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# Synergies and Differences between Biodiversity, Nature, Water and Marine Environment EU Policies

## Deliverable 2.1

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| | |
|---|---|
| AF | Assessment Framework |
| BD | Birds Directive |
| CAP | Common Agricultural Policy |
| CBD | Convention on Biological Diversity |
| CF | Cohesion Fund |
| CFP | Common Fisheries Policy |
| CICES | Common International Classification of Ecosystem Services |
| CIS | Common Implementation Strategy |
| DPS | Drivers- Pressures- State |
| EAFRD | European Agricultural Fund for Rural Development |
| EBM | Ecosystem-based Management |
| EC | European Commission |
| EEA | European Environment Agency |
| EIA | Environmental Impact Assessment |
| EMFF | European Maritime and Fisheries Fund |
| ERDF | European Regional Development Fund |
| FCS | Favourable Conservation Status |
| GES | Good Environmental Status |
| HD | Habitats Directive |
| IAS | Invasive alien species |
| MAES | Mapping and Assessment of Ecosystems and their Services |

| | |
|---|---|
| MPAs | Marine Protected Areas |
| MSCG | Marine Strategy Coordination Group |
| MSFD | Marine Strategy Framework Directive |
| MSY | Maximum Sustainable Yield |
| Mt | million tonnes |
| PoMs | Programme of Measures |
| RBD | River Basin District |
| RBMPs | River Basin Management Plans |
| RDPs | Rural Development Programmes |
| SACs | Special Areas of Conservation |
| SCI | Sites of Community Interest |
| SDGs | Sustainable Development Goals |
| SEA | Strategic Environmental Assessment |
| SPAs | Special Protection Areas |
| WFD | Water Framework Directive |
| WP | Work Package |

# About AQUACROSS

Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies (AQUACROSS) aims to support EU efforts to protect aquatic biodiversity and ensure the provision of aquatic ecosystem services. Funded by Europe's Horizon 2020 research programme, AQUACROSS seeks to advance knowledge and application of ecosystem-based management (EBM) for aquatic ecosystems to support the timely achievement of the EU 2020 Biodiversity Strategy targets.

Aquatic ecosystems are rich in biodiversity and home to a diverse array of species and habitats, providing numerous economic and societal benefits to Europe. Many of these valuable ecosystems are at risk of being irreversibly damaged by human activities and pressures, including pollution, contamination, invasive species, overfishing and climate change. These pressures threaten the sustainability of these ecosystems, their provision of ecosystem services and ultimately human well-being.

AQUACROSS responds to pressing societal and economic needs, tackling policy challenges from an integrated perspective and adding value to the use of available knowledge. Through advancing science and knowledge; connecting science, policy and business; and supporting the achievement of EU and international biodiversity targets, AQUACROSS aims to improve ecosystem-based management of aquatic ecosystems across Europe.

The project consortium is made up of sixteen partners from across Europe and led by Ecologic Institute in Berlin, Germany.


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# 1 Introduction

## 1.1 The AQUACROSS project

Aquatic ecosystems are rich in biodiversity and home to a diverse array of species and habitats that are vital to Europe's economic and social well-being. Many aquatic ecosystems are currently at significant risk of being irreversibly damaged by human activities and by the numerous pressures these create, including pollution, contamination, invasive species, and overfishing, as well as climate change. To combat these pressing challenges and build resilience to these pressures, the EU is taking action on multiple fronts to safeguard the status of aquatic ecosystems and their biodiversity, as illustrated by the implementation of the Birds and Habitats Directives (BD, HD), the Water Framework Directive (WFD), the Marine Strategy Framework Directive (MSFD), and the EU 2020 Biodiversity Strategy. However, despite progress, EU directives have been unable to halt and reverse the trend of declining biodiversity of aquatic ecosystems. Actually, biodiversity is declining worldwide, and at a much faster rate in aquatic than in most terrestrial systems (Vaughn, 2010).

AQUACROSS aims to support EU efforts to enhance the resilience and stop the loss of biodiversity in aquatic ecosystems, as well as to ensure the ongoing and future provision of aquatic ecosystem services. The project focuses on advancing the knowledge base and application of the ecosystem-based management (EBM) concept for aquatic ecosystems by developing cost-effective measures and integrated management practices. AQUACROSS has four key objectives:

- To support the coordinated implementation of the EU 2020 Biodiversity Strategy and international biodiversity targets for an improved functioning of aquatic ecosystems as a whole;
- To explore, advance and support the implementation of the EBM concept across aquatic ecosystems in the EU and beyond for the purposes of enhancing human well-being;
- To specifically identify and test robust, cost-effective and innovative management and business models and tools for seizing all the opportunities offered by aquatic ecosystem services that correspond to the objectives and challenges faced by stakeholders, businesses, and policy-makers; and,
- To mobilise policy-makers, businesses, and societal actors at global, EU, Member State, and case study levels in order to learn from real-world experiences aligned to EU policy implementation and to co-build and test assessment frameworks, concepts, tools, management approaches, and business models, to ensure end-users' uptake of project results.

## 1.2 Policy orientation in AQUACROSS

Understanding and framing existing and proposed policy processes is required to ensure the relevance of the AQUACROSS findings to inform and provide concrete advice on the future implementation process of biodiversity protection targets for aquatic ecosystems. The "Policy Orientation" Work Package (WP) within the AQUACROSS project identifies and explores how specific features of the existing nature, water, and marine policies can be coordinated in an integrated framework that specifically addresses the EU 2020 Biodiversity Strategy targets. This will also include the review of accompanying policy documents, the efforts of the EU Common Implementation Strategy (CIS) of the WFD and the MSFD, identifying operational objectives, concepts, and terminology, and experiences with implementing policies (from case studies), to inform all other parts of AQUACROSS. This exercise identifies and highlights the synergies, barriers and opportunities between water-, marine- and nature-relevant policies for more effective implementation of environmental protection policies across aquatic ecosystems in Europe. This will result in the streamlining of approaches, leading to the implementation of integrated EBM approaches for aquatic ecosystems.

The overall aim of WP2 "Policy Orientation" is to provide policy direction for all research within AQUACROSS. Specific objectives (from the Description of Action) include:

- Determine the extent of existing and planned EU policies and laws to achieve and/or hinder EU and international biodiversity targets.
- Determine coherence and/or incoherence of current environmental protection policies affecting the management of aquatic ecosystems.
- Establish a common language for nature, freshwater, coastal and marine environmental protection policies to collectively achieve the EU 2020 Biodiversity Strategy targets.
- Identify end-user needs in terms of data and information systems, as well as lessons learned with fulfilling policy requirements for data.
- Synthesise the insights gained from AQUACROSS for practitioners and policy-making.

## 1.3 Objectives of the report

The findings of this report are primarily targeted at the AQUACROSS consortium to frame their research in policy. However, policy lessons are also drawn that can be useful for EU policy-makers. Thus, this deliverable contributes to the achievement of the first three objectives of WP2 (see previous section). It aims to establish a common language (within the project) for nature, freshwater, coastal and marine environmental protection policies to collectively achieve the EU 2020 Biodiversity Strategy targets. Furthermore, it aims to:

- Determine how EU policies and laws contribute to achieve and/or hinder EU and international biodiversity targets.

- Determine the coherence and/or incoherence of current environmental protection policies affecting the management of aquatic ecosystems.

This report aims to identify the main international and European level policy drivers affecting biodiversity conservation targets (negatively or positively). In addition, synergies, opportunities and barriers between the specific operational features of existing environmental and related sectoral policies in Europe that are specifically relevant for the protection of aquatic ecosystems are identified. The findings from this top-down analysis will be applied as recommendations for further research in the project and the conclusions serve to identify further research questions that will be investigated in future deliverables of the project through a bottom-up approach in the AQUACROSS case studies. These different levels of analysis (i.e. top-down assessment presented in this report and bottom-up analysis carried out in case studies) will help with the identification of critical implementation challenges where the higher strategic policy level meets on-the-ground implementation activity and the identification of innovative solutions for policy coordination.

In addition to this deliverable, D2.2 provides an inventory and assessment of data and information systems stemming from relevant EU policy initiatives. Finally, D2.3 will provide further insights gained from AQUACROSS case studies on the practical implementation of EBM, so as to provide policy-relevant information guiding EBM operationalisation for the achievement of the EU biodiversity targets in aquatic ecosystems.

## 1.4 Content and structure of the report

In order to achieve the objectives presented in the previous section, this deliverable compiles three types of analysis.

Firstly, key environmental policies protecting biodiversity in freshwater, coastal and marine realms were reviewed to characterise existing general and specific objectives with regards to aquatic biodiversity relevant for the achievement of the EU biodiversity Strategy. The assessment also considered the extent to which these European policies are achieving their individual goals. The analysis contributes to determine *how much* EU policies and laws contribute to achieve and/or hinder EU and international biodiversity targets. It also helps delimit the main environmental targets as to what the current policy view is of a healthy aquatic ecosystem across the freshwater, coastal and marine continuum. This information is useful for the definition of environmental targets in AQUACROSS case studies.

Secondly, a large number of European policies were reviewed to identify how they positively or negatively influence aquatic biodiversity and its protection. This analysis helps determine *how* EU policies and laws contribute to achieve and/or hinder EU and international biodiversity targets. It also contributes to establish some conclusions on whether European policy has a synergistic or conflict mix of instruments to address the main problems facing aquatic biodiversity and whether gaps in policy exist. This analysis focused on an integrated analysis of six key “threats” to aquatic biodiversity. The threats were selected to present a varied and representative range of pressures affecting the aquatic environment. The impact

of policies was then mapped out against each threat using a core concept of the AQUACROSS project –the DPSIR framework.[1]

The information from this analysis is useful for AQUACROSS case studies by providing a comprehensive list of European policies and their instrument, and a tested methodological approach to carry out the policy characterisation of key threats in case studies. A number of synergies, conflicts and gaps in the European policy framework, that can be further examined in case studies (e.g. best practice in reducing conflicts or filling gaps), are highlighted.

Thirdly, the key environmental policies protecting aquatic biodiversity in freshwater, coastal and marine realms were further reviewed to examine the degree to which they can work synergistically or antagonistically for the implementation of EBM.[2] EBM is the core concept of AQUACROSS which points towards the use of specific measures focused on the enhancement and restoration of ecosystem processes and functions. EBM represents a functional management approach for enhancing the protection of biodiversity, and thus is a useful concept to assess how existing environmental policies work together to protect biodiversity.

The assessment is structured around six key policy-relevant principles defining EBM. This analysis contributes to evaluate the possible future use of EBM as an integrative policy concept for the safekeeping and protection of aquatic biodiversity. It also provides some conclusions on the coherence and/or incoherence of current environmental protection policies affecting the management of aquatic ecosystems.

Information from this analysis includes the supporting elements, barriers and gaps for the coordinated implementation of key environmental policies in the implementation of EBM, which is useful for the definition and testing of management options in AQUACROSS case studies.

This report is structured in the following way:

- Chapter 2 sets the scene with an introduction of the Biodiversity Strategy and a brief summary of EU policies that are relevant for the protection of aquatic biodiversity, including international policy frameworks. The current state of knowledge on policy integration is briefly assessed.

[1] Looking across several policy frameworks and finding synergies and conflicts requires a systemic view on the way policies manage or impact ecological and social systems. The Drivers-Pressures-State-Impact-Responses (DPSIR) framework can help categorise threats to aquatic biodiversity along a defined causal chain, including natural and human Drivers and Pressures leading to changed State in aquatic biodiversity and associated ecological, social and economic Impacts. Following that causal chain, Responses aim to reduce Impacts by acting on Drivers, Pressures or State.

[2] The AQUACROSS concept identifies EBM as a range of activities that involves: i) moving away from flagship species, hotspots, single pressures etc to become more holistic and comprehensive; ii) consider more systematically trade-offs and co-benefits between policies and across environmental, social and economic domains; iii) maximising the value of natural assets and the joint value of all flows of ecosystem services; and iv) expanding the choice of measures to strengthen social abilities and the maintenance of ecosystem processes and functions (and thereby build overall resilience).

- Chapter 3 presents the overview of the current situation towards the achievement of the environmental objectives of the nature, water and marine Directives in Europe.
- Chapter 4 presents the integrated assessment of EU policies for the protection of aquatic biodiversity against the six key threats. The chapter begins by presenting the methodological approach of the assessment, followed by an analysis of policies positively influencing aquatic biodiversity and then of those negatively influencing.
- Chapter 5 presents the coherence of key EU environmental policies for the implementation of ecosystem based management. The chapter begins by presenting the methodological approach of the assessments, followed by an analysis of the EU Habitats and Birds Directives, followed by the WFD and MSFD.
- Chapter 6 synthesises the key conclusions stemming from the policy analysis in Chapters 3 to 5 , and presents some recommendations for further AQUACROSS research.
- Chapter 7 presents a framework to guide the further policy analysis in AQUACROSS case studies.

# 2 Setting the Scene for the Analysis

This chapter presents a brief overview of the key EU environmental policies that can support the achievement of the EU Biodiversity Strategy in the freshwater, coastal and marine realms. It then highlights the wide range of international and EU policies relevant for aquatic biodiversity conservation, and our current state of understanding with regards to the coherence of the policy framework.

## 2.1 Key EU policies for the protection of aquatic biodiversity

The EU 2020 Biodiversity Strategy (EC, 2011) aims to implement the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets (CBD-UNEP, 2010 and 2013). This strategy identifies six targets that cover the main factors driving biodiversity loss and aim to reduce existing pressures on nature. These are, in summary, (EC, 2014):

- **Target 1**: conserving and restoring nature through better application of the Birds and Habitats Directives with the goal of halting biodiversity loss and restoring biodiversity by 2020.
- **Target 2**: maintaining, enhancing and restoring (15% as minimum by 2020) ecosystems and their services, by integrating green infrastructure into land-use planning.
- **Target 3**: ensuring the sustainability of agriculture and forestry through enabling existing funding mechanisms to assist in the application of biodiversity protection measures.
- **Target 4**: ensuring sustainable use of fisheries resources by 2015 with the goal of achieving MSFD targets by 2020.
- **Target 5**: combating invasive alien species.
- **Target 6**: addressing the global biodiversity crisis and meeting international biodiversity protection obligations.

The EU Biodiversity Strategy is translated into action in aquatic realms through a complex array of environmental policies and laws, including the MSFD, WFD, Birds and Habitats Directives (the "nature directives"), and the Invasive Alien Species (IAS) Regulation, as well as a number of sectoral policies, such as the Common Agricultural Policy (CAP).

The "Mid-term Review of the EU Biodiversity Strategy to 2020", which has been published by the European Commission (EC) in October 2015, takes stock of progress made towards the strategy's targets and actions since it was adopted in 2011. Whilst the report recognises

some improvement in the knowledge base generated and the achievement in the development of some policy frameworks, in relation to the key target of the Strategy, the review concludes that "at the current rate of implementation, biodiversity loss and the degradation of ecosystem services will continue throughout the EU" (EC, 2015). This fact is illustrated by the comparison of current data observations and the EU 2010 biodiversity baseline indicators (EC, 2015). The review identifies three main reasons for this failure: i) the weak level of implementation and enforcement efforts by Member States, ii) the need for more effective integration of relevant policies, and iii) the setting of "coherent priorities underpinned by adequate funding" (EC, 2015a). So despite some progress and effort, EU directives have, as of yet, not been able to halt and reverse the trend of declining biodiversity in aquatic ecosystems.

The European environmental policy framework for the protection of aquatic biodiversity in Europe is extensive. In Box 1 below, the BD, HD, WFD and MSFD, which are the pillars of the framework, are introduced.

### Box 1: Introducing the European Nature, Water and Marine Directives

***The Birds and Habitats Directives***

The EU adopted the Birds Directive (BD) (79/147/EC) in April 1979 with the objective to commit to the protection of all wild bird species naturally occurring within the EU. The Habitats Directive (HD) (92/43/EEC) was amended in May 1992 with the objective to conserve natural habitats and wild fauna and flora in the European territory of the Member States to which the treaty applies. Precisely, the EU BD and HD require the Member States to implement two main sets of provisions. The first set of measures requires Member States to establish a strict protection regime for all wild European bird species and other endangered species listed in Annex IV of the HD, both inside and outside protected sites. The second set requires the designation of core sites for the protection of species and habitat types listed in Annex I and II of the HD and Annex I of the BD, as well as for migratory birds. Together, these designated sites form part of a coherent ecological network of nature areas, known as the European Natura 2000 Network. The provisions of these Directives require Member States to introduce a range of further measures, including the undertaking of surveillance of habitats and species and the reporting on the implementation of the Directives every six years, including assessment of the conservation status of species and habitats listed in the Annexes to the Directives.

***The Water Framework Directive***

The EU Water Framework Directive (WFD) (2000/60/EC) was adopted in the year 2000 with the aim to promote long-term sustainable water management based on a high level of protection of the aquatic environment. All rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile (12 nautical miles for chemical status) all fall within the scope of the WFD. These waters are divided into units called water bodies. The WFD set ambitious environmental targets, aiming for "good status" of all freshwater, transitional and coastal water bodies, and for groundwater, by 2015, and introduces the principle of preventing any further deterioration of status. There follow a number of exemptions to the general objectives that allow for less stringent objectives, extension of deadline beyond 2015, or the implementation of new projects, provided a set of conditions are fulfilled. The directive requires Member States to identify river basins in their territories, assign responsible authorities, assess and monitor the status of the river basins and produce and implement river basin management plans

(RBMPs) to fulfil the objective of the directive.

*The Marine Strategy Framework Directive*

The European Commission adopted the Marine Strategy Framework Directive (MSFD) (2008/56/EC) in 2008 with the objective to protect and preserve the marine environment, prevent its deterioration and restore the environment in areas where it has been adversely affected. The MSFD aims to achieve or maintain 'good environmental status' (GES) in the waters concerned by 2020, while accommodating the existing Community and international requirements and the needs of the marine region or sub-region concerned. GES is defined by the MSFD as the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable. The MSFD covers marine waters within the sovereignty or jurisdiction of Member States as well as the seabed and subsoil. Each Member State is obliged to develop a Programme of Measures (PoM) in order to meet the objective of GES of the MSFD.

## 2.2 A complex policy landscape

### 2.2.1 EU policies and global goals

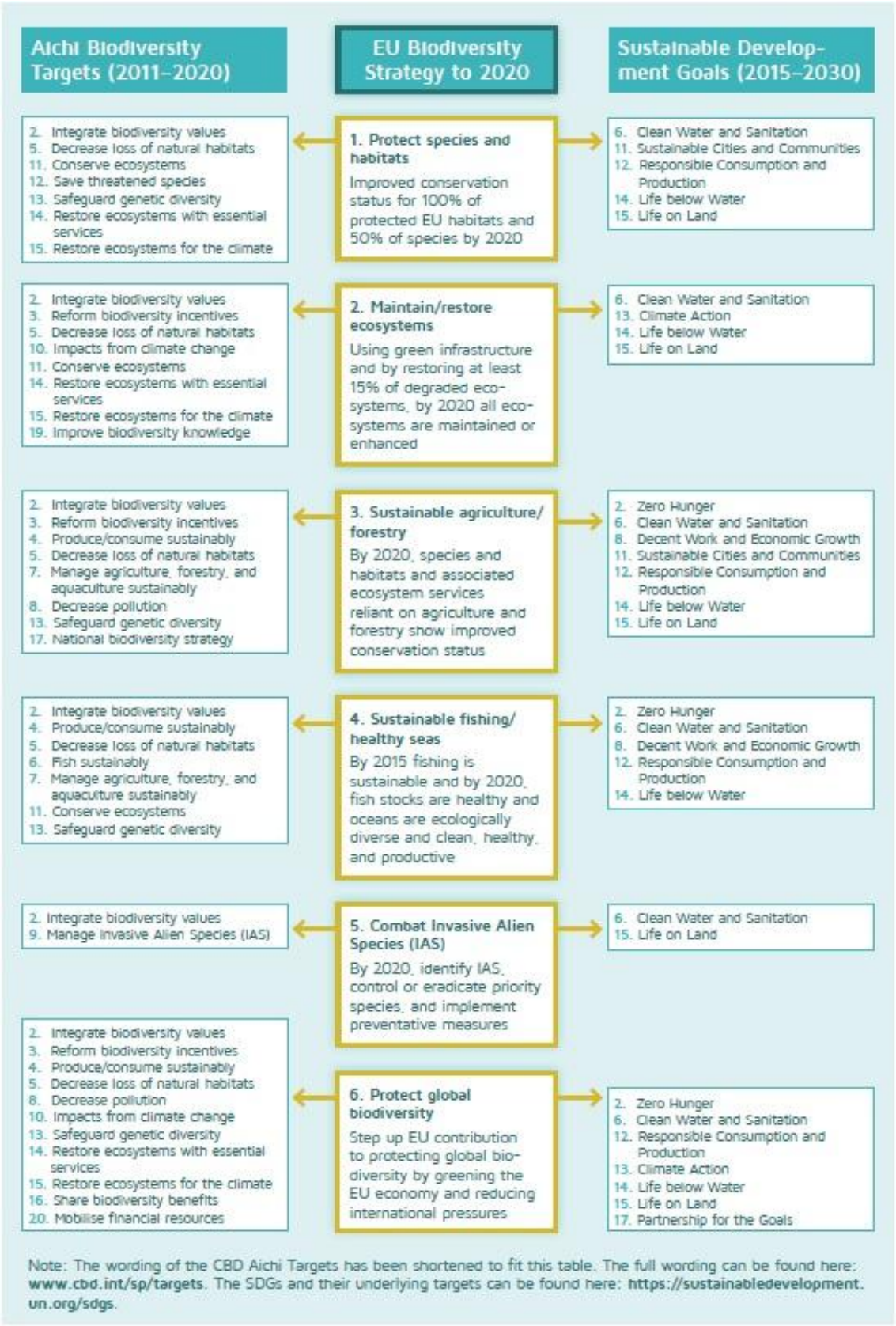
International and European policy have agreed set targets for the protection of ecosystems and biodiversity. At the international level, efforts are coordinated by the Convention on Biological Diversity (CBD), the main objective of which is to promote the development of national strategies for the conservation and sustainable use of biological diversity, mainly through Art. 6, 7, 10, and 17, at national and European levels. Further efforts include a host of relevant protocols (e.g. Cartagena Protocol on Biosafety; Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation) and conventions (e.g. Convention on International Trade in Endangered Species; Bonn Convention on Migratory Species; Bern Convention on the Conservation of European Wildlife and Natural Habitats).

By considering common policy goals, data streams, objectives, and definitions, existing EU policy frameworks could potentially be better streamlined to contribute more purposefully to meet global initiatives. The EU Biodiversity Strategy establishes six targets to halt the loss of biodiversity and ecosystem services. As shown in Figure 1 below, the EU biodiversity policy is closely aligned with international goals. The figure was constructed by conducting a crosswalk exercise and matching the six headline EU Biodiversity Targets (and their twenty specific actions) with the CBD's Aichi Targets and the Sustainable Development Goals (SDGs) of the 2030 Agenda (and their 169 specific targets) based on keywords. For example, EU Biodiversity Target 5 *Combat Invasive Alien Species* aims under action 15 to, "provide a legal framework to fight invasive alien species" within its lifetime of 2011 – 2020. This can be considered a close match for Aichi Biodiversity Target 9: "By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment," and Target 15.8 of the 15th SDG, *Life on Land*, which states that "by 2020, introduce

measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species." While some of the links between overarching targets and goals displayed are easy to identify, for others it is necessary to go to the action or specific target level to see the link.

The UN SDGs represent an ambitious plan to reach a sustainable future by 2030. They also show that biodiversity is not simply an environmental goal, but also essential to social and economic ambitions. The CBD Aichi Biodiversity Targets also recognise biodiversity for a sustainable future – both as a means and a goal. Similarly, the EU has identified biodiversity in freshwater, coastal, and marine ecosystems, amongst others, as of great significance and at risk of being irreversibly damaged. The EU's goals are formulated in the 2020 Biodiversity Strategy, which seeks to address the main factors driving biodiversity loss and to reduce existing pressures on nature.

Figure 1: Direct Links between the EU Biodiversity Strategy and International Biodiversity Objectives




Note: The wording of the CBD Aichi Targets has been shortened to fit this table. The full wording can be found here: **www.cbd.int/sp/targets**. The SDGs and their underlying targets can be found here: **https://sustainabledevelopment.un.org/sdgs**.

### 2.2.2 A brief overview of EU policies relevant for the protection of aquatic biodiversity

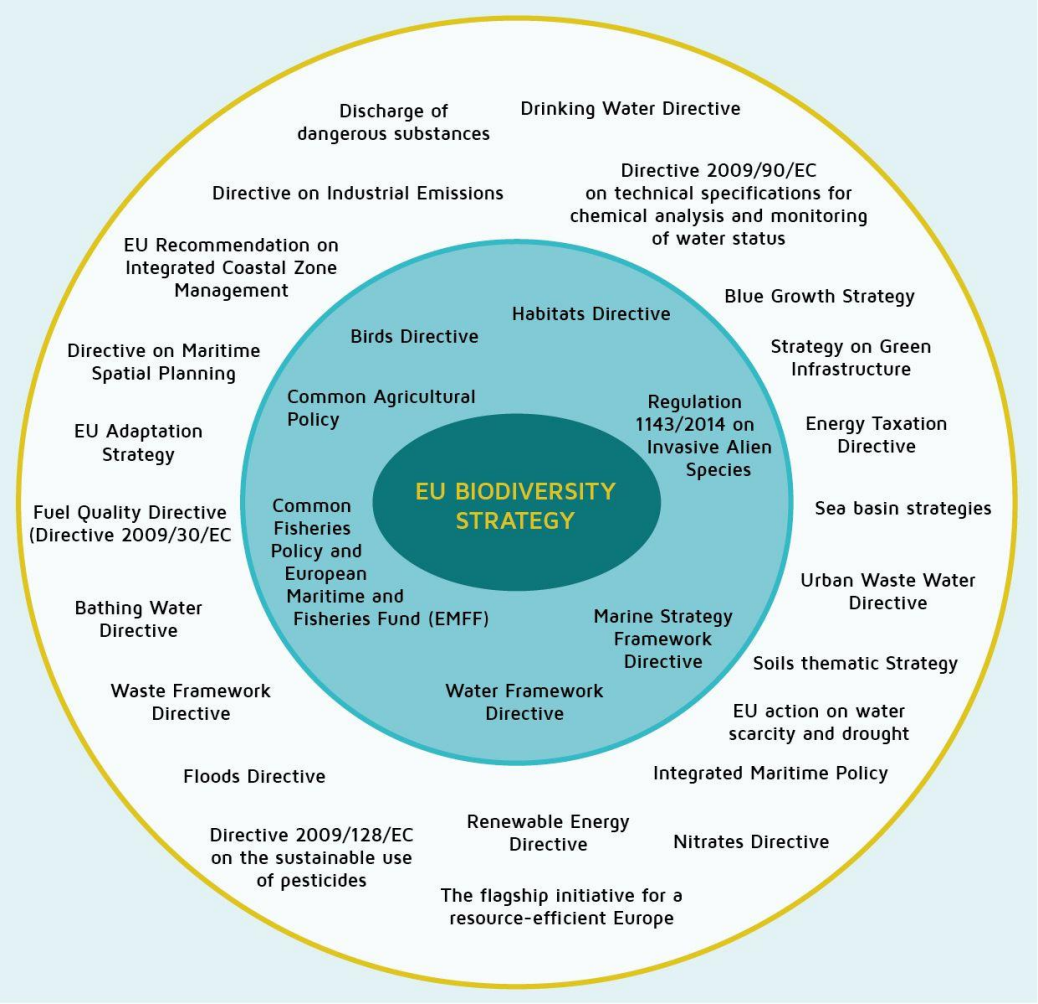
A large number of other European policies can directly or indirectly impact aquatic biodiversity. Such policies may include "emission control" policies, such as the Nitrates Directive (91/676/EEC) or the Urban Wastewater Directive (91/271/EEC), "sectoral" policies, such as the CAP or the Common Fisheries Policy (CFP) (380/2013), and general "growth" and infrastructure development policies, such as transport policies or cohesion and structural funds. One of the first activities in WP2 was, thus, to identify and characterise existing European policies relevant to the achievement of EU 2020 Biodiversity Strategy in aquatic ecosystems. The objective was to understand relevant EU policies, their objectives and implementation logic, as well as to identify what should be considered in more detail in further analysis for this report.

The review work focused on key EU pieces of legal documents, including Regulations, Directives, and Decisions (Annex 1 illustrate an overview of the different EU legal Acts). These are binding instruments.[3] Where directly relevant to the protection of EU aquatic biodiversity, some non-binding EU instruments, such as Communications, Recommendations and Opinions, were also considered. They were identified initially through a web-search on the EU Commission website and expert knowledge. Each of the identified policies was analysed by experts within AQUACROSS using a review template (Annex 2 and individual policy review templates are provided in Annex 3).

Figure 2 illustrates the range of policies influencing the achievement of the EU Biodiversity Strategy in aquatic environments. The inner core includes those EU policies directly mentioned in the EU Biodiversity Strategy; the outer core is additional policies identified by the initial review work. The figure illustrates well the complexity of the policy framework.

[3] Member States have primary responsibility for the correct and timely application of EU Treaties and legislation, and the Commission monitors the application of Union law. The Commission may take action if a Member State fails to incorporate EU directives into its national law and to report/communicate to the Commission what measures it has taken; or is suspected of breaching Union law. If no solution can be found at an early stage, the Commission can open formal infringement proceedings and eventually refer the Member State to the European Court of Justice.

Figure 2: Initial policy review: inner and outer core of considered policies relevant for the achievement of the targets of the 2020 EU Biodiversity Strategy




### 2.2.3 Integration and coordination between EU policies: state of knowledge

As highlighted in the 7th Environmental Action Plan of the EU and recent policy developments, future European environmental policy will aim to strengthen implementation and enforcement while ensuring "value for money" through more integrated approaches. The coordination between EU environmental policies is key to improve the effectiveness and efficiency of the European environmental policy framework, i.e. ensuring targets are met while reducing implementation costs. A preliminary and non-exhaustive review of available material on the integration and coordination of relevant European policies was performed. The list of relevant reports can be found in Table 1.

Table 1: Links to major assessments and national reports for the main EU policies relevant to the policy gap analysis

| Policy | Sources |
|---|---|
| **Biodiversity Strategy** | • Mid-term review of the EU's Biodiversity Strategy: European Parliament resolution of 2 February 2016 on the mid-term review of the EU's Biodiversity Strategy (2015/2137(INI))<br>• Report from the Commission to the European Parliament and the Council: The Mid-Term Review of the EU Biodiversity Strategy to 2020<br>• Mid-term review of the EU biodiversity strategy to 2020 EU assessment of progress towards the targets and actions |
| **BD and HD** | • Habitats Directive reporting (information page and links)<br>• The State of Nature in the European Union: Report on the status of and trends for habitat types and species covered by the Birds and Habitats Directives for the 2007-2012 period as required under Article 17 of the Habitats Directive and Article 12 of the Birds Directive<br>• European Environment Agency's "State of Nature in the EU" Technical Report No 2/2015<br>• Web tool on biogeographical assessments of conservation status of species and habitats under Article 17 of the Habitats Directive<br>• Member State National Summaries for Article 17 of the Habitats Directive (2007-2012)<br>• Birds Directive reporting (information page and links)<br>• Reporting under Article 12 of the Birds Directive (period 2008-2012): *Member State Deliveries*<br>• Fitness check of the Habitats and Birds Directive |
| **WFD** | • WFD Implementation reports (information page and links)<br>• Links to the official WFD implementation web sites of the EU Member states<br>• River basin Management Plans for the WFD and the Floods Directive<br>• Fitness check of EU water policy |
| **MSFD** | • Reporting for the Marine Strategy Framework Directive (information page)<br>• The first phase of implementation of the Marine Strategy Framework Directive (2008/56/EC): The European Commission's assessment and guidance<br>• JRC In-Depth Assessment of the EU Member States' Submissions for the MSFD under articles 8, 9 and 10<br>• Report from the Commission to the European Parliament and the Council on the progress in establishing marine protected areas (as required by Article 21 of the Marine Strategy Framework Directive 2008/56/EC |
| **Integrative assessments** | • Joint Directors' Meeting. A starter's guide: Overview on the main provisions of the BD, HD, WFD and MSFD: similarities and differences. November 2015. Draft 3-REV<br>• EC Links between the WFD and the Nature Directives. Frequently Asked Questions. DG Environment.<br>• European Environment Agency Presentation of WFD and Nature Directives.<br>• Links between the MSFD and the Nature Directives<br>• Overview of the Potential Interactions and Impacts of Commercial Fishing Methods on Marine Habitats and Species Protected under the EU Habitats Directive<br>• EC Guidance on Aquaculture and Natura 2000. Sustainable aquaculture activities in the context of the Natura 2000 Network.<br>• EC Guidance document on Inland waterway transport and Natura 2000: Sustainable inland waterway development and management in the context of the EU Birds and Habitats Directives.<br>• EC Guidance on how to support Natura 2000 farming systems to achieve conservation objectives, based on Member States good practice experiences.<br>• EC Guidance document on eutrophication assessment in the context of European water policies. Common Implementation Strategy. |

First conclusions highlight that there is a growing policy interest in the topic of policy coordination for the achievement of biodiversity targets in aquatic realms. Specifically, there are several recent attempts to examine and identify linkages between biodiversity and aquatic

policies, the most recent being the document prepared in view of the Nature, Biodiversity, Marine and Water Joint Director's meeting that took place in November 2015. The document intends to give a quick overview to everyone who wants to understand the commonalities and differences of the directives.

There exist in-depth assessments between e.g. the WFD and HD/BD (EC, 2011a; EEA, undated) and the MSFD and HD/BD (EC, 2012). There are also specific assessments between sectors and biodiversity protection, such as between commercial fishing methods and protected marine habitats and species. Guidance material also exists on the linkages between sectors and Natura 2000 requirements: aquaculture, inland waterways transport, farming and climate change. However, the above-mentioned in-depth assessments usually focus on bilateral linkages.

One first attempt to take a more systemic approach to assessing linkages across relevant policies is the WFD CIS guidance on eutrophication, which i) provides an overall conceptual framework for the assessment of eutrophication, ii) an assessment of common understanding of eutrophication in EU and international policies (including cross-comparative analysis of concepts and definitions, key terms, assessment results and class comparison), and iii) an overview of current eutrophication assessment methodologies and criteria in European countries (looking specifically at lakes, rivers, transitional, coastal and marine waters). The guidance takes a bias in that it uses the WFD concept of ecological status in the context of eutrophication as the reference point for the setting of propositions for the harmonisation of classification criteria and monitoring.

## 2.3 Conclusion: scope of the AQUACROSS policy review

The preliminary review presented in this chapter illustrates the complex and fragmented nature of European environmental policy for the protection of aquatic biodiversity and our limited understanding on their synergies and conflicts. The following three chapters examine European policies for the protection of aquatic biodiversity through three angles: first, by reviewing in detail relevant existing environmental targets and their achievement, second, by reviewing the range of policy instruments influencing (positively and negatively) aquatic biodiversity, and third, by reviewing the synergies and barriers between key environmental EU legislation for the implementation of EBM.

# 3 EU Environmental Targets and the Status of European Waters

This chapter presents an overview of the current European policy objectives with regards to aquatic biodiversity protection, and their linkages with the achievement of the EU Biodiversity Strategy. It also provides an assessment of the extent to which European policies that contribute to protect biodiversity across freshwater, coastal and marine realms are achieving their specific individual goals. The information presented in this chapter should help delimit what the current policy view is of a healthy aquatic ecosystem across the freshwater, coastal and marine continuum, and related environmental targets.

The assessment presented in this chapter considers that the objectives of the EU Biodiversity Strategy strongly rely on the nature, water and marine Directive's own successes, more specifically the nature directives, the WFD and the MSFD. The review focused on status assessments based on relevant EC, European Environment Agency (EEA) and other European-wide reports.

## 3.1 Relevant policy objectives

Overall, the EU Biodiversity Strategy has six targets, but fails to provide clear environmental objectives for the purposes of managing aquatic ecosystems. For example, the Strategy states that Member States should restore 15% of degraded ecosystems by 2020, but there are no clear objectives in how to do so or what constitutes a 'restored' ecosystem. Though these targets set forth overarching objectives that are flexible enough to allow Member States the freedom to implement them in various ways (i.e. suitable for EU-level), they fail to provide measurable objectives for local administrators and managers of these systems (i.e. at the local-level). In addition, the target is set for all ecosystem types, including land and aquatic ones, meaning that there is no requirement to achieve the target for aquatic ecosystems.

The nature directives, WFD and MSFD each contain their own goals and objectives (Table 2). With these four directives, the European policy framework provides for clear environmental targets for aquatic ecosystems in all water realms (i.e. achieving favourable conservation status, maintain bird populations including those dependent on wetlands, good status for all freshwater, transitional and coastal waters, good environmental status for marine waters). The directives also include objectives in terms of reducing specific pressures (e.g. introduction of invasive alien species, emissions of pollutants) and implementing specific measures (e.g. implementation of protected areas, combined approach to pollution emission control).

Many of the objectives from the four key environmental directives can support the achievement of the EU Biodiversity Strategy targets in aquatic ecosystems. As Table 3

illustrates, direct and clear linkage exists in Target 1 since the implementation of the nature directives is part of the Biodiversity Strategy objectives. Other objectives of the nature directives, WFD and MSFD will contribute more or less indirectly. For example, marine strategies will apply an ecosystem-based approach to maintain marine ecosystems and their services, which is closely aligned with Target 2 of the Biodiversity Strategy. The link between Target 3 on increasing the contribution of agriculture and forestry to maintaining and enhancing biodiversity is perhaps the weakest since the environmental directives compete with other EU policies (e.g. CAP) to regulate and influence agricultural activities

Table 2: Goals and objectives of the main EU environmental directives relevant to aquatic ecosystems

| | HD | BD | WFD | MSFD |
|---|---|---|---|---|
| **Main protected subjects** | Natural habitats and wild flora & fauna of Community interest | All naturally occurring wild birds (including their eggs, nests and habitats) | Inland surface waters, transitional and coastal waters and groundwater | Marine waters including coastal waters, seabed and subsoil |
| **Goals** | Contribute to biodiversity through conservation of natural habitats and of wild fauna and flora | Conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States | Protection and improvement of inland surface waters, transitional and coastal waters and groundwater | Achieve / maintain GES in the marine environment |
| **Objectives** | - Maintain / restore favourable conservation status (FCS) of relevant habitats and species throughout their natural range<br>- Designate Special Areas of Conservation (SACs) for the conservation of relevant species<br>- Management of features of the landscape which are of major importance for relevant species<br>- Regulation of deliberate introduction into the wild of non-native species so as to prejudice relevant habitats and species<br>- Avoid deterioration of relevant habitats and disturbance of relevant species in Natura 2000 sites (Special Areas of Conservation [SACs] and the BD's Special Protection Areas[SPAs]) | - Maintain / adapt the population of wild birds to a certain level (corresponding to ecological, scientific, cultural, economic and recreational requirements)<br>- Designate Special Protection Areas (SPAs) for the conservation of relevant species<br>- Regulate that any introduction of species of bird which do not occur naturally in the wild state does not prejudice the local flora and fauna<br>- Preserve, maintain or re-establish a sufficient diversity and area of habitats for all relevant species of birds | <u>For surface waters</u>:<br>- Prevent deterioration of surface water bodies<br>- Protect, enhance and restore surface water bodies to achieve good status<br>- Protect and enhance artificial and heavily modified surface water bodies to achieve good ecological potential and good surface chemical status<br>- Reduce pollution from priority substances / phase out emissions, discharges and losses of substances<br>- Ensure that discharges into surface waters are controlled according to a combined approach<br><u>For protected areas</u>:<br>- Achieve compliance with standards and objectives under protected area legislation<br>- Establish a register of protected areas lying within RBDs<br>*There are other detailed objectives for groundwater and drinking water | - Ecosystems function fully<br>- Ecosystems are resilient to human-induced environmental change<br>- Species & habitats are protected, biodiversity loss prevented<br>- Ecosystem properties support the ecosystems<br>- Anthropogenic inputs do not cause pollution<br>- Achieve qualitative descriptors used for determining GES: biological diversity, non-indigenous species, commercially exploited fish and shellfish, food webs, eutrophication, sea floor integrity, hydrographical conditions, contaminants, contaminants in fish and seafood, marine litter and energy including underwater noise |

*Source: JDM (Joint Directors' Meeting) (2015). A starter's guide: Overview on the main provisions of the Birds and Habitats Directives, the Water Framework Directive and the Marine Strategy Framework Directive: similarities and differences. November 2015. Draft 3-REV*

Table 3: How far do EU policies contribute to the individual targets of the Biodiversity Strategy?

| | BD | HD | WFD | MSFD |
|---|---|---|---|---|
| **Target 1 -Fully implement the Birds and Habitats Directive** | Implementing the Birds Directive is part of the target. | Implementing the Habitats Directive is part of the target. | The WFD supports the implementation of the Birds and Habitats Directives (BHD) by integrating their protected areas and their conservation measures in its management plans. Protecting and enhancing the ecological status of water bodies contributes also to the BHD targets outside of Natura 2000 sites. | The protection of marine species and habitats is an explicit aim of the MSFD. |
| **Target 2 - Maintain and restore ecosystems and their services** | The BD aims at maintaining and restoring populations of bird species and their habitats. This is closely aligned with this target*. However, focusing only on selected bird species, the scope remains limited. | The aims of the HD to maintain and restore habitats and species populations are closely aligned with this target*. However, the HD promotes species and habitats conservation in their own rights, and not based on human benefits. | The WFD aims at reaching good status for all water bodies and does not allow a deterioration of the current status. This is in line with and contributes to reaching this target, although tradeoffs can exist between individual ecosystem services. | Marine strategies shall apply an ecosystem-based approach and maintaining ecosystems and their services is a general aim of the directive. |
| **Target 3 - Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity** | Protected bird species depending on agricultural activities or living in forests require conservation activities in these sectors. This increases the contribution of the sectors to the protection of biodiversity. | Part of the protected species or habitats depend on agricultural activities or forests. The required conservation activities increase the contribution of these sectors to the protection of biodiversity. | The link to forestry is limited, but agricultural pressures are addressed. With measures limiting the use of nutrients and pesticides, the WFD contributes to the conservation of agriculture-dependent biodiversity and of aquatic biodiversity which is affected by | There is no link to forestry. There is a small link to agriculture, through the management of pollutants coming from it; in particular in coastal areas. |

| | | | | |
|---|---|---|---|---|
| | | | diffuse pollution. | |
| **Target 4 – Ensure the sustainable use of fisheries resources** | No direct impact. | No direct influence on the management of fish stocks. But the designation of marine Natura 2000 sites (which may support the recovery of depleted fish stocks) and pollution control measures may lead to indirect benefits*. | No direct impact. Pollution control measures might lead to indirect impacts. | The target itself makes reference to the objective of the MSFD. |
| **Target 5 – Combat Invasive Alien Species** | The BD addresses alien species as far as they threaten the protected bird species. | The HD requires "measures to be taken to prevent the introduction of alien species and, indirectly, to address their impacts on European Protected Species"*. | Although not identified at the beginning, alien species are since the 2nd planning cycle part of the pressures to be reported. Preventing or controlling adverse impacts of invasive alien species is one of the key types of measures. | Keeping alien species at levels that do not adversely alter the ecosystems forms part of the descriptors of GES and hence part of the MSFD objectives. |
| **Target 6 – Help avert global biodiversity loss** | Although the BD undertakes measures to avert losses of biodiversity in the EU (which may benefit some species that move beyond), it is of limited relevance to this target*. | Although the HD undertakes measures to avert losses of biodiversity in the EU (which benefit some species that move beyond), it is of limited relevance to this target*. | Apart from cross-border cooperations the WFD does not target biodiversity conservation outside the EU. It had though some indirect effects, as some non-EU countries adopted similar approaches. | The MSFD is supporting activities aiming at halting the loss of biodiversity within the EU. However, its role of contributing to the CBD is made explicit. |

Legend: = Target covered by the directive in a comprehensive way;
= Target covered by the directive but not comprehensively;
= No direct impact.

Note: The link has been made at an overall, conceptual level. More operational provisions are not taken into account here. Also exceptional cases and exemptions might have different impacts on the individual targets.

Information sources: AQUACROSS WP2 individual policy characterisations and author's assessment, complemented by the following source: *Milieu Ltd., IEEP & ICF International and Ecosystems Ltd. (2015) "Evaluation Study to support the Fitness Check of the Birds and Habitats Directives. Draft – Emerging Findings". Background document for the Fitness Check Conference of 20 November 2015.

## 3.2 Review of status assessment reports

This section provides a review of status assessments under the nature directives, WFD and MSFD in order to have an idea of their degree of success with achieving their own objectives, both in terms of reaching environmental targets and in terms of implementing requirements on reducing specific pressures or implementing specific measures.

### 3.2.1 Habitats and Birds Directives

The draft findings of the fitness check consultant report on the nature directives (Milieu et al., 2015) indicate that the objectives of the HD and BD were not being met, despite their long term implementation (since the 1980s). In regard to the contribution of the Directives towards ensuring biodiversity, one of the observed deficiencies is relevant to aquatic ecosystems.

The impacts of the measures taken so far are not yet sufficient to meet the overall aims of the Directives. The HD Art. 17 assessment for 2007–2012 (EEA, 2015a) shows that only 23% of animal and plant species and only 16% of habitat types were considered to be in a favourable conservation status. Aquatic ecosystems are particularly concerned: 20% of species in marine inlets and transitional waters, 17.6% of species in river and lakes, 17% in coastal ecosystems, 12.7% in shelf ecosystem and only 4.5% of species in open oceans are in favourable status.[4] Regarding habitats, the favourable conservation status of open ocean, shelf, coastal and river and lakes ecosystems are broadly similar (14–16% of habitats in favourable status).

Rivers and lakes, and marine inlets and transitional waters are the aquatic ecosystems in which most species (respectively 73,6 and 60%) and habitats (respectively 73,4% and 76,4%) are under un-favourable or inadequate status, while wetland habitats are also several affected by human activities (85.2% of wetlands are in un-favourable or inadequate status) (EEA, 2015a).

Despite limited progress towards improving the conservation status of species and habitats in Europe, the consultant report (Milieu et al., 2015) on the fitness check of the nature directives conclude that the directives contributed to reducing the rate of degradation, and in some cases reverting it. This was mainly due to the implementation of protected areas. The authors mention that the directives were not effective in managing the environment outside of Natura 2000 sites.

The consultant report also indicate that, while the terrestrial Natura 2000 has almost been completely established, the establishment of the freshwater and marine network of Special

[4] There remain large uncertainties in ocean, shelf and coastal ecosystems, respectively 83.3%, 54.5%, 41.5% of species have unknown status.

Protection Areas (SPAs) and Special Areas of Conservation (SACs) is progressing at a slower rate. Marine areas stand out for showing slower progress towards the nature directives than expected. The study notes that in those locations where implementation took place as planned, pressures on biodiversity were effectively reduced and habitats and species showed signs of recovery.

The development of conservation measures, the establishment of financing mechanisms and the management of external features have all been identified as areas where progress is not on track (Milieu et al., 2015).

### 3.2.2 Water Framework Directive

The EEA's 2012 report 'European waters – assessment of status and pressures' (EEA, 2012) provides a snapshot of the environmental status of European rivers, lakes, and coastal and transitional waters. The authors found that half of these waters are in less than good ecological status or potential, and thus falling short of WFD objectives. Among the different types of water bodies, rivers and transitional waters show worse ecological status than lakes and coastal waters, in addition to having more pressures and impacts. The report points to morphology alterations and diffuse pollution from agriculture as two pressures that will require the most progress at the moment.

There are significant variations in the status or potential of water bodies within Member States and between river basins (EC, 2012b). For example, in some river basins in Northern Germany, the Netherlands and Belgium, the reported status or potential of more than 90% of the water bodies is less than good. Many other river basin districts (RBDs) in Northern France, Southern Germany, Poland, Czech Republic, Hungary and Southern England have reported between 70% and 90% of their river bodies in less than good status or potential.

While it appears that the EU will fall short of its objectives, there are still some positive trends (though not as positive as planned). The proportion of surface water bodies in good ecological status or potential was expected to increase from 42% in 2009 to 52% in 2015, in the 21 Member States considered for that calculation.[5] The EEA could not provide forecasts for 2021 and 2027 due to lacking data (EEA, 2012): 15% of surface water bodies in the EU are in unknown ecological status and 40% in unknown chemical status (EC, 2012b).

Since the WFD has only been recently implemented and environmental trends may not reflect simply the impact of the directive, it is worth examining the level of implementation of other objectives than environmental targets, such as specific measures and instruments proposed by the directive. Two types of measures are required by the WFD: basic measures which refer to existing requirements under EU legislation which may contribute to reaching WFD objectives, and supplementary measures which are those necessary to reach WFD objectives when basic measures are not sufficient.

[5] Some Member States were included due to lack of data or an unknown number of total water bodies.

The EC (EC, 2015a) evaluated that in many cases the basic measures dictated by the WFD do not suffice to meet its goals. For example, two thirds of river basin districts indicated that supplementary measures would be necessary to decrease diffuse pollution from agriculture. Overall, 23% of the basic measures required by the WFD were reportedly completed, 66% were ongoing, and 11% had yet to begin. For supplementary measures, most of them were also ongoing (54%), with 29% completed and 17% not started. Thus it is clear that the implementation of the WFD is still in progress or has not even begun (EC, 2015a).

### 3.2.3 Marine Strategy Framework Directive

The European Topic Centre for Inland, Coastal and Marine Waters conducted an "Initial Assessment of European Seas based on Marine Strategy Framework Directive Article 8 reporting" which provides detailed information on not only the status of European seas but also observed trends, which helps assess further progress towards goals set by the MSFD (ETC/ICM, 2015).

According to the report, most marine fish assessments of 'good' environmental status have an 'improving' or 'stable' trend, whilst for the marine fish assessments of 'not good' there isn't a clear pattern. All marine reptile assessments of 'good' environmental status have an 'improving' or 'stable' trend, whilst the only marine turtle assessment of 'not good' has a 'declining' trend associated with it. Most assessments of 'good' environmental status for marine mammals have a 'stable' trend. Population size (11%) and distribution (10%) are the only criteria with 'not good' assessments reported for marine invertebrates (ETC/ICM, 2015).

The EEA published a report on the State of Europe's Seas which gives more insights on the status on marine ecosystems. Unfortunately, 80% of the species and habitats assessed under the MSFD are categorised as 'unknown', and only 4% have achieved the 2020 target of 'good' status. For marine mammals, nearly 80% of assessments (within the MSFD initial assessment) concluded an 'unknown' status and for those known, an 'unfavourable' status was concluded. It was estimated, that one third of marine bird populations are declining, one third are stable, and one third are growing. The HD assessments show that turtles in European seas are not in 'favourable conservation status' for the period 2007–2012 (EEA, 2015).

Currently, most of the assessed commercial fish stocks in European waters (58%) are not in GES, with 19% of the stocks exploited sustainably, 11% with their reproductive capacity intact, and only 12% considered in GES. There is no coherent information available for invertebrates in Europe's seas, but there is strong regional evidence that communities of benthic invertebrates remain under severe pressure in certain parts of European seas.

Mainly due to monitoring difficulties, the MSFD has not delivered an analysis on seabed habitats. However, the HD mentions that from 2001–2006 40% of assessed marine habitats were in 'unfavourable' conservation status and 9% in 'favourable', while from 2007–2012 the percentage rose to 66% 'unfavourable' and 9% 'favourable' remained. The condition of water-column habitats varies by regional seas. In the Baltic Sea, 29% of the water column habitat

assessments were in 'good environmental status' while in the Mediterranean Sea 46% of the water-column habitat assessments were in GES (ETC/ICM, 2015).

In regard to habitats, most assessments of 'good' environmental status for seabed habitats have a 'stable' trend, whilst the few assessments of 'not good' for seabed habitats normally have a 'declining' trend. All water column habitat assessments of 'good' have a 'stable' or 'unknown' trend, whilst all assessments of 'not good' have an 'unknown' trend (ETC/ICM, 2015).

In early 2014, the Commission put forward a report discussing the shortcomings of Member State's submissions and the first phase of implementation progress of the MSFD in terms of adequacy, consistency and coherence. The EC determined that significant knowledge gaps on marine issues affected data availability, as well as the coherence of GES definitions and targets, which vary extensively among the Member States. These critical inconsistencies among Member States shape inadequate implementation strategies and set lower levels of ambition than necessary to achieve GES by 2020. The Commission underlined that even though Member States have access to a well-developed basis for regional cooperation through the Regional Sea Conventions, the dimension of applying regional cooperation within their marine strategies varies heavily from nation to nation. The level of coherence between marine strategies is the lowest for Member States of the Mediterranean Sea and Black Sea regions (EC, 2014a).

## 3.3 Conclusions

The recent EEA State of the Environment 2015 report concludes that, although some progress has been made and environmental policy has delivered many improvements, Europe remains far from meeting policy objectives and having healthy aquatic ecosystems (EEA, 2015a). The key summary facts are indeed far from satisfactory:

- 23% of all animal and plant species and 16% of all habitat types in Europe are considered to be in a favourable conservation status.
- 50% of Europe's surface freshwater, transitional and coastal water bodies are in Good Status, but this conclusion is difficult to interpret in biodiversity-relevant terms when around 75% of rivers and lakes ecosystem types are still in bad or inadequate unfavourable conservation status.
- In the marine area, there is still a long way to go, with 80% of the species and habitats assessed under the MSFD still categorised as unknown status.

Progress made with the implementation of the nature directives, WFD and MSFD mirrors the limited success of the EU Biodiversity Strategy so far. The timely implementation of the nature, water and marine Directives is critical for the success of the EU Biodiversity Strategy objectives by 2020 in aquatic ecosystems. In the next chapter, the range of drivers leading to aquatic biodiversity loss, and existing policy responses, are further examined.

# 4 Integrated Assessment of EU Policies for the Protection of Aquatic Biodiversity

## 4.1 Objective of the chapter

This chapter presents an integrated assessment of how EU policies influence aquatic biodiversity, in order to determine how EU policies and laws contribute to achieve and/or hinder EU and international biodiversity targets. It also discusses whether European policy has a synergistic or conflict mix of instruments to address the main problems facing aquatic biodiversity and whether gaps in policy exist. With this European "policy framing", work within the AQUACROSS case studies will examine more specifically the influence of European policies on aquatic biodiversity and its protection at local level.

The integrated assessment presented in this chapter is based on the application of the DPSIR framework to six key threats to aquatic biodiversity. The six key threats were selected to provide a representative range of pressures affecting aquatic biodiversity. The assumption is that, if a threat is minimised or reinforced through a specific policy, biodiversity is impacted, respectively, positively or negatively. The DPSIR framework (see Chapter 1.4) is then used to characterise the temporal and spatial dynamics of these threats, and how they are influenced by underpinning socio-economic drivers and European policies. The chapter presents an integrated synthesis across threats; the assessment carried out for each threat is available in Annex 4 and the individual threat templates in Annex 5.

## 4.2 Methodology

As highlighted by the preliminary policy review (presented briefly in Chapter 2 ), a large number of EU policies are potentially relevant when determining how EU policies and laws influence aquatic biodiversity. Furthermore, these policies may affect aquatic biodiversity in a myriad of ways. The main methodological challenge is thus to adequately represent the causal chain between EU policies and aquatic biodiversity.

A workshop was conducted in February 2016 with European policy experts to identify potential methodological approaches for structuring the analysis of the linkages between EU policies and aquatic biodiversity. Discussions also focused on challenges and opportunities for the achievement of policy objectives for aquatic ecosystems within the context of supporting the EU Biodiversity Strategy. Two main findings from the workshop were:

- The assessment could be structured according to Drivers, Pressures and State (DPS) following the DPSIR framework. Aquatic biodiversity loss is the related Impact. Potential policy Responses could be mapped against the DPS highlighting positive and negative interaction with biodiversity protection of aquatic ecosystems along the causal links.
- Understanding policy responses to known "threats to biodiversity" could be the basis for analysis. Aquatic biodiversity is defined as the range of species and habitats existent in the freshwater, coastal and marine realms. However, biodiversity conservation is not solely dependent on the protection of species and habitats, but also on the maintenance of environmental conditions conducive to species and habitats richness. A sole focus on direct threats to species and habitats (e.g. extraction of species, habitat loss) would be too narrow, and a broader examination of threats is necessary.

The DPSIR framework is a concept that helps to disentangle the biophysical and social aspects of a system under study (Smeets and Weterings, 1999) and is a component of the AQUACROSS concept (Gomez el al., 2016). A literature review was carried out to identify existing definitions of DPSIR and how relevant they were for the characterisation of key threats to aquatic biodiversity across aquatic realms (Fisher et al., 2009; WG GES, 2011; Burkhard, 2012; Haines-Young, 2013; Maes et al., 2013; Gari et al., 2015, Gomez et al., 2016). Based on existing definitions and because of a need for consistency across freshwater, coastal and marine realms, a set of consolidated definitions was developed for the purposes of the policy analysis presented in this chapter:

- **Drivers**: A driver is a human activity, in particular production and consumption processes, that may produce an environmental effect (i.e. a pressure) on the ecosystem. In a macroeconomic context, production or consumption processes are structured according to economic sectors (e.g. agriculture, energy, industry, transport, households). The importance and scale of a driver are dependent from driving forces in society and the needs of human beings (e.g. the needs for shelter, food and water, mobility, entertainment and culture). For an industrial sector, a driving force could be the need to be profitable and to produce at low costs, while for a nation a driving force could be the need to keep unemployment levels low. Drivers are also influenced by the regulatory and market conditions in which they operate.
- **Pressures**: Pressures are mechanisms through which a driver has an effect on the environment. Pressures can be of a physical, chemical or biological nature, and include for example the extraction of water or aquatic species, emissions of chemicals, waste, radiation or noise, or the introduction of invasive alien species.
- **State**: State refers to the environmental condition of an ecosystem as described by its physical, chemical and biological parameters. Physical parameters encompass the quantity and quality of physical phenomena (e.g. temperature, light availability). Chemical parameters encompass the quantity and quality of chemicals (e.g. atmospheric $CO_2$ concentrations, nitrogen levels). Biological parameters encompass the condition at the ecosystem, habitat, species, community, or genetic levels (e.g. fish stocks, biodiversity).

- Further, another relevant definition outside the DPSIR for the relevance criteria analysis is that of environmental status. For our purposes, **'Status'** of the system, which is linked with politically-defined thresholds and criteria to assess the state of the ecosystem is seen as an anthropogenic interpretation of an ecosystem's 'State' based on preconceived notions of desired ecosystem quality. In the context of GES or Environmental Quality Status, this term draws together the determination of the 'state' of individual ecosystem components, typically through use of particular criteria, threshold values and indicators, to assign a 'status' classification (e.g. at GES, below GES). 'Status' can either be applied to the overall quality/condition of the marine environment, at the level of the individual descriptors of GES or at the level of individual functional groups, habitats, species or populations. For the WFD, five classes are used for GES, for HD three classes are used. A further distinction is necessary when referring to the term 'state target'. In this context, the meaning is limited specifically to targets which articulate the desired quality/condition of specific ecosystem components or characteristics.

Following the conclusion of the workshop to work on the basis of key threats to aquatic biodiversity, a review of scientific literature was performed. Several studies have identified and evaluated key threats to freshwater biodiversity (Gleick et al., 2001; Dudgeon et al., 2006; Vörösmarty et al., 2010; Gorenflo and Warner, 2016) and coastal and marine biodiversity (Halpern et al.; 2008, 2015; Costello et al., 2010; Knights et al., 2015). In addition, there are combined policy relevant assessments, which contain information on threats to aquatic biodiversity (EEA, 2012a; EEA, 2015, 2015a, Maxwell et al., 2016). However, a consolidated list of key threats to aquatic biodiversity (across freshwater, coastal and marine realms) in Europe does not exist. Furthermore, the 'threats' listed lack consistency across reviewed studies. For example, some studies include economic activities (e.g. shipping, fishing) while others focus on pressures (e.g. pollution, morphological alterations) and yet others include a mix of the two. The threats identified[6] in the reviewed studies were classified using the DPSIR framework (using the definition above). The table below reports the pressures obtained from this review.

6 Please note that for the purposes of the policy review analysis, the selection of threats focused on single pressures driven by human activities. Other compounding factors, such as climate change, are considered through their impact on selected pressures.

Table 4: List of pressure obtained from the review of key threats to biodiversity

| | |
|---|---|
| **Hydro-morphological pressures** | • Alterations to morphological conditions of aquatic habitats<br>• Alteration to catchment drainage<br>• Restriction of species movement<br>• Sediment movement<br>• Collisions with aquatic species<br>• Extraction of water |
| **Pollution Pressures** | • Nitrogen pollution<br>• Phosphorous pollution<br>• Organic matter<br>• Plastic waste<br>• Other chemicals (pesticides, other contaminants)<br>• Sound and electromagnetic waves |
| **Biological Pressures** | • Extraction of species<br>• Invasive alien species<br>• Microbial pathogens |

Source: own elaboration

For the purposes of this report, a selection of pressures was made in order to illustrate a good range of policy challenges as examples across the freshwater, coastal and marine continuum. Two pressures per broader categories (hydro-morphological, pollution and biological pressures) were made. The following threats (pressures) for aquatic biodiversity were selected:

- Nitrogen pollution
- Extraction of species
- Water abstraction
- Invasive Alien Species
- Alteration to morphological conditions of aquatic habitats
- Plastic Waste in the aquatic environment

A template was then designed to apply the DPSIR framework for each of these selected threats. The template includes in particular (see Annex 4):

- A description of the threat (as pressure) and the linked state, so as to characterise the environmental condition of freshwater, coastal and marine waters, with a focus on those parameters that are affected by the identified pressures;
- A description of the drivers leading to the threat, including an assessment of its significance to the European economy and future trends so as to evaluate the likely evolution of driving forces leading to increase or reduce the threat;
- A description of the relevant European policies and how they influence (positively or negatively) the threat, identified drivers, and linked state.

To assess at which level a specific European policy instrument acted, the following definitions were used:

- At the level of Drivers, when the policy influences human activities and uses of aquatic environments that induce pressures. This includes, for example, influencing the type of economic activity (e.g. subsidies for organic farming) or practices.
- At the level of Pressures (threat), when the policy targets the direct or indirect effect of a driver (e.g. emissions of pollutants, alterations to flow or morphology). This includes, for example, end-of-pipe pollution measures (e.g. requirements for building wastewater treatment plant).
- At the level of State, when the policy establishes relevant standards and targets on the environmental condition of an aquatic ecosystem as described by its physical, chemical and biological parameters, or aims to directly restore these environmental conditions (e.g. restoration of habitat).

Filled-in templates for each threat are presented in Annex 5. This chapter presents a synthesis of these results across threats, firstly describing each threat and their trends, secondly drivers and their trends, and thirdly the policies and their instruments. The last section of this chapter presents some brief policy-relevant conclusions.

## 4.3 What is threatening aquatic biodiversity in Europe?

### 4.3.1 Introducing the threats and their effects on aquatic biodiversity

This section defines the identified threats and introduces their main environmental effects to aquatic ecosystems.

#### Nitrogen pollution

Nitrogen enrichment poses a continuous major threat to the aquatic ecosystems of Europe (ETC Water, 2010; EEA, 2015). Nitrogen is a limiting nutrient in aquatic environments. Thus, nitrogen enrichment can contribute to an increase in plant growth, changes in nutrient cycling, uncontrolled growth of algae, eutrophication, acidification, an increase of organic matter settlement, stimulation of cyanobacteria blooms, oxygen depletion, and mortality of benthic fauna and fish (EEA, 2015). Nitrogen pollution has also been identified as a cause of Phaeocystis ('sea foam') blooms and dead zones. In cases where nitrogen leaches into the groundwater, the chemical ultimately reaches surface rivers and eventually impacts freshwater bodies such as wetlands, lakes and rivers, as well as terrestrial ecosystems that interact with these water bodies (ETC Water, 2010). In addition to disrupting the food web and overall species composition (EEA, 2015), the resulting impacts of nitrogen enrichment can negatively affect the manifold of socio-economic activities related to the aquatic environment (Perrot et al., 2014 in EEA, 2015).

#### Extraction of Species

Another key threat on aquatic biodiversity is the extraction of species, as it gravely affects species biodiversity and very often also habitats. Biodiversity is affected through the active removal of living organisms and genetic resources from the ecosystem while the aquatic habitat can be disrupted as a result of the processes involved in extractive activities, e.g. overfishing, bottom trawling, mechanical seaweed harvesting, wild fish for feedstock. This affects population abundance and parameters (including age, and sex ratios), which sequentially can impact the entire makeup of the species concerned and the related food web in highly unpredictable ways. Generally, these impacts include changes in populations of dependent species (predators and/or prey of the affected species) and trophic downgrading. In extreme cases, the extraction of species can cause (in tandem with other pressures such as increased nutrient output and climate change) collapses of fish stocks, and irreversible regime shifts, such as those seen in the Black Sea and Baltic Sea, in the 1970s and 1980s (EEA, 2015).

### Water Abstraction

The over-abstraction of water resources from both surface water and groundwater bodies can lead to reduced river flows, lower lake and groundwater levels, and the drying-up of wetlands (EEA, 2010, 2012, 2015a), influencing natural flow regimes, which is the most important determinant for rivers and wetland ecosystems – which in turn will determine the composition of species (Bunn and Arthington, 2002). Changes in flow features (e.g. the width, depths, velocity patterns and shear stresses within the system) can lead to different responses in ecosystem components and the overall ecosystem function, as aquatic species have developed life history strategies in response to the natural flow regimes. Thus, maintaining the natural pattern of longitudinal and lateral connectivity is essential to the viability of populations of many riverine species and also affects the invasion and successes of exotic and introduced species in rivers. Groundwater outflow is also a critical input for many temporal rivers and lakes (EC, 2015b). Excessive abstraction of water can negatively influence water quality, as less water is available to dilute pollutants. In coastal areas, over-abstraction of aquifers often results in salt-water intrusion, which alters the quality and use of groundwater (EEA, 2010).

### Invasive Alien Species

European waters are additionally affected by the admittance and dissemination of IAS through a multitude of drivers and pressures that harm the native aquatic biodiversity. Alien species are species that are transported outside of their natural range across ecological barriers due to direct or indirect human action. Some of these species cannot adapt to the new environment and die out quite rapidly, but others may survive, reproduce and spread. A percentage of the species that become established can have a significant negative impact on the ecology of their new location as well as serious economic and social consequences (EC, 2013). IAS can affect native biological diversity by means of introducing competition, predation and transmission of diseases between alien and native species. The highest numbers of IAS is found in aquatic ecosystems with high levels of connectivity with other ecosystems, high human frequency and high levels of disturbance. Such areas include

harbours, canals, and recreational areas along rivers or coasts and at lakes (Keller et al., 2011).

### Alteration to morphological conditions of aquatic habitats

In addition to the previously mentioned threats, alterations to the existing morphology of aquatic habitats through human activity can significantly affect the corresponding biodiversity. Alterations to morphology are linked to a range of pressures on aquatic ecosystems such as constructions (e.g. dams, weirs, dykes and levees), channelization, straightening, deepening or dredging, and mineral extraction. These anthropogenic interferences can negatively impact biodiversity in a direct and indirect manner (Nilsson and Berggren, 2000). Dams, for example, fragment habitat and migration opportunities, and may cause species extinction (Kruk and Penczak, 2003). With modified flow dynamics, bed material may be trapped and coarsened, which consequently leads to the depletion of spawning gravels (Kondolf, 1997). Dykes, levees and embankments disconnect rivers and estuaries from floodplains, wetlands, and oxbow lakes, causing loss of seasonal flood pulses and alluvial aquifer recharge in riparian zones. Changed water regime in the riparian zone may cause disturbance for the present biodiversity and enable new species to invade (Planty-Tabacchi et al., 1995). Dredging in river bed or seafloor can create physical stress on species and changes of habitats such as the decline of individual densities and species abundances or biomass in benthic communities (OSPAR Commission, 2009).

### Plastic waste

Marine litter is widely recognised as a significant threat to the marine environment, causing environmental and socio-economic damage on a global scale (Leslie et al., 2011). Due to its characteristics of longevity, low cost and versatility, plastic is a common material that has been highly used since the beginning of the 20$^{th}$ century to manufacture an enormous range of products all over the world. Unfortunately, these characteristics also make it problematic when it comes to its end-of-life phase. Once in the marine environment, plastic wastes can persist for hundreds of years (Mudgal et al., 2011). Thus, plastic debris is one of the greatest threats to the marine biodiversity. Individual marine animals can be injured and die due to the entanglement in floating debris very often, but not exclusively, related to fishing gear. Marine biodiversity can also mistake plastics as food and ingest it (UNEP, 2016). With time, plastic items fragment into smaller pieces, some of which cannot be seen with the naked eye. Microplastics can be ingested by a wider range of smaller animals, affecting marine food-webs. Research shows that these microplastics can also attract toxic chemical pollutants to their surface, harming further the animals that ingest them (EEA, 2015b). There are also evidences that plastics can be responsible for the increase of range of non-native species through transportation of organisms and the creation of novel habitat. They also allow the dispersal of pathogens that can pose threats to humans and marine animals (UNEP, 2016)

### 4.3.2 Trends in the impacts of threats on aquatic biodiversity

As previously discussed, the status of aquatic biodiversity in Europe is largely inadequate if sustainable species development is to be secured. While current assessments reveal poor results for freshwater, coastal and marine waters all across Europe, it remains important to consider past and future trends. This will allow us to determine if the course of political action in place permits the recovery of biodiversity, or if policies need to be adjusted in order to achieve sufficient numbers in all aquatic species in European waters.

Some threats appear to have undergone positive trends in recent years. Reduction in nitrogen concentration in European waters has undergone a positive trend over the last 30 years. Between 1992 and 2010, average nitrate levels in rivers have decreased by 11%, down to 2.2 mg/l while a decrease of up to 15% has been observed in European lakes (EEA, 2012). Nitrogen loads to the Baltic Sea have reduced by 16% between 1994 and 2010 while a 30% drop since 1985 was observed for the North Sea (EEA, 2015). A decrease in nitrogen concentration in coastal and marine waters may be visible in the Baltic Sea and the North Sea, however, these encouraging trends are not necessarily reflected as most monitoring stations show essentially unchanged concentrations between 1985 and 2010 (EEA, 2012). Most European coastal waters still carry enough nitrogen in water bodies to lead to eutrophication. In freshwaters, enough nitrogen still remains to lead to the loss of biodiversity and the situation for European marine waters is particularly alarming (Erisma et al., 2011; Carstensen et al., 2014).

In terms of species extraction, signs of improvement are also present. In 2007, 94% of assessed fish stocks in the EU North-east Atlantic Ocean and the Baltic Sea were fished above Maximum Sustainable Yield (MSY) rates. Promising trends have been observed since then, with the number of overfished stocks falling from 94% in 2007 to 39% in 2013 in those regional seas (EEA, 2015). However, the level of knowledge on species extraction is still very limited, especially in the Mediterranean Sea and Black Sea regions, making it impossible to assess change over time.

While some trends are positive, other threats continue on the rise. IAS are being introduced in Europe's seas with increasing regularity. Currently, Europe's seas harbour around 1 400 IAS, 80% of which have been introduced since 1950 (EEA, 2015). The Mediterranean is the European sea with the largest number of IAS, with over a fifth (21%) of all threatened and near threatened freshwater fish species currently being threatened by IAS (IUCN, 2014). Additionally, even though species extraction is on a positive trend, fishing in the marine environment has had severe repercussions and has in some instances lead to species endangerment beyond recovery.

The amount of plastic waste generated has dramatically increased in the 20th century and is pervasive now to all water realms. Packaging waste represents the major source of plastic pollution in Europe (Eurostat, 2016). The nature of waste itself is, however, changing, due to the dramatic rise in the use of hi-tech products. As a result, waste now contains complex materials, including plastics, precious metals and hazardous materials that are difficult to

deal with (EC, 2010). It is important to note that, although recycling and recovery rates may be improving, the actual amount of plastic waste produced has remained roughly the same in the last 10 years. There is little information on the amounts, rates or impacts of plastic waste in freshwater, whereas there is a major effort to quantify those in coastal and marine areas (Dris et al., 2015).

Monitoring, data accuracy and availability are still a major issue. Some trends are yet unclear, in particular regarding hydro-morphological alterations. Historically, European rivers have undergone significant modifications through land improvements, damming and increased water abstraction associated with the expansion and intensification of agriculture, industrial revolutions, and more recently the post-war economic growth. While the rate of morphological alterations has likely reduced, it is not established whether trends have reversed or will in the future. For example, while it is established that water abstraction in Europe has generally decreased since the 1990s, it is expected that water stress will remain a concern, and that improvements in efficiency will not be able to offset all impacts of climate change. Similarly, with the risk of extreme events growing, additional flood protection may be brought forward.

In summary, while there are some positive tendencies present for threats on aquatic biodiversity in Europe, the negative trends persist. Even though regulatory and monitoring frameworks are in place and the negative effects of threats on biodiversity are scientifically proven, progress in species conservation is too gradual or ineffective to make a sustainable impact. It needs to be determined whether a fault is present in the policy frameworks that are in place to prevent degradation or if other factors contribute to this decline. An extensive analysis of the derivation of species depletion will give further insight on what regulatory instruments and processes are not operating adequately. The following sections examine drivers to deliver this understanding.

## 4.4 What are the key human activities leading to loss of aquatic biodiversity?

Human activities are the cause of multiple alterations to ecosystems that negatively impact aquatic biodiversity. The cause or drivers of these activities can be traced to complex processes and trends, such as demographic changes (population change, settlement patterns), economic factors (GDP, income, standards of living), and global trends (international trade; climate change; geopolitical factors; governance; and advances in science, technology and innovation triggered by ecological and social adaptive processes) (see OECD, 2016). Though these drivers are important, they transcend the scope of jurisdictional boundaries imposed on nations and Member States, and call for global mechanisms to address their causes. This highlights the need to identify and address drivers and pressures caused by human activities that lead to loss in aquatic biodiversity at a manageable scale.

### 4.4.1 What is driving biodiversity loss in Europe?

As discussed in the previous sections, there are multiple threats to aquatic biodiversity that lead to losses in biodiversity. Identifying these threats is the first step in addressing this issue; however, it is necessary to investigate further how these threats manifest themselves and what contributing factors lead to this manifestation. In other words, where do the pressures that lead to aquatic biodiversity loss come from? What are the drivers of these pressures? This section aims to identify key drivers of aquatic biodiversity loss and link these activities to key pressures on aquatic biodiversity. An analysis of the key threats mentioned above revealed important drivers and pressures that contribute to aquatic biodiversity loss. Some drivers were identified across multiple threats and have been grouped below, while others play a more significant role in relation to one threat (Table 5).

Table 5: Summary of Key Drivers in Relation to their Contribution to Key Threats to Aquatic Biodiversity

| | Nitrogen pollution | Extraction of Species | Water abstraction | Invasive Alien Species | Morphological alterations | Plastic Waste |
|---|---|---|---|---|---|---|
| **Agriculture** | X | | X | | X | |
| **Urban areas** | X | | X | | X | X |
| **Water utilities** | X | | X | | X | |
| **Commercial fishing** | | X | | | | X |
| **Aquaculture** | X | X | | X | X | X |
| **Energy** | X | | X | | X | |
| **Transport** | X | | | X | X | X |
| **Industry** | X | X | X | | X | X |
| **Waste sector** | X | | | | | X |
| **Tourism** | X | | X | | X | X |
| **Species trade** | | | | X | | |

As a summary (detailed information for each threat can be found in the Annex 5):

- **Agriculture** contributes more than half of nitrogen inputs to Europe's marine waters, generally due to high nitrogen inputs from mineral fertilisers and manure (EEA, 2012, 2015). Furthermore, diffuse pollution from agriculture is considered a significant pressure in at least 40% of European river and coastal water bodies and 33% of lakes and transitional water bodies, most of which is linked to nitrate pollution (EEA, 2012). In

addition, agriculture accounts for 36% of annual total water use for irrigation purposes in Europe (between 2002 and 2012), with high seasonal variation between summer and winter months. This water abstraction also demands infrastructure to deliver the water, causing alteration to morphology and pressures from cross-profile constructions and impoundments. Expanding agricultural areas in floodplains and coastlines is often accompanied by land reclamation and drainage to avoid water logging and to manage high groundwater tables (Feick et al., 2005).

- **Urban areas** are often situated along freshwater systems (rivers), estuaries and coastal areas, and thus contribute largely to alterations in morphology of water bodies, mainly to create living space in cities and protect urban dwellers from floods (EEA, 2016). Alteration to morphology include the straightening, deepening and widening of rivers, the reinforcement and rising of river banks and embankments to facilitate land drainage and prevent local flooding. Discharges of untreated municipal sewage, including storm water and sewer overflows that discharge waste water directly into the rivers or sea during heavy rainfall, are a major source of plastic pollution in the marine environment. Domestic use of drinking water and discharges through wastewater contributes significantly to water abstraction and nitrogen pollution in Europe (EC, 2015). This is closely linked to the water utility industry (see below).
- **Water utilities**, such as public water supply and wastewater treatment, contribute to the threats of water abstraction and nitrogen pollution. Overall, public water supply accounts for 32% of total water use, with 61% of total annual water supplied by the public water system in Europe (EEA, 2016). Pressures on water resources are particularly high in areas with high population density and abstraction levels remain more or less stable throughout the year (EEA, 2016). In addition, discharges from sewerage and wastewater contribute to point sources of nitrogen and plastic, causing significant pressure in all MS (EC, 2015).
- **Commercial fishing** is the most relevant economic activity to species extraction. In marine and coastal ecosystems, commercial fishing is responsible for the extraction of aquatic species, due to intensive fishing methods like trawling, that can affect the genetic structure of a species population, subsequently impacting food-web dynamics, stock resilience and overall stock levels (EEA, 2015). As a result, EU-27 total catches in all fishing regions have been in steady decline over the past ten years. Unlike marine fishing, inland fishing does not represent a significant pressure nor a relevant economic activity for most or the European rivers, lakes and other freshwater bodies. Inland fishing has not made a significant contribution to the diet of most Europeans since the 14$^{th}$ century. Plastic waste generated during commercial fishing and aquaculture-related activities include fishing gear. Abandoned, lost, or otherwise discarded fishing gear has a major impact and causes unnecessary impacts on non-target species and habitats (STAP 2011; UNEP 2016).
- **Aquaculture** contributes to excess nitrogen levels in water sources through fish feed and through $N_2O$ emissions to the atmosphere (EEA, 2015). The need for fish feed also links to extraction of species and the pressure on fish stocks that are used as feed. Not only

fish are subject to aquaculture, but other aquatic species, such as seaweed, for use in i.e. agriculture and cosmetics are harvested. Aquaculture is linked to alteration to morphology, which causes changes in sediment transport and erosion from aquaculture installations. These installations (e.g. fish cages and trestles) impede water flow of estuaries and coasts and increases competition for space (Environment Agency, 2009). The practice itself also impacts morphology through bottom trawling, fisheries-related dredging and bottom-culture mussels and is the cause of 27% of introduced IAS, through the unintended escape of farmed species and their associated organisms (e.g. parasites and diseases).

- **Energy** causes pressures on coastal waters through dredging and direct physical modifications to the seabed through the construction of oil and gas infrastructure (off-shore platforms, oil terminals and drilling facilities, pipelines) (UK TAG, 2003). Combustion of fossil fuels of coal lead to nitrogen atmospheric emissions and subsequent deposition primarily during rain showers. The energy sector also abstracts water for cooling purposes from rivers, which leads to impoundments and derivations. Hydropower installations often require cross-profile constructions that directly modify morphological characteristics of rivers and lead to the creation of reservoirs, therefore submerging and destroying riparian habitats (UK TAG, 2003). Other renewable energy systems, such as tidal energy and off-shore wind, create pressures on coastal water morphology (UK TAG, 2003).
- **Transport** contributes to nitrogen emissions through the combustion of fossil fuels and the subsequent atmospheric deposition. Infrastructure for transportation (e.g. bridge supports, causeways, boat slipways) impacts the morphology of rivers, lakes, and transitional and coastal waters (UK TAG, 2003). Similarly, marine transport is linked to physical damage to the seabed, while the construction of ports is linked to changes in the morphology of freshwater habitats and coastlines (EEA, 2015). Shipping is the most prominent pathway for the introduction of IAS, where organisms are frequently transported in the ballast water of ships or attached to hulls as fouling organisms (Keller et al., 2011). Riverine transport of waste from landfills along rivers, and municipal landfills located on the coast are of a major driver of plastic waste in the marine environment.
- **Industry** (mining, quarrying, manufacturing and construction) contributes to water abstraction (around 4%) of freshwater in Europe, and is linked to alteration to morphology through the processes of deepening and dredging (EEA, 2016). Mining and quarrying can result in large emissions of pollutants and sediments downstream, destroying habitats and contaminating whole ecosystems. Industry can also lead to nitrogen emissions through wastewater discharges and the combustion of fossil fuels. Industrial plastic waste may also become marine debris if it is not properly treated or if lost during transport or during loading and unloading processes at port facilities. Blue biotechnology is an emerging industry which depends on the extraction of aquatic genetic resources to be used in applications such as fragrances, flavours and medicine (Ecorys et al., 2012).

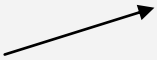
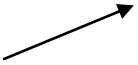
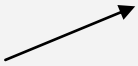
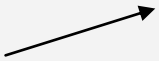
- **The waste sector** contributes to the emissions of a range of pollutants, plastic in particular through for debris from waste collection, transportation and disposal sites entering the marine environment (Mouat and Lozano, 2009). Riverine transport of waste from landfills along rivers, and municipal landfills located on the coast are of a particular concern. The degree to which the land-based plastic waste reach the ocean will depend on the effectiveness of solid waste management (UNEP, n.d.).
- **Tourism** demands water abstraction, accounting for about 11% of water abstraction in Europe (EEA, 2016) and contributes to the emission of nitrogen through wastewater discharges. Tourism often requires the construction of infrastructure in lakes, rivers and transitional waters, such as outfalls, jetties, piers, sea-locks, boat slipways, bridge supports, and causeways (UK TAG, 2003). Tourism tends to alter the natural environment through the development of previously pristine areas, causing, for example, changes in siltation that significantly disturb organisms in a coastal environments (WWF, 2014; EEA, 2015). It is estimated that tourist facilities account for up to 16% of the waste generated by shoreline and recreational activities (UNEP/MAP, 2007).
- **Species trade** is a key pathway for IAS introduction, in particular the marine ornamental fish trade. Freshwater ecosystems, particularly freshwater plants, are deeply affected by ornamental introductions (mainly in aquarium and water-garden species) as it accounts for 8% of established IAS (Keller et al., 2011).

### 4.4.2 Economic outlook

Though these key drivers and their activities contribute to producing pressures that threaten aquatic biodiversity, they also represent significant economic sectors that the European economy relies upon. They lead to economic growth, are important for employment, and supply valuable services and products necessary to society, such as food, energy and clean water. Policy responses need to account for these socio-economic factors, understand the economic driving forces underpinning threats to aquatic biodiversity, and the likely trajectory of current and future pressures. A detailed review of the economic significance of drivers, including current and future trends, was performed for each threats (see Annex 5).

Table 6 presents a synthesis of the information gathered per driver. These figures provided confirm that drivers underpinning aquatic biodiversity loss also represent critical sectors for the European economy. Forecasts as to their future also indicate an intensification of each driver, which is likely to result in stronger pressure on aquatic ecosystem and further biodiversity loss. European policies need to account for these trends, and provide adequate responses.

Table 6: Importance of relevant Sectors for the European Economy and Future Trends

| Driver | Significance to European Economy | Future trends |
|---|---|---|
| **Agriculture** | • Utilised agricultural area: 170 million hectares (2013)<br>• 10.8 million farms operating in the EU-28 (2014)<br>• Employs 9.5 million people, 4.4% of total employment (EU-28, 2013)<br>• GVA of the sector is around 160 billion EUR (2013)<br>• Share of agriculture in EU-27's GDP (GVA/GDP): 1.2% (2013) |  |
| **Urban areas** | • 67% of EU GDP in metropolitan regions of more than 250 000 inhabitants<br>• 7% of the EU's population live in cities of over 5 million inhabitants<br>• In the EU: 26 cities of more than 1 million inhabitants, and 373 cities of more than 100 000 inhabitants 72.4% of the EU's population lives in cities, towns and suburbs |  |
| **Water utilities** | • Involves 75 400 enterprises and employs 1.5 million people.<br>• A GVA of 97.5 billion EUR |  |
| **Commercial fishing** | • GVA of EU fisheries amounts to 3.4 billion EUR<br>• Provides 127 686 jobs<br>• 83 590 fishing vessels registered in the EU fleet |  |
| **Aquaculture** | • Supplies 24% of Europe's seafood (2014)<br>• GVA of 1 500 million EUR (EU-28) (2013)<br>• 80 000 employees in a full time equivalent of around 27 000 jobs (2013)<br>• 8th biggest aquaculture producer in the world (2015) |  |
| **Energy** | • Renewable sources supply 25% of primary energy production in Europe.<br>• Hydropower accounts for 16.6% of primary energy production, the EU 28's largest renewable energy resource (2013).<br>• Offshore wind: 10% of total wind energy in Europe; 35 000 employees; GVA of 2.4 billion EUR.<br>• Crude oil and gas: 9.1% and 15.5%, respectively, of energy supply.<br>• Oil and gas: GVA 107-133 billion EUR, and 25 000- 50 000 jobs (2011). |  |
| **Transport** | • Road transport: 49.4% of total good transport within the EU, inland waterways: 4%, intra-EU maritime transport: 31% (2015).<br>• Turnover for road freight: 312 billion EUR; 2 945 700 employees<br>• Turnover for road passenger: 121 billion EUR; 1 988 500 employees<br>• Shipping: 75% of imported and exported goods by weight in Europe (2015).<br>• Value of shipping to overall trade: 1,733.7 billion EUR (50.7% of EU trade) |  |
| **Industry** | • 1.2 million employees in chemical industry; generates 551 billion EUR; the 5th largest industry of Europe; contributes 7% of Europe's manufacturing added value; 17% of global production.<br>• 19 000 firms in the mining and quarrying industry in EU-28; 614 400 jobs; turnover: 260 222 million EUR; added value: 85 903 million EUR (2012).<br>• 3.3 million firms in construction; 12.7 million employees; turnover of 1 545 459 million EUR; and 492 897 million EUR of value added (2012).<br>• Blue biotechnology industry: GVA of 800 million EUR; 18 000 natural products and 4 900 patents associated with genes of marine organisms |  |
| **Waste sector** | • Turnover of 137 billion EUR; 2 million jobs<br>• 1.1% of EU GDP |  |
| **Tourism** | • Tourism contributes up 10% of EU GDP.; employs 12 million people (2013).<br>• Turnover of 941 075 million EUR.<br>• Coastal and maritime tourism: 3.2 million jobs and 183 billion EUR in |  |

| | | |
|---|---|---|
| | GVA; or 1/3 of the EU's maritime economy.<br>• Yachting and marinas: 371 900 people, GVA: 38 billion EUR (2011). | |
| **Species trade** | • Total value of imports for ornamental fish into the EU is 72.3 million EUR.<br>• Imports of freshwater species into the EU accounts for 82.9% of the total value of imports for the year, with the remaining 17.1% attributed to the import of marine species.<br>• Imports of marine ornamental fish arrived to the EU from 42 different countries, and freshwater fish from 37 different countries. | → |

References: agriculture (EU DG AGRI, 2013; EC, 2015c); urban areas (CITIES, 2014); water utilities (Eurostat, 2015, 2016a); commercial fishing (EEA, 2015); aquaculture (EEA, 2015); DG MARE, 2016); energy (EEA, 2015; Eurostat, 2016b); transport (EC, 2015a, 2015d); industry (Ecorys et al., 2012; EEA, 2015; Eurostat, 2016c, 2016d); tourism (EEA, 2015; EC, 2016a; EEA, 2016, Eurostat, 2016e); species trade (Ornamental Aquatic Trade Association, 2015).

The following provides a short account of current and future trends for each driver, in order to illustrate the challenge for European society and policy-makers in its attempt to reduce aquatic biodiversity loss:

- **Agriculture** is a major land use in Europe, covering 40% of the total land area of the EU (EU DG AGRI, 2013). EU agriculture has undergone a process of intensification since the 1950s, relying on increased use of fertiliser to boost production and resulting in increased nitrogen emissions. However, average nitrogen surpluses in agriculture has dropped by 32% between 1990 and 2005 thanks to decreased fertiliser application and increased nitrogen use efficiency (improved application) (Bouraoui and Grizzeti, 2011). Despite this reduction, a number of economic forecasts indicate that future agricultural development may lead to further emissions. For example, EU poultry meat production is expected to expand by close to 4% (EC, 2015) and cereal production is expected to grow due to combination of feed demand, export markets and the expansion of biofuel use in transport (EU, 2015). Similarly, while irrigation methods have significantly improved in Europe over the past decade, leading to a decrease in water abstraction in the agricultural sector by 22% (MARM/BPIA 2009; EEA 2010a), irrigation accounts for 5.8% of the total utilised agricultural area and irrigated areas are likely to grow with increased demand for cereals and biofuels, and increased water scarcity and droughts under climate change.
- The share of Europe's population that lives in **urban areas** has steadily increased in the 20th century and is expected to further increase from 73% today to over 80% in 2050 (UN, 2014). The water exploitation index already shows that from 2002-2012 in the Mediterranean region, areas around big cities are affected by water stress especially during summer due to extraction (ETC/ICM, 2015b) –a situation that may expand across central and northern Europe with the twin pressure of urbanisation and climate change. The further expansion of urban areas will also require land for building and construction which will put pressure on the morphology of freshwater and coastal waters.

- **Water utilities** represent a major economic activity in Europe. With an expanding population (expected 5% by 2050),[7] the next three decades will see an increasing number of people generating nutrient-rich wastewater that will require treatment before being released in the environment. Despite effects to increase water use efficiency, abstraction by the public water supply sector has only slightly declined by 5% (EEA, 2016a). Currently, efforts are made at EU level to promote wastewater reuse, amongst others through providing minimum quality standards for water reused for irrigation (and groundwater recharge) (EC, 2016).
- **Commercial fishing** has seen total catches steadily declining in the EU-27, with increases in imports of popular species: tuna, cod and salmon (EEA, 2015). Industrialised countries will rely increasingly on imports to meet rising demand due to lack of capacity for increased capture fisheries (fully or overfished stocks), in addition to increasing aquaculture output. According to FAO (2016) the global fishery production (capture plus aquaculture) is projected to expand, reaching 196 million tonnes (Mt) in 2025. Accordingly, the average price for wild fish (excluding fish for reduction) is projected to grow by more than that for farmed fish (7% as compared with 2%), further increasing the value of commercial fishing and demand for maintaining if not increasing total species extraction.
- With an annual global growth rate of 7% (FAO, 2014), **aquaculture** production is expected to reach 102 Mt by 2025. In Europe, consumption per capita has decreased in recent years while demand for organic aquaculture products has grown rapidly (EUMOFA, 2015). Non-fish aquaculture (e.g. seaweed) has declined in Europe over the past decade (EEA, 2015). Increased aquaculture production can lead to nitrogen pollution, the introduction of invasive alien species and further alterations to the morphology of aquatic habitats, especially in lakes, transitional and coastal areas.
- With efforts to mitigate climate change, **energy** production is currently switching from natural gas and oil sources to renewable sources. For example, the share of electricity from renewable energy increased from around 15% in 2004 to 27% in 2014. Accordingly, nitrogen pollution from energy production may reduce in the future, while alterations to morphology of aquatic habitats may be affected by a range of renewable energy projects. While the amount of electricity from hydropower has remained relatively stable, offshore wind installations are booming in Europe, doubling in number of installations between 2014 and 2015 (WindEurope, 2016). The contribution of tidal energy is still marginal. However, experts believe that wave and tidal could provide 15% of energy consumption in Europe (EEA, 2015). Abstraction demand for cooling power plants may remain stable or increase in the future, especially if nuclear power (a major consumer of water) is further adopted.
- Road freight and passenger transport is an important part of the European economy, as is shipping. The **transport sector** is likely to continue growing alongside economic

[7] http://ec.europa.eu/economy_finance/structural_reforms/ageing/demography/index_en.htm

development (Eurostat, 2010; COWI, 2015). For example, in the marine sector, the volume of freight handled in the EU's over 1 200 ports is steadily increasing and many plans for seaport development are planned to keep up with the increase of marine cargo (ETC/ICM, 2012). This poses challenges with regards to the control of atmospheric nitrogen emissions if fossil fuel remains a major source of transport energy or biofuel is further adopted, as well as to the presentation of the morphology of coastal and transitional habitats and the control of invasive alien species transported by ships carrying international trade.

- Water abstraction in the **industrial sector** (mining, quarrying, manufacturing and construction) has decreased by 27% since the 1990s through improvements in water efficiency. Marine mineral extraction is expected to increase in the next years from 5% of the mined supply of metals coming from ocean floors in 2020 up to 10% by 2030 (Ecorys et al., 2012). Though a young industry, the European industry for blue biotechnology currently has a growth rate of over 10% per year (Ecorys et al., 2012; Douglas-Westwood Limited, 2005). There is no legal framework that has yet been universally accepted to protect and regulate the mechanisms, thus enabling socio-economic pressures on genetic resource extraction (Arrieta et al., 2010). The EU accounts for around 25% of world production, and although global plastics production is estimated to have fallen from 245 Mt in 2008 to around 230 Mt in 2009 as a result of the financial and economic crisis, trends shows that plastic production has increased globally and an increase is expected in the future mainly driven by the packaging sector (Mudgal et al., 2011).
- Although Europe has managed to improve its **waste** management, there is still a long way to go to ensure that the waste produced is recycled. Only 36% of total waste production is recycled, while the rest is landfilled or burned. The materials wasted sent to landfill could have an annual commercial value of around 5.25 billion EUR[8].
- **Tourism** is a major economic sector in Europe, representing up to 10% of EU GDP. The number of tourists rose by 30% across Europe between 2002 and 2012 (with an increase in water use of 7% between 2002 and 2008). It is expected that tourism will further increase in the future, with implications for water abstraction and nitrogen pollution in touristic areas. Mass-market tourism is expanding, which in turn leads to an increase in building activity in coastal regions of the EU (Eurostat, 2015). Recreational activities in marine and coastal areas are numerous though not well documented, which makes it difficult to identify socio-economic data.
- **Species trade** is a key pathway for IAS introduction. The marine ornamental fish trade is a worldwide industry that targets a remarkable quantity and diversity of reef fish species and provides an important source of revenue for exporting countries, particularly developing nations in Southeast Asia (Leal et al., 2015). Imports of marine ornamental fish arrived into the EU from 42 different countries, whereas freshwater fish were supplied by 37 different countries (Ornamental Aquatic Trade Association, 2015).

[8] http://ec.europa.eu/environment/waste/pdf/WASTE%20BROCHURE.pdf

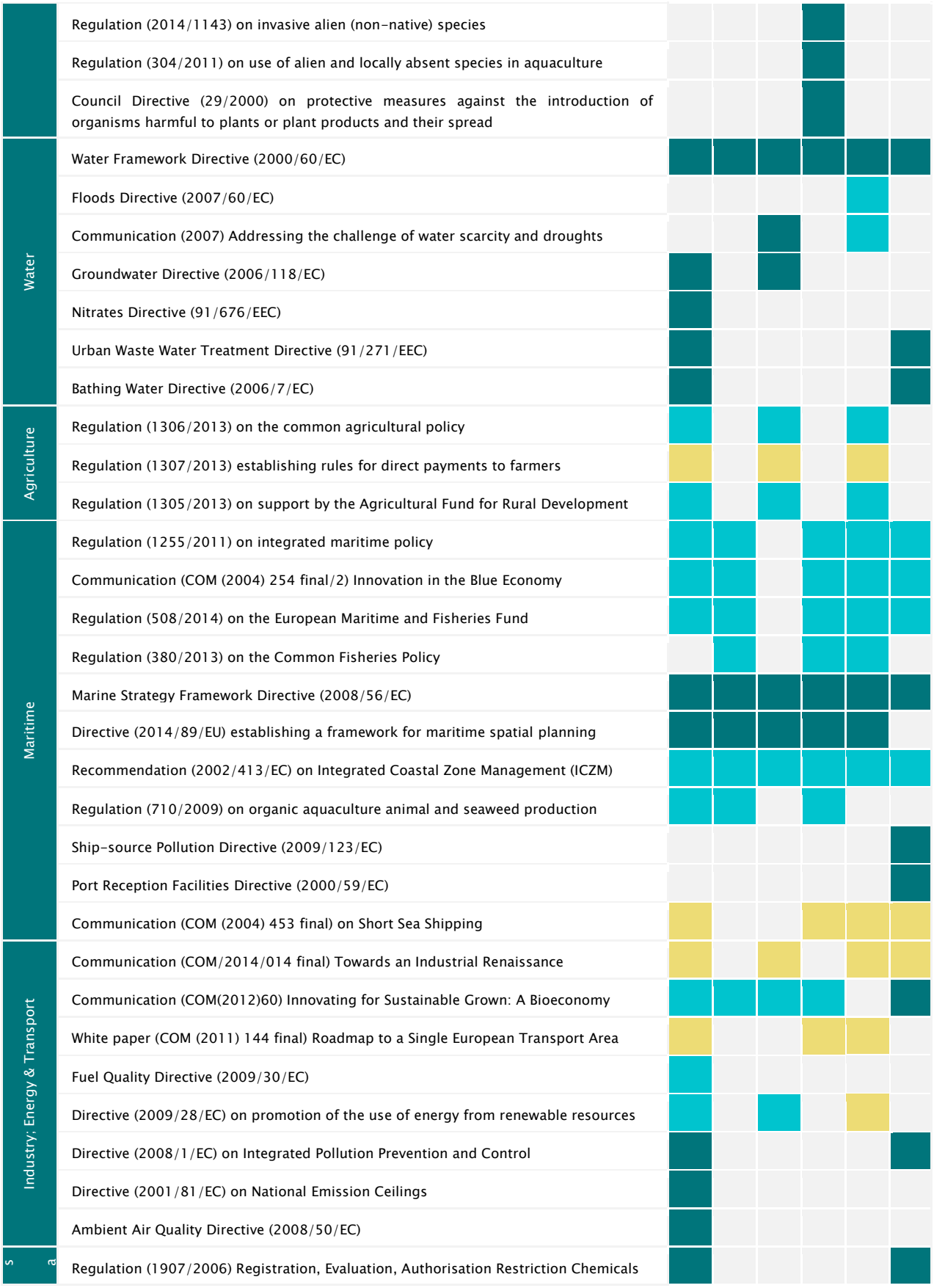
## 4.5 What EU policies govern the management of aquatic biodiversity?

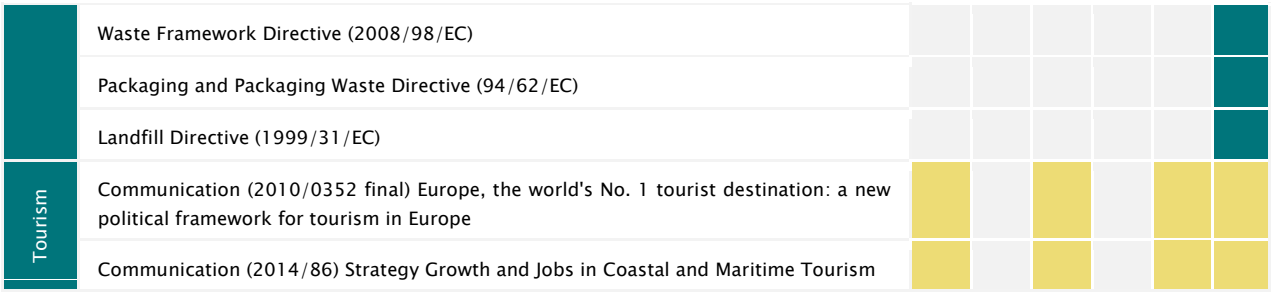
Table 7 below illustrates a summary of key policies affecting positively or negatively aquatic biodiversity, based on the assessments made by each expert or each threat (see Annex 5):

- A relationship is deemed "positive" when the instrument/measure reduces intensity of drivers or pressures or aims to restore state, leading to a potential positive outcome on aquatic biodiversity. For example, this may occur when a policy aims to subsidise farming so that it uses less fertiliser (positive impact on nitrogen pollution) or sets our targets for reaching specific nutrient standards for the quality of freshwater.
- A relationship is deemed "negative" when the instrument/measure increases intensity of drivers or pressures, leading to a potential negative outcome on aquatic biodiversity. For example, this may occur when a policy aims to fund new port infrastructure in coastal areas (negative impact on morphological conditions of coastal habitats).
- A relationship is deemed "positive and negative" when the instrument/measure has mixed effect. For example one policy instrument may fund new infrastructure for water abstraction (negative impact) as well as more water efficient irrigation equipment (positive impact on water abstraction).

Table 7: Summary of Key Policies Affecting Positively or Negatively Aquatic Biodiversity

| | Key Policies | Threats | | | | | |
|---|---|---|---|---|---|---|---|
| | | Nitrogen Pollution | Species Extraction | Water Abstraction | Invasive Alien Species | Alterations to Morphology | Plastic Waste |
| General | Decision (1386/2013/EU) General Union Environment Action Programme to 2020 | | | | | | |
| General | Regulation (1293/2013) for a Programme for the Environment and Climate Action | | | | | | |
| General | Environmental impact assessment (2011/92/EU) Directive | | | | | | |
| General | Strategic environmental assessment (2001/42/EC) Directive | | | | | | |
| General | Communication (2011/571) Resource Efficient Europe | | | | | | |
| General | Communication (2008/699) on Raw Materials Initiative | | | | | | |
| General | Regulation (1300/2013) on Cohesion Fund | | | | | | |
| General | Regulation (1301/2013) on Regional Development Funds | | | | | | |
| al Herit | Birds Directive (2009/147/EC) | | | | | | |
| al Herit | Habitats Directive (92/43/EEC) | | | | | | |


Regulation (2014/1143) on invasive alien (non-native) species
Regulation (304/2011) on use of alien and locally absent species in aquaculture
Council Directive (29/2000) on protective measures against the introduction of organisms harmful to plants or plant products and their spread
Water
Water Framework Directive (2000/60/EC)
Floods Directive (2007/60/EC)
Communication (2007) Addressing the challenge of water scarcity and droughts
Groundwater Directive (2006/118/EC)
Nitrates Directive (91/676/EEC)
Urban Waste Water Treatment Directive (91/271/EEC)
Bathing Water Directive (2006/7/EC)
Agriculture
Regulation (1306/2013) on the common agricultural policy
Regulation (1307/2013) establishing rules for direct payments to farmers
Regulation (1305/2013) on support by the Agricultural Fund for Rural Development
Maritime
Regulation (1255/2011) on integrated maritime policy
Communication (COM (2004) 254 final/2) Innovation in the Blue Economy
Regulation (508/2014) on the European Maritime and Fisheries Fund
Regulation (380/2013) on the Common Fisheries Policy
Marine Strategy Framework Directive (2008/56/EC)
Directive (2014/89/EU) establishing a framework for maritime spatial planning
Recommendation (2002/413/EC) on Integrated Coastal Zone Management (ICZM)
Regulation (710/2009) on organic aquaculture animal and seaweed production
Ship-source Pollution Directive (2009/123/EC)
Port Reception Facilities Directive (2000/59/EC)
Communication (COM (2004) 453 final) on Short Sea Shipping
Industry; Energy & Transport
Communication (COM/2014/014 final) Towards an Industrial Renaissance
Communication (COM(2012)60) Innovating for Sustainable Grown: A Bioeconomy
White paper (COM (2011) 144 final) Roadmap to a Single European Transport Area
Fuel Quality Directive (2009/30/EC)
Directive (2009/28/EC) on promotion of the use of energy from renewable resources
Directive (2008/1/EC) on Integrated Pollution Prevention and Control
Directive (2001/81/EC) on National Emission Ceilings
Ambient Air Quality Directive (2008/50/EC)
Regulation (1907/2006) Registration, Evaluation, Authorisation Restriction Chemicals




Legend:
= Positive effect on aquatic biodiversity;
= Mixed effects on aquatic biodiversity;
= Policy instruments with a negative effect
= No effects

The following two sections identify and differentiate between those policies that have a positive effect on the management of aquatic biodiversity from those that have a negative influence (either indirectly supporting drivers and/or pressures).

## 4.6 Policies contributing to reducing the loss of aquatic biodiversity

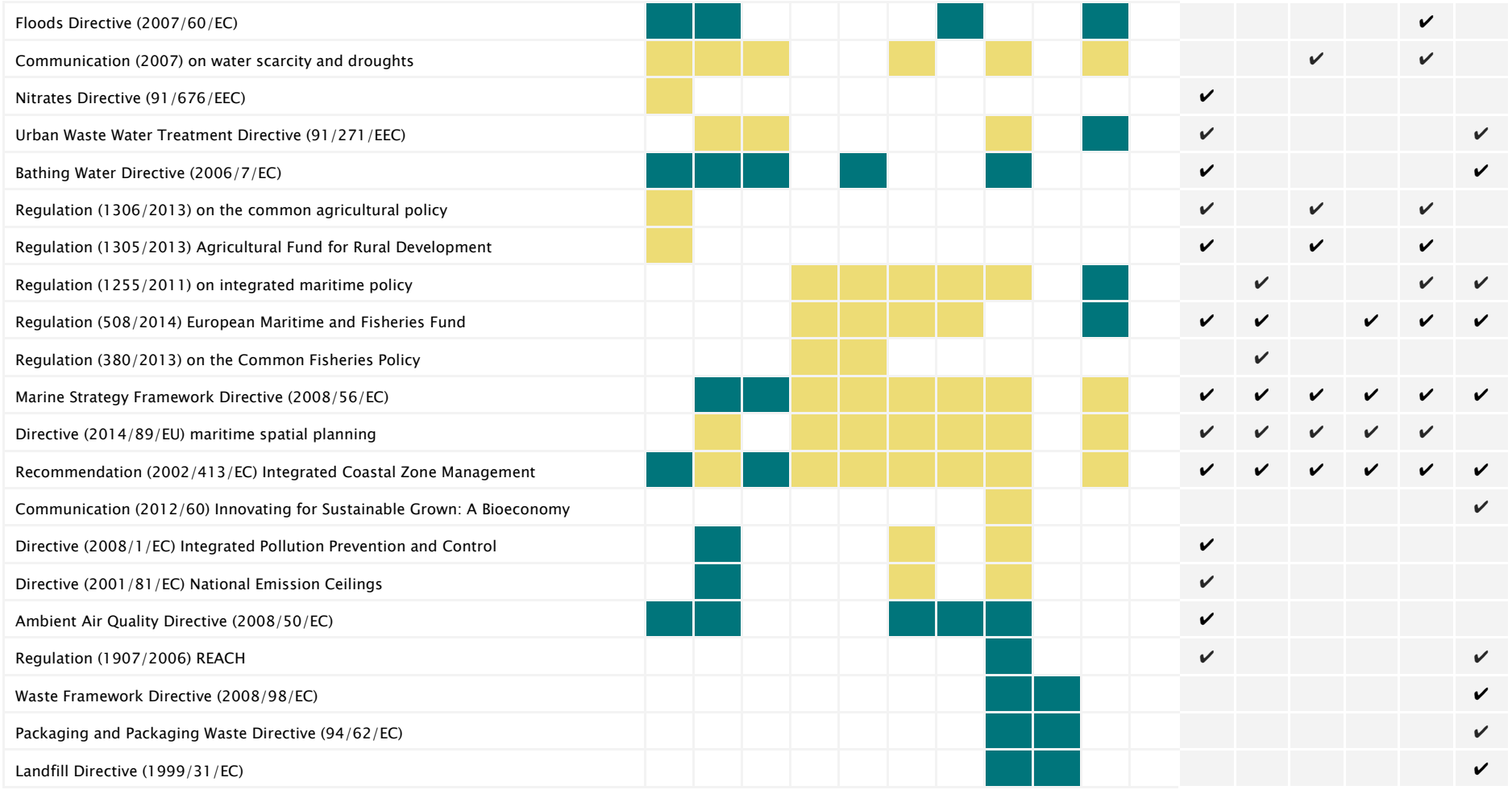
A number of EU policies contribute to reducing the threats on aquatic biodiversity illustrated above. There are a wide variety of ways policies may influence these threats, directly and indirectly. Environmental policies may establish specific targets to reach on the state of aquatic environment, or may require measures that tackle pressures and drivers impacting state. There may be indirect links, for example when a general objective aims to improve total environmental status. Environmental mainstreaming is also another avenue, for example when conditions are attached to the distribution of sectoral subsidies.

Table 8 presents an overview of the links between reviewed policies and their relevance to different threats and drivers (i.e. whether they have an instrument that explicitly or implicitly target a driver or pressures from specific drivers).

The next two sub-sections present in more detail these links, first for key cross-cutting policies, then for more specific policies. The final sub-section draws some observations on where these “positive” policies act along the DPS continuum.

Table 8: Mapping of policies contributing to reducing loss of aquatic biodiversity against drivers and threats targeted

| Policy Instruments | Drivers targeted | | | | | | | | | | | Threats potentially tackled | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Agriculture | Urban Areas | Water Utility | Fishing | Aquaculture | Energy | Transport | Industry | Waste sector | Tourism | Species trade | Nitrogen Pollution | Species Extraction | Water Abstraction | Invasive Alien Species | Alterations to Morphology | Plastic Waste |
| Decision (1386/2013/EU) General Union Environment Action Programme to 2020 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Regulation (1293/2013) for a Programme for the Environment and Climate Action | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Environmental impact assessment (2011/92/EU) Directive | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Strategic environmental assessment (2001/42/EC) Directive | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Communication (2011/571) Resource Efficient Europe | | | | | | | | ■ | ■ | | | ✔ | | | | | ✔ |
| Communication (COM(2008)699) on Raw Materials Initiative | | | | | | | | ■ | ■ | | | | | | | | |
| Regulation (1300/2013) on Cohesion Fund | | ■ | ■ | | | ■ | ■ | ■ | ■ | ■ | | ✔ | | ✔ | | ✔ | ✔ |
| Regulation (1301/2013) Regional Development Funds | | ■ | ■ | | | ■ | ■ | ■ | ■ | ■ | | ✔ | | ✔ | | ✔ | ✔ |
| Habitats Directive (92/43/EEC) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Birds Directive (2009/147/EC) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Regulation (2014/1143) on invasive alien species | | | | | ■ | | ■ | | | ■ | ■ | | | | ✔ | | |
| Regulation (EU) No 304/2011 concerning use of alien and locally absent species in aquaculture | | | | | ■ | | | | | | | | | | ✔ | | |
| Directive (29/2000) on introduction of organisms harmful to plants or plant products and against their spread | | | | | ■ | | ■ | | | | ■ | | | | ✔ | | |
| Regulation (EC 338/1997) on the protection of species of wild fauna and flora by regulating trade therein | | | | | ■ | | ■ | | | | ■ | | | | ✔ | | |
| Water Framework Directive (2000/60/EC) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |


Floods Directive (2007/60/EC)
Communication (2007) on water scarcity and droughts
Nitrates Directive (91/676/EEC)
Urban Waste Water Treatment Directive (91/271/EEC)
Bathing Water Directive (2006/7/EC)
Regulation (1306/2013) on the common agricultural policy
Regulation (1305/2013) Agricultural Fund for Rural Development
Regulation (1255/2011) on integrated maritime policy
Regulation (508/2014) European Maritime and Fisheries Fund
Regulation (380/2013) on the Common Fisheries Policy
Marine Strategy Framework Directive (2008/56/EC)
Directive (2014/89/EU) maritime spatial planning
Recommendation (2002/413/EC) Integrated Coastal Zone Management
Communication (2012/60) Innovating for Sustainable Grown: A Bioeconomy
Directive (2008/1/EC) Integrated Pollution Prevention and Control
Directive (2001/81/EC) National Emission Ceilings
Ambient Air Quality Directive (2008/50/EC)
Regulation (1907/2006) REACH
Waste Framework Directive (2008/98/EC)
Packaging and Packaging Waste Directive (94/62/EC)
Landfill Directive (1999/31/EC)
Legend:
= The policy targets the driver or pressures associated implicitly.
= The policy targets the driver or pressures associated explicitly.

### 4.6.1 Key cross-cutting policies

A number of instruments cross-cut all threats implicitly. The **Decision (1386/2013/EU) General Union Environment Action Programme to 2020** is the overarching document governing environmental policy in the Union. It has the general objective to ensure protection, conservation and enhancement of the EU's natural capital. It recognises the importance of presenting the loss of aquatic biodiversity and promotes better implementation of existing legislation. It specifically calls to improve resource efficiency by means of monitoring the efficiency of water use in the different economic sectors. It actively supports further efforts to manage the nutrient cycle, calling for more cost-effective, sustainable and resource-efficient approaches, in particular regarding the efficient use of fertilisers. Combating IAS is also a primary objective of the Programme.

Closely associated with the 7th EAP, the **Regulation (1293/2013) for a Programme for the Environment and Climate Action (LIFE)** (LIFE 2014-2020) is the financial instrument through which the EU finances projects that help reach environmental and climate objectives across the Union. Several "Priority Areas" listed in Annex III relate to the protection of aquatic biodiversity. For example, under "Nature and Biodiversity", the first Priority Area aims to fund "activities aimed at improving the conservation status of habitats and species, including marine habitats and species, and bird species, of Union interest". Furthermore, water is a thematic priority under "Environment and resource efficiency," with specific support for the conservation of the marine environment, the preparation of river basin management plans (RBMPs) and the efficient use of water resources. Interestingly, combating IAS is not specifically mentioned.

The four main environmental directives (the BD, HD, WFD and MSFD) set a number of measures which can contribute to tackle the reviewed threats. **The Nature Directives** (BD and HD) act mainly via the designation of protected species which should be managed appropriately across their whole natural range in the EU; and the creation of SACs and SPAs, also called the Natura 2000 network, representing the core habitats for designated species. The first mechanism, involving the management of species across their whole natural range, does not provide a firm basis for policy action, except regarding the threat on "extraction of species" since designated species would require specific careful monitoring and their capture or deliberate killing is strictly controlled and regulated. There is more scope within the legal text for policy action within and near protected areas, as the Nature Directives allow the application of restrictions to human activities such as infrastructural, industrial and agricultural activities, so as to avoid their deterioration. For example, controls on abstraction may be taken when it threatens the conservation of classified species. The same principle applies to activities leading to nitrogen pollution, the extraction of species and the modification of morphological conditions. The Nature Directives also place restrictions on the deliberate introductions of IAS into the wild.

The ecological status of the **WFD** describes the extent to which biological and physico-chemical quality elements differ compared to their reference (or high status) conditions as a

result of human activity. Management measures are required when pressures resulting human activities affect quality elements to the extent that the water body is classified less than "good status" or is at risk of deterioration. A RBMP must be developed that tackles significant drivers and pressures. The WFD places special emphasis on tackling drivers underpinning pressures of water deterioration. For example, RBMPs may not only establish improved wastewater treatment but also changes in household behaviour or technologies to reduce nutrient loads. The WFD foresees the application of basic measures, which are mainly requirements set under other EU legislation (Art. 11.3), and supplementary measures which are implemented in addition to basic measures with the aim of achieving the objectives of the directive (Art 11.4).

The environmental status of the **MSFD** (Art. 9.1) refers to eleven descriptors (listed in Annex I), many of which relate to the threats reviewed. For example, the qualitative indicator on "sea-floor integrity" can directly lead to action preventing or restoring morphological alterations. Management measures are required when human activities alter descriptors to the extent that the marine area is classified less than "good status" or is at risk of deterioration. Member States must develop marine strategies (Art. 5.1) and Programme of Measures (PoMs) (13.1) to reach GES. Annex VI lists examples of possible measures. Furthermore the MSFD requires the establishment of marine protected areas (MPAs) (Art. 13.4), coherent with the Nature Directives, in which more stringent measures are to be adopted to reduce the risk to the environment (Art. 13.5). For example, stricter rules may apply to fishing within MPAs.

### 4.6.2 An overview of policies contributing to reducing the loss of aquatic biodiversity for each threat

This section presents some insights for each specific threat –a more detailed assessment is provided in the Annex 5 for each individual threat:

- Regarding **nitrogen pollution**, the Urban Waste Water Treatment Directive (91/271/EEC) and the Nitrates Directive (91/676/EEC) set target values for the eutrophic state of freshwater and coastal waters, and promote measures to reduce nitrogen emissions respectively from the domestic and industrial sector, and the agricultural sector. Other relevant policies include the Drinking Water Directive (98/83/EC) the Bathing Water Directive (previously 76/100/EEC, now 2006/7/EC) and the Groundwater Directive (2006/118/EC). The WFD integrates all these objectives in its status assessment and the establishment of RBMPs and PoMs, while the MSFD mostly relies on freshwater and land related policies, such as the WFD and the CAP, to reduce nitrogen emissions. The nitrogen threat is also tackled through legislation on air quality protection, with the National Emission Ceilings Directive (2001/81/EC), the Directive on Industrial Emissions concerning Integrated Pollution Prevention and Control (2008/1/EC), and the Ambient Air Quality Directive (2008/50/EC). All three seek to reduce $NO_x$ emissions through controls on emissions (e.g. licensing and authorisations) and the promotion of best available techniques (e.g. more efficient combustion processes).

- In terms of **species extraction**, the CFP mainly promotes measures to reduce pressures from fishing activities, for example by increasing selectivity and reducing unwanted catches. Furthermore, it should lead, as it is the case with the multi-species plan for the Baltic, to the adoption of multi-species plans that contain conservation measures with quantifiable targets to restore and maintain fish stocks at levels capable of producing MSY and control over the number of fishing capacity of the fishing fleet. Some of these measures are financially supported by the Regulation (508/2014) on the European Maritime and Fisheries Fund and reinforced by the MSFD.
- **Water abstraction** is considered in the WFD, which promotes measures to tackle pressures (e.g. water use efficiency, alternative water sources) and mitigate the impact on state of water abstraction (e.g. artificial recharge of groundwater bodies). Also, the principle of recovery of the costs of water services (Art. 9), including environmental and resource costs and hence the impact of water services on the environment, is implemented via water pricing, which provide incentives for users to use water resources efficiently. Further emphasis is given in the EU policy framework on water reuse and groundwater recharge through the Communication (2007) "Addressing the challenge of water scarcity and droughts in the European Union", and the Communication (2015) "Closing the loop – An Action plan for the Circular Economy". Water use in agriculture is targeted via a register and authorisation scheme on irrigation and funding for improving irrigation techniques under the CAP.
- Combating **IAS** is established through the Directive (29/2000) on "protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community", the Regulation (304/2011) concerning use of alien and locally absent species in aquaculture, and the Regulation (1143/2014) on invasive alien (non-native) species. The latter regulation foresees three types of interventions: prevention, early detection and rapid eradication, and management. Aside from these regulations, the Nature Directives place restrictions on the deliberate introduction of alien species into the wild. Most of the regulations, policies and directives focus on decreasing pressures (i.e. restrict and regulate IAS introduction into the wild) but not drivers (e.g. transport, aquaculture).
- **Alterations to morphology** are not tackled by specific policies, but more or less explicitly integrated in the Nature Directives, WFD and MSFD. The WFD establishes a specific management regime for water bodies most affected by morphological changes through their designation as Heavily Modified Water Bodies. The Note (2011) "Towards Better Environmental Options for Flood Risk Management" encourages the adoption of less intrusive flood risk protection measures such as Natural Water Retention Measures. Transversally, the Environmental Impact Assessment (EIA) Directive (2011/92/EU, amended by 2014/52/EU) and the Strategic Environmental Assessment (SEA) Directive (2001/42/EC) are important instruments for considering and minimising impacts of new morphological alterations. Sectoral funding, such as those provided by the Regulation (1305/2013) on support for rural development by the European Agricultural Fund for

Rural Development, can be used to restore the morphological state of freshwater and coastal waters.

- There are specific directives and policies in place to limit and eliminate **plastic waste**. The Waste Framework Directive (2008/98/EC) sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. The Packaging and Packaging Waste Directive (94/62/EC) requires Member States to ensure that preventive measures are implemented by, for example, national programmes, extended producer responsibility programmes, and to develop packaging reuse systems for the reduction of the impact of packaging and packaging waste on the environment. The wastewater treatment sector is as mentioned above regulated by the Urban Waste Water Treatment Directive (91/271/EEC. The Communication (2011/571) Resource Efficient Europe sets out concrete actions on marine litter by establishing SACs together with the Nature Directives' Natura 2000 Network and designating, for instance, that by 2020, market and policy incentives reward business investments in efficiency.

### 4.6.3 Mapping relevant policies against the DPS

Table 9 provides an overview of all identified instruments from the reviewed policies that act positively in reducing threats to aquatic biodiversity and mapped against the DPS continuum. The following can be highlighted:

- **At the level of State**, the European policy framework is quite well established for the protection of aquatic biodiversity with the Nature Directives focused on protecting habitats and species and the environmental targets of the WFD and MSFD. The reviewed threats are well covered by these four directives with further targets specifically set by other Directives for nitrogen (e.g. nitrogen standards), species extraction (e.g. MSY) and IAS. Current policy developments on Ecological Flows (CIS, 2015) and Green Infrastructure (EC, 2013a) provide the basis for further policy action on the water abstraction and morphological threats.
- **At the level of Pressures**, the European policy framework is also quite well established. Most reviewed policies in fact act at that level through e.g. pollutant emission control, adoption of best available/water-efficient technologies, alternative water sources and water reuse, etc.

Few policies appear to place strong control on **Drivers**. The establishment of strict licensing schemes regulating water uses for pollutant emissions or abstraction can indirectly lead to some control on drivers by encouraging alternative production systems or development paths if the authorisation is not expected to be provided. In a similar way, controls on fishing capacity and fleet, the control on new modifications to freshwater and coastal water bodies, or the licensing of new chemicals can not only reduce fishing, morphological and pollution emission pressures, but also incentivise the development of alternative economic activities. Some instruments provide more direct economic incentives to influence drivers (e.g. Rural Development Funds). However, our assessment suggests that sectoral policies broadly encourage negative economic activities and are thus discussed in the next chapter.

Table 9: Mapping of main policy instruments for each threat against the DPS framework

| | Nitrogen Pollution | Species Extraction | Water Abstraction | Invasive Alien Species | Alterations to Morphology | Plastic Waste |
|---|---|---|---|---|---|---|
| **State** | Favourable Condition & protected areas (HD, BD)<br>Nitrogen targets & vulnerable zones (ND) & Sensitive areas (UWWTD)<br>Quality targets (BWD, GD)<br>Environmental targets & measures (WFD)<br>Environmental targets & Marine protected areas (MSFD)<br>Rural Development (CAP II)<br>Air quality standards (AAQD)<br>Funding environmental projects (LIFE) | Favourable Condition & protected areas (HD, BD)<br>Environmental targets (WFD)<br>Environmental targets & Marine protected areas (MSFD)<br>Conservation targets, stock recovery areas (CFP)<br>Funding environmental projects (LIFE) | Favourable Condition & protected areas (HD, BD)<br>Environmental targets & measures (WFD)<br>Environmental targets & Marine protected areas (MSFD)<br>Funding environmental projects (LIFE) | Favourable Condition & protected areas (HD, BD)<br>Environmental targets & Marine protected areas (MSFD)<br>Funding environmental projects (LIFE) | Favourable Condition & protected areas (HD, BD)<br>Environmental targets & measures (WFD)<br>Environmental targets & Marine protected areas (MSFD)<br>Rural Development (CAP II)<br>Funding environmental projects (LIFE) | Favourable Condition & protected areas (HD, BD)<br>Environmental targets & Marine protected areas (MSFD)<br>Bathing water inspection (BWD)<br>Funding environmental projects (LIFE) |
| **Pressures** | Restriction activities (HD, BD)<br>Action programmes & Codes Good Practice (ND)<br>Collection and treatment of wastewater, water reuse and re-use of sludge (UWWTD)<br>Measures (BWD)<br>RBMP measures (WFD)<br>Advisory services and cross-compliance (CAP I)<br>Rural Development (CAP II)<br>Permits & best available techniques (IPPC)<br>Emission ceilings & action programme (ECD)<br>Air quality plan (AAQD)<br>Sustainability criteria on biofuels (RED)<br>Green investments (Regional Funds)<br>Funding environmental projects (LIFE) | Restriction activities (HD, BD)<br>RBMP measures (WFD)<br>Marine Strategies (MSFD)<br>Technical measures, multi-annual plans, catch limits, size of fleet (CFP)<br>Sustainability criteria in aquaculture (EMFF)<br>Funding environmental projects (LIFE)<br>Investments in infrastructure (Regional Funds)<br>Funding for reducing impacts (EMFF) | Restriction activities (HD, BD)<br>RBMP measures (WFD)<br>Marine Strategies (MSFD)<br>Water reuse (CEP)<br>Advisory services and cross-compliance (CAP I)<br>Rural Development (CAP II)<br>Investments in (green) infrastructure (Regional Funds)<br>Funding environmental projects (LIFE)<br>Sustainability criteria on biofuels (RED)<br>Env. impact assess. (EIA)<br>Strategic env. Ass. (SEA) | Restriction activities (HD, BD)<br>RBMP measures (WFD)<br>Marine Strategies (MSFD)<br>Prevention, early detection and rapid eradication, and management (RIAS)<br>Regulation introduction of alien species into wild (HD, BD)<br>Permit on aquaculture (RASA)<br>Permit on imports (PMIOP)<br>Permit system on trade (PSFFR)<br>Funding environmental projects (LIFE) | Restriction activities (HD, BD)<br>RBMP measures (WFD)<br>Marine Strategies (MSFD)<br>Marine spatial plans (MSP)<br>Environmental impact assessments (EIA)<br>Strategic environmental assessment (SEA)<br>Funding for reducing impacts (EMFF)<br>Advisory services and cross-compliance (CAP I)<br>Rural Development (CAP II)<br>Funding environmental projects (LIFE) | Restriction activities (HD, BD)<br>Licensing of chemicals (REACH)<br>RBMP measures (WFD)<br>Marine Strategies (MSFD)<br>Marine spatial plans (RERM)<br>Waste management (LD, WsFD, PPWD, UWWTD)<br>Funding environmental projects (LIFE) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Env. impact assess. (EIA)<br>Strategic env. Ass. (SEA) | | | | | |
| **Drivers** | Restriction activities (HD, BD)<br>Codes Good Practice (ND)<br>Discharge authorisation (UWWTD)<br>Management measures (BWD)<br>RBMP measures (WFD)<br>Advisory services and cross-compliance (CAP I)<br>Rural Development (CAP II)<br>Emission ceilings & action programme (ECD)<br>Air quality plan (AAQD) | Restriction activities (HD, BD)<br>RBMP measures (WFD)<br>Fishing capacity and opportunities, register and entry/exit scheme (CFP)<br>Diversification of economic activities of fishing communities (EMFF) | Restriction activities (HD, BD)<br>RBMP measures (WFD)<br>Advisory services and cross-compliance on abstraction permit system (CAP I)<br>Rural Development (CAP II) | Restriction activities (HD, BD)<br>Regulation introduction of alien species into wild (HD, BD)<br>Permit on aquaculture (RASA)<br>Permit on imports (PMIOP)<br>Permit system on trade (PSFFR) | Restriction activities (HD, BD)<br>RBMP measures (WFD)<br>Marine Strategies (MSFD)<br>Advisory services and cross-compliance (CAP I)<br>Rural Development (CAP II) | Restriction activities (HD, BD)<br>Support bio-based products (BIO)<br>Licensing of chemicals (REACH) |

Legend for reviewed policies:

AAQD: Ambient Air Quality Directive (2008/50/EC)
BD: Birds Directive (2009/147/EC)
BIO: Communication (2012/60) Innovating for Sustainable Grown: A Bioeconomy
BWD: Bathing Water Directive (2006/7/EC)
CAP I: Regulation (1306/2013) on the financing, management and monitoring of the common agricultural policy
CAP II: Regulation (1305/2013) on European Agricultural Fund for Rural Development
CFP: Regulation (380/2013) on the Common Fisheries Policy
ECD: Directive (2001/81/EC) on National Emission Ceilings
EIA: Environmental impact assessment (2011/92/EU) Directive
EMFF: Regulation (508/2014) on the European Maritime and Fisheries Fund
GD: Groundwater Directive (2006/118/EC)
HD: Habitats Directive (92/43/EEC) ;
IPPC: Directive (2008/1/EC) on Industrial Emissions concerning Integrated Pollution Prevention and Control
LD: Landfill Directive (1991/31/EC)
LIFE: Regulation (1293/2013) for a Programme for the Environment and Climate Action;
MSFD: Marine Strategy Framework Directive (2008/56/EC)
MSP: Directive (2014/89/EU) establishing a framework for maritime spatial planning
ND: Nitrates Directive (91/676/EEC)
PMIOP: Directive (29/2000) on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community
PPWD: Packaging and Packaging Waste Directive (94/62/EC)
PSFFR: Regulation (EC 338/1997) on protection of species of wild fauna and flora by regulating trade therein
RASA: Regulation (EU) No 304/2011 concerning use of alien and locally absent species in aquaculture
REACH: Regulation (1907/2006) Registration, Evaluation, Authorisation and Restriction of Chemicals
RED: Directive (2009/28/EC) on the promotion of the use of energy from renewable resources
Regional Funds: Regulation (1300/2013) on Cohesion Fund and Regulation (1301/2013) on Regional Development Funds
RERM: Regulation (1255/2011) on integrated marine policy
RIAS: Regulation (2014/1143) on invasive alien (non-native) species
SEA: Strategic environmental assessment (2001/42/EC) Directive
UWWTD: Urban Waste Water Treatment Directive (91/271/EEC)
WFD: Water Framework Directive (2000/60/EC)
WsFD: Waste Framework Directive (2008/98/EC)

## 4.7 Policies contributing to intensifying loss of aquatic biodiversity

EU policies supporting the expansion of sectoral economic activities can contribute to intensifying the threats onto aquatic ecosystems. Table 10 presents a summary of such policies and their impact on different drivers and threats. These linkages are discussed in more detail in the next two sub-sections, the first one presenting an overview of policies per threat, the second sub-section presenting a more specific discussion on EU funding instruments.

### 4.7.1 Overview per threat

As an overview per threat:

- There are policies that may increase the **nitrogen pollution** in aquatic ecosystems. These include policies such the CFP, which promotes aquaculture, and policies that promote the expansion of agriculture such as the Pillar I of the CAP and the Directive (2009/28/EC) on the Promotion of the Use of Energy from Renewable Resources, which encourages the cultivation of crops to be used as biofuels.
- Regarding **species extraction**, the socio-economic aspects surrounding the threat have not yet been addressed adequately, and economic growth is even promoted in some policy areas. The CFP promotes small-scale coastal fishing and sustainable aquaculture to contribute to food security and supplies, growth and unemployment, which could lead to an increase in activity. The same is true for the Communication (COM (2004) 254 final/2) "Innovation in the Blue Economy: realising the potential of our seas and oceans for jobs and growth" that promotes the growth of the aquaculture and marine biotechnology sector.
- Even though political action has promoted a reduction in **water abstraction** within the EU, economic welfare is still the focus of most Member States. Most water-related policies that focus on economic growth go against a decrease in water abstraction. For instance, the Communication "Towards an Industrial Renaissance" and the Communication (COM/2010/0352 final) "Europe, the world's No. 1 tourist destination" clearly promote the sustaining of competitiveness in Europe's economy. These actions will lead to an intensification of the driver. Even the Regulation (1305/2013) on support for rural development by the European Agricultural Fund for Rural Development promotes energy crops that increase water demand and supports infrastructure to increase agricultural output, which could also intensify water use.

Table 10: Summary of European Policy Mechanisms that Directly or Indirectly lead to Threats to Aquatic Biodiversity

| Sectoral Policies | Promoted Drivers | | | | | | | | | | Key Threats to Aquatic Biodiversity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Agriculture | Urban Areas | Water Utilities | Fishing | Aquaculture | Energy | Transport | Industry | Waste sector | Tourism | Species Trade | Nitrogen Pollution | Species Extraction | Water Abstraction | Invasive Alien Species | Alterations to Morphology | Plastic Waste |
| Regulation (508/2014) on the European Maritime and Fisheries Fund | | | | ■ | ■ | | | ■ | | | | ✔ | ✔ | | ✔ | ✔ | ✔ |
| Regulation (380/2013) on the Common Fisheries Policy | | | | ■ | ■ | | | | | | | ✔ | ✔ | | ✔ | ✔ | ✔ |
| Communication (COM (2004) 254 final/2) Innovation in the Blue Economy | ■ | | | | ■ | | | | | | | ✔ | ✔ | | | | |
| Regulation (1307/2013) establishing rules for direct payments to farmers under support schemes | ■ | | | | | | | | | | | ✔ | | ✔ | | ✔ | |
| Regulation (1305/2013) for European Agricultural Fund for Rural Development | ■ | | | | | | | | | | | ✔ | | ✔ | | ✔ | |
| Regulation (1300/2013) on Cohesion Fund | | | | | | ■ | ■ | | | | | ✔ | | | ✔ | ✔ | ✔ |
| Regulation (1301/2013) on Regional Development Funds | | ■ | ■ | | | ■ | ■ | ■ | | ■ | | ✔ | | ✔ | | ✔ | ✔ |
| Directive (2009/28/EC) on the promotion of the use of energy from renewable resources | ■ | | | | | ■ | | | | | | ✔ | | ✔ | | ✔ | |
| Communication (COM/2014/014 final) Towards an Industrial Renaissance | | | ■ | | | | | ■ | | | | | | ✔ | | | ✔ |
| Communication (COM/2010/0352 final) Europe, the world's No. 1 tourist destination | | | | | | | | | | ■ | | | | ✔ | | | ✔ |
| Communication (COM (2004) 453 final) on Short Sea Shipping | | | ■ | | | | ■ | | | | | ✔ | | | ✔ | ✔ | |
| White paper (COM (2011) 144 final) Roadmap to a Single European Transport Area | | | ■ | | | | ■ | | | | | | | | ✔ | | ✔ |
| Floods Directive (2007/60/EC) | | | ■ | | | | | | | | | | | | | ✔ | |
| Fuel Quality Directive (2009/30/EC) | ■ | | | | | | | | | | | ✔ | | | | | |
| Regulation (710/2009) on organic aquaculture animal and seaweed production | | | | | ■ | | | | | | | | ✔ | | ✔ | | |

Legend:
■ = Direct support (funding mechanisms) that increase threats to aquatic biodiversity;
■ = Encouraging a change of sectoral practices that leads to increase the threat;
■ = Promotion of the threat through new practices by changing the regulatory landscape
□ = Not applicable

- There are regulations and policies in place that indirectly increase drivers and pressures of **invasive alien species**. Especially policies concerning maritime transport such as the Communication (COM (2004) 453 final) on Short Sea Shipping and the White Paper (COM (2011) 144 final) "Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system", and, thus, can lead to the introduction of IAS rather than reduce it. It should also be noted that the WFD fails to directly address IAS within the directive and, thus, lowers its potential for minimising the threat; however, guidance from the EC as well as further work on this subject within the Commission's ECOSTAT group clearly supports the inclusion of alien species data in work to implement the WFD.
- Several regulations or strategic documents increase the threat of **alterations to morphology**, especially in relation to three drivers: flood protection, energy and navigation. Relevant policies include the Floods Directive (2007/60/EC), the Directive on the promotion of the use of energy from renewable resources (2009/28/EC), the Communication (COM (2004) 453 final) on Short Sea Shipping, and the White paper (COM (2011) 144 final) Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system.
- **Plastic waste** pollution, notably via marine litter, can be increased via strategies aiming to increase the level of industrial activities (e.g. Communication 2014/014 Towards an Industrial Renaissance), tourism (e.g. Communication 2010/0352 Europe, the world's No. 1 tourist destination), and transport (e.g. communication 2004/453 on Short Sea Shipping, and the White paper 2011/144 Roadmap to a Single European Transport Area).

### 4.7.2 Insights into EU funding instruments

As investigated in the threats templates (see Annex 5), the ways found in which European policy can promote drivers by increasing the amount of economic activity through:

- Direct support: funding mechanisms to drivers that increase threats to aquatic biodiversity.
- Direct regulation: promoting a direct change of sectoral practices that leads to a promotion of the threat.
- Indirect regulation: Indirectly promoting the threat by changing the regulatory framework.

This section aims to introduce available funding mechanisms at the EU level and investigate to what degree these funding mechanisms influence drivers that negatively affect aquatic biodiversity. Table 10 provides a summary of European policy mechanisms (key regulations and strategies) that directly or indirectly support the threats to aquatic biodiversity.

The most significant policies for the intensification of agricultural nitrogen, water abstraction and morphological alterations threats are part of CAP, which has a threefold aim: to improve agricultural productivity and ensure a stable supply of affordable food, to enable farmers to

make a “reasonable living”, and to address climate change and sustainable management of natural resources.

The CAP is defined by a number of basic legislative acts. The European Agricultural Guarantee Fund Regulation (1306/2013) and the Direct Payment Regulation (1307/2013) establishes the rules for financial support for farmers to stabilise their income (EU budget of about 290 billion EUR between 2014 and 2020). The Market Regulations (1308/2013) establishes a set of rules which regulates agricultural markets in the EU.[9] Although direct payment is decoupled from production –which reduces the incentive to intensify production (and thereby e.g. increasing nitrogen emissions through increased use of fertilisers), together with market stabilisation, they maintain the viability of agricultural practices in several regions and, therefore, indirectly contribute to several threats to aquatic biodiversity. The direct aids and market related instruments of CAP make around 1/3 of the total EU budget. Important to mention that through Regulation (1306/2013) there is an effort to ensure cross-compliance with environmental protection policies by promoting good farm management practices through maintaining land in Good Agricultural and Ecological condition.

Further to CAP, the main mechanisms in line with the objectives of the Europe 2020 strategy for supporting growth in the EU occur through a variety of available financing mechanisms under the European Structural and Investment Funds. These are: European Regional Development Fund (ERDF), European Social Fund, Cohesion Fund (CF), European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF). Each of these funding mechanisms has their own objectives.

Through the EAFRD, Member States must prepare Rural Development Programmes (RDPs) that outline activities for strengthening the competitiveness, social cohesion and environmental performance of agriculture and the rural economy (EU budget of 95 billion EUR between 2014 and 2020). The general rules of the EAFRD are set at EU level, but significant flexibility is built into the system and RDPs are co-financed by Member States. Implementation can differ substantially across the Member States. This mechanism can contribute to maintaining (intensive) agriculture by encouraging investments and strengthening of the agricultural sector. Although, there are also payments to support environmental protection included in the EAFRD.

Further to EAFRD, other relevant EU funding mechanisms are the EU CF. The CF Regulation (1300/2013) is directed towards countries whose Gross National Income per capita is less than 90% of the EU average in order to reduce economic disparities in the EU. It supports investments in transport and the environment, including the promotion of energy derived

[9] These rules are part of the Common Market Organisation which builds on the rules for the common market in goods and services with specific policy tools that help improve the functioning of agricultural markets. The CMO sets out the parameters for intervening on agricultural markets and providing sector-specific support (e.g. for fruits and vegetables, wine, olive oil sectors, school schemes). It also includes rules on marketing of agricultural products (e.g. marketing standards, geographical indications, labelling) and the functioning of producer- and interbranch organisations. Finally, it covers issues related to international trade (e.g. licenses, tariff quota management, inward and outward processing) and competition rules.

from renewable sources. Investments under the CF can potentially lead to increased nitrogen emissions through increased transport (atmospheric emissions) and by promoting biofuel renewable energy, which is associated with an intensification of agriculture and the use of fertilisers, alongside increased water abstraction. Through the same funding source, both sectors (transport and energy) have the potential to alter the morphology of aquatic habitats (inland waterways for navigation and dams for energy generation).

Similarly, the ERDF Regulation (1301/2013) aims to strengthen economic and social cohesion in the EU by correcting imbalances between its regions. It specifically supports productive investments in Small and Medium sized Enterprises which create and safeguard employment, and can thus indirectly lead to an intensification of the nitrogen or morphology alterations threats if leading to the intensification of e.g. industrial activity or transport. Together, the EU regional funds (Cohesion and Regional Development) amount to about 350 billion EUR of EU budget.

How European Structural and Investment Funds work in practice can be best illustrated through an example using the Water industry in Europe. The construction costs of water supply and wastewater systems are eligible for assistance under the Cohesion Policy from the ERDF and the CF, varying from 25% to 85% of eligible expenditure. In the period 2000–2006, such support totalled 4.05 billion EUR, with four Member States (Greece, Italy, Portugal, and Spain) accounting for nearly 90% of all the funding. In addition to these amounts, soft loans from the European Investment Bank[10] are made available for water supply and sanitation projects in the EU and the European Free Trade Association countries to cover for investment expenditure not covered through the ERDF and the CF. A total of 9.1billion EUR was lent to the water sector by the Bank from 2003 to 2007.

Industrial water abstraction is also linked to the recent "Communication for a European Industrial Renaissance" (COM/2010/0352 final). The communication aims for industrial modernisation and calls for investing in innovation, resource efficiency, new technologies, skills and access to finance, accelerated by the use of dedicated EU funds. Funding is based on effective combinations of COSME (Competitiveness of Enterprises and SMEs), Horizon 2020, Structural Funds (regional funds at least 100 billion EUR) and national funding to pursue innovation, investment and reindustrialisation. The objective is to reach a 20% target of industry's share in Europe's GDP by 2020.

Regarding relevant maritime policies, the EMFF Regulation (508/2014) promotes the development of fisheries and maritime activities and the strengthening of their competitiveness to safeguard rural coastal communities and promote their economies and

[10] Please note that the European Investment Bank (EIB), in support of EC Regional and Environmental policies, can use the various EU funds and instruments (subsidies and grants) for leveraging budgetary funds through EIB financing. As a non-profit, policy-driven public bank, interest rates are based on the EIB's borrowing cost with a small margin to cover administrative expenses and other costs. The EIB lends to public or private utility companies, national or local authorities, or it can directly finance individual projects. It can lend up to 50% of the investment costs of individual projects, but financing may be combined with EU grants depending on the scope and definition of the individual project. However, on average its lending makes up 30% of the total cost of water projects, split more or less equally between public and private sector borrowers.

jobs creation. It provides financial support for the implementation of the CFP Regulation (1380/2013). The EMFF regulation covers a total budget of 6.4 billion EUR for the period 2014-2020. 89% of the total budget is managed by Member States. The EMFF is used to co-finance projects, along with national funding. In both regulations, aquaculture and commercial fisheries - which can both contribute to nitrogen pollution, extraction of species, IAS and alteration to morphology - are the major activities targeted through this funding mechanism, although emphasis is given on the need for promoting more sustainable practices. Furthermore, Regulation (710/2009) "on organic aquaculture animal and seaweed production" promotes and regulates the organic aquaculture sector in Europe. While the regulations may have positive effects in terms of some pressures to aquatic ecosystems, it is expected that will increase the threats from IAS and species extraction.

Other policies that support drivers worth highlighting can be found in the field of energy and transport; the Directive on the promotion of the use of energy from renewable resources (2009/28/EC) requires adopting national renewable energy action plans setting targets for the share of energy from renewable sources. Because Member States are likely to increase bio-energy crops to meet targets and bio-energy crops require more nutrients and water for their growth, it is possible that the directive leads to increased emissions of nitrogen, larger water abstractions and further morphological alterations to freshwater ecosystems. The Fuel Quality Directive (previously 98/70/EC, now 2009/30/EC) introduces Low Carbon Fuel Standard which may encourage the increased use and demand for biofuels. In addition, hydropower is currently the biggest source of renewable electricity in Europe (ETC/ICM, 2012) and more installations might be built as a response to this measure. Hydropower installations are associated with several kinds of pressures on water bodies (e.g. cross-profile constructions) which ultimately lead to the alteration of morphology (ETC/ICM, 2012). Increases in wind energy and ocean energy can also lead through an increase in pressures and, thus, alteration of morphology.

Similarly, the Floods Directive (2007/60/EC) also increases the threat of morphological alterations. Typical flood defence measures, such as river channelling and dykes, are pressures which lead to alteration of morphology (ETC/ICM, 2012). This is an example about the further promotion of threats to aquatic biodiversity through new sectoral practices encouraged by new regulations and highlights the difficult trade-offs that policy faces when promoting the protection of the environment.

## 4.8 Conclusions

Overall, the European policy framework represents a comprehensive set of legislation and regulations protecting aquatic biodiversity. As the chapter showed nevertheless, there is a need to reverse negative trends: initiatives in last 40 years have contributed to reduce scale of some pressures-and in some cases reverse trends- but not yet to a level to prevent biodiversity loss.

The review has shown that there are number of transversal environmental policy instruments which work across threats (e.g. Nature Directives, WFD, MSFD, LIFE, EIA, and SEA). Some of these provide scope for a large range of action, at the level of state, pressures and drivers. More specifically, Table 11 below synthesises some of the main outcomes of the strengths and weaknesses of the EU policy framework for each threat. Some threats are tackled by more specific instruments, especially extraction of species (e.g. with the CFP, EMFF), nitrogen (with e.g. the Nitrates Directive, Urban Waste Water Treatment Directive); IAS and, increasingly so, plastics. The "weakest" policy frameworks (in terms of scope of design) appear to be on water abstraction and morphology, all of which have few specific instruments at EU level.

The analysis shows that the policy framework is most developed when it comes to defining environmental targets (level of state) and sets a number of instruments to reduce pressures by encouraging the adoption of more resource-efficient practices, but it becomes less specific when tackling sectors (drivers) and supporting more environmental sound economic development. There is clearly more scope to mainstream further in sector policies: this would require considering how growth and competition policies impact aquatic biodiversity, and aim to "uncouple" growth and resource use.

Overall, the EU policy landscape appears to have a mixed effect: in some ways it provides protection to aquatic biodiversity, in other ways, it encourages activities that lead to further deterioration. Given the range of available policy instruments, one key question is how to improve the coherence of EU policy to further protect aquatic biodiversity. The next chapter further examine this question, by discussing the potential for implementing EBM as an innovative management approaches to protecting aquatic biodiversity.

Table 11: Overview of key strength, weaknesses and opportunities to strengthen the European policy framework on the key identified threats

| Threat | Strength | Weaknesses/challenges | Opportunities |
|---|---|---|---|
| **Nitrogen Pollution** | An extensive policy framework that tackles the threat along the whole DPS, including major drivers. Clear set of measures on pressures. | Major incentives supporting key drivers (agriculture) and a policy framework that mainly set specific instruments to reduce the threat at the level of state and pressures | Strengthen mainstreaming on key drivers (e.g. reduced support to intensive agriculture) |
| **Extraction of Species** | An extensive policy framework that tackles the threat along the whole DPS, including fishing and aquaculture. Clear set of instruments on | An emphasis on production and supporting the fishing and aquaculture sector with weak requirements for sustainable production | Strengthen mainstreaming on key drivers (e.g. reduced support to intensive fishing practices) |

| | | | |
|---|---|---|---|
| | pressures | | |
| **Water Abstraction** | Some policy support for reducing pressures (e.g. increasing water efficiency) with range of funding instruments available for multiple drivers (mainly urban and industry) | Major incentives to increase overall water use across a range of drivers. Limited range of instruments on state (e.g. water quantity) and unclear instruments to tackle drivers (e.g. promote less water intensive economic activities) | Strengthen instruments acting on state (e.g. application of ecological flows)<br><br>Strengthen mainstreaming on key drivers (e.g. reduced support to irrigated agriculture)<br><br>Develop instruments on drivers (e.g. better control between economic development e.g. tourism and available resources) |
| **Alien Invasive Species** | An extensive policy framework that regulates the introduction of species (pressures) and trade (driver) | Few instruments on how to deal with the threat at the level of state (e.g. how to restore natural conditions) and on key drivers (e.g. transport) | Strengthen instruments on specific drivers (e.g. reducing impact of transport) |
| **Alteration to Morphology** | A policy framework that provides a good level of control on new development (pressures) | Lack of strong policy support to do restoration and deal with past alterations (e.g. restoring state). Lack of strong instruments on current drivers (e.g. transport, energy) to tackle new alterations | Strengthen mainstreaming on key drivers (e.g. licensing of modifications)<br><br>Develop instruments for restoration of state (e.g. river restoration) |
| **Plastic Waste** | A nascent policy framework that provides some control on the emissions of litter (pressures) | Lack of instruments to tackle existing litter and pollutants in water (e.g. no target in WFD) and need to strengthen instruments on drivers (e.g. support for alternative material) | Strengthen instruments acting on state (e.g. establishing targets for safe plastic concentration in water, removal of plastic waste)<br><br>Strengthen instruments on specific drivers (e.g. plastic industry) |

# 5 Synergies and Barriers between Key Environmental Policies for the Protection of Aquatic Biodiversity

This chapter presents an assessment of the degree to which the key European environmental policies for the protection of aquatic biodiversity work synergistically or antagonistically for the implementation of EBM. The aim is to evaluate the possible future use of EBM as an integrative policy concept for the safekeeping and protection of aquatic biodiversity. With this European "policy framing", work within the AQUACROSS case studies will examine more specifically the implementation challenges and innovations from a bottom-up perspective.

The assessment presented in this chapter is structured around key principles of EBM. From a broad analysis across European policies in Chapter 4 , the scope is narrowed back to the key environmental policies examined in Chapter 3 : the Nature Directives, WFD and MSFD. The assumption is that these directives will be the main overarching EU instruments through which EBM can be implemented. The focus of the analysis is thus on the policy requirements of these four directives, so as to evaluate the degree or potential of policy support to work synergistically for the implementation of EBM.

## 5.1 Methodology

The work undertaken within AQUACROSS is based on the hypothesis that EBM is a holistic and integrative approach that can help to address the challenges around implementing policies that govern aquatic ecosystems – particularly by promoting multiple benefits – and can be used to sustainably manage and protect biodiversity.

One of the first steps for the assessment involved the identification of principles of EBM in the context of AQUACROSS and aquatic ecosystems that is mindful of existing policy requirements. Based on the list of identified EBM principles, an analysis of key policies against these EBM principles is possible. So the starting element is a consolidated definition of EBM for the purpose of the policy analysis. However, EBM is a complex concept, incorporating a wide range of principles. While there is currently no single, agreed-upon overarching definition of EBM, it can generally be understood as any management or policy option intended to restore, enhance and/or protect the resilience of an ecosystem so as to sustain or improve the flow of ecosystems services and conserve biodiversity (Gomez et al., 2016). This includes any course of action purposely intended to improve the ability of an

ecosystem to remain within critical thresholds, to respond to change and/or to transform to find a new equilibrium or development path.

Using the EBM principles highlighted in the AQUACROSS Innovative Concept (Gomez et al., 2016), the following policy-relevant principles for EBM were developed for the purpose of the assessment reported in this chapter:

### 1. EBM considers ecological integrity, biodiversity, resilience and ecosystem services

EBM aims to maximise the joint value of all ecosystem services rather than focusing on maximising the provision of some ecosystem services (drinking water, water for irrigation, urban soil, dilution of pollutants, etc.) over others. EBM considers the dynamic relationship among and between species, as well as their abiotic environment, and protects the integrity of the ecosystem as a means to preserve a complementary array of ecosystems services as well as to preserve biodiversity in its own rights. EBM is thus characterised by a focus on multiple benefits or environmental services and its simultaneous contribution to a range of targets across different policy domains.

### 2. EBM is carried out at appropriate spatial scales

Managing ecosystems is far more ambitious than managing water bodies, single assets or even river basins or regional seas. Hence, EBM management decisions and actions must take place at the appropriate level, taking into account ecosystem boundaries and complex connections and adaptive processes. This might imply decentralisation to the level of local communities, but may also require action at higher levels, through, for example, transboundary cooperation or even cooperation at the global level. Ecosystem connections within and across realms should be considered, as management interventions in ecosystems often have unknown or unpredictable effects on other ecosystems.

### 3. EBM develops and uses multi-disciplinary knowledge

Effective design and implementation of EBM requires an understanding of the complex ecological and social systems to be managed which in turn requires the development of multi-disciplinary knowledge. A more detailed understanding of ecosystem functions and structure, and the roles of the components of biological diversity in ecosystems, as well as a better understanding of social institutions and decision-making processes are needed to understand ecosystem resilience and the effects of biodiversity loss and habitat fragmentation; underlying causes of biodiversity loss; and determinants of local biological diversity in management decisions. EBM draws on scientific knowledge to ascertain the connections, integrity and biodiversity within an ecosystem as well as its dynamic nature and associated uncertainties, while also drawing on local knowledge of stakeholders.

### 4. EBM builds on social-ecological interactions, stakeholder participation and transparency

Rather than treating society and the environment as separate entities, EBM acknowledges social-ecological interactions and seeks to balance ecological and social concerns. It requires an identification of what set of ecosystem services could and should be sustainably provided while taking into account potential impacts on biodiversity. As ecosystem services are asymmetrically valued by different users, deciding on EBM alternatives implies synergies and trade-offs between benefits and beneficiaries. EBM gives prominence to transparent and inclusive decision-making between authorities and stakeholders. It seeks to results in agreements amongst stakeholders with potentially conflicting interests and advance collective action by building consensus on a shared vision for the future (e.g. the array of ecosystem services to be preserved).

#### 5. EBM supports policy coordination

Effective EBM requires cooperation and collective action to share the array of ecosystem services obtained across different stakeholders and policy domains, and to break institutional silos along with disciplinary borders. By seeking to balance ecological and social concerns, EBM opens new opportunities of pursuing different policy objectives simultaneously (in water provision, energy, land use, food, climate change adaptation, etc.). EBM also contributes to designing cooperative instruments and policy synergies to take advantage of these opportunities and minimises associated transaction costs.

#### 6. EBM incorporates adaptive management

Ecosystem processes and functions are complex and variable. Accepting that there are no optimal solutions and that the future is uncertain, EBM seeks to build adaptation capacities by restoring critical ecosystems and strengthening social abilities to respond to a range of possible future scenarios. Short-term opportunities of management interventions should be weighed against long-term benefits of alternative interventions. While long-term goals must be spelled out, inevitably, unforeseen issues will modify those goals or show new ways to reach them. As a consequence, long-term goals and the management tools used to achieve them must be regularly revisited. Monitoring should be implemented so that indications of potential problems or changes are spotted early.

In accordance with the principles stated above, the focus of the analysis centred on a core set of European policies that aim to protect aquatic biodiversity (i.e. Nature Directives, WFD and MSFD), while keeping in mind linkages between this core set with the broader European policy framework. In a first step, the assessment focused on comparing the legal texts for each Directive with the principles of EBM. In a second step, results for each individual directive were compared to each other in order to examine synergies and conflicts.

This analysis is based on different aspects of each Directive's respective legislation, including, objectives (i.e. overall objectives as well as targets and standards), spatial and temporal scales (i.e. units of management), planning processes and steps, and management measures promoted to achieve each Directive's aims. A targeted analysis was also carried out

of supporting documents, such as EU communication and CIS guidance documents and texts, as well as of relevant publications (see Table 1 in Chapter 2).

The chapter is structured as follows. Firstly, a synthesis of the assessment comparing each individual directive to each EBM principles is presented. Detailed assessments are available in Annexes 6 (introduces the proposed review template) and 7 (showing the detailed EBM mapping analysis). Secondly, a discussion about the individual and joint potential of the four key policies to work synergistically to apply each EBM principle is presented for each EBM principle. The chapter concludes with a summary of strengths and weaknesses of the current policy context for supporting each EBM principle.

## 5.2 Mapping key policies against ecosystem-based management principles

### 5.2.1 Habitats and Birds Directives

The Nature Directives do not integrate many of the elements of EBM; but, on the other hand, do not prevent EBM implementation and some of their requirements are coherent with EBM principles.

EBM 1: ecological integrity, biodiversity, resilience and ecosystem services

The Nature Directives mostly support the idea that ecological integrity, biodiversity and ecosystem resilience should be considered in the management of natural systems, but they do not consider explicitly 'ecosystem services'.

The overall objective of the HD is to conserve natural habitats and wild fauna and flora in the European territory of the Member States. The HD also aims to maintain and restore to a Favourable Conservation Status (FCS) all habitat types and species of community interest. FCS describes a situation where a habitat type or species is prospering in both quality and extent and population – and has good prospects to do so in the future. The HD thus recognises that features of the landscape should be managed to support the conservation of relevant species. The BD focuses on conserving all naturally occurring birds in the wild state in the European territory of the EU Member States. The BD calls for measures to protect birds but also to preserve, maintain (prevent deterioration) or re-establish a sufficient diversity and area of habitats for certain bird species. These measures have the potential to have a positive impact not only on bird species but also on the wider ecosystem.

While the Nature Directives do align with the idea that ecosystems should be protected so as to preserve an array of ecosystem services, their focus on protecting specific habitats and species does not necessarily align with the idea of maximising the joint value of all ecosystem services. Recent work by the EEA has nevertheless mapped habitats and species classified under the Nature Directives against the working group Mapping and Assessment of Ecosystems and their Services (MAES) ecosystem types (EEA, 2015b). Some assessment also

used the MAES and Common International Classification of Ecosystem Services (CICES) typology of Ecosystems and ecosystem services types to present progress in biodiversity protection in Europe through the Nature Directives. Other initiatives led by the EC, such as the application of Green Infrastructures,[11] aims to provide a framework for the consideration of multiple benefits within nature protection, which aligns well with the ecosystem services concept.

EBM 2: appropriate spatial scales

The Nature Directives do not set specific scales at which conservation action must be carried out. They establish a framework to protect the most vulnerable species and habitat types across their entire natural range within the EU, including marine areas where Member States exercise jurisdictional rights.

The HD focus on terrestrial and aquatic habitats distinguished by geographic, abiotic and biotic features while the BD focuses on bird species. To support the conservation of habitats and species across their whole natural range, the Nature Directives require the establishment of a network of protected areas, commonly called Natura 2000. For the HD, Member States must propose a list of sites hosting habitats and species listed in the Annexes, which provides the basis for selection of Sites of Community Interest (SCI) and SACs.[12] For animal species ranging over wide areas the sites correspond to "the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction. For aquatic species which range over wide areas, such sites will be proposed only where there is a clearly identifiable area representing the physical and biological factors essential to their life and reproduction" (Art. 4).

Under the BD, Member States are free to designate the most suitable territories as SPAs for the conservation of species in the geographical sea and land area where this Directive applies. More generally, the BD establishes a general system of species protection in particular against hunting, trading and deliberate disturbance of bird species.

The Nature Directives also acknowledge the multi-level approach to biodiversity conservation by enabling proportionate and appropriate implementation in each Member State and at site level. The HD allows for flexibility in the type of conservation measures which have to be established for SACs, including "appropriate statutory, administrative or contractual measures' and 'if need be management plan"' (Art. 6). Under the BD, measures relate to protection of specific species (e.g. probation of hunting, capture), but also to protection of habitats, while the designation of SPAs contribute to Natura 2000, indicating conservation action at multiple scales.

[11] See: http://ec.europa.eu/environment/nature/ecosystems/index_en.htm

[12] A Site of Community Importance (SCI) = a site which, in the biogeographical region or regions to which it belongs, contributes significantly to the maintenance or restoration at a favourable conservation status of a natural habitat type or of a species, and/or contributes significantly to the maintenance of biological diversity within the biogeographic region or regions concerned. They are proposed to the Commission by the State Members and once approved, they can be designated as SACs by the State Member. Special Areas of Conservation form part of the Natura site network together with Special Protection Areas designated within the Birds Directive.

Measures in Natura 2000 will involve different spatial scales. At local level, management agreement (Annex II A) will involve contractual measures between the competent authorities and individual landowners (EC, 2000). Internationally, the Nature Directives acknowledge that threats to habitats and species are often of a transboundary nature, and both explicitly call for transboundary cooperative research between Member States.

Overall, the Nature Directives appear to contribute to fostering ecosystem-level environmental protection and ecological coherence, the key mechanism being the coherence of Natura 2000 sites and their capacity to promote coherent and effective ecological networks across the EU so as to maintain the overall health of species and natural habitats across Europe.

### EBM 3: multi-disciplinary knowledge

On the whole, the Nature Directives support the use of multi-disciplinary knowledge. The development of a protection regime for habitats and species, and designation of Natura 2000 sites, is done on scientific grounds and must consider element of biology, ecosystem functions and structure. A pre-defined list of habitats and species are set out in the directives. Assessment elements of their status, as defined in the HD, focus on natural habitat types (range, areas covered, specific structure and functions, future prospects) and species (range, population, habitat, future prospects). While effects of biodiversity loss, habitat fragmentation and ecological dynamics are considered, there is no specific requirement to identify and consider key thresholds in ecological dynamics in order to maintain 'resilience' (link with EBM Principle 1).

The Nature Directives include consideration of social and economic issues, whereby Member States must provide information on threats and pressures for the assessment of conservation status for species and habitats (Art. 12 BD, Art. 17 HD). Measures taken under the HD and BD (Art. 2) must take into account economic, social and cultural requirements and regional and local characteristics of the area concerned which would assumedly entail multidisciplinary knowledge. There is nevertheless no explicit mention of the potential use of local knowledge in either directive.

### EBM 4: social-ecological interactions, stakeholder participation and transparency

The Nature Directives do incorporate provisions to balance ecological and social concerns. For example, Member States must take account of economic, social and cultural requirements and characteristics when implementing measures to restore the favourable status of sites and species.

Furthermore, under the HD, any plan or project likely to have a significant effect on a Natura 2000, either individually or in combination with other plans or projects, shall undergo an appropriate assessment to determine its implications for the site. The competent authorities can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned (Art. 6.3). Projects can go ahead if there is no other satisfactory alternative, and there are imperative reasons of overriding public interest,

including those of a social or economic nature (Art. 6.1).[13] In such cases the Member State must take appropriate compensatory measures to ensure that the overall coherence of the Natura 2000 Network is protected (Art. 6.4). Under the BD, Member States may also derogate in the interest of public health or safety, air safety, for the protection of flora and fauna and to prevent damage to crops, livestock, fisheries and water.

Thus, while the Nature Directives do not call for an explicit assessment of trade-offs in the provision of ecosystem services, they do allow for the consideration of various benefits that society receives from ecosystems. For example, the protection of a specific habitat or species is likely to help maximise associate cultural services (i.e. natural heritage) or the supporting services that a specific habitat or species provide for other ecosystem services. Derogations are allowed for maximising other types of services such as food provisioning services or provision of energy.

The Nature Directives do not require the active involvement of stakeholders. In particular, there are no requirements for public consultation[14] and there is no indication of when it is appropriate to obtain the opinion of the general public. There is a general requirement for public participation and official EU guidance encourages Member States to involve the public, e.g. on issues related to the establishment of the conservation measures (EC, 2012a). At EU level, implementation is supported by the Habitats Committee (Art. 20 & 21 of HD) and the Ornis Committee (Art. 16 of BD) which comprise representatives from all member states and the EU Commission. Decisions are made with a qualified majority (using weighted votes).

Member States are also asked to reflect on positive changes in public acceptance towards biodiversity protection, and cooperation between authorities, nature conservationists and other interest groups and initiatives. Finally, although not legally required, there are several consultative bodies with stakeholders at EU level such as the Natura 2000 Biogeographical Process[15], which is a multi-stakeholder co-operation process managed by the EU Commission to enhance cross-territorial cooperation.

### EBM 5: policy coordination

Despite some differences in scope and operational measures, both directives aim to protect biodiversity in coordination with other European policy instruments.

In terms of coordination of implementation between the BD and the HD, the protection regime for SCIs, SACs and SPAs has been harmonised through Art. 7 of the HD (Milieu et al., 2015). A change from a 3-year to 6-year reporting cycle for the BD means that the BD and HD are now reasonably synchronised so that information is available in policy-relevant cycles and can give strong input to the overall biodiversity debate. Both directives are characterised

[13] Several guidance documents have been prepared to support implementation, e.g. http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm
[14] Consultation of the public is required for site designation under Directive 85/337/EEC (Directive on the assessment of the effects of certain public and private projects on the environment)
[15] See: http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm

by a similar dual structure of measures, consisting of a network of protected areas and strict protection regime of species in the wider landscape. Similar steps are required (e.g. establishing conservation measures, preventing/mitigating impacts from plans and projects, managing them in accordance with ecological needs). Although management provisions of the HD (Art. 6.1) do not apply to SPAs, Art. 4.1 and 4.2 of the BD provide for a similar approach (EC, 2000).

Being anterior to the WFD and MSFD, there is no specific requirement in the Nature Directives to coordinate with the water and marine legislation. However, the HD requires adoption of prioritised action frameworks (Art. 8) to define the funding needs and priorities for Natura 2000 at a national or regional level and so facilitate their integration into different EU instruments, in particular financing ones. EBM 6: adaptive management

The Nature Directives do not require adaptive management but establish processes that can support its implementation. For example, the Nature Directives require Member States to report progress on the state of conservation every six years. While this encourages some cycles of planning and revisions, it is not clearly spelled out in both directives. Member States have also a certain margin of manoeuvre or flexibility in implementing provisions. Under the HD, Member States can propose adaptations to the list of SACs in light of results of surveillance of conservation status of habitats and species (Art. 6). The concrete targets to be achieved can vary and can also evolve with for example better scientific knowledge. Finally, the HD stresses for example the need to go beyond simple management measures to ensure conservation towards preventive and anticipatory approaches to avoid deterioration, which can overall build ecological resilience.

Table 12 below illustrates examples of coordination of funding sources to support the objectives of the Nature Directives. Funding appears, thus, theoretically available and to a degree coordinated between different policy instruments. However, only the LIFE programme provides dedicated support to biodiversity and Natura 2000 as a primary objective, whereas other EU funding instruments are primarily targeted to deliver EU goals on rural, regional, infrastructural, social and scientific development. The extent to which nature and biodiversity are successfully integrated into the funding programmes depends nevertheless primarily on priority-setting at national and regional levels and the capacity of stakeholders to absorb funds.

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the HD stresses for example the need to go beyond simple management measures to ensure conservation towards preventive and anticipatory approaches to avoid deterioration, which can overall build ecological resilience.

Table 12: Funding Mechanisms and their Support to the Nature Directives

| Funding instrument | Link with the Nature Directives |
|---|---|
| **Regulation (1306/2013) on the financing, management and monitoring of the common agricultural policy** | CAP and Nature Directives are potentially complementary, as some of the CAP's incentives and associated environmental conditions (e.g. cross-compliance) can be beneficial for biodiversity, although much depends on Member State implementation choices. For example, direct payments, although eligibility rules have led to unintended biodiversity damage in some Draft Emerging Findings -Evaluation Study to support the Fitness Check of the Birds and Habitats Directive 5 areas. |
| **Regulation (1305/2013) on support for rural development by the European Agricultural Fund for Rural Development** | The EAFRD fund provides direct opportunities for financing a range of Natura 2000 activities in the context of agri-environment-climate and forest-environmental schemes. These schemes provide compensation payments for additional costs and income foregone resulting related to managing agricultural and forest land within Natura 2000 sites, improving knowledge on rural biodiversity, and drawing up Natura 2000 management plans. Furthermore, a great variety of more indirect opportunities are available, allowing the management of Natura 2000 to be linked with broader rural development efforts, such as promoting organic farming, improving risk management, and enhancing business development. In addition, payments for areas facing natural and other specific constraints can support farming systems associated with certain European protected habitats and species. |
| **Regulation (1300/2013) on Cohesion Fund and Regulation (1301/2013) on Regional Development Funds** | Cohesion and Regional Policy has both positive and negative impacts on the objectives and implementation of the Nature Directives. It can provide funding to directly support their objectives (e.g. conservation measures) but also for activities that may threaten nature objectives such as transport, energy and other infrastructure. There is room for improvement in the integration of the goals of the Nature Directives into Cohesion and Regional Policy to enhance the role of green infrastructure and nature-based solutions. |
| **Regulation (1293/2013) for a Programme for the Environment and Climate Action (LIFE)** | LIFE-Nature is the main fund for biodiversity, although some Natura 2000 sites receive money from LIFE-Environment. LIFE has a much smaller financial capacity than other EU funding sources such as the Common Agricultural Policy and Structural Funds. Projects financed by LIFE are also of limited duration. Funding under the new LIFE instrument for the period 2014-2020 amounts to 3.4 billion EUR. |
| **Research and Innovation funds** | Research and Innovation policy through the H2020 programme, for example, does not directly support biodiversity and nature protection. Biodiversity is however included in Societal Challenge 5: 'Climate action, environment, resource efficiency and raw materials' and Societal Challenge 2: 'Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bio-economy'. |

### 5.2.2 Water Framework Directive

As with the Nature Directives, the WFD does not integrate many of the elements of EBM; but equally the Directive does not prevent EBM implementation and some of its requirements are coherent with EBM principles.

### EBM 1: ecological integrity, biodiversity, resilience and ecosystem services

None of the key terms "ecological integrity", "biodiversity", "resilience" or "ecosystem services" is mentioned in the WFD. However, they are all implicitly reflected. The key objective of the WFD is to achieve good status or potential for all water bodies by 2015 and avoid deterioration (Art. 4). Ecologic status is an expression of the quality of the structure and functioning of aquatic ecosystems associated with surface waters. It is defined as the deviation of specified biological elements from undisturbed reference conditions, supported by hydromorphological and physicochemical quality elements. Thus, the environmental objectives of the WFD consider aquatic biodiversity.[16]

Through a classification of status into different classes (i.e. high, good, moderate, poor and bad status), the WFD considers the role of critical (e.g. pollution) thresholds and the need to maintain ecosystems within equilibrium and certain ranges to maintain resilience. Specific EU guidance is available on adaptation, although mainstreaming is not a requirement of the WFD.

While the WFD aligns with the idea that all aquatic ecosystems should be protected, it does not aim to maximise all ecosystems services. It does nevertheless establish an integrated framework for all European legislation pertaining to water, in particular bathing water, drinking water and wastewater treatment. Furthermore, recent emphasis in the Blueprint for Safeguarding Europe's water has been on searching for multiple benefits, in particular with drought management through e.g. the concept of ecological flows (CIS, 2015) and flood risk management through e.g. better environmental options for flood risk management (EC, 2011b) and the concept of Natural Water Retention Measures.[17]

### EBM 2: appropriate spatial scales

The WFD recognises hydrological units, and sets the primary management units at the level of water bodies and the administrative unit at the level of river basin districts, first at national level and at international level if the river basin is transboundary. Furthermore, water bodies are discrete and significant parts of surface water, for example a river stretch or an estuary. The WFD recognises different water categories, including surface water bodies (i.e. rivers, lakes coastal, transitional) and groundwater bodies. PoMs can include measures targeting a specific water body to the whole river basin district. The WFD strongly promotes integrated water and land management, and therefore expands the traditional scale of water management from a sole focus on aquatic systems to surrounding land. In transboundary river basins, coordination among member states and with non-member states is explicitly promoted in the Directive.

[16] The biological quality elements are generally phytoplankton, (benthic) aquatic flora, benthic invertebrates and fish, and the assessment is generally based on species composition and abundance. Some aquatic organism groups are not included in the WFD, e.g. zooplankton or amphibians. Also, species depending on water, but living outside the water, e.g. the otter or the beaver, are not included in WFD ecological status assessment, although they can benefit from a healthy aquatic environment.

[17] See: www.nwrm.eu

Overall, the WFD recognises natural and administrative boundaries, and promotes a multi-level approach to the management of aquatic ecosystems. However, the scales promoted by the WFD -which are primarily the water body and river basin levels- may not always be appropriate to tackle the threats to the relevant aquatic ecosystem, for example when needing to tackle nitrogen deposition from air pollution (leading to water eutrophication) or when considering migratory fish with the open-seas.

EBM 3: multi-disciplinary knowledge

The WFD supports the development and use of multi-disciplinary knowledge. The characterisation of the RBD (Art. 5) includes an analysis of pressures and impacts from human activities, the economic analysis, the delineation of water bodies and the establishment of the typology and reference conditions for surface water bodies. No explicit impact assessment of the measures is foreseen by the WFD. However, the selection of measures has to take their cost-effectiveness ratio into account, and thus ensure compliance at minimum costs for both public and private entities.

Overall, the WFD requires the consideration of information from different economic sectors, and the assessment of status as well as the selection of measures mobilise knowledge from different scientific disciplines (e.g. ecology, chemistry, economy). However, the WFD does not ask for a detailed understanding of ecosystem functions and structures, nor does it specify how stakeholder opinions and knowledge should be taken into account.

EBM 4: social-ecological interactions, stakeholder participation and transparency

The WFD incorporates provisions to balance ecological and social concerns and support stakeholder engagement and transparency.

While the objective of good ecological status requires adequate attention to ecological needs, socio-economic concerns are considered in several ways. For example, good ecological status is not required, but good ecologic potential, for water bodies designated as “heavily modified” or “artificial” in view of their existing modifications to their hydro-morphology. The use of exemptions to reaching the environmental objectives (good ecological status and potential) is also possible if certain conditions are met. Exemptions include extension of deadlines (Art. 4.4), less stringent objectives (Art. 4.5), temporary deterioration (Art. 4.6) and new modifications (Art. 4.7).

Thus, while the WFD does not foresee discussions about trade-offs between ecosystem services, it does allow the consideration of environmental, economic and social factors which are associated with ecosystem services. For example, the maximisation of flood regulation services can be considered for justifying lower objectives. The appropriate application of designations and exemptions has nevertheless been the subject of much debate. Strict conditions must be met for the use of designations and exemptions, and guidance by the CIS

of the WFD has been published.[18] However, substantial debate still exists on the practical interpretation of key methodological elements. This includes for example the characterisation of the hydro-morphological condition of water bodies, the application of the concept of overriding public interest or the use of disproportionate cost analysis.

The WFD encourages the active involvement of all interested parties in implementation, in particular the production, review and updating of river basin management plans (Art. 14). Transparency is a strong requirement in the WFD as it specifically requires the open publication and distribution of timetables, work programmes, assessment reports, and draft plans. Six months consultation periods are requested. In addition, the public can access background document and information on request. Reporting to the EC is extensive, and includes assessment reports, monitoring programmes, plans and progress reports (Art. 15). Implementation at European level is supported by the CIS which consists of Member States and stakeholder representatives. Multiple implementation guidance documents have been prepared and published by the CIS,[19] including one specifically on public participation. While the WFD is explicitly supporting public consultation, decisions remain in the control of competent authorities. The degree to which consultation results are taken into account is largely left to Member States and competent authorities to decide.

### EBM 5: policy coordination

The WFD promotes an integrated water management approach and policy coordination is an explicit aim. The WFD specifically harmonises objectives and approaches across water-related policies by requiring the inclusion of relevant measures from other water directives in the WFD programme of measures.[20] These take the form of basic or supplementary measures in the river basin management plans (see Chapter 3 ).

Because the WFD is anterior to the MSFD, it does not create specific linkages with the MSFD, although it generally requires that implementation should contribute to the protection of marine waters (Art. 1). The WFD provides more specific linkages with the Nature Directives (EC, 2011a). At the minimum, the WFD requires compliance with standards and objectives applicable under the nature directive (Art. 4.9). In particular, designation (i.e. as heavily modified or artificial) of a particular site does not change objectives under the Nature Directives. In addition, the application of exemptions under the WFD must be justified under the HD if the exemptions would significantly affect the conservation status of BD and HD protected species and habitats (Art. 4.8). In any cases, exemptions must be coherent with the measures taken under the Nature Directives (Art. 4.9). Recent initiatives at EU level such as

[18] See: http://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm
[19] See: http://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm
[20] The following Directives are specifically mentioned: Bathing Water Directive (76/160/EEC); Birds Directive (79/409/EEC); Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC); Major Accidents (Seveso) Directive (96/82/EC); Environmental Impact Assessment Directive (85/337/EEC); Sewage Sludge Directive (86/278/EEC); Urban Waste-water Treatment Directive (91/271/EEC); Plant Protection Products Directive (91/414/EEC); Nitrates Directive (91/676/EEC); Habitats Directive (92/43/EEC); Integrated Pollution Prevention Control Directive (96/61/EC)

Natural Water Retention promote integrated measures across the WFD and nature and other directives.

In terms of financing, there are no specific funding sources linked to the objectives of the WFD. Fundamentally, Member States' PoMs should contain different instruments (legal, administrative, technical, infrastructure, training, etc.), and are potentially funded in different ways. Through the cost recovery provisions for water services (Art. 9, including environmental and resource costs), service users and polluters (according to the polluter-pays-principle) are expected to finance part of the measures. This will be complemented by public funds.

European funds – structural cohesion or CAP funds – can also contribute to finance some WFD measures. The Commission's proposal for 2014-2020 cohesion policy builds on key elements of the WFD proposing ex-ante conditionality for the use of cohesion and structural funds in the water sector. Cohesion policy provides an opportunity for joining water use management needs and implementation of water policy. In the current programming period of the LIFE programme, funding has been introduced with the possibility to co-finance projects which integrate different EU funds and other financial sources in a single, large scale project for the implementation of measures under the WFD. Within those, funding can be granted to RBMPs, Natura 2000 networks and cross-border flood protection strategies.

### EBM 6: adaptive management

Although the WFD does not explicitly set out an adaptive management approach, many of its provisions support it. The WFD is organised around six year planning cycles, starting with the characterisation of the RBD, the monitoring and the assessment of status, the objective setting, and finally the PoMs and their implementation. Environmental objectives can be reach in up to three planning cycles (by 2027 at the latest) thereby allowing for a flexible, medium-term approach. Monitoring and evaluation of the effectiveness of measures link one planning cycle with the next.

The WFD provides for some flexibility with regards to the measures which can be included in the PoMs. Whereas the basic measures are fixed, a series of supplementary measures can be included, if deemed necessary for reaching the WFD objectives (see also Chapter 3 ). Restorative and preventive measures are promoted, such as those for efficient water use and those preventing the impact of accidental pollution (Art. 11.3). These measures can increase robustness against risks and form part of a strategy to deal with uncertain future events.

The WFD mentions the precautionary principles and does not allow deterioration in the status of water bodies (unless exemptions apply) (Art. 1). Temporary deterioration in the status of water bodies is also allowed if it is the result of nature causes or exceptional circumstances which could not have been foreseen (Art. 4.6). The WFD does not integrate climate change in its legal text, although it can be integrated into the planning process (EC, 2009).

### 5.2.3 Marine Strategy Framework Directive

The MSFD is the most aligned piece of aquatic ecosystems protection legislation with EBM principles.

EBM 1: ecological integrity, biodiversity, resilience and ecosystem services

The MSFD supports in general the idea that management should consider ecological integrity, biodiversity, resilience and ecosystem services. The Directive explicitly refers to these concepts within the legal text (Art. 1.2, 1.3, 3.5, Annex I). The overall objective of the MSFD is to establish a framework to achieve or maintain GES in the marine environment by the year 2020 at the latest. GES is to be determined on the basis of 11 qualitative descriptors (set out in Annex 1 of the Directive), which should ensure that the marine environment is protected, preserved and, where practicable, restored. The ultimate aim is to maintain biodiversity and provide diverse and dynamic marine areas which are clean, healthy and productive. GES is associated with a situation whereby the structure, functions and processes of marine ecosystems allow those ecosystems to function fully and maintain resilience.

Of notable importance, Member States must apply the ecosystem-approach to keep levels of human activities compatible with the achievement of GES (Art. 1.3). A sustainable use of marine goods and services is sought. MPAs, which can contribute to ecological integrity, are expressly called for (Art 13.4). Measures included in Member States' PoMs must take GES descriptors into account, including biodiversity, ecological integrity, safe biological limits, etc. (Art. 5.b.i, Annex I). Types of measures proposed in Annex VI include input, output and spatial controls, which can be seen as measures to ensure activities are conducted within critical thresholds.

EBM 2: appropriate spatial scales

The MSFD widely supports the idea that management should take into account ecosystem boundaries and complex, multi-level connections. The MSFD covers marine waters (the waters, seabed, and subsoil) of Member States' jurisdictional reach under UNCLOS[21] and coastal areas (Art. 3.1). Environmental status includes factors that may affect the area both from within and outside the area concerned (Art. 3.4). The MSFD establishes marine regions that go beyond Member States' territorial boundaries. Member States should not only consider other nations' territories as extension of their own ecosystems, but should evaluate how they themselves affect marine areas that lie beyond their borders (Art. 13.8). There is thus much emphasis in the MSFD on transboundary cooperation from Member States (Art. 4; 5.1; 6), in particular regarding monitoring and implementation of measures (Art. 11.2; 7; Annex II).

[21] United Nations Law of the Sea (UNCLOS)- Ratified countries have jurisdictional rights over their territorial waters, exclusive economic zones (EEZs), and continental shelves, to which the MSFD recognises and incorporates into the scope of its legislative text.

EBM 3: multi-disciplinary knowledge

The MSFD, in principle, supports the use of multi-disciplinary knowledge. It calls for Member States to undertake an Initial Assessment of the socio-economic features of their marine environments using existing data, which is considered a key part of the planning process (Art. 8.1). Planning steps include an analysis of pressures and impacts of the marine environment (Art. 8). Member States are further required to consider the social and economic impacts of measures to reach environmental objectives; Member States are required to carry out a Cost Benefit Analysis and should ensure that measures are cost-effective (Art. 13.3). A Working Area on Cross-cutting Issues has been put in place in order to support project coordination, offer scientific advice and science-policy interface, and provide information on cost-effective measures as key area for all EU CIS Working Groups of the MSFD (EC, 2013b).

EBM 4: social-ecological interactions, stakeholder participation and transparency

The MSFD supports the principle that EBM builds on social-ecological interactions, stakeholder participation and transparency. Member States are allowed to adopt derogations in the form of "exceptions" to reaching the environmental targets due to modifications or alterations to the physical characteristics of marine waters brought about by actions taken for reasons of overriding public interest which outweigh the negative impact on the environment (Art. 14.1). In addition, Member States are not required to take action if the costs to achieve GES are deemed 'disproportionate' to the determined risks (Art. 14.4). CIS guidance (EC, 2015e) has reviewed the topic of derogations and provides examples.

There are few reporting requirements to the EC under the MSFD. Member States are required to make information and data available to the European institutions (Art. 19.3) and to inform the Commission on the establishment of PoMs (Art. 13.9). In addition, Member States should make scientific information on MPAs as well as the intended affects of their PoMs in regards to the data available for the general public (Art. 13.6).

Member States are not required to ensure a regular exchange with key stakeholders, but they must offer opportunities to interested parties to participate (Art. 19.1). A regulatory committee –the Marine Strategy Coordination Group (MSCG) – is established at European level although its role is not specified (Art. 25). The coordination group currently works as a platform to exchange information and encourage best practices, building on the WFD experience. The MSFD calls for multiple parties to be involved in its development and implementation, including bodies such as the Regional Sea Conventions, Advisory Bodies and Regional Advisory Councils that are already embedded in EU marine management, as well as land-locked countries that lie within respective catchment areas (Art. 6.1; 6.2; 19.1). Annex VI highlights that measures in PoMs could include measures for communication, stakeholder involvement and raising public awareness. Finally, the CIS suggests that the groups of people affected most by changes in ecosystem services from policies should be incorporated into the Initial Assessment (EC, 2011).

EBM 5: policy coordination

The MSFD legal text explicitly makes reference to multiple policies and their coordination (Art. 13.2), such as the Urban Waste Water Treatment, the Bathing Water Quality Directives, as well as any forthcoming legislation on environmental quality standards in the field of water policy or international agreements. Types of measures suggested by the MSFD and supported by the CIS include management coordination measures (EC, 2015). In addition, the implementation of the Directive shall be supported by existing Community financial instruments in accordance with applicable rules and conditions (Art. 22). The most relevant funding sources are identified as the European Structural and Investment Funds, EMFF, ERDF, LIFE and H2020.

Annex IV of the MSFD highlights that environmental targets must be compatible with existing commitments, including those under the Nature Directives and WFD. Thus, implementation of MSFD can contribute to achieving FCS, but cannot impair the implementation of the Nature Directives and the application of "exceptions" under the MSFD cannot take precedence over Nature Directives obligations (EC, 2012). In other words, FCS is a regulatory minimum under the MSFD (and can thus contribute to reaching MSFD environmental objectives). The MSFD requires the adoption of spatial protection measures which should include protected areas established under the HD and BD and international or regional agreements.

EBM 6: adaptive management

The MSFD explicitly incorporates adaptive management (Art. 3.5). Member States must regularly update their marine environment assessments, their targets for GES, monitoring programmes and PoMs every six years (Art. 17). This allows for adaptive management over time to respond to new or emerging marine threats and to adjust response measures accordingly.

The directive promotes a precautionary approach so that the capacity of marine ecosystems to respond to human-induced changes is not compromised (i.e. resilience) (Art. 1.3). Attainment or maintenance of good environmental status is seen as maintaining ecosystem resilience (Art. 3.5). The MSFD, thus, supports preventative and restorative measures, and the idea of no-deterioration and restoration is present throughout the directive. In this sense, the use of spatial protection measures in PoMs (Art. 13.4) can increase ecosystem robustness and adaptability.

The MSFD does not set out an explicit approach to manage uncertainties, and Member States are not required to adopt mitigation measures to respond to expected long-term changes, such as climate change. Follow-up guidance suggests nevertheless that sources of uncertainty should be explicitly identified, especially during the economic and social analysis (EC, 2011). Member States are allowed to identify instances where environmental targets cannot be achieved due to natural causes or force majeure, which allows for some flexibility to deal with unforeseen events.

## 5.3 Discussion

This discussion aims to answer the following question: how much could – in theory – the key pieces of environmental legislation for the protection of aquatic biodiversity work together to support each EBM principle?

EBM 1: ecological integrity, biodiversity, resilience and ecosystem services

The focus of the nature, water and marine environmental policies is on species diversity, protection of key species and habitats, and reaching environmental state indicators, which are closely linked to biodiversity conservation and maintenance of ecological integrity.

However, there are cases where nature and water directives do not target overall biodiversity protection and where trade-offs exist. In the HD, the focus is on selected species and habitats of Community interest. This also means that the HD does not systematically consider all the species occurring in a given (aquatic) ecosystem, and addresses the status of the aquatic community only indirectly, by looking at the status of the habitat type. The WFD looks at the presence or absence of certain species, only if their presence has been selected as a parameter for the assessment of the status of a specific biological quality element in the definition of good status or if their absence is essential to determine the ecological status of that water body type. In contrary to the Nature Directives, the aim of the WFD is not to protect certain species but rather to use species as indicators of the ecological status of the aquatic ecosystem.

Taking as an example a biological element that describes the water quality in rivers in relation with the composition, abundance and age structure of fish fauna; healthy fish communities are often seen as the sensitive part of fluvial ecosystems and many of the WFD restoration actions can be targeted towards increasing their numbers (repopulation of specific species) or ensuring their presence at that specific water body level (remove fish barriers). However, the representative species that are selected as indicators may not be the ones that better reflect the structure and functioning of the ecosystem and thus, its ability to support biodiversity may be affected by the WFD actions. For example, the freshwater pearl mussel, an endangered species found in many European rivers, often requires for its survival lower nutrient concentrations than those needed for good ecological status (EC, 2011a), as a result its conservation can be further hindered by WFD restoration actions.[22]

Within EBM, it would be important to lay these conflicts of objectives between the two directives open, and to let society prioritise between them. Fundamentally, there are always trade-offs, and choices have to be made about the species or habitats which shall be protected in priority. In this sense, actually both directives are complementary. Whereas the WFD focuses on general favourable conditions for (aquatic) biodiversity conservation, the

[22] For example fish stocking to meet WFD objectives has been found, among other drivers and pressures, to have a negative impact in freshwater pearl mussel populations in the river Rede in the UK (Gosselin, 2015),

Nature Directives ensure that the needs of the most endangered (or endemic) species and habitats are covered. And it is in the rare cases where both are not coherent that a social choice needs to be made to prioritise between the two.

Safeguarding the overall (not just some) provision of ecosystem services is not a stated objective in the nature and water policies. Fundamentally, the implementation of nature and water Directives in isolation is mainly focused on certain ecosystem services (e.g. maintain nursery populations and habitats under the HD and BD, drinking water provision under the WFD). The EU Biodiversity Strategy, which has six targets to ensure biodiversity protection, fails to provide a clear definition of restoration objectives for the purposes of managing aquatic ecosystems. From targets 1 (on the implementation of the Birds and Habitats Directives) and 2 (with an aim to maintain and enhance ecosystem services and restore degraded ecosystems at least 15% by 2020), it can be argued that the environmental objectives for the successful achievement of the EU Biodiversity Strategy are defined in the Nature Directives, which mainly are related with ensuring the conservation of a wide range of rare, threatened or endemic animal and plant species. The Nature Directives strive for biodiversity conservation through restriction of competing harmful activities, and monitoring of progress can only be made on scientific grounds based on pressures and impacts to species and population numbers. This approach enhances the possible provision of ecosystem services in relation with biodiversity protection but would fail to link these to many of their potential beneficiaries, as ecosystem services use is to an extent curtailed depending on the type of activities permitted in the protected area.

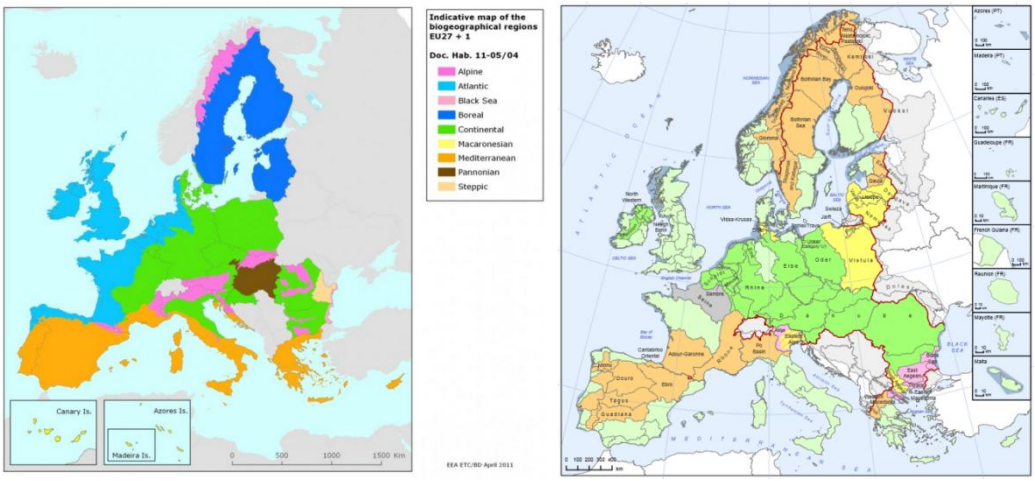
Arguably, the habitats for the species regulated under the Nature Directives must be further protected and their management supported through other environmental Directives. For the protection of aquatic ecosystems, these are mainly the WFD and MSFD. But in terms of environmental objectives, the WFD does not aim to restore specific habitats characteristics but rather to the achievement of certain quality (chemical and biological elements) and quantity levels in the water body. Translated into the language of the EU Biodiversity Strategy, this means that the WFD allows the maximisation and constant supply of ecosystem services based on sustainable uses of water (ecosystem service demand), as far as some environmental thresholds (GES) are not impaired. The more recent MSFD, through its 11 descriptors and ecosystem-related management approaches, makes a closer reference to the objectives of the Biodiversity Strategy as the focus is on maintaining the health of marine ecosystems and ensuring the supply of their services as the general aim of the directive. However, the MSFD recommends but not requires the use of an ecosystem services approach.

Different and inconsistent interpretations on the application of the ecosystem eervices approach linked to restoration objectives under the nature, marine and water Directives call for the development and application of a clear policy framework for taking into account ecosystem services and managing trade-offs to increase the potential effectiveness of policy instruments towards biodiversity protection. In this context, there is a need to reconcile actions under target 2 of the EU Biodiversity Strategy (WG MAES framework) with existing

assessment tools under the WFD (e.g. cost-effectiveness analysis and disproportionate cost analysis), MSFD (cost-effectiveness analysis, cost-benefit analysis) and Nature Directives.

EBM 2: appropriate spatial scales

The Nature Directives, WFD and MSFD remain primarily focused on ecological scales. The Nature Directives and the MSFD emphasise the need to take into account whole ecosystems, while WFD specifically works at hydrological scales and more specifically at water body and RBD level and, thus, expand the focus of water management from water systems to land (Figure 3). The nature directive protect natural terrestrial, freshwater and marine habitats (HD) and wild birds (BD), while the WFD targets freshwater and coastal waters, and the MSFD coastal and marine waters as well as the seabed and subsoil on which Member States have jurisdiction under international law. The WFD with MSFD (being posterior), overlap in the one nautical mile from the shoreline. This calls for a need of harmonisation for those objectives that target similar pressures (e.g. eutrophication). There is a degree of equivalence between the WFD status categories and HD status classes (see EC, 2015), but there is no direct correspondence between WFD water body types and habitat types of the HD.



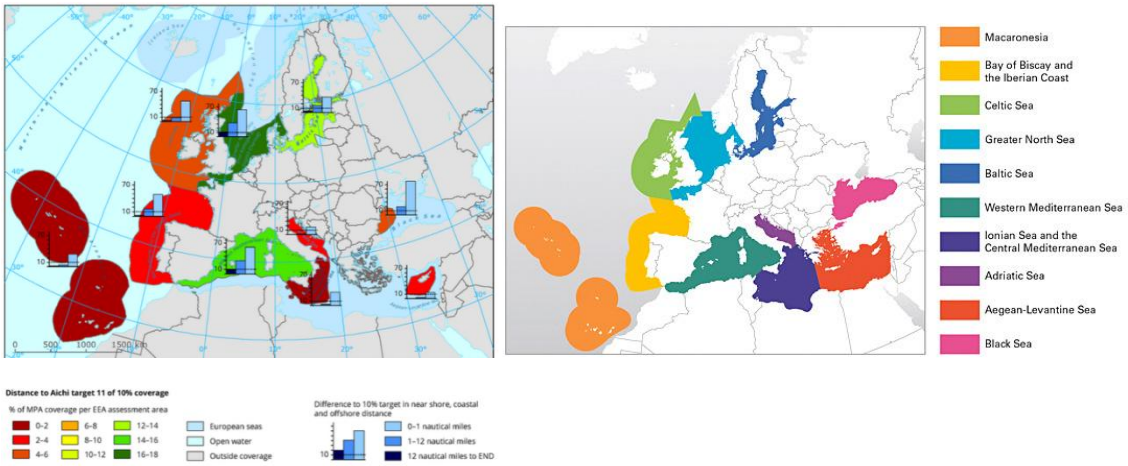



Figure 3: Maps of management units by Nature Directives (top left), WFD (top right), and MSFD (Marine Protected Areas, bottom-left; and Regions & Sub-Regions, bottom-right)

### EBM 3: multi-disciplinary knowledge

The nature, marine and water Directives support the use of multi-disciplinary knowledge (ecology, chemistry, economy) to inform several aspects of their planning process; such as the understanding of threats, pressures and impacts to the environment. The four Directives do not require in depth assessments of ecological functions and structures, but rather focus on drivers, pressures and state indicators which are linked to conditions deemed favourable for biodiversity. Table 13 presents the list used in the reporting system of each directive, and illustrates the inconsistencies and need to homogenise to increase synergies in the treatment of data and assessments between directives.

A vast amount of knowledge has been successfully mobilised in terms of monitoring and assessments at least at the Member States level for all four directives. However, much of this effort is focused on checking compliance towards objectives at the EU level rather than empowering management at the local level, as it can be seen by the lack of integration with local knowledge. This highlights that the overall definition of knowledge that is used in these directives would have to be re-interpreted in order to better integrate different sources of knowledge and fit better with EBM principles.

### EBM 4: social-ecological interactions, stakeholder participation and transparency

The nature, water and marine directives acknowledge social-ecological interactions and the need to seek a balance between ecological and social concerns. As mentioned before, the nature, water and marine directives do not explicitly use an ecosystem services framework to seek this balance, but they do consider the costs and benefits of alternative courses of action. “Derogations” to the environmental objectives set out in the legal text are possible in all directives, in particular in cases of “overriding public interest” which is a common idea across the legislative texts. Most of the more specific criteria and methodologies to be used do nevertheless differ between the directives (e.g. ‘significant risk’, ‘disproportionate costs’).

It is thus likely that the application of derogations will lead to potential conflicts between the environmental directives during implementation.

The nature, water and marine directives incorporate to different degrees the need for a transparent decision-making process, with all four directives requiring the diffusion of information to the public, some form of consultation and regular reporting to the EC. However, the role of stakeholders or local actors in decision-making is unclear in all four directives. There is no requirement to take into account the views expressed in during consultation, and there is no requirement to create supporting institutional arrangements to tackle conflicting interests and advance collective action at local level. At European level, multiple stakeholder frameworks exist, which are closely involved in further policy development, implementation and evaluation (e.g. Habitats Committee, WFD CIS, MSCG). However, it can be expected that the degree to which an inclusive process is established in Member States will largely be dependent on the competent authorities responsible for the implementation of each piece of legislation.

Table 13: Categories for drivers, pressures and assessment elements in the reporting system of each directive

| Policy | Drivers | Pressures | Assessment elements |
|---|---|---|---|
| HD & BD | - Agriculture<br>- Forestry<br>- Mining, extraction of materials and energy production<br>- Transportation and service infrastructure<br>- Urbanisation, residential and commercial development<br>- Use of living resources (other than agriculture & forestry)<br>- Disturbances due to human activities<br>- Pollution<br>- Invasive and introduced species<br>- Modification of natural conditions<br>- Natural processes (excluding catastrophes)<br>- Climate change<br>- Threats and pressures from outside the EU territory | - Agriculture<br>- Forestry<br>- Mining, extraction of materials and energy production<br>- Transportation and service infrastructure<br>- Urbanisation, residential and commercial development<br>- Use of living resources (other than agriculture & forestry)<br>- Disturbances due to human activities<br>- Pollution<br>- Invasive and introduced species<br>- Modification of natural conditions<br>- Natural processes (excluding catastrophes)<br>- Climate change<br>- Threats and pressures from outside the EU territory | BD: No detailed definition – but similar logic is used as for species under the Habitats Directive.<br>HD:<br>Natural habitat types:<br>• Range<br>• Areas covered<br>• Specific structure and functions<br>• Future prospects<br>Species (non-bird):<br>• Range<br>• Population<br>• Habitat for the species<br>• Future prospects |
| WFD | - Agriculture<br>- Climate change<br>- Energy – hydropower<br>- Energy – non-hydropower<br>- Fisheries and aquaculture<br>- Flood protection<br>- Forestry<br>- Industry | - Point sources<br>- Diffuse sources<br>- Abstraction<br>- Physical alteration of channel/bed/riparian area/shore<br>- Dams, barriers and locks<br>- Hydrological alteration<br>- Hydromorphological alteration | Detailed in Annex V:<br>• Biological: aquatic flora, macroinvertebrates, fish, etc.<br>• Physico-chemical: nutrients, oxygenation, acidification, salinity, et.<br>• Hydromorphological: hydrological conditions, continuity, bed substrate, etc. |

| | | | |
|---|---|---|---|
| | - Tourism and recreation<br>- Transport<br>- Urban development | - Introduced species and diseases<br>- Exploitation and removal of animals or plants<br>- Litter or fly tipping<br>- Groundwater (recharge or alteration of water level or volume)<br>- Anthropogenic pressure (other, unknown, historical pollution) | • Priority substances and chemicals relevant for groundwater |
| **MSFD** | - Energy production<br>- Extraction of living resources<br>- Extraction of non-living resources<br>- Food production<br>- Man-made structures (incl. construction phase)<br>- Military<br>- Recreation<br>- Research and survey<br>- Transport<br>- Waste disposal<br>- Land-based activities/industries<br>- Other | - Physical loss (smothering, sealing)<br>- Physical damage (changes in siltation, abrasion, selective extraction)<br>- Other physical disturbance (underwater noise, marine litter)<br>- Interference with hydrological processes (changes in thermal or salinity regime)<br>- Contamination by hazardous substances<br>- Systematic and/or intentional release of substances<br>- Nutrient and organic matter enrichment (fertilisers, organic matter)<br>- Biological disturbance – introduction of microbial pathogens (non-indigenous species and translocations; selective, also incidental non-target catches) | 11 descriptors in Annex I plus details in Annex III and GES Decision criteria:<br>• Biodiversity<br>• Non-indigenous species<br>• Commercial fish and shellfish<br>• Food webs<br>• Eutrophication<br>• Sea-floor integrity<br>• Hydrographical conditions<br>• Contaminants<br>• Contaminants in seafood<br>• Marine litter<br>• Energy incl. underwater noise |

EBM 5: policy coordination

Each of the reviewed policies works well in coordinating actions inside their policy field, especially the WFD and the MSFD as framework Directives. The Nature Directives provide an integrative and coherent range of policy mechanisms for species conservation in different ecosystem types (protection regimes for SCIs, SACs and SPAs). The WFD provides an integrated and comprehensive approach to water protection in general and targets several issues in relation with water management (river restoration, promoting sustainable water use, tackling pollution, mitigating floods and droughts). The MSFD is to a degree embedded inside the objectives of the Blue Growth Strategy and Integrated Maritime Policy and close links are established with other policy instruments relevant for environmental protection such as Maritime Spatial Planning and the CFP (CIS, 2015a).

In terms of coordination between the nature, marine and water directives for the overall purposes of the EU Biodiversity Strategy and the implementation of EBM in aquatic ecosystems, there is potential for further integration. Currently, coordination between these policy areas is an implicit aim in WFD and MSFD legal texts. The MSFD depends on the WFD for reducing pressures from freshwater and inland sources. However, mechanisms to enable integration with sectoral policies are not very strong and in most instances, they remain unclear. The WFD and MSFD both fully incorporate Nature Directives targets and measures, but this coordination is only a requirement when dealing with protected areas. Only the MSFD contains as a key objective that "biodiversity is maintained by 2020" in close integration with the Biodiversity Strategy and it is the first EU legislation that aims at the protection of the full range of marine biodiversity as an integrative objective.

The definition and scope of good status under the WFD has a number of commonalities with the MSFD GES. But there is potential for adopting measures that can support achieving jointly these objectives. Thus, also increasing the efficiency and cost-effectiveness of the proposed policy instruments, this is a requirement for the selection of PoMs for both the WFD and MSFD. PoMs under the WFD, and not only inside protected areas, have the potential to support the achievement of FCS under the Nature Directives for species and habitats that depend on freshwater resources, exploiting synergies between the HD and BD and water legislation. GES under the MSFD takes into account a variety of environmental aspects, including ecosystem functions, hydro-morphological, physical and chemical properties, as well as the protection of marine species and habitats. Again, overlaps can be found with the HD and BD in terms of some species and habitats of concern.

There is scope for increasing future policy coordination between the nature, marine and water directives. For example, the likely future revision of the WFD legal text offers a window of opportunity to ensure the inclusion of further provisions to streamline the WFD with the marine and Nature Directives, under the umbrella of the Biodiversity Strategy objectives. In addition, the review and possible revision of the MSFD GES Decision 2010/477/EU could be used to integrate the approaches established under the WFD and the Nature Directives (CIS, 2013).

Direct EU funding is available for measures taken in marine strategies and programmes under the MSFD and SCI under the HD; however they are not necessarily coordinated. There is thus further scope to promote implementation of coordinated measures, for example through some form of cross-compliance requirements in EU funding instruments. Further guidance on integration may be needed so as to ensure that financing in some areas does not support some policy objectives at the expense of others. Furthermore, the WFD does not have direct EU funding, but benefit from cost recovery provisions that allows for sharing investments between public budgets and private funding. This could possibly be made more explicit and further exploited under the nature and marine directives.

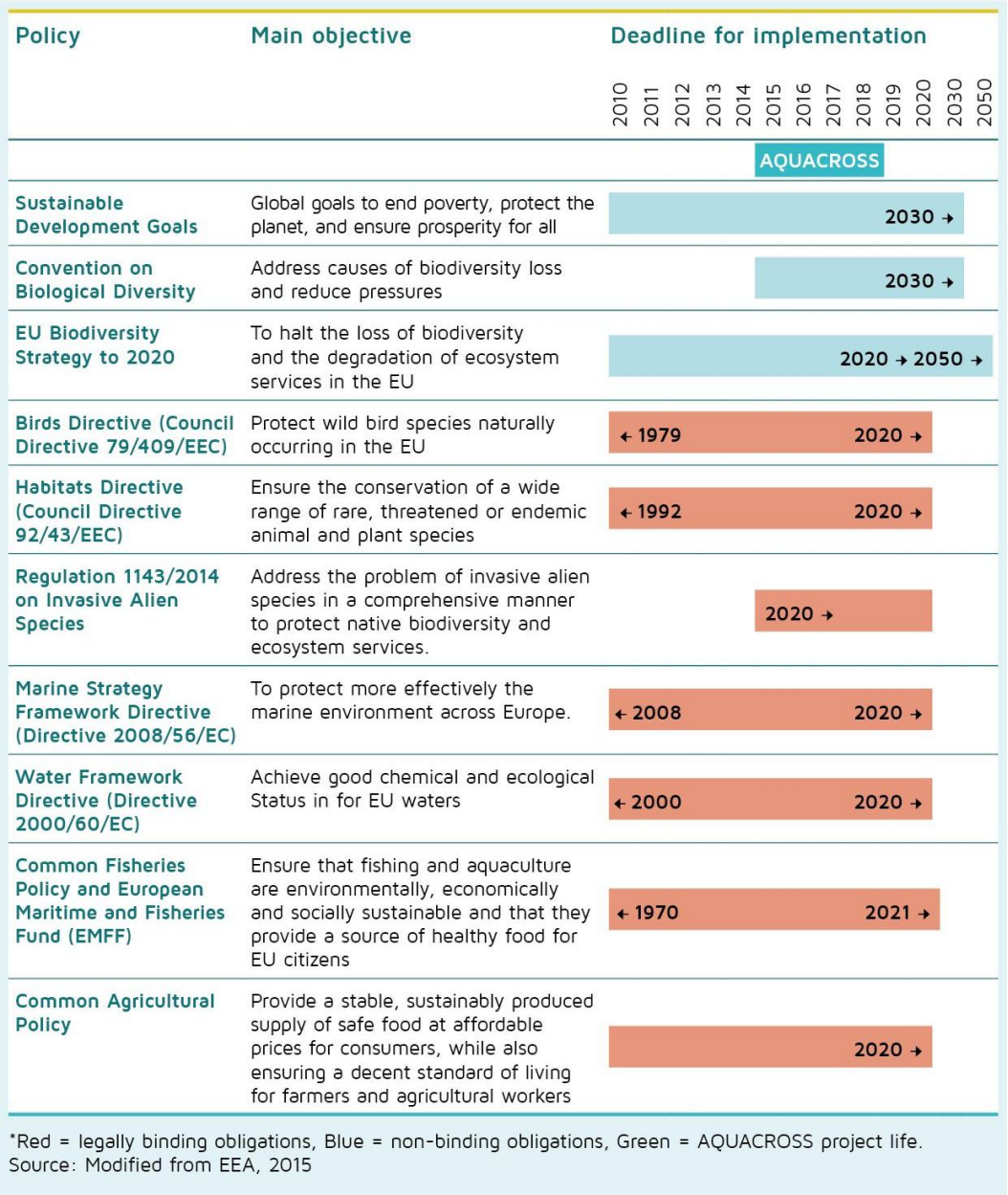
EBM 6: adaptive management

While only the MSFD explicitly embraces adaptive management, the planning steps established in the nature and water directives support it implicitly. One of the strongest supports is in the focus of all directives in preventing the loss of ecosystem resilience through preventative and restorative measures. Member States, in all four directives, must avoid the deterioration of the protected features (e.g. habitats, birds, water bodies, marine areas) while also striving more broadly to avoid pollution and reduce pressure on aquatic biodiversity.

The directives mostly differ on their deadlines and time horizon (see Figure 4). The Nature Directives do not have specific deadlines for reaching their environmental objectives, although the objective of halting biodiversity by 2020 by the EU Biodiversity Strategy is arguably an important deadline for the two directives. The MSFD also aims to achieve GES by 2020, while the WFD has deadlines in 2015, with up to three planning cycles (2021, with final deadline in 2027). It can be argued that the four directives do not differ much, and could be synchronised, especially because all four have planning cycles of six years. This is possible as the synchronisation of the HD and BD in 2013, and their coordination in terms of reporting requirements and deadlines for implementation, show. This has encouraged the streamlining of efforts to achieve both Directives – in a way this will translate in better assessments and target existing uncertainties in protected areas designations.

The four directives somewhat lack a long-term view (~50-100 years) and do not offer an explicit framework for dealing with uncertainties and future change. Member States are not required to outline potential future scenarios or develop potential measures to respond to these scenarios, nor to anticipate planned or coordinated responses to risk events. Uncertainty is dealt implicitly in a variety of ways, mostly by allowing a margin of manoeuvre or flexibility in implementing provisions or by applying the precautionary principle. Learning and adjustments in objectives and management measures are encouraged through monitoring and evaluation during planning cycles. More practically, there are no suggestions with regards to the use of particular assessment approaches, such as scenarios or robust decision-making.

Figure 4: Timeline for Selected Policy Objectives and Targets Relevant for the Management of Aquatic Ecosystems




*Red = legally binding obligations, Blue = non-binding obligations, Green = AQUACROSS project life.
Source: Modified from EEA, 2015

## 5.4 Conclusions

To conclude this chapter, a summary of key findings of the main strengths and weaknesses or challenges of the current policy context is provided in Table 14. Overall, there is a lot of EU policy support for the implementation of EBM and potential to increase synergies between policies with this purpose. The EU policy framework in the form of the Nature Directives, WFD and MSFD support several key dimensions of EBM (e.g. ecological integrity, acknowledgement of multiple scales, multi-disciplinary knowledge, stakeholder participation, transparency, policy coordination, adaptive management), with the MSFD being the most explicit about EBM

implementation. In practice, however, mechanisms and instruments set in place in the legislative framework are still limited, especially with regards to the implementation of the ecosystem services approach, the integration of planning processes and monitoring programmes, the integration of local knowledge in the decision-making process, coherent approaches to exemptions and derogations and the consideration of uncertainties in management and governance.

Table 14: Strength and weaknesses in the coordination of the Nature Directives, WFD and MSFD for the implementation of EBM

| EBM Principle | Strengths | Weaknesses/Challenges |
|---|---|---|
| **1: EBM considers ecological integrity, biodiversity, resilience and ecosystem services** | Reviewed policies support the key concepts of EBM implicitly, with undisputed linkages in their objectives with biodiversity conservation. | No clear policy framework for taking into account ecosystem services and managing trade-offs, which reduces the potential effectiveness of the policy instruments towards biodiversity protection. The WG MAES framework could be applied to streamline approaches among the Directives. |
| **2: EBM is carried out at appropriate spatial scales** | Management is encouraged at relevant ecological scales, while multiple levels in social systems (and the need to coordination) are acknowledged. | No clear framework or guidance on how to work across scales; no clear acknowledgment of cross water realms linkages (except in MSFD); objectives set a specific scales (e.g. water body level in WFD) may not take into account of ecological dynamics |
| **3: EBM develops and uses multi-disciplinary knowledge** | Reviewed directives encourage inter-disciplinary approaches and consideration of societal values and interest in decision-making | No explicit requirement to integrate local knowledge (e.g. to improve contextual understanding of management units).<br>Differences in objectives, scope and approaches result in different monitoring needs. Synergies in monitoring programmes can be exploited. The main objective should be to integrate monitoring as far as possible. |
| **4: EBM builds on social-ecological interactions, stakeholder participation and transparency** | Participation is an element of all reviewed directives and mechanisms are crafted to enable a balance between ecological and social concerns. | Unclear distribution of powers and role of local communities in decision-making unclear (e.g. who decides?)<br>Multiple types of criteria for derogations among directives which increase potential for different interpretation and conflicts |
| **5: EBM supports policy coordination** | Policy coordination is strongly encouraged.<br>Scope for revisions of the legal acts to foster further policy integration in line with Biodiversity Strategy objectives.<br>Scope for funding instruments to support integration of Programme of Measures | Few specific mechanisms that help strong coordination are proposed, especially outside protected areas. |
| **6: EBM incorporates adaptive management** | Policies support evaluation of management measures, with clear (although separate) planning cycles for HD&BD, WFD and MSFD. | No strong framework for dealing with uncertainties (and climate change), no legislative guidance with regards to timescale envisaged, limited length of regulatory requirements (e.g. WFD revisions in 2020s) and no clear methodological proposition (e.g. use of scenarios) |

# 6 Key Conclusions and Recommendations for AQUACROSS

This chapter synthesises the main policy conclusions regarding the main objectives of this report, which are to identify the main international and European level policy drivers affecting biodiversity conservation targets (negatively or positively), as well as, to identify synergies, opportunities and barriers between existing environmental and related sectoral policies relevant for the protection of aquatic ecosystems. These conclusions are followed by a number of recommendations for further research in the AQUACROSS project through its local and regional case studies.

## 6.1 Key conclusions

The first observation made in Chapter 3 of the report highlighted that, while some progress has been made, Europe remains far from achieving policy objectives and having healthy aquatic ecosystems. A vast majority of freshwater and coastal habitats are deteriorated while many marine species are in critical conditions. Reaching the EU Biodiversity Strategy objectives in aquatic ecosystems remain thus very challenging.

Furthermore, the EU Biodiversity Strategy largely relies on other EU policies to achieve its objectives for aquatic ecosystems. Amongst those, the Nature Directives, the WFD and MSFD stand out as key pieces of legislation, but they are either supported (positive synergies) or in competition (conflicts) with a multiple of other environmental and sectoral policies. The assessment carried out on a selected number of "threats" to aquatic biodiversity shows that the policy framework is more developed for a number of pressures, such as extraction of species, nitrogen, invasive alien species and, increasingly so, plastics. Water abstraction and morphology to aquatic habitats have few specific policy instruments at EU level.

Analyses carried out in this report show indeed a complex landscape of legal and policy provisions, some of which aim to reduce pressures on aquatic ecosystems and biodiversity while others (directly or indirectly) reinforce those pressures. The DPS analysis shows that the emphasis of the policy framework is to establish environmental targets and to some extent tackle pressures; EU policy is weakest in diverting (economic) support from economic activities (e.g. agriculture, aquaculture, fishing, industries, tourism) that can harm aquatic biodiversity. There is clearly scope to mainstream further policy actions in sectoral policies: this would require mainstreaming biodiversity protection into existing policy frameworks, in this specific case, by considering how seeking economic growth and competition policies

impact aquatic biodiversity, and aim to "uncouple" growth and resource use. More specific observations are presented in the conclusions of Chapter 4 , including the presentation of an integrative approach to characterise policy actions relevant for the protection and management of aquatic ecosystems.

In operational terms, how can MS and regional authorities improve the coherence of EU policies to meet biodiversity targets? Chapter 5 aimed to provide some insights on this matter by examining the potential for implementing EBM as an innovative, integrative management approach for the safekeeping and protection of aquatic biodiversity. The analysis, focused on the supporting elements of the Nature Directives, WFD and MSFD as the four key environmental policies aiming to protect aquatic biodiversity, shows that EBM can in most part be made operational through their implementation.

The four directives put much emphasis already on considering ecological integrity in management approaches, coordinating between multiple ecological and social scales, using multi-disciplinary knowledge, encouraging stakeholder participation, establishing more transparent reporting, increasing policy coordination and establishing adaptive cycles of revisions. While few mechanisms and instruments currently exist, the four directives do not conflict with a number of other dimensions of EBM, such as the use of the ecosystem services approach to guide decision-making, the building of social-ecological resilience, co-management with local communities, and the consideration and management of uncertainties in decision-making.

Several existing synergies between the four directives were observed, but there is scope for more integration with regards to monitoring programmes, objectives and targets, planning processes, and decision-making criteria (e.g. exemptions and derogations). These issues, and how to overcome them, will be further examined through practical experiences in AQUACROSS case studies.

## 6.2 Recommendations for AQUACROSS research

The report provides a number of insights that can help frame and structure the work in AQUACROSS case studies, including:

- A synthesis of the main environmental targets set out in EU policy for the establishment of the policy targets in the evaluation of policy options in case studies
- A tested methodological approach to carry out the policy characterisation of case studies, so as to identify the key elements (Drivers, Pressures) to be managed (Responses) in order to achieve environmental targets (State)
- A comprehensive list of European policies, their instrument and how they relate to the protection of aquatic biodiversity, in particular through a number of key threats (pressures) that are relevant to the challenges faced in the case studies
- A number of identified gaps in the European policy framework for the management of key threats to aquatic biodiversity, which can be further examined in case studies

- A tested methodological approach to assess, in case studies, the degree of national or regional policy support for EBM implementation, so as to guide the selection of practical and feasible EBM measures
- A number of supporting elements, barriers and gaps for the coordinated implementation of key EU environmental policies along EBM principles, which can also support the selection of EBM measures in case studies

More specifically, some key questions arising from the analysis of policy responses to key threats carried in Chapter 4 (see Conclusions for potential responses to be investigated) include:

- How to strengthen the enforcement of existing policy?
- How to strengthen environmental targets on emerging threats, such as plastics?
- How to mainstream aquatic biodiversity in sector policies, in particular growth and competition policies? How to "uncouple" growth and resource use?
- How to form a successful policy mix?

Furthermore, the analysis on the coherence between key EU environmental policies for the implementation of EBM presented in Chapter 5 has highlighted a number of questions and opportunities in the implementation of case studies (Ultimately, it is also important to note that case studies should aim to identify best practice and test innovative approaches to overcome barriers and gaps identified at EU level. The report concludes in the next chapter by providing a general framework for policy analysis in case studies.

Table 15).

Ultimately, it is also important to note that case studies should aim to identify best practice and test innovative approaches to overcome barriers and gaps identified at EU level. The report concludes in the next chapter by providing a general framework for policy analysis in case studies.

Table 15: Summary of Areas for Further Development in AQUACROSS

| EBM Principle | Specific research questions to be assessed | Links with planned AQUACROSS work |
|---|---|---|
| **1: EBM considers ecological integrity, biodiversity, resilience and ecosystem services** | *Link between policy targets and biodiversity? How to improve understanding of ecological functions and processes and use it to support decision-making?* | The AQUACROSS Assessment Framework (AF) (informed by D2.1) will develop (and test in the case studies) an integrative framework for taking into account ecosystem services and managing trade-offs. The AQUACROSS AF which is sustained by the AQUACROSS concept (D3.1 – already available) integrates issues of complex ecological and social interactions, resilience and ecosystem services in a framework already anchored in latest policy developments (e.g. WG MAES DPSIR conceptual |

| | | |
|---|---|---|
| | | framework) and the latest CICES classification).<br><br>The assessment of causalities is the topic of WP5 of AQUACROSS. Sustained by the principles identified in the AF, causalities will be tested in all AQUACROSS case studies. |
| | *Link between causal links between biodiversity and Ecosystem services?* | |
| **2: EBM is carried out at appropriate spatial scales** | *How to manage / coordinate across multiple scales and management units?* | The AQUACROSS AF provides a useful and powerful theoretical and conceptual tool to understand feedbacks and impacts across multiple scales and the emergent properties that arise from spatial coupling of local ecosystems and indirect interactions at local or regional scales. The AF approach integrates the perspectives of community ecology, to provide novel fundamental insights into the dynamics and functioning of ecosystems from local to global scales, and to increase our ability to predict the consequences of drivers and pressures on biodiversity and the provision of ecosystem services to human societies. This will be tested in the AQUACROSS case studies. |
| **3: EBM develops and uses multi-disciplinary knowledge** | *How to effectively integrate knowledge from multiple scientific disciplines to support EBM?* | At the forefront of its approach, AQUACROSS considers the active and facilitated involvement of key actors at different levels to inform the development of the project's overall concept. Work in the AQUACROSS case studies builds on an effective participatory process described in the AF and managed by WP1 stakeholder engagement, putting stakeholders and policy demands first as drivers to scientific activities (e.g. interviewing stakeholders about needs, experiences and perceptions, participation of stakeholders in the case studies, testing of findings and products to ensure their validity and operability). |
| **4: EBM builds on social-ecological interactions, stakeholder participation and transparency** | *What are legitimate and accountable forms of decision-making in EBM? How can trade-offs between biodiversity protection and societal needs be managed?* | Following that ecosystem services appear to be the most appropriate way of assessing social, cultural and economic impacts. The AQUACROSS AF develops a set of criteria to be used to assess EBM for the achievement of the objectives of the EU Biodiversity Strategy to 2020 targets. The criteria include relevant elements to increase transparency such as effectiveness, efficiency, equity and fairness, policy implementability, financial feasibility. The proposed criteria will be applied for the assessment of management practices in the case studies. The identification of management approaches and the development of objectives for analysis will be done with local stakeholders. |
| **5: EBM** | *What are the links* | The AQUACROSS AF provides insights on how to identify |

| | | |
|---|---|---|
| **supports policy coordination** | *between policy targets and provision of ecosystem services? Which planning tools are necessary – or how must existing planning tools be adapted – to reveal changes in the provision of ESS linked to management measures? How can trade-offs between policy objectives be managed? What mechanisms can support coordination between environmental policies and sectoral policies?* | and set local-level, measurable policy objectives to meet the overarching goals of AQUACROSS: to better protect EU aquatic biodiversity and ensure the continued provision of aquatic ecosystem services, spanning freshwater, coastal and marine ecosystems. The application of the AQUACROSS concept is integrative of policy objectives in its nature.<br><br>The AQUACROSS AF also deals with the analysis of deficits, which should lead to the identification and design of management alternatives aimed at meeting integrated policy objectives. Two of these management alternatives are Green Infrastructure/protected areas; the AQUACROSS case studies will provide first insights into the ex-ante evaluation of such management practices, which in theory, have the potential to be policy instruments for promoting the achievement of shared policy objectives between the nature, marine and water Directives. |
| **6: EBM incorporates adaptive management** | *How to deal with uncertainties in planning and implementation?* | Uncertainty is a critical factor at different stages of the assessment process. This is explored in the AQUACROSS AF, which is intended to provide analytical approaches to address uncertainty and to achieve robust solutions grounded on existing policy needs and implementation cycles. |

# 7 A Framework for the Analysis of EBM Implementation and the Coordinated Implementation of Policies in AQUACROSS Case Studies

## 7.1 Objectives

The main objective of this protocol is to support AQUACROSS case studies in the identification of relevant policy led actions at the local level for the management of aquatic biodiversity:

- To provide guidance to perform an integrative policy characterisation of the case studies in AQUACROSS according to the project's objectives
- This analysis is one of the components for understanding the complex socio-ecological system in the case studies. The policy analysis will be also useful for the collection of relevant policy data at the case study level, specifically:
    - For the identification of relevant drivers and the definition of relevant policy indicators useful for their description according to existing policy evaluation frameworks.
    - For the identification of relevant pressures to aquatic biodiversity and the definition of relevant policy indicators for their description according to existing policy evaluation frameworks.
    - Identification and definition of relevant environmental status indicators at the case study level according to existing policy evaluation frameworks.
    - Identification of appropriate policy scales for the analysis
    - Identification and preliminary EBM analysis of measures/policies that are relevant for the management of aquatic biodiversity at the local level

## 7.2 Background

This deliverable introduces the findings from a top-down (high level EU) policy analysis relevant for the objectives of WP2 policy orientation of AQUACROSS. For such analysis, the following steps were proposed:

- Setting the scene for the analysis
    - Overview of the relevant policy context for freshwater biodiversity protection at the EU level
- EU environmental targets and the status of European waters
    - Identification of relevant environmental objectives for the protection of aquatic biodiversity at the EU level
- Integrative analysis of EU policies for the protection of aquatic biodiversity
    - Identification of threats and mapping of policies against DPS matching the AQUACROSS integrative concept.
- Ecosystem based management and EU environmental policy
    - Mapping EBM relevant policy principles with identified policy actions matching AQUACROSS objectives

In AQUACROSS, case study work will perform the bottom-up policy analysis: identifying real policy needs at the local level. It will complement findings from D2.1 in DEL 2.3 and help develop case studies storylines.

**What examples of threats to aquatic biodiversity are relevant in the AQUACROSS case studies?**

Table 16: Examples of threats to aquatic biodiversity relevant to AQUACROSS case studies

| AQUACROSS Case Study | Examples of Some threats to Aquatic Biodiversity in AQUACROSS Case Studies |
|---|---|
| **Case Study 1**: Trade-offs in ecosystem-based fisheries management in the North Sea aimed at achieving Biodiversity Strategy targets | Pressures from Fishing (extraction of species) |
| **Case Study 2**: Analysis of transboundary water ecosystems and green/blue infrastructures in the Intercontinental Biosphere Reserve of the Mediterranean Andalusia (Spain) - Morocco | Organic pollution (Nutrients) and water abstraction |
| **Case Study 3**: Danube River Basin - harmonising inland, coastal and marine ecosystem management to achieve aquatic biodiversity targets | Morphological alterations to river and coastal habitats |
| **Case Study 4**: Management and impact of Invasive Alien Species (IAS) in Lough Erne in Ireland | Invasive Alien Species |
| **Case Study 5**: Improving integrated management of Natura 2000 sites in the Vouga River, from catchment to coast, Portugal | Various sources of micro and macro pollutants, invasive Alien Species, alterations to river and coastal habitats |
| **Case Study 6**: Understanding eutrophication processes and restoring good water quality in Lake Ringsjön - Rönne å Catchment in Kattegat, Sweden | Organic pollution (Nutrients) |
| **Case Study 7**: Biodiversity management for rivers of the Swiss Plateau | Various sources of micro and macro pollutants: including organic pollution (nutrients); and alterations to river habitats |
| **Case Study 8**: Ecosystem-based solutions to solve sectoral conflicts on the path to sustainable development in the Azores | Pressures from Fishing (extraction of species) |

## 7.3 Integrative policy analysis in the case studies: How?

- Objective: an analysis of the ways in which European policies (and actions) positively or negatively influence aquatic biodiversity conservation in the case study areas. This can be done with the analysis of specific transposition rules and their interpretation at the local level from the identified policy instruments at the European level.
- Four main steps are proposed for the identification and analysis of relevant policy measures/choices at the local level:
    - Step 1: Identification of key threats to aquatic biodiversity and their resulting effect on aquatic biodiversity.
    - Step 2: Description of Drivers and Pressures linked to each of the identified key threats. In this report, key threats were associated with broad groups of Pressures. The objective of this step is to characterise the range of specific pressures within that group and the underpinning drivers.
    - Step 3: Description of State (and status) linked to each key threat. The objective of this step is to characterise the environmental condition of freshwater, coastal and marine waters, with a focus on those parameters that are affected by the identified Pressures to aquatic biodiversity.
    - Step 4: Mapping of local level actions (linked to European and international policies) against the DPS. The objective of this step is to characterise how policies influence (positively or negatively) the key threat.
- Six templates in the Annex 5 can be used as examples to perform the integrative policy analysis at the case study level. In this exercise, the proposed integrative policy assessment was applied to the following threats to aquatic biodiversity:
    - Input of Nitrogen
    - Extraction of Species
    - Water extraction
    - Alien Invasive Species
    - Morphological alterations to aquatic habitats
    - Plastic waste
- As a reference for the selection of relevant policies at the local level, the summary below of key EU policies affecting positively or negatively aquatic biodiversity for the identified threats above can help to narrow down the search of relevant management/policy instruments at the local level (Table 17).

Table 17: Key identified policies for certain threats to aquatic biodiversity

| Key identified policies for certain threats to aquatic biodiversity |
|---|
| Decision (1386/2013/EU) General Union Environment Action Programme to 2020 |
| Regulation (1293/2013) for a Programme for the Environment and Climate Action (LIFE) |
| Environmental impact assessment (2011/92/EU) Directive |
| Strategic environmental assessment (2001/42/EC) Directive |
| Birds Directive (2009/147/EC) |
| Habitats Directive (92/43/EEC) |
| Regulation (2014/1143) on invasive alien (non-native) species |
| Regulation (304/2011) concerning use of alien and locally absent species in aquaculture |
| Council Directive (29/2000) on protective measures against the introduction of organisms harmful to plants or plant products and their spread |
| Water Framework Directive (2000/60/EC) |
| Floods Directive (2007/60/EC) |
| Communication (2007) Addressing the challenge of water scarcity and droughts |
| Groundwater Directive (2006/118/EC) |
| Nitrates Directive (91/676/EEC) |
| Urban Waste Water Treatment Directive (91/271/EEC) |
| Bathing Water Directive (2006/7/EC) |
| Directive (2008/1/EC) on Industrial Emissions concerning Integrated Pollution Prevention and Control |
| Directive (2001/81/EC) on National Emission Ceilings |
| Ambient Air Quality Directive (2008/50/EC) |
| Regulation (1907/2006) concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals |
| Regulation (1305/2013) on support for rural development by the European Agricultural Fund for Rural Development |
| Regulation (1306/2013) on the financing, management and monitoring of the common agricultural policy |
| Regulation (1307/2013) establishing rules for direct payments to farmers under support schemes |
| Marine Strategy Framework Directive (2008/56/EC) |
| Directive (2014/89/EU) establishing a framework for maritime spatial planning |
| Regulation (380/2013) on the Common Fisheries Policy |
| Regulation (508/2014) on the European Maritime and Fisheries Fund |
| Communication (COM (2004) 254 final/2) Innovation in the Blue Economy |
| Regulation (710/2009) on organic aquaculture animal and seaweed production |
| Regulation (1300/2013) on Cohesion Fund |
| Regulation (1301/2013) on Regional Development Funds |
| White paper (COM (2011) 144 final) Roadmap to a Single European Transport Area |
| Communication (COM (2004) 453 final) on Short Sea Shipping |
| Directive (2009/28/EC) on the promotion of the use of energy from renewable resources |
| Fuel Quality Directive (2009/30/EC) |
| Communication (COM/2010/0352 final) Europe, the world's No. 1 tourist destination |
| Communication (COM/2014/014 final) Towards an Industrial Renaissance |

Legend:
= Mostly positive effect on aquatic biodiversity found;
= Mixed effects on aquatic biodiversity found;
= Policy instruments with a negative effect found.

## 7.4 Mapping EBM relevant policy principles with identified policy actions at the local level

- Objective: the framework will examine more specifically the implementation challenges and innovations to achieve EBM from a bottom-up perspective.
- The framework proposed to match identified management measures with the EBM principles.
- The framework could be applied to proposed policy measures under investigation in the case studies and the identification of gaps according to the EBM principles and the objectives of AQUACROSS.
- The analysis has close links with the identification of appropriate responses and the objectives of WP8 in the case studies.
- Definitions for each of the relevant EBM policy principles can be found in this report.
- The EBM principles and relevant questions for assessment in the case studies:

| EBM Principle | Specific research questions to be assessed in the case studies |
|---|---|
| **1: EBM considers ecological integrity, biodiversity, resilience and ecosystem services** | *Link between policy targets and biodiversity? How to improve understanding of ecological functions and processes and use it to support decision-making?*<br>*Link between causal links between biodiversity and Ecosystem services?* |
| **2: EBM is carried out at appropriate spatial scales** | *How to manage / coordinate across multiple scales and management units?* |
| **3: EBM develops and uses multi-disciplinary knowledge** | *How to effectively integrate knowledge from multiple scientific disciplines to support EBM?* |
| **4: EBM builds on social-ecological interactions, stakeholder participation and transparency** | *What are legitimate and accountable forms of decision-making in EBM? How can trade-offs between biodiversity protection and societal needs be managed?* |
| **5: EBM supports policy coordination** | *What are the links between policy targets and provision of ecosystem services? Which planning tools are necessary – or how must existing planning tools be adapted – to reveal changes in the provision of ESS linked to management measures? How can trade-offs between policy objectives be managed? What mechanisms can support coordination between environmental policies and sectoral policies?* |
| **6: EBM incorporates adaptive management** | *How to deal with uncertainties in planning and implementation?* |

- Templates which map the legislative requirements of the HD, BD, WFD and MSFD to EBM principles are available in the annexes of this report as illustrative examples to guide the analysis.

## 7.5 Next steps

- The proposed protocol will be discussed with AQUACROSS case study leaders and revised according to their comments.
- Detailed review templates will be developed in WP2 to guide the policy characterisation work in the case studies.

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# Synergies and Differences between Biodiversity, Nature, Water and Marine Environment EU Policies

## Deliverable 2.1 – ANNEXES

## Policy Review Annex

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 642317.

| | |
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# About AQUACROSS

Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies (AQUACROSS) aims to support EU efforts to protect aquatic biodiversity and ensure the provision of aquatic ecosystem services. Funded by Europe's Horizon 2020 research programme, AQUACROSS seeks to advance knowledge and application of ecosystem-based management (EBM) for aquatic ecosystems to support the timely achievement of the EU 2020 Biodiversity Strategy targets.

Aquatic ecosystems are rich in biodiversity and home to a diverse array of species and habitats, providing numerous economic and societal benefits to Europe. Many of these valuable ecosystems are at risk of being irreversibly damaged by human activities and pressures, including pollution, contamination, invasive species, overfishing and climate change. These pressures threaten the sustainability of these ecosystems, their provision of ecosystem services and ultimately human well-being.

AQUACROSS responds to pressing societal and economic needs, tackling policy challenges from an integrated perspective and adding value to the use of available knowledge. Through advancing science and knowledge; connecting science, policy and business; and supporting the achievement of EU and international biodiversity targets, AQUACROSS aims to improve ecosystem-based management of aquatic ecosystems across Europe.

The project consortium is made up of sixteen partners from across Europe and led by Ecologic Institute in Berlin, Germany.


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# 1 Definitions of EU Acts

| EU legal act | Definition |
|---|---|
| Regulations | In Community law, a Regulation is an instrument of general scope that is binding in its entirety and directly applicable in all Member States. Regulations can be adopted under the EC Treaty by the European Parliament and the Council or by the Council or by the Commission. Regulations are often used in the field of judicial cooperation in civil matters. They are directly applicable, so they require no transposal into the Member States' domestic law and directly confer rights or impose obligations.<br><br>A "regulation" is a binding legislative act. It must be applied in its entirety across the EU. For example, when the EU wanted to protect the names of agricultural products coming from certain areas such as Parma ham, the Council adopted a regulation. |
| Directives | In Community law a directive is a legislative instrument that is binding on the Member States to whom it is addressed as regards the result to be attained but leaves them free to determine the form and methods. Directives may be adopted under the EC Treaty either by the European Parliament and the Council or by the Council or by the Commission. The Community institutions use Regulations more often than Directives in judicial cooperation in civil matters. Once adopted, Community Directives still have to be transposed by each of the Member States, that is to say they must be implemented by national law.<br><br>A "directive" is a legislative act that sets out a goal that all EU countries must achieve. However, it is up to the individual countries to decide how. This was the case with the working time directive, which stipulates that too much overtime work is illegal. The directive sets out minimum rest periods and a maximum number of working hours, but it is up to each country to devise its own laws on how to implement this. |
| Decisions | In Community law, a decision is a legislative instrument that is binding in its entirety on all those to whom it is addressed. A decision may be adopted under the EC Treaty either by the European Parliament and the Council or by the Council or by the Commission. Decisions are rarely used in the field of judicial cooperation in civil matters. The European Judicial Network in Civil Matters was established by a Council Decision.<br><br>A "decision" is binding on those to whom it is addressed (e.g. an EU country or an individual company) and is directly applicable. For example, when the Commission issued a decision fining software giant Microsoft for abusing its dominant market positionpdf, the decision applied to Microsoft only. |

| | |
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| Communications | A Communication is a policy document with no mandatory authority. The Commission takes the initiative of publishing a Communication when it wishes to set out its own thinking on a topical issue. A Communication has no legal effect. |
| Recommendations | In Community law, a Recommendation is a legal instrument that encourages those to whom it is addressed to act in a particular way without being binding on them. A recommendation enables the Commission (or the Council) to establish non-binding rules for the Member States or, in certain cases, Union citizens.<br><br>A "recommendation" is not binding. When the Commission issued a recommendation that pay structures for financial-sector employees should not encourage excessive risk taking, this did not have any legal consequences. A recommendation allows the institutions to make their views known and to suggest a line of action without imposing any legal obligation on those to whom it is addressed. |
| Opinions | An "opinion" is an instrument that allows the institutions to make a statement in a non-binding fashion, in other words without imposing any legal obligation on those to whom it is addressed. An opinion is not binding. It can be issued by the main EU institutions (Commission, Council, Parliament), the Committee of the Regions and the European Economic and Social Committee. While laws are being made, the committees give opinions from their specific regional or economic and social viewpoint. For example, the Committee of the Regions issued an opinion on the clean air policy package for Europe. |

*Source: adapted from http://ec.europa.eu/civiljustice/glossary/glossary_en.htm*

# 2 Template Used for Review of European Policies

## Box 1: Important Notes

* The overall aim of this template is to capture relevant information about the reviewed policy for a planned comparability analysis. Please be aware that: 1) some questions may overlap and this is on purpose; and 2) use footnotes to include weblinks to relevant information and reports. Please ensure that you include web links to ALL relevant implementation and guidance documents.
** Examples from WFD, MSFD, CAP and Birds and Habitats Directives are provided (*in italics red font 9pt*) for illustration purposes to guide answers to some of the questions. Please delete these examples when filling out the template.
***Please upload first drafts here: http://aquacross.eu/internal/task-21-identifying-policies-affecting-achievement-eu-and-international-biodiversity
In the folder: First drafts policy reviews templates
Please follow this filling system:
Template_number.Policy_Acronym.Reviewer_initials.VersionDocument.Upload date. For example: T5.WFD.ML.V1.17092015

**** We hope a first draft can be completed by Monday 28th September – the objective would be also to judge the suitability of the template in explaining any relevant EU policy!!!! So we are interested in 1) the content that you can insert but also 2) your feedback about the template.

| # | Heading | Questions/*Answers (please replace text and examples in red font italics with your reply to the questions)* |
|---|---|---|
| 1. 1 | **Name / Type of the Legal Act or Policy** | Please insert the known acronym, common and full legal name of the Policy legal Act<br>*Example: WFD, Water Framework Directive, Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy*<br><br>Based on the background of this note about the policy process in the EU please include space for the inclusion of subsequent legal Acts (Communication, Directives and regulations) related with the reviewed Type of the Legal Act or Policy.<br>Please name all regulations and other legal texts relevant for the Legal Act and Policy. Afterwards, please link the text in the template to the identified policy and subsequent regulations and try to be as explicit as possible as to their interaction.<br><br>*Example: CAP legislation is defined under four consecutive Regulations:*<br>*1. Rural Development: Regulation 1305/2013*<br>*2. "Horizontal" issues such as funding and controls: Regulation* |

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| | | *1306/2013*<br>*3. Direct payments for farmers: Regulation 1307/2013*<br>*4. Market measures: Regulation 1308/2013*<br>*A further Regulation 1310/2013 lays down certain transitional provisions as regards the application of the four basic regulations in the year 2014.*<br><br>Note: When completing the template ensure that the answers to relevant headings make them reference (if applicable) to relevant regulations and other EU legal Acts |
| 1.2 | **Entry into force** | Month/Year |
| 1.3 | **Departments/Units in charge** | Which EU Institutions/DG is competent for its administration? E.g. DG MARE, DG ENV, ...<br>*If possible, please provide a brief description of roles in the relevant Unit at the Commission and contact details of relevant officials you are aware of.*<br><br>*Example: Birds and Habitats Directive: DG ENV, Dir. B Natural Capital, 3. Nature* |
| 1.4 | **Common Implementation strategy (CIS processes** | Are there any Working Groups at EU level involved in the implementation of the act or policy? Please name them and briefly introduce the core role of the group.<br>*If relevant, you can copy the structure of the topics created for the Common Implementation Strategy (CIS) processes for this policy.*<br>*Example: MSFD*<br>*MSCG – Marine Strategy Coordination Group*<br>*WG GES – Working Group Good Environmental Status*<br>*WG DIKE – Working Group Data, Information, and Knowledge Exchange*<br>*WG ESA – Economic and Social Analysis*<br>*Technical subgroups (currently on Noise and Marine litter)* |
| 2 | **Administrative body handling implementation in MS** | Please give your assessment of which authorities in MSs primarily deal with the implementation of this policy (at ministry and regional level)? This can be several authorities.<br>*Note: This is not uniform EU-wide, but perhaps some conclusions can be drawn from certain MS examples. Please complete a minimum of three EU cases.*<br>*German Implementation of the Birds and Habitats Directive*<br>*Ministry of Environment (BMUB) in Germany coordinates and designates N2000 areas in EEZ, States (Länder) designate in their respective areas of jurisdiction. Whether or not the drafting of management plans for N2000 sites is obligatory depends on the state regulation. The responsible administrative body for management plans for the EEZ is the BfN, The responsible administrative bodies for drafting the management plans for terrestrial N2000 areas are the environmental ministries or agencies of the states*<br>*More information on how Natura 2000 is implemented in different countries can be found at: http://ec.europa.eu/environment/nature/natura2000/management/docs/conservation%20measures-Annex%202.pdf (report from 2011), and here* |

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| | | *http://ec.europa.eu/environment/nature/natura2000/management/docs/conservation%20measures.pdf* |
| 3.1 | **Main Objective** | What is the KEY SINGLE overall objective of the policy?<br>*Please copy and paste the exact wording from the relevant article in the legal text.*<br>*Example WFD: The environmental objectives of the WFD are defined in Article 4. The aim is long-term sustainable water management based on a high level of protection of the aquatic environment. Article 4.1 defines the WFD general objective to be achieved in all surface and groundwater bodies, i.e. good status by 2015, and introduces the principle of preventing any further deterioration of status. There follow a number of exemptions to the general objectives that allow for less stringent objectives, extension of deadline beyond 2015, or the implementation of new projects, provided a set of conditions are fulfilled.* |
| 3.2 | **Principles included in the legal text** | *Definition: Principle is defined as a fundamental, well-settled Rule of Law . A basic truth or undisputed legal doctrine; a given legal proposition that is clear and does not need to be proved. A principle provides a foundation for the development of other laws and regulations. (definition from: West's Encyclopedia of American Law, edition 2. Copyright 2008 The Gale Group, Inc.). The general principles of European Union law are general principles of law which are applied by the European Court of Justice and the national courts of the member states when determining the lawfulness of legislative and administrative measures within the European Union. General principles of European Union law may be derived from common legal principles in the various EU member states, or general principles found in international law or European Union law. Amongst others the European Court of Justice has recognised fundamental rights (see human rights), proportionality, legal certainty, equality before the law and subsidiarity as general principles of European Union law. For each of the reviewed policies in this template, the principles they apply should be clearly stated in their legal text!*<br><br>Which principles (according to the definition above) are specifically mentioned in the legal text? Suggestion: search for the word principle in the legal text of the policy. Please just introduce the principles specifically mentioned in the legal text:<br>*Example MSFD: precautionary principle (article 27 and 44), polluter pays principle (article 27); subsidiarity (article 43), proportionality (article 43).* |
| 3.3 | **Other objectives/Key concepts/key elements of the legislation** | Other objectives/key concepts introduced by the policy.<br>*What are the main pillars of implementation of the legal text. Easy to obtain from the relevant DGs website.*<br>*E.g The WFD introduced a number of key principles into the management and protection of aquatic resources:*<br>*(1)The integrated planning process at the scale of river basins, from characterisation to the definition of measures to reach the environmental objectives.*<br>*(2) A comprehensive assessment of pressures, impacts and status of the aquatic environment, including*<br>*from the ecological perspective.* |

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| | | *(3)The economic analysis of the measures proposed/taken and the use of economic instruments.*<br>*(4)The integrated water resources management principle encompassing targeting environmental objectives with water management and related policies objectives.*<br>*(5)Public participation and active involvement in water management*<br>*Source: 3rd WFD implementation report* |
| 3.4 | **Terminology** | Which KEY terms are defined/used in the legal act/policy?<br>*E.g. GES, POM, etc?*<br>Please introduce a summary of KEY relevant terms and abbreviations.<br>*Look at relevant articles and definitions. 10 to 15 key terms maximum. Check functional definitions of the terms. Check guidance documents and web links. Please indicate key documents.*<br>*Example: In the MSFD: 'environmental status' means the overall state of the environment in marine waters, taking into account the*<br>*structure, function and processes of the constituent marine ecosystems together with natural physiographic,*<br>*geographic, biological, geological and climatic factors, as well as physical, acoustic and chemical conditions,*<br>*including those resulting from human activities inside or outside the area concerned;* |
| 3.5 | **Derogations** | Are there any provisions laid out in the policy act for derogations within the EU countries or EU overseas entities (outermost regions)? |
| 4 | **Types of management measures** | Which are the types of measures considered and selected for the achievement of the objectives? Are there any impact assessments of their possible performance? Please give us your expert opinion and include web links. |
| 5.1 | **Spatial coverage** | If the scope has a spatial dimension: What is the spatial coverage? E.g. All water bodies, including coastal waters up to 1 nm from land<br>*Example: In the context of the WFD, the 'water environment' includes: rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile (12 nautical miles for chemical status). These waters are divided into units called water bodies.* |
| 5.2 | **Reporting units – what are the specific transposition requirements** | On which spatial unit is reporting carried out? E.g. river basin/ Member State – are you aware of any commission studies that discuss the issue of different governance settings for reporting. Include links to studies.<br>*Please Copy conclusions from available docs and check guidance documents for wider interpretations.*<br>*Example WFD: The main reporting unit for river basin management plans are the River Basin Districts (RBDs)*<br>*Article 13*<br>*1. Member States shall ensure that a river basin management plan is produced for each river basin district lying entirely within their territory.*<br>*2. In the case of an international river basin district falling entirely within the Community, Member States shall ensure coordination with the aim of producing a single international river basin management plan. Where such an international river basin management plan is not produced, Member States shall produce river basin management plans covering at least those parts of the international river basin district falling within their territory to achieve the objectives of this Directive.* |

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| | | *...*<br>*5. River basin management plans may be supplemented by the production of more detailed programmes and management plans for sub-basin, sector, issue, or water type, to deal with particular aspects of water management. Implementation of these measures shall not exempt Member States from any of their obligations under the rest of this Directive.*<br>*In reality, in the 1st planning cycle, the geographical scope of the RBMPs does not correspond exactly to the number of RBDs, and a number of different models can be identified:*<br>*- Most Member States have prepared one RBMP for each RBD exclusively within their territory*<br>*- Most Member States who have part of an international RBD within their territory have produced one RBMP for the national part of the international RBD.*<br>*In some cases they have also reported international RBMPs produced for the whole international RBD.*<br>*- Some Member States have prepared one plan covering all of their territory (for instance in Slovakia or in Slovenia) but which includes sections on each of the relevant RBDs.*<br>*- Some Member States have prepared several RBMPs for each RBD and for sub-basins. For instance, in Romania all of the territory falls within the Danube RBD and is covered by the Danube International RBMP (A-level), as well as by the national Romanian Danube RBMP (B-level). In addition, and fully in accordance with the Directive (Article 13.5 WFD), more detailed sub-RBMPs have been prepared for each of the 11 sub-basins. For the purpose of this assessment, the Romanian Danube RBMP has however been considered as one RBMP.*<br>*- In Denmark, 15 RBMPs were reported for the Jutland and Funen RBD, and 7 RBMPs were reported for the Sjaelland RBD, but no overall single RBMP for the whole respective RBD was submitted. For the purpose of this assessment these RBMPs have been assessed as two RBMPS, that is one per RBD.*<br>*- In Germany, where most of the territory is covered by international RBDs for which international RBMPs exist (Danube, Elbe, Rhine, Ems, Odra), no RBMP for the national parts of these RBDs were adopted. Instead RBMPs were adopted at the Federal State level. For the purpose of this assessment, the German plans were assessed as one RBMP per RBD, although in reality 16 RBMPs were adopted. A similar situation applies in Belgium, where the RBMPs are adopted by the respective regions, and where the three regions have different timetables relating to the implementation of the Directive due to serious delays in Wallonia and the Brussels Region.*<br>*Source: 3rd WFD implementation report.* |
| 5.3 | **Management unit** | Which operational management unit does the legal act/policy refer to?<br>*E.g. Water body, marine waters under jurisdiction of MS (including territorial sea, EEZ and (outer) continental shelf), fish stocks in the CFP.* |
| 6.1 | **Key planning steps** | What are the key planning steps prescribed?<br>*E.g. initial assessment, definition of GES, targets&indicators, monitoring programmes, POMs, implementation* |
| 6. | **Timelines** | What are the agreed timelines for implementation? |

| | | |
|---|---|---|
| 2 | | *E.g for reporting period/ frequency or implementation?*<br>*If available include here the latest version of the timetable for implementation*<br>*If relevant, please do also mention regular and planned revisions – important for integration and scope for changes in the legal text of the policy act* |
| 7.1 | **Integration/coordination issues with other related pieces of legislation** | Please highlight any existing synergies with other pieces of legislation. Does your Directive refer to other policies and how to handle the interaction?<br>*Please use your expert judgement based on legislative documents and guidance documents and let us know where these synergies are.*<br>*E.g. MSFD legal text specifically highlights links with Birds and Habitats Directive*<br>*The MSFD in its Article 6 states: "The establishment of marine protected areas, including areas already designated or to be designated under Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and*<br>*flora (5) (hereinafter referred to as the 'Habitats Directive'), Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds...".* |
| 7.2 | **Coordination issues with the EU Biodiversity Strategy** | Which policy measures of this piece of legislation could have direct/ indirect effect on each single target of the EU biodiversity Strategy?<br>*Answer could based on available official documents, available literature, expert judgement...*<br>*For example the Good Agricultural Environmental Conditions requirements include buffer strips along water courses and a more specific definition of landscape features not to be removed. This measure directly affects the target 2 of the EU bio strategy Thus maintaining and enhancing ecosystems and their services.* |
| 8.1 | **Relevance to ecosystems/habitats?**<br>*Here we mean the environmental system of interest within the specific policy* | 1. What **ecosystems/habitats** are addressed explicitly by the legal act/policy?<br><br>2. Which **ecosystems** are affected/impacted implicitly in your opinion by the relevant policy?<br>*Please include links to relevant documentation*<br><br>3. Do you see any links to **Aquatic Biodiversity** and **Ecosystem Services**?<br><br>*In answer to these questions please state whether (aquatic) biodiversity and ecosystem services are mentioned in the directive or whether links to it can be made. As a first step please provide – in addition to the descriptive part in the template– your "opinion" on potential links between the different elements of the directive (e.g. objectives, derogations, measures) and the WP2 relevant aspects (e.g. could they represent barriers, opportunities or synergies; do they probably have positive or negative impacts on aquatic biodiversity protection, etc.).* |
| 8.2 | **Drivers**<br>*A human activity that may produce an environmental effect (i.e. a pressure) on the ecosystem.* | 1. What is the definition of drivers used in the implementation process of this policy?<br>*Check official documentation supporting the implementation process of this policy. Include web links.*<br><br>2. Which drivers does the legal act/policy adress?<br>*E.g. fishing sector, industry, water uses, etc. Please name and define all types* |

| | | |
|---|---|---|
| | *Examples for drivers are agriculture or industry. Source: EEA* | *of drivers defined in guidance documents with links to official documents.*<br><br>3. Are there any indicators used in the available official guidance documents? If so please introduce them in a table: Type/unit/indicator used for the assessment/definitions/And how indicators are quantified (metrics). |
| 8.3 | **Pressures**<br>*The direct environmental effect of the driver, such as an effect that causes a change in water flow or a change in the water chemistry.*<br>*Examples are the abstraction of water for industrial processes or an increased nutrient load caused by agricultural use of fertilizers. Source: EEA* | 1. What is the definition of pressures used in the implementation process of this policy?<br>*Check official documentation supporting the implementation of this policy. Include links.*<br><br>2. Which pressures does the legal act/policy address?<br>*E.g. pollution, abstractions, physical changes etc. Please name and define all types of pressures defined in official guidance documents with links to official documents.*<br><br>3. Are there any indicators used in the available official guidance documents? If so please introduce them in a table: Type/unit/indicator used for the assessment/definitions/And how indicators are quantified (metrics). |
| 8.4 | **Assessment of Environmental State**<br>*By state we mean: The environmental condition of an ecosystem as described by its physical, chemical and biological parameters. This includes:*<br>*• Physical parameters encompass the quantity and quality of physical phenomena (e.g. temperature, light availability)*<br>*• Chemical parameters encompass the quantity and quality of chemicals (e.g. atmospheric CO2* | 1. How does the legal act/policy address environmental state?<br><br>2. Which are the relevant terms/parameters to be measured in indicators? How are they defined?<br>*Check official documentation supporting the implementation of this policy. Include links.*<br><br>3. Are there any indicators used in the available official guidance documents? If so please introduce them in a table: Type/unit/indicator used for the assessment/definitions/And how indicators are quantified (metrics). |

| | | |
|---|---|---|
| | *concentrations, nitrogen levels)*<br>*• Biological parameters encompass the condition at the ecosystem, habitat, species, community, or genetic levels (e.g. fish stocks or biodiversity)*<br>*(US EPA, n.d.)* | |
| 8.5 | **Assessment of Status**<br>Assessment of the deviation of an ecosystem's current environmental state in comparison to the expected policy objective state. | 1. How does the legal act/policy address environmental status? Which are the relevant terms/parameters to be measured in indicators? How are they defined? *Check official documentation supporting the implementation of this policy. Include links.*<br><br>2. Are there any indicators used in the available official guidance documents? If so please introduce them in a table: Type/unit/indicator used for the assessment/definitions/And how indicators are quantified (metrics).<br><br>*Please check the distinction between state and status: WFD example: 'Water status' according to the WFD. This is, the general expression of the status of a body of water as determined by the poorer of its ecological status and its chemical status (in the case of surface water) or the poorer of its quantitative status and its chemical status (in the case of groundwater).* |
| 9 | **Data** | What type and Where is data at MS being reported to at European level? Where is this data available? |
| 10 | **Funding** | 1. If applicable: Which funds are directly associated with the directive?<br>*E.g. EMFF for CFP*<br><br>2. Which other funding mechanisms can be used in the implementation of the legal act/policy?<br>*E.g. LIFE Programme* |
| 11 | **Other issues to be aware of relevant for AQUACROSS? Other comments?** | 1. What else should we be aware about the implementation of this policy?<br><br>2. Any recommendations for the improvement of the template specifically in relation to your policy of expertise? Are we missing other relevant headings? |

# 3 Reviewed Policies

## 3.1 Habitats Directive

Author: Helen Klimmek (IUCN)

Reviewer: Manuel Lago, Ecologic Institute

**Habitats Directive**

**Name/Type of the Legal Act or Policy**

Habitats Directive – Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

Amendment: The enlargement of the European Union with Croatia in 2013 brought the most recent amendments of the EU nature conservation legislation – Directive 2013/17/EU of 13 May 2013 *adapting certain directives in the field of environment, by reason of the accession of the Republic of Croatia. The changes concern only the annexes of the directive*: new typical and endangered species and habitats in Croatia have been added to the annexes. In addition, a small number of earlier typographical errors were corrected. Unlike the previous enlargements, no new biogeographic regions were added to the existing ones but changes to the Indicative Map of Biogeographic Regions in light of Croatia's future accession to the European Union were already adopted by the Habitats Committee in 2011.

**Entry into force**

5 June 1994

**Departments/Units in charge**

DG ENV, Dir. B Natural Capital, 3. Nature

**Common Implementation strategy (CIS processes)**

At EU level, implementation of the Habitats and Birds Directive is supported by the Habitats Committee (under Art. 20 and 21 of the Habitat Directive) rsp. by the Ornis Committee (under Art. 16 of the Birds Directive) which comprise representatives from all Member States and the EU Commission (EC). Decisions are made with a qualified majority (using weighted votes). In its capacity as a scientific and technical advisory committee, the Habitats Committee also includes the Habitats Scientific Working Group. The Habitats Committee assists the EC in the implementation of the Habitats Directive and is responsible for delivering an opinion on the draft list of LIFE-Nature projects to be financed every year.

**Administrative body handling implementation in MS**

Germany: The German Ministry of Environment (BMUB) coordinates and designates N2000 areas in EEZ, States (Länder) designate in their respective areas of jurisdiction. Whether or not the drafting of management plans for N2000 sites is obligatory depends on the state regulation. The responsible administrative body for management plans for the EEZ is the BfN. The responsible administrative bodies for drafting the management plans for terrestrial N2000 areas are the state environmental ministries or agencies.

Austria: Implementation of the provisions of the Habitats directives is the responsibility of the Austrian states (Länder). The Austrian Environment Ministry (Umweltbundesamt) was responsible for compiling the report for 2007-2013, with support of a steering committee of representatives from the Länder.

UK:

**Table 1**. Responsibilities for surveillance assessment and implementation for transposition of Article 11 and Article 12.4 (incidental capture and kill) surveillance.

| 'Country' | Responsibility for assessment of surveillance requirement | Responsibility for implementing surveillance required |
|---|---|---|
| England | NE | Secretary of State |
| Wales | CCW | Welsh Ministers |
| Scotland | SNH | SNH |
| Northern Ireland | DoENI | DoENI |
| Offshore | JNCC | Secretary of State |

**Main Objective**

Art. 2: The aim of this Directive shall be to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies.

The EU Birds and Habitats Directives require the Member States to implement two main sets of provisions: The first set of measures requires Member States to establish a strict protection regime for all wild European bird species and other endangered species listed in Annex IV of the Habitats Directive, both inside and outside Natura 2000 sites.The second set requires the designation of core sites for the protection of species and habitat types listed in Annex I and II of the Habitats Directive and Annex I of the Birds Directive, as well as for migratory birds. Together, these designated sites form part of a coherent ecological network of nature areas, known as the European Natura 2000 Network. Other than the selection of sites for the Natura 2000 Network, which is done on purely scientific grounds, measures under the two directives must take account of the economic, social and cultural requirements and regional and local characteristics of the area concerned.

**Other objectives/Key concepts/key elements of the legislation**

The provisions of the Directive require Member States to introduce a range of measures, including:

- Maintain or restore European protected habitats and species listed in the Annexes at a favourable conservation status as defined in Art. 1 and 2;
- Contribute to a coherent European ecological network of protected sites by designating Special Areas of Conservation (SACs) for habitats listed on Annex I and for species listed on Annex II. These measures are also to be applied to Special Protection Areas (SPAs) classified under Art. 4 of the Birds Directive. Together SACs and SPAs make up the Natura 2000 network (Art. 3);
- Ensure conservation measures are in place to appropriately manage SACs and ensure appropriate assessment of plans and projects likely to have a significant effect on the integrity of an SAC. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest. In such cases compensatory measures are necessary to ensure the overall coherence of the Natura 2000 network (Art. 6);
- Member States shall also endeavour to encourage the management of features of the landscape that support the Natura 2000 network (Art. 3 and10);
- Undertake surveillance of habitats and species (Art. 11),
- Ensure strict protection of species listed on Annex IV (Art. 12 for animals and Art. 13 for plants).

Report on the implementation of the Directive every six years (Art. 17), including assessment of the conservation status of species and habitats listed on the Annexes to the Directive.

**Terminology**

*Conservation status:* the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Art. 2.

*Site:* geographically defined area whose extent is clearly delineated;

*Special area of conservation*: a site of Community importance designated by the Member States

through a statutory, administrative and/or contractual act where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and/or the populations of the species for which the site is designated;

*Favourable conservation status:* The maintenance or restoration of "favourable conservation status" (FCS) is the overall objective for all habitat types and species of Community interest. Such species are listed in Annexes II, IV and V to the Directive. In simple terms, FCS could be described as a situation where a habitat type or species is doing sufficiently well in terms of quality and quantity and has good prospects of continuing to do so in future. The fact that a habitat or species is not threatened (i.e. not faced by any direct extinction risk) does not necessarily mean that it has favourable conservation status. The target of the Directive is defined in a positive way, as a 'favourable' situation to be reached and maintained, which needs to be defined based on the best available knowledge. Therefore, the obligation of a Member State FCS for species is defined in general terms in Art. 1(i) of the Habitats Directive.

**Derogations**

While the nature directives apply to the Spanish and Portuguese outermost regions (Canaries, Madeira, Azores), and are voluntarily applied by Spain to Ceuta and Melilla, they do not apply to the French outermost regions. *See Commission Staff Working Document, Annex to the Communication from the Commission, 'Halting the Lostt of Biodiversity by 2010-and Beyond; Sustaining Ecosystem Services for Human Well-being, Impact Assessment' (SEC(2006) 607, 22 May 2006) p3, s 5.1.1.*

**Types of management measures**

Art. 6 is one of the most important articles in the Habitats Directive as it defines how Natura 2000 sites are managed and protected: Paragraphs 6(1) and 6(2) require that, within Natura 2000, Member States:

- Take appropriate conservation measures to maintain and restore the habitats and species for which the site has been designated to a favourable conservation status;
- Avoid damaging activities that could significantly disturb these species or deteriorate the habitats of the protected species or habitat types.

Paragraphs 6(3) and 6(4) lay down the procedure to be followed when planning new developments that might affect a Natura 2000 site. Thus: Any plan or project likely to have a significant effect on a Natura 2000, either individually or in combination with other plans or projects, shall undergo an *Appropriate Assessment* to determine its implications for the site. The competent authorities can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned (Art. 6.3). In exceptional circumstances, a plan or project may still be allowed to go ahead, in spite of a negative assessment, provided there are no alternative solutions and the plan or project is considered to be of overriding public interest. In such cases the Member State must take appropriate compensatory measures to ensure that the overall coherence of the Natura 2000 Network is protected. (Art. 6.4)

**Spatial coverage**

Natural habitats and wild fauna and flora in the European territory of the Member States to which the Treaty applies.

**Reporting units - what are the specific transposition requirements**

Art. 17 of the Habitats Directive requires that Member States regularly prepare and submit reports on progress made in implementing the directive, using a format agreed by the Habitats Committee and published in 2005 (EC, 2005). For the period from 2007 to 2012, Habitats Committee guidelines were published, and edited by the ETC/BD (Evans and Arvela, 2011). The Art. 17 reports prepared by Member States have three sections: a) general information on directive implementation, including information on the number of sites and their area, the proportion of sites with management plans and measures undertaken; b) assessments of the conservation

status of species; and c) assessments of the conservation status of habitats. Art. 17 reporting covers the habitat types and species across the whole territory of the Member State concerned, not only those within Natura 2000 sites.

**Management unit**

Natural habitats and wild fauna and flora in the European territory of the Member States to which the Treaty applies.

**Key planning steps**

*Art. 4.1:* On the basis of the criteria set out in Annex III (Stage 1) and relevant scientific information, each Member State shall propose a list of sites indicating which natural habitat types in Annex I and which species in Annex II that are native to its territory the sites host. For animal species ranging over wide areas these sites shall correspond to the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction. For aquatic species which range over wide areas, such sites will be proposed only where there is a clearly identifiable area representing the physical and biological factors essential to their life and reproduction. Where appropriate, Member States shall propose adaptation of the list in the light of the results of the surveillance referred to in Art. 11. The list shall be transmitted to the Commission, within three years of the notification of this Directive, together with information on each site. That information shall include a map of the site, its name, location, extent and the data resulting from application of the criteria specified in Annex III (Stage 1) provided in a format established by the Commission in accordance with the procedure laid down in Art. 21. *Art. 4.2:* On the basis of the criteria set out in Annex III (Stage 2) and in the framework both of each of the nine biogeographical regions referred to in Art. 1 (c) (iii) and of the whole of the territory referred to in Art. 2 (1), the Commission shall establish, in agreement with each Member State, a draft list of sites of Community importance drawn from the Member States' lists identifying those which host one or more priority natural habitat types or priority species. Member States whose sites hosting one or more priority natural habitat types and priority species represent more than 5% of their national territory may, in agreement with the Commission, request that the criteria listed in Annex III (Stage 2) be applied more flexibly in selecting all the sites of Community importance in their territory. The list of sites selected as sites of Community importance, identifying those which host one or more priority natural habitat types or priority species, shall be adopted by the Commission in accordance with the procedure laid down in Art. 21. *Art. 4.3:* The list referred to in paragraph 2 shall be established within six years of the notification of this Directive. *Art. 4.4:* Once a site of Community importance has been adopted in accordance with the procedure laid down in paragraph 2, the Member State concerned shall designate that site as a special area of conservation as soon as possible and within six years at most, establishing priorities in the light of the importance of the sites for the maintenance or restoration, at a favourable conservation status, of a natural habitat type in Annex I or a species in Annex II and for the coherence of Natura 2000, and in the light of the threats of degradation or destruction to which those sites are exposed. *Art. 4.5:* As soon as a site is placed on the list referred to in the third subparagraph of paragraph 2 it shall be subject to Art. 6 (2), (3) and (4).

**Timelines**

Art. 17 requires Member States to report every six years about the progress made with the implementation of the Habitats Directive. As the main focus of the directive is on maintaining and/or restoring a favourable conservation status for habitat types & species of community interest, monitoring & reporting under the directive is focusing on that. Monitoring of conservation status is an obligation arising from Art. 11 of the Habitats Directive for all habitats (as listed in Annex I) and species (as listed in Annex II, IV and V) of Community interest. Consequently this provision is not restricted to Natura 2000 sites and data need to be collected both in and outside the Natura 2000 network to achieve a full appreciation of conservation status.

The main results of this monitoring have to be reported to the Commission every six years according to Art. 17 of the directive.

**Integration/coordination issues with other related pieces of legislation**

The Birds Directive and the Habitats Directive are largely coherent, internally and with each other, despite some differences in scope and operational measures. Ultimately, both aim at contributing to ensuring biodiversity in coordination with other instruments. The protection regime for SCIs, SACs and SPAs has been harmonised through Art. 7 of the Habitats Directive.

The Nature Directives work in coordination with other EU environmental legislation and policies. Particularly important are the horizontal instruments, namely the EIA, SEA and Environmental Liability Directives, as well as legislation and policy in the key water, marine and climate change areas. The objectives and goals of these instruments are coherent with the Nature Directives, although coordinated implementation in practice is required to achieve the best outcomes. Improvements in coordination and management could also reduce the administrative burden on stakeholders, for example in reporting. Regarding other policy areas beyond environment, the picture is more mixed.

The development of network energy infrastructure and energy sources such as biofuels, wind power, shale gas and hydropower can also have negative impacts on habitats and species. There are good examples of ways to prevent/reduce such impacts in Commission guidance documents on wind energy and Natura 2000 and on environmental assessment for energy infrastructure; and through stakeholder initiatives such as the Renewables Grid Initiative, bringing together transmission system operators and NGOs.

With regard to fisheries, the legal framework is considered coherent with the Directives; however the last reform of the CFP still has to deliver results on the ground. In this respect the completion of the marine part of the Natura 2000 network and its effective management is expected to bring an important improvement. Concerns have been expressed by some stakeholders about the impacts of aquaculture on habitats and species, but also about the burden placed on aquaculture caused by strict interpretation of the requirements under Art. 6.3 of the Habitats Directive.

There is limited evidence available regarding the impact of the Directives on the EU internal market. A common approach through the Directives is considered as vital to avoid a 'race to the bottom' in environmental standards while giving business legal certainty. However some business stakeholders highlighted the fact that different implementation approaches across Member States have disadvantaged some economic operators and this has prevented a level playing field.

On international and global commitments on nature and biodiversity, the Directives are generally considered as coherent. Very few inconsistencies, particularly in relation to species protection under international treaties have been identified and the Directives are key instruments for EU to deliver on these international commitments

**Coordination issues with the EU Biodiversity Strategy**

The Habitats Directive is directly linked to the EU Biodiversity Strategy – Target 2: Fully Implement the Habitat and Birds Directive. The Habitats Directives (along with the Birds Directive) is the cornerstones of the EU's biodiversity policy, enabling all 28 EU Member States to work together, within the same legal framework, to conserve Europe's most endangered and valuable species and habitats across their entire natural range within the EU. The Habitats and Birds Directives make a major contribution to the EU's biodiversity target. They contribute directly through the conservation of targeted habitats and species, which include a high proportion of semi-natural habitats and threatened species (especially amongst vertebrates). Many more species are protected indirectly, through the diverse and species-rich habitats in the Natura 2000 network. The Directives also support all the targets of the EU's Biodiversity Strategy, especially the restoration of ecosystem services under Target 2. However, the Directives alone cannot deliver the EU 2020 goal of halting the loss of biodiversity without complementary action being taken,

especially in other key policy sectors such as agriculture.

**Relevance to ecosystems/habitats?**

*Ecosystems/habitats addressed explicitly by the legal act/policy:* Marine, coastal and halophytic habitats; Coastal sand dunes and continental dunes; Freshwater habitats; Temperate heath and scrub; Sclerophyllous scrub (matorral); Natural and semi-natural grassland formations; Raised bogs and mires and fens; Rocky habitats and caves; Forests.The directive relates to all habitats and species in the whole territory of the Member State concerned.

*Links to Aquatic Biodiversity and Ecosystem Services:* See Annex 1: Natural habitat types of community interest whose conservation requires the designation of special areas of conservation, for list of aquatic habitats that are explicitly mentioned by the directive. Clear links to ecosystem services. The EU Birds and Habitats Directives represent the most ambitious and large-scale initiative ever undertaken to conserve Europe's natural heritage. State of nature in the EU- Results from reporting under the nature directives 2007-2012 report highlights the importance of healthy ecosystems for providing society with a wealth of valuable ecosystem services, such as fresh water, carbon storage, pollinating insects etc., protection against floods, avalanches and coastal erosion, as well as ample opportunities for tourism and recreation. The benefits that flow from the Natura 2000 network alone are estimated to be worth in the order of €200 to €300billion/year.

**Drivers**

*Definition of Drivers:* The policy does not seem to distinguish between Pressures and Drivers – the 'list of threats and pressures' available on the reference portal (see 8.3) contains both human activities that produce an environmental impact (i.e. agriculture or transportation) and direct environmental effects (i.e. pollution).

*Drivers addressed in legal text :* Agriculture; Forestry; Sylviculture; Mining, extraction of materials and energy production; Transportation and service corridors; Urbanisation; residential and commercial development; Biological resource use other than agriculture & forestry; Human intrusions and disturbances; pollution; Invasive, other problematic species and genes; Natural System modifications; Natural biotic and abiotic processes (without catastrophes), Geological events, natural catastrophes, Climate change, Threats and pressures from outside the EU territory (see 8.3 and list of pressures and threats used for the assessment.

*Indicators:* The list of pressures and threats is compatible with similar lists used for reporting under the Water and Marine Strategy Framework Directives and for the Ramsar Convention as well as the proposals of Salafsky et al. (2008)[1]. Special attention was paid to ensure potential marine threats and pressures were included.

The relative importance of a threat or pressure must be ranked in one of three categories:

| Code | Meaning | Comment |
|---|---|---|
| H | High importance/ impact | Important direct or immediate influence and/or acting over large areas. |
| M | Medium importance/ impact | Medium direct or immediate influence, mainly indirect influence and/or acting over moderate part of the area/acting only regionally. |
| L | Low importance/ impact | Low direct or immediate influence, indirect influence and/or acting over small part of the area/ acting only regionally. |

As the intention is not to report every existing threat or pressure the total number of data entries

[1] Salafsky, N., et al. 2008. A standard lexicon for biodiversity conservation: unified classifications of threats and actions. *Conservation Biology* 22: 897-911.

is strictly limited to a maximum of 20 (to avoid very long lists of threats and pressures of minor importance). If there are no threats and pressures present, "X" should be used to indicate no pressures and threats. Unknown threat or pressure should be indicated by "U". The number of entries with the highest rank is limited to a maximum of 5 data entries. This will make it possible to identify the most important factors at a European scale. It is recommended to use the lowest number of possible data entries to adequately describe the situation and it is recommended to use level 2 categories for "high importance" (for example J02 "human induced changes in hydraulic conditions"). (From Assessment and reporting under Art. 17 of the Habitats Directive Explanatory Notes & Guidelines for the period 2007-2012)

**Pressures**

*Definition Pressures:* The policy does not seem to distinguish between Pressures and Drivers – the 'list of threats and pressures' available on the reference portal (see below) refers to both human activities (i.e. agriculture or transportation) and direct environmental effects (i.e. pollution). The policy does distinguish between pressure and threat: "For Art. 17 reporting pressures are considered to be factors which are acting now or have been acting during the reporting period, while threats are factors expected to be acting in the future. It is possible for the same impact to be both a pressure and a threat if it is having an impact now and this impact is likely to continue." The list of pressures and threats used for the assessment can be found on the Art. 17 Reference Portal includes: Agriculture; Forestry; Sylviculture; Mining, extraction of materials and energy production; Transportation and service corridors; Urbanisation; residential and commercial development; Biological resource use other than agriculture & forestry; Human intrusions and disturbances; pollution; Invasive, other problematic species and genes; Natural System modifications; Natural biotic and abiotic processes (without catastrophes), Geological events, natural catastrophes, Climate change, Threats and pressures from outside the EU territory.

*Indicators:* The list of pressures and threats is compatible with similar lists used for reporting under the Water and Marine Strategy Framework Directives and for the Ramsar Convention as well as the proposals of Salafsky et al. (2008). Special attention was paid to ensure potential marine threats and pressures were included. The relative importance of a threat or pressure must be ranked in one of three categories:

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| H | High importance/ impact | Important direct or immediate influence and/or acting over large areas. |
| M | Medium importance/ impact | Medium direct or immediate influence, mainly indirect influence and/or acting over moderate part of the area/acting only regionally. |
| L | Low importance/ impact | Low direct or immediate influence, indirect influence and/or acting over small part of the area/ acting only regionally. |

**Assessment of Environmental State**

Difficult to determine distinction between 'state' and 'status' within the directive. See 8.5.

**Assessment of Status**

'Favourable Conservation Status' (FCS) is the overall objective to be reached for all habitat types and species of community interest and it is defined in Art. 1 of the Habitats Directive. In simple words it can be described as a situation where a habitat type or species is prospering (in both quality and extent/population) and with good prospects to do so in future as well. The fact that a habitat or species is not threatened (*i.e.* not faced by any direct extinction risk) does not mean that it is in favourable conservation status. The target of the directive is defined in positive terms, oriented towards a favourable situation, which needs to be defined, reached and maintained. It is

therefore more than avoiding extinctions. Favourable Conservation Status is assessed across all national territory (or by biogeographical or marine region within a country where 2 or more regions are present) and should consider the habitat or species both within the Natura 2000 network and in the wider countryside or sea. Favourable Conservation Status is defined in the Habitats Directive (Art. 1e for habitats and Art. 1i for species).

The Habitats Directive requires periodic assessment of the species and habitat types to see if they are at FCS. For reporting under Art. 17 *a format with three classes of Conservation Status has been adopted*; – *Favourable (FV), Unfavourable-Inadequate (U1) and Unfavourable-Bad (U2)*. 'Favourable Conservation Status' is defined in the Directive and effectively describes the situation where the habitat or species can be expected to prosper without any change to existing management or policies. The unfavourable category has been split into two classes to allow improvements or deterioration to be reported: 'Unfavourable-Inadequate' for situations where a change in management or policy is required to return the habitat type or species to favourable status but there is no danger of extinction in the foreseeable future and 'Unfavourable-Bad' is for habitats or species in serious danger of becoming extinct (at least regionally). There is also an 'Unknown' class which can be used where there is insufficient information available to allow an assessment. For graphical representation, each class is colour coded, green for Favourable, amber for Unfavourable-Inadequate', red for Unfavourable-Bad and grey for unknown. Assessments should be qualified with a plus or minus to indicate a trend (improving or declining) as described below in section IId.

Favourable Conservation Status is defined in Art. 1 of the Habitats Directive by four parameters for each habitat type and species. The agreed method for the evaluation of conservation status assesses each of the parameters separately, with the aid of an evaluation matrix, and then combines these assessments to give an overall assessment of conservation status. The parameters are: range, population (species), and area (habitat types). They all require the setting of threshold values to determine if the parameter is favourable or unfavourable. These are referred to as 'Favourable Reference Values'.

The aim of the mid-term review is to take stock of progress in relation to the targets and actions under the EU biodiversity strategy to 2020. Identifying gaps in implementation is necessary in order to inform decision-makers of areas in which increased efforts are needed to ensure that the EU meets its biodiversity commitments by 2020. The 2015 mid-term review of the EU biodiversity strategy to 2020 consists of a Report from the Commission to the European Parliament and the Council on "The Mid-Term Review of the EU Biodiversity Strategy to 2020" and the more detailed Commission Staff Working Document "EU assessment of progress in implementing the EU Biodiversity Strategy to 2020 part 1, part 2, part 3". Contributions from the Member States to the 2015 Mid-Term Review, based on their 5th national reports to the Convention on Biological Diversity, are compiled in a separate document. For a summary of progress towards the 2020 biodiversity targets see the leaflet. The latest report on the state of nature in the EU shows that the number of species and habitats in secure/favourable or improved conservation status has increased slightly since the 2010 baseline. However, many habitats and species that were already in unfavourable status remain so, and some are deteriorating further. While much has been achieved since 2011 in carrying out the actions under this target, the most important challenges remain the completion of the Natura 2000 marine network, ensuring the effective management of Natura 2000 sites, and securing the necessary finance to support the Natura 2000 network.

This year (2015) the European Commission is carrying out a "Fitness Check" of the Birds Directive (2009/147/EC) and Habitats Directive (92/43/EEC) as part of its ongoing Regulatory Fitness and Performance (REFIT) initiative. The REFIT initiative focuses on reducing 'regulatory burden', so as to meet EU policy and regulatory goals at least cost and best achieve the benefits of EU regulation. "Fitness Checks" are comprehensive evidence-based policy evaluations that are intended to

identify excessive administrative burdens, overlaps, gaps, and inconsistencies. The Fitness Check will include online consultations and interviews with stakeholders across the EU-28 planned for the first half of 2015. Initial findings will be presented at a stakeholder conference in September 2015, with a final report envisaged in early 2016.

**Data**

The Art. 17 reports prepared by Member States have three sections; (i) general information about the implementation of the Directive, (ii) the assessments of conservation status of species, and (iii) of habitats. The Art. 17 reporting covers the habitats and species in the whole territory of the Member State concerned, not only those within Natura 2000 sites.

Main outcomes from the nature directives reporting: The European Commission and the European Environment Agency supported by its European Topic Centre on Biological Diversity have published several reports summarising the main result of the status of species (including birds) and habitats at the EU (EU biogeographical) level. The information reported by the Member States and the EU assessments of status can be accessed through the web viewing tool. Dataset containing the reported information and the EU assessments of status can be downloaded from European Environment Agency's datacentre. Basic statistics and an overview of the main results from the Member State reports are provided in National Summaries. The Art. 17 reports from the Member States were delivered via the ReportNet mechanisms of the European Environment Agency.

**Funding**

There are many EU funding opportunities for financing biodiversity and Natura 2000 across different instruments. However, only the LIFE programme provides dedicated support to biodiversity and Natura 2000 as a primary objective, whereas other EU funding instruments are primarily targeted to deliver EU goals on rural, regional, infrastructural, social and scientific development. Evidence is mixed on the extent to which nature and biodiversity are successfully integrated into the funding programmes, as this depends on priority-setting at national and regional levels and capacity of stakeholders to absorb funds.

The CAP and Nature Directives are potentially complementary, as some of the CAP's incentives and associated environmental conditions (e.g. cross-compliance) can be beneficial for biodiversity, although much depends on Member State implementation choices. For example, direct payments, as well as payments for areas facing natural and other specific constraints can support farming systems associated with certain European protected habitats and species, although eligibility rules have led to unintended biodiversity damage in some Draft Emerging Findings -Evaluation Study to support the Fitness Check of the Birds and Habitats Directive 5 areas. Pillar 2 funded measures, and especially agri-environment - climate schemes are the primary means of supporting management practices that are beneficial to biodiversity. Without such support via the CAP the conservation status of agricultural habitats and species would be worse than it currently is. However, the CAP could contribute more to the goals of the Nature Directives, especially if Pillar 2 funding was increased and Member States better tailored and targeted their measures more towards biodiversity priorities.

Cohesion Policy has both positive and negative impacts on the objectives and implementation of the Directives. It can provide funding to directly support their objectives (e.g. conservation measures) but also for activities that may threaten nature objectives such as transport, energy and other infrastructure. There is room for improvement in the integration of the goals of both Directives into Cohesion Policy to enhance the role of green infrastructure and nature-based solutions.

*Life-Programme:* Although Member States carry the major responsibility for funding the Natura 2000 network within their national borders, in some cases there are possibilities for receiving EU money. The main EU financing instrument for this is the LIFE programme which is intended to

fund environmental pilot projects, in order to establish best practice for larger financial instruments such as Structural Funds. LIFE-Nature is the main fund for biodiversity, although some Natura 2000 sites also receive money from LIFE-Environment. As a funding instrument LIFE has a much smaller financial capacity than other EU funding sources such as the Common Agricultural Policy and Structural Funds. Projects financed by LIFE are also of limited duration.

Art. 8 of the Habitats Directive specifically refers to EU co-financing for necessary conservation measures and requires adoption of prioritised action frameworks (PAF) to define the funding needs and priorities for Natura 2000 at a national or regional level and so facilitate their integration into different EU funding instruments.

*EAFRD:* Direct opportunities include, for example, financing a range of Natura 2000 activities in the context of agri-environment-climate and forest-environmental schemes, compensation payments for additional costs and income foregone resulting related to managing agricultural and forest land within Natura 2000 sites, improving knowledge on rural biodiversity, and drawing up Natura 2000 management plans. Furthermore, a great variety of more indirect opportunities are available, allowing the management of Natura 2000 to be linked with broader rural development efforts, such as promoting organic farming, improving risk management and enhancing business development. These indirect opportunities can provide, for example, support to carrying out certain activities identified in site-specific management plans such as supporting biodiversity-friendly organic farming and branding of local produce from Natura 2000 sites

*EMFF:* In general, the EMFF Regulation stipulates that where appropriate the specific needs of Natura 2000 areas and the contribution of the programme to the establishment of a coherent network of fish stock recovery areas should be integrated into the EMFF OPs (Art. 18(c) of the Regulation). According to the Regulation, dedicated support in accordance with PAFs is provided for the management, restoration and monitoring of coastal and marine Natura 2000 sites (Art. 40(e)). Support is also foreseen to be given to the preparation, including studies, drawing-up, monitoring and updating of protection and management plans for fishery-related activities relating to Natura 2000 sites (Art. 40(d)). In addition, support is also made available for the management, restoration and monitoring of other marine protected areas (MPAs) to support the implementation of the Marine Strategy Framework Directive (MSFD) (Art. 40(f)). Such general support can also be used, for example, to contribute to maintaining and/or restoring the overall ecological connectivity of the Natura 2000 network. Finally, support is also provided for the uptake of aquaculture methods compatible with biodiversity conservation, including Natura 2000 management requirements (Art. 54). Furthermore, a variety of more indirect opportunities are available, allowing the management of Natura 2000 to be linked with the broader development of fisheries and/or viability of fishing communities. Such opportunities include, for example, the establishment of cooperation between scientists and fishermen, and the diversification of livelihoods in rural communities. While these indirect opportunities do not necessarily cater for all management measures relevant to a site, they can provide support for carrying out certain activities identified in site-specific management plans such as development of Natura 2000 monitoring in the context of broader schemes aimed at monitoring the marine environment.

*ERFD:* The ERDF will provide several opportunities to fund Natura 2000 during the 2014-2020 period. Dedicated support is possible for the protection of biodiversity and ecosystem services, including Natura 2000. In addition, support is also made available for a range of activities supporting broader sustainable regional development, with possible indirect links to Natura 2000 management. Such indirect measures include, for example, supporting investment in the mitigation of and adaptation to climate change (e.g. nature-based solutions for carbon storage and sequestration, mitigating risks of climate change), protecting, promoting and developing cultural heritage (e.g. Natura 2000 sites) and integrating Natura 2000 related socio-economic opportunities into broader plans to regenerate deprived urban and rural communities.

*European Social Fund:* The ESF could provide several opportunities to fund Natura 2000 during the 2014-2020 period. Most of the opportunities are not, however, Natura 2000 specific but rather support broader social and economic cohesion, with possible indirect links to Natura 2000 management. Such indirect opportunities include, for example, enhancing the competitiveness of SMEs dealing with Natura 2000 and enhancing Natura 2000 related institutional capacity and efficient public administration.

*Horizon 2020:* Given the scope of Horizon 2020, all opportunities related to financing management activities on Natura 2000 sites need to take place in the research context. However, this allows for a wide range of Natura 2000 measures to be funded, mainly related to the development and testing of new management approaches and/or evaluation of the past Natura 2000 management regime.

*Cohesion Fund:* The Cohesion Fund (CF) will provide a number of opportunities to fund Natura 2000 during the 2014-2020 period. Dedicated support is provided for the protection of biodiversity and ecosystem services (e.g. in the context of green infrastructure). Support is also made available to a range of activities supporting investment in broader sustainable regional development, with possible links to Natura 2000 management.

Such indirect measures include, for example, supporting investment in adaptation to climate change (e.g. nature-based solutions and integrating Natura 2000 related socio-economic opportunities into broader plans to regenerate deprived urban and rural communities).

## 3.2 Birds Directive

Author: Helen Klimmek (IUCN)

Reviewer: Manuel Lago, Ecologic Institute

| Birds Directive |
| --- |
| **Name/Type of the Legal Act or Policy** |
| DIRECTIVE 2009/147/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, of 30 November 2009 on the conservation of wild birds (replacing Council Directive 79/409/EEC of 2 April 1979). This Directive replaces Directive 79/409/EEC of 2 April 1979 (more commonly known as the Birds Directive), which was the oldest EU legislative text relating to nature. However, the modifications made are purely formal. The Birds Directive established for the first time a general system for the protection of all species of wild birds naturally occurring in the territory of the Union. It also recognises that wild birds, which include a large number of migratory species, are a shared heritage of the EU Member States and that their conservation, to be effective, requires cooperation on a global scale.<br>Amending Act: Council Directive 2013/17/EU of 13 May 2013 adapting certain directives in the field of environment, by reason of the accession of the Republic of Croatia (entry into force 1.7.2013) |
| **Entry into force** |
| Directive 79/409/EEC: 06.04.1979<br>Directive 2009/147/EC : 15.2.2010 |
| **Departments/Units in charge** |
| DG ENV, Dir. B Natural Capital, 3. Nature |
| **Common Implementation strategy (CIS processes)** |
| At EU level, implementation of the Habitats and Birds Directive is supported by the Habitats Committee (under Art. 20 and 21 of the Habitat Directive) rsp. by the Ornis Committee (under Art. 16 of the Birds Directive) which comprise representatives from all member states and the EU Commission. Decisions are made with a qualified majority (using weighted votes). In its capacity as a scientific and technical advisory committee, the Habitats Committee also includes the Habitats Scientific Working Group._The Habitats Committee assists the European Commission in the implementation of the Habitats Directive and is responsible for delivering an opinion on the draft list of LIFE-Nature projects to be financed every year. The Ornis Committee assists the Commission in the implementation of the Birds Directive. |
| **Administrative body handling implementation in MS** |
| *German Implementation of the Birds and Habitats Directive:* Ministry of Environment (BMUB) in Germany coordinates and designates N2000 areas in EEZ, States (Länder) designate in their respective areas of jurisdiction. Whether or not the drafting of management plans for N2000 sites is obligatory depends on the state regulation. The responsible administrative body for management plans for the EEZ is the BfN. The responsible administrative bodies for drafting the management plans for terrestrial N2000 areas are the environmental ministries or agencies of the states<br>*Transposition to UK Legislation:* In the UK, the provisions of the Birds Directive are implemented through the Wildlife & Countryside Act 1981 (as amended), the Conservation (Natural Habitats, &c.) Regulations 2010 (as amended); the Wildlife (Northern Ireland) Order 1985; the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985; the Conservation (Natural Habitats, &c.) (Northern Ireland) Regulations 1995 (as amended) the Offshore Marine |

Conservation (Natural Habitats & c.) Regulations 2007 as well as other legislation related to the uses of land and sea.

*Austria:* Implementation of the Birds Directive is handled by the laws of the sub-national states (Die Vogelschutz-Richtlinie wird in Österreich in den jeweiligen Landesnaturschutzgesetzen umgesetzt).

**Main Objective**

To guarantee the conservation and govern the exploitation of wild birds naturally occurring in the European territory in order to maintain their population at a satisfactory level, or to adapt their population to that level.

*Art. 1.1:* This Directive relates to the conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States to which the Treaty applies. It covers the protection, management and control of these species and lays down rules for their exploitation.

*Art. 1.2:* It shall apply to birds, their eggs, nests and habitats.

*Art. 2:* Member States shall take the requisite measures to maintain the population of the species referred to in Art. 1 at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level.

**Other objectives/Key concepts/key elements of the legislation**

Principles of *wise use and ecologically balanced control* of the species of birds (Art. 7)

Member States of the European Union (EU) shall take measures to guarantee the conservation and govern the exploitation of wild birds naturally occurring in the European territory in order to maintain their population at a satisfactory level, or to adapt their population to that level. Definition of wild bird: bird species naturally occurring in the wild state in the European Territory of the Member States to which the Treaty applies.

*Protection of habitats:* The disappearance or deterioration of habitats represents a threat to the conservation of wild birds. Their protection is therefore essential. To preserve, maintain or re-establish the biotopes and habitats of birds, Member States shall: designate protected areas; ensure the upkeep and management of habitats in accordance with ecological needs; and re-establish destroyed biotopes and create biotopes.

*Special protection areas:* Member States shall create special protection areas (SPAs) for threatened species of birds and for migratory birds (see Annex I). These areas are to be situated in the birds' natural area of distribution and may include wintering and nesting grounds or staging posts along migration routes.Member States shall pay particular attention to wetlands, which are in decline across Europe. They shall also create conditions favourable to the survival or reproduction of the species occurring in special protection areas. To this end, they shall take the necessary steps to avoid pollution or deterioration of habitats or any disturbances affecting the birds. They shall also assess the impact of projects likely to have a significant effect on the designated areas and take appropriate measures to avoid them. The special protection areas (SPAs), together with the special areas of conservation (SACs) under the HabitatsDirective (92/43/EEC), form the Natura 2000 European network of protected ecological sites.

*Protection of wild birds:* This Directive establishes a general system of protection for all species of wild birds occurring in European territory. It prohibits in particular: deliberate destruction or capture of wild birds; destruction of, or damage to, nests; taking or keeping eggs even if empty; practices which deliberately disturb the birds and which jeopardise the conservation of the species; and trade in and the keeping of live or dead species the hunting and capture of which are not permitted (this prohibition also applies to any parts or derivatives of a bird). Under certain conditions, Member States may derogate from the provisions laid down for the protection of wild birds. However, the consequences of such derogations must not be incompatible with the

conservation objectives specified in the Directive. Member States must promote research for the purposes of the management, protection and wise exploitation of the species of wild birds occurring in the European territory (see Annex V).

*Hunting:* Species whose numbers, distribution and reproductive rate allow may be hunted. However, the practice of hunting must comply with certain principles: the number of birds taken must not jeopardise the maintenance at a satisfactory level of the population of species which may be hunted; species are not to be hunted during periods of breeding or rearing; migratory species are not to be hunted during their return to their breeding grounds; and methods for the large-scale or non-selective killing of birds are prohibited (see Annex IV).The list of species which may be hunted is provided in Annex II (Part A gives the list of species which may be hunted throughout the EU, and Part B the list of species which may be hunted in certain countries only).

**Terminology**

*Conservation status:* the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Art. 2.

*Site:* geographically defined area whose extent is clearly delineated;

*Special area of conservation*: a site of Community importance designated by the Member States through a statutory, administrative and/or contractual act where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and/or the populations of the species for which the site is designated;

*Favourable conservation status:* The maintenance or restoration of "favourable conservation status" (FCS) is the overall objective for all habitat types and species of Community interest. Such species are listed in Annexes II, IV and V to the Directive. In simple terms, FCS could be described as a situation where a habitat type or species is doing sufficiently well in terms of quality and quantity and has good prospects of continuing to do so in future. The fact that a habitat or species is not threatened (i.e. not faced by any direct extinction risk) does not necessarily mean that it has favourable conservation status. The target of the Directive is defined in a positive way, as a 'favourable' situation to be reached and maintained, which needs to be defined based on the best available knowledge. Therefore, the obligation of a Member State FCS for species is defined in general terms in Art. 1(i) of the Habitats Directive.

**Derogations**

While the nature directives apply to the Spanish and Portuguese outermost regions (Canaries, Madeira, Azores), and are voluntarily applies by Spain to Ceuta and Melilla, they do not apply to the French outermost regions.

**Types of management measures**

*EU Management plans for huntable bird species considered to be in unfavourable status:* The "Birds Directive" allows for certain species to be hunted, which are listed in Annex II of the Directive. Since the adoption of the Directive in 1979, regular monitoring reports from BirdLife International are indicating that certain huntable species are considered to have an unfavourable conservation status. The Commission is therefore supporting the preparation of management plans for several species listed in Annex II. These draft framework plans have been extended to EU-25 and define clear management measures. It will be the Member States who will ultimately have responsibility for implementation the plans at national level but this will be made much more feasible with the support of the key stakeholders, including FACE and BirdLife. These plans will need to be regularly monitored and updated in the light of new scientific knowledge.

The European Commission has launched a new 'EU Cormorant Platform' website as part of an EU project on the sustainable management of Cormorant Populations (Corman). This year (2015) the European Commission is carrying out a "Fitness Check" of the Birds Directive (2009/147/EC) and Habitats Directive (92/43/EEC) as part of its ongoing Regulatory Fitness and Performance (REFIT)

initiative. The REFIT initiative focuses on reducing 'regulatory burden', so as to meet EU policy and regulatory goals at least cost and best achieve the benefits of EU regulation. "Fitness Checks" are comprehensive evidence-based policy evaluations that are intended to identify excessive administrative burdens, overlaps, gaps, and inconsistencies. The Fitness Check will include online consultations and interviews with stakeholders across the EU-28 planned for the first half of 2015. Initial findings will be presented at a stakeholder conference in September 2015, with a final report envisaged in early 2016.

**Spatial coverage**

This Directive relates to the conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States to which the Treaty applies. It covers the protection, management and control of these species and lays down rules for their exploitation. It shall apply to birds, their eggs, nests and habitats.

**Reporting units - what are the specific transposition requirements**

1. Member States shall forward to the Commission every three years, starting from 7 April 1981, a report on the implementation of national provisions taken under this Directive.
2. The Commission shall prepare every three years a composite report based on the information referred to in paragraph 1. That part of the draft report covering the information supplied by a Member State shall be forwarded to the authorities of the Member State in question for verification. The final version of the report shall be forwarded to the Member States.

Art. 12 of the Birds Directive requires that Member States regularly prepare and submit reports on progress made in national implementation of the Birds Directive. In 2011, the Commission, in agreement with Member States, revised the reporting procedure and frequency in order to focus reporting obligations on the status and trends of bird populations, thereby streamlining reporting under Art. 12 of the Birds Directive with reporting on conservation status under Art. 17 of the Habitats Directive. Art. 12 reports prepared by Member States comprise two sections: (a) general information about the implementation of the Birds Directive, including main achievements, classification of SPAs, SPA management plans and details of any introductions of non-native bird species; and (b) reports on the size and trend of populations and distribution of individual bird taxa, including sections for reporting on the main threats and pressures affecting taxa for which SPAs have been classified (designated 'SPA trigger species'), as well as their coverage by the SPA network and relevant conservation measures taken. Checklists of the bird taxa covered by the Birds Directive and their occurrence per Member State were prepared in consultation with Member States, and are available on the Art. 12 Reference Portal. Reporting was by subspecies or other subspecific units where subspecies are listed in Annex I of the Directive, for: subspecies for which international Species Action Plans (SAPs), Management Plans (MPs) or Brief Management Statements (BMSs) have been prepared (15); subspecies or distinct flyway populations listed in Column A of Table 1 of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) 'Status of the Populations of Migratory Waterbirds (2009-2012) (16); subspecies or distinct populations of species classified as globally threatened or near threated, according to the IUCN 2010 Red List. Member States also reported on the presence status of bird taxa (i.e. present, newly arriving and extinct). The statistics, figures and tables presented in this report are based on taxa that Member States reported as nationally 'present' or 'extinct after 1980', i.e. extinct after the Birds Directive came into force (17).

**Management unit**

This Directive relates to the conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States to which the Treaty applies.

**Timelines**

Reporting obligations under the Birds Directive, are set out in Art. 12, which requires reports on implementation of the Directive every three years. Until recently, the reporting cycles of the two

nature Directives were not synchronised, making it difficult to get an overview of implementation in the broad sense. In 2011, Member States and the Commission agreed that the Art. 12 report for the Birds Directive should become more similar, in terms of format and timing, to the Art. 17 Report for the Habitats Directive. The 10th Art. 12 report (2008-2012) is the first in the new format and in the future will be repeated at six yearly intervals, allowing simultaneous analysis of the results of both Directives' reports at both national and EU levels.

**Integration/coordination issues with other related pieces of legislation**

Under the Birds Directive Member States select the most suitable sites and designate them directly as Special Protection Areas (SPAs). The special protection areas (SPAs), together with the special areas of conservation (SACs) under the Habitats Directive (92/43/EEC), form the Natura 2000 European network of protected ecological sites.

Natura 2000 is the centrepiece of EU nature & biodiversity policy. It is an EU wide network of nature protection areas established under the 1992 Habitats Directive. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It is comprised of Special Areas of Conservation (SAC) designated by Member States under the Habitats Directive, and also incorporates Special Protection Areas (SPAs) which they designate under the 1979 Birds Directive. Natura 2000 is not a system of strict nature reserves where all human activities are excluded. Whereas the network will certainly include nature reserves most of the land is likely to continue to be privately owned and the emphasis will be on ensuring that future management is sustainable, both ecologically and economically. The establishment of this network of protected areas also fulfils a Community obligation under the UN Convention on Biological Diversity. Natura 2000 applies to Birds Sites and to Habitats Sites, which are divided into biogeographical regions. It also applies to the marine environment.

**Coordination issues with the EU Biodiversity Strategy**

The Birds Directive is directly linked to the EU Biodiversity Strategy – Target 2: Fully Implement the Habitat and Birds Directive. Together these two Directives form the cornerstone of the EU's biodiversity policy, enabling all 28 EU Member States to work together, within the same legal framework, to conserve Europe's most endangered and valuable species and habitats across their entire natural range within the EU. The Habitats and Birds Directives make a major contribution to the EU's biodiversity target. They contribute directly through the conservation of targeted habitats and species, which include a high proportion of semi-natural habitats and threatened species (especially amongst vertebrates). Many more species are protected indirectly, through the diverse and species-rich habitats in the Natura 2000 network. The Directives also support all the targets of the EU's Biodiversity Strategy, especially the restoration of ecosystem services under Target 2. However, the Directives alone cannot deliver the EU 2020 goal of halting the loss of biodiversity without complementary action being taken, especially in other key policy sectors such as agriculture.

**Relevance to ecosystems/habitats?**

*Ecosystems/habitats addressed explicitly by the legal act/policy:* This Directive relates to the conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States to which the Treaty applies. It covers the protection, management and control of these species and lays down rules for their exploitation. It shall apply to birds, their eggs, nests and habitats. The European Union has nine biogeographical regions (Alpine, Atlantic, Black Sea, Boreal, Continental, Macaronesian, Mediterranean, Pannonian, Steppic) , each with its own characteristic blend of vegetation, climate and geology. Under the Birds Directive Member States select the most suitable sites and designate them directly as Special Protection Areas (SPAs). These sites then automatically become part of the Natura 2000 network.

*Ecosystems affected by relevant policies:* By relating to conservation in "all European territory" the directive implicitly includes all marine, terrestrial and aquatic ecosystems – forests, lagoons,

wetlands, grasslands, rivers, etc.

*Links to Aquatic Biodiversity and Ecosystem Services:* Clear links to ecosystem services. The EU Birds and Habitats Directives represent the most ambitious and large-scale initiative ever undertaken to conserve Europe's natural heritage. State of nature in the EU- Results from reporting under the nature directives 2007-2012 report highlights the importance of Healthy ecosystems for providing society with a wealth of valuable ecosystem services, such as fresh water, carbon storage, pollinating insects etc., protection against floods, avalanches and coastal erosion, as well as ample opportunities for tourism and recreation. The benefits that flow from the Natura 2000 network alone are estimated to be worth in the order of €200 to €300billion/year.

**Drivers**

*Definition of Drivers:* The policy does not seem to distinguish between Pressures and Drivers – the 'list of threats and pressures' available on the reference portal (see 8.3) contains both human activities (i.e. agriculture or transportation) and direct environmental effects (i.e. pollution). See list of Threats & Pressures used for reporting under Art. 12.

*Drivers addressed in legal text:* See 8.3. Urban sprawl and transport networks have fragmented and reduced bird habitats; intensive agriculture, forestry and fisheries and the use of pesticides have diminished food supplies; and there has been a need to regulate hunting to ensure that it does not damage populations. Factors which may affect the numbers of birds: repercussions of man's activities and in particular the destruction and pollution of their habitats, capture and killing by man and the trade resulting from such practices.

**Pressures**

*Definition Pressures:* The policy does not seem to distinguish between Pressures and Drivers – the 'list of threats and pressures' available on the reference portal (see 8.2) contains both human activities (i.e. agriculture or transportation) and direct environmental effects (i.e. pollution).

*Pressures addressed* : Agriculture; Forestry; Sylviculture; Mining, extraction of materials and energy production; Transportation and service corridors; Urbanisation; residential and commercial development; Biological resource use other than agriculture & forestry; Human intrusions and disturbances; pollution; Invasive, other problematic species and genes; Natural System modifications; Natural biotic and abiotic processes (without catastrophes), Geological events, natural catastrophes, Climate change, Threats and pressures from outside the EU territory (see 8.3 and list of pressures and threats used for the assessment – The same list is used for the Habitats and Birds Directive)

*Indicators:* Section on pressures and threats from Art. 12 reporting guidelines: Section 7. Main pressures and threats.

| Code | Meaning | Comment |
|---|---|---|
| H | High importance/ impact | Important direct or immediate influence and/or acting over large areas. |
| M | Medium importance/ impact | Medium direct or immediate influence, mainly indirect influence and/or acting over moderate part of the area/acting only regionally. |
| L | Low importance/ impact | Low direct or immediate influence, indirect influence and/or acting over small part of the area/ acting only regionally. |

**Assessment of Environmental State**

Difficult to distinguish between environmental state and status within the directive. Every six years, Member States are asked to report back to the European Commission on the conservation status of some 2,000 species and habitat types protected under the two EU Directives, in order to see how well they are faring across the EU. The results for the period 2007-2012 were published in May 2015 in the Commission's 'The State of Nature' report.

**Assessment of Status**

*Mid-Term Review of EU Biodiversity Strategy:* The aim of the mid-term review is to take stock of progress in relation to the targets and actions under the EU biodiversity strategy to 2020. Identifying gaps in implementation is necessary in order to inform decision-makers of areas in which increased efforts are needed to ensure that the EU meets its biodiversity commitments by 2020. The 2015 mid-term review of the EU biodiversity strategy to 2020 consists of a Report from the Commission to the European Parliament and the Council on "The Mid-Term Review of the EU Biodiversity Strategy to 2020" and the more detailed Commission Staff Working Document "EU assessment of progress in implementing the EU Biodiversity Strategy to 2020 part 1, part 2, part 3". Contributions from the Member States to the 2015 Mid-Term Review, based on their 5th national reports to the Convention on Biological Diversity, are compiled in a separate document. For a summary of progress towards the 2020 biodiversity targets see the leaflet. The latest report on the state of nature in the EU shows that the number of species and habitats in secure/favourable or improved conservation status has increased slightly since the 2010 baseline. However, many habitats and species that were already in unfavourable status remain so, and some are deteriorating further. While much has been achieved since 2011 in carrying out the actions under this target, the most important challenges remain the completion of the Natura 2000 marine network, ensuring the effective management of Natura 2000 sites, and securing the necessary finance to support the Natura 2000 network.

*Fitness Check:* This year (2015) the European Commission is carrying out a "Fitness Check" of the Birds Directive (2009/147/EC) and Habitats Directive (92/43/EEC) as part of its ongoing Regulatory Fitness and Performance (REFIT) initiative. The REFIT initiative focuses on reducing 'regulatory burden', so as to meet EU policy and regulatory goals at least cost and best achieve the benefits of EU regulation. "Fitness Checks" are comprehensive evidence-based policy evaluations that are intended to identify excessive administrative burdens, overlaps, gaps, and inconsistencies. The Fitness Check will include online consultations and interviews with stakeholders across the EU-28 planned for the first half of 2015. Initial findings will be presented at a stakeholder conference in September 2015, with a final report envisaged in early 2016.

**Data**

Art. 12 reports prepared by Member States comprise two sections: (a) general information about the implementation of the Birds Directive, including main achievements, classification of SPAs, SPA management plans and details of any introductions of non-native bird species; and (b) reports on the size and trend of populations and distribution of individual bird taxa, including sections for reporting on the main threats and pressures affecting taxa for which SPAs have been classified (designated 'SPA trigger species'), as well as their coverage by the SPA network and relevant conservation

**Funding**

*LIFE Programme:* For the purposes of LIFE funding, the Ornis Committee has adopted a list of bird species listed in Annex I of the Directive which are considered as priority for funding under the LIFE programme. This list includes all globally threatened species that regularly occur in the European Union. Potential funding opportunities for Natura2000in EU budget 2014-2020.

*EAFRD:* Direct opportunities include, for example, financing a range of Natura 2000 activities in the context of agri-environment-climate and forest-environmental schemes, compensation payments for additional costs and income foregone resulting related to managing agricultural and forest land within Natura 2000 sites, improving knowledge on rural biodiversity, and drawing up Natura 2000 management plans. Furthermore, a great variety of more indirect opportunities are available, allowing the management of Natura 2000 to be linked with broader rural development efforts, such as promoting organic farming, improving risk management and enhancing business development. These indirect opportunities can provide, for example, support to carrying out

certain activities identified in site-specific management plans such as supporting biodiversity-friendly organic farming and branding of local produce from Natura 2000 sites

*EMFF:* In general, the EMFF Regulation stipulates that where appropriate the specific needs of Natura 2000 areas and the contribution of the programme to the establishment of a coherent network of fish stock recovery areas should be integrated into the EMFF OPs (Art. 18(c) of the Regulation). According to the Regulation, dedicated support in accordance with PAFs is provided for the management, restoration and monitoring of coastal and marine Natura 2000 sites (Art. 40(e)). Support is also foreseen to be given to the preparation, including studies, drawing-up, monitoring and updating of protection and management plans for fishery-related activities relating to Natura 2000 sites (Art. 40(d)). In addition, support is also made available for the management, restoration and monitoring of other marine protected areas (MPAs) to support the implementation of the Marine Strategy Framework Directive (MSFD) (Art. 40(f)). Such general support can also be used, for example, to contribute to maintaining and/or restoring the overall ecological connectivity of the Natura 2000 network. Finally, support is also provided for the uptake of aquaculture methods compatible with biodiversity conservation, including Natura 2000 management requirements (Art. 54). Furthermore, a variety of more indirect opportunities are available, allowing the management of Natura 2000 to be linked with the broader development of fisheries and/or viability of fishing communities. Such opportunities include, for example, the establishment of cooperation between scientists and fishermen, and the diversification of livelihoods in rural communities. While these indirect opportunities do not necessarily cater for all management measures relevant to a site, they can provide support for carrying out certain activities identified in site-specific management plans such as development of Natura 2000 monitoring in the context of broader schemes aimed at monitoring the marine environment.

*ERDF:* The ERDF will provide several opportunities to fund Natura 2000 during the 2014-2020 period. Dedicated support is possible for the protection of biodiversity and ecosystem services, including Natura 2000. In addition, support is also made available for a range of activities supporting broader sustainable regional development, with possible indirect links to Natura 2000 management. Such indirect measures include, for example, supporting investment in the mitigation of and adaptation to climate change (e.g. nature-based solutions for carbon storage and sequestration, mitigating risks of climate change), protecting, promoting and developing cultural heritage (e.g. Natura 2000 sites) and integrating Natura 2000 related socio-economic opportunities into broader plans to regenerate deprived urban and rural communities.

*ESF:* The ESF could provide several opportunities to fund Natura 2000 during the 2014-2020 period. Most of the opportunities are not, however, Natura 2000 specific but rather support broader social and economic cohesion, with possible indirect links to Natura 2000 management. Such indirect opportunities include, for example, enhancing the competitiveness of SMEs dealing with Natura 2000 and enhancing Natura 2000 related institutional capacity and efficient public administration.

*Horizon2020:* Given the scope of Horizon 2020, all opportunities related to financing management activities on Natura 2000 sites need to take place in the research context. However, this allows for a wide range of Natura 2000 measures to be funded, mainly related to the development and testing of new management approaches and/or evaluation of the past Natura 2000 management regime.

*Cohesion Fund:* The Cohesion Fund will provide a number of opportunities to fund Natura 2000 during the 2014-2020 period. Dedicated support is provided for the protection of biodiversity and ecosystem services (e.g. in the context of green infrastructure). Support is also made available to a range of activities supporting investment in broader sustainable regional development, with possible links to Natura 2000 management. Such indirect measures include, for example, supporting investment in adaptation to climate change (e.g. nature-based solutions and

integrating Natura 2000 related socio-economic opportunities into broader plans to regenerate deprived urban and rural communities).

## 3.3 Invasive Alien Species Regulation

Author: Helen Klimmek (IUCN)

Reviewer: Manuel Lago, Ecologic Institute

| Invasive Alien Species Regulation |
|---|
| **Name/Type of the Legal Act or Policy** |
| The Regulation 1143/2014 on invasive alien species |
| **Entry into force** |
| The Regulation 1143/2014 on invasive alien species entered into force on 1 January 2015. |
| **Departments/Units in charge** |
| DG Environment, Unit B2 – Biodiversity and Unit B.3 – Nature |
| **Common Implementation strategy (CIS processes)** |
| *Working Group on Invasive Alien Species (WGIAS):* The mission of this group, chaired by DG Environment (Unit B.2 "Biodiversity" and Unit B.3 "Nature"), is to bring together the European Commission, Member States' representatives and various stakeholders (mainly NGOs) as well as the European Environment Agency. It aims at fostering an exchange views and coordinate issues related to the implementation of the Nature Directives (Birds Directive and Habitats Directive) and the EU 2020 Biodiversity Strategy in particular the targets and actions therein. This Group also reports to Nature Directors as appropriate.<br>Main Task: Assist the Commission in the preparation of legislation or in policy definition; Coordinate with Member States to exchange of views and Provide expertise to the Commission when preparing implementing measures.<br>*Committee on Invasive Alien Species:* The implementation of the Regulation is supported by a Committee made up of representatives of all Member States.<br>*Scientific Forum on Invasive Alien Species:* Furthermore, advice on scientific questions related to the implementation of the Regulation is provided through a Scientific Forum with representatives of the scientific community appointed by the Member States. |
| **Administrative body handling implementation in MS** |
| The implementation of the Regulation is supported by a Committee made up of representatives of all Member States. |
| **Main Objective** |
| This Regulation sets out rules to prevent, minimise and mitigate the adverse impact on biodiversity of the introduction and spread within the Union, both intentional and unintentional, of invasive alien species. |
| **Other objectives/Key concepts/key elements of the legislation** |
| The Regulation includes three distinct types of measures, which follow an internationally agreed hierarchical approach to combatting IAS: Prevention: a number of robust measures are foreseen to prevent new IAS from entering the EU in the first place, either intentionally or unintentionally; Early warning and rapid response: Member States must put in place an early warning system to detect the presence of IAS as early as possible and take rapid measures to prevent it from becoming established; and Management of already established invasive alien species: some IAS are already well established in the EU territory, concerted action is needed to manage them so that they do not spread any further and to minimise the harm they cause.<br>The new EU Regulation centres around the development of a list of invasive alien species of Union Concern. This will contain a sub-set of IAS that are deemed to be the 'worst offenders' amongst the 1,000-1,800 IAS present in Europe. This will enable EU action to focus on those IAS that cause |

the most damage and where targeted measures are clearly required at EU level. As this is a new policy area, a prioritised approach is especially important as it will enable the system to be developed gradually, giving the Commission and Member States the opportunity to learn from experience. Decisions to list a species as IAS of Union Concern will rely on evidence-based risk assessments. The assessments must be done according to agreed criteria so that the results are valid for the whole of the EU, and will therefore only need to be undertaken once.
A Standing Committee of experts nominated by the Member States and the Commission will then evaluate each risk assessment and decide on whether the species should be included in the list of EU Concern. Species on the list will be effectively banned, and Member States will be required to take measures to ensure they are not introduced, traded, kept, bred, or released in the EU

**Terminology**

*Alien species*: any live specimen of a species, subspecies or lower taxon of animals, plants, fungi or micro-organisms introduced outside its natural range; it includes any part, gametes, seeds, eggs or propagules of such species, as well as any hybrids, varieties or breeds that might survive and subsequently reproduce.
*Invasive alien species:* an alien species whose introduction or spread has been found to threaten or adversely impact upon biodiversity and related ecosystem services.
*Contained holding:* keeping an organism in closed facilities from which escape or spread is not possible.
*Ex-situ conservation:* the conservation of components of biological diversity outside their natural habitat.
*Population control:* any lethal or non-lethal action applied to a population of invasive alien species, while also minimising the impact on non-targeted species and their habitats, with the aim of keeping the number of individuals as low as possible, so that, while not being able to eradicate the species, its invasive capacity and adverse impact on biodiversity, the related ecosystem services, on human health or the economy, are minimised.
*Containment*: any action aimed at creating barriers which minimises the risk of a population of an invasive alien species dispersing and spreading beyond the invaded area.
*Management:* any lethal or non-lethal action aimed at the eradication, population control or containment of a population of an invasive alien species, while also minimising the impact on non-targeted species and their habitats.

**Derogations**

In pursuing the objectives of this Regulation, it is appropriate to take account of the specific situation of the outermost regions, and in particular their remoteness, insularity and the uniqueness of their respective biodiversities. Therefore, the requirements under this Regulation to take restrictive and preventive measures relating to invasive alien species of Union concern should be adapted to the specificities of the outermost regions, as defined by the Treaty on the Functioning of the European Union (TFEU), taking into account European Council Decisions 2010/718/EU (15) and 2012/419/EU (16).
Art. (Art.) 6 - Provisions for the Outermost Regions: 1. Invasive alien species of Union concern shall not be subject to Art. 7 or Art. 13 to 20 in the outermost regions; 2. By 2 January 2017, each Member State with outermost regions shall adopt for each of those regions a list of invasive alien species of concern, in consultation with those regions; 3. As regards the invasive alien species included on the lists referred to in paragraph 2 of this Article, Member States may, within the respective outermost regions, apply the measures as provided for in Art. 7 to 9, 13 to 17, 19 and 20, as appropriate. Those measures shall be compatible with the TFEU and be notified to the Commission in accordance with Union law; 4. Member States shall immediately notify the Commission and shall inform the other Member States of the lists referred to in paragraph 2 and of any update to those lists.

**Types of management measures**

Art. 19 – Management Measures: Within 18 months of an invasive alien species being included on the Union list, Member States shall have in place effective management measures for those invasive alien species of Union concern which the Member States have found to be widely spread on their territory, so that their impact on biodiversity, the related ecosystem services, and, where applicable, on human health or the economy are minimised. Those management measures shall be proportionate to the impact on the environment and appropriate to the specific circumstances of the Member States, be based on an analysis of costs and benefits and also include, as far as is feasible, the restoration measures referred to in Art. 20. They shall be prioritised based on the risk evaluation and their cost effectiveness. The management measures shall consist of lethal or non-lethal physical, chemical or biological actions aimed at the eradication, population control or containment of a population of an invasive alien species. Where appropriate, management measures shall include actions applied to the receiving ecosystem aimed at increasing its resilience to current and future invasions. The commercial use of already established invasive alien species may be temporarily allowed as part of the management measures aimed at their eradication, population control or containment, under strict justification and provided that all appropriate controls are in place to avoid any further spread. When applying management measures and selecting methods to be used, Member States shall have due regard to human health and the environment, especially non-targeted species and their habitats, and shall ensure that, when animals are targeted, they are spared any avoidable pain, distress or suffering, without compromising the effectiveness of the management measures. The surveillance system provided for in Art. 14 shall be designed and used to monitor the effectiveness of eradication, population control or containment measures in minimising the impact on biodiversity, the related ecosystems services and, where applicable, on human health or the economy. The monitoring shall also assess the impact on non-targeted species, as appropriate. Where there is a significant risk that an invasive alien species of Union concern will spread to another Member State, the Member States in which that species is present shall immediately notify the other Member States and the Commission. Where appropriate, the Member States concerned shall establish jointly agreed management measures. Where third countries may also be affected by the spread, the Member State affected shall endeavour to inform the third countries concerned.

**Spatial coverage**

This Regulation applies to all invasive alien species. This Regulation does not apply to: species changing their natural range without human intervention, in response to changing ecological conditions and climate change; genetically modified organisms as defined in point 2 of Art. 2 of Directive 2001/18/EC; pathogens that cause animal diseases; for the purpose of this Regulation, animal disease means the occurrence of infections and infestations in animals, caused by one or more pathogens transmissible to animals or to humans; harmful organisms listed in Annex I or Annex II to Directive 2000/29/EC, and harmful organisms for which measures have been adopted in accordance with Art. 16(3) of that Directive; species listed in Annex IV to Regulation (EC) No 708/2007 when used in aquaculture; micro-organisms manufactured or imported for use in plant protection products already authorised or for which an assessment is ongoing under Regulation (EC) No 1107/2009; or micro-organisms manufactured or imported for use in biocidal products already authorised or for which an assessment is ongoing under Regulation (EU) No 528/2012

**Reporting units – what are the specific transposition requirements**

Member State Level. Art. 13: 1. Member States shall, within 18 months of the adoption of the Union list carry out a comprehensive analysis of the pathways of unintentional introduction and spread of invasive alien species of Union concern at least in their territory, as well as in their marine waters as defined in point (1) of Art. 3 of Directive 2008/56/EC, and identify the pathways which require priority action ('priority pathways') because of the volume of species or of the

potential damage caused by the species entering the Union through those pathways. 2. Within three years of the adoption of the Union list, each Member State shall establish and implement one single action plan or a set of action plans to address the priority pathways it has identified pursuant to paragraph 1. Action plans shall include timetables for action and shall describe the measures to be adopted and, as appropriate, voluntary actions and codes of good practice, to address the priority pathways and to prevent the unintentional introduction and spread of invasive alien species into or within the Union. 3. Member States shall ensure coordination with the aim of establishing one single action plan or a set of action plans coordinated at the appropriate regional level in accordance with Art. 22(1). Where such regional action plans are not established, Member States shall establish and implement action plans for their territory and as far as possible coordinated at the appropriate regional level.

**Timelines**

*Art. 4: List of invasive alien species of Union concern:* The Commission shall adopt, by means of implementing acts, a list of invasive alien species of Union concern ('the Union list'), on the basis of the criteria laid down in paragraph 3 of this Article. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Art. 27(2). The draft implementing acts shall be submitted to the Committee referred to in Art. 27(1) by 2 January 2016. The Commission shall undertake a comprehensive review of the Union list at least every six years and shall, in the meantime, update it, as appropriate

*Art. 6: Provisions for the outermost regions:* By 2 January 2017, each Member State with outermost regions shall adopt for each of those regions a list of invasive alien species of concern, in consultation with those regions.

*Art. 13: Action plans on surveillance:* Member States shall, within 18 months of the adoption of the Union list carry out a comprehensive analysis of the pathways of unintentional introduction and spread of invasive alien species of Union concern at least in their territory, as well as in their marine waters as defined in point (1) of Art. 3 of Directive 2008/56/EC, and identify the pathways which require priority action ('priority pathways') because of the volume of species or of the potential damage caused by the species entering the Union through those pathways. Within three years of the adoption of the Union list, each Member State shall establish and implement one single action plan or a set of action plans to address the priority pathways it has identified pursuant to paragraph 1. Action plans shall include timetables for action and shall describe the measures to be adopted and, as appropriate, voluntary actions and codes of good practice, to address the priority pathways and to prevent the unintentional introduction and spread of invasive alien species into or within the Union.

*Art. 14: Surveillance System:* Within 18 months of the adoption of the Union list, Member States shall establish a surveillance system of invasive alien species of Union concern, or include it in their existing system, which collects and records data on the occurrence in the environment of invasive alien species by survey, monitoring or other procedures to prevent the spread of invasive alien species into or within the Union.

*Art. 15: Official Controls:* By 2 January 2016, Member States shall have in place fully functioning structures to carry out the official controls necessary to prevent the intentional introduction into the Union of invasive alien species of Union concern. Those official controls shall apply to the categories of goods falling within the Combined Nomenclature codes to which a reference is made in the Union list, pursuant to Art. 4(5).

*Art. 24: Reporting and Review:* By 1 June 2019, and every six years thereafter, Member States shall update and transmit to the Commission the following: a description, or an updated version thereof, of the surveillance system pursuant to Art. 14 and of the official control system on alien species entering the Union pursuant to Art. 15; the distribution of the invasive alien species of Union concern or regional concern in accordance with Art. 11(2) present in their territory,

including information regarding migratory or reproductive patterns; information about the species considered as invasive alien species of Member State concern pursuant to Art. 12(2); the action plans referred to in Art. 13(2); aggregated information covering the entire national territory on the eradication measures taken in accordance with Art. 17, the management measures undertaken in accordance with Art. 19, their effectiveness, and their impact on non-targeted species; the number of the permits referred to in Art. 8 and the purpose for which they were issued; measures taken to inform the public about the presence of an invasive alien species and any actions that citizens have been requested to take; the inspections required under Art. 8(8); and information on the cost of action undertaken to comply with this Regulation, when available.

By 5 November 2015, Member States shall notify the Commission and inform the other Member States of the competent authorities in charge of applying this Regulation. By 1 June 2021, the Commission shall review the application of this Regulation including the Union list, the action plans referred to in Art. 13(2), the surveillance system, customs controls, eradication obligation and management obligations, and submit a report to the European Parliament and to the Council, which may be accompanied by legislative proposals for the amendment of this Regulation, including changes to the Union list. That review shall also examine the effectiveness of the implementing provisions on invasive alien species of regional concern, the need for and the feasibility of, including species native to the Union in the Union list and whether further harmonisation is needed to increase the effectiveness of the action plans and measures undertaken by the Member States. The Commission shall, by means of implementing acts, specify the technical formats for reporting in order to simplify and streamline reporting obligations for the Member States in relation to the information pursuant to paragraph 1 of this Article. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Art. 27(2).

**Integration/coordination issues with other related pieces of legislation**

Link with CBD: The Union, as a party to the Convention on Biological Diversity, approved by Council Decision 93/626/EEC , is bound by Art. 8(h) of that Convention, according to which the Parties shall, as far as possible and as appropriate, 'prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species'.

This regulation supports the achievement of the objectives of Directives 2000/60/EC, 2008/56/EC and 2009/147/EC of the European Parliament and of the Council and Council Directive 92/43/EEC, by preventing, minimising and mitigating the adverse effects of invasive alien species on biodiversity and related ecosystem services, and on human health and safety as well as to reduce their social and economic impact. See here an overview of socio-economic and environmental impacts of IAS.

**Coordination issues with the EU Biodiversity Strategy**

This regulation impacts the implementation of the entire Biodiversity Strategy – IAS are a major threat to Europe's biodiversity and can cause the local extinction of indigenous species, for instance through competition for limited resources such as food and habitats, inter-breeding, or the spread of exotic diseases. The impact of IAS may sometimes be so profound that they can alter the structure and functioning of entire ecosystems, compromising their ability to provide valuable ecosystem services, such as pollination, water regulation or flood control.

The IAS regulation obviously relates to Target 5 (Combat IAS) and also links to Target 2 (Maintaining and restoring ecosystems and their services), Target 4 (Ensuring the sustainable use of fisheries resources and ensuring good environmental status of the marine environment), and Target 6 (Avert global biodiversity loss).

**Relevance to ecosystems/habitats?**

*Ecosystems/habitats addressed explicitly by the legal act/policy:* This Regulation applies to all invasive alien species and therefore implicitly addresses all ecosystems and habitats.

*Ecosystems affected by relevant policies: All* ecosystems are implicitly impacted.
*Links to Aquatic Biodiversity and Ecosystem Services:* Yes, the IAS regulation aims to prevent, minimise and mitigating the adverse effects of invasive alien species on biodiversity and related ecosystem services, and on human health and safety as well as to reduce their social and economic impact. See here an overview of socio-economic and environmental impacts of IAS.

**Drivers**

*Drivers addressed in legal text :* Invasive Alien Species enter the EU in a wide variety of ways. Some are introduced intentionally for use in farming, forestry, aquaculture, horticulture or for recreational purposes, or even as pets and garden plants or as biocontrol agents (e.g. Asian ladybirds). Others came into the EU unintentionally, either as contaminants of other commodities (e.g. ragweed seeds in bird feed mixtures) or as 'hitchhikers' and 'stowaways' on board vessels or equipment). The pathways of release in the environment vary considerably according to the species group and the surrounding environment. Alien plant species mostly escape from cultivation (e.g. gardens, farms) whereas freshwater alien species are often intentionally released for aquaculture or recreational angling. In the marine environment, most alien species come into Europe as unintentional stowaways.
*Indicators:* See report Invasive alien species indicators in Europe. To support the 'Streamlining European 2010 Biodiversity Indicators' (SEBI 2010) process, the European Environment Agency (EEA) commissioned a study to revisit and further develop the indicator 'Invasive alien species in Europe'. The aim of the current project is to critically review and improve this indicator, and propose an updated methodology. Further, options for methodologies of new indicators, which monitor IAS over time across Europe, will be discussed. Particular attention is given to closely linking the indicator(s) to recent biodiversity policy goals and developments.

**Pressures**

*Definition Pressures*: No definition of pressures found.
*Pressures addressed:* Human drivers (i.e. farming, forestry, aquaculture, horticulture) can cause the spread of IAS which can result in the local extinction of indigenous species, for instance through competition for limited resources such as food and habitats, inter-breeding, or the spread of exotic diseases. They can also alter the structure and functioning of entire ecosystems, compromising their ability to provide valuable ecosystem services, such as pollination, water regulation or flood control.
*Indicators:* See above section on Drivers.

**Assessment of Environmental State**

Legislation still in early stages - in the process towards implementation

**Assessment of Status**

Legislation still in early stages - in the process towards implementation

**Data**

The European Alien Species Information Network (EASIN) is an online platform that aims to facilitate the exploration of existing information on alien species from distributed sources. Preparatory study, August 2015 - In order to support the prioritisation of invasive alien species for future risk assessments, a horizon scanning methodology for the Europe was developed and implemented. The outcome was a list of 95 species, including all taxa (except microorganisms) within marine, terrestrial and freshwater environments, considered as very high or high priority for risk assessment. The results presented in its report cannot be in any way regarded as the list that the Commission will be proposing, nor to represent the opinion of the Commission.

**Funding**

A number of EU funds can be used to assist Member States in eradicating or managing IAS on their territory, including the Rural Development Programme, INTERREG and the EU LIFE fund. The EU's LIFE-Nature Fund has supported over 180 projects to-date to assist tackling IAS in Natura

2000 sites, at a cost of some €44 million.

# 3.4 Convention on Biological Diversity

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Reviewer: Manuel Lago, Ecologic Institute

## Convention on Biological Diversity

**Name/Type of the Legal Act or Policy**

CBD, Convention on Biological Diversity

Supplementary agreements:

*Cartagena Protocol*: On 29 January 2000, the Conference of the Parties to the Convention on Biological Diversity adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety. The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. It establishes an advance informed agreement (AIA) procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of such organisms into their territory. The Protocol contains reference to a precautionary approach and reaffirms the precaution language in Principle 15 of the Rio Declaration on Environment and Development. The Protocol also establishes a Biosafety Clearing-House to facilitate the exchange of information on living modified organisms and to assist countries in the implementation of the Protocol.

*Nagoya Protocol:* The *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity* is a supplementary agreement to the Convention on Biological Diversity. It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The Nagoya Protocol on ABS was adopted on 29 October 2010 in Nagoya, Japan and entered into force on 12 October 2014, 90 days after the deposit of the fiftieth instrument of ratification. Its objective is the fair and equitable sharing of benefits arising from the utilization of genetic resources, thereby contributing to the conservation and sustainable use of biodiversity. In decision X/2, the tenth meeting of the Conference of the Parties, held from 18 to 29 October 2010, in Nagoya, Aichi Prefecture, Japan, adopted a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period. This plan provides an overarching framework on biodiversity, not only for the biodiversity-related conventions, but for the entire United Nations system and all other partners engaged in biodiversity management and policy development.

**Entry into force**

The Convention on Biological Diversity (CBD) entered into force on 29 December 1993

**Departments/Units in charge**

The Convention on Biological Diversity provides a global legal framework for action on biodiversity. It brings together the Parties in the Conference of the Parties (COP) which is the Convention's governing body that meets every two years, or as needed, to review progress in the implementation of the Convention, to adopt programmes of work, to achieve its objectives, and provide policy guidance. The COP is assisted by the Subsidiary Body on Scientific, Technical, and Technological Advice (SBSTTA), which is made up of government representatives with expertise in relevant fields, as well as observers from non-Party governments, the scientific community, and other relevant organizations. SBSTTA is responsible for providing recommendations to the COP on the technical aspects of the implementation of the Convention.

Other subsidiary bodies have been established by the COP to deal with specific issues as they arise. These are called "ad hoc open-ended Working Groups" because they are established for a limited mandate and period of time, and because they are open to all Parties as well as the participation of observers. Working Groups make recommendations to the COP, and, as is the case for the Working Group on Access and Benefit-Sharing, may also provide a forum for negotiations of a particular instrument under the Convention. The COP and SBSTTA may also establish expert groups or call for the organization by the Secretariat of liaison groups, workshops, and other meetings. Participants in these meetings are usually experts nominated by governments, as well as representatives of international organizations, local and indigenous communities and other bodies. Unlike SBSTTA and the open-ended Working Groups these are usually not considered as intergovernmental meetings. The purpose of these meetings vary: Expert groups may provide scientific assessments, for example, while workshops may be used for training or capacity building. Liaison groups advise the secretariat or act as for cooperation with other conventions and organizations.

**Common Implementation strategy (CIS processes)**

The EU Biodiversity Strategy to 2020 follows up on the 2006 EU Biodiversity Action Plan and is the European Union's equivalent to a National Biodiversity Strategy and Action Plan (NBSAP) – and among the first ones to be fully aligned with the global Strategic Plan for Biodiversity 2011-2020. Apart from this EU Biodiversity Strategy, nearly all EU Member States have revised their own NBSAPs. As presented in their respective country profiles, EU Member States' NBSAPs further add to the implementation of the CBD and related multilateral agreements in individual countries through a wide range of national and sub-national policies and measures.

The EU Biodiversity Strategy to 2020 underlines the need for close coordination between authorities at all levels – EU, national, sub-national – which are responsible for ensuring implementation of the Strategy, as well as the importance of stakeholders' involvement in implementation (including business and society at large). To this end, the Strategy is accompanied by a common implementation framework (CIF), which also serves the purposes of monitoring, assessing and reporting on progress in implementing the Strategy. The CIF involves the European Commission and Member States in partnership with key stakeholders and civil society. Specifically, its purpose is to (i) facilitate implementation of the EU Biodiversity Strategy to 2020 by putting in place a clear and logical EU level governance framework that is as efficient and effective as possible; (ii) create ownership for the implementation of the Biodiversity Strategy across all relevant policy areas by involving representatives from a wide range of services, ministries and institutions in implementation of the Strategy; (iii) ensure the involvement of all relevant stakeholders at the appropriate level of policy making, beyond the traditional "biodiversity community"; and (iv) to minimise duplication of work and maximise synergies between efforts undertaken at different levels and by different actors and stakeholders; share information and best practice and address common challenges.

**Administrative body handling implementation in MS**

National Biodiversity Strategies and Action Plans (NBSAPs) are the principal instruments for implementing the Convention at the national level (Art. 6). The Convention requires countries to prepare a national biodiversity strategy (or equivalent instrument) and to ensure that this strategy is mainstreamed into the planning and activities of all those sectors whose activities can have an impact (positive and negative) on biodiversity. To date, a total of 184 of 196 (94%) Parties have developed NBSAPs in line with Art. 6. Submitted NBSAPs can be found here.

*Belgium:* In November 2013, Belgium's Interministerial Conference for the Environment adopted an update of the National Biodiversity Strategy to 2020. Based largely on the previous Strategy (2006-2016), the update incorporates provisions aligned with the Strategic Plan for Biodiversity (2011-2020) and the EU Biodiversity Strategy to 2020. It will guide activities for revising federal

and regional biodiversity action plans and be promoted in sectoral policy-making. Its main focuses are: a) tackling emerging risks and the impact of internal trade of live specimens; b) protecting and restoring biodiversity and associated ecosystem services through protected areas - green infrastructure - no net loss; identifying pathways of introduction on IAS; c) phasing out perverse incentives and using guidelines on the integration of the values of biodiversity and ecosystem services in development strategies, planning processes and reporting systems included; developing an approach to include these values in national accounting; d) implementing the Nagoya Protocol; e) mapping ecosystem services in Belgium and assessing their values; f) ensuring the implementation and enforcement of biodiversity legislation; g) involving provinces, cities and other local authorities; h) boosting the mobilization of resources (including through innovative mechanisms) and enhancing capacities. The Strategy contains 15 priority strategic objectives and 85 operational objectives that have been mapped to the Aichi Biodiversity Targets and to the targets of the EU Biodiversity Strategy. Specific actions and indicators for the Strategy will be developed at a later stage (during the implementation process).

*Spain:* The Spanish "Plan Estratégico del Patrimonio Natural y la Biodiversidad 2011-2017", adopted through Royal Decree 1274 on 16 September 2011, constitutes a fundamental element in support of the 2007 Law on Natural Heritage and Biodiversity. The plan considers themes derived from the Strategic Plan for Biodiversity 2011-2020 and the 2011 EU Strategy, and was subjected to Strategic Environmental Assessment in accordance with the provisions of the 2006 law on assessment of the effects of environmental plans and programmes.

*United Kingdom:* While ultimate responsibility for CBD implementation lies with the Department for Environment, Food and Rural Affairs (DEFRA) of the UK Government, it is shared among the UK's 4 countries (England, Northern Ireland, Scotland, and Wales) and its Overseas Territories and Crown Dependencies. In view of this, individual Country Biodiversity Strategies have been developed, as have a number of strategies for the Overseas Territories and Crown Dependencies. To date, England and Scotland have completed revisions of their strategies in the light of the 2010 Nagoya outcomes. A UK-wide post-2010 biodiversity framework has also been developed.

*England* - "Biodiversity 2020: A strategy for England's wildlife and ecosystem services" outlines the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea, building upon the Natural Environment White Paper published in June 2011. The strategy stresses the provision of support for healthy well-functioning ecosystems and the establishment of coherent ecological networks. A set of outcomes for 2020 has been defined, including the establishment of a network of marine protected areas containing in excess of 25% of English waters by the end of 2016. The strategy aims to ensure that biodiversity values are considered in the decision- making processes of both the public and private sectors. The government also intends to develop new and innovative financing mechanisms for achieving the 2020 outcomes.

*Scotland* - "2020 Challenge for Scotland's Biodiversity" published in 2013 is Scotland's response to implementing the Nagoya outcomes and the EU Biodiversity Strategy to 2020. It aims to protect and restore biodiversity on land and in Scotland's seas, and support healthier ecosystems; connect people with the natural world, for their health and wellbeing and to involve them more in decisions about their environment; maximise the benefits for Scotland of a diverse natural environment and the services it provides, contributing to sustainable economic growth.

*France:* The revised National Biodiversity Strategy (2011-2020) is coherent with various existing national strategies and action plans. The strategy attaches particular importance to increasing biodiversity information and education for all stakeholders; biodiversity mainstreaming in development projects (especially in overseas territories where exceptionally rich biodiversity has significant socioeconomic and cultural value for the local populations); as well as to biodiversity governance at all levels (global to local).

Reporting by Parties: Parties will inform the Conference of the Parties of the national targets or commitments and policy instruments they adopt to implement the Strategic Plan, as well as any milestones towards these targets, and report on progress towards these targets and milestones, including through their fifth and sixth national reports. Suggested milestones, as well as suggested indicators, are to be developed in accordance with the processes laid out in paragraphs 3 (b), (e) and 17 (g) of decision X/2 on the Strategic Plan as well as decision X/7 on goals, targets and associated indicators. Parliamentarians, by responding to the needs and expectations of citizens on a regular basis, should play a role in reviewing the implementation of the Convention at the national and subnational levels, as appropriate, to help Governments produce a more comprehensive review.

Review by the Conference of the Parties: The Conference of the Parties, with the support of other Convention bodies, in particular the Ad Hoc Open-ended Working Group on Review of Implementation of the Convention, will keep under review implementation of this Strategic Plan, and support effective implementation by Parties ensuring that new guidance is informed by the experience of Parties in implementing the Convention, in line with the principle of adaptive management through active learning. The Conference of the Parties will review the progress towards the Aichi Biodiversity Targets[13] as set out in the Strategic Plan and make recommendations to overcome any obstacles encountered in meeting those targets, including revision of the provisional technical rationale, possible indicators and suggested milestones for the Aichi Biodiversity Targets and measures contained therein, and, as appropriate, to strengthen the mechanisms to support implementation, monitoring and review. To facilitate this work, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) should develop a common set of biodiversity metrics to be used to assess the status of biodiversity and its values.

Increasingly, Subnational Biodiversity Strategies and Action Plans (SBSAPs) are being developed at state/provincial/territorial, local and cities levels. Greater attention is also being given to the development of Regional (supranational) Biodiversity Strategies and Action Plans (RBSAPs). Decentralized planning serves as an effective support mechanism for implementing COP-10 decision X/2 and decision X/22 on, respectively, the Strategic Plan for Biodiversity (2011-2020) and the Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity (2011-2020). SBSAPs prepared by countries at subnational, local and cities levels, as well as information on activities being undertaken in this regard, are provided below where available.

**Main Objective**

*Art. 1:* The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

**Principles included in the legal text**

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

The Cartagena Protocol contains reference to a precautionary approach and reaffirms the precaution language in Principle 15 of the Rio Declaration on Environment and Development.

**Other objectives/Key concepts/key elements of the legislation**

In decision X/2, the tenth meeting of the Conference of the Parties, held from 18 to 29 October

2010, in Nagoya, Aichi Prefecture, Japan, adopted a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period. This plan provides an overarching framework on biodiversity, not only for the biodiversity-related conventions, but for the entire United Nations system and all other partners engaged in biodiversity management and policy development. Parties agreed to translate this overarching international framework into revised and updated national biodiversity strategies and action plans within two years. Additionally, in decision X/10, the Conference of the Parties decided that the fifth national reports, due by 31 March 2014, should focus on the implementation of the 2011-2020 Strategic Plan and progress achieved towards the Aichi Biodiversity Targets.

**Terminology**

*Biological resources*: includes genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

*Biotechnology*: any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.

*Domesticated or cultivated species:* means species in which the evolutionary process has been influenced by humans to meet their needs.

*Ecosystem*: a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

*Ex-situ conservation*: the conservation of components of biological diversity outside their natural habitats.

*In-situ conditions:* conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

*In-situ conservation:* means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

*Sustainable use:* the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

**Derogations**

*Denmark:* the Kingdom of Denmark became a State Party to the CBD by ratification (1993). The Convention applies fully to Greenland, an autonomous entity within the Kingdom and one of the EU's OCTs.

*France:* France became a State Party to the CBD by ratification (1994) and the Convention applies to all its overseas entities, some being ORs and others OCTs of the EU.

*Netherlands:* the Kingdom of the Netherlands became a State Party to the CBD, on behalf of the Netherlands, by acceptance (1994). The Convention came into force in Aruba and the Netherlands Antilles in June 1999.

*Portugal:* the Azores and Madeira are autonomous regions of Portugal and ORs of the EU, where the CBD fully applies by virtue of Portugal's ratification of the Convention (1993).

*Spain:* the Canary Islands constitute an autonomous region of Spain and an OR of the EU, where the CBD fully applies by virtue of Spain's ratification of the Convention (1993).

*United Kingdom:* the United Kingdom of Great Britain and Northern Ireland signed the Convention (1992) on behalf of the Kingdom, including its Overseas Territories, but only three (the BVI, the Cayman Islands, and Saint Helena, Tristan da Cunha and Ascension Island) were included, at their request, in the UK's ratification of the Convention (1994). Some other territories are interested in becoming part of the UK's ratification, but the process for doing so is unclear.

**Types of management measures**

The thematic programmes of work of the Convention include: biodiversity of inland waters, marine and coastal biodiversity, agricultural biodiversity, forest biodiversity, biodiversity of dry and sub-humid lands, mountain biodiversity and island biodiversity. Together with the various cross-cutting issues they provide detailed guidance on implementation of the Strategic Plan. They are key tools to be considered in the updating of national biodiversity strategies and action plans.

Inland Waters Biodiversity

*CBD Tools and Guidelines*

CBD Technical Series No. 22 /Ramsar Technical Report No. 1: Guidelines for the Rapid Ecological Assessment of Biodiversity in Inland Water, Coastal and Marine Areas

CBD Technical Series No. 27 /Ramsar Technical Report No. 3: Valuing wetlands - Guidance for Valuing the Benefits Derived from Wetland Ecosystem Services

*Other Tools and Guidelines*

Much of the technical tools and guidance relevant to the programme of work is produced in partnership with the Ramsar Convention and may be found on their website.

Integrated Water Resources Management Toolbox (produced by the Global Water Partnership) -In the IWRM ToolBox, you will find a collection of good practices for managing water resources at all levels. The ToolBox is a free and open database with a library of case studies and references that can be used by anyone who is interested in implementing better approaches for the management of water or learning more about improving water management on a local, national, regional or global level. The ToolBox is also an excellent tool for you to engage with a broader community of interested professionals around the world and to share your experiences.

Educational Opportunities in Water Management The UNESCO-IHE Institute for Water Education has a diversity of flexible arrangements to improve your knowledge and skills in water management. They offer full time programmes in Delft, the Netherlands, such as a 4-year PhD programme and an 18-month Water Management Master of Science Programme, as well as short courses of 3 to 4 weeks. They also offer part-time programmes in the form of 16-week on-line courses and upon request are able to offer tailor-made training sessions to groups.

The Swedish University of Agricultural Sciences offers a two-year masters programme focusing on Integrated Water Resource Management (IWRM), which seeks to combine technologies, institutional strategies and processes needed for facilitation of sustainable management of watersheds, basins, rivers and coastal waters in the face of conflicting interests. The aim of the programme is to prepare students for the challenge of IWRM by providing training in managing complex stakeholder, inter-sectoral and transboundary processes. Please click here for further information on the masters programme. To learn about the Network for Integrated Transboundary Water Research of the Swedish University of Agricultural Sciences, please click here.

Marine and Coastal Biodiversity

*Programme of Work*

The elaborated programme of work, as contained in the annex to decision VII/5, aims to assist the implementation of the Jakarta Mandate at the national, regional and global level. It identifies key operational objectives and priority activities within the five key programme elements, namely: implementation of integrated marine and coastal area management, marine and coastal living resources, marine and coastal protected areas, mariculture, and alien species and genotypes. It also provides a general element to encompass the coordinating role of the Secretariat, the collaborative linkages required and the effective use of experts, as well as an element on enabling activities.

The ecosystem approach, precautionary principle, the importance of science, making full use of the roster of experts, the involvement of local and indigenous communities and three levels of programme implementation (national, regional and global) were identified by the Parties as the basic principles for the implementation of the programme of work. The primary basis for this

programme of work is action at national and local levels. The Parties should, in accordance with Art. 6 of the Convention, develop national strategies, plans and programmes in order to promote the conservation and sustainable use of marine and coastal biological diversity.
At the regional level, organizations, arrangements and bodies should be invited to coordinate activities relevant to the programme of work.
At the global level, the United Nations Environment Programme (UNEP) (including the Global International Water Assessment), the Food and Agriculture Organization of the United Nations (FAO), the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC/UNESCO), the International Maritime Organization (IMO), the United Nations and other relevant bodies should be encouraged to implement the programme of work. These organizations should be invited to inform the CBD on their efforts to implement the Convention.
General management measures: Achieving a positive outcome requires actions at multiple entry points, which are reflected in the goals of this Strategic Plan. These include: (a) Initiating action to address the underlying causes of biodiversity loss, including production and consumption patterns, by ensuring that biodiversity concerns are mainstreamed throughout government and society, through communication, education and awareness, appropriate incentive measures, and institutional change; (b) Taking action now to decrease the direct pressures on biodiversity. Engagement of the agricultural, forest, fisheries, tourism, energy and other sectors will be essential to success. Where trade-offs between biodiversity protection and other social objectives exist, they can often be minimized by using approaches such as spatial planning and efficiency measures. Where multiple pressures are threatening vital ecosystems and their services, urgent action is needed to decrease those pressures most amenable to short-term relief, such as over-exploitation or pollution, so as to prevent more intractable pressures, in particular climate change, from pushing the system "over the edge" to a degraded state; (c) Continuing direct action to safeguard and, where necessary, restore biodiversity and ecosystem services. While longer-term actions to reduce the underlying causes of biodiversity are taking effect, immediate action can help conserve biodiversity, including in critical ecosystems, by means of protected areas, habitat restoration, species recovery programmes and other targeted conservation interventions; (d) Efforts to ensure the continued provision of ecosystem services and to ensure access to these services, especially for the poor who most directly depend on them. Maintenance and restoration of ecosystems generally provide cost-effective ways to address climate change. Therefore, although climate change is an additional major threat to biodiversity, addressing this threat opens up a number of opportunities for biodiversity conservation and sustainable use; (e) Enhanced support mechanisms for: capacity-building; the generation, use and sharing of knowledge; and access to the necessary financial and other resources. National planning processes need to become more effective in mainstreaming biodiversity and in highlighting its relevance for social and economic agendas. Convention bodies need to become more effective in reviewing implementation and providing support and guidance to Parties.

**Spatial coverage**

Global - The CBD incorporates the vast majority of the world's governments and sets out commitments for maintaining the world's ecological underpinnings as we go about the business of economic development.

**Reporting units - what are the specific transposition requirements**

Reporting is carried out on national level: The Convention requires countries to prepare a national biodiversity strategy (or equivalent instrument) and to ensure that this strategy is mainstreamed into the planning and activities of all those sectors whose activities can have an impact (positive and negative) on biodiversity.
*Strategic Plan for Biodiversity 2011-2020:18.* Reporting by Parties: Parties will inform the

Conference of the Parties of the national targets or commitments and policy instruments they adopt to implement the Strategic Plan, as well as any milestones towards these targets, and report on progress towards these targets and milestones, including through their fifth and sixth national reports. Suggested milestones, as well as suggested indicators, are to be developed in accordance with the processes laid out in paragraphs 3 (b), (e) and 17 (g) of decision X/2 on the Strategic Plan as well as decision X/7 on goals, targets and associated indicators. Parliamentarians, by responding to the needs and expectations of citizens on a regular basis, should play a role in reviewing the implementation of the Convention at the national and subnational levels, as appropriate, to help Governments produce a more comprehensive review.

*19.* Review by the Conference of the Parties: The Conference of the Parties, with the support of other Convention bodies, in particular the Ad Hoc Open-ended Working Group on Review of Implementation of the Convention, will keep under review implementation of this Strategic Plan, and support effective implementation by Parties ensuring that new guidance is informed by the experience of Parties in implementing the Convention, in line with the principle of adaptive management through active learning. The Conference of the Parties will review the progress towards the Aichi Biodiversity Targets[13] as set out in the Strategic Plan and make recommendations to overcome any obstacles encountered in meeting those targets, including revision of the provisional technical rationale, possible indicators and suggested milestones for the Aichi Biodiversity Targets and measures contained therein, and, as appropriate, to strengthen the mechanisms to support implementation, monitoring and review. To facilitate this work, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) should develop a common set of biodiversity metrics to be used to assess the status of biodiversity and its values.

Increasingly, Subnational Biodiversity Strategies and Action Plans (SBSAPs) are being developed at state/provincial/territorial, local and cities levels. Greater attention is also being given to the development of Regional (supranational) Biodiversity Strategies and Action Plans (RBSAPs). Decentralized planning serves as an effective support mechanism for implementing COP-10 decision X/2 and decision X/22 on, respectively, the Strategic Plan for Biodiversity (2011-2020) and the Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity (2011-2020).

**Timelines**

Strategic Plan for Biodiversity: In decision X/2, the tenth meeting of the Conference of the Parties, held from 18 to 29 October 2010, in Nagoya, Aichi Prefecture, Japan, adopted a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period. This plan provides an overarching framework on biodiversity, not only for the biodiversity-related conventions, but for the entire United Nations system and all other partners engaged in biodiversity management and policy development. Parties agreed to translate this overarching international framework into revised and updated national biodiversity strategies and action plans within two years. Additionally, in decision X/10, the Conference of the Parties decided that the fifth national reports, due by 31 March 2014, should focus on the implementation of the 2011-2020 Strategic Plan and progress achieved towards the Aichi Biodiversity Targets.

**Integration/coordination issues with other related pieces of legislation**

The EU is strongly committed to further strengthening the CBD as the key international instrument for achieving global biodiversity targets and to making sure that it is effectively implemented. The EU Biodiversity Strategy outlines how the CBD's Strategic Plan for Biodiversity is implemented by the EU. The Strategy, 'Our life insurance, our natural capital: an EU biodiversity strategy to 2020' (COM 2011/244 final, adopted in May 2011) lays down the framework for EU action during this decade, in order to meet the commitments made by EU leaders in March 2010. The Strategy is also the European Union's means of implementing the CBD Strategic Plan for Biodiversity into EU policies and actions, a 'National Biodiversity Strategy and Action Plan' (NBSAP) in the CBD

terminology. In addition to the EU Biodiversity Strategy, nearly all EU Member States have also developed their own NBSAPs, further adding to the implementation of the CBD and related international agreements at national level through a wide range of national and sub-national policies and measures. The EU Biodiversity Strategy to 2020 is built around six mutually supportive targets which address the main drivers of biodiversity loss and aim to reduce the key pressures on nature and ecosystem services in the EU. Each target is further translated into a set of time-bound actions and other accompanying measures. Target 6 addresses the EU's contribution to global biodiversity conservation, which requires concerted international action. The actions foreseen in the Strategy aim not only to ensure the EU fulfils the commitments it made in the CBD and in other international fora, but also, as the world's biggest trading bloc, to reduce its own biodiversity footprint in the rest of the world and assist developing countries in their efforts to conserve biodiversity and ensure its sustainable use. Actions foreseen in this context will in particular aim to reduce the biodiversity impacts of EU consumption patterns; enhance the contribution of trade policy to conserving biodiversity, whilst eliminating as far as possible any negative impacts of EU trade agreements; 'biodiversity-proof' EU development cooperation programmes and projects in order to minimise their negative impacts on biodiversity; provide the right market signals for biodiversity conservation, including work to reform, phase out and eliminate harmful subsidies at both EU and Member State level and to provide positive incentives for biodiversity conservation and sustainable use. In addition, the EU will aim to mobilise additional resources for global biodiversity conservation from all possible sources, and has recently proposed legislation to implement the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation so that the EU can ratify the Protocol as soon as possible.

**Coordination issues with the EU Biodiversity Strategy**

The CDB has direct implications for all parts of the EU biodiversity strategy. See EU biodiversity targets and their link to CBD Aichi targets.

**Relevance to ecosystems/habitats?**

The CBD implicitly relates to all ecosystems and habitats. The Strategic Plan includes 20 headline targets for 2015 or 2020 (the "Aichi Biodiversity Targets"), organized under five strategic goals. Several of these make direct, explicit reference to aquatic ecosystems. Strategic goal B. Reduce the direct pressures on biodiversity and promote sustainable use:

***Target 6:*** By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

***Target 10:*** By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Strategic goal C. Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity use:

***Target 11:*** By 2020, at least 17% of terrestrial and inland water areas, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

**Drivers**

Among the main pressures and drivers causing biodiversity loss are habitat fragmentation, degradation and destruction due to land-use change. Natural grasslands are still being turned

into arable land and built-up areas, and extensive agricultural land is being converted into forms of more intensive agriculture and parts into forest. Intensive agricultural production systems and land abandonment are a major concern, as 70% of species are threatened by the loss of their habitat. Fragmentation due to urban sprawl and infrastructure development — nearly 30% of EU land show signs of moderately high to very high fragmentation — severely affects ecosystem connectivity and their health and ability to provide services. Further, 30% of species are threatened by overexploitation of forests, oceans, rivers, lakes and soils — for instance: 88% of stocks are being fished beyond maximum sustainable yields, which mean that stocks may not be replenished. Also, 26% of species are threatened by pollution in the form of pesticides, and fertilisers like nitrates and phosphates. In particular, half of the geographical range of natural and semi-natural habitats across the European Union was exposed to atmospheric nitrogen deposits above the critical load in 2004. Increasing threats to biodiversity are invasive alien species — about 12,000 alien species have been found in the environment, 10-15% of them becoming invasive, and their number is steadily rising, in particular in marine and estuarine systems, threatening 22% of species — and climate change, with already recorded negative impacts on, for example, a majority of bird species.

**Pressures**

*See above*

**Assessment of Environmental State**

Difficult to differentiate between status and state in convention. See below

**Assessment of Status**

The fifth national reports, which were due in 2014, have a particular focus on assessing progress made towards the implementation of the Strategic Plan for Biodiversity. They provide information on the status and trends of biodiversity in each country as well as activities underway and planned, including case studies. Many Parties provide a self-assessment of progress towards the Aichi Targets (see Part III of GBO-4). For countries that have not yet updated their NBSAPs, the national reports provide important information on national targets and commitments under development. National reports are available here.

*Indicators:* The Ad Hoc Technical Expert Group on Indicators for the Strategic Plan for Biodiversity 2011-2020 identified three categories of operational indicators. Indicators which are ready for use at the global level are denoted by the letter (A). Indicators which could be used at the global level but which require further development to be ready for use are denoted by the letter (B). Additional indicators for consideration for use at the national or other sub-global level are denoted by the letter (C) and given in italics. The set of (A) and (B) indicators are those which should be used to assess progress at the global level, while the (C) indicators are illustrative of some of the additional indicators available to Parties to use at the national level, according to their national priorities and circumstances

**Data**

National reports are periodic reports provided by Parties to the Convention on Biological Diversity. These reports address a number of issues including the status and trends of biodiversity at the national level, the implementation of national biodiversity strategies and action plans, the mainstreaming of biodiversity, as well as the successes and challenges encountered. The fifth national reports, which were due in 2014, have a particular focus on assessing progress made towards the implementation of the Strategic Plan for Biodiversity. They provide information on the status and trends of biodiversity in each country as well as activities underway and planned, including case studies. Many Parties provide a self-assessment of progress towards the Aichi Targets (see Part III of GBO-4). For countries that have not yet updated their NBSAPs, the national reports provide important information on national targets and commitments under development. National reports are available here.

The second meeting of the Conference of the Parties called for the preparation of a periodic report on biological diversity: the Global Biodiversity Outlook (GBO). It suggested that the GBO should provide a summary of the status of biological diversity and an analysis of the steps being taken by the global community to ensure that biodiversity is conserved and used sustainably, and that benefits arising from the use of genetic resources are shared equitably. The fourth edition of the Global Biodiversity Outlook and its underlying technical reports draw upon several sources of information (i.e. National Biodiversity Action Plans, National Reports, Indicator-based extrapolations of recent and current trends to 2020 Model-based scenarios to 2050) to assess progress made towards CBD targets.

**Funding**

The most important single source of funding for biodiversity-related activities is the financial mechanism of the Convention, the Global Environment Facility (GEF). The GEF is a partnership for international cooperation, bringing 183 countries, international institutions, civil society organizations and the private sector together to address global environmental issues. Since 1991, the GEF has provided $12.5 billion in grants and leveraged $58 billion in co-financing for 3,690 projects in 165 developing countries. Developed and developing countries alike have provided these funds to support projects related to biodiversity, climate change, international waters, land degradation, and chemicals and waste.

*Other:* Darwin Initiative (UK); BioNET Events Bulletin-includes training workshops and conferences; Belgian Development Cooperation support to GTI projects; California Academy of Sciences-Various internship opportunities mostly directed at U.S. citizens; European Funding Sources-list of funding sources in the European GTI Toolkit; The Systematics Research Fund-supported by the councils of the Linnean Society and the Systematics Association.

**Other issues to be aware of relevant for AQUACROSS?**

This IUCN position paper provides views and recommendations on the urgent need to step up work to achieve the Strategic Plan for Biodiversity 2011-2020.

# 3.5 Water Framework Directive

Author: Verena Mattheiß, ACTeon

Reviewer: Eleftheria Kampa, Ecologic Institute

## Water Framework Directive

**Name/Type of the Legal Act or Policy**

WFD, Water Framework Directive, Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

Communications linked to the WFD:

- Commission communication to the European Parliament and the Council on the wise use and conservation of wetlands, which recognised the important functions they perform for the protection of water resources (29 May 1995)
- Commission communication to the European Parliament and the council on European Community water policy setting out the principles for a Community water policy (21 February 1996)
- The Blueprint Communication 2012: The blueprint to Safeguard Europe's Water resources, COM(2012)
- The Water Framework directive and the Floods Directive: Actions towards the 'good status' of EU water and to reduce flood risks, COM(2015)120

Daughter directives of the WFD following Art. 16 (Strategies against pollution of water) and Art. 17 (Strategies to prevent and control pollution of groundwater): Directive 2006/118/EC on the protection of groundwater against pollution and deterioration; Directive on priority substances = Directive on Environmental Quality Standards (2008/105/EC). Other directives pursuant to the WFD: Directive 2009/90/EC on technical specifications for chemical analysis and monitoring of water status.

Commission Decisions: Two Commission Decisions (2005 and 2008) on ecological status established a register of almost 1 500 sites included in an intercalibration exercise to allow for comparison of different countries' standards, and published the results.

**Entry into force**

December 2000

**Departments/Units in charge**

DG ENV, Dir. C Quality of Life, Water & Air, 1. Water

Dir. C Quality of Life, Water & Air:

Director: Marianne Wenning

Administrative Assistant: T. Verlinden

Additionally, Art. 21 fixes that the Commission shall be assisted by a regulatory committee

**Common Implementation strategy (CIS processes)**

A Common Implementation Strategy (CIS) has been agreed upon five months after the entry into force of the Directive. The work resulted for instance in several guidance documents, resource documents or key events related to different aspects of the WFD implementation. The work is organised through work programmes which are fixed for a period of two to three years. The current work programme ("Strengthening the implementation of EU water policy through the second river basin management plans – Work Programme 2013-2015") provides for the following structure:

Nine working groups are organised in 3 clusters:

1 Water Status Cluster: includes the Working Groups Ecostat, Groundwater, Chemicals (previous

WGs A, C & E) and Ecological Flow (building upon part of previous EG on WS&D).

2 Water Management Cluster: includes the Working Groups Programme of Measures (builds upon part of previous EG on WS&D with additional expertise), Agriculture (previous EG on Agriculture), and Floods (previous WG F).

3 Knowledge Integration & Dissemination Cluster: includes the Working Groups Economics (NEW) and Data and information sharing (previous WG D Reporting).

Next to the working groups there is a Strategic Coordination Group (SCG) and the Water Directors (WD) which hold strategic discussions. The WD decide what needs to be done, the SCG ensures delivery of the work programme by steering and coordinating the activities of the working groups. WD can decide to create new WGs to cover emerging issues.

**Administrative body handling implementation in MS**

According to the WFD, all member states need to report the competent authorities responsible for the implementation of the WFD. All reported competent authorities can be found in the EIONET Central Data Repository: http://cdr.eionet.europa.eu/

Some examples are provided in the following: In France, implementation of the directive (e.g. drafting of river basin (district) management plans) takes place through the water agencies at the level of river basin districts. In Luxembourg: WFD implementation handled at national level by the "Administration de la gestion de l'eau". In Germany, the competent authorities for implementing the WFD are the ministries of environment at the Länder level.

The Austrian Art. 3 report indicates that, given that the WFD consists of several different implementation phases (e.g. elaboration of the RBMPs, monitoring, implementation of the PoM), different authorities can be responsible for different implementation parts. In Austria for example, the federal ministry of agriculture, forestry, environment and water is responsible for the elaboration of the RBMP and all reporting requirements. The implementation of the programmes of measures is done at Länder or at district (Bezirk) level.

The 3rd WFD implementation report states that: "In some cases the responsibility for WFD implementation has been placed in dedicated units without clear links to the day-to-day water management or feedback at basin level. The result creates overlapping approaches and in some cases decisions and actions that are not compatible with WFD objectives."

**Main Objective**

The key objective of the WFD is to achieve good status for all water bodies by 2015. This includes the objectives of good ecological and chemical status for surface waters and good quantitative and chemical status for groundwater.

The environmental objectives of the WFD are defined in Art. 4. The aim is long-term sustainable water management based on a high level of protection of the aquatic environment. Art. 4.1 defines the WFD general objective to be achieved in all surface and groundwater bodies, i.e. good status by 2015, and introduces the principle of preventing any further deterioration of status. There follow a number of exemptions to the general objectives that allow for less stringent objectives, extension of deadline beyond 2015, or the implementation of new projects, provided a set of conditions are fulfilled.

**Principles included in the legal text**

Preamble (11): "As set out in Art. 174 of the Treaty, the Community policy on the environment is to contribute to pursuit of the objectives of preserving, protecting and improving the quality of the environment, in prudent and rational utilisation of natural resources, and to be based on the precautionary principle and on the principles that preventive action should be taken, environmental damage should, as a priority, be rectified at source and that the polluter should pay."

Preamble (18): "Community water policy requires a transparent, effective and coherent legislative framework. The Community should provide common principles and the overall framework for

action. This Directive should provide for such a framework and coordinate and integrate, and, in a longer perspective, further develop the overall principles and structures for protection and sustainable use of water in the Community in accordance with the principles of subsidiarity."

Preamble (38): "The use of economic instruments by Member States may be appropriate as part of a programme of measures. The principle of recovery of the costs of water services, including environmental and resource costs associated with damage or negative impact on the aquatic environment should be taken into account in accordance with, in particular, the polluter-pays principle. An economic analysis of water services based on long-term forecasts of supply and demand for water in the river basin district will be necessary for this purpose."

Preamble (44): "In identifying priority hazardous substances, account should be taken of the precautionary principle, relying in particular on the determination of any potentially adverse effects of the product and on a scientific assessment of the risk."

Art. 9: Recovery of costs for water services

Art. 9.1: "Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle."

The principle of recovery of the costs of water services is also mentioned in Annex III on Economic Analysis.

The 3rd WFD implementation report calls also the management at river basin scale a WFD principle.

**Other objectives/Key concepts/key elements of the legislation**

The WFD introduced a number of key principles into the management and protection of aquatic resources: (1) The integrated planning process at the scale of river basins, from characterisation to the definition of measures to reach the environmental objectives. (2) A comprehensive assessment of pressures, impacts and status of the aquatic environment, including from the ecological perspective. (3) The economic analysis of the measures proposed/taken and the use of economic instruments. (4) The integrated water resources management principle encompassing targeting environmental objectives with water management and related policies objectives. (5) Public participation and active involvement in water management. Other important elements: The main instrument for the implementation of the WFD is the RBMP and the accompanying Programme of Measures (PoM). Adequate water pricing needs to be ensured to provide adequate incentives for users to use water efficiently in accordance with the WFD (Art. 9.1). Good water status should be reached and – in any case – the status of water bodies shall not deteriorate (Art. 4).

Preamble (40): "With regard to pollution prevention and control, Community water policy should be based on a combined approach using control of pollution at source through the setting of emission limit values and of environmental quality standards."

**Terminology**

Art. 2 of the WFD provides definitions for 41 terms. These include for example definitions for: surface water, groundwater, inland water, river, lake, transitional water, coastal water, artificial water body, heavily modified water body, body of surface water, aquifer, etc. Definitions of some terms are provided in the following. 1. 'Surface water' means inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters. 2. 'Groundwater' means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil. 6. 'Transitional waters' are bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows. 7. 'Coastal water' means surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where

appropriate up to the outer limit of transitional waters. 8. 'Artificial water body' means a body of surface water created by human activity. 9. 'Heavily modified water body' means a body of surface water which as a result of physical alterations by human activity is substantially changed in character, as designated by the Member State in accordance with the provision of Annex II. 10. 'Body of surface water' means a discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water. 13. 'River basin' means the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta. 15. 'River basin district' means the area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is identified under Art. 3(1) as the main unit for management of river basins. 17. 'Surface water status' is the general expression of the status of a body of surface water, determined by the poorer of its ecological and its chemical status. 18. 'Good surface water status' means the status achieved by a surface water body when both its ecological status and its chemical status are at least 'good'. 21. 'Ecological status' is an expression of the quality of the structure and functioning of aquatic ecosystems associated with surface waters, classified in accordance with Annex V. 22. 'Good ecological status' is the status of a body of surface water, so classified in accordance with Annex V. 23. 'Good ecological potential' is the status of a heavily modified or an artificial body of water, so classified in accordance with the relevant provisions of Annex V. 24. 'Good surface water chemical status' means the chemical status required to meet the environmental objectives for surface waters established in Art. 4(1)(a), that is the chemical status achieved by a body of surface water in which concentrations of pollutants do not exceed the environmental quality standards established in Annex IX and under Art. 16(7), and under other relevant Community legislation setting environmental quality standards at Community level. 34. 'Environmental objectives' means the objectives set out in Art. 4. 35. 'Environmental quality standard' means the concentration of a particular pollutant or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment. 38. 'Water services' means all services which provide, for households, public institutions or any economic activity: (a) abstraction, impoundment, storage, treatment and distribution of surface water or groundwater, (b) waste-water, collection and treatment facilities which subsequently discharge into surface water. 39. 'Water use' means water services together with any other activity identified under Art. 5 and Annex II having a significant impact on the status of water.

Some examples of frequently used abbreviations in the context of the WFD: RBMP: River basin management plan; RBD: River basin district; PoM: Programme of measures; GES / GEP: Good Environmental Status / Good Environmental Potential.

**Derogations**

Exemptions are possible on the basis of natural conditions of the water body (Art. 4.4(c)) or if the achievement of good status is technically infeasible or disproportionately costly (Art. 4.4, 4.5 and 4.7). The deadline for reaching good status can be extended up to 2027 or beyond. Where exemptions are applied, the WFD requires MS to justify and explain the reasons in the RBMPs.

Preamble (30): "In order to ensure a full and consistent implementation of this Directive any extensions of timescale should be made on the basis of appropriate, evident and transparent criteria and be justified by the Member States in the river basin management plans"

Preamble (31): "In cases where a body of water is so affected by human activity or its natural condition is such that it may be unfeasible or unreasonably expensive to achieve good status, less stringent environmental objectives may be set on the basis of appropriate, evident and transparent criteria, and all practicable steps should be taken to prevent any further deterioration of the status of waters."

Preamble (32): "There may be grounds for exemptions from the requirement to prevent further

deterioration or to achieve good status under specific conditions, if the failure is the result of unforeseen or exceptional circumstances, in particular floods and droughts, or, for reasons of overriding public interest, of new modifications to the physical characteristics of a surface water body or alterations to the level of bodies of groundwater, provided that all practicable steps are taken to mitigate the adverse impact on the status of the body of water. "

Art. 4.3 allows the designation of artificial and heavily modified water bodies which have different environmental objectives

**Types of management measures**

The WFD foresees two different types of measures: basic and supplementary measures.

Basic measures are the minimum requirements to be complied with and include (Art. 11.3): Measures required to implement already existing Community legislation for the protection of water (including for example the urban wastewater treatment directive and the nitrates directive); Measures to ensure the recovery of costs for water services; Measures to promote an efficient and sustainable water use; Measures to ensure the quality of drinking water and to reduce the level of purification treatment required for the production of drinking water; Controls over the abstraction of fresh water and groundwater, and impoundment of fresh surface water; Controls and prior authorization of artificial groundwater recharge; Regulation of point source discharges; Prevention and control of diffuse pollution; Measures against any other significant adverse impacts on the status of water, in particular measures to ensure that the hydromorphological conditions of the bodies of water are consistent with the achievement of the good ecological status or potential; Prohibition of direct discharges of pollutants into groundwater; Measures against pollution with priority substances; Measures required to prevent significant losses of pollutants from technical installations, and to prevent and/or to reduce the impact of accidental pollution incidents for example as a result of floods, including through systems to detect or give warning of such events including, in the case of accidents which could not reasonably have been foreseen, all appropriate measures to reduce the risk to aquatic ecosystems.

Supplementary measures are those measures designed and implemented in addition to the basic measures, with the aim of achieving the objectives of the directive (Art. 11.4). Annex VI Part B lists an non-exclusive list of supplementary measures: (i) legislative instruments, (ii) administrative instruments, (iii) economic or fiscal instruments, (iv) negotiated environmental agreements, (v) emission controls, (vi) codes of good practice, (vii) recreation and restoration of wetlands areas, (viii) abstraction controls, (ix) demand management measures, inter alia, promotion of adapted agricultural production such as low water requiring crops in areas affected by drought, (x) efficiency and reuse measures, inter alia, promotion of water-efficient technologies in industry and water-saving irrigation techniques, (xi) construction projects, (xii) desalination plants, (xiii) rehabilitation projects, (xiv) artificial recharge of aquifers, (xv) educational projects, (xvi) research, development and demonstration projects, (xvii) other relevant measures.

No explicit impact assessment of the measures is foreseen by the WFD. However: The selection of measures shall take their cost-effectiveness into account; The WFD foresees "a review of the impact of human activity on the status of surface waters and on groundwater" (Art. 5.1.) to check whether water bodies will fail to meet the environmental quality objectives (Annex II 1.5); According to Annex VII, the "first update of the river basin management plan and all subsequent updates shall also include", amongst others "an assessment of the progress made towards the achievement of the environmental objectives, including presentation of the monitoring results for the period of the previous plan (…) and explanation for any environmental objectives which have not been reached".

**Spatial coverage**

In the context of the WFD, the 'water environment' includes: rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile (12 nautical miles for chemical status). These waters

are divided into units called water bodies. It is important to note that small water bodies are not covered by the WFD. This is one of the main elements where the WFD and the Habitats Directive can potentially complement each other to increase protection of aquatic ecosystems.

**Reporting units - what are the specific transposition requirements**

The main reporting unit for river basin management plans are the River Basin Districts (RBDs)

*Art. 13:* 1. Member States shall ensure that a river basin management plan is produced for each river basin district lying entirely within their territory. 2. In the case of an international river basin district falling entirely within the Community, Member States shall ensure coordination with the aim of producing a single international river basin management plan. Where such an international river basin management plan is not produced, Member States shall produce river basin management plans covering at least those parts of the international river basin district falling within their territory to achieve the objectives of this Directive. 5. River basin management plans may be supplemented by the production of more detailed programmes and management plans for sub-basin, sector, issue, or water type, to deal with particular aspects of water management. Implementation of these measures shall not exempt Member States from any of their obligations under the rest of this Directive.

In reality, in the 1st planning cycle, the geographical scope of the RBMPs does not correspond exactly to the number of RBDs, and a number of different models can be identified: Most Member States have prepared one RBMP for each RBD exclusively within their territory ; Most Member States who have part of an international RBD within their territory have produced one RBMP for the national part of the international RBD. In some cases they have also reported international RBMPs produced for the whole international RBD ; Some Member States have prepared one plan covering all of their territory (for instance in Slovakia or in Slovenia) but which includes sections on each of the relevant RBDs; Some Member States have prepared several RBMPs for each RBD and for sub-basins. For instance, in Romania all of the territory falls within the Danube RBD and is covered by the Danube International RBMP (A-level), as well as by the national Romanian Danube RBMP (B-level). In addition, and fully in accordance with the Directive (Art. 13.5 WFD), more detailed sub-RBMPs have been prepared for each of the 11 sub-basins; In Denmark, 15 RBMPs were reported for the Jutland and Funen RBD, and 7 RBMPs were reported for the Sjaelland RBD, but no overall single RBMP for the whole respective RBD was submitted; In Germany, where most of the territory is covered by international RBDs for which international RBMPs exist (Danube, Elbe, Rhine, Ems, Odra), no RBMP for the national parts of these RBDs were adopted. Instead RBMPs were adopted at the Federal State level. A similar situation applies in Belgium, where the RBMPs are adopted by the respective regions, and where the three regions have different timetables relating to the implementation of the Directive due to serious delays in Wallonia and the Brussels Region.

**Management unit**

The River Basin (District) (RB(D)) is the water management unit and the central entity for WFD implementation. The Water Bodies are the management units within each river basin district. River basins covering the territory of more than one MS are assigned to an International River Basin District.

**Key planning steps**

The planning process starts with the transposition and the administrative arrangements, followed by the characterisation of the river basin district, the monitoring and the assessment of status, the objective setting, and finally the programme of measures and their implementation. Monitoring and evaluation of the effectiveness of measures links one planning cycle with the next. The programme of measures is the tool to respond to the identified pressures, thus enabling the river basin/water body to reach good status. The characterization of the river basin district includes the pressures and impacts analysis, the economic analysis, the delineation of water bodies and the

establishment of the typology and reference conditions for surface water bodies, and the basis for the ecological status assessment. The whole planning process is accompanied by public participation and stakeholder involvement.

**Timelines**

The Water Framework Directive sets out clear deadlines for each of the requirements which add up to an ambitious overall timetable. The key milestones are listed below.

| Year | Issue | Reference |
|---|---|---|
| 2000 | Directive entered into force | Art. 25 |
| 2003 | Transposition in national legislation | Art. 23 |
| | Identification of River Basin Districts and Authorities | Art. 3 |
| 2004 | Characterisation of river basin: pressures, impacts and economic analysis | Art. 5 |
| 2006 | Establishment of monitoring network | Art. 8 |
| | Start public consultation (at the latest) | Art. 14 |
| 2008 | Present draft river basin management plan | Art. 13 |
| 2009 | Finalise river basin management plan including progamme of measures | Art. 13 & 11 |
| 2010 | Introduce pricing policies | Art. 9 |
| 2012 | Make operational programmes of measures | Art. 11 |
| 2015 | Meet environmental objectives; First management cycle ends; Second river basin management plan & first flood risk management plan. | Art. 4 |
| 2021 | Second management cycle ends | Art. 4 & 13 |
| 2027 | Third management cycle ends, final deadline for meeting objectives | Art. 4 & 13 |

**Integration/coordination issues with other related pieces of legislation**

The establishment of integrated water resource management is one of the basic concepts of the WFD. Coordination and integration with other Community legislation can therefore be found at several places in the text of the WFD.

Preamble WFD (16): "Further integration of protection and sustainable management of water into other Community policy areas such as energy, transport, agriculture, fisheries, regional policy and tourism is necessary. This Directive should provide a basis for a continued dialogue and for the development of strategies towards a further integration of policy areas. This Directive can also make an important contribution to other areas of cooperation between Member States, inter alia, the European spatial development perspective (ESDP)."

Preamble WFD (21): "The Community and Member States are party to various international agreements containing important obligations on the protection of marine waters from pollution, in particular the Convention on the Protection of the Marine Environment of the Baltic Sea Area, signed in Helsinki on 9 April 1992 and approved by Council Decision 94/157/EC (1), the Convention for the Protection of the Marine Environment of the North-East Atlantic, signed in Paris on 22 September 1992 and approved by Council Decision 98/249/EC (2), and the Convention for the Protection of the Mediterranean Sea Against Pollution, signed in Barcelona on 16 February 1976 and approved by Council Decision 77/585/EEC (3), and its Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources, signed in Athens on 17 May 1980 and approved by Council Decision 83/101/EEC (4). This Directive is to make a contribution towards enabling the Community and Member States to meet those obligations."

Preamble WFD (35): "Within a river basin where use of water may have transboundary effects, the requirements for the achievement of the environmental objectives established under this Directive, and in particular all programmes of measures, should be coordinated for the whole of the river basin district. For river basins extending beyond the boundaries of the Community, Member States should endeavour to ensure the appropriate coordination with the relevant non-member States. This Directive is to contribute to the implementation of Community obligations under international conventions on water protection and management, notably the United Nations Convention on the protection and use of transboundary water courses and international lakes, approved by Council Decision 95/308/EC [...] and any succeeding agreements on its application."

Preamble WFD (47): "This Directive should provide mechanisms to address obstacles to progress in improving water status when these fall outside the scope of Community water legislation, with a view to developing appropriate Community strategies for overcoming them."
Preamble WFD (47): "The provisions of this Directive take over the framework for control of pollution by dangerous substances established under Directive 76/464/EEC [...]. That Directive should therefore be repealed once the relevant provisions of this Directive have been fully implemented."
10 on the combined approach for point and diffuse sources sets out that emission controls and limit values fixed in other Community legislation have to be established or implemented. The following Directives are mentioned: Directive 96/61/EC on integrated pollution prevention and control; Directive 91/271/EEC on urban waste-water treatment ; Directive 76/464/EEC on pollution caused by certain dangerous substances discharged into the aquatic environment + Daughter directives ; Any other relevant Community legislation.
Art. 11: Programme of measures: Each programme of measures shall include 'basic' measures, which amongst others are those measures required to implement Community legislation for the protection of water, including the ones mentioned in Art. 10, and the following ones (part A of Annex VI): The Bathing Water Directive (76/160/EEC); The Birds Directive (79/409/EEC); The Drinking Water Directive (80/778/EEC) as amended by Directive (98/83/EC); The Major Accidents (Seveso) Directive (96/82/EC); The Environmental Impact Assessment Directive (85/337/EEC); The Sewage Sludge Directive (86/278/EEC); The Urban Waste-water Treatment Directive (91/271/EEC); The Plant Protection Products Directive (91/414/EEC); The Nitrates Directive (91/676/EEC); The Habitats Directive (92/43/EEC); The Integrated Pollution Prevention Control Directive (96/61/EC)
Annex IV (Art. 6): The register of protected areas shall include areas designated for the birds and habitats directive; areas designated as bathing waters under the Bathing water directive; vulnerable zones under the nitrates directive and sensitive areas under the urban wastewater treatment directive.
Furthermore, the WFD requires that objectives for protected areas established under Community legislation should also be met. Thus while the WFD introduces the new concept of good ecological status, it also incorporates the numerical limits of earlier legislation (e.g. the mandatory upper limit value for nitrates stemming from the nitrates directive or the drinking water directive). (Source: CIS guidance no. 3)
Annex V 1.3.5 foresees specific monitoring requirements for protected areas for drinking water purposes as well as for habitat and species protection areas.

**Coordination issues with the EU Biodiversity Strategy**

Increasing the integration of water and other environmental and sectoral policy objectives (including nature) is part of the objectives of the current CIS working programme. The WFD aims at reaching good status for all water bodies and does not allow a deterioration of the current status. In general it can be assumed that this is in line with and contributes to target 2 of the Biodiversity strategy "Maintain and restore ecosystems and their services", in particular Action 7 on ensuring no net loss of biodiversity and ecosystem services. Some relevant elements of the WFD text:
Art. 4.1(c): Environmental objectives for protected areas: "Member States shall achieve compliance with any standards and objectives at the latest 15 years after the date of entry into force of this Directive, unless otherwise specified in the Community legislation under which the individual protected areas have been established."
Art. 6: Register of protected areas: Art. 6.1: "Member States shall ensure the establishment of a register or registers of all areas lying within each river basin district which have been designated as requiring special protection under specific Community legislation for the protection of their surface water and groundwater or for the conservation of habitats and species directly depending

on water."
Art. 8.1: Amongst other, monitoring programmes shall – for protected areas – "be supplemented by those specifications contained in Community legislation under which the individual protected areas have been established"
Art. 11: Programme of measures: It is foreseen that the PoM contains measures required to implement Community legislation for the protection of water, including measures required under the Birds and the Habitats Directive.
Also some of the supplementary measures proposed (Annex VI Part B) are directly relevant for the Biodiversity Strategy:(v) emission controls, (vii) recreation and restoration of wetlands areas, (xiii) rehabilitation projects
Annex IV: Protected areas: "The register of protected areas required under Art. 6 shall include the following types of protected areas: (ii) areas designated for the protection of economically significant aquatic species; (v) areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant natural 2000 sites designated under Directive 92/43/EEC and Directive 79/409/EEC.
The WFD implementation also contributes to target 5 of the Biodiversity strategy "combating invasive alien species". In the 1st reporting cycle, alien species was not a specific element of reporting under the WFD pressure and impact analysis. However, many Member States identified this as a major issue. In the WFD reporting for the 2nd planning cycle, invasive species are a new explicit element of reporting for all MS, as an explicit pressure "5.1 Introduced species and diseases" and as one of the Key Types of Measures KTM "18 Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases".

**Relevance to ecosystems/habitats?**

*River*: "a body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course" (Art. 2.4 WFD)
*Lake*: "a body of standing inland surface water" (Art. 2.5 WFD)
*Transitional waters*: "bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows." (Art. 2.6 WFD)
*Coastal waters:* "means surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters." (Art. 2.7 WFD)
*Groundwater*: "all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil" (Art. 2.2 WFD)
*artificial water body*: "a body of surface water created by human activity" (Art. 2.8 WFD)
*Heavily modified water body:* "a body of surface water which as a result of physical alteration by human activity is substantially changed in character" (Art. 2.9 WFD)
Preamble (20): "The quantitative status of a body of groundwater may have an impact on the ecological quality of surface waters and terrestrial ecosystems associated with that groundwater body."
Art. 1 (a): [Purpose of the directive:] "prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems"; "Member States shall protect, enhance and restore all bodies of surface water"... (Art. 4.1(a)(ii)) It can be assumed that the WFD has a positive effect on all surface water ecosystems. There are also impacts on the ecosystems of the marine environment and on the ecosystems of floodplains, which are not directly covered by the WFD. It can be assumed that the directive has a positive impact on aquatic biodiversity, amongst

others through their measures against water pollution, measures to control water abstraction and measures to improve hydromorphology of water bodies. The term "Ecosystem Services" does not occur in the WFD. The supply of clean drinking water (as an ecosystem service) is directly mentioned in the directive:

Preamble (22): "This Directive is to contribute to securing the drinking water supply for the population."

Art. 1 (e): [the directive contributes to] "the provision of the sufficient supply of good quality surface water and groundwater as needed for sustainable, balanced and equitable water use"

Art. 7: Waters used for the abstraction of drinking water: Identification and monitoring of water bodies used for drinking water abstraction. Compliance with standards of the drinking water directive.

Art. 7.3: "Member States shall ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water. Member States may establish safeguard zones for those bodies of water."

The provision of fresh water can be seen as an ecosystem service. The directive mentions abstractions of fresh surface water and groundwater (Art. 11.3 (e)). There is a clear link between the WFD and both Aquatic Biodiversity and Ecosystem Services. It can be assumed that all aquatic ecosystem services are influenced by the WFD. Part of the ecosystem services are (more or less directly) addressed in the economic analysis of water uses done within the framework of the WFD (e.g. use of water for households, agriculture, industry; non-consumptive use for navigation, hydropower). An economic analysis of water use is foreseen in Art. 5.

If energy production through hydropower or industrial use of flowing water for cooling purposes is also an ecosystem service, then the WFD is also limiting the provision of ecosystem services. Construction of new dams for hydropower plants for example are against the principle of non-deterioration of the ecological status of water bodies.

The normative definitions of high/good/moderate ecological status (which are the target of the directive) are provided in Annex V 1.2. The main criteria for water bodies at desirable status are based on the absence of anthropogenic alterations and "undisturbed conditions". It can be assumed that this is in line with the "optimal" situation with regards to biodiversity objectives. Under this assumption, all activities under the WFD aiming at GES are contributing as well to the objectives of the biodiversity strategy.

**Drivers**

The term "driver" is not defined in the legal text of the WFD. The guidance document no. 3 on Analysis of Pressures and Impacts uses the definition of the DPSIR framework: A driver is "an anthropogenic activity that may have an environmental effect (e.g. agriculture, industry)". The WFD addresses indirectly all drivers which put water bodies at risk of failing good ecological status. Art. 9 mentions water users, which should at least be disaggregated into industry, households and agriculture.

The list of drivers to report on as indicated in the new 2016 WFD reporting guidance: agriculture, climate change, energy (hydropower and non-hydropower), fisheries and aquaculture, flood protection, forestry, industry, tourism and recreation, transport, urban development.

The required economic analysis includes the development of a baseline scenario, which assesses forecasts in key economic drivers likely to influence pressures and thus water status. However, drivers in this sense are of a slightly different type. They include for example demography, climate, technological development or sector policies, like the common agricultural policy). (Source: CIS guidance no. 1 on Economics). There are no predefined indicators to describe drivers in the WFD legal text.

**Pressures**

The term "pressure" is mentioned, but not defined in the legal text of the WFD. The guidance document no. 3 on Analysis of Pressures and Impacts uses the definition of the DPSIR framework: A pressure is "the direct effect of the driver (for example, an effect that causes a change in flow or a change in the water chemistry)".

Preamble of the WFD: "Waters in the Community are under increasing pressure from the continuous growth in demand for sufficient quantities of good quality water for all purposes."

Art. 10: The combined approach for point and diffuse sources

Art. 11 on the PoM mentions abstraction of fresh surface water and groundwater, and impoundment of fresh surface water.

The new 2016 WFD reporting guidance indicates an extensive list of pressures to report on.

**Assessment of Environmental State**

The term "state" is not defined in the legal text of the WFD. The guidance document no. 3 on Analysis of Pressures and Impacts uses the definition of the DPSIR framework: The state is "the condition of the water body resulting from both natural and anthropogenic factors (i.e. physical, chemical and biological characteristics)".

Annex II 1.1 and 1.2 defines surface water body types for rivers, lakes, transitional or coastal waters as well as artificial water bodies and heavily modified water bodies; and Annex II 1.3 provides for the establishment of type-specific reference conditions for surface water body types. For each surface water body type, type-specific hydromorphological, physicochemical and biological reference conditions shall be defined which represent the values of the environmental quality elements for that water body type at high ecological status. The Quality elements for the classification of ecological status are defined in Annex V 1.1 for each surface water body type:

Indicators can be found in different CIS guidance documents (see also list under 8.5), for example in the guidance no. 27 "Technical Guidance for Deriving Environmental Quality Standards".

**Assessment of Status**

Ecological status as defined by the WFD is an expression of the quality of the structure and functioning of aquatic ecosystems. The WFD intercalibration exercise has compared Member States' methods for assessing ecological status to ensure that they are consistent with the WFD definitions ensuring comparability of results across Member States. Source: 3rd WFD implementation report: The CIS guidance documents no. 6, 14 and 30 are about the intercalibration exercise.

Surface water good status is defined in terms of biology, supported by chemistry and morphology. Good status is furthermore defined as a deviation from reference conditions.

*Surface water status* is the general expression of the status of a body of surface water, determined by the poorer of its ecological status and its chemical status." (Art. 2.17 WFD)

*Good surface water status* means the status achieved by a surface water body when both its ecological status and its chemical status are at least good." (Art. 2.18 WFD)

*Ecological status* is an expression of the quality of the structure and functioning of aquatic ecosystems associated with surface waters, classified in accordance with Annex V." (Art. 2.21 WFD)

*Good ecological status* is the status of a body of surface water, so classified in accordance with Annex V." (Art. 2.22 WFD)

*Good ecological potential* is the status of a heavily modified or an artificial body of water, so classified in accordance with the relevant provisions of Annex V." (Art. 2.23 WFD)

*Good surface water chemical status* means the chemical status required to meet the environmental objectives for surface waters established in Art. 4(1)(a), that is the chemical status achieved by a body of surface water in which concentrations of pollutants do not exceed the environmental quality standards established in Annex IX and under Art. 16(7), and under other relevant Community legislation setting environmental quality standards at Community level." (Art.

2.24 WFD)

No numerical limit values are provided by the WFD text itself.

Annex V 1.2 provides definitions for high, good and moderate status for all quality elements.

For example, the definition of high status in rivers with regards to fish fauna:

"Species composition and abundance correspond totally or nearly totally to undisturbed conditions.

All the type-specific disturbance-sensitive species are present.

The age structure of the fish communities show little sign of anthropogenic disturbance and are not indicative of a failure in the reproduction or development of any particular species."

Annex V 1.4 specifies how the comparability between member states shall be ensured, by expressing results of biological monitoring in terms of ecological quality ratios. Furthermore, each "Member State shall divide the ecological quality ratio scale for their monitoring system for each surface water category into five classes ranging from high to bad ecological status". Furthermore, the establishment of an *intercalibration network* is foreseen, consisting "of sites selected from a range of surface water body types present within each ecoregion.

*Biological elements* which determine the status of a surface water body are sub-divided in three components: flora, benthic invertebrates, and fish fauna (this component is excluded in coastal waters). Together these are used to place the water body in one of the five classes: high, good, moderate, poor and bad. Generally high is "undisturbed" or "nearly undisturbed", good indicates "slight disturbance", moderate indicates "moderate disturbance", poor indicates "major alterations", and bad indicates "severe alterations". (CIS guidance No.3)

*Chemical and physico-chemical elements* have two components: general and specific pollutants. While for specific pollutants, environmental quality standards can be set, numerical limits do not exist for the general components.

The components used for the assessment of hydromorphological elements vary between water body type, but the classification is as for the general chemical elements (i.e. high, good and moderate) with similar definitions of the classes (Table 2.4). The hydromorphological elements are not used in the determination of ecological status, but could be the cause of the failure to achieve good or high ecological status. (CIS guidance No. 3)

Several CIS guidance documents are relevant for the assessment of state and status within the WFD. These include for example: No.10: Rivers and Lakes – Typology, Reference Conditions and Classification Systems; No. 13: Overall Approach to the Classification of Ecological Status and Ecological Potential

**Data**

"The reporting requirements of the WFD are specified in the Art. 3 and 15. Art. 3 requires MS to provide information to the European Commission on the identification of River Basin Districts and Competent Authorities, whilst Art. 15 requires information to be provided to the Commission on: The analysis carried out according to Art. 5; Monitoring programmes; River Basin Management Plans." (CIS guidance no. 21). Data issues were previously managed by the CIS working group D on reporting. Now data and information sharing are part of CIS cluster 3 on knowledge integration and dissemination (source: CIS Working programme 2013-2015). Reporting of MS consists of published plans and accompanying documentation as well as the electronic reporting through the Water Information System for Europe (WISE). Reporting includes a wide range of different data, for example: number of water bodies, % of water bodies in good status or potential (for 2009 or 2015, differentiated in ecological, chemical and quantitative status and ground- and surface water bodies), different parameters describing the state of the water bodies (chemical, biological, hydromorphological).

The CIS Guidance document No. 21 for reporting under the WFD specifies all reporting requirements for the purpose of compliance checking under the WFD. They are divided in big

categories, including the following: Reporting requirements for river basin management planning, geographically referenced information, surface water bodies, groundwater bodies, pressures, impacts and programmes of measures, economic data. Although the WFD allowed the introduction of legally binding reporting formats (Art. 20.2), such formats have not been developed to allow for some flexibility and to respect the ambitious deadlines of the WFD. Instead, reporting guidance has been introduced through reporting sheets, which are informal arrangements between the Commission and MS: MS committed voluntary to submit information to WISE. Reporting sheets were made on an article by article basis. The CIS guidance document from 2009 "contains all the information originally in the Reporting sheets but presented in a clearer, object-related way with the ultimate focus being on fully reported and comparable RBMP".

**Funding**

Member States' Programmes of Measures contain different instruments (legal, administrative, technical, infrastructure, training, etc.), and are potentially funded in different ways. Public budget is expected to cover part of the measures but also private operators are expected to provide funds e.g. through the cost recovery provisions. European funds – Structural cohesion or CAP funds – can also contribute to financing some WFD measures. The Commission's proposal for a new LIFE regulation 2014-2020 includes the possibility to co-finance projects which integrate different EU funds and other financial sources in a single, large scale project for the implementation of measures under the WFD. The Commission's proposal for 2014-2020 cohesion policy builds on key elements of the WFD proposing ex-ante conditionality for the use of cohesion and structural funds in the water sector. Cohesion policy provides an opportunity for joining water use management needs and implementation of water policy. In the current programming period of the **LIFE+** progamme, funding has been introduced for **integrated projects**. Within those, funding can be granted to RBMPs, Natura 2000 networks and cross-border flood protection strategies.

**Other issues to be aware of relevant for AQUACROSS?**

Art. 19 indicates that the Commission shall, once a year, for information purposes present to the 'Committee' (Art. 21) "an indicative plan of measures having an impact on water legislation which it intends to propose in the near future". It could be interesting for the purpose of our project to be informed about these plans. The indicators used for the characterisation of the ecological status of the water bodies can be relevant indicators also in the context of Aquacross. They are particularly interesting by the fact that they should be widely available. See information on the "Impact of the European Water framework directive on knowledge of biodiversity".

# 3.6 Floods Directive

Author: Verena Mattheiß, ACTeon

Reviewer: Eleftheria Kampa, Ecologic Institute

## Floods Directive

**Name/Type of the Legal Act or Policy**

FD, Floods Directive, Directive 2007/60/EC on the assessment and management of flood risks
No subsequent legal acts could be identified. Those which preceded the directive include the following communication from 2004; Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on Flood risk management: Flood prevention, protection and mitigation. COM(2004)472 final.

**Entry into force**

November/2007

**Departments/Units in charge**

DG Environment
*DG ENV, Dir. C Quality of Life, Water & Air, 1. Water*
*KAVVADAS I.: Policy Officer – Water Framework Directive, Floods Directive & water policy*

**Common Implementation strategy (CIS processes)**

FDRDG – Floods Directive Reporting Drafting Group: set up in Oct. 2008 with the task of developing reporting sheets and relevant schemas
WGF – Floods Working Group: "As part of the Common Implementation Strategy a Working Group on Floods has been set up to on one hand support the implementation of the Floods Directive, and on the other hand provide a platform for information exchange on flood risk management." Following this information exchange on current practices, amongst others the following documents have been developed by member states and stakeholders taking part in the working group: "A CIS Guidance document N°24 entitled "River basin management in a changing climate" (2009), includes a chapter on how to take into account climate change throughout the different stages of implementation of the Floods Directive; A Resource document " Floods Working Group (CIS) Resource document Flood Risk Management, Economics and Decision Making Support" was agreed by WG F in October 2012. A number of WGF Thematic workshops on different themes related to the implementation of the Floods Directive have been organised by the WGF and its members. Examples of themes addressed are Flash Flood and pluvial flood management, the Catchment approach to flood management, Flood Risk Management plans, Land use, Floods and economics, and finally Stakeholder involvement in flood risk management. For more information see the floods Risk management library on CIRCABC."DG Environment developed in March 2011 an information package (including a note) on "Towards Better Environmental Options in Flood Risk Management" which supports the use of natural water retention measures in flood risk management.

**Administrative body handling implementation in MS**

"The Floods Directive indicates that Member States may make use of the administrative arrangements made under Art. 3 of the Water Framework Directive. However, different competent authorities may be appointed by Member States for the Floods Directive."
All reported competent authorities can be found in the EIONET Central Data Repository. In Germany, the competent authorities for implementing the FD are the ministries of environment at the Länder level. In France, management takes place through the water agencies at the level of

river basin districts. In Ireland, the Commissioners of Public Works are the appointed competent authority. The Office of Public Works is an agency of Government within the Department of Finance group of services. In Portugal, the Portuguese Environment Agency is the appointed competent authority for the FD. In addition, the Regional Secretariat for Agriculture and Environment is responsible for the FD in the Azores, and the Regional Directorate of Environment for the FD in Madeira.

**Main Objective**

"The purpose of this Directive is to establish a framework for the assessment and management of flood risks, aiming at the reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community." (Art. 1, FD)

**Principles included in the legal text**

Solidarity principle: "The solidarity principle is very important in the context of flood risk management. In the light of it Member States should be encouraged to seek a fair sharing of responsibilities, when measures are jointly decided for the common benefit, as regards flood risk management along water courses." (Preamble FD)

The preamble of the directive refers to international principles of flood risk management, indicating that effective flood prevention and mitigation requires transboundary cooperation. (Preamble FD)

"This Directive respects the fundamental rights and observes the principles recognised in particular by the Charter of Fundamental Rights of the European Union. In particular, it seeks to promote the integration into Community policies of a high level of environmental protection in accordance with the principle of sustainable development as laid down in Art. 37 of the Charter of Fundamental Rights of the European Union." (Preamble FD)

"Since the objective of this Directive, namely the establishment of a framework for measures to reduce the risks of flood damage, cannot be sufficiently achieved by the Member States and can by reason of scale and effects of actions be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Art. 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve that objective." (Preamble FD)

**Other objectives/Key concepts/key elements of the legislation**

"Flood risk management plans should focus on prevention, protection and preparedness. With a view to giving rivers more space, they should consider where possible the maintenance and/or restoration of floodplains, as well as measures to prevent and reduce damage to human health, the environment, cultural heritage and economic activity." (Preamble FD)

"Member States should base their assessments, maps and plans on appropriate 'best practice' and 'best available technologies' not entailing excessive costs in the field of flood risk management." (Preamble FD)

"Considerable flexibility should be left to the local and regional levels, in particular as regards organisation and responsibility of authorities." (Preamble FD)

objectives for flood risk management should focus on the reduction of potential adverse consequences of flooding for human health, the environment, cultural heritage and economic activity, and, if considered appropriate, on non-structural initiatives and/or on the reduction of the likelihood of flooding. (Art.7.2, FD)

"Flood risk management plans shall take into account relevant aspects such as costs and benefits, flood extent and flood conveyance routes and areas which have the potential to retain flood water, such as natural floodplains, the environmental objectives of Art. 4 of Directive 2000/60/EC, soil and water management, spatial planning, land use, nature conservation, navigation and port infrastructure." (Art.7.3, FD)

"Flood risk management plans shall address all aspects of flood risk management focusing on prevention, protection, preparedness, including flood forecasts and early warning systems and taking into account the characteristics of the particular river basin or sub-basin. Flood risk management plans may also include the promotion of sustainable land use practices, improvement of water retention as well as the controlled flooding of certain areas in the case of a flood event." (Art.7.3, FD)

The directive reinforces the rights of the public to access information and encourages public participation in the planning process (Art. 10, FD)

Flood risk management programmes are most effective if they include the following elements:

- Prevention: preventing damage caused by floods by avoiding construction of houses and industries in present and future flood-prone areas; by adapting appropriate land-use, agricultural and forestry practices;
- Protection: taking measures, both structural and non-structural, to reduce the likelihood of floods and/or the impact of floods in a specific location;
- Preparedness: informing the population about flood risks and what to do in the event of a flood;
- Emergency response: developing emergency response plans in the case of a flood;
- Recovery and lessons learned: returning to normal conditions as soon as possible and mitigating both the social and economic impacts on the affected population.

**Terminology**

"For the purpose of this Directive, in addition to the definitions of 'river', 'river basin', 'sub-basin' and 'river basin district' as set out in Art. 2 of Directive 2000/60/EC, the following definitions shall apply: *Flood :* the temporary covering by water of land not normally covered by water. This shall include floods from rivers, mountain torrents, Mediterranean ephemeral water courses, and floods from the sea in coastal areas, and may exclude floods from sewerage systems. *Flood risk :* the combination of the probability of a flood event and of the potential adverse consequences for human health, the environment, cultural heritage and economic activity associated with a flood event."

**Types of management measures**

The following types of measures /groups of aggregated measures have been identified for the FD according to the CIS guidance document no. 29 on reporting under the FD:

| Aspects of flood risk management | Type | Description |
|---|---|---|
| No Action | No Action | No measure is proposed to reduce the flood risk in the APSFR or other defined area |
| Prevention | Avoidance | Measure to prevent the location of new or additional receptors in flood prone areas, such as land use planning policies or regulation |
| | Removal or relocation | Measure to remove receptors from flood prone areas, or to relocate receptors to areas of lower probability of flooding and/or of lower hazard |
| | Reduction | Measure to adapt receptors to reduce the adverse consequences in the event of a flood actions on buildings, public networks, etc.... |
| | Other prevention | Other measure to enhance flood risk prevention (may include, flood risk modeling and assessment, flood vulnerability assessment, maintenance programmes or policies etc...) |
| Protection | Natural flood management / runoff and | Measures to reduce the flow into natural or artificial drainage systems, such as overland flow interceptors and / or storage, enhancement of infiltration, etc and including in-channel. |

| | | |
|---|---|---|
| | catchment management | floodplain works and the reforestation of banks, that restore natural systems to help slow flow and store water. |
| | Water flow regulation | Measures involving physical interventions to regulate flows, such as the construction, modification or removal of water retaining structures (e.g., dams or other on-line storage areas or development of existing flow regulation rules), and which have a significant impact on the hydrological regime. |
| | Channel, Coastal and Floodplain Works | Measures involving physical interventions in freshwater channels, mountain streams, estuaries, coastal waters and flood-prone areas of land, such as the construction, modification or removal of structures or the alteration of channels, sediment dynamics management, dykes, etc. |
| | Surface Water Management | Measures involving physical interventions to reduce surface water flooding, typically, but not exclusively, in an urban environment, such as enhancing artificial drainage capacities or through sustainable drainage systems (SuDS). |
| | Other Protection | Other measure to enhance protection against flooding, which may include flood defence asset maintenance programmes or policies |
| Preparedness | Flood Forecasting and Warning | Measure to establish or enhance a flood forecasting or warning system |
| | Emergency Event Response Planning / Contingency planning | Measure to establish or enhance flood event institutional emergency response planning |
| | Public Awareness and Preparedness | Measure to establish or enhance the public awareness or preparedness for flood events |
| | Other preparedness | Other measure to establish or enhance preparedness for flood events to reduce adverse consequences |
| Recovery and Review (Planning for the recovery and review phase is in principle part of preparedness) | Individual and societal recovery | Clean-up and restoration activities (buildings, infrastructure, etc.)<br>Health and mental health supporting actions, incl. managing stress<br>Disaster financial assistance (grants, tax), incl. disaster legal assistance, disaster unemployment assistance<br>Temporary or permanent relocation<br>Other |
| | Environmental recovery | Clean-up and restoration activities (with several sub-topics as mould protection, well-water safety and securing hazardous materials containers)<br>Other |
| | Other recovery and review | Lessons learnt from flood events<br>Insurance policies<br>Other |

Art. 7.3 specifies furthermore that "Flood risk management plans may also include the promotion of sustainable land use practices, improvement of water retention as well as the controlled flooding of certain areas in the case of a flood event."

The same article mentions that flood risk management plans shall take costs and benefits into account.

**Spatial coverage**

Flood risk is to be assessed for the river basin districts as defined in the WFD, or any coastal areas or river basins assigned as management units by the Member State.

"Flood hazard maps shall cover the geographical areas which could be flooded according to the following scenarios: (a) floods with a low probability, or extreme event scenarios; (b) floods with a medium probability (likely return period ≥ 100 years); (c) floods with a high probability, where appropriate." (Art. 6.3)

**Reporting units – what are the specific transposition requirements**

Reporting units are river basin districts defined under the WFD, or any coastal areas or river basins assigned as management units by the Member State.

**Management unit**

Management units of the FD are: River basin districts, or unit of management referred to in Art. 3(2)(b), or the portion of an international river basin district lying within their territory. (Art. 4, FD)

**Timelines**

Directive 2007/60/EC on the assessment and management of flood risks set out clear deadlines for each of the requirements. The key milestones are listed below.

| Issue | Deadline | Reference |
|---|---|---|
| Entry into force | 26.11.2007 | Art 18 |
| Transposition | 26.11.2009 | Art 17 |
| Reporting format Preliminary Flood Risk Assessment | 22.12.2009 | Art 11 |
| Administrative arrangements to be in place and to be notified to the Commission | 26.5.2010 | Art 3 |
| Cut-off date transitional measure (availability of existing tools) | 22.12.2010 | Art 13 |
| Preliminary flood risk assessment | 22.12.2011 | Art 4 & 5 |
| Public participation process starts (publication of mechanism and timetable for consultation) | 22.12.2012 * | Art 9.3 & 10 |
| Flood hazard and risk maps | 22.12.2013 ** | Art 6 |
| Flood risk management plans | 22.12.2015 *** | Art 7 |
| 2nd Preliminary Flood Risk Assessment, specific requirement on climate change<br>Commission's first implementation report due. | 22.12.2018 | Art 14.1 & 4 |
| 2nd Flood hazard and risk maps | 22.12.2019 | Art 14.2 |
| End of 1st flood risk management cycle<br>2nd Flood Risk Management Plans, specific requirement on climate change.<br>3rd Water Framework Directive River Basin Management Plans. | 22.12.2021 | Art 14.3 & 4 |

Review /update every 6 years thereafter. Reporting to the Commission: 3 months after. * = coordination with Art. 14 (WFD) requirements ; ** = date of 1st review of pressure and impact analysis under the WFD ; *** = date of 1st review of WFD river basin management plans

Revisions: "The elements of flood risk management plans should be periodically reviewed and if necessary updated, taking into account the likely impacts of climate change on the occurrence of floods." (Preamble FD) "In particular, the Commission should be empowered to adapt the Annex to scientific and technical progress." (Preamble FD) Also: "The Commission may, taking into account the periods for review and updating, adapt the Annex to scientific and technical progress." (Art. 11.2 (FD)) Dates for reviews for the preliminary flood risk management, the flood hazard and the flood risk maps as well as the flood risk management plan are fixed in Art. 14 of the FD (every six years).

**Integration/coordination issues with other related pieces of legislation**

The FD requires that flood risk management plans should seek for relevant coordination within river basin districts and promote the achievement of environmental objectives laid down in Community legislation. The FD foresees in particular the coordination with the WFD: "Development of river basin management plans under Directive 2000/60/EC and of flood risk management plans under this Directive are elements of integrated river basin management. The two processes should therefore use the mutual potential for common synergies and benefits, having regard to the

environmental objectives of Directive 2000/60/EC, ensuring efficiency and wise use of resources while recognising that the competent authorities and management units might be different under this Directive and Directive 2000/60/EC." (Preamble FD, see also Art. 3). Art. 9 of the FD is dedicated to the coordination with the WFD. Inter-linkages with reporting processes under the WFD and the FD are further detailed in the CIS guidance document no. 29.

Annex A.4 (FD) specifies that flood risk management plans shall include also a summary of "flood related measures taken under other Community acts, including Council Directives 85/337/EEC of June 1985 on the assessment of the effects of certain public and private projects on the environment (...) and 96/82/EC of 9 December 1996 on the control of major accident hazards involving dangerous substances (...), Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (...) and Directive 2000/60/EC".

In addition, both the EU Adaptation Strategy and the Green Infrastructure Strategy, which have been adopted after the Floods Directive, provide for integration and cooperation with the FD. Whereas the first emphasises the importance of taking climate change into account when thinking about flood protection measures, the second promotes flood protection as one of the benefits of green infrastructure (in particular linked to the restoration of flood plains, but not only). Finally, the EU Action on Water Scarcity and Droughts can be seen as a complement to the Floods Directive, as these are the two policies addressing water quantity aspects.

**Coordination issues with the EU Biodiversity Strategy**

Amongst others, flood risk management plans shall take into account soil and water management and nature conservation (Art. 7.3, FD). With regards to flood protection measures, the EU Commission promotes more environmentally sensitive options like natural water retention measures, or green infrastructure in general. This allows for important synergies with the EU Biodiversity Strategy. Wider, it is asked for integrated flood risk management, which focuses "on sustainable water management and measures which work with nature are becoming more important, as they contribute to the strengthening of resilience of nature and society to extreme weather events". The promotion of natural water retention measures is fully in line with Target 2 of the Biodiversity Strategy (Maintain and restore ecosystems and their services), and in particular Action 6 on setting priorities to restore and promote the use of green infrastructure. However, the opposite is the case with 'traditional', structural flood protection measures which may destroy ecosystems and might impede the delivery of ecosystem services.

**Relevance to ecosystems/habitats?**

The text of the FD mentions "bodies of water": "In cases of multi-purpose use of bodies of water for different forms of sustainable human activities (e.g. flood risk management, ecology, inland navigation or hydropower) and the impacts of such use on the bodies of water, Directive 2000/60/EC provides for a clear and transparent process for addressing such uses and impacts, including possible exemptions from the objectives of 'good status' or of 'non-deterioration' in Art. 4 thereof." (Preamble FD) Also "natural floodplains" are specifically mentioned in the FD, as areas which should be taken into account in flood risk management plans for their potential to retain water (Art. 7.3; FD).

Measures to reduce or prevent flood risk are affecting in particular river and coastal ecosystems, but also floodplains.

Neither aquatic biodiversity nor ecosystem services are directly mentioned in the directive. It is depending on the choice of flood management measures, whether aquatic biodiversity and ecosystem services are positively or negatively affected. The EU Commission is promoting "better environmental options" for flood risk management, with a presumable positive effect on aquatic biodiversity and ecosystem services. Examples of positive effects are: measures to increase retention capacity reduce surface flow and erosion, thus reduce pollutants input ; green "flood

protection measures“ improve hydromorphology/structure of the river banks and in this way improve water and habitat quality in the flood plain; restoration of groundwater related ecosystems (to increase retention capacity) have benefits for ecology; the restriction of urban development in flood plains will have positive impact on aquatic ecosystems.
Examples of negative effects: technical flood protection infrastructure, e.g. dikes, can have negative impacts on ecological status of water bodies, including the related ecosystems and species ; weirs and dams built to support flood protection are barriers for migrating species ; flood protection through natural floodplains for example can be seen as an ecosystem service promoted by the directive. Also all ecosystem services linked to natural water retention can be seen as indirectly promoted by the directive. This includes for example removal of pollutants through infiltration in soil, groundwater recharge, climate regulation, etc.

**Drivers**

There is no definition of drivers in the directive.
Floods as such are a natural process, and there is no direct (human) driver behind. However, assuming that flood frequency and importance increase with climate change, activities accelerating climate change can be seen as drivers for floods.
Furthermore, and more relevant for the implementation of the FD, some drivers are increasing the risk of damages caused by floods. This includes for example house construction in floodplains, urbanisation increasing soil sealing, agriculture/forestry (e.g. practices increasing erosion), or navigation (canalisation).

**Pressures**

There is no definition of pressures in the directive. Pressures indirectly addressed are for example hydromorphological alterations (e.g. abstractions (pumping), modification of floodplains, canalisation of rivers) or reduced infiltration.

**Assessment of Environmental State**

The characterisation of the flood risk of an area could be interpreted as a kind of characterisation of the environmental state.
The (preliminary) flood risk assessment shall take into account in particular past flood events (including flood extent and conveyance routes and an assessment of the adverse impacts they have entailed) as well as “an assessment of the potential adverse consequences of future floods for human health, the environment, cultural heritage and economic activity, taking into account as far as possible issues such as the topography, the position of watercourses and their general hydrological and geomorphological characteristics, including floodplains as natural retention areas, the effectiveness of existing man-made flood defence infrastructures, the position of populated areas, areas of economic activity and long-term developments including impacts of climate change on the occurrence of floods”. (Art. 4)
Indicators to be informed in flood hazard maps are listed under question 9.

**Data**

Art. 11 (FD) foresees that the Commission may adopt technical formats for the purpose of processing and transmission of data, including statistical and cartographic data, to the Commission. However, an informal arrangement in the form of Reporting sheets and a voluntary commitment of MS to submit this information to WISE has been chosen (CIS guidance no. 29).
Guidance for reporting under the Floods Directive is given through the CIS guidance document no. 29. It provides a compilation of reporting sheets adopted by Water Directors and includes sections from the “Floods Directive 2007/60/EC: Concept paper on Reporting and compliance checking", which was endorsed by Water Directors in November 2009.
Reporting requirements in the FD are going back to the following articles: Art. 3 (Competent Authority and Units of Management); Art. 4 and 5 (Preliminary Flood Risk Assessment); Art. 6 (Flood Hazard Maps and Flood Risk Maps); Art. 7 and 8 (Flood Risk Management Plans); Art. 15.

According to Art. 6 (FD), flood hazard maps for example shall show for the different flood scenarios the following information: the flood extent; water depths or water level; where appropriate, the flow velocity or the relevant water flow; the indicative number of inhabitants potentially affected; type of economic activity of the area potentially affected; IPPC relevant installations which might cause accidental pollution in case of flooding; potentially affected protected areas identified in Annex IV(1)(i), (iii) and (v) to Directive 2000/60/EC; other information which MS consider useful.

Reporting sheets have been translated to electronic reporting schemas. More information on the reporting schemas can be obtained from the Floods Directive reporting resources webpage, which includes several support files for the Floods Directive reporting.

Several supporting documents, tools and services facilitate the workflow for electronic Floods Directive reporting under WISE: Document No.1: Floods Directive reporting: User manual; Document No.2: Floods Directive reporting: User Guide to the reporting schema; Document No.3: Floods Directive reporting: User Guide to reporting spatial data; Document No.4: Guidance on reporting for FHRM of spatial information.

The document "Floods Directive reporting. A user guide for electronic reporting" (document 1) includes background information on reporting tools and QA/QC validation rules for reporting under Art. 3 (Competent Authority and Unit of Management), Art. 4 and 5 (Preliminary Flood Risk Assessment) and Art. 13 (Availability of transitional measures).

To facilitate the submission of information according to the schemas to WISE, the following tools have been developed: Access database (back-end). This complements the schemas and organizes the information into database tables. The database allows for manual entry, but also bulk data import can be used, depending upon the skill and the needs of the user; Access database (front-end). The front-end of the Access database is a user interface that also complements the schemas and organises the information into the back-end database tables. The front-end user interface only allows for manual entry and is only developed for the reporting of the CA (Competent Authority) and UoM (Unit of Management); XML Conversion tool which generates the schemas from the Access database; QA/QC rules help ensure the information is filled out correctly. The QA/QC is run from ReportNet and a Desktop validation tool. The document "User Guide to the Floods Reporting Schema" (Document No. 2) provides background information on the general issues in the schemas, the common schema and the key elements for reporting under Art. 3 (CA and UoM) and Art. 4 and 5 (PFRA).

The document "Support for reporting of Floods Directive. Guidance on reporting of spatial Data" (Document No. 3) provides a short guidance in the preparation and reporting of geographic data under the Floods Directive (FD) focusing on spatial information data to be provided for Art. 3 (CA and UoM) and Art. 4 and 5 (PFRA).According to Art. 6 of the Floods Directive, Member States shall produce flood mapping according to some minimum recommendations which are summarized in support Document No. 4 on "Reporting of spatial data for the Floods Directive (Part II). Guidance on reporting for flood risk and hazard maps of spatial information". This document aims at providing guidance on the visualisation of the information to be shown on the flood maps, providing a technical framework for the setting up of Member State flood maps on national servers (INSPIRE) and describing how the information and maps will be used. Furthermore, the document "CIS Guidance Document No. 22: Updated Guidance on Implementing the Geographical Information System (GIS) Elements of the EU Water policy", shall be taken into account for reporting purposes. Templates for shape file(s) are available for the purpose of reporting of the Floods Directive. Floods Directive data reported trough ReportNet is visualised in the Floods Directive Viewer on WISE.

**Funding**

Under the Solidarity Fund it is possible to grant rapid financial assistance in the event of a major

disaster to help the people, natural zones, regions and countries concerned to return to conditions that are as normal as possible. However the Fund may only intervene for emergency operations, and not for the phases preceding an emergency. (Preamble of the FD) The text of the FD makes reference to the cost recovery principle of the WFD: "Directive 2000/60/EC provides for cost recovery in Art. 9." (Preamble FD)

The communication on flood risk management from 2004 specifies that the "Structural Funds, in particular the European Regional Development Fund, and the Cohesion Fund can fund preventive (infrastructure) investments including for flood protection. The European Regional Development Fund can also contribute to financing infrastructure related research and technological development." Furthermore, the "INTERREG initiative under the European Regional Development Fund, has supported improved cross-border cooperation on flood protection".

National funds are the most important source of funding for flood risk management (FRM) measures. Agricultural flood-relevant Natural Water Retention Measures (NWRM) can be financed by the European Agricultural Fund for Rural Development (EAFRD), and hence under the Rural Development Programme (RDP – Pillar 2 of the CAP). The following table lists the articles of the Rural Development Regulation with relevance for NWRM implementation and gives examples of NWRM included in actions eligible for funding (CIS WG Agriculture, 2014)

| Rural Development Regulation – Articles | Examples of NWRM included in actions eligible for funding |
|---|---|
| Art. 17 – Investments in physical assets | Artificial wetlands for treatment and reuse of waste water; Reconnection of floodplains; Creation of natural banks; Re-meandering of rivers; Pond restoration and creation; Restoration of terraces |
| Art. 18 – Restoring agricultural production potential damaged by natural disasters and catastrophic events, and introduction of appropriate prevention actions | Flood prevention measures (e.g. afforestation upland to prevent erosion) |
| Art. 22 – Afforestation and creation of woodlands | Establishment of forests and their maintenance – if done in the right place with the right species can maintain stable water tables, protect and improve water quality, and slow down flows (reduce flash floods; Targeted woodland creation to improve water quality and flood alleviation, eg, afforestation of montane areas, of reservoir catchments, of riparian areas, and targeted planting in Mediterranean areas for catching precipitation; Plant tree shelter belts on slopes; Preserve or re-establish native trees along river margins/buffers |
| Art. 23 – Establishment of agro-forestry systems | Establishment of agro-forestry systems in agricultural land and corresponding infrastructures – if done in the right place with the right species can maintain stable water tables, protect and improve water quality and slow down flash floods. |
| Art. 28 – Agri-environment-climate | Wetland creation, restoration and management; Restoration/management/protection of sediment capture ponds; Riparian buffer strips (with vegetation or woodland); Riparian trees in agricultural landscapes; Soil management practices, tillage methods, diversified crop rotations and patterns, catch crops, cover crops, winter cover crops, nitrogen fixing crops, choice of drought tolerant species or varieties; Planting hedgerows; reintroducing/maintaining terraces |
| Art. 30 – Natura 200 and Water Framework Directive payments | Large buffers, wetlands, conversion of arable to forestry/extensive grassland |

In the current programming period of the LIFE+ programme, funding has been introduced for

integrated projects. Within those, funding can be granted to RBMPs, Natura 2000 networks and cross-border flood protection strategies.

# 3.7 Drinking Water Directive

Author: Anne-Laurence Agenais, ACTeon

Reviewer: Verena Mattheiß, ACTeon; Josselin Rouillard, Ecologic Institute

| Drinking Water Directive |
|---|
| **Name/Type of the Legal Act or Policy** |
| DWD, Drinking Water Directive, Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption<br>One motivation of the DWD was to adapt the Council Directive 80/778/EEC relating to the quality of water intended for human consumption to scientific and technological progress. That Directive does not apply anymore and a correlation table between articles of DWD and articles of previous directive 80/778/EEC is set out in Annex V of the DWD. |
| **Entry into force** |
| 12/1998 |
| **Departments/Units in charge** |
| DG ENV + DG ENRG, DG SANCO, DG ENTR |
| **Common Implementation strategy (CIS processes)** |
| Revision of technical annexes: The Commission worked in close consultation with Member States, experts and stakeholders on a revised text for Annexes II and III. The amendments will give in the future an opportunity to monitor drinking water parameters at more appropriate frequencies (adaptation of Annexes to scientific and technical progress). It will be adopted later in 2015 by the Commission, provided there are no objections from Council and Parliament. It will enter into application after a transposition period of 24 months in 2017."<br>The group constituted by Commission, Member States and Joint Research Centre, working on the aspects above mentioned is called Drinking Water Committee.<br>Drinking water aspects are furthermore treated in different CIS working groups of the WFD. For example, the CIS Work Programme 2013-2015 mentions that coordination with the implementation of other water-related Directives (among which Drinking Water Directive) has improved, and two working groups of the Water status Cluster have tasks that aim at ensuring coordination between both directives (Working group Chemicals (Surface Water Chemical Status and Monitoring): "Ensuring coherence and consistency in risk management approaches under other legislation" and Working Group Groundwater: "Drinking water – better integration in River Basin Planning and Management. Risk assessment in the catchment area (contributing to water safety plans), monitoring and data access/exchange in collaboration with Drinking Water Committee"). WFD CIS Guidance Document No. 16 on Groundwater in Drinking Protected Areas is also representative of the attention paid to the interrelation between WFD implementation and DWD implementation or revision. |
| **Administrative body handling implementation in MS** |
| In most cases, but depending on countries, it is either the Ministry of Health (France, Italy, Austria), either the Ministry of environment (Belgium, Germany, Ireland) which dealt with the implementation of the DWD. Some countries have delegated the monitoring of the quality of water required by the DWD to independent authorities (drinking water inspectorate in UK), or at regional scale (Health Regional Agencies in France). |
| **Main Objective** |
| "The objective of this Directive shall be to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and |

clean." (Art. 1)

**Principles included in the legal text**

Precautionary principle (to set parametric values that would ensure that water intended for human consumption can be consumed safely on a life-long basis)

**Other objectives/Key concepts/key elements of the legislation**

Key principles laid in the DWD are:

- Planning – Member States have the obligation to establish water supply zones and adequate monitoring programmes in accordance with the minimum requirements set in the Directive.
- Regulation – Member States are required to take all necessary measures to ensure that the water intended for human consumption is wholesome and clean.
- Monitoring – Member States have the obligation to ensure that regular monitoring of the quality of water is carried out in order to check that the water available to consumers meets the requirements of the Drinking Water Directive (48 microbiological, chemical and indicator parameters must be tested regularly).
- Information and Reporting – The Directive also requires providing regular information to consumers (on meeting quality standards, remedial action and restriction in use, exemptions and derogations). In addition, drinking water quality has to be reported to the European Commission every three years. After each reporting cycle the Commission produces a synthesis report, which summarizes the quality of drinking water and its improvement at a European level.

**Terminology**

(Art. 2) 'water intended for human consumption' shall mean: a) all water either in its original state or after treatment, intended for drinking, cooking, food preparation or other domestic purposes, regardless of its origin and whether it is supplied from a distribution network, from a tanker, or in bottles or containers; b) all water used in any food-production undertaking for the manufacture, processing, preservation or marketing of products or substances intended for human consumption unless the competent national authorities are satisfied that the quality of the water cannot affect the wholesomeness of the foodstuff in its finished form.

'domestic distribution system' shall mean the pipe work, fittings and appliances which are installed between the taps that are normally used for human consumption and the distribution network but only if they are not the responsibility of the water supplier, in its capacity as a water supplier, according to the relevant national law.

**Derogations**

Member States may, for a limited time depart from chemical quality standards specified in the Directive. This process is called "derogation". Derogations can be granted, provided it does not constitute a potential danger to human health and provided that the supply of water intended for human consumption in the area concerned cannot be maintained by any other reasonable means. As a rule, two derogations are allowed by the Directive; each of them limited in time to a maximum of three years.

**Types of management measures**

In addition to monitoring and consumer information, no major types of measures are described in the Directive to ensure a wholesome and clean drinking water. However, they may include measures for reducing pollution on water bodies, water protection and remedial actions (measures of water treatment). In case of failure to meet the parametric values, restrictions in use must be applied. An example for consumer information is the website where all the results about drinking water quality by municipality are given with frequent updates.

**Reporting units – what are the specific transposition requirements**

Reporting to the Commission is done at member state level. Each report shall include, as a minimum, all individual supplies of water exceeding 1 000 $m^3$ a day as an average or serving more

than 5 000 persons. (Art. 13)

**Management unit**

The DWD applies to: all distribution systems serving more than 50 people or supplying more than 10 cubic meter per day, but also distribution systems serving less than 50 people/supplying less than 10 cubic meter per day if the water is supplied as part of an economic activity; drinking water from tankers; drinking water in bottles or containers; water used in the food-processing industry, unless the competent national authorities are satisfied that the quality of the water cannot affect the wholesomeness of the foodstuff in its finished form.

The Drinking Water Directive doesn't apply to: natural mineral waters recognised as such by the competent national authorities; and waters which are medicinal products.

**Key planning steps**

The DWD doesn't clearly prescribed key steps in its text. However key steps for its implementation are implied in the regulations themselves: establishment of appropriate monitoring programmes by the competent authorities for all water intended for human consumption (Art. 7.2); adoption of measures to limit water pollution when possible and if not sufficient, application of the necessary remedial actions to restore water quality; information of consumers on water quality standards met, and if parametric values are not met information of consumers about restrictions in use; reporting on the quality of water intended for human consumption, destined for consumers and the Commission.

**Timelines**

For the 15 Member States which were part of the EU before 2004 (EU-15):

November 2003: In accordance with the provisions of Art. 14 of the Directive, Member States would have taken the measures necessary to ensure that the quality of water intended for human consumption complies with the Directive.

November 2008: The Directive provides for a separate conformity deadline for bromate and trihalomethans.

November 2013: The Directive provides for a separate conformity deadline for lead.

For the 12 Member States which joined the EU in 2004, 2007 and 2013: New Member States had to comply with the Directive by the day of accession unless specific implementation deadlines were laid down in the Accession Treaties. Transitional periods are provided for CZ, EE, CY, LV, LT, HU, MT, PL, SI, and SK.

The first report should cover the years 2002, 2003 and 2004 and be published within one calendar year of the end of the reporting period. (Art. 13) Embedded in the DWD is the need to assess a possible review of the Annexes I, II and III at least every five years (art 11).

**Integration/coordination issues with other related pieces of legislation**

Synergies mainly concerned regulations on phytosanitary/chemical products and their possible impact on water quality (interdiction of products, conditions of use, etc.) or regulations on water bodies' protection. The WFD complements the Drinking Water Directive requirements by establishing safeguard zones where water for human consumption is abstracted. Drinking water is thus protected at source where it is abstracted until delivery at the tap. *(source: WISE - Water Note 9 - Linking all EU water legislation within a single framework, 2008, DG ENV)*

Linked documents in EUR-Lex: Based on this Directive: Thematic strategy on the sustainable use of pesticides (European Parliament resolution of 2007)

Cited in this Directive: Directive concerning the placing of biocidal products on the market (98/8/EC); Council Directive concerning the placing of plant protection products on the market (91/414/EEC); others documents but not concerning environment, as construction products, exploitation and marketing of natural mineral waters, proprietary medicinal products.

Mentioning this directive: Water Framework Directive (2000/60/EC); Directive on the protection of groundwater against pollution and deterioration (2006/118/EC); Regulation concerning the

making available on the market and use of biocidal products (528/2012); others directive or regulations but concerning water intended for human consumption.
Moreover, implementation of Nitrates Directive and Urban Waste Water Directive contributes to attain objectives of the DWD by developing measures to respect the parametric values for nitrates in water bodies and for pollutants in waste water discharged.

**Coordination issues with the EU Biodiversity Strategy**

There is no direct effect of DWD on EU Biodiversity Strategy. An indirect effect could be the following: the goal of clean and wholesome water provided for human consumption could be attained, among other measures, through maintaining and restoring ecosystems services (Biodiversity Strategy – Target 2).

**Relevance to ecosystems/habitats?**

Freshwater and groundwater bodies (rivers, lakes and wetlands in the MEA's classification) where water is abstracted and intended for human consumption, because they need to be protected and/or monitored to ensure a safe and clean quality. In an indirect way, protection zones around abstraction points could also be affected, but concerned measures are in fact included in WFD and not DWD. Agricultural plots (croplands in the MEA's classification) could also be indirectly affected because of regulations on phytosanitary products necessitated to respect DWD goals. As mentioned above, aquatic biodiversity could be impacted in water bodies where water is abstracted and intended for human consumption. The impact would rather be positive as the goal is to improve water quality. To some extent, clean water (or contribution to cleaner water) could also be seen as an ecosystem service provided by aquatic biodiversity. This ecosystem service goes along with a lower use of water treatments and/or remedial actions.

**Drivers**

Drivers implicitly addressed by the DWD are domestic distribution system managers and food industries using water that affect the wholesomeness of the foodstuff. (Plus indirectly farmers, waste water treatment managers, industries polluting water, etc.)

**Pressures**

Pressures indirectly addressed in the DWD are pollution (with an objective to reduce it to attain water quality standards), and abstraction (with a requirement to monitor quality of water supplied and thus abstracted).

**Assessment of Environmental State**

Chemical and microbiological states are addressed in the DWD. Physical state is also partly addressed through indicators as colour, odour, and taste. 48 parameters (chemical, microbiological, indicator) to be monitored. 48 indicators defining parametric values for chemical, microbiological and indicator parameters, quantified in concentration in water (mg/ml, nb/ml, etc.). Annexes 2 and 3 specify monitoring requirements and methods of analysis for some parameters. Parameters and indicators are defined in the Annex 1 of the Directive, which is amended every five years by the Commission to take into account scientific and technical progress.

**Assessment of Status**

Status is addressed as clean and wholesome if parameters meet the parametric values defined by the Directive.

**Data**

Currently, data reporting for the period 2011-2013 is ongoing. The EC adopted in 2014 a Synthesis Report on the Quality of Drinking Water in the EU examining the Member States' reports for the period 2008-2010. As referred to in the synthesis report, technical reports which contain detailed fact sheets per Member State are also available.

**Funding**

The European Regional Development Fund (ERDF) can co-finance actions and infrastructures in the

specific sector of drinking water, and thus participate to the DWD implementation. The cost recovery principle of the Water Framework Directive foresees that costs of water services (including the provision of drinking water) are covered by the users. Although not questioned in the current DWD, the difference of costs and benefits between measures that rectify the pollution causes at source and remedial actions is a key point of DWD funding.

**Other issues to be aware of relevant for AQUACROSS?**

An evaluation of the directive is currently carried out and will be followed by an impact assessment (environmental, social and economic) of different policy options foreseen for the revision of the directive → www.safe2drink.eu/. Questioning future DWD policy options and the links with other water directives (WFD, UWWTD, etc.), EC plans to consider internally the scope of each of them and their interrelation.

# 3.8 Bathing Water Directive

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## Bathing Water Directive

**Name/Type of the Legal Act or Policy**

BWD, Bathing Water Directive, Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC

Amending acts:1) Regulation (EC) No 596/2009 ; 2) Directive 2013/64/EU

It replaces Directive 76/160/CEE of 1976. Among the changes, new bacteria in the water are measured: E. coli and intestinal enterococci, which are indicators of bacteria in bathing water.

Preceding Communication: Commission Proposal COM (2002) 581 Final: Proposed Directive of the European Parliament and the Council concerning the quality of bathing water (24.12.02).

**Entry into force**

24th March 2006

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**Common Implementation strategy (CIS processes)**

There is a Bathing Water Committee. Art. 16.1 states "The Commission shall be assisted by a committee". Following a workshop on bathing water profiles (Namur, 27-28 June 2007), the Regulatory Committee under the Bathing Water Directive in its meeting of 26 November 2007 discussed the findings of this workshop and agreed to create a working group to develop a document reflecting best knowledge and practice on bathing water profiles (Report on Bathing Water Profiles, 2009). It might not exist anymore as there is no more information on its activities.

There is a Commission Expert Group on the Implementation of the Bathing Water Directive (2006/7/EC) (E02936) which is still active. The informal Expert Group on the Implementation of the Bathing Water Directive provides advice and expertise to the Commission and its services in relation to the implementation of the latter Directive. Contact: ENV-C02-ARES@ec.europa.eu or ENV-WATER@ec.europa.eu

CIS work programme 2013-2015: Work on BWD has been integrated in the new structure as one theme of the Water Management group.

CIS guidance document n° 23 - "Eutrophication Assessment in the Context of European Water Policies": while the old Bathing Waters Directive (76/160/EEC) does not require a direct assessment of eutrophication (rather, the monitoring of several parameters relevant to the assessment of eutrophication), the new one requires bathing water profiles to be established -

when the bathing water profile indicates a tendency for proliferation of macro-algae and/or marine phytoplankton, investigations shall be undertaken to determine their acceptability and health risks and adequate management measures shall be taken, including information to the public.

**Administrative body handling implementation in MS**

In France, the water and biodiversity and risk prevention divisions of the Ministry of Ecology, Sustainable Development and Energy are responsible for the elaboration and transmission to the European Commission of the national implementation reports, contributing to the Water Information System for Europe (WISE). The water and biodiversity division is assisted by the ONEMA (National Agency for Water and Aquatic Environments) for data collection. A national reporting system is set up with a basin coordination group responsible for the collection of data from competent authorities. The Observation and statistics department of the Sustainable development division of the ministry of Ecology also contributes to data collection.

In the UK, the Environment Agency is responsible for monitoring water quality. The Environment Agency has developed a system to give a daily assessment of the water quality risk at a number of bathing waters. Sites covered by the system can be found on the tool: Bathing Water Data Explorer. Anyone can recommend that a bathing water should be designated or de-designated. Local councils are required to provide public information showing that the area is a bathing water and giving information about water quality and potential pollution sources. "The revised Directive poses a number of challenges for Department of Environment Food and Rural Affairs (Defra), the Environment Agency, local authorities and beach operators. It aims to set more stringent water quality standards and also puts a stronger emphasis on beach management and public information."

In Germany, the Länder are responsible for the enforcement of the legal provisions, i. e. for the designation and monitoring of EU bathing waters. They publish information on bathing water quality on the internet (information points/Auskunftsstellen). More information is also provided on the relevant health authorities of the counties and municipalities.

**Main Objective**

Art. 1.2. "The purpose of this Directive is to preserve, protect and improve the quality of the environment and to protect human health by complementing Directive 2000/60/EC."

Report on Bathing Water Profiles (2009): "The main objective of the 2006/7/EC bathing water Directive is to reduce gastroenteritis and other waterborne health risks."

**Principles included in the legal text**

Preamble (12): "Since the objectives of this Directive, namely the attainment by the Member States, on the basis of common standards, of a good bathing water quality and a high level of protection throughout the Community, cannot be sufficiently achieved by the Member States and can be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Art. 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve those objectives"

**Other objectives/Key concepts/key elements of the legislation**

It requires Members States to monitor and assess the bathing water for at least two parameters of (faecal) bacteria. In addition, they must inform the public about bathing water quality and beach management, through the so-called bathing water profiles. These profiles contain for instance information on the kind of pollution and sources that affect the quality of the bathing water and are a risk to bathers' health. In this light, the Commission introduced a symbol on bathing water classification in 2011.

**Terminology**

A key term concerns "bathing waters", which are to be considered as "any element of surface

water where the competent authority expects a large number of people to bathe and has not imposed a permanent bathing prohibition, or issued permanent advice against bathing" (Art. 1.3)
Also, 'pollution' means the presence of microbiological contamination or other organisms or waste affecting bathing water quality and presenting a risk to bathers' health as referred to in Art. 8 and 9 and Annex I, column A" (Bathing Water Profiles report)
'Poor, sufficient, good and excellent quality': please refer to Annex II for definitions. Example: Bathing waters are to be classified as 'poor' if, in the set of bathing water quality data for the last assessment period, the percentile values for microbiological enumerations are worse than the 'sufficient' values set out in Annex I, column D.
Other definitions are included in Art. 2 (namely: "competent authority", "permanent", "large number", "bathing season", "management measures", "short-term pollution", "abnormal situation", "set of bathing water quality data", "bathing water quality assessment", "cyanobacterial proliferation", "public concerned", 'surface water', 'groundwater', 'inland water', 'transitional waters', 'coastal water' and 'river basin').

**Derogations**

There are no derogations to the Directive. Directive 2006/7/EC repeals Directive 76/160/EEC. A major change concerns the number of parameters for analysis used to monitor and assess the quality of bathing waters and to classify them, i.e. two (intestinal enterococci and escherichia coli) instead of nineteen. Other parameters could be taken into account, such as the presence of cyanobacteria or microalgae.

**Types of management measures**

Each year, the Member States shall identify the bathing waters in their territory and define the length of the bathing season. They shall establish monitoring at the location most used by bathers or where the risk of pollution is greatest. Monitoring shall take place by means of sampling: four samples, including one before the start of the bathing season; three samples only if the seasons does not exceed eight weeks or if the region is subject to special geographical constraints. Member States shall communicate the results of their monitoring to the Commission with a description of the water quality management measures. Monitoring may be suspended exceptionally once the Commission has been informed. Water quality is assessed on the basis of microbiological data defined according to the parameters described in Annex I. Member States shall then establish a classification of waters of poor, sufficient, good or excellent quality. This classification shall comply with the criteria set out in Annex II. All bathing waters in the EU must be at least of sufficient quality by the end of the 2015 bathing season. Furthermore, Member States are to take the necessary measures to improve the number of bathing waters of good or excellent quality. If quality is poor, Member States shall adopt the necessary measures to manage and eliminate pollution, and to protect and inform bathers.
The Directive provides for profiles to be established to identify possible pollution, for one or more than one contiguous bathing waters. In particular, they comprise an assessment of:the physical, geographical and hydrological characteristics of the bathing water and of other surface waters in the catchment area; pollution and sources thereof; management measures.These profiles must be established by 24 March 2011. Member States shall adopt exceptional measures if unexpected situations deteriorate the quality of waters or represent a risk to bathers' health. According to Art. 7, "Such measures shall include information to the public and, if necessary, a temporary bathing prohibition."
Appropriate monitoring must also be implemented if there is a risk of proliferation of algae. The authorities responsible must therefore: take management measures and provide information immediately if a proliferation of cyanobacteria (or blue algae) occurs; assess the health risks if there is a proliferation of macro-algae and/or marine phytoplankton. In short : 'management measures' means the following measures undertaken with respect to bathing water: (a)

establishing and maintaining a bathing water profile; (b) establishing a monitoring calendar; (c) monitoring bathing water; (d) assessing bathing water quality; (e) classifying bathing water; (f) identifying and assessing causes of pollution that might affect bathing waters and impair bathers' health; (g) giving information to the public; (h) taking action to prevent bathers' exposure to pollution; (i) taking action to reduce the risk of pollution;

**Spatial coverage**

The Directive applies to surface waters that can be used for bathing except for swimming pools and spa pools, confined waters subject to treatment or used for therapeutic purposes and confined waters artificially separated from surface water and groundwater. Bathing waters include inland, coastal and transitional waters.

**Reporting units – what are the specific transposition requirements**

Member States must monitor the bathing waters every year. Member States should also prepare a description of bathing waters and the potential impacts and threats to water quality, both as an information for citizens and as a management tool for the responsible authorities, through the so-called bathing water profiles. They could include in particular a description of the area concerned, any sources of pollution and the location of the water monitoring points. Every year the Commission publishes a summary report on the quality of bathing water, based on the reports that the Member States should submit to it before the start of each bathing season. At present, the Commission and the European Environment Agency publish an EU-wide report covering all 28 Member States, both in a paper and online version. Reports on individual Member States, the so-called national country reports, are also available online.

**Management unit**

Bathing waters (see definition above). Member States shall annually identify all bathing waters and define the length of the bathing season (Art. 3).There are differing quality criteria between inland waters and coastal waters and transitional waters (Annex I of the Directive).

**Key planning steps**

Monitoring (Art. 3): Member States shall annually identify all bathing waters and define the length of the bathing season. They shall define monitoring points, which are either where most bathers are expected or where the greatest risk of pollution is expected, according to the bathing water profile. A monitoring calendar for each bathing water shall be established before the start of each bathing season. It should provide for at least four samples to be taken per season (except where the season is very short or where there are special geographic constraints). Member States shall ensure that the analysis of bathing water quality takes place in accordance with the reference methods specified in Annex I and the rules set out in Annex V.

4 Bathing water quality assessment (Art. 4): Member States shall ensure that sets of bathing water quality data are compiled through the monitoring of the parameters set out in Annex I, column A. Sets of bathing water data used to carry out bathing water quality assessments shall always comprise at least 16 samples or, in the special circumstances referred to in Annex IV, paragraph 2, 12 samples.

5 Classification and quality status of bathing waters (Art. 5): The waters are classified according to their level of quality: poor, sufficient, good or excellent, linked to clear numerical quality standards for bacteriological quality. The category "sufficient" is the minimum quality threshold that all Member States should attain by the end of the 2015 season at the latest. Where water is classified as "poor", Member States should take certain management measures, e.g. banning bathing or posting a notice advising against it, providing information to the public, and suitable corrective measures.

6 Bathing water profiles (Art. 6) : Member States shall ensure that bathing water profiles are established in accordance with Annex III. Each bathing water profile may cover a single

bathing water or more than one contiguous bathing waters. These profiles describe the potential impacts and threats to water quality, both as an information for citizens and as a management tool for the responsible authorities.

7 Public participation is encouraged (especially related to the establishment, review and updating of lists of bathing waters). The Directive also ensures timely information of the public during the bathing season, with an obligation for Member States to disseminate actively and promptly information on bathing water quality (Art. 12). In particular, notices banning or advising against bathing should be rapidly and easily identifiable.

8 Reports (Art. 13): Member States shall provide the Commission with the results of the monitoring and with the bathing water quality assessment for each bathing water body, as well as with a description of significant management measures taken. Member States shall provide this information annually by 31 December in relation to the preceding bathing season. The Commission shall publish an annual summary report on bathing water quality in the Community, including bathing water classifications, conformity with this Directive and significant management measures undertaken. The Commission shall publish this report by 30 April every year, including via the Internet.

**Timelines**

By 2008: the Commission shall submit a report to the European Parliament and to the Council;
By 24 March 2008: Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive; Before 24 March 2008 : identification of all bathing waters and definition of length of bathing season in all MS (shall then be notified to the Commission annually, including the reason for any change compared to the preceding year); From the start of the fifth bathing season after 24 March 2008: information concerning bathing waters shall be disseminated to the public;
When monitoring of bathing water has started under this Directive: annual reporting to the Commission shall be made;
By 30 April every year: the Commission shall publish an annual summary report on bathing water quality in the Community, including bathing water classifications;
By 24 March 2010: The Commission shall present a draft of the measures to be taken with respect to information providance as to the current bathing water classification and any bathing prohibition or advice against bathing (indicated by a clear symbol);
By 24 March 2011: Bathing water profiles shall be established for the first time;
By the end of 2014: MS shall submit written observations to the Commission on that report including on the need for any further research or assessments which may be required to assist the Commission in its review of this Directive;
By the end of the 2015 bathing season: the first classification according to the requirements of this Directive shall be completed. All bathing waters must be at least “sufficient”;
No later than 2020: the Commission shall review this Directive with particular regard to the parameters for bathing water quality, including whether it would be appropriate to phase out the ‘sufficient’ classification or modify the applicable standards, and shall present if necessary appropriate legislative proposals in accordance with Art. 251 of the Treaty.
In the case of bathing waters classified as ‘good’, ‘sufficient’ or ‘poor’, the bathing water profile is to be reviewed regularly: at least every 4 years for ‘good’, 3 years for ‘sufficient’ and 2 years for ‘poor’.

**Integration/coordination issues with other related pieces of legislation**

Preamble (7) states : “In order to increase efficiency and wise use of resources, this Directive needs to be closely coordinated with other Community legislation on water, such as Council Directives 91/271/EEC of 21 May 1991 concerning urban waste-water treatment, 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from

agricultural sources and Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy." Synergies are made regarding definitions of 'surface water', 'groundwater', 'inland water', 'transitional waters', 'coastal water' and 'river basin' (they have the same meaning as in Directive 2000/60/EC). Also regarding the establishment, reviewing and updating of bathing water profiles, adequate use shall be made of data obtained from monitoring and assessments carried out pursuant to Directive 2000/60/EC (framework for Community action in the field of water policy) that are relevant for this Directive (Art. 6 and 13).

**Coordination issues with the EU Biodiversity Strategy**

In general, measures that help improve water quality and reduce pollutants can have a positive impact on Targets 2 and 4.

**Relevance to ecosystems/habitats?**

Surface water, groundwater, confined waters, inland water, transitional waters, coastal water, river basin. Note: The Directive focuses on surface waters (coastal and inland) where a large number of people is expected to bathe during touristic seasons. Aquatic ecosystems (inland waters, rivers, lakes, coastal and marine inlet waters, transitional waters) are therefore the main ones concerned, but the focus is on public health (as opposed to environmental protection for the sake of environmental protection). The Directive focuses on the presence of microbiological contamination or other organisms or waste affecting bathing water quality in order to protect bathers' health in priority. However, the context of spatial and temporal concentration of activities linked to bathing and other touristic activities (sports, food, etc.) represents a considerable pressure on the coasts and natural habitats. This aspect is not addressed by the Directive but it affects the quality of the water as well as ecosystems and aquatic biodiversity. Bathing can be considered as an ecosystem service (provision of recreational services). Data collected on the quality of water under this Directive can thus serve as an indicator for this ecosystem service. It has been analyzed that "managing coastal zones solely in terms of public health could have potentially negative consequences on a range of other social and cultural ecosystem services, e.g. recreation." (Quilliam RS, Kinzelman J, Brunner J and Oliver DM, "Resolving conflicts in public health protection and ecosystem service provision at designated bathing waters". J Environ Manage. 2015 Sep 15;161:237-42.)

**Drivers**

It is very much linked to the UWWTD drivers (wastewater discharges from industries and houses).
Water uses for bathing purposes are addressed but not as a driver for pollution; the effects of other drivers for the protection of bathers seem to be the focus (such as wastewater discharges). The Bathing Water Profiles must address the other drivers (including the identification and assessment of causes of pollution). The guidance on the elaboration of Bathing Water Profiles provides the following indicative list of sources of pollution and pollution routes: Wastewater treatments; Sewage overflow; wrong connections, untreated discharges; Scattered dwellings and touristic resorts discharges; Rainwater discharge; Road run-off; Slaughterhouses or manure processing plants; Cattle in the meadows (if so, what kind of cattle); Leaching of manure and manure run-off; Dairy farms with the possibility of yard run-off towards ditches; Agricultural hinterland; Rivers, ditches, canals (influence of connected waters from other watersheds, also e.g. via pumping stations or sluices/locks) etc.; Swirling and/or release of sediment, dredged sludge on sewage sludge; Recreational boating and charter shipping (untreated discharges); Inland shipping (untreated discharges); Houseboats; Bathers; Domestic animals on the beach; Birds colonies; Fauna (animals living in the wild), rats, etc.; Groundwaters inputs; Cooling water discharge; Industrial (e.g. agro-food industry) and discharges from mining.

**Pressures**

Pollution: the presence of microbiological contamination or other organisms or waste affecting

bathing water quality and presenting a risk to bathers' health.

**Assessment of Environmental State**

It assesses the quantity of microbiological elements (Intestinal enterococci; Escherichia coli) present in bathing water and sets restrictions. Appropriate measures must be taken to limit their presence to authorized levels and manage risks. This includes: surveillance, early warning systems and monitoring; prevention, reduction or elimination of the causes of pollution (Annex II). The guidance on the elaboration of Bathing Water Profiles recommends to consider the following: the influence of precipitation; climate data for the concerned Member State can be downloaded from various meteorological stations; a correlation may exist with heavy rain, sewer overflow or manure run-off, for example; the influence of the maximum temperature and the number of sun hours; there may be a correlation with recreational pressure; the influence of the direction of the wind; the periods (division in time) in which exceedances occur. Is this at the beginning of the bathing season, at the end of the season or is it different every year. There may be a correlation with ongoing activities in the surrounding area, the breeding season of birds or the spreading of manure, for example; has the area been transformed, which might explain the exceedances; bathing prohibitions (or advice against bathing); registration of complaints; bacteriological data, and also changes in the other bathing water parameters; numbers of visitors (influence of bathing); times of sampling/testing; all other bathing water parameters (water temperature, acidity, etc.). Indicators for inland waters:

| A | B | C | D | E |
|---|---|---|---|---|
| Parameter | Excellent quality | Good quality | Sufficient | Reference methods of analysis |
| Intestinal enterococci (cfu/100 ml) | 200 | 400 | 330 | ISO 7899-1 or ISO 7899-2 |
| Escherichia coli (cfu/100 ml) | 500 | 1000 | 900 | ISO 9308-3 or ISO 9308-1 |

For coastal waters and transitional waters:

| A | B | C | D | E |
|---|---|---|---|---|
| Parameter | Excellent quality | Good quality | Sufficient | Reference methods of analysis |
| Intestinal enterococci (cfu/100 ml) | 100 | 200 | 185 | ISO 7899-1 or ISO 7899-2 |
| Escherichia coli (cfu/100 ml) | 250 | 500 | 500 | ISO 9308-3 or ISO 9308-1 |

**Assessment of Status**

It assesses the quantity of microbiological elements (Intestinal enterococci; Escherichia coli) present in bathing water and sets restrictions. Appropriate measures must be taken to limit their presence to authorized levels and manage risks. This includes: surveillance, early warning systems and monitoring; prevention, reduction or elimination of the causes of pollution (Annex II). Sufficient quality (with associated limits in the amounts of microbiological presence) as a reference for the assessment. Annex I of the Directive. Waters are classified according to their quality levels: excellent, good, sufficient or poor/non-compliant. Notices banning or advising against bathing should be rapidly and easily identifiable. The Commission adopted on the 27 May 2011 a decision establishing a symbol for information to the public on bathing water classification and any bathing prohibition.

**Data**

The state of bathing waters is shown in EEA's interactive map. The map shows monitoring locations and quality of bathing water from 2004 until 2014.The last compliance report (2014) also includes some data.

**Funding**

*No information found at the European level.*

In France, Water Agencies (Agences de l'eau) provide funds for local authorities to establish the water profiles of their bathing waters. Department councils (conseil départemental) also had complementary funds – however this may evolve with coming institutional and regulatory reforms.

# 3.9 Urban Waste Water Directive

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## Urban Waste Water Directive

**Name/Type of the Legal Act or Policy**

Urban Waste Water Directive (UWWT Directive), Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment

To clarify the requirements of the Directive in relation to discharges from urban waste water treatment plants to sensitive areas which are subject to eutrophication, Directive 98/15/EC amending Directive 91/271/EEC was adopted. It had the effect of amending Table 2 of Annex I.

Commission Decision 2014/431/EU was adopted on 26 June 2014 and replaces the Commission Decision 93/481/EEC on 28 July 1993. It defines the information that Member States should provide the Commission when reporting on the state of implementation of the Directive according to Art. 17, and specifies the format in which the information should be provided. This Decision was adopted in accordance with Art. 18 of the Directive.

Concerning its implementation: Report from the Commission - Implementation of Council Directive 91/271/EEC of 21 May 1991 concerning urban wastewater treatment, as amended by Commission Directive 98/15/EC of 27 February 1998 - Summary of the measures implemented by the Member States and assessment of the information received pursuant to Art. 17 and 13 of the Directive (COM(98) 775 final of 15.1.1999). Commission Report - Implementation of Council Directive 91/271/EEC of 21 May 1991 concerning urban wastewater treatment, as amended by Commission Directive 98/15/EC of 27 February 1998 (COM(2001) 685 final of 21.11.2001). Report from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions:- Implementation of Council Directive 91/271/EEC of 21 May 1991 concerning urban wastewater treatment, as amended by Commission Directive 98/15/EC of 27 February 1998 (COM(2004) 248final of 23.4.2004). Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Seventh report on the implementation of the Urban Waste Water Treatment Directive (91/271/EEC) (COM(2013) 574 final of 7.8.2013). Commission Staff Working Document - Accompanying document to the Communication from the Commission to the European Parliament and the Council - 'Towards Sustainable Water Management in the European Union' - First stage in the implementation of the Water Framework Directive 2000/60/EC [COM(2007) 128 final] [SEC(2007) 363] (SEC(2007) 362 final of 22.3.2007). Commission Staff Working Document - 5th Commission Summary on the Implementation of the Urban Waste Water Treatment Directive (SEC(2009) 1114 final of 3.8.2009). Commission Staff Working Document - 6th Commission Summary on the Implementation of the Urban Waste Water Treatment Directive (SEC(2011) 1561 final of 7.12.2011).

**Entry into force**

19 June 1991

**Departments/Units in charge**

DG ENV, Dir. C Quality of Life, Water & Air, 1. Water
Mr MISIGA Pavel
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**Common Implementation strategy (CIS processes)**

There is a UWWTD-REP Working Group which has produced the Guidance document "Terms and Definitions of the Urban Waste Water Treatment Directive" used to assist the reporting process. However, it seems that this WG is no longer active as no other documents seem to have been produced. The Directive's Preamble states that a "Committee should be established to assist the Commission on matters relating to the implementation of this Directive and to its adaptation to technical progress." Art. 18 states that the Committee shall be "composed of the representatives of the Member States and chaired by the representative of the Commission".

CIS guidance document n° 23 – "Eutrophication Assessment in the Context of European Water Policies": The UWWT Directive does not specify any methods or guideline values for assessing eutrophication. The guidance document specifies some criteria used by Member States to assess eutrophication and cites relevant case law (decision number C-280/02, ECJ judgement on 23/09/2004 vs. France) related to the breach of the Directive requirements in relation to non-designation of sensitive areas and lack of infrastructure for 130 agglomerations discharging into sensitive areas. The ruling addresses the following points: Broader interpretation of purposes of Directive 91/271/EEC; Important guidance on component parts of definition of "eutrophication" ; Need to decouple duty to designate sensitive areas from whether or not agglomerations with more than 10 000 population equivalents exist in catchment.

CIS work programme 2013-2015: work on UWWD has been integrated in the new structure as one theme of the Water Management group.

**Administrative body handling implementation in MS**

*French Implementation of the Urban Waste Water Directive:* The ministry of Ecology is responsible for the implementation of the second national action plan (2012-2018) for the upgrading of wastewater treatment in metropolitan areas, adopted in 2011. It aims at pursuing the implementation of European directives on water and to integrate wastewater treatment in a sustainable development logic. It comes with financial, organizational and communication measures. It is implemented in partnership with ONEMA (The French National Agency for Water and Aquatic Environments) and the water agencies.

Municipalities are required to collect waste water rejected by households or companies authorized to reject into the collective network, and to treat them before their release into nature.

*UK Implementation of the Urban Waste Water Directive:* The Environment Agency, the Northern Ireland Environment Agency and the Scottish Environment Protection Agency and Wales Environment Agency are the UK's environmental regulators. Their regulation role covers continuous discharges from the water industry, other industrial sectors and private discharges as well as intermittent discharges, such as those from combined sewer overflows or emergency overflows. Typically, any discharge to controlled waters requires a discharge authorization which sets out standards for parameters monitored in effluent from treatment plants. The umbrella body for UK water supply and sewerage services providers is Water UK, representing all major statutory water and wastewater service supply organisations in England, Wales, Scotland and Northern Ireland. They work at national and European level for a strong water industry on behalf of their members and the interests of all of their stakeholders. On behalf of their members, they engage with Defra and with other government departments and with the principal UK regulatory bodies – including Ofwat, the Environment Agency, the Drinking Water Inspectorate and their equivalents in Scotland, Wales and Northern Ireland.

*Belgian Implementation of the Urban Waste Water Directive:* The implementation of the urban wastewater treatment directive is managed at a regional level in Belgium. For instance, the Brussels-Capital region is responsible for: flood risk management; collection and treatment of waste and storm water; status monitoring of surface waters and those collected in sewers; protection and development of underground and surface water. Usually, municipalities are responsible for drainage; Chartered sanitation agencies are responsible for the realization and

exploitation of sewage infrastructure collection; the Société Publique de Gestion de l'Eau (for the Walloon Region) coordinates actions of different operators and ensures the financing of collective sewage treatment, of priority drainage and of the protection of groundwater catchment facilities; the regional departments for the environment are in charge of delivering reviews of treated water discharges.

**Main Objective**

Art. 1: "The objective of the Directive is to protect the environment from the adverse effects of the abovementioned waste water discharges".

CIS guidance document n° 23: "The Urban Waste Water Treatment Directive (UWWT Directive) aims to protect the environment from adverse effects of urban waste water discharges and direct discharges from certain (food processing) industries. It sets treatment levels on the basis of the agglomeration size and the sensitivity of waters receiving the discharges."

**Principles included in the legal text**

There are no principles of law included within the legal text.However the judgements in the framework of the Directive's implementation have called upon the precautionary principle.

**Other objectives/Key concepts/key elements of the legislation**

Four main obligatory elements are laid down in the Directive: Planning; Regulation; Monitoring; Information and reporting

Specifically the Directive requires:

- The Collection and treatment of waste water in all agglomerations of >2000 population equivalents (p.e.);
- Secondary treatment of all discharges from agglomerations of > 2000 p.e., and more advanced treatment for agglomerations >10 000 population equivalents in designated sensitive areas and their catchments;
- A requirement for pre-authorisation of all discharges of urban wastewater, of discharges from the food-processing industry and of industrial discharges into urban wastewater collection systems;
- Monitoring of the performance of treatment plants and receiving waters; and
- Controls of sewage sludge disposal and re-use, and treated waste water re-use whenever it is appropriate.

**Terminology**

*Eutrophication:* refers to water becoming enriched by nutrients – like compounds of phosphorus and nitrogen – disrupting the water's balance of organisms and, in general, the quality of water.

*Secondary treatment:* waste water treatment by a process usually involving biological treatment (using aerobic bacteria, enzymes, etc.) with a secondary settlement or other process, which respects the directive's requirements in Annex I.

*Sensitive areas*: (i) water bodies at risk of eutrophication, (ii) surface waters for drinking containing more than 50 mg/litre of nitrates, and (iii) areas where further treatment is needed to comply with EU legislation on, for example, water, bathing water, shellfish waters and the conservation of habitats and birds.

*From the Directive:*

Criteria to define 'sensitive areas' (that require more stringent treatment before discharge) are included in Annex II of the Directive: "A water body must be identified as a sensitive area if it falls into one of the following groups : (a) natural freshwater lakes, other freshwater bodies, estuaries and coastal waters which are found to be eutrophic or which in the near future may become eutrophic if protective action is not taken […] (b) surface freshwaters intended for the abstraction of drinking water which could contain more than the concentration of nitrate laid down under the relevant provisions of Council Directive 75/440/EEC of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States if

action is not taken ; (c) areas where further treatment than that prescribed in Art. 4 of this Directive is necessary to fulfil Council Directives."

Criteria to define 'less sensitive areas' (which require less stringent treatment before discharge) are included in Annex II of the Directive: "A marine water body or area can be identified as a less sensitive area if the discharge of waste water does not adversely affect the environment as a result of morphology, hydrology or specific hydraulic conditions which exist in that area. When identifying less sensitive areas, Member States shall take into account the risk that the discharged load may be transferred to adjacent areas where it can cause detrimental environmental effects. Member States shall recognize the presence of sensitive areas outside their national jurisdiction. The following elements shall be taken into consideration when identifying less sensitive areas : open bays, estuaries and other coastal waters with a good water exchange and not subject to eutrophication or oxygen depletion or which are considered unlikely to become eutrophic or to develop oxygen depletion due to the discharge of urban waste water."

Other key terms are included in Art. 2, amongst which:

'1 p.e. (population equivalent)' means the organic biodegradable load having a five-day biochemical oxygen demand (BOD5) of 60 g of oxygen per day;

'Urban waste water' means domestic waste water or the mixture of domestic waste water with industrial waste water and/or run-off rain water;

'domestic waste water' means waste water from residential settlements and services which originates predominantly from the human metabolism and from household activities;

'industrial waste water' means any waste water which is discharged from premises used for carrying on any trade or industry, other than domestic waste water and run-off rain water;

'agglomeration' means an area where the population and/or economic activities are sufficiently concentrated for urban waste water to be collected and conducted to an urban waste water treatment plant or to a final discharge point;

'appropriate treatment' means treatment of urban waste water by any process and/or disposal system which after discharge allows the receiving waters to meet the relevant quality objectives and the relevant provisions of this and other Community Directives;

**Derogations**

Indirect derogations are foreseen through less stringent treatment requirements in smaller agglomerations and less sensitive areas. Implementation deadlines for new Member States (EU-10 and EU-2) shall be in accordance with the transitional periods indicated in the Accession Treaties and the Directive deadlines (if not mentioned in the Treaties).

The 12 newer Member States, which joined the EU since 2004, were granted transitional periods which can extend the deadlines up to 2018. This gives time for the countries concerned to put the necessary infrastructure and equipment in.

**Types of management measures**

Annex I sets requirements for urban wastewater: "The design, construction and maintenance of collecting systems shall be undertaken in accordance with the best technical knowledge not entailing excessive costs, notably regarding: volume and characteristics of urban waste water, prevention of leaks, limitation of pollution of receiving waters due to storm water overflows."

Urban waste water discharges from agglomerations of between 10 000 and 150 000 p.e. to coastal waters and those from agglomerations of between 2 000 and 10 000 p.e. to estuaries situated in less sensitive areas must receive at least primary treatment ('primary treatment' means treatment of urban waste water by a physical and/or chemical process involving settlement of suspended solids, or other processes in which the BOD5 of the incoming waste water is reduced by at least 20% before discharge and the total suspended solids of the incoming waste water are reduced by at least 50%).

Urban waste water entering collecting systems shall before discharge be subject to secondary

treatment ('secondary treatment' means treatment of urban waste water by a process generally involving biological treatment with a secondary settlement or other process) or an equivalent treatment at the latest Dec. 2000 for all discharges from agglomerations of more than 15 000 p.e., Dec. 2005 for all discharges of between 10 000 and 15 000 p.e. and for discharges to fresh-water and estuaries from agglomerations of between 2 000 and 10 000 p.e.

By 31 December 2005, urban waste water entering collecting systems shall before discharge be subject to appropriate treatment ('appropriate treatment' means treatment of urban waste water by any process and/or disposal system which after discharge allows the receiving waters to meet the relevant quality objectives and the relevant provisions of this and other Community Directives) for discharges to fresh-water and estuaries from agglomerations of less than 2 000 p.e. and discharges to coastal waters from agglomerations of less than 10 000 p.e.

Urban waste water entering collecting systems shall before discharge into sensitive areas be subject to more stringent treatment by 31 December 1998 at the latest for all discharges from agglomerations of more than 10 000 p.e.

Tables 1 to 3 of Annex I set the quantified requirements for stringent treatment of discharges from urban waste water treatment plants.

According to Art. 3, Member States shall ensure that all agglomerations are provided with collecting systems for urban waste water.

According to Art. 4, Member States shall ensure that urban waste water entering collecting systems shall before discharge be subject to secondary treatment or an equivalent treatment.

According to Art. 2(9): “appropriate treatment” means “ treatment of urban waste water by any process and/or disposal system which after discharge allows the receiving waters to meet the relevant quality objectives and the relevant provisions of this and other Community Directives.” Appropriate treatment can mean a range of treatments from the basic (rustic) to the technologically sophisticated.

**Spatial coverage**

Are concerned: agglomerations from 2000 population equivalent to over 15 000 population equivalent, and their respective collection systems (including urban wastewater treatment plants). Member States are also required to establish the outer (seaward) limits of estuaries for the purposes of this Directive as part of the programme for implementation in accordance with the provisions of Art. 17 (1) and (2).

**Reporting units - what are the specific transposition requirements**

The reporting exercise is at MS level. So far, six Implementation Reports have been published by the European Commission since 1998. The reports are based on data reported by Member States through questionnaires. Since 2007, the reporting under Art. 15 of the UWWTD follows a new standardised approach, which was jointly developed by the European Commission, the European Environment Agency and Member States and which was set-up in line with reporting principles under the Water Information System for Europe (WISE). All 27 Member States completed the reporting exercise 2011 and provided a complete dataset. The Commission requested Member States to provide data on waste water collection and treatment under Art. 15(4) of the Directive, based on an electronic questionnaire (Q2011). In total, 23 Member States made their first data submission within the official deadline to report for Q2011. Four Member States (BE, HU, PL and PT) uploaded their first data set shortly after the official deadline and until 17 February 2012 at the latest.

**Management unit**

Urban wastewater collection and treatment systems operators and their agglomerations from at least.2000 p.e.

**Key planning steps**

The planning aspects of the Directive require Member States to:

- Designate sensitive areas (sensitive water bodies) in accordance with three specific criteria, and to review their designation every four years;
- Identify the relevant hydraulic catchment areas of the sensitive areas and ensure that all discharges from agglomerations with more than 10 000 p.e. located within the catchment shall have more stringent than secondary treatment;
- Establish less sensitive areas if relevant;
- Establish a technical and financial programme for the implementation of the Directive for the construction of sewage collecting systems and wastewater treatment plants addressing treatment objectives within the deadlines set up by the Directive (and the Accession Treaties for new Member States).

**Timelines**

| Date | Objective |
|---|---|
| 30 June 1993 | Transposition of the Directive; Designation of sensitive areas and their catchments; review – every four years<br>Identification of less sensitive areas if there are reasons for the Member State to do so; review – every four years |
| 31 December 1993 | Discharge of industrial waste water into collecting systems and urban waste water treatment plants subject to prior regulation and authorisation; Requirements for authorisation of direct discharges of industrial waste water from food processing industries to surface water in place; Establishment of programme for the implementation of the Directive |
| 30 June 1994 | Implementation programmes communicated to the Commission (After this deadline, the programmes shall be updated by 30 June every two years, if necessary = i.e. if there are changes) |
| 30 June 1995 | Situation reports on collection, treatment and the disposal of urban waste water and sewage sludge in their areas are published every two years and transmitted to the Commission |
| 31 December 1997 | 1st review of designation of sensitive areas, their catchments (and less sensitive areas – if appropriate); – review every four years |
| 31 December 1998 | Collecting systems for agglomerations >10 000 p.e. where discharges are into a sensitive area and its catchment ; Disposal of sludge from urban waste water treatment plants subject to general rules of registration or authorisation; Disposal of sludge to surface waters is banned |
| 31 December 2000 | Collecting systems for all agglomerations >15 000 p.e. discharging into normal areas; All discharges from agglomerations >15 000 p.e. subject to secondary treatment; Direct discharges of industrial biodegradable waste water from plants representing the load of > 4 000 p.e. to surface water subject to prior regulation and authorisation; Collecting systems for all agglomerations between 2 000 and 15 000 p.e. |
| 31 December 2005 | All discharges from agglomerations 10 000 – 15 000 p.e. subject to secondary treatment; Discharges to freshwater and estuaries from agglomerations between 2 000 and 10 000 p.e. subject to secondary treatment; Discharges to freshwater and estuaries from agglomerations <2 000 p.e. subject to appropriate treatment; Discharges to coastal waters from agglomerations < 10 000 p.e. subject to appropriate treatment; Review of identification of sensitive areas and less sensitive areas |
| Until Dec. 2018 | Deadlines for EU-12 available here: http://ec.europa.eu/environment/water/water-urbanwaste/legislation/pdf/transitional_periods_eu10_eu2.pdf. Croatia has until Dec. 2023. |

**Integration/coordination issues with other related pieces of legislation**

The UWWTD in its Art. 2 states that ""appropriate treatment" means treatment of urban waste water by any process and/or disposal system which after discharge allows the receiving waters to meet the relevant quality objectives and the relevant provisions of this and other Community Directives". However, no explicit reference to a specific Directive is made in the legal text. The

Commission in its last implementation report states that full implementation of the Directive is a pre-requisite for meeting the environmental objectives set out in the EU Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD).
Also, these Directives make explicit reference to the UWWTD in their texts (Art. 10 of the WFD and Art. 13 of the MSFD).
"The Urban Waste Water Treatment Directive and the Nitrates Directive are older Directives controlling specific pollution sources, whose measures are to be integrated into those of the Water Framework Directive, but are not altered by the Water Framework Directive."
"The Urban Waste Water Treatment Directive requires action to reduce pollution through end-of-pipe requirements. It is a complement to the legislation limiting pollution at source from agriculture (nitrates, pesticides) and industry and addresses pollution from households that would otherwise be discharged without treatment. The impressive improvement in the quality of EU bathing waters in the last decades is to a large extent due the implementation of the Directive."
Moreover, to help minimise pollution from various point sources, the Integrated Pollution Prevention and Control directive, which came into force 1996, can be seen as a complement to the UWWTD, as it has a set of common rules on permitting for industrial installations.

**Coordination issues with the EU Biodiversity Strategy**

The UWWTD addresses the issues of chemical status and pollution of EU waters by targeting the significant point-source and diffuse chemical and other pollution in the aquatic environment. It therefore avoids discharges loaded with nutrients in the environment (lakes, water courses, the sea...).
In this regard it has an indirect effect on Target 2: Maintain and restore ecosystems and their services and in particular on Action 7: Ensure no net loss of biodiversity and ecosystem services - as it has an effect on the degradation or enhancement of ecosystems located in discharge points (or concerned by diffuse pollution).
Since the UWWTD is linked with the implementation of the MSFD (and the achievement of Good Environmental Status), it also has an indirect impact on Target 4: Ensure the sustainable use of fisheries resources and in particular on Action 14: Eliminate adverse impacts on fish stocks, species, habitats and ecosystems.
Since sensitive areas are explicitly including areas which need an advanced treatment to fulfil Council Directives, it ensures that urban wastewater is not putting pressure on habitats protected under the habitats directive. The UWWTD is hence also contributing to Target 1 of the Biodiversity Strategy.

**Relevance to ecosystems/habitats?**

Are mentioned estuaries and coastal waters, freshwater, high mountain regions, catchment areas of sensitive areas (please see definition above for water bodies that are considered as "sensitive areas"), surface waters. The Directive's objective is to avoid/reduce the degradation of surface water quality. It seems that all aquatic ecosystems can be affected (marine and freshwater at the points of wastewater discharges and also through diffuse pollution).Terrestrial ecosystems may also be affected indirectly (including forest, littoral zone and riparian zone ecosystems). Impacts of wastewater that is not properly treated and discharged in the environment range from locally increased fish mortality to widespread problems such as the spread of algae threatening whole eco-systems due to over fertilisation by farmers. Aquatic biodiversity and ecosystem services are not mentioned in the Directive. However, they may be affected by poor water quality. For example, ecosystem services such as the provision of clean drinking water and food or also recreational activities may be affected The 7th implementation report states "Wastewater pollution can also accelerate biodiversity loss and deteriorate drinking water supplies or bathing waters, causing public health concerns. These include outbreaks of water-borne diseases, especially linked to small water supplies, diseases due to exposure to contaminated bathing water (organic pollution,

pollution by algal bloom due to excess of nutrients) or the consumption of contaminated seafood, etc. These impacts may also entail negative consequences for economic sectors such as the tourism or the shellfish farming industry."

**Drivers**

- Agglomerations and their waste loads / settlement areas and their discharges, including the resident and non-resident (tourists ...) population;
- Industrial waste water from enterprises and economic activities (including small and medium sized-enterprises) that is or should be discharged into the collecting system or urban wastewater treatment plant; In particular, "adverse effects of discharges of biodegradable industrial waste water from the agro-food sector (e.g. milk processing industry, meat industry, breweries etc.)" are addressed (7th Implementation Report);
- Industries covered by Art. 11 ( a list of industrial sectors concerned by the Directive is included in Annex III);
- All remaining urban waste water whether collected (via collecting systems as referred to in Art. 3(1)) or not collected but generated in an agglomeration.

The existence of an agglomeration relates to a de facto situation of 'population and/or economic activities, which are sufficiently concentrated for urban waste water to be collected and conducted to an urban wastewater treatment plant or a final discharge point' *(http://ec.europa.eu/environment/water/water-urbanwaste/info/pdf/terms.pdf p. 6).*

The main indicator used for the characterisation of the driver is the size of the agglomeration in person equivalents ('1 p.e. (population equivalent)' means the organic biodegradable load having a five-day biochemical oxygen demand (BOD5) of 60 g of oxygen per day - Directive Art. 2).

**Pressures**

The legal act/policy addresses pollution, mainly (organic pollution and excessive nutrient loads - phosphorus, nitrogen, bacteriological pollution that might affect human health).

Low levels of implementation can lead to organic pollution in rivers and lakes and also to the accumulation of excessive nutrient loads (eutrophication) especially affecting lakes, coastal and marine waters which are particularly sensitive.

Success indicators used in this assessment to measure the reduction of discharged loads of nutrients and organic matter from urban waste water treatment plants to European surface waters are: Percentage of national population connected to primary waste water treatment; Percentage of national population connected to secondary waste water treatment; Percentage of national population connected to tertiary waste water treatment.

The indicators illustrate: changes in wastewater treatment in the regions of Europe since the 1980s; conformity (in terms of providing tertiary treatment) by Member States with the requirement to provide, by 31 December 1998, stringent treatment for agglomerations with population equivalent (p.e.) more than 10 000 that discharge into sensitive areas; levels of urban wastewater treatment in large cities in the EU (agglomerations >150 000 p.e.).

Rationale: Wastewater from households and industry represents a significant pressure on the water environment because of the loads of organic matter and nutrients as well as hazardous substances. With high levels of the population in EEA member countries living in urban agglomerations, a significant fraction of wastewater is collected by sewers connected to public wastewater treatment plants. The level of treatment before discharge and the sensitivity of the receiving waters determine the scale of impacts on aquatic ecosystems. The types of treatments and conformity with the directive are seen as proxy indicators for the level of purification and the potential improvement of the water environment.

Primary (mechanical) treatment removes part of the suspended solids, while secondary (biological) treatment uses aerobic or anaerobic micro-organisms to decompose most of the organic matter and retain some of the nutrients (around 20-30%). Tertiary (advanced) treatment removes the

organic matter even more efficiently. It generally includes phosphorus retention and in some cases nitrogen removal. Primary treatment alone removes no ammonium whereas secondary (biological) treatment removes around 75%. The indicator tracks the success of policies to reduce pollution from wastewater by describing the trends in the percentage of the population connected to public wastewater treatment plants with different levels of purification.
*Source: EEA, 2015*

**Assessment of Environmental State**

"Treatment of urban waste water by any process and/or disposal system which after discharge allows the receiving waters to meet the relevant quality objectives and the relevant provisions of this and other Community Directives." (Art. 2)
However the environmental "state" is not part of the Directive's vocabulary.
For waters subject to Art. 4 and 5 the following parameters and their maximum concentrations must be monitored: Biochemical oxygen demand (BOD5 at 20 °C) without nitrification: 25 mg/l O2 ; Chemical oxygen demand (COD):125 mg/l O2 ; Total suspended solids: 35 mg/l for more than 10 000 p.e.; 60 for 2000-10 000 p.e.
More stringent requirements apply for discharges from treatment plants to sensitive areas subject to eutrophication (defined in Annex I table 2). One or both parameters apply depending on the local situation: Total phosphorus parameter: 2 mg/l P (10 000 - 100 000 p. e.); 1 mg/l P (more than 100 000 p. e.); Total nitrogen: 15 mg/l N (10 000 - 100 000 p. e.); 10 mg/l N (more than 100 000 p.e.).
A maximum permitted number of samples which fail to conform compared to samples taken is defined (table 3 of Annex I).

**Assessment of Status**

It does not explicitly address "environmental status". However its ultimate aim is "to reach the target of the WFD that is a good chemical and biological status for all waters in 2015, the discharge of substances being one of the major problems to face".
"As regards concrete measures foreseen in the various Directives to combat eutrophication, according to Art. 5(2) of Directive 91/271/EEC, Member States shall ensure that urban waste water entering collecting systems shall before discharge into sensitive areas be subject to a more stringent treatment to reduce the nutrient load, for agglomerations of more than 10,000 p.e.. In addition, in accordance with Art. 5(5), discharges which are located in the relevant catchment areas of sensitive areas and which contribute to the pollution of these areas shall also be subject to a more stringent treatment.
Nevertheless, following Art. 5.8 of Directive 91/271/EEC, Member States do not have an obligation to identify sensitive areas (i.e. sensitive water bodies) if they implement, on their whole territory, more stringent treatment (Art. 5.2 and 5.3) or apply 75% reduction of the overall load of total nitrogen and of total phosphorus entering all urban waste water treatment plants (Art. 5.4)."
Urban Waste Water Treatment Directive (91/271/EEC). There is no EU guidance on how the monitoring of water status/quality should be undertaken (the Directive gives guidance on the monitoring of the effluents before discharge from the treatment works (Annex 1D of Directive 91/271/EEC)). There may be national examples available. Source: CIS Guidance document n° 23 on Eutrophication Assessment in the Context of European Water Policies

**Data**

There is a reporting system in place: Art. 15 of the Directive requires Member States to collect monitoring data and to make it available to the Commission within 6 months of receipt of a request. To date the Commission has issued four such requests. Art. 17 of the Directive requires Member States to provide the Commission with information on the status and programme of implementation for the Directive. Commission Decision 93/481/EEC provides the information that this report should contain and the format in which it should be supplied.

Data on compliance with UWWTD is available through an interactive map and database here: http://www.eea.europa.eu/data-and-maps/uwwtd/interactive-maps/urban-waste-water-treatment-maps. It displays aggregated results of the legal compliance with the Directive requirements for collecting system, biological and more stringent treatment. The data sheet presents description of individual treatment plants, key figures on performance, information of the point of discharge as well as the information on legal compliance of the agglomeration served by the presented treatment plant.

Other layers include:

- Layer Agglomeration overall compliance: the layer displays aggregated results of the legal compliance with the Directive requirements for collecting system, biological and more stringent treatment.
- UWWTD agglomerations – treatment pathways: This layer shows the type of treatment for all agglomerations >= 2.000 p.e.
- UWWTD agglomerations – big cities: This layer shows apportionment of generated load in p.e. from agglomerations >= 150.000 p.e.
- UWWTD treatment plants: This layer shows types of treatment for urban wastewater treatment plants reported for agglomerations >= 2.000 p.e.
- UWWT plants – types of additional polishing treatment steps: The layer displays all treatment plants reported for agglomerations >= 2.000 p.e., which are equipped with additional polishing treatment steps e.g. disinfection, sand filtration and other.
- UWWTD plants – performance compliance, overall: The layer displays overall performance (compliance of individual treatment plants with the effluent standards stipulated by the Directive).
- UWWTD receiving areas, catchments: This layer shows the areas with sensitivity as designated by the Member states.

The CIS guidance document no. 21 on reporting under the WFD specifies that reporting under the UWWTD has various backgrounds, through Committee procedures. E.g. “reporting under Art. 17 of UWWTD was set up via Commission Decision 83/481/EEC, while reporting under Art. 15(4) was based on the Commission duty to issue the questionnaires (request of information) to the Member States with the duty to reply within six months”.

**Funding**

EU funds can be used to assist in the implementation of the Directive, in particular the Cohesion Fund and European Regional Development Fund (ERDF) which help those regions lagging behind or facing structural difficulties in achieving sustainable development. These Funds have significantly supported Member States and the regions to invest in the needed infrastructures for waste water treatment over several programming periods. The financial support for investments in waste water related works and infrastructures was planned to be about 14.3 billion € in 21 Member States in the current programming period 2007-13. It is mainly, but not only, the "new" Member States that have allocated the largest shares of their funding into waste water treatment. During the reported years 2009/2010, the total cumulative allocated funds in the category "waste water" was 3.5 billion € for 2009 and 9.7 billion € for 2010. The Member States with highest cumulative allocated amounts were Poland (3.3 billion €), Romania (1.2 billion €) and Hungary (0.6 billion €).”*Source: 7th implementation report*

**Other issues to be aware of relevant for AQUACROSS?**

Compliance rates for collecting systems: “Most of the EU Member States collect their waste waters at very high levels with an average rate of compliance equal to 94% (up from 92%). Some 15 Member States even reach compliance of 100%. All Member States have either maintained or improved on previous results. However, there are still countries where there is either no or only partial collection of sewage. Five Member States still had compliance rates below 30% in

2009/2010 (BG, CY, EE, LV, SI)."
Secondary treatment:" In 2009/2010, a total of 82% of the waste waters in the EU received secondary treatment complying with the provisions of the Directive"
More stringent treatment: "overall compliance rate of 77%"

# 3.10 Nitrates Directive

Author: Ruta Landgrebe, Ecologic institute

Reviewer: Verena Mattheiß, ACTeon

## Nitrates Directive

**Name/Type of the Legal Act or Policy**

Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (hereafter, Nitrates Directive)

Based on the background of this note about the policy process in the EU please include space for the inclusion of subsequent legal Acts (Communication, Directives and regulations) related with the reviewed Type of the Legal Act or Policy.

Please name all regulations and other legal texts relevant for the Legal Act and Policy. Afterwards, please link the text in the template to the identified policy and subsequent regulations and try to be as explicit as possible as to their interaction.

The Nitrates Directive has close links with other EU policies concerning water, air, climate change and agriculture, and its implementation yields benefits in all these areas and is related to the following EU legal acts:

- The Water Framework Directive (WFD, 2000/60/EC)
- The Groundwater Directive (2006/118/EC)
- The National Emission Ceilings Directive (2001/81/EC)
- Climate change policy
- The Common Agricultural Policy (CAP)
- The Urban Wastewater Directive (1991/271/EEC)

**Entry into force**

December 1991

**Departments/Units in charge**

Nitrates Directive: DG ENV, Dir. B Natural Capital, 1. Agriculture, Forests and Soil

Roles of the Unit 1. Agriculture, Forests and Soil: Dir. B is responsible for the protection of the natural environment; Unit B1 focuses on soil conservation, forest protection and management and environmental policy aspects of agriculture

Contact details of relevant officials: Head of Unit – Olazabal Claudia; Policy Officer – Nitrates Directive – Bonetti M.; Team Leader – Implementation of the Nitrates Directive – Presicce F.

**Common Implementation strategy (CIS processes)**

Common Implementation Strategy (CIS) for the Water Framework Directive, Water Management Cluster, WG on Agriculture. Normally, the implementation of the Nitrates Directive is managed by agricultural and environmental ministries, with support of the environmental agencies on technical issues (in particular, the setting of the nitrate vulnerable zones, derogations requests, and setting of periods during which manure / organic fertilizers are not allowed to be applied on fields, or technical requirements for manure / slurry storage facilities)

German implementation of the Nitrates Directive: The Federal States in Germany are responsible for the implementation of the action programs, monitoring and control, as well as education, training and advisory services.[2]

[2] Baltic Forum for Innovative Technologies for Sustainable Manure Management, By Anne-Luise Skov Jensen, WP7 Business Innovation, December 2013, The Nitrates Directive and the Directive on the Promotion of the Use of Energy from Renewable Sources – Transnational Analysis of Implementation/Baltic Manure WP7 Business Innovation, The Nitrates Directive and the

UK implementation of the Nitrates Directive: Department for Environment, Food and Rural Affairs (Defra)

**Main Objective**

Art. 1 defines the overall objective to be: "reduce water pollution caused or induced by nitrates from agricultural sources" and to "prevent further such pollution" of both ground and surface waters.

**Principles included in the legal text**

The word 'principle' is not mentioned in the Nitrates Directive; neither the terms: 'precautionary principle', 'polluter pays principle', 'subsidiarity' or 'proportionality'.

**Other objectives/Key concepts/key elements of the legislation**

The Nitrates Directive introduces a number of instruments at preventing and reducing water pollution by nitrates from agricultural sources:

- Nitrate Vulnerable Zones (Art. 3(2)): "all known areas of land in their territories which drain into" "waters affected by pollution and waters which could be affected by pollution if action pursuant Art. 5 (creating action programmes for NVZs) is not taken". Revision of the NVZ designations is required at least every four years.
- Action programmes (Art. 5) must be created for all areas designated as NVZs, either a single programme applicable to multiple NVZs or a separate one for different NVZs or parts of the zones. The action programmes should be implemented by farmers within NVZs on a compulsory basis. If ineffective, the action programmes must be amended to more effectively accomplish the Directive's objectives.
- Code(s) of good agricultural practice (Art. 4) established by MS which farmers can implement on a voluntary basis.

Regular reports by MS to the Commission on the results of monitoring of nitrate concentrations in surface and ground waters, surface water eutrophication levels, impacts of the action programme(s) on water quality and agricultural practices and revisions made to the action programme(s), and estimations of future water quality trends (Art. 10).

**Terminology**

Art. 2 introduces the following terms for the purpose of Nitrates Directive: "(a) 'groundwater': means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil ; (b) 'freshwater': means naturally occurring water having a low concentration of salts, which is often acceptable as suitable for abstraction and treatment to produce drinking water; (c) 'nitrogen compound': means any nitrogen-containing substance except for gaseous molecular nitrogen; (d) 'livestock': means all animals kept for use or profit; (e) 'fertilizer': means any substance containing a nitrogen compound or nitrogen compounds utilized on land to enhance growth of vegetation; it may include livestock manure, the residues from fish farms and sewage sludge; (f) 'chemical fertilizer': means any fertilizer which is manufactured by an industrial process; (g) 'livestock manure': means waste products excreted by livestock: or a mixture of litter and waste products excreted by livestock, even in processed form; (h) 'land application': means the addition of materials to land whether by spreading on the surface of the land, injection into the land, placing below the surface of the land or mixing with the surface layers of the land; (i) 'eutrophication': means the enrichment of water by nitrogen compounds, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned; (j ) 'pollution': means the discharge, directly or indirectly, of nitrogen compounds from agricultural sources into the aquatic environment, the results of which are such as to cause

hazards to human health, harm to living resources and to aquatic ecosystems, damage to amenities or interference with other legitimate uses of water; (k) 'vulnerable zone': means an area of land designated according to Art. 3 (2). ("all known areas of land in their territories which drain into the waters identified according to paragraph 1 ["Waters affected by pollution and waters which could be affected by pollution"] and which contribute to pollution.")"

In addition, the Nitrates Directive introduces two following terms:

- 'action programmes' (Art 5): "... Member States shall, for the purpose of realizing the objectives specified in Art. 1, establish action programmes in respect of designated vulnerable zones. ... An action programme may relate to all vulnerable zones in the territory of a Member State or, where the Member State considers it appropriate, different programmes may be established for different vulnerable zones or parts of zones."
- 'A code of good agricultural practice' (Annex II): "A code or codes of good agricultural practice [have] the objective of reducing pollution by nitrates and taking account of conditions in the different regions of the Community." According to Art. 4.1(a,b) The Member States must establish a code of good agricultural practice which farmers can implement on a voluntary basis, including training and information programmes for farmers to promote application of measures included within the codes.

**Derogations**

"The Nitrates Directive provides the possibility for an exemption from the rule on the maximum quantity of 170 kg of nitrates per hectare and per year allowed for land application of livestock manure, on the condition that it can be established that the objectives of the Directive are still met and that the exemption is based on objectives criteria such as long growing seasons, crops with high nitrogen uptake, high net precipitation or soils with high denitrification capacity. The Commission shall decide whether to grant an exemption or not, based on advice provided by the Nitrates Committee who assists the Commission in the implementation of the Directive. The prerequisites for any exemption are the appropriate designation of nitrate vulnerable zones and action programmes which fully comply with the Directive. Furthermore, the exemption is only valid for the duration of the action programme" (EU, Agricultural Nitrates Summary).

**Types of management measures**

- identify surface water and groundwater affected by pollution or at risk of being so, based on procedures and criteria detailed in the Directive (specifically when the concentration of nitrates in groundwater or surface water reaches 50 mg/l or when the surface water is eutrophic or is at risk of being so);
- designate vulnerable zones, which are all known areas of land in their territories which drain into surface waters and groundwater which are affected by pollution or at risk of being so. The Nitrates Directive provides a possibility for Member States to be exempted from the requirement to designate vulnerable zones if the action programmes are applied to the whole of their national territory;
- establish a code of good agricultural practice to be implemented by farmers on a voluntary basis throughout the Member State territory, which shall include the measures detailed in Annex II to the Directive;
- set up national action programmes. These programmes must contain the measures listed in the good agricultural practice codes, as well as the additional measures listed in Annex III to the Directive, which aim to limit the land application of mineral and organic fertilisers containing nitrogen, as well as land application of livestock manure.

Action programmes need to include: obligatory measures concerning periods of prohibition of the application of certain types of fertiliser, capacity of manure storage vessels, limitations to the application of fertilisers (on steep slopes; to water-saturated, flooded, frozen or snow-covered ground; near water courses), and other measures set out in codes of good agricultural practice

Member States need to take additional measures or to reinforce their action programmes in order to achieve the objectives of the Directive. Member States must monitor water quality, applying standardised reference methods to measure the nitrogen-compound content, and assess the concentrations in surface and groundwaters, as well as long-term trends. The monitoring of trends is closely linked to WFD implementation, since nutrient loading is a key pressure under WFD (EU, Agricultural Nitrates Summary).

Every four years the Member States are required to report to the European Commission: the results of the monitoring of nitrates concentrations in surface and ground waters, surface water eutrophication levels, assessment of the impacts of the action programme(s) on water quality and agricultural practices; revision of NVZs and action programme(s); and estimations of future trends in water quality. Various studies have been commissioned by the EC to evaluate the implementation and effectiveness of the Nitrates Directive. National action programmes are evaluated by Member States. See, for example, Northern Ireland.

**Spatial coverage**

Member States must designate territories (land) draining into water bodies which are vulnerable to high nitrate levels or eutrophication as Nitrate Vulnerable Zones (NVZs). NVZ are designated based on whether surface waters (particularly those used for drinking water) and groundwaters contain or could contain more than 50 mg/l nitrates and whether freshwater bodies, estuaries, coastal waters, and marine waters are or could become eutrophic in the near future if an action programme is not applied to the contributing lands. Either the entire territory of the land or only certain areas can be designated as NVZs, depending on differing intensity of agricultural production, climatic variables, soil type and topography. Revision of the NVZ designations is required at least every four years to take into account changes and factors unforeseen at the time of the previous designation (according to Art. 3.4).

**Reporting units – what are the specific transposition requirements**

The main reporting unit is the designated NVZs; NVZs can cover either particular areas or the entire territory of the country. Some MS have designated the whole territory (e.g. Slovenia), while others not (e.g. UK).

**Management unit**

Nitrate Vulnerable Zones (NVZs) – "areas of land in their territories which drain into the waters [affected by pollution and waters which could be affected by pollution] if action [programmes are not implemented] and which contribute to pollution." (Art. 3.2)

**Key planning steps**

- monitoring of water quality
- identification of surface waters and groundwaters affected by pollution or at risk of being so;
- designation of NVZs/exemption from this requirement if the action programme(s) are applied to the whole territory of the country;
- establishment of a code of good agricultural practice;
- set up compulsory action programmes for NVZs;
- implementation;
- reporting; and
- revision of the NVZs and action programmes.

**Timelines**

The Nitrates Directive was notified to the Member States on 19 December 1991. As mandated in Art. 3(2), the Member States had two years following the Directive's adoption to designate Nitrate Vulnerable Zones (NVZs). The Member States also had further two-year period to create their code(s) of good agricultural practice and action programme(s) for the NVZs (Art. 5).

Further, the Nitrates Directive follows a four-year cycle: action programmes shall be implemented within four years of their establishment as well as reviewed and if necessary revised at least every

four years; Member States shall submit a report to the Commission on the implementation of the Nitrates Directive for every four year cycle (see below).

Reporting:

- 2012-2015 report is planned to be published in 2017
- 2008-2011 report (COM/2013/0683 final)
- 2008-2011 Commission Staff Working Document (SWD/2013/0405 final)
- 2004-2007 Report (Corrigendum)
- 2004-2007 Commission Staff Working Document (Corrigendum)
- 2000-2003 Report (COM/2007/0120 final)
- 2000-2003 Commission Staff Working Document (SEC/2007/0339 final)
- 1996-1999 Report (COM/2002/0407 final)

**Integration/coordination issues with other related pieces of legislation**

Common Agricultural Policy: excessive use of nitrogen from organic manures and synthetic fertilizers poses a key environmental risk for EU waters. Marine protection (North Sea and other waters) is mentioned – the link is through the eutrophication process resulting from excessive nitrates concentrations. In addition to agriculture and maritime policies, the Nitrates Directive has close links with other EU policies concerning water, air, and climate change. Implementation of the Nitrates Directive yields benefits in all these areas and is related to the following EU legal acts :

- The Water Framework Directive (WFD, 2000/60/EC)
- The Groundwater Directive (2006/118/EC)
- The National Emission Ceilings Directive (2001/81/EC)
- Climate change policy (including Effort Sharing Decision)
- The Urban Wastewater Directive (1991/271/EEC)

The coordination with the WFD is central for the implementation of both Directives, since nitrate concentrations in groundwater and surface waters are a key pressure affecting the chemical status. NVZ definitions are also used in defining what types of measures can be funded as voluntary measures under Rural Development Programmes (since Nitrates Directive is part of the statutory management requirements under the cross-compliance, it is also part of the environmental baseline which is used to define the requirements for agri-environment-climate measures (AECM), i.e. AECMs must go beyond the baseline). Moreover, N20 emissions are a potent greenhouse gas, so improved nitrogen efficiency is key for achieving climate objectives for agriculture (see, link).

**Coordination issues with the EU Biodiversity Strategy**

For example, several Member States have included nutrient management measures, such as wider buffer strips around water courses, among the agri-environmental initiatives for which farmers can receive payments. These measures contribute to the implementation of the Nitrates Directive and directly affect the target 2 of the EU biodiversity strategy, thus maintaining and enhancing ecosystems and their services.

**Relevance to ecosystems/habitats?**

Aquatic ecosystems are mentioned twice in the Nitrates Directive:

- In the Preamble, which states that: it is necessary to reduce water pollution caused by nitrates from agricultural sources and to prevent further such pollution in order to protect human health and living resources and aquatic ecosystems as well as preserve the legitimate uses of water.
- In the definition of 'pollution' in Art. 2(j) that states that "'pollution' means the discharge, directly or indirectly, of nitrogen compounds from agricultural sources into the aquatic environment, the results of which are such as to cause hazards to human health, harm to living resources and to aquatic ecosystems, damage to amenities or interference with other legitimate uses of water".

All aquatic ecosystems (rivers, lakes, wetlands, coastal waters, marine water) can be affected by eutrophication through nitrate input from agricultural sources. Aquatic biodiversity is strongly influenced by the nutrient content of the water. High nitrate concentrations can negatively affect ecosystem services depending on the water quality (e.g. drinking water provision) and on the aesthetic quality of the water body (e.g. through algal bloom). They can have, however, a positive impact e.g. on fish growth and provision of biomass (e.g. reeds).

**Drivers**

The Nitrates Directive aims to protect waters in Europe by preventing nitrates from agricultural sources from polluting groundwater and surface waters by encouraging the use of good agricultural practices. The legal act/policy address: agricultural activities, agricultural sector.
In order to meet the maximum allowable level of nitrates in the water bodies (50 mg/l nitrates), the maximum allowable amount of livestock manure applied to land is 170 kg/ha. Member States may calculate this amount on the basis of animal numbers.

**Pressures**

The Nitrates Directive considers chemical pressures. Art. 2 of the Nitrates Directive provides the definitions of 'eutrophication' and 'pollution': (i) 'eutrophication': means the enrichment of water by nitrogen compounds, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned; (j) 'pollution': means the discharge, directly or indirectly, of nitrogen compounds from agricultural sources into the aquatic environment, the results of which are such as to cause hazards to human health, harm to living resources and to aquatic ecosystems, damage to amenities or interference with other legitimate uses of water. Commission' evaluation report (2008-2011) identifies the following three pressures from agriculture: livestock population and concentration, mineral fertilizer use, and N-balance and N-discharge into the environment
In targeting the maximum level of allowable nitrates in the water bodies (50 mg/l nitrates), a limitation is set for the amount of livestock manure applied to land to 170 kg/ha.

**Assessment of Environmental State**

Chemical parameters such as pollution with nitrogen compounds and biological parameters such as eutrophication expressed through accelerated growth of algae and higher forms of plant life.
Nitrates (mg/l) in surface waters (particularly those used for drinking water) and groundwaters.
NVZs are designated based on whether surface waters (particularly those used for drinking water) and groundwaters contain or could contain more than 50 mg/l nitrates if an action programme is not applied to the contributing lands, and whether freshwater bodies, estuaries, coastal waters, and marine waters are or could become eutrophic in the near future if an action programme is not applied to the contributing lands.

**Assessment of Status**

Nitrate concentration and trophic status: (all examples from the Commission Staff Working Document).

- For example, in Austria, the following indicators for eutrophication assessment were used for rivers: nitrates concentrations, the trophic state, and phytobenthos; for lakes: nitrates concentrations, the trophic state, phytoplankton, total phosphorus and Secchi depth. Phytobenthos and phytoplankton are biological quality parameters which have been developed in accordance with the Water Framework Directive, as indicators for eutrophication.
- In Flanders, the eutrophication status of fresh waters was assessed by means of total phosphorus.
- In Wallonia, the eutrophication status of rivers was assessed by means of orthophosphate, total phosphorus and chlorophyll-a.
- The assessment of the trophic status varies widely among Member States, not only regarding

the parameters used, but also concerning the methodologies for the definition of trophic status classes.

- Note, the document uses the terms 'trophic state' and 'trophic status' equally: for example, "The trophic status of transitional waters was assessed by means of dissolved inorganic nitrogen and reactive phosphorus. The TRIX (Trophic State Index according to MEDPOL Convention) was used for coastal waters as well as for marine waters. As regards lakes, the Water Framework Directive classification system based on the chlorophyll-a concentrations was used and the results converted to the values for trophic state according to OECD 1982, used within the context of the Nitrates Directive."

*Indicators:*

- The indicators for eutrophication (biological quality parameters) as developed in accordance with the WFD: phytobenthos and phytoplankton.
- The indicators for eutrophication assessment for rivers: nitrates concentrations, the trophic state, phytobenthos, total phosphorus, orthophosphate, and chlorophyll-a.
- The indicators for eutrophication assessment for lakes: nitrates concentrations, the trophic state, phytoplankton, total phosphorus and Secchi depth.

**Data**

1. Member State information: information on the current implementation of the Nitrates Directive in different EU Member States can be found on websites of competent authorities.

- For example, the 5th German Nitrates Report, issued in September 2012 by the Federal German Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), includes the following type of data:
    - measures taken on the federal and States levels to develop, promote and implement the code of good agricultural practice for agricultural fertilization, which is prescribed by the Nitrates Directive and implemented through the Fertiliser Ordinance into the national law;
    - impact of the action programme on water quality (Germany applies the action programme throughout the entire territory of the country);
    - nitrogen balance – as an indicator of the effectiveness of the action programme and any further measures;
    - further actions necessary to reduce nitrate emissions from agricultural activities, such as for example, improving the Fertiliser Ordinance.

2. The current status of NVZs and whole territory designations in the EU27 can be viewed using the map viewer on the website of the Joint Research Centre. The map also provides the national NVZ info sites and the boundaries of the river basins and NUTS Regions (1-5).

3. Reports from the Commission to the Council and the European Parliament on implementation of the Nitrates Directive (Art. 11 reports) can be found under the following link.

- The Report from the Commission to the Council and the European Parliament on the implementation of the Nitrates Directive fulfils the Commission's obligations under Art. 11 of the Nitrates Directive. It is based on the reports submitted by the Member States under Art. 10 referring to a four-year period (e.g. the last reported four-year period included the years 2008 to 2011) and is accompanied by a Staff Working Document (SEC(2013)), which includes maps and tables on indicators of nutrient pressures from agricultural sources, water quality and designated nitrate vulnerable zones, both at EU level and per each Member State.

The reports submitted by the Member States under Art. 10 of the Nitrates Directive should in particular contain information pertaining to codes of good agricultural practice, designated nitrate vulnerable zones, results of water monitoring, and a summary of the relevant aspects of action programmes drawn up for NVZs.

**Funding**

Public funds, for example (though not available for all measures in the Member States):[3]

- Germany, the Lower Saxony: for the implementation of measures, farmers receive a subsidy which is covered by the Lower Saxon water and nature conservation board (NLWKN).

Ireland: the Rural Development Program (2014-2020) totals €4.1 billion out of which €1.9 billion is national and the remaining is from the EU. Under this program, funding will be available under the GLAS (Green Low-Carbon Agri-Environment Scheme) to fund initiatives such as riparian margins, fencing of watercourses, low emission slurry spreading and green cover. The adoption of this scheme entails compulsory soil sampling and compulsory involvement of an advisor from FAS.

The European Agricultural Fund for Rural Development (EAFRD) (though not available for all measures in the Member States):

- The CAP backs up the Nitrates Directive through direct support for farmers (Regulation 1307/2013) and rural development measures (Regulation 1305/2013). For example, several Member States have included nutrient management measures, such as wider buffer strips around water courses, among the agri-environmental initiatives for which farmers can receive payments. Direct support is subject to cross-compliance with EU environmental legislation, including the Nitrates Directive.

For example in Poland, the Rural Development Program 2009-2013 offers subsidies for the investments in the modernisation of animal production farms, contributing up to 75% of the costs of investments undertaken for the implementation of the Nitrates Directive (Korczyńska, et al., 2013)[4]. The new Rural Development Programme 2014-2020 is much weaker in terms of water protection measures. This is caused by the transfer of 25% of funds from pillar II of the Common Agricultural Policy into Pillar I (Kalinowska, 2014)[5].

[3] European Commission, Directorate-General for the Environment (not published, expected in 2015). Resource Efficiency in Practice - Closing Mineral Cycles

[4] Korczyńska, A. et al., 2013. Baltic Manure WP7 Business Innovation. Guidelines on: Incentives and support mechanisms stimulating innovation within manure management in Poland, s.l.: s.n.

[5] Kalinowska, M. (., 2014. Personnal communication [Interview] 2014.

# 3.11 Directive on Environmental Quality Standards

Authors: Astrid Schmidt-Kloiber and Florian Pletterbauer, BOKU

Reviewer: Verena Mattheiß, ACTeon

## Directive on Environmental Quality Standards

**Name/Type of the Legal Act or Policy**

Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council.

The Directive is called "Directive on Environmental Quality Standards", but also known as the "Priority Substances Directive".

Other relevant previous acts: Decision No 2455/2001/EC: sets out the first list of 33 substances or groups of substances that have been prioritised for action at Community level.

**Entry into force**

December 2008

**Departments/Units in charge**

*DG ENV, Dir. C Quality of Life, Water & Air, 1. Water*

*[CLAYTON H.: Policy Officer – Implementation and Development of Water Framework and Priority Substances Directives & water policy]*

**Common Implementation strategy (CIS processes)**

Art. 9, EQSD: The Commission shall be assisted by the Regulatory Committee referred to in Art. 21(1) of Directive 2000/60/EC.

WFD CIS Working Group "Chemicals"

**Main Objective**

"In accordance with Art. 4 of Directive 2000/60/EC, and in particular paragraph 1(a), Member States should implement the necessary measures in accordance with Art. 16(1) and (8) of that Directive, with the aim of progressively reducing pollution from priority substances and ceasing or phasing out emissions, discharges and losses of priority hazardous substances." (Preamble EQSD)

The objective of the directive is "that of achieving of good surface water chemical status by laying down EQS for priority substances and certain other pollutants" (Preamble EQSD (32))

Art. 1: Subject matter "This Directive lays down environmental quality standards (EQS) for priority substances and certain other pollutants as provided for in Art. 16 of Directive 2000/60/EC, with the aim of achieving good surface water chemical status and in accordance with the provisions and objectives of Art. 4 of that Directive."

**Principles included in the legal text**

In the preamble: Precautionary principle; the principle that preventive action should be taken; that environmental damage should, as a priority, be rectified at source and that the polluter should pay. (2) Principle of subsidiarity; principle of proportionality (the directive does not go beyond what is necessary in order to achieve the objective) (21)

**Other objectives/Key concepts/key elements of the legislation**

"As a matter of priority, causes of pollution should be identified and emissions should be dealt with at source, in the most economically and environmentally effective manner" (Preamble EQSD).

The EQSD established:

- in Annex I, limits on concentrations of the priority substances in surface waters of 33 priority substances and 8 other pollutants;
- the list of 33 priority substances in Annex II as Annex X of the Water Framework Directive;
- the possibility of applying EQS for sediment and biota, instead of those for water;
- the possibility of designating mixing zones adjacent to discharge points where concentrations of the substances in Annex I might be expected to exceed their EQS;
- a requirement for Member States to establish an inventory of emissions, discharges and losses of the substances in Annex I
- an obligation to review the list of priority substances by 13 January 2011.

By replacing five older directives, the EQSD contributed to the Commission's Better Regulation initiative.

**Terminology**

For the definition of terms, reference is made to the definitions given in the Water Framework Directive (WFD). Important terms used in the directive include the following:

*Environmental quality standards* (EQS): "means the concentration of a particular pollutant or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment." (WFD Art. 2)

*Priority substances*: are substances of EU-wide concern which present a significant risk to or via the aquatic environment. Emissions, discharges and losses of priority substances need to be reduced.

*Priority hazardous substances*: are a subset of priority substances. According to the WFD, "'Hazardous substances' means substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern." The emission, discharge or loss of priority hazardous substances needs to be ceased or phased-out.

*Maximum allowable concentrations*: are EQS established to protect against short-term exposure of chemical pollution.

**Derogations**

"In accordance with Art. 13 of, and Annex VII(A)(5) to, Directive 2000/60/EC, any exemptions to the application of the EQS for priority substances applied to water bodies in accordance with Art. 4(4), (5) and (6) of that Directive, taking into account Art. 4(8) and (9) thereof, should be reported in the river basin management plans. Provided that the requirements of Art. 4 of Directive 2000/60/EC including conditions for exemptions are met, activities, including dredging and shipping, leading to discharges, emissions and losses of priority substances can take place." (Preamble EQSD (17)). Exemptions are furthermore possible in relation to transboundary pollution (Art. 6 EQSD)

**Types of management measures**

- Appliance of EQS for surface water bodies.
- Possibly establishment of EQS for sediment and/or biota at national level. (Art. 3(2); EQSD)
- Arrange for the long-term trend analysis of concentrations of those priority substances that tend to accumulate in sediment and/or biota and ensuring that such concentrations do not significantly increase in sediment and/or relevant biota (Art. 3(3); EQSD)
- Possibly establishment of mixing zones adjacent to points of discharge: Concentrations of one or more substances may exceed the relevant EQS within such mixing zones if they do not affect the compliance of the rest of the body of surface water with those standards. (Art. 4(1); EQSD)
- Establishment of an inventory of emissions, discharges and losses: ..."Member States shall establish an inventory, including maps, if available, of emissions, discharges and losses of all priority substances and pollutants listed in Part A of Annex I to this Directive for each river

basin district or part of a river basin district lying within their territory including their concentrations in sediment and biota, as appropriate." (Art. 5(1); EQSD)

- The EQSD itself does not foresee measures to reduce pollutants.

**Spatial coverage**

The EQS apply to surface water bodies. As reference is made to the WFD, it can be supposed that the spatial coverage corresponds to the one of the WFD.

**Reporting units – what are the specific transposition requirements**

"Member States should be able to establish EQS for sediment and/or biota at national level and apply those EQS instead of the EQS for water set out in this Directive. Such EQS should be established through a transparent procedure involving notifications to the Commission and other Member States so as to ensure a level of protection equivalent to the EQS for water set up at Community level. The Commission should summarise these notifications in its reports on the implementation of Directive 2000/60/EC." (Preamble EQSD (16); also Art. 3)

Reporting of the EQSD is directly linked to reporting under the WFD. Exemptions to EQS for example need to be reported in the river basin management plans. The same applies to designated mixing zones. Updated inventories of emission, discharges and losses shall be published in the updated river basin management plans. (Art. 5, EQSD)

**Management unit**

The EQS are set for surface water bodies, they are harmonised through the EQSD at European level. The directive encourages member states to establish EQS for sediment and biota at national level. The inventory of emissions, discharges and losses shall be made for each river basin district or part of a river basin district lying within the territory of the member state. (Art. 5(1); EQSD)

**Key planning steps**

The EQSD encourages the following: (1)Member states can establish EQS for sediment and biota at national level, in addition to EQS for surface water provided by the directive; (2)MS can designate mixing zones in the proximity of the points of discharge. Technical guidelines should be developed to contribute to the harmonisation of methodologies used by Member States to establish the inventories of emissions, discharges and losses, including losses from pollution accumulated in sediments.

**Timelines**

"Member States shall determine the frequency of monitoring in sediment and/or biota so as to provide sufficient data for a reliable long-term trend analysis. As a guideline, monitoring should take place every three years, unless technical knowledge and expert judgment justify another interval." (Art. 3(3) EQSD)

Member States shall update their inventories as part of the reviews of the analyses specified in Art. 5(2) of Directive 2000/60/EC (= at the latest 13 years after the date of entry into force of the WFD and every six years thereafter). "Member States shall publish the updated inventories in their updated river basin management plans." (Art. 5, EQSD)

"The Commission shall, by 2018, verify that emissions, discharges and losses as reflected in the inventory are making progress towards compliance with the reduction or cessation objectives laid down in Art. 4(1)(a)(iv) of Directive 2000/60/EC, subject to Art. 4(4) and (5) of that Directive." (Art. 5(5) EQSD)

**Integration/coordination issues with other related pieces of legislation**

The EQSD amends and subsequently repeals Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC and 86/280/EEC. The directive follows and amends the WFD. The WFD "lays down a strategy against pollution of water and requires further specific measures for pollution control and environmental quality standards (EQS). This Directive lays down EQS in accordance with the provisions and objectives of Directive 2000/60/EC" (Preamble EQSD).

The EQSD makes furthermore reference to the following legal acts:

- EU Drinking Water Directive: specifying that it may require more stringent standards. (Preamble EQSD (18))
- Regulation (EC) No 166/2006 of the European Parliament and Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register
- Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control

The criteria for identifying substances that are persistent, bioaccumulative and toxic, as well as substances of other equivalent concern, notably very persistent and very bioaccumulative, as referred to in Directive 2000/60/EC, are established in the Technical Guidance Document for Risk Assessment in support of Directive 93/67/EEC, Directive 98/8/EC and Regulation (EC) No 1907/2006. In order to ensure consistency of Community legislation, only those criteria should be applied to the substances under review according to Decision No 2455/2001/EC, and Annex X to Directive 2000/60/EC should be replaced accordingly. (Preamble EQSD (28))

**Coordination issues with the EU Biodiversity Strategy**

Target 1: Chemical pollution can affect individual species. Protecting from chemical pollution can protect individual species.

Target 2: All ecosystem services depending on the quality of water are supported by the EQSD.

Target 3: Some of the priority (hazardous) substances are pesticides. Regulating their use reduces the negative impact of agriculture on biodiversity.

Target 4: Some priority (hazardous) substances may have an impact on fish stocks (e.g. influencing reproduction). In this case the EQSD can also have a positive impact on fish resources.

**Relevance to ecosystems/habitats?**

The directive mentions the "aquatic environment" (Preamble EQSD). "Chemical pollution of surface water presents a threat to the aquatic environment with effects such as acute and chronic toxicity to aquatic organisms, accumulation in the ecosystem and losses of habitats and biodiversity, as well as a threat to human health" (Preamble EQSD). In terms of ecosystem services, all services depending on chemical water quality are concerned (e.g. drinking water provision and bathing).

**Drivers**

No definition of the term provided in the legal act. The EQSD directly mentions dredging, shipping, use of pesticides. An EEA report on "Hazardous substances in Europe's fresh and marine waters" (2011) mentions the following key sources of hazardous substances: Urban environment; Agriculture; Mining; Landfills and contaminated land; Transport of hazardous substances to coastal waters; Sources emitted directly into the marine environment.

**Pressures**

Pollution is the main subject of the directive, with both point and diffuse pollution mentioned.

**Assessment of Environmental State**

The preamble of the EQSD states that member states should monitor amongst others sediment and biota in order to provide data for long-term trend analysis of those priority substances that tend to accumulate in sediment and/or biota. At the same time it is mentioned, that "for the majority of substances the establishment of EQS values at Community level should, at this stage, be limited to surface water only". "Furthermore, Member States should be able to establish EQS for sediment and/or biota at national level and apply those EQS instead of the EQS for water set out in this Directive." EQS are defined in terms of annual average values and in terms of maximum allowable concentrations.

**Assessment of Status**

The subject of the directive is to set environmental quality standards (EQS) for a selected list of pollutants. Thereby it further defines good chemical status of water bodies.

"The aquatic environment can be affected by chemical pollution both in the short- and long-term, and therefore both acute and chronic effects data should be used as the basis for establishing

EQS. In order to ensure that the aquatic environment and human health are adequately protected, EQS expressed as an annual average value should be established at a level providing protection against long-term exposure, and maximum allowable concentrations should be established to protect against short-term exposure."

# 3.12 Water Security and Drought Policy

Author: Josselin Rouillard, Ecologic Institute

Reviewer: Verena Mattheiß, ACTeon

| Water Security and Drought Policy |
|---|
| **Name/Type of the Legal Act or Policy** |
| The "2007 Communication on WS&D": WS&D policy, EU Action on Water Scarcity and Drought, Communication from the Commission to the European Parliament and the Council - Addressing the challenge of water scarcity and droughts in the European Union (COM/2007/0414 final)<br>The "2012 Communication on WS&D": no short acronym or short name, Communication from the Commission to the European Parliament and the Council -report on the review of the European Water Scarcity and Droughts Policy (COM/2012/672 final).<br>The "Water Blueprint": Water Blueprint, the Blueprint to safeguard Europe's water, Communication from the Commission to the European Parliament and the Council - A Blueprint to Safeguard Europe's Water Resources (COM/2012/673 final) |
| **Entry into force** |
| 07/2007 |
| **Departments/Units in charge** |
| DG ENV, Dir. C Quality of Life, Water & Air, Water 1 |
| **Common Implementation strategy (CIS processes)** |
| A specific group on WS&D existed until 2013 in the CIS of the WFD. In the Work Programme 2013-2015 WS&D topics are discussed in several CIS groups in order to avoid an artificial separation of water quality and quantity. Most important ones are:<br>• WG Ecological Flow in the Cluster Water Status (e.g. work on guidance on Ecologic Flows published in 2014)<br>• WG Programme of Measures in Cluster Water Management (e.g. water re-use, leakage reduction, Ecodesign Directive for water efficiency)<br>• WG Agriculture in Cluster Water Management (e.g. illegal abstraction, hydromorphology)<br>Indirectly:<br>• WG on Ecological Status in the Cluster Water Status (e.g. work on hydromorphology and assessment of ecological potential)<br>• WG Groundwater in the Cluster Water Status (e.g. groundwater use and availability, e-flows, metering, water efficiency, water pricing)<br>WGs Economics and Group Data/Information Sharing under the Cluster Knowledge Integration and Dissemination (e.g. water accounts, indicators for water efficiency and resilience to extreme events) |
| **Administrative body handling implementation in MS** |
| Since there is no legal requirement to implement WS&D it is unclear which authorities primarily deal with implementation. However, reporting of activities carried out is made by MS who are the primary administrative body responsible to the European Commission. Also, management planning for reducing the effects of droughts and mitigating water scarcity are usually integrated in the WFD RBMP. In France the relevant authorities are thus water agencies while in e.g. UK it is the environmental regulators (ex. EA, SEPA). As for RBMPs, DMPs are developed and implemented by Water Agencies in France, environmental regulators in the UK.<br>That said, different authorities may be responsible for different relevant measures. For example, mainstreaming consideration of droughts and water scarcity into Rural Development Programmes |

is the responsibility of regions in France as opposed to the national government (DEFRA) in the UK. Standards and regulations for water use efficiency in buildings or products may be led by national government or municipalities (e.g. Zaragoza, Spain).

**Main Objective**

The 2007 Communication on WS&D does not present a clear single aim, although it could be assumed that it is to reduce the risk of water scarcity and (man-made) droughts in Europe. The Communication states that it "aims to present an initial set of policy options".

The Impact Assessment of the 2007 Communication states clearer objectives for the 2007 Communication: 1) address the increasing impacts of water scarcity and droughts in the European Union; 2) ensure the long-term protection of available water resources; 3) ensure sustainable water availability across Europe and promote sustainable water uses.

**Principles included in the legal text**

The 2007 Communication on WS&D refers to the following principles:

- A water efficient and water-saving economy and culture
- Focus on water demand management
- Ensure the user-pays principle, effective water pricing and cost recovery of water services
- Integration with other policies

The 2012 Communication on WS&D re-emphasises these principles and specifies:

- Need to internalise environment and resource costs

Use of economic assessments (CBA, CEA) to select measures and incentivise integration with other planning processes

**Other objectives/Key concepts/key elements of the legislation**

The 2007 Communication on WS&D does not present specific objectives, but is structured around "options" that need to be implemented. The main "options" are: 1) putting the right price tag on water, 2) allocating water and water-related funding more efficiently, 3) improving drought risk management, 4) considering additional water supply infrastructures, 5) fostering water efficient technologies and practices, 6) fostering the emergence of a water saving culture in Europe, and 7) improve knowledge and data collection.

The Impact Assessment of the 2007 Communication on WS&D states specific objectives: enhance preparedness for increasing droughts, 2) mitigate all impacts of water scarcity and droughts on the environment, economy and society, 3) create the conditions for sustainable economic and social development across Europe in a context of climate change and increasing water scarcity and droughts. Operation objectives are also stated: 1) identify the most appropriate and cost-effective measures in order to efficiently address water scarcity and droughts and 2) consider possible priorities or a hierarchy to guide policy-making in the light of water availability at river basin level.

A report on how to develop Drought management Plans (*ec.europa.eu/environment/water/quantity/pdf/dmp_report.pdf) states that they should aim to:* 1) guarantee water availability to meet essential human needs (health and life), avoid or minimize negative drought impacts on the status of water bodies, especially on ecological flows and quantitative status of groundwater, and minimize negative effects on economic activities.

**Terminology**

*Water scarcity*: long-term water imbalance where water demand exceeds water availability (can thus happen also in regions of water abundance but also large water use). It is a human-driven phenomenon.

*Droughts:* temporary decrease in average water availability, primarily due to rainfall efficiency. Their intensity can be compounded by a (man-made) water scarcity situation. Vice-versa, a water scarcity situation can be exacerbated by a drought.

*Drought Management Plan*: a dynamic framework for an ongoing set of actions to prepare for, and effectively respond to drought. It is to move from a crisis management to a risk management

based approach. See report on how to develop Drought management Plans (*ec.europa.eu/environment/water/quantity/pdf/dmp_report.pdf)*

*Ecological flows:* "hydrological regime consistent with the achievement of the environmental objectives of the WFD in natural surface water bodies as mentioned in Art. 4(1). Considering Art. 4(1) of the WFD, the environmental objectives refer to:

- non deterioration of the existing status
- achievement of good ecological status in natural surface water body,
- compliance with standards and objectives for protected areas, including the ones designated for the protection of habitats and species where the maintenance or improvement of the status of water is an important factor for their protection, including relevant Natura 2000 sites designated under the Birds and Habitats Directives (BHD)2. See CIS guidance on e-flows.

*Water balance*: "the numerical calculation accounting for the inputs to, outputs from, and changes in the volume of water in the various components (e.g. reservoir, river, aquifer) of the hydrological cycle, within a specified hydrological unit (e.g. a river catchment or river basin) and during a specified time unit (e.g. during a month or a year), occurring both naturally and as a result of the human induced water abstractions and returns." See the CIS guidance on water balances.

*Water accounts*: "integrates physical (hydrological) and economic information related to water consumption and use, to achieve equitable and transparent water governance for all water users and a sustainable water balance between water availability, demand and supply." See the CIS guidance on water balances.

**Derogations**

The policy does not have regulatory power, thus no need for derogations.

**Types of management measures**

The 2007 Communication on WS&D proposes the following measures:

- *Putting the right price on water*: Put in place water tariffs on consistent economic assessment of water use and their values; Introduce compulsory metering programmes in all water sectors; Full implementation of WFD
- *Allocating water and water-related funding more efficiently*: improving land use planning (e.g. promoting sustainable agriculture, inter-linkage with biofuel development, implementation of SEA Directive, identification of water stress basin, include adequate measures in WFD RBMPs), financing water efficiency (refinement of regional and rural development funding, set up fiscal incentives)
- *Improving drought risk management*: develop drought risk management plans (including adequate methodologies for drought thresholds and mapping), set up observatory and early warning system, optimising EU Solidarity Fund and European Mechanism for Civil Protection
- *Consider additional water supply infrastructures*: in last resort
- *Fostering water efficient technologies and practices*: regulatory standards, set up incentives for uptake
- *Fostering emergence of water saving culture*: labelling schemes, establishing actor networks, set up educational programmes, advisory services, campaigns
- *Improve knowledge and data collection*: WS&D information system for Europe (present annual European assessment, use of WISE, use of GMES to deliver space-based data), research and development opportunities (use of LIFE and Transboundary Neighbourhood and Partnership Instrument -ENPI)

The Impact Assessment of the 2007 Communication on WS&D identifies 3 scenarios (focus on increasing water supply, focus on water pricing, promoting an integrated approach). The water supply scenario (based on reservoirs, water transfers and desalination) results in benefits in the short term (development of economic activities) but negative impacts in the long term (ecological impacts, salt intrusions, loss of wetlands, insecurity regarding long-term resource availability,

increase water price as scarcity increases, social conflicts). Water pricing policies leads to a decrease in water consumption and changes in land use towards higher value uses (welfare gains), but would impact vulnerable economic activity (e.g. agriculture) and lead to affordability issues. The integrated approach highlights the efficiency gains and the possibilities to manage negative impacts.

The 2012 Communication on WS&D re-emphasises the following measures: 1) defining and implementing ecological flow (and integrating in WFD process for achieving Good Ecological Status), 2) defining and implementing targets for water efficiency (including better water accounting and efficiency targets at sectoral level), 3) promoting economic incentives for efficient water use (including application of Art 9 of WFD but also mentioning use of water market/trading mechanisms and Payment for Ecosystem Services), 4) guiding land use to respond to water scarcity (including fighting against illegal abstraction), 5) enhancing drought management (early warning system, drought emergency, Green Infrastructure and water re-use to reduce vulnerability), 6) promoting resilience to climate change (link with adaptation).

The Water Blueprint 2012 builds on the 2012 Communication to emphasise the role of linking WS&D with land use management and ecological status (including hydro-morphological elements, green infrastructure and NWRM, illegal abstraction for irrigation, meeting ecological flows), promoting water efficiency (pricing policies, metering, application of WFD Art 9, use of water accounts, water efficiency targets and water stress indicators in RBMP, eco-design, integration with the Common Agricultural Policy, increasing irrigation efficiency, tackling leakages, water trading, water re-use for irrigation and industrial purposes, European Drought Observatory, integration of climate change and drought risk management plans into RBMP)

**Spatial coverage**

Official publications do not refer to a specific scale of implementation. Options act at different scales and are mainstreamed through different policies. However, the emphasis is now on integrating WS&D in WFD implementation (e.g. through e-flows for GES; measures through RBMP planning and pricing mechanisms), thus the scale is moving towards those of the WFD (water body, RBD). Much emphasis is also on RDP, so another scale of action is farm units and administrative units of the CAP. (*ec.europa.eu/environment/water/quantity/pdf/dmp_report.pdf)* indicates that the scale for applying these plans should be aligned to the WFD, and therefore the river basin or sub-basin level

**Reporting units - what are the specific transposition requirements**

There are no strict reporting obligations under the WS&D except those through other policies (WFD, RDP, etc). Before 2012, annual reports by the Commission (http://ec.europa.eu/environment/water/quantity/eu_action.htm) were made to the European Parliament based on a survey made at national level. In 2009 only 14 Member States answered this survey. Since 2012, there is not such apparent reporting, so it is likely that this exercise is now integrated in WFD processes.

**Key planning steps**

No specific planning is set in the policy documents. Given the linkages with WFD, RBMP is likely to be the main avenue for planning.

The report on how to develop Drought management Plans (*ec.europa.eu/environment/water/-quantity/pdf/dmp_report.pdf)* does not present planning steps. However, the report differentiates between pre-drought and during drought activities. Before the drought, Drought Management Plans should be developed. They should include the following content: 1) characteristics of basin under drought conditions, 2) river basin experience of historical droughts, 3) characterization of droughts within the basin, 4) drought warning system implementation, 5) program of measures, 6) organizational arrangements, 7) public supply specific plans,8) prolonged drought strategy. Levels of drought intensity should be defined; implementation of prevention and emergency

measures would be triggered depending on risk level and drought intensity. Strong public participation is necessary for preparing the plan but also during the drought for implementing the emergency measures.An earlier document, pre-dating the 2007 Communication, suggest the following steps: 1) review of historical droughts and impacts (also referred to as drought characterisation), 2) drought indicator network (also referred to as drought control), 3) drought states thresholds calibration, 4) drought mitigation measures, 5) plan audit, 6) drought management improvement. It is seen as a cycle.

**Timelines**

The 2007 Communication did not specify any (regulatory) timeframe for the implementation of actions and measures, nor does the 2012 Communication or the Water Blueprint. The most relevant timescale is likely to be the one of the WFD RBMP process.

**Integration/coordination issues with other related pieces of legislation**

The 2007 Communication on WS&D explicitly mentions: WFD (through RBMP), CAP (in particular funding under RDP), Structural and cohesion funds (funding of water supply infrastructures), LIFE+ (securing protection of sensitive water habitats), European Union Solidarity Fund and Community Mechanism for Civil Protection (supporting early warning, drought emergency and drought impacts), the transboundary programme under the European Neighbourhood and Partnership Programme (ENPI, to coordinate action between states), SEA Directive (to ensure water efficiency is considered in large investments and other policies). It also mentions the UN Convention to combat desertification UNCCD)

The Impact Assessment of the 2007 Communication on WS&D highlights other synergies: Agenda 21, the Ecodesign Directive 2005/32/EC, Directive 92/75/EEC on labelling and product standards, Council Directive 89/106/EEC on construction products, energy policies with regards to the promotion of biofuel.

The 2012 Communication on WS&D has highlighted further linkages with the EC Communication on sustainable use of resources COM(2011)17 (reminding Member State on the need to include water efficiency when using cohesion policy funding), European Water Partnership (to promote new technologies), Climate Change Adaptation Strategy (to improve planning and better consider scenarios of future impacts and demand).

In addition, the Water Blueprint 2012 mentions the EU Resource Efficiency Roadmap (specifically the "water milestone").

**Coordination issues with the EU Biodiversity Strategy**

The Water Blueprint 2012 is the most specific document on the linkages between WS&D and biodiversity. It states that the use of Green Infrastructures, in particular Natural Water Retention Measures, can help reduce the negative effects of droughts and support the provision of ecosystem services in line with the Biodiversity Strategy.

**Relevance to ecosystems/habitats?**

The 2007 Communication on WS&D only mentions biodiversity in general.

The Impact Assessment of the 2007 Communication on WS&D emphasise impacts on groundwater (aquifer depletion and seawater intrusion), surface waters (minimum water flows and increased concentrations of pollutants due to less dilution) and wetlands. Droughts can further exacerbate impacts such as seawater intrusion, eutrophication, wetland desiccation, and high rates of fish mortality. Indirectly the WS&D policy affects inland waters (river, lakes), transitional waters (deltas) and groundwater-dependent ecosystems (which can be terrestrial, semi-aquatic and aquatic).

The link to the WFD and the focus on water demand management in the WS&D policy documents would suggest a direct positive link on aquatic biodiversity and the delivery of ecosystem services. The primary aim is to reduce pressure from human activities on the environment. Also, Drought Management Plan primarily aims to reduce the impact of natural water deficit period on the water environment and society, by prioritising the meeting of essential human needs. It does not put

emphasis on sustaining all economic activity but rather identify maximum welfare gain while meeting minimum environmental flows.

**Drivers**

Planning for WS&D is through the preparation of Drought Risk Management Plans and via WFD RBMP. The policy papers use WFD terminology. The Impact Assessment on the 2007 Communication on WS&D refer to the main water uses abstracting or consuming water in Europe as being, in order or importance: agriculture, energy, household (public water supply) and industry. Tourism is also an important sector but its contribution as a driver is only assessed indirectly as direct consumption cannot be assessed. Following its definition, a drought can be driven by climatic factors.

A presentation by the EEA for the review of WS&D policy in 2012 (available here): presents the following drivers (some are state as pressures too): those linked to climate change (precipitation, evapotranspiration, temperature), population density, water use per sector, irrigation, households/tourism.

The CIS guidance on water balances presents the following indicators: water demand, conveyance efficiency and losses, economic information on users (yield, income generated, agricultural surface area), additional water supplies (reuse, deslination), water use

A report on how to develop Drought management Plans identifies the following indicators: stored surface reservoir volumes, aquifer water levels, river flows, reservoir outflows, precipitation, snow reserves.

**Pressures**

Planning for WS&D is through the preparation of Drought Risk Management Plans and via WFD RBMP. The policy papers use WFD terminology for pressures. The 2007 Communication aims to address primarily water abstraction pressures.

A presentation by the EEA for the review of WS&D policy in 2012 (available here) presents the following pressures (some are seen as drivers too, see Q8.2): those linked to climate change (precipitation, evapotranspiration, temperature), and abstraction for public water supply, irrigation, process water and cooling water. The CIS guidance on water balances presents the following indicators: abstractions, reservoir inflow/outflow, returned water, water transfers.

**Assessment of Environmental State**

Most policy documents on WS&D, especially the early ones such as the 2007 Communication, mention a lack of indicators to establish intensities of water scarcity and droughts situations. The guidance on water balance and the one on ecological flows provide the two most complete outline of how environmental states can be assessed in relation to WS&D.

A presentation by the EEA for the review of WS&D policy in 2012 presents the following parameters for the environmental state dimension: deficit in water balance (including from natural causes), drought (net precipitation deficit), water exploitation index (WEI), levels of over-abstraction, reservoir storage, river discharge, decreasing groundwater levels, low river flows, loss of wetlands, saltwater intrusion. The CIS guidance on water balances presents a number of relevant indicators: streamflow, groundwater level, aquifer discharge/recharge, total water availability, change in water storage.

The CIS guidance on ecological flows suggest that it could serve as a useful indicator for establishing targets to be reached in terms of water quantity for maintaining Good Ecological Status.

**Assessment of Status**

There is no specific assessment of environmental status in the early WS&D documents. Policy documents though refer to the link between physical parameters on water quantity (hydro-morphology, and more recently e-flows) and ecological status for surface waters. For groundwater, a direct assessment on water quantity status. Following the WFD, ecological status

for surface waters, quantitative status for groundwater.

**Data**

All official documents highlight the lack of homogeneous data on WS&D across Europe. However, efforts have been done under the CIS to develop indicators for WS&D, in particular regarding droughts under the European Drought Observatory (under JRC) and its interoperability arrangements with key data centers at European, regional and local levels.

Some relevant indicators include: Eurostat -data from eurostat is the most used in the policy documents, in particular (all national level): Water availability, Water abstraction, Water use by supply category (e.g. surface, groundwater) and economical sector, Water use in the manufacturing industry by activity and supply category, Water use balance. Additional relevant eurostat indicators include (all national level): Renewable freshwater resources, Annual freshwater abstraction by source and sector, Water made available for use. At NUTS 2 and RBD levels: Freshwater resources, Water abstraction, Water use. Agri-environment indicators: Irrigable area / Share of irrigable area in utilised agricultural area, Irrigated area / Share of irrigated area in utilised agricultural area, Share of irrigated crop area in total area with that crop, Share of holdings using surface, sprinkler or drip irrigation systems, Volume of water used for irrigation, Water source used for irrigation

EEA water data center / WISE: Water use intensity of irrigated crops, Water exploitation index, WFD WISE Information at water body level on drivers, pressures (e.g. abstraction), impacts (e.g. abstraction exceeds available GW resource), status (e.g. groundwater quantity status). At RBD level, proposed measures (volontary).

FAO Aquastat has a range of indicators for water resources and management at national, continental and large river basins levels:

Satellite imagery through the Global Monitoring for Environment Security (GMES) to identify areas illegal abstraction

Indicators for droughts are a special case. In the WFD, special clauses apply to the non-achievement of GES in case of "prolonged droughts". Work on WS&D indicators has focused on better characterising droughts. A report on how to develop Drought management Plans indicates that two types of indicators exist: those that are used to prepare for an event and those that make it possible to characterise the event when it happens.

The European Drought Observatory is the main gateway for drought indicators in Europe with factsheet available for each of the following indicators: Combined drought indicator; Daily soil moisture/daily soil moisture anomaly/forecast soil moisture anomaly; Standardised Precipitation Index at SYNOP stations from the MARS database (+ those interpolated to 0.25dd grid); Snowpack indicator; Spatial average of SPI at SYNOP stations (+ interpolated for Eurostat NUTS3 regions); Vegetation productivity (fAPAR)/Vegetation productivity anomaly; Vegetation water content/vegetation water content anomaly; Normalised Difference Water Index.

**Funding**

EU funds: European Agricultural Fund for Rural Development (EAFRD); European Regional Development Fund (ERDF), Cohesion Fund and European Social Fund (especially for water supply infrastructures); LIFE; European Union Solidarity Fund, Community Mechanism for Civil Protection

WFD: implementation of RBMPs and of appropriate pricing (cost recovery, inclusion of resource and environment costs)

# 3.13 Marine Spatial Planning Directive

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Reviewer: Marieken van der Sluis, IMARES, WUR.

## Marine Spatial Planning Directive

**Name/Type of the Legal Act or Policy**

Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning

*Commission Communication; Proposal for the directive; Impact assessment; Stakeholder consultation; and Roadmap.*

**Entry into force**

23-07-2014

**Departments/Units in charge**

DG MARE presumably Dir A — Policy development and coordination

**Common Implementation strategy (CIS processes)**

There is no CIS or a similar Strategy or working groups established for MSP yet

**Administrative body handling implementation in MS**

Note that transposition of the directive will not yet have taken place in all EU countries (deadline for transposition is September 2016). The designation of a competent authority is what the directive obliges MS to do. However, maritime spatial planning is already practiced since longer in several EU countries:

- In Germany, the responsible organization for MSP in the Exclusive Economic Zone is the Bundesamt für Seeschiffahrt und Hydrographie (BSH), which is subordinate to the Federal Ministry for Traffic and Digital Infrastructure (Bundesministerium für Verkehr und digitale Infrastruktur)
- In The Netherlands, the responsible agency for MSP, which is part of the National Waterplan, is Rijkswaterstaat (Sea and Delta), an agency of the Ministry of Infrastructure and Environment.

In Spain, the Ministry of Economy and Competitivenes (Ministerio de Economía y Competitividad)is responsible for MSP (not sure whether a plan has already been issued)

**Main Objective**

To establish a common framework for MSP, "aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources"

**Principles included in the legal text**

(Taken from provision (14))

- Sustainable use of marine goods and services by present and future generations,
- Ecosystem-based approach,
- The Precautionary Principle, and
- The principle that "preventive action should be taken, as laid down in Art. 191(2) of the Treaty on the Functioning of the European Union".
- Proportionality (provision 12)

Subsidiarity (provision 12)

**Other objectives/Key concepts/key elements of the legislation**

Art 5 of the Directive states: 1 When establishing and implementing maritime spatial planning, Member States shall consider economic, social and environmental aspects to support sustainable development and growth in the maritime sector, applying an ecosystem-based approach, and to

promote the coexistence of relevant activities and uses. 2 Trough their maritime spatial plans, Member States shall aim to contribute to the sustainable development of energy sectors at sea, of maritime transport, and of the fisheries and aquaculture sectors, and to the preservation, protection and improvement of the environment, including resilience to climate change impacts. In addition, Member States may pursue other objectives such as the promotion of sustainable tourism and the sustainable extraction of raw materials.3 This Directive is without prejudice to the competence of Member States to determine how the different objectives are reflected and weighted in their maritime spatial plan or plans. According to DG Mare's website: to establish a set of minimum common requirements for planning, while each EU country will be free to plan its own maritime activities, reduce conflicts, encourage investment, increase coordination, increase cross-border cooperation, protect the environment

**Terminology**

'maritime spatial planning' means a process by which the relevant Member State's authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives (MSP)

Further definitions provided: Marine region, Marine waters, Integrated Maritime Policy

An important term used, but not clearly defined in the directive, which is also important in relation to the work of Aquacross, is the term 'Land-sea interactions' (LSI). There is, however, a separate article on LSI (Art. 7), which specifies that" *In order to take into account LSI, MS can make use of integrated coastal zone mgt", and that MS should strive to promote "coherence of the resulting maritime spatial plan or plans with other relevant processes"*

Blue Growth: This means opportunities for marine and maritime sustainable growth',

No Key documents or guidance documents have been published by the commission since mid 2014 (when the directive was called into life). However the commission is currently in the process of initiating a number of projects which should produce guidance documents. A list of MSP-related calls for tenders which have been issued since the directive was approved include the following (at the time of writing (1st of October 2015), neither of these contracts had been issued) :

- Call for tenders MARE/2014/45 – Study on the establishment of a framework for processing maritime economic data in Europe
- Call for proposals: MARE/2014/46 Action on Maritime Spatial Planning in the Northern European Atlantic
- Call for tenders MARE/2014/23 – Assistance mechanism for the implementation of maritime spatial planning
- Call for proposals MARE/2014/22 – Projects on Maritime Spatial Planning

Apart from this list, the commission has organized a series of MSP conferences throughout 2014 and 2015.

**Derogations**

According to provision (27), landlocked MS are exempted from the obligation to transpose the MSP directive. No further derogations specified. Art. 2 specifies that the "Directive shall not apply to activities the sole purpose of which is defence or national security (1), and that the directive "shall not interfere with Member States' competence to design and determine, within their marine waters, the extent and coverage of their maritime spatial plans. It shall not apply to town and country planning" If Member States apply terrestrial planning to coastal waters or parts thereof, this Directive should not apply to those waters.

**Types of management measures**

MS are obliged to establish procedural steps for drafting plans, and in these procedural steps, they are obliged to follow the principles outlined, including stakeholder participation, Land-Sea Interaction, ensure transboundary cooperation and cooperation with third states. In the impact

assessment which can be found here.

**Spatial coverage**

In principle the entire marine waters of Member States, excluding those coastal areas which are already subject to town and country planning. However, MS can decide themselves the "extent and coverage of their maritime spatial plans"

**Reporting units – what are the specific transposition requirements**

The reporting is carried out on Member State level (in principle for all marine waters). MS are free to choose reporting unit.(They may also produce two or more MSPs).
The Netherlands has produced one MSP for the period 2015-2025, which is also incorporated as an appendix in the National water plan (2016-2021).
Germany has produced a joint document which basically incorporates two MSPs (based on two separate processes) one for the Baltic, one for the North Sea.
EC has to report to parliament and council from 31st March 2022 on every four years.

**Management unit**

National waters, except those (coastal) waters which are under the jurisdiction and planned for by local municipal authorities.

**Key planning steps**

No planning steps or policy cycles are prescribed, but the MS is obliged to establish a procedure for MSP and to coordinate with neighbouring EU MS and third parties. Furthermore, MS are obliged to designate the competent authorities for implementation.

**Timelines**

Transposition of Directive until September 2016. The maritime spatial plans referred to in Art. 4 shall be established as soon as possible, and at the latest by 31 March 2021 (see Art. 15-Transposition). MS shall submit plans to the EC three months after their approval. "Maritime spatial plans shall be reviewed by Member States as decided by them but at least every ten years". (Art. 6.3)

**Integration/coordination issues with other related pieces of legislation**

Provision 15 of the MSP directive states that it should contribute to:

- The renewable Energy Directive (Directive 2009/28/EC)
- The Council Regulation (EC) No 2371/2002 of 20 December 2002 on the conservation and sustainable exploitation of fisheries resour ces under the Common Fisheries Policy (OJ L 358, 31.12.2002, p. 59).
- The Birds and Habitats directive (Directive 2009/147/Ec and Directive 92/43/EEC)
- Decision No 884/2004/EC of the European Parliament and of the Council of 29 April 2004 amending Decision No 1692/96/EC on Community guidelines for the development of the trans-European transport network
- The Water Framework Directive (Directive 2000/60/EC),
- The Marine Strategy Framework Directive )Directive 2008/56/EC)

And recalls the following EC communications:

- EU biodiversity strategy to 2020
- Roadmap to a Resource Efficient Europe
- The EU Strategy on Adaptation to Climate Change
- Strategic goals and recommendations for the EU's maritime transport policy until 2018
- Regional Policies inlcuding sea-basin and macro-regional strategies

Other pieces of legislation mentioned in the Directive include:
Provision 2 – Integrated Maritime Policy
Provision 4 – Europe 2020 Strategy
Provision 5 – Blue Growth Strategy
Provision 6 – REGULATION (EU) No 1255/2011 OF THE EUROPEAN PARLIAMENT AND OF THE

COUNCIL of 30 November 2011 establishing a Programme to support the further development of an Integrated Maritime Policy
Provision 12 -RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2002 concerning the implementation of Integrated Coastal Zone Management in Europe (2002/413/EC)
Provision 18 - On criteria and methodological standards on good environmental status of marine waters (2010/477/EU)
Provision 23 - Strategic Environmental Assessment (SEA) Directive (Directive 2001/42/EC of the European Parliament and of the Council)
Provision 24 - Marine Knowledge 2020 and DIRECTIVE 2007/2/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

**Coordination issues with the EU Biodiversity Strategy**

The way how marine protected areas are dealt with, which activities are allowed in them, the location of windparks and transport routes have a direct impact on biodiversity

**Relevance to ecosystems/habitats?**

Marine ecosystems (benthic and pelagic), Coastal ecosystems. Biodiversity is mentioned in provision 1 : The high and rapidly increasing demand for maritime space for different purposes, such as installations for the production of energy from renewable sources, oil and gas exploration and exploitation, maritime shipping and fishing activities, ecosystem and biodiversity conservation, the extraction of raw materials, tourism, aquaculture installations and underwater cultural heritage, as well as the multiple pressures on coastal resources, require an integrated planning and management approach. Ecosystem services are mentioned in provision 13: In marine waters, ecosystems and marine resources are subject to significant pressures. Human activities, but also climate change effects, natural hazards and shoreline dynamics such as erosion and accretion, can have severe impacts on coastal economic development and growth, as well as on marine ecosystems, leading to deterioration of environmental status, loss of biodiversity and degradation of ecosystem services. Due regard should be had to these various pressures in the establishment of maritime spatial plans. Moreover, healthy marine ecosystems and their multiple services, if integrated in planning decisions, can deliver substantial benefits in terms of food production, recreation and tourism, climate change mitigation and adaptation, shoreline dynamics control and disaster prevention.

**Drivers**

In the directive, the word 'drivers' is not used. Human activities at sea which should be coordinated by MSP could be considered as drivers, see below.
In the following the possible activities to include in MSPs mentioned in the Directive are listed: aquaculture areas; fishing areas; installations and infrastructures for the exploration, exploitation and extraction of oil, of gas and other energy; resources, of minerals and aggregates, and for the production of energy from renewable sources; maritime transport routes and traffic flows; military training areas; nature and species conservation sites and protected areas; raw material extraction areas; scientific research; submarine cable and pipeline routes; recreation and tourism; underwater cultural heritage

**Pressures**

The word pressures is not used in this context in the directive.

**Assessment of Environmental State**

The environmental status is not described nor assessed in behalf of this directive.

**Assessment of Status**

The environmental status is not described nor assessed in behalf of this directive.

**Data**

MS shall submit plans, including relevant existing explanatory material on the implementation of this Directive, and all subsequent updates, to the EC three months after their approval. MS should inform EC about competent authorities. EC will submit to the European Parliament and to the Council, at the latest one year after the deadline for establishment of the maritime spatial plans (i.e. 2021), and every four years thereafter, a report outlining the progress made in implementing this Directive. (Art. 14)

**Funding**

European Maritime and Fisheries Fund (EMFF), which can be generally used for the implementation of the IMP.

EU funds from a number of financial programmes (LIFE, cohesion) could be envisaged for support of some measures in strategies or programmes, as well as co-funding projects.

**Other issues to be aware of relevant to AQUACROSS?**

Note that this directive has only just entered into force, many things such as a CIS, etc will, if at all, only be called into existence at a later stage

# 3.14 Marine Strategy Framework Directive

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## Marine Strategy Framework Directive

**Name/Type of the Legal Act or Policy**

MSFD – DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)

Commission Communication, Thematic Strategy on the Protection and Conservation of the Marine Environment, COM(2005)504 final

Proposal for a Directive establishing a Framework for Community Action in the field of Marine Environmental Policy (Marine Strategy Directive), COM(2005) 505 final

Commission Staff Working Paper, Impact Assessment – Annex to the Communication on the Thematic Strategy and Proposal for a Directive establishing a Framework for Community Action in the field of Marine Environmental Policy, SEC(2005) 1290

Commission Decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters

Commission Staff Working Paper on the Relationship between the initial assessment of marine waters and the criteria for good environmental status

Marine Protected Areas Report (and annex) shows significant progress in establishing protected areas in Europe's seas, with benefits for the economy and the environment.

COMMISSION DECISION of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters (notified under document C(2010) 5956)

REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT The first phase of implementation of the Marine Strategy Framework Directive (2008/56/EC) The European Commission's assessment and guidance, COM/2014/097 final

Other policies etc. are mentioned below

**Entry into force**

17 June 2008

**Departments/Units in charge**

DG Environment C 2

**Common Implementation strategy (CIS processes)**

Marine Directors – highest level political group focused on ensuring the overall implementation of the directive; MSCG – Marine Strategy Coordination Group – Link between Marine Directors and Working Groups, preparing material for the Marine Directors and overseeing the work of the Working Groups; WG GES – Working Group Good Environmental Status – support Member States in the determination of GES; WG DIKE – Working Group Data, Information, and Knowledge Exchange – supports Member States with their data reporting obligations; WG ESA – Economic and Social Analysis – develops common methodologies and approaches to carry out the economic and social analysis of the use of the marine waters; Technical subgroups (currently on Noise and Marine litter) – two technical subgroups, focusing on emerging areas of particular concern, *underwater noise* and *litter*, have been set up under WG GES to advise on the standardization of monitoring methods and provide a forum for exchange of principles and best practice on target setting and

assessment methodologies.

**Administrative body handling implementation in MS**

In Ireland it is led by the Department of Environment, Community and Local Government (DECLG). Expert advisors from a broad range of relevant Government Departments and State Agencies are engaged in the process and contributing scientific knowledge (Marine Institute, Environmental Protection Agency, National Parks and Wildlife Service).
In Sweden it is implemented by the Swedish Agency for Marine and Water Management.
In Germany it is led by the Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB, Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety) with support from Bundesministerium für Verkehr und digitale Infrastruktur '(BMVI, Federal Ministry of Transport and Digital Infrastructure); 'Bundesministerium für Ernährung und Landwirtschaft '(BMEL, Federal Ministry of Food and Agriculture (This department is necessary to be part of the marine environmental process, as agriculture has an indirect effect on the marine ecosystem through its fertilizers), Bundesamt für Naturschutz' (BfN), the 'Umweltbundesamt'(UBA) and the 'Bundesamt für Seeschifffahrt und Hydrographie'(BSH), including the respective Ministries of the Länder Schleswig-Holstein, Hamburg, Niedersachsen, Mecklenburg-Vorpommern, and working groups (WG) in which the federal government and its 'Länder' come together. Those working groups are the LAWA, the WG on water and the LANA WG on environmental protection, rural conservation and recovering and finally the ARGE BLMP, WG on measurement programs for the marine environment in North and Baltic Sea as well as the marine expert group).
In the Netherlands the implementation is led bij the Ministry of Infrastructure and the Environment, the responsible agency is Rijkswaterstaat.

**Main Objective**

Protection and preservation of the marine environment, the prevention of its deterioration and where practicable the restoration of that environment in areas where it has been adversely affected (provision 43)

**Principles included in the legal text**

Art. 27: Member States should then establish and implement programmes of measures which are designed to achieve or maintain good environmental status in the waters concerned, while accommodating existing Community and international requirements and the needs of the marine region or subregion concerned. Those measures should be devised on the basis of the precautionary principle and the principles that preventive action should be taken, that environmental damage should, as a priority, be rectified at source and that the polluter should pay.
Art. 43 : Since the objectives of this Directive, namely protection and preservation of the marine environment, the prevention of its deterioration and where practicable the restoration of that environment in areas where it has been adversely affected, cannot be sufficiently achieved by Member States and can therefore, by reason of the scale and effects of the Directive, be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Art. 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve those objectives.
Art. 44: Programmes of measures and subsequent action by Member States should be based on an ecosystem-based approach to the management of human activities and on the principles referred to in Art. 174 of the Treaty, in particular the precautionary principle.
Art. 45: This Directive respects the fundamental rights, and observes the principles, recognised by the Charter of Fundamental Rights of the European Union (19), in particular Art. 37 thereof which seeks to promote the integration into the policies of the Union of a high level of environmental protection and the improvement of environmental quality in accordance with the principle of

sustainable development.
Art. 19: With regard to access to environmental information, Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information shall apply.

**Other objectives/Key concepts/key elements of the legislation**

Chapter 1 Art 1: 1. This Directive establishes a framework within which Member States shall take the necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest.
2. For that purpose, marine strategies shall be developed and implemented in order to a: protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected; b: prevent and reduce inputs in the marine environment, with a view to phasing out pollution as defined in Art. 3(8), so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea.
3. Marine strategies shall apply an ecosystem-based approach to the management of human activities, ensuring that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations.
Chapter 1 Art. 4: This Directive shall contribute to coherence between, and aim to ensure the integration of environmental concerns into, the different policies, agreements and legislative measures which have an impact on the marine environment.

**Terminology**

In Art. 3.1. 'marine waters' means: (a) waters, the seabed and subsoil on the seaward side of the baseline from which the extent of territorial waters is measured extending to the outmost reach of the area where a Member State has and/or exercises jurisdictional rights, in accordance with the Unclos, with the exception of waters adjacent to the countries and territories mentioned in Annex II to the Treaty and the French Overseas Departments and Collectivities; and (b) coastal waters as defined by Directive 2000/60/EC, their seabed and their subsoil, in so far as particular aspects of the environmental status of the marine environment are not already addressed through that Directive or other Community legislation;
2. 'marine region' means a sea region which is identified under Art. 4. Marine regions and their subregions are designated for the purpose of facilitating implementation of this Directive and are determined taking into account hydrological, oceanographic and biogeographic features;
3. 'marine strategy' means the strategy to be developed and implemented in respect of each marine region or subregion concerned as laid down in Art. 5;
4. 'environmental status' means the overall state of the environment in marine waters, taking into account the structure, function and processes of the constituent marine ecosystems together with natural physiographic, geographic, biological, geological and climatic factors, as well as physical, acoustic and chemical conditions, including those resulting from human activities inside or outside the area concerned;
5. 'good environmental status' means the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations, i.e.: (a) the structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors, allow those ecosystems to function fully and to maintain their resilience to human-induced environmental change. Marine species and habitats are protected, human-induced decline of

biodiversity is prevented and diverse biological components function in balance;(b) hydro-morphological, physical and chemical properties of the ecosystems, including those properties which result from human activities in the area concerned, support the ecosystems as described above. Anthropogenic inputs of substances and energy, including noise, into the marine environment do not cause pollution effects;

Good environmental status shall be determined at the level of the marine region or subregion as referred to in Art. 4, on the basis of the qualitative descriptors in Annex I. Adaptive management on the basis of the ecosystem approach shall be applied with the aim of attaining good environmental status;

6. 'criteria' means distinctive technical features that are closelylinked to qualitative descriptors;

7. 'environmental target' means a qualitative or quantitative statement on the desired condition of the different components of, and pressures and impacts on, marine waters in respect of each marine region or subregion. Environmental targets are established in accordance with Art. 10;

8. 'pollution' means the direct or indirect introduction into the marine environment, as a result of human activity, of

substances or energy, including human-induced marine underwater noise, which results or is likely to result in

deleterious effects such as harm to living resources and marine ecosystems, including loss of biodiversity, hazards

to human health, the hindering of marine activities, including fishing, tourism and recreation and other legitimate uses of the sea, impairment of the quality for use of sea water and reduction of amenities or, in general,impairment of the sustainable use of marine goods and services;

9. 'regional cooperation' means cooperation and coordination of activities between Member States and, whenever possible, third countries sharing the same marine region or subregion, for the purpose of developing and implementing

marine strategies;

10. 'regional sea convention' means any of the international conventions or international agreements together with their governing bodies established for the purpose of protecting the marine environment of the marine regions referred to in Art. 4, such as the Convention on the Protection of the Marine Environment of the Baltic Sea, the Convention for the Protection of the Marine Environment of the North-east Atlantic and the Convention for the Marine Environment and the Coastal Region of the Mediterranean Sea.

**Derogations**

Art. 14 Exceptions:

1. A Member State may identify instances within its marine waters where, for any of the reasons listed under points (a) to (d), the environmental targets or good environmental status cannot be achieved in every aspect through measures taken by that Member State, or, for reasons referred to under point (e), they cannot be achieved within the time schedule concerned:
   a) action or inaction for which the Member State concerned is not responsible
   b) natural causes;
   c) force majeure;
   d) modifications or alterations to the physical characteristics of marine waters brought about by actions taken for reasons of overriding public interest which outweigh the negative impact on the environment, including any transboundary impact;
   e) natural conditions which do not allow timely improvement in the status of the marine waters concerned.

The Member State concerned shall identify such instances clearly in its programme of measures and shall substantiate its view to the Commission. In identifying instances a Member State shall consider the consequences for Member States in the marine region or subregion concerned.

However, the Member State concerned shall take appropriate ad-hoc measures aiming to continue pursuing the environmental targets, to prevent further deterioration in the status of the marine waters affected for reasons identified under points (b), (c) or (d) and to mitigate the adverse impact at the level of the marine region or subregion concerned or in the marine waters of other Member States.

2. In the situation covered by paragraph 1(d), Member States shall ensure that the modifications or alterations do not permanently preclude or compromise the achievement of good environmental status at the level of the marine region or subregion concerned or in the marine waters of other Member States.
3. The ad-hoc measures referred to in the third subparagraph of paragraph 1 shall be integrated as far as practicable into the programmes of measures.
4. Member States shall develop and implement all the elements of marine strategies referred to in Art. 5(2), but shall not be required, except in respect of the initial assessment described in Art. 8, to take specific steps where there is no significant risk to the marine environment, or where the costs would be disproportionate taking account of the risks to the marine environment, and provided that there is no further deterioration.

Where, for either of these reasons, a Member State does not take any steps, it shall provide the Commission with the necessary justification to substantiate its decision, while avoiding that the achievement of good environmental status be permanently compromised.

**Types of management measures**

Each Member State is obliged to develop a Programme of Measures (POM) in order to meet the objectives (GES) of the MSFD. These measures will likely range across the typology of policy measures (i.e. regulation, economic instruments, voluntary agreements, etc.). As part of this, the Member States are also required to do an impact assessment.

Annex VI of the Directive outlines the POM as (1) Input controls: management measures that influence the amount of a human activity that is permitted. (2) Output controls: management measures that influence the degree of perturbation of an ecosystem component that is permitted. (3) Spatial and temporal distribution controls: management measures that influence where and when an activity is allowed to occur. (4) Management coordination measures: tools to ensure that management is coordinated. (5) Measures to improve the traceability, where feasible, of marine pollution. (6) Economic incentives: management measures which make it in the economic interest of those using the marine ecosystems to act in ways which help to achieve the good environmental status objective. (7) Mitigation and remediation tools: management tools which guide human activities to restore damaged components of marine ecosystems. (8) Communication, stakeholder involvement and raising public awareness. The Directive states in Art. 12, 3: When drawing up the programme of measures pursuant to paragraph 2, Member States shall give due consideration to economic impacts of the measures envisaged. To assist the competent authority or authorities referred to in Art. 7 to pursue their objectives in an integrated manner, Member States may identify or establish administrative frameworks in order to benefit from such interaction.

**Spatial coverage**

(a) waters, the seabed and subsoil on the seaward side of the baseline from which the extent of territorial waters is measured extending to the outmost reach of the area where a Member State has and/or exercises jurisdictional rights, in accordance with the Unclos, with the exception of waters adjacent to the countries and territories mentioned in Annex II to the Treaty and the French Overseas Departments and Collectivities; and (b) coastal waters as defined by Directive 2000/60/EC, their seabed and their subsoil, in so far as particular aspects of the environmental status of the marine environment are not already addressed through that Directive or other Community legislation;

1. Member States shall, when implementing their obligations under this Directive, take due account of the fact that marine waters covered by their sovereignty or jurisdiction form an integral part of the following marine regions: (a) the Baltic Sea; (b) the North-east Atlantic Ocean; (c) the Mediterranean Sea; (d) the Black Sea.
2. Member States may, in order to take into account the specificities of a particular area, implement this Directive by reference to subdivisions at the appropriate level of the marine waters referred to in paragraph 1, provided that such subdivisions are delimited in a manner compatible with the following marine subregions: (a) in the North-east Atlantic Ocean: (i) the Greater North Sea, including the Kattegat, and the English Channel;(ii) the Celtic Seas; (iii) the Bay of Biscay and the Iberian Coast; (iv) in the Atlantic Ocean, the Macaronesian biogeographic region, being the waters surrounding the Azores, Madeira and the Canary Islands; (b) in the Mediterranean Sea: (i) the Western Mediterranean Sea; (ii) the Adriatic Sea;( iii) the Ionian Sea and the Central Mediterranean Sea; (iv) the Aegean-Levantine Sea.

**Reporting units - what are the specific transposition requirements**

In most cases on the Member State's marine waters, Exclusive Economic Zone. But MS are also able and in some cases do (Spain) split into additional sub-units.

**Management unit**

Marine waters of MS. See spatial coverage above.

**Key planning steps**

Member States concerned endeavour to follow a common approach: (a) preparation:
(i) an initial assessment, to be completed by 15 July 2012 of the current environmental status of the waters concerned and the environmental impact of human activities thereon, in accordance with Art. 8;
(ii) a determination, to be established by 15 July 2012 of good environmental status for the waters concerned, in
accordance with Art. 9(1);
(iii) establishment, by 15 July 2012, of a series of environmental targets and associated indicators, in accordance
with Art. 10(1);
(iv) establishment and implementation, by 15 July 2014 except where otherwise specified in the relevant Community legislation, of a monitoring programme for ongoing assessment and regular updating of targets, in accordance with Art. 11(1);
(b) programme of measures:
(i) development, by 2015 at the latest, of a programme of measures designed to achieve or maintain good environmental status, in accordance with Art. 13(1), (2) and (3); (ii) entry into operation of the programme provided for in point (i), by 2016 at the latest, in accordance with Art. 13(10).

**Timelines**

According to DG Environment's website:

- The initial assessment of the current environmental status of national marine waters and the environmental impact and socio-economic analysis of human activities in these waters (by 15 July 2012)
- The determination of what GES means for national marine waters (by 15 July 2012)
- The establishment of environmental targets and associated indicators to achieve GES by 2020 (by 15 July 2012)
- The establishment of a monitoring programme for the ongoing assessment and the regular update of targets (by 15 July 2014)
- The development of a programme of measures designed to achieve or maintain GES by 2020 (by 2015)

- The review and preparation of the second cycle (2018 – 2021)

Chapter IV Art. 17

1. Member States shall ensure that, in respect of each marine region or subregion concerned, marine strategies are kept up to date.

2. For the purposes of paragraph 1, Member States shall review, in a coordinated manner as referred to in Art. 5, the following elements of their marine strategies *every six years* after their initial establishment: (a) the initial assessment and the determination of good environmental status, as provided for in Art. 8(1) and 9(1) respectively; (b) the environmental targets established pursuant to Art. 10(1); (c) the monitoring programmes established pursuant to Art. 11(1); (d) the programmes of measures established pursuant to Art. 13(2).

3. Details of any updates made following the reviews provided for in paragraph 2 shall be sent to the Commission, to the Regional Sea Conventions and to any other Member States concerned *within three months* of their publication in accordance with Art. 19(2).

4. Art. 12 and 16 shall apply mutatis mutandis to this Article.

Art. 18 Interim Reports : Member States shall, *within three years of* the publication of each programme of measures or update thereof in accordance with Art. 19(2), submit to the Commission a brief interim report describing progress in the implementation of that programme.

**Integration/coordination issues with other related pieces of legislation**

The Water Framework Directive (2000, including the water industry directive and the nitrates directive) is closely linked to the MSFD. It sets a goal of achieving Good Status for all EU surface and groundwaters by 2015, tying in with the goal of Good Environmental Status under the Marine Directive. Following an adaptive management approach, it establishes a six-year planning cycle, during which Member States prepare River Basin Management Plans and develop actions and measures to achieve Good Status by 2015. Initial plans were published in 2009 and will be reviewed in 2015. Actions taken will reduce marine pollution from land-based sources and will protect ecosystems in coastal and transitional waters, which are vital spawning grounds for many marine fish species.

The Habitats and Birds Directives (1992 and 1979, codified 2009) are Europe's central laws on nature conservation, providing special protection for key sites (the Natura 2000 network), animal species, plant species and habitat types of European importance. This protection will be reinforced with the Marine Directive's Marine Protected Areas.

The Common Fisheries Policy (2002) sets out a collaborative approach to managing the EU's shared seas and fisheries. Among other things, it lays down rules to ensure Europe's fisheries are sustainable and do not damage the marine environment. The planned reform in 2011 should take into account the environmental impacts of fishing and the objectives of the Marine Directive to help ensure they are met.

The EU REACH Regulation (Registration, Evaluation, Authorisation and Restriction of Chemical substances), which entered into force on 1 June 2007, aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances, like the environmental risk they pose. It is directly related to Descriptor 8 (contaminants) and indirectly to Descriptor 9 (contaminants in seafood) and 10 (marine litter) of the Marine Directive.

The MSP Directive (spatial planning may impact ecological status)

(The IMP, of which the MSFD forms the environmental pillar)

EU biodiversity strategy to 2020

The renewable Energy Directive (Directive 2009/28/EC) (might conflict with descriptor 11)

Also mentioned in Art. 13: Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment (21) and Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality (22)

*Source: EC, 2016*

**Coordination issues with the EU Biodiversity Strategy**

The MSFD is significant for the EU Biodiversity Strategy as it is the overarching framework Directive targeted at the marine environmental status, which is directly linked to biodiversity.

Provision 18 : This MSFD should support the strong position taken by the Community, in the context of the Convention on Biological Diversity, on halting biodiversity loss, ensuring the conservation and sustainable use of marine biodiversity, and on the creation of a global network of marine protected areas by 2012. Additionally, it should contribute to the achievement of the objectives of the Seventh Conference of the Parties to the Convention on Biological Diversity, which adopted an elaborate programme of work on marine and coastal biodiversity with a number of goals, targets and activities aimed at halting the loss of biological diversity nationally, regionally and globally and at securing the capacity of the marine ecosystems to support the provision of goods and services, and a programme of work on protected areas with the objective of establishing and maintaining ecologically representative systems of marine protected areas by 2012.

**Relevance to ecosystems/habitats?**

Habitats addressed explicitly by the legal act/policy: Marine and coastal

Ecosystems affected/impacted implicitly by the relevant policy: Freshwater (e.g. new measures which affect marine areas may affects on freshwater e.g. regarding litter)

Links to Aquatic Biodiversity and Ecosystem Services: Both aquatic biodiversity and ecosystem services are central points to the MSFD.

In the MSFD Ecosystem services are directly linked to the marine environmental status: Marine strategies shall apply an ecosystem-based approach to the management of human activities, ensuring that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations.

Aquatic biodiversity is part of this marine environmental status: good environmental status' means the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations, i.e.: a) the structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors, allow those ecosystems to function fully and to maintain their resilience to human-induced environmental change. Marine species and habitats are protected, human-induced decline of biodiversity is prevented and diverse biological components function in balance; b) hydro-morphological, physical and chemical properties of the ecosystems, including those properties which result from human activities in the area concerned, support the ecosystems as described above. Anthropogenic inputs of substances and energy, including noise, into the marine environment do not cause pollution effects.

**Drivers**

The official Directive (Provision 24) states : Member States across a marine region or subregion should undertake an analysis of the features or characteristics of, and pressures and impacts on, their marine waters, identifying the predominant pressures and impacts on those waters, and an economic and social analysis of their use and of the cost of degradation of the marine environment. They may use assessments already carried out in the context of regional sea conventions as a basis for their analyses. Two guidance documents exist: Commission Staff Working Paper and Working Group on Economic and Social Analysis.

**Pressures**

An Annex of the MSFD defines pressures and impacts.
Table 2 Pressures and impacts: Physical loss: Smothering (e.g. by man-made structures, disposal of dredge spoil), sealing (e.g. by permanent constructions).
Physical damage: Changes in siltation (e.g. by outfalls, increased run-off, dredging/disposal of dredge spoil), abrasion (e.g. impact on the seabed of commercial fishing, boating, anchoring), selective extraction (e.g. exploration and exploitation of living and non-living resources on seabed and subsoil).
Other physical disturbance: Underwater noise (e.g. from shipping, underwater acoustic equipment), marine litter.
Interference with hydrological processes: Significant changes in thermal regime (e.g. by outfalls from power stations), significant changes in salinity regime (e.g. by constructions impeding water movements, water abstraction).
Contamination by hazardous substances: Introduction of synthetic compounds (e.g. priority substances under Directive 2000/60/EC which are relevant for the marine environment such as pesticides, antifoulants, pharmaceuticals, resulting, for example, from losses from diffuse sources, pollution by ships, atmospheric deposition and biologically active substances), introduction of non-synthetic substances and compounds (e.g. heavy metals, hydrocarbons,resulting, for example, from pollution by ships and oil, gas and mineral exploration and exploitation, atmospheric deposition, riverine inputs), introduction of radio-nuclides.
Systematic and/or intentional release of substances: Introduction of other substances, whether solid, liquid or gas, in marine waters, resulting from their systematic and/or intentional release into the marine environment, as permitted in accordance with other Community legislation and/or international conventions.
Nutrient and organic matter enrichment: Inputs of fertilisers and other nitrogen, and phosphorus-rich substances (e.g. from
point and diffuse sources, including agriculture, aquaculture, atmospheric deposition), inputs of organic matter (e.g. sewers, mariculture, riverine inputs).
Biological disturbance: Introduction of microbial pathogens, introduction of non-indigenous species and translocations, selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing).

**Assessment of Environmental State**

Member States are obliged to do an Initial Assessment (Art. 8) of their marine waters, it states: In respect of each marine region or subregion, Member States shall make an initial assessment of their marine waters, taking account of existing data where available and comprising the following: an analysis of the essential features and characteristics, and current environmental status of those waters, based on the indicative lists of elements set out in Table 1 of Annex III, and covering the physical and chemical features, the habitat types, the biological features and the hydro-morphology.
ANNEX III Indicative lists of characteristics, pressures and impacts (referred to in Art. 8(1), 9(1), 9(3), 10(1), 11(1) and 24):

| | |
|---|---|
| Physical and chemical features | Topography and bathymetry of the seabed, annual and seasonal temperature regime and ice cover, current velocity, upwelling, wave exposure, mixing characteristics, turbidity, residence time, spatial and temporal distribution of salinity, spatial and temporal distribution of nutrients (DIN, TN, DIP, TP, TOC) and oxygen, pH, pCO2 profiles or equivalent information used to measure marine acidification. |
| Habitat types | The predominant seabed and water column habitat type(s) with a description of the characteristic physical and chemical features, such as depth, water temperature regime, currents and other water movements, salinity, structure and substrata composition of the seabed, identification and mapping of special habitat types, especially those recognised or identified under Community legislation (the Habitats |

| | |
|---|---|
| | Directive and the Birds Directive) or international conventions as being of special scientific or biodiversity interest, habitats in areas which by virtue of their characteristics, location or strategic importance merit a particular reference. This may include areas subject to intense or specific pressures or areas which merit a specific protection regime. |
| Biological features | A description of the biological communities associated with the predominant seabed and water column habitats. This would include information on the phytoplankton and zooplankton communities, including the species and seasonal and geographical variability, information on angiosperms, macro-algae and invertebrate bottom fauna, including species composition, biomass and annual/seasonal variability, information on the structure of fish populations, including the abundance, distribution and age/size structure of the populations, a description of the population dynamics, natural and actual range and status of species of marine mammals and reptiles occurring in the marine region or subregion, a description of the population dynamics, natural and actual range and status of species of seabirds occurring in the marine region or subregion, a description of the population dynamics, natural and actual range and status of other species occurring in the marine region or subregion which are the subject of Community legislation or international agreements,an inventory of the temporal occurrence, abundance and spatial distribution of non-indigenous, exotic species or, where relevant, genetically distinct forms of native species,which are present in the marine region or subregion. |
| Other features | A description of the situation with regard to chemicals, including chemicals giving rise to concern, sediment contamination, hotspots, health issues and contamination of biota (especially biota meant for human consumption), a description of any other features or characteristics typical of or specific to the marine region or subregion. |

**Assessment of Status**

The Directive gives qualitative indicators for Good Environmental Status, which links to environmental state. ANNEX I: Qualitative descriptors for determining good environmental status (referred to in Art. 3(5), 9(1), 9(3) and 24):
(1) Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions; (2) Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems; (3) Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock; (4) All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity; (5) Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters; (6) Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected; (7) Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems; (8) Concentrations of contaminants are at levels not giving rise to pollution effects; (9) Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards; (10) Properties and quantities of marine litter do not cause harm to the coastal and marine environment; (11) Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment. The Commission also produced an ANNEX CRITERIA AND METHODOLOGICAL STANDARDS FOR GOOD ENVIRONMENTAL STATUS.

**Data**

Physical and socioeconomic data is being reported by the Member States for the Initial Assessment (Art 8). Data is collected on: seabed habitats, water column habitats, marine invertebrates, marine fish, marine reptiles, seabirds, marine mammals, physical features, physical

features, physical loss, physical damage, marine litter, underwater noise, extraction of fish and shellfish, microbial pollution, hazardous substances, non-synthetic hazardous substances, synthetic hazardous substances, radionuclide hazardous substances, hazardous substances in seafood, acute pollution events, hydrological processes, nutrients and organic enrichment, non-indigenous species and economic data such as Gross Value Added and employment. Data is being reported to the European Commission, and not available to the public other than through the Member State's initial assessment reports. An overview and assessment of the data collected was done by the European Topic Centre on Inland, Coastal and Marine Waters. There are also several initiatives in regard to marine data.

**Funding**

Art. 22 of the MSFD stipulates that the implementation of the Directive shall be supported by existing Community financial instruments in accordance with applicable rules and conditions. WG ESA developed a guidance document for co-financing.

The most relevant funding sources are identified as: EU Structural and Investment Funds (ESI Funds): European Maritime and Fisheries Fund (EMFF), EU Regional Funds: European Regional Development Fund (ERDF), Cohesion Fund (CF), EU Programme for the Environment and Climate Action (LIFE), EU Framework Programme for Research and Innovation (Horizon 2020). Funding for the MSFD is linked to the type of measure.

**Other issues to be aware of relevant for AQUACROSS?**

The scope of this policy is very broad: applying to all marine ecosystem services and all marine ecosystems and habitats within EU waters. The MSFD will therefore interfere with all EU marine policies. There is high risk for conflicts with other policies: targets and measures of the MSFD may not be compatible with targets and measures of other marine policies and therefore a high need for synchronization with other policies.

# 3.15 Common Fisheries Policy

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## Common Fisheries Policy

**Name/Type of the Legal Act or Policy**

REGULATION (EU) No 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the Common Fisheries Policy (CFP)
Official documents according to CFP website.
Regulation (EU) 2015/812 of the European Parliament and of the Council of 20 May 2015 amending Council Regulations (EC) No 850/98, (EC) No 2187/2005, (EC) No 1967/2006, (EC) No 1098/2007, (EC) No 254/2002, (EC) No 2347/2002 and (EC) No 1224/2009, and Regulations (EU) No 1379/2013 and (EU) No 1380/2013 of the European Parliament and of the Council, as regards the landing obligation, and repealing Council Regulation (EC) No 1434/98.
REGULATION (EU) No 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC.
Green paper Reform of the Common fisheries Policy
Synthesis of the Consultation on the Reform of the Common Fisheries Policy

**Entry into force**

1 January 2014

**Departments/Units in charge**

COM /DG MARE: Fisheries (and aquaculture) policy is divided across several units of DG MARE. This can be seen in the organisational chart.

**Common Implementation strategy (CIS processes)**

The CFP has Advisory Councils (ACs) – which are stakeholder- led organizations that provide the Commission and EU countries with recommendations on fisheries management matters.
There are seven ACs: Baltic Sea AC, Long Distance AC, Mediterranean AC, North Sea AC, North-western waters AC, Pelagic stocks AC, South-western waters AC. It also has the Scientific, Technical and Economic Committee for Fisheries (STECF) which provides scientific advice, particularly in the fields of marine biology, marine ecology, fisheries science, fishing gear technology and fishery economics.

**Administrative body handling implementation in MS**

In Germany, the Federal Ministry of Food and Agriculture (BMEL) (acting through its "Fisheries, EU enlargement and International Trade Relations" Directorate) is the competent authority responsible for fisheries and aquaculture. The federal ministry drafts policies, guidelines and promotes actions especially at the EU level in this area. The fisheries laws are executed by the states (Länder), whose exclusive *legislative* power is limited to national inland water fisheries. *More information on how the CFP is implemented in Germany*.
In the Netherlands, the Ministry of Economic Affairs, Directoraat-generaal Agro en Natuur is responsible for fisheries and aquaculture.

**Main Objective**

Provision 4: The CFP should ensure that fishing and aquaculture activities contribute to long-term environmental, economic, and social sustainability. It should include rules that aim to ensure the traceability, security and quality of products marketed in the Union. Furthermore, the CFP should

contribute to increased productivity, to a fair standard of living for the fisheries sector including small-scale fisheries, and to stable markets, and it should ensure the availability of food supplies and that they reach consumers at reasonable prices. The CFP should contribute to the Europe 2020 Strategy for smart, sustainable and inclusive growth, and should help to achieve the objectives set out therein.

**Principles included in the legal text**

- Subsidiarity: Clear definition of responsibilities at the Union, regional, national and local levels
- Subsidiarity: Regionalisation through sea-basin/fisheries based recommendations for COM act on certain conservation measures by MS concerned
- EBA: Taking account of regional specificities, through a regionalised approach
- EBA: Measures in accordance with the best available scientific advice
- EBA: Long-term perspective
- Participation: Stakeholder involvement in particular Advisory Councils, at all stages
- Consistency with other Union policies
- Impact assessments as appropriate
- Transparency of data handling in accordance with existing legal requirements
- Cooperation and exchange of best practice among MS
- Precautionary approach
- principle of proportionality,

Others:

- Administrative cost efficiency
- Primary responsibility of the flag State
- Coherence between the internal and external dimension of the CFP

**Other objectives/Key concepts/key elements of the legislation**

- Make the best use of unwanted catches, without creating a market for such of those catches below the minimum conservation reference size
- Provide conditions for economically viable and competitive fishing capture and processing industry and land-based fishing related activity
- Provide for measures to adjust the fishing capacity of the fleets to levels of fishing opportunities with a view to having economically viable fleets without overexploiting marine biological resources
- Contribute to a fair standard of living for those who depend on fishing activities
- Contribute to an efficient and transparent internal market for fisheries and aquaculture products and contribute to ensuring a level-playing field for fisheries and aquaculture products marketed in the Union
- Take into account the interests of both consumers and producers
- Promote coastal fishing activities, taking into account socio- economic aspects

Art. 2 Objectives: 1. The CFP shall ensure that fishing and aquaculture activities are environmentally sustainable in the long-term and are managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and of contributing to the availability of food supplies. 2. The CFP shall apply the precautionary approach to fisheries management, and shall aim to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield. In order to reach the objective of progressively restoring and maintaining populations of fish stocks above biomass levels capable of producing maximum sustainable yield, the maximum sustainable yield exploitation rate shall be achieved by 2015 where possible and, on a progressive, incremental basis at the latest by 2020 for all stocks. 3. The CFP shall implement the ecosystem-based approach to fisheries management so as to ensure that negative impacts of fishing activities on the marine ecosystem are minimised, and shall endeavour

to ensure that aquaculture and fisheries activities avoid the degradation of the marine environment. 4. The CFP shall contribute to the collection of scientific data. 5. The CFP shall, in particular: (a) gradually eliminate discards, on a case-by-case basis, taking into account the best available scientific advice, by avoiding and reducing, as far as possible, unwanted catches, and by gradually ensuring that catches are landed; (b) where necessary, make the best use of unwanted catches, without creating a market for such of those catches that are below the minimum conservation reference size; (c) provide conditions for economically viable and competitive fishing capture and processing industry and land-based fishing related activity; (d) provide for measures to adjust the fishing capacity of the fleets to levels of fishing opportunities consistent with paragraph 2, with a view to having economically viable fleets without overexploiting marine biological resources; (e) promote the development of sustainable Union aquaculture activities to contribute to food supplies and security and employment;(f)contribute to a fair standard of living for those who depend on fishing activities, bearing in mind coastal fisheries and socio-economic aspects; (g) contribute to an efficient and transparent internal market for fisheries and aquaculture products and contribute to ensuring a level-playing field for fisheries and aquaculture products marketed in the Union; (h) take into account the interests of both consumers and producers; (i) promote coastal fishing activities, taking into account socio- economic aspects; (j) be coherent with the Union environmental legislation, in particular with the objective of achieving a good environmental status by 2020 as set out in Art. 1(1) of Directive 2008/56/EC, as well as with other Union policies.

**Terminology**

*Union waters*: Waters under the sovereignty or jurisdiction of the Member States, with the exception of the waters adjacent to the territories listed in Annex II to the Treaty.

*Marine biological resources*: Available and accessible living marine aquatic species, including anadromous and catadromous species during their marine life.

*Fresh water biological resources*: Available and accessible living fresh water aquatic species.

*Fishing vessel*: Any vessel equipped for commercial exploitation of marine biological resources or a blue fin tuna trap.

*Union fishing vessel*: Fishing vessel flying the flag of a Member State and registered in the Union.

*Maximum sustainable yield (MSY)*: Highest theoretical equilibrium yield that can be continuously taken on average from a stock under existing average environmental conditions without significantly affecting the reproduction process.

*Precautionary approach to fisheries management*: As referred to in Art. 6 of the UN Fish Stocks Agreement, approach according to which the absence of adequate scientific information should not justify postponing or failing to take management measures to conserve target species, associated or dependent species and non-target species and their environment.

*Ecosystem-based approach to fisheries management*: Integrated approach to managing fisheries within ecologically meaningful boundaries which seeks to manage the use of natural resources, taking account of fishing and other human activities, while preserving both the biological wealth and the biological processes necessary to safeguard the composition, structure and functioning of the habitats of the ecosystem affected, by taking into account the knowledge and uncertainties regarding biotic, abiotic and human components of ecosystems.

*Discards*: Catches that are returned to the sea.

*Low impact fishing*: Utilising selective fishing techniques which have a low detrimental impact on marine ecosystems or which may result in low fuel emissions, or both.

*Selective fishing*: Fishing with fishing methods or fishing gears that target and capture organisms by size or species during the fishing operation, allowing non-target specimens to be avoided or released unharmed.

*Fishing mortality rate*: Rate at which biomass or individuals are removed from a stock by means of

fishery activities over a given period.

*Stock*: Means a marine biological resource that occurs in a given management area.

*Catch limit*: Either a quantitative limit on catches of a fish stock or group of fish stocks over a given period where such fish stocks or group of fish stocks are subject to an obligation to land, or a quantitative limit on landings of a fish stock or group of fish stocks over a given period for which the obligation to land does not apply.

*Conservation reference point*: Values of fish stock population parameters (such as biomass or fishing mortality rate) used in fisheries management, for example in respect of an acceptable level of biological risk or a desired level of yield.

*Minimum conservation reference size*: Size of a living marine aquatic species taking into account maturity, as established by Union law, below which restrictions or incentives apply that aim to avoid capture through fishing activity; such size replaces, where relevant, the minimum landing size.

*Stock within safe biological limits*: Stock with a high probability that its estimated spawning biomass at the end of the previous year is higher than the limit biomass reference point (Blim) and its estimated fishing mortality rate for the previous year is less than the limit fishing mortality rate reference point (Flim).

*Safeguard*: Precautionary measure designed to avoid something undesirable occurring.

*Fishing effort*: Product of the capacity and the activity of a fishing vessel; for a group of fishing vessels it is the sum of the fishing effort of all vessels in the group.

*Member State having a direct management interest*: Member State which has an interest consisting of either fishing opportunities or a fishery taking place in the exclusive economic zone of the Member State concerned, or, in the Mediterranean Sea, a traditional fishery on the high seas.

*Aquaculture*: Rearing or cultivation of aquatic organisms using techniques designed to increase the production of the organisms in question beyond the natural capacity of the environment, where the organisms remain the property of a natural or legal person throughout the rearing and culture stage, up to and including harvesting.

*Entry to the fishing fleet*: Registration of a fishing vessel in the fishing vessel register of a Member State.

*Technical measure*: Measure that regulates the composition of catches by species and size and the impacts on components of the ecosystems resulting from fishing activities by establishing conditions for the use and structure of fishing gear and restrictions on access to fishing areas.

*Transferable fishing concession*: Revocable user entitlement to a specific part of fishing opportunities allocated to a Member State or established in a management plan adopted by a Member State in accordance with Art. 19 of Council Regulation (EC) No 1967/2006 which the holder may transfer.

*Fishing capacity*: Vessels tonnage in GT (Gross Tonnage) and its power in kW (Kilowatt) as defined in Art. 4 and 5 of Council Regulation (EEC) No 2930/86.

*Fishing licence*: Licence as defined in point (9) of Art. 4 of Council Regulation (EC) No 1224/2009.

*Fishing authorisation*: Authorisation as defined in point (10) of Art. 4 of Regulation (EC) No 1224/2009.

*Fishing activity*: Searching for fish, shooting, setting, towing, hauling of a fishing gear, taking catch on board, transhipping, retaining on board, processing on board, transferring, caging, fattening and landing of fish and fishery products.

*Fishery product*: Aquatic organisms resulting from any fishing activity or products derived there from.

*Operator*: Natural or legal person who operates or holds any undertaking carrying out any of the activities related to any stage of production, processing, marketing, distribution and retail chains of fisheries and aquaculture products.

*Serious infringement*: Infringement that is defined as such in relevant Union law, including in Art. 42(1) of Council Regulation (EC) No 1005/2008 and in Art. 90(1) of Regulation (EC) No 1224/2009
*End-user of scientific data*: Body with a research or management interest in the scientific analysis of data in the fisheries sector.
*Surplus of allowable catch*: Part of the allowable catch which a coastal State does not harvest, resulting in an overall exploitation rate for individual stocks that remains below levels at which stocks are capable of restoring themselves and maintaining populations of harvested species above desired levels based on the best available scientific advice.
*Aquaculture products*: Aquatic organisms at any stage of their life cycle resulting from any aquaculture activity or products derived there from.
*Spawning stock biomass*: Estimate of the mass of the fish of a particular stock that reproduces at a defined time, including both males and females and fish that reproduce viviparously
*Mixed fisheries*: Fisheries in which more than one species is present and where different species are likely to be caught in the same fishing operation.
*Sustainable fisheries partnership agreement*: International agreement concluded with a third state for the purpose of obtaining access to waters and resources in order to sustainably exploit a share of the surplus of marine biological resources, in exchange for financial compensation from the Union, which may include sectoral support.
Terms used but not defined (in the basic regulation but probably in secondary acts like management plans, however, some like the multi-annual plans could be considered as defined taken the specifications given in the regulation): Multi-annual plan, Fishing opportunity, Pilot project, Fish stock recovery area /Coherent networks, De minimis, Scientific body, Expert group, Advisory Council.

**Derogations**

Country specific, temporal derogations existed but have been abolished. There is a derogation specified regarding the urgent establishment of conservation measures, in Art. 11: In general, "Art. 11 of the CFP sets out three possible scenarios:

- The first deals with Member State conservation measures that will not affect other Member States' fishing vessels (Art. 11(1)).
- The second scenario relates to when the conservation measures will affect other Member States' fishing vessels. In this case, the European Commission may produce delegated acts (or proposals for EU legislation) based on the initiating Member State's proposal and, possibly, joint recommendations developed with the Member States whose fishing interests are affected (Art. 11(2)-(3)).
- The third scenario deals with cases of urgency where the achievement of the relevant conservation objective is at risk (Art. 11(4)-(5))."

Art 11 §4: Commission may in case of absence of a joined proposal by MS and in case of urgency adopt management measures, if the goals of as specified in Art. 13(4) of Directive 2008/56/EC, Art. 4 of Directive 2009/147/EC, or Art. 6 of Directive 92/43/EC are threatened to be jeopardized.
Art. 15 "Landing Obligation": several derogations i.e. de minimis exemption

**Types of management measures**

Conservation measures (multi-annual plans, fishing opportunities, technical measures, fish stock recovery areas, landing obligation); Fleet/Capacity measures; Control measures; Financial measures (EMFF); Incentives for low impact fishing methods; Regionalisation
Types of management approaches

- Ecosystem-based management to fisheries (see definitions) through MSY, discard ban, multi-annual plans, stock recovery areas, technical measures, promotion of selective/low impact fishing; Ecosystem-based approach through seabasin-based approach and link to MSFD; Decentralisation through Regionalisation (option for Member States concerned to provide

recommendations on Commission act on conservation measures); Science-based through DCF and advisory bodies; Participatory through Advisory Councils

**Spatial coverage**

Sectoral: Conservation of marine biological resources and the management of fisheries and fleets exploiting such Resources; Fresh water biological resources, aquaculture, processing and marketing in relation to markets and financial measures

Spatial: Activities as specified above: on the territory of Member States, in Union waters, including by fishing vessels flying the flag of, and registered in, third countries, by Union fishing vessels outside Union waters, by nationals of Member States, without prejudice to the primary responsibility of the Flag State.

**Reporting units - what are the specific transposition requirements**

Reporting specifically mentioned in the CFP:

Member States (MS) should take specific measures to align the number of Union fishing vessels with available resources, based on their assessments of the balance between the fishing capacity of their fleets and the fishing opportunities available to them. The assessments should be made in accordance with Commission (COM) guidelines and be presented in an annual report to be transmitted to the COM. Those reports should be made public. Each MS should be able to choose the measures and instruments which it wishes to adopt in order to reduce excessive fishing capacity

Art. 8, 3: The COM may be empowered in a multiannual plan to establish such biologically sensitive protected areas. Art. 18(1) to (6) shall apply. The COM shall report regularly to the European Parliament and to the Council on protected areas.

Art. 26, 3: Every year, MS shall submit to the COM a report on the execution of their national data collection programmes and shall make it publicly available.

Art. 49 Review: The COM shall report to the European Parliament and to the Council on the functioning of the CFP by 31 December 2022.

Art. 50 Annual Report: The COM shall report annually to the European Parliament and to the Council on the progress on achieving MSY and on the situation of fish stocks, as early as possible following the adoption of the yearly Council Regulation fixing the fishing opportunities available in Union waters and, in certain non-Union waters, to Union vessels.

**Management unit**

- North Sea ICES zones IIIa and IV
- Baltic Sea ICES zones IIIb, IIIc and IIId
- North Western waters ICES zones V (excluding Va and only Union waters of Vb), VI and VII
- South Western waters ICES zones VIII, IX and X (waters around Azores), and CECAF zones 34.1.1, 34.1.2 and 34.2.0 (waters around Madeira and the Canary Islands)
- Mediterranean Sea Maritime Waters of the Mediterranean to the East of line 5°36'West
- Black Sea GFCM geographical sub-area as defined in Resolution GFCM/33/2009/2

**Key planning steps**

Reporting:

- Evaluation by the COM of Fleet Entry/Exit Regime by 30 December 2018
- Report by MS annually on the balance between fishing capacity and opportunity
- Report by the COM to EP & Council annually on the balance between fishing capacity and opportunity
- Report by the COM to EP & Council annually on MSY implementation and stock status
- Report by the COM to EP & Council by 31 December 2022 on CFP performance

**Timelines**

- MSY 2015-2020 The current policy stipulates that between 2015 and 2020 catch limits should be set that are sustainable and maintain fish stocks in the long term. A ban on

discarding in pelagic fisheries (such as mackerel and herring) started on 1 January 2015, with a further ban on discards in all other fisheries to start between 1 January 2016 and 2019.

- Regional recommendation to COM by MS concerned for measures as provided in the CFP against deadline as stipulated in the relevant secondary act
- Emergency measures by COM/MS with immediate effects (15 days) for 6months/3months
- Landing obligation for all stocks by 2015 for pelagic and salmon and stepwise for all other stocks per sea basin 2015-2019
- MS strategic plans on aquaculture by 30 June 2014, By 30 June 2014, Member States shall establish a multiannual national strategic plan for the development of aquaculture activities on their territory.
- MS/COM to reply to advice by Advisory Councils within 2 months The Commission shall report to the European Parliament and to the Council on the functioning of the CFP by 31 December 2022.

**Integration/coordination issues with other related pieces of legislation**

Conflict with Biodiversity Strategy

- MSY objective not 2015 but 2015-2020
- No clear MSY definition in the Biodiversity Strategy
- Conservation reference size (link to landing obligation plus gear specifications) conflicts with aim of population age and size structure indicative for a healthy stock
- No concrete targets or timelines to ensure fisheries management with no significant adverse impacts on species and ecosystems

Conflicts with Birds and Habitat Directive: I see a conflict between the CFP and the successful implementation of the Natura 2000 legislation, as MS can only decide on fisheries management measures for their own fleet and not for the fleets of other MS. Concerning the fact that fishing is one of the main marine drivers, this implies that the management plans for marine SACs can only be effective if the measures have been issued/approved by the EC. This process is complex and lengthy and may be one of the reasons why the management plans for marine SACs in the EEZ (outside territorial seas) are so delayed in Europe. In urgent cases the Commission can make use of an exemption specified in Art. 4 (see also 3.5).This was used successfully for the Darwin mounts.

Conflicts with MSFD: Fisheries management is crucial for the achievement of the targets of the MSFD. However, while the first is managed on the level of the European Union, the latter is managed on MS level. Hence there is some potential for conflict

Martime Spatial Planning Directive (MSPD): Through their maritime spatial plans, Member States contribute to the sustainable development of fisheries and aquaculture sectors. The CFP is also linked with the Water Framework Directive through the need for good quality water for commercially exploitable fish to grow/proliferate. The CFP is also closely linked with the Marine Strategy Framework Directive (Descriptor 3 on commercially exploited fish and shellfish)

**Coordination issues with the EU Biodiversity Strategy**

The CFP is directly related to target 4 of the Biodiversity strategy. The reformed CFP has the vision to achieve sustainable fisheries, which is, at least theoretically, in line with target 4 of the Biodiversity Strategy. The reformed CFP has not been in force long enough to have sufficient evidence for judging on whether implementation is in conformity with this vision, and thus to assess its impact on target 4 of the biodiversity strategy.

The TAC agreed on a political level in the past has, however, oftentimes not followed the suggestions according to scientific advice. Furthermore, MS have failed to respect their allocated quota (e.g. regarding deep sea fish).

Some key issues related to the CFP's objective to progressively restore and maintain populations of fish stocks above biomass levels capable of producing MSY are the availability of data on the

biomass levels capable of producing MSY, exceptions for a delay in setting the TACs, the issue of timelines to achieve MSY exploitation rates. Furthermore, the way how the precautionary principle is interpreted in the CFP is contested.

| Detailed list of targets of the EU Biodiversity Strategy | |
|---|---|
| Target 1: Fully implement the Birds and Habitats Directives | 100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; 50% more species assessments under the Birds Directive show a secure or improved status |
| Target 2: Maintain and restore Ecosystems and their services | Establishing green infrastructure, restoring at least 15% of degraded ecosystems |
| Target 3: Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity | 3A) Agriculture: Maximise areas under agriculture covered by biodiversity-related measures under the CAP; bring about a measurable improvement in the conservation status of species and habitats and in ecosystem services as compared to the EU2010 Baseline<br>3B) Forests: Forest Management Plans or equivalent instruments in place for all forests publicly owned and for holdings above a certain size that receive funding under the EU Rural Development Policy, a measurable improvement in the conservation status of species and habitats in ecosystem services as compared to the EU 2010 Baseline. |
| Target 4: Ensure the sustainable use of fisheries resources | MSY by 2015; Achieve a population age and size distribution indicative of a healthy stock through fisheries management with no significant adverse impacts on other stocks, species and ecosystems, in support of achieving Good Environmental Status by 2020, as required under the Marine Strategy Framework Directive. |
| Target 5: Combat invasive alien species | Invasive Alien Species (IAS) and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS. |
| Target 6: Help avert global biodiversity loss | EU has stepped up its contribution to averting global biodiversity loss. |

**Relevance to ecosystems/habitats?**

The CFP addresses the conservation of marine and freshwater fisheries resources and aquaculture activities, which are dependent on the functioning of marine and freshwater ecosystems. The CFP does state that impacts on 'marine biodiversity and marine ecosystems' should be minimized.

**Drivers**

Definition of drivers used in the implementation process of this policy : Fishing and aquaculture

**Pressures**

There is no single definition of *pressures* used in the implementation process. Intense fishing pressure on sensitive stocks (fishing pressure on habitats due to destructive fishing methods, bycatch) is addressed by the legal text. The CFP introduces fishing fleet capacity ceilings, measured in kilowatts (kW) and gross tonnage (GT) ; TACs and Quota, assigned per species, zone, country and year in tonnage ; Furthermore the CFP states that multiannual plans should contain quantifiable indicators of progress, as well as indicators for environmental, economic and social sustainability.

**Assessment of Environmental State**

The policy does not explicitly target environmental state, rather status of fish stocks.

Related terms: Fish stock (Baltic, North Sea, Black Sea, Atlantic), GFCM management unit (Mediterranean) for stock advice; Sea basin for ecosystem assessments; Fisheries for fleet assessments; Variable for policy performance.

For describing the desired state of the fish stocks the CFP uses the concept of biomass levels

capable of producing MSY, and introduces spawning stock biomass biomass reference point (Blim) and fishing mortality rate reference point (Flim).

**Data**

MS to collect data on fisheries and fish stocks according to DCF (Council Regulation (EC) No 1543/2000 establishing a Community framework for the collection and management of the data needed to conduct the common fisheries policy). Scientific bodies (STECF, JRC & ICES) to analyse the data and provide scientific advice. Report by the COM to EP & Council annually on the balance between fishing capacity and opportunity. MS to compile control data from logbooks, sales notes and satellite data according to Control Regulation (Council Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy) European Fisheries Control Agency (EFCA) to assist MS to comply with the rules of the CFP. COM EU Market Observatory for Fisheries and Aquaculture products (EUMOFA)

**Funding**

European Maritime and Fisheries Fund (EMFF) (REGULATION (EU) No 508/2014)

**Other issues to be aware of relevant for AQUACROSS?**

The policy might conflict with legislation outside EU waters.

# 3.16 Integrated Coastal Zone Management

Authors: Alejandro Iglesias-Campos, Julian Barbière and Ana Barbosa, IOC-UNESCO

Reviewers: Fátima Lopes Alves and Ana Isabel Lillebø, Universidade de Aveiro

| Integrated Coastal Zone Management |
|---|
| **Name/Type of the Legal Act or Policy** |
| ICZM Recommendations<br>Recommendations of the European Parliament and of the Council of 30 May 2002 concerning the implementation of Integrated Coastal Zone Management in Europe.<br>Other legal texts relevant for the Legal Act and Policy:<br>Water Framework Directive; Drinking Water Directive; Habitats and Birds Directives; Floods Directive; Urban Waste Water Directive; Bathing Water Directive; Discharge of Dangerous Substances; Directive on technical specifications for chemical analysis and monitoring of water status; EU action on water scarcity and drought; Integrated Maritime Policy; Maritime Spatial Planning Directive; Marine Strategy Framework Directive; Common Fisheries Policy and European Maritime and Fisheries Fund; Soils Thematic Strategy; Common Agricultural Policy; Waste Framework Directive<br>Action plans and regulations related to waters, biodiversity, climate change, agriculture, drought and water scarcity, desertification, tourism and blue economy. |
| **Entry into force** |
| May 2002 |
| **Departments/Units in charge** |
| DG ENV (Coordination) EEA, ETCs and Member States (In charge of the implementation).<br>Ms. Birgit Snoeren, DG ENV<br>Mr. Andrus Meiner, EEA |
| **Common Implementation strategy (CIS processes)** |
| WG ICZM – The EU ICZM Expert group facilitates the implementation of the EU ICZM Recommendation. The expert group consists of Commission, Member States, Candidate countries and relevant European coastal interest or stakeholder groups. The working group on indicators and data established 2 sets of indicators, one aimed to measure progress in ICZM, the other one measuring sustainability on the coast. Progress in this work has been reported to the expert group at each meeting. The reports of the working group can be seen below, for discussion and orientations for further work given by the expert group, please refer to the minutes of expert group meetings. The EU ICZM Recommendation requested national reports on the implementation of the ICZM Recommendation by February 2006 (Chap. VI(1)). National reporting by the Member States (reports 2002-2006 and 2006-2010). See Member State 2006-2010 reports. |
| **Administrative body handling implementation in MS** |
| Belgium: Federal Ministry of Environment with the support of the Government of Flanders<br>Bulgaria: Ministry of Environment<br>France: Ministry of Ecology and Sustainable Development<br>Germany: Federal Ministry of Environment in coordination with the federal states.<br>Italy: Ministry of Environment and Environmental Protection Institute<br>Latvia: Ministry of Environment<br>Lithuania: Ministry of Environment<br>Poland: Ministry of Environment and Ministry of Transportation |

Portugal: Ministry of Environment, Spatial Planning and Energy
Romania: Ministry of Environment
Slovenia: Ministry of Environment and Planning
Spain: Ministry of Environment, Ministry of Public Works in coordination with the autonomous communities
Sweden: Ministry of Environment in coordination with the local authorities
United Kingdom: Department of Environment, National Environment Agency

**Main Objective**

A European Parliament and Council Recommendation concerning the implementation of Integrated Coastal Zone Management in Europe was adopted on 30 May 2002 (2002/413/EC). It lists eight principles defining the essential characteristics of ICZM. Integration across sectors and levels of governance, as well as a participatory and knowledge-based approach, are hallmarks of ICZM. Based on these principles, the Recommendation outlines steps which the Member States should take to develop national strategies for ICZM. Given the cross-border nature of many coastal processes, coordination and cooperation with neighbouring countries and in a regional sea context are also encouraged.

**Principles included in the legal text**

From chapter II: In formulating national strategies and measures based on these strategies, Member States should follow the principles of integrated coastal zone management to ensure good coastal zone management, taking into account the good practices identified, inter alia, in the Commission's demonstration programme on integrated coastal zone management. In particular, coastal zone management should be based on: (a) a broad overall perspective (thematic and geographic) which will take into account the interdependence and disparity of natural systems and human activities with an impact on coastal areas; (b) a long-term perspective which will take into account the precautionary principle and the needs of present and future generations; (c) adaptive management during a gradual process which will facilitate adjustment as problems and knowledge develop. This implies the need for a sound scientific basis concerning the evolution of the coastal zone; (d) local specificity and the great diversity of European coastal zones, which will make it possible to respond to their practical needs with specific solutions and flexible measures; (e) working with natural processes and respecting the carrying capacity of ecosystems, which will make human activities more environmentally friendly, socially responsible and economically sound in the long run; (f) involving all the parties concerned (economic and social partners, the organisations representing coastal zone residents, non-governmental organisations and the business sector) in the management process, for example by means of agreements and based on shared responsibility; (g) support and involvement of relevant administrative bodies at national, regional and local level between which appropriate links should be established or maintained with the aim of improved coordination of the various existing policies. Partnership with and between regional and local authorities should apply when appropriate; (h) use of a combination of instruments designed to facilitate coherence between sectoral policy objectives and coherence between planning and management.

**Other objectives/Key concepts/key elements of the legislation**

From chapter III: Member States conduct or update an overall stocktaking to analyse which major actors, laws and institutions influence the management of their coastal zone. This stocktaking should: (a) consider (but not be limited to) the following sectors and areas: fisheries and aquaculture, transport, energy, resource management, species and habitat protection, cultural heritage, employment, regional development in both rural and urban areas, tourism and recreation, industry and mining, waste management, agriculture and education; (b) cover all administrative levels; (c) analyse the interests, role and concerns of citizens, non-governmental organisations, and the business sector; (d) identify relevant inter-regional organisations and

cooperation structures, and (e) take stock of the applicable policy and legislative measures.

**Types of management measures**

From chapter I: Member States take into account the sustainable development strategy and the Decision of the European Parliament and of the Council laying down the sixth Community environment action programme(7), and take a strategic approach to the management of their coastal zones, based on: (a) protection of the coastal environment, based on an ecosystem approach preserving its integrity and functioning, and sustainable management of the natural resources of both the marine and terrestrial components of the coastal zone; (b) recognition of the threat to coastal zones posed by climate change and of the dangers entailed by the rise in sea level and the increasing frequency and violence of storms; (c) appropriate and ecologically responsible coastal protection measures, including protection of coastal settlements and their cultural heritage; (d) sustainable economic opportunities and employment options; (e) a functioning social and cultural system in local communities; (f) adequate accessible land for the public, both for recreational purposes and aesthetic reasons; (g) in the case of remote coastal communities, maintenance or promotion of their cohesion; (h) improved coordination of the actions taken by all the authorities concerned both at sea and on land, in managing the sea-land interaction.

**Spatial coverage**

All member states, including landlocked countries.

**Reporting units - what are the specific transposition requirements**

Linked with the WFD, MSFD and Bathing Waters Directive, coastal zone is identified as the land sea interface from inland to the external limit of 1nm from the coastline. It is not specifically mentioned in the ICZM Recommendation but in the WFD and MSFD.

**Management unit**

The coastal area as defined by the WFD and MSFD directives which limits will be established by each member state depending on the distribution of coastal management competences.

**Key planning steps**

National strategies and national reports were expected following Chapter IV and Chapter VI of the Recommendation document:

a) The national strategies: 1. Based on the result of the stocktaking, each Member State concerned, in partnership with the regional authorities and inter-regional organisations, as appropriate, should develop a national strategy or, where appropriate, several strategies, to implement the principles for integrated management of the coastal zone. 2. These strategies might be specific to the coastal zone, or might be part of a geographically broader strategy or programme for promoting integrated management of a larger area. 3. These strategies should: identify the roles of the different administrative actors within the country or region whose competence includes activities or resources related to the coastal zone, as well as mechanisms for their coordination. This identification of roles should allow an adequate control, and an appropriate strategy and consistency of actions; identify the appropriate mix of instruments for implementation of the principles outlined in Chapter II, within the national, regional or local legal and administrative context. In developing these strategies, the Member States should consider the appropriateness of developing national strategic plans for the coast to promote integrated management ensuring, inter alia, the control of additional urbanisation and of the exploitation of non-urban areas while respecting natural features of the coastal environment;land purchase mechanisms and declarations of public domain to ensure public access for recreational purposes without prejudice to the protection of sensitive areas; developing contractual or voluntary agreements with coastal zone users, including environmental agreements with industry; harnessing economic and fiscal incentives, and working through regional development mechanisms; develop or maintain national and, where

appropriate, regional or local legislation or policies and programmes which address both the marine and terrestrial areas of coastal zones together; particularly, identify measures to promote bottom-up initiatives and public participation in integrated management of the coastal zone and its resources; identify sources of durable financing for integrated coastal zone management initiatives where needed, and examine how to make the best use of existing financing mechanisms both at Community and at national level; identify mechanisms to ensure full and coordinated implementation and application of Community legislation and policies that have an impact on coastal areas, including when reviewing Community policies; include adequate systems for monitoring and disseminating information to the public about their coastal zone. These systems should collect and provide information in appropriate and compatible formats to decision makers at national, regional and local levels to facilitate integrated management. The work of the European Environment Agency can serve inter alia as a basis for this purpose. These data should be publicly available in accordance with relevant Community legislation, in particular with the Directive of the European Parliament and of the Council on public access to environmental information and repealing Council Directive 90/313/EEC(8); determine how appropriate national training and education programmes can support implementation of integrated management principles in the coastal zone.

Reporting and review:

a) Member States report to the Commission on the experience in implementation of this Recommendation 45 months after its adoption.

b) These reports are available to the public and include, in particular, information concerning:

   i. the results of the national stocktaking exercise;
   ii. the strategy or strategies proposed at the national level for implementation of integrated coastal zone management;
   iii. a summary of actions taken, or to be taken, to implement the national strategy or strategies;
   iv. an evaluation of the expected impact of the strategy or strategies on the status of the coastal zone;
   v. an evaluation of the implementation and application of Community legislation and policies that have an impact on coastal areas.

Of the 20 coastal EU MS, 14 submitted their official national reports representing 65% of the coastal area and 70% of the coastline of Europe. The reports covered very different situations: newly developed national strategies, a new phase in a longer on-going national process of implementing ICZM, the results of stocktaking exercises and initial proposals for a coastal strategy. Research indicates that all coastal EU Member States regulate coastal use and development in some form. Steps were taken during 2000-2005 towards a more integrated planning and management approach, but a mature and well-functioning ICZM involving all relevant levels of governance is still rarely observed. A key achievement of the EU ICZM Recommendation has been to codify a common set of principles that should underlie sound coastal planning and management. While the evaluation confirms the relevance of these ICZM principles, the implementation of the EU ICZM Recommendation also reveals varying interpretations and understanding of ICZM across Europe. To foster a more coherent and effective implementation of ICZM, the principles need to be made more operational and better communicated. The diversity of coasts, along with the different administrative systems between and within Member States , implies though that there are no readily available, one-size-fits-all solutions. Rather there is a need for a more systematic comparative analysis and increased exchange of experiences in Europe.

**Timelines**

The Commission reviewed this Recommendation in 2007, as referred within 55 months following

the date of its adoption and submit to the European Parliament and the Council an evaluation report accompanied if appropriate by a proposal for further Community action. The review output was integrated in the Communication from the Commission – Report to the European Parliament and the Council: an evaluation of Integrated Coastal Zone Management (ICZM) in Europe (COM/2007/0308 final).

**Integration/coordination issues with other related pieces of legislation**

Coordination as cooperation is mentioned in Chapter V: a) Member States should encourage, enter into or maintain dialogue and implement existing conventions with neighbouring countries, including non-Member States in the same regional sea, to establish mechanisms for better coordination of responses to cross-border issues. b) Member States also work actively with the Community institutions and other coastal stakeholders to facilitate progress towards a common approach to integrated coastal zone management, examining the need for a European coastal stakeholder's forum. In this process, ways of using existing institutions and conventions should be explored. c) In this context, cooperation with the accession countries is maintained and enhanced.

**Coordination issues with the EU Biodiversity Strategy**

The coordination issues are not directly specified in the recommendation text, but the priorities strategically involve the combination of policies and instruments to consider the interdependence and disparity of natural systems and human activities with an impact (on the biodiversity) on coastal areas. In addition to the natural processes and the capacity of ecosystems, the recommendation emphasizes the need of an environmentally friendly, socially responsible and economically sound approach in the long term.

**Relevance to ecosystems/habitats?**

The coastal area is addressed. All land and water ecosystems within the limits of the coastal area, which could include the full extent of a river basin district (terrestrial and aquatic ecosystems) and the transitional and coastal waters. Links to aquatic ecosystems/biodiversity : as referred in the sections above, the recommendations requested Member states to take into account the sustainable development strategy and the decisions of the European Parliament and the Council to develop a strategic approach to the management of the coastal zones in Europe, attending the principles of protection of the coastal environment based on an ecosystem approach by preserving its integrity and functioning. This is mentioned in the strategic approach of the recommendation and the principles (Chapters I and II). The ecosystem-based management is a framework to preserve the integrity and functioning of the ecosystems when providing services to humans, including both terrestrial and aquatic biodiversity.

**Drivers**

The recommendation itself recognize the coastal zone as an important environmental, economic, social, cultural and recreational ecosystem which possess a unique biodiversity in terms of flora and fauna.

The Agenda 21 (Chapter 17), the UN Conference on Environment and Development in Rio 1992 and the evaluation reports on the coast made by the European Environment Agency and EIONET can be considered the main drivers.

National assessment should analyse the interests, role and concerns of citizens, non-governmental organizations and business sector. This assessment should also consider the following sectors: fisheries and aquaculture, transport, energy, resource management, species and habitat protection, cultural heritage, employment, regional development in both rural and urban areas, tourism and recreation, industry and mining, waste management, agriculture and education; The indicators were defined by the working group on indicators and data with the support of the European Environment Agency and the European Topic Centre on Terrestrial Environment (ETC-TE/ETC-LUSI/ETC-SIA). The indicators guidelines provide the list of indicators

and guidance on how to select the most suitable indicators for each coastal zone, including type/unit/indicator used for the assessment/definitions and how to quantify them. The Working Group on Indicators and Data developed and tested a list of indicators in parallel with the INTERREG Project DEDUCE: see link.

**Pressures**

Recommendations do not include any section dedicated to definitions. Pressures which the legal act/policy address: Climate change, sea level rise, increase of frequency and strength of storms and increased coastal erosion and flooding. The majority of indicators developed after the recommendation entered into force are not available anymore. The EEA has not maintained them in the EEA Data Service.

**Assessment of Environmental State**

The recommendation includes a request to Member states to define adequate monitoring and information systems as part of the strategy to report on the state of the environment of the coasts in Europe, as well as a dissemination tool for the public. The terms and parameters were defined by Member states and through the INTERREG Project DEDUCE which published in 2007 the Indicators Guidelines to adopt an indicators-based approach to evaluate coastal sustainable development.

**Assessment of Status**

The Recommendation text does not address the environmental status, thus no term or parameter was indicated. The Communication COM(2007)308 final, developed the linkages in between the ICZM Recommendations and the coastal and marine policy framework, for example In October 2005, the Commission adopted its Thematic Strategy on the Protection and the Conservation of the Marine Environment, including the later approved MSFD. By proposing a legislative framework to achieve a good environmental status of the marine environment, the institutional strategy enhanced the existing body of EU policies and legislation available for the terrestrial part of the coastal zone, (e.g. WFD including transitional and coastal waters' ecological status) supporting the implementation on Integrated Coastal Zone Management.

The MSFD and the EU Integrated Coastal Zone Management policy are considered in the broader framework of the EU Maritime Policy from 2006 to present time. Integrated Coastal Zone Management has a role to play in current marine and maritime policy framework, moreover, given the particular exposure of coastal zones to the possible impacts of climate change, the European Climate Change Programme, in particular its part on impacts and adaptation are also of key importance to Europe's coastal zones.

**Data**

DEDUCE provided the indicators and the MS reported using the available information. The EEA has not maintained the data and information provided by Member states in their data and information service in web and during the production of the latest state of the coastal environment report, the data and information provided by the countries in between 2002 and 2010 were not used. The website of the DEDUCE project led by the Government of the Spanish Region of Catalonia is not operative anymore. However, the EEA portal provides a variety of data and maps related to this issue. The COM (2007) 308 final aims to support the implementation of ICZM, more investment will be needed in the capacity to gather information, analyse it and inform the relevant decision-makers and the public at large. The recently adopted INSPIRE Directive provides the legal framework for a more effective infrastructure for the use and dissemination of spatial information. The Shared Environmental Information System which is being developed by the Commission, the European Environment Agency and the Member States in the context of INSPIRE should assist in making coastal zone information more readily available.

**Funding**

None. Data was generated by using funds from different funding sources, e.g. National funds,

LIFE, as such it is difficult to point out specific data sources.

**Other issues to be aware of relevant for AQUACROSS?**

Several countries cooperated in transboundary issues. DG ENV used the limited resources to analyse the impacts of the Recommendations in the development of coastal and marine information systems.

# 3.17 Strategy for Soil Protection

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Reviewers: Alexandra Rossi, ACTeon

## Strategy for Soil Protection

**Name/Type of the Legal Act or Policy**

The Thematic Strategy for Soil Protection consists of a Communication from the Commission to the other European Institutions (COM(2006) 231), a proposal for a framework Directive (COM(2006) 232), and an Impact Assessment (SEC (2006) 1165 and SEC(2006) 620).

After almost eight years of not reaching qualified majority in the Council, the Commission withdrew the proposal for a Soil Framework Directive on 30 April 2014. However, the Commission indicated that it will remain committed to the objective of the protection of soil and will examine options on how to best achieve this.

Based on the background of this note about the policy process in the EU please include space for the inclusion of subsequent legal Acts (Communication, Directives and regulations) related with the reviewed Type of the Legal Act or Policy.

Please name all regulations and other legal texts relevant for the Legal Act and Policy. Afterwards, please link the text in the template to the identified policy and subsequent regulations and try to be as explicit as possible as to their interaction.

Achieving the objectives of the Thematic Strategy for Soil Protection is of particular importance for agriculture sector, the aquatic environment, protected areas, air quality and climate change mitigation as it yields benefits in all these areas and vice versa. The following EU legal acts are therefore related to the Thematic Strategy for Soil Protection:

- The seventh Environment Action Programme (EAP):[6] entered into force in January 2014 and will be guiding European environment policy until 2020 (2014-2020). As regards soil protection, the 7th EAP recognises soil degradation as a serious challenge and aims that land is managed sustainably, soil is adequately protected and the remediation of contaminated sites is well in progress in the European Union by 2020. It commits the EU and its Member States to strengthen efforts to reduce soil erosion, increase soil organic matter and to remediate contaminated sites, as well as to enhance the integration of land use aspects into coordinated decision-making involving all relevant government levels, supported by the adoption of targets on soil and on land as a resource, and land planning objectives.
- The Resource Efficiency Roadmap: the Communication on Roadmap to a Resource Efficient Europe (COM/2011/0571 final) sets soil and land related milestones to be reached by 2020, and a vision for the structural and technological change needed up to 2050:
    - EU policies take into account their direct and indirect impact on land use in the EU and globally, and keeping on track the rate of land take with an aim to achieve no net land take by 2050;
    - continuously implement the actions needed for reducing soil erosion and increasing soil organic matter, as well as for remedial work on contaminated sites in progress.
- Water Policy:
    - The Water Framework Directive (2000/60/EC), the Groundwater Directive (2006/118/EC), the Nitrates Directive - the aquatic environment is especially sensitive

[6] Issued with the Decision No 1386/2013/EU

to pollution coming from/through soil. It is therefore necessary to pay particular attention to avoid pollution of surface water and groundwater by taking appropriate soil management measures. The EU Floods Directive – the promotion of sustainable and integrated flood management in the Floods Directive results in an indirect contribution to the protection of soils mainly by aiming to maximising natural infiltration and retention capacities of soils.

- Nature Conservation Policy:
  - The Wild Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC) – soil is a major element of the terrestrial ecosystems, therefore a good quality of soil contributes significantly to the favourable conservation status of the Natura 2000 sites protected in accordance with the Wild Birds and Habitats Directives.
- The Common Agricultural Policy (CAP):
  - Pillar 1 of the CAP – direct payments (cross-compliance and greening requirements): two Regulations 1306/2013 and 1307/2013 are of relevance to soil protection, the former of which includes the rules for cross-compliance with the Annex II table laying out the Statutory Management Requirements (SMRs) and the Good Agricultural and Environmental Conditions (GAECs). Regulation 1307/2013 specifies the direct payments for farmers (dependent upon their compliance with the cross-compliance scheme) and includes the new greening requirements under the 2014-2020 programming period.
    - The Pillar 1 of the CAP is relevant to soil protection because the cross-compliance standards include soil provisions which the MS' adopt as GAECs according to their specific context. There are three specific GAEC issues dedicated to soil in Annex II of the Regulation 1306/2013 for the cross-compliance system (GAEC 4 – minimum soil cover, GAEC 5 – minimum land management reflecting site specific conditions to limit erosion, and GAEC 6 – maintenance of soil organic matter level through appropriate practices including ban on burning arable stubble, except for plant health reasons)[7]; GAEC 7 – retention of landscape features – is indirectly focused on soil.
    - All three greening requirements are indirectly relevant to soil protection, because the environmentally-friendly farming practices such as crop diversification and maintenance of permanent grassland contribute positively to soil functionality and health; and the conservation of the areas of ecological interest – contributes to extensive agriculture and in this way contributes to soil quality.
  - Pillar 2 – the Rural Development Policy (EAFRD Regulation, EU, No. 1305/2013): One of the EAFRD objectives – "ensuring the sustainable management of natural resources, and climate action" (Art. 4) – is relevant to soil protection because the measures which incentivise "sustainable management of natural resources, and climate action" (e.g., agri-environment-climate, organic farming) may contribute to more farmers practicing soil-friendly methods of land management and agricultural production.
  - There are six priorities which have been determined for rural development in the EU, and the MS must include at least 4 of the 6 in their rural development programmes (RDPs). One of these priorities – Priority 4 "on restoring, preserving and enhancing ecosystems related to agriculture and forestry" – focuses in part on "preventing soil erosion and improving soil management" (EAFRD Reg. No. 1305/2013, Art.4). Another

[7] The requirement can be limited to a general ban on burning arable stubble, but a Member State may decide to prescribe further requirements.

Priority 5 may result indirectly in soil protection as one of the focuses is on "fostering carbon conservation and sequestration in agriculture and forestry". This would be relevant to soil as it would promote use of methods which increase soil carbon sequestration and building climate resilient agriculture would encourage adaptation methods, such as using cover crops to potentially increase water infiltration for flood prevention and reduced erosion as well as retain soil moisture for drought resistance (UNEP, 2012).

- Air Policy: the National Emission Ceilings Directive (2001/81/EC) sets upper air emissions limits for each Member State for the four pollutants responsible for acidification, eutrophication and ground-level ozone pollution (sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia). In addition to Community activities, Member States are largely responsible for taking relevant measures in order to comply. The NEC Directive does not consider the protection of soil directly but the measures taken to reduce acidification also contributes to soil health and quality.

Climate change (LULUCF): the Decision No 529/2013/EU on accounting rules on greenhouse gas (GHG) emissions and removals resulting from activities relating to land use, land-use change and forestry (LULUCF) is of relevance to soil protection. It is because forests and agricultural lands, that currently cover more than three-quarters of the EU territory, naturally hold large stocks of carbon, preventing its escape into the atmosphere. Good practices of farmers and forest owners contribute for securing carbon stored in soils and forests. This contribute at the same time to reduced GHG emissions and to increased soil organic matted and quality of soil in general.

**Entry into force**

Communication on the Thematic Strategy for Soil Protection (COM/2006/0231 final) was issued on 22.9.2006.

**Departments/Units in charge**

The Thematic Strategy for Soil Protection: DG Environment, Unit B1: Agriculture, Forests and Soil
Role of the Unit B1: Dir. B is responsible for the protection of the natural environment; Unit B1 focuses on soil conservation, forest protection and management and environmental policy aspects of agriculture.
Contact details of relevant officials: Olazabal C. (Head of Unit), Delsalle J. (Team Leader - Soil protection and sustainable land use), Masson J. (Policy Officer - Soil protection and sustainable land use).

**Common Implementation strategy (CIS processes)**

Commission Expert Group to implement the soil protection provisions of the 7th EAP: following the withdrawal of the legislative proposal for a Soil Framework Directive (COM(2006) 232) in 2014, and as required by the 7th EAP, to reflect with Member States on how soil quality issues could be addressed using a targeted and proportionate risk-based approach within a binding legal framework, the DG Environment established an informal, permanent Expert Group to implement the soil protection provisions of the 7th EAP, composed by experts mandated by Member States to support the Commission in this work (EU, Soil Quality Issues, 2016).

**Administrative body handling implementation in MS**

The Thematic Strategy for Soil Protection is a Communication from the Commission to the other European Institutions (COM/2006/0231 final) and thus not legally binding ("A Communication is a policy document with no mandatory authority. The Commission takes the initiative of publishing a Communication when it wishes to set out its own thinking on a topical issue. A Communication has no legal effect").

**Main Objective**

Section 3.1: "The overall objective is protection and sustainable use of soil, based on the following guiding principles:

(1) Preventing further soil degradation and preserving its functions:

- when soil is used and its functions are exploited, action has to be taken on soil use and management patterns, and
- when soil acts as a sink/receptor of the effects of human activities or environmental phenomena, action has to be taken at source.

(2) Restoring degraded soils to a level of functionality consistent at least with current and intended use, thus also considering the cost implications of the restoration of soil."

**Principles included in the legal text**

principles of subsidiarity (section 3.2)

The following principles were mentioned in the proposal for the Soil Framework Directive: precautionary principle (explanatory memorandum), polluter pays principle (preamble 26, Art. 13), subsidiarity principle (explanatory memorandum, Preamble 10), proportionality principle (explanatory memorandum, preamble 10), prevention principle (preamble 20), principle of sustainable development (preamble 35).

**Other objectives/Key concepts/key elements of the legislation**

The Thematic Strategy for Soil Protection is built around four key pillars to meet the goals of the Thematic Strategy:

1. Legislation: binding framework legislation on protection and sustainable use of soil is a principal aim of the Strategy. The Commission aims with it to establish a targeted policy to close the gap of missing binding legislation on soil protection and ensure comprehensive soil protection.

2. Integration: integration of soil protection in the formulation and implementation of national and Community policies such as agriculture, regional development, transport and research have a significant impact on soil. Therefore, soil protection needs to be further integrated in other policy areas.

3. Research: closing the current recognised knowledge gap in certain areas of soil protection through research supported by Community and national research programmes is important for further effective soil protection policy development. The previous Seventh Framework Programme (2007-2013) and the current Horizon 2020 (2014-2020) work programme covers research on soil functions as part of priority areas (Horizon 2020 - priority area on 'Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy').

4. Awareness-raising: increasing public awareness of the need to protect soil is important to change the perception, and consequently the behaviour of the public with regard to soil and its protection.

**Terminology**

"Soil is generally defined as the top layer of the earth's crust, formed by mineral particles, organic matter, water, air and living organisms. It is the interface between earth, air and water and hosts most of the biosphere." Defines degradation processes and threats of soil, including: erosion, decline in organic matter, local and diffuse contamination, sealing, compaction, decline in biodiversity, salinisation, floods and landslides

**Derogations**

No, not a legal act.

**Types of management measures**

Voluntary: research, integration, awareness-raising

**Spatial coverage**

The Thematic Strategy for Soil Protection addresses all soil (types) in EU.

The proposal for a framework Directive (COM(2006) 232) introduced 'areas at risk' to be delineated by Member States to five major soil threats (i.e. erosion, organic matter decline, compaction, salinisation and landslides). The proposal further required the MSs to identify

contaminated sites.

**Reporting units – what are the specific transposition requirements**

Member States

**Management unit**

The Thematic Strategy for Soil Protection does not refer to any 'operational management unit' as such. The Thematic Strategy for Soil Protection addresses all soil (types) in EU. The proposal for a framework Directive (COM(2006) 232) introduced 'areas at risk' to be delineated by Member States to five major soil threats (i.e. erosion, organic matter decline, compaction, salinisation and landslides). The 'risk areas' are the areas in the national territory of the Member States, defined at the appropriate level, 'where there is decisive evidence, or legitimate grounds for suspicion, that one or more of [...] soil degradation processes has occurred or is likely to occur in the near future'. To ensure a coherent and comparable approach in different Member States, the identification of risk areas should be based on a common methodology, which includes elements known to be driving forces for the various degradation processes (common elements for the five soil threats are provided in Annexes I-V). In the identified 'risk areas', Member States should take measures to prevent further soil degradation. Such 'risk areas' shall be made public and reviewed at least every ten years. The proposal further required the MSs to identify contaminates sites.

**Key planning steps**

The Thematic Strategy for Soil Protection established a ten-year work program for the European Commission, and foreseen the following 'next steps':

- To develop calls for research projects to support policymaking in line with the objectives of the Thematic Strategy;
- To incorporate in decision-making any new knowledge acquired on soil biodiversity from 2006 onwards;
- To review the Sewage Sludge Directive in 2007, and to ensure that maximum benefit is gained from the reintroduction of nutrients while further limiting the release of dangerous substances into the soil;
- To review the Integrated Pollution Prevention and Control (IPPC) Directive in 2007 to strengthen its soil protection and contamination prevention aspects, in particular focusing on harmonisation of the basic obligation to avoid any pollution risk, returning the sites of IPPC installations to a "satisfactory state", and periodically monitoring soil on the sites;
- To monitor whether the need to protect soil is adequately taken into account in the Rural Development Plans for 2007-2013, and onwards;
- To check the contribution made to soil protection by the minimum requirements for good agricultural and environmental condition (GAEC) defined by Member States in accordance with Art. 5 and Annex IV of Regulation 1782/2003;
- To initiate activities to develop best practices to mitigate negative effects of sealing on soil functions in 2007;
- To prepare a Common Implementation Strategy for the Framework Directive and the other pillars of the strategy, in partnership with Member States, while maintaining an open dialogue with experts who participated in the stakeholder consultation. This will allow initiating activities to support Member States in identifying and developing the most cost-effective measures to achieve the objectives of the strategy. This will also allow better cooperation between Member States in reaching comparable approaches to soil protection;
- To build a robust approach to address the interaction between soil protection and climate change from the viewpoints of research, economy and rural development so that policies in this areas are mutually supportive;
- To assess possible synergies between measures aiming at protection and sustainable use of soil and measures incorporated in river basin management plans under the Water Framework

Directive in 2009;

- To assess possible synergies between measures aiming at protection and sustainable use of soil and measures aiming at the protection of coastal waters, including those incorporated in the Thematic Strategy on the Protection and Conservation of the Marine Environment;
- To ensure integration of soil protection aspects in product policy to prevent contamination of soil; and
- To ensure that the actions of this strategy and the initiatives taken under the UNCCD, the UNCBD, the Kyoto Protocol and the Alpine Convention are mutually supportive, consistent and complementary.

**Timelines**

The Thematic Strategy for Soil Protection set a frame for soil protection in the EU and established a ten-year work program for the European Commission. Approximately five years after the adoption of the Soil Thematic Strategy, on 13 February 2012, the European Commission published a policy report on the implementation of the Soil Thematic Strategy and ongoing activities (COM(2012) 46). The report provides an overview of the actions undertaken by the European Commission to implement the four pillars of the Strategy. It also presents the ongoing soil deterioration trend both in Europe and globally, as well as future challenges to ensure its protection. The Thematic Strategy for Soil Protection foresees that the progress towards meeting its objectives will be evaluated as part of the review of the Sixth EAP.

**Integration/coordination issues with other related pieces of legislation**

In the Thematic Strategy for Soil Protection, two out of four key pillars considered integration as and coordination issues, i.e.:

- framework legislation with protection and sustainable use of soil as its principal aim;
- integration of soil protection in the formulation and implementation of national and Community policies;

(1) A proposal for the framework legislation for soil (as proposed in the Thematic Strategy for Soil Protection) refers to other numerous issues and pieces of legislation. It proposes that programmes of measures could build on measures already implemented in national and Community contexts, such as:

- cross-compliance and rural development under the CAP;
- codes of good agricultural practice and action programmes under the Nitrates Directive;
- measures under the river basin management plans for the Water Framework Directive;
- flood risk management plans;
- national forest programmes and sustainable forestry practices and forest fire prevention measures;
- sewage sludge.

(2) Under the integration aspects, the Thematic Strategy for Soil Protection refers to community policies, inter alia, agriculture, regional development, transport and research, which have a significant impact on soil. It states that soil protection will need to be further integrated in other policy areas, if the goals of this strategy are to be met, and refers to:

- Sewage Sludge Directive: review the Sewage Sludge Directive in 2007 to ensure that maximum benefit is reaped from the reintroduction of nutrients while further limiting the release of dangerous substances into the soil;
- IPPC Directive: review the Integrated Pollution Prevention and Control (IPPC) Directive in 2007 to strengthen its soil protection and contamination prevention aspects;
- CAP – rural development: monitor whether the need to protect soil is adequately taken into account in the Rural Development Plans for 2007-2013;
- CAP – cross-compliance: check the contribution made to soil protection by the minimum requirements for good agricultural and environmental condition defined by Member States in

accordance with Art. 5 and Annex IV of Regulation 1782/2003,

- Soil sealing: initiate activities to develop best practices to mitigate negative effects of sealing on soil functions in 2007;
- Climate change: address the interaction between soil protection, climate change and rural development so that policies in this areas are mutually supportive;
- WFD: possible synergies between measures aiming at protection and sustainable use of soil and measures incorporated in river basin management plans under the Water Framework Directive in 2009;
- Marine Environment: possible synergies between measures aiming at protection and sustainable use of soil and measures aiming at the protection of coastal waters, including those incorporated in the Thematic Strategy on the Protection and Conservation of the Marine Environment;
- Product policy: integration of soil protection aspects in product policy to prevent contamination of soil;
- International commitments: ensure that the actions of this strategy and the initiatives taken under the UNCCD, the UNCBD, the Kyoto Protocol and the Alpine Convention are mutually supportive, consistent and complementary.

The Thematic Strategy for Soil Protection does not indicate in this list the EU Floods Directive as it was issued one year later in 2007. The promotion of sustainable and integrated flood management in the Floods Directive results in an indirect contribution to the protection of soils mainly by aiming to maximising natural infiltration and retention capacities of soils. In addition, EU promotes the development of Natural water retention measures. They are measures that aim to safeguard and enhance the water storage potential of landscape, soil, and aquifers, by restoring ecosystems, natural features and characteristics of water courses and using natural processes. In addition, the third key pillar 'Research' refers to soil biodiversity aiming to get a better understanding of the function of biodiversity as an environmental service, and refers to: the Convention on Biological Diversity and the Forest Focus Programme. The work programme of the current EU Research and Innovation programme – Horizon 2020 (2014 to 2020) consider issues on sustainable use of soil to be more important and foresees a funding for soil-related research projects. This should thus ensure a progress in research and increased knowledge on different aspects of soil protection.

**Coordination issues with the EU Biodiversity Strategy**

The activities of integration of soil aspects into other policy areas foreseen to meet the goals of the Thematic Strategy for Soil Protection refer to many EU polices that contribute to maintaining and enhancing ecosystems and their services thus directly affect the target 2 of the EU biodiversity strategy. (See point 7.1 above). In addition, soil biodiversity directly contributes to the target 2.

**Relevance to ecosystems/habitats?**

Ecosystems are addressed in general terms. Though soil/land plays a central role in the terrestrial ecosystems. Soil is a habitat. The three major ecosystem groups, according to the MAES typology, terrestrial freshwater and marine can be impacted by the goals of the Thematic Strategy for Soil Protection, though this is not explicitly stated in the Communication. Terrestrial ecosystems are directly addressed as land/soil is a key building component of them. The freshwater and marine ecosystems are indirectly impacted by the Thematic Strategy for Soil Protection. Certain measures aiming at protection and sustainable use of soil also contribute to reduction of pollution to water ecosystems. Such measures contribute to achieving the goals of the water related legislation such WFD, Nitrates Directive and Thematic Strategy on the Protection and Conservation of the Marine Environment. Aquatic Biodiversity is not mentioned in the Thematic Strategy for Soil Protection. The Strategy states that soil not performing its broad range of functions and services to ecosystems and humans, results in loss of soil fertility, carbon and biodiversity, lower water-

retention capacity, disruption of gas and nutrient cycles and reduced degradation of contaminants.

**Drivers**

The Thematic Strategy for Soil Protection states that soil degradation in Europe is driven or exacerbated by human activity such as inadequate agricultural and forestry practices, industrial activities, tourism, urban and industrial sprawl and construction works. Drivers which the legal act/policy address: agricultural and forestry sectors, industry, tourism, urbanisation and industrialisation, construction works. The Thematic Strategy for Soil Protection does not introduce any indicators; and there is no any official guidance document on indicators yet. Nevertheless, most relevant could be the agri-environmental indicators used at operational level within the EU statistical system EUROSTAT (see driving forces indicators, such as: mineral fertiliser consumption, consumption of pesticides, irrigation, energy use, land use change, cropping patterns, livestock patterns, soil cover, tillage practices, manure storage, intensification/ extensification, specialisation, and risk of land abandonment).

**Pressures**

The Thematic Strategy for Soil Protection does not define pressures for soil.

Pressures determine changes in the state of soil resources and result in soil threats, such as erosion, decline in organic matter, local and diffuse contamination, sealing, compaction, decline in biodiversity, salinisation, floods and landslides (as identified in the Thematic Strategy for Soil Protection). A combination of some of these threats can ultimately lead to desertification in arid or sub-arid climatic conditions. Examples of pressures for certain soil threats:

- For soil erosion: intensive agricultural activities, monocropping, intensive use of artificial fertilisers, etc.
- For soil sealing: expanding urban areas, road infrastructure, etc.

The Thematic Strategy for Soil Protection does not introduce any indicators; and there is no any official guidance document on indicators yet. Nevertheless, most relevant could be the agri-environmental indicators used at operational level within the EU statistical system EUROSTAT (see the pressures and risks indicators, such as: gross nitrogen balance, risk of pollution by phosphorus, pesticide risk, ammonia emissions, greenhouse gas emissions, water abstraction, soil erosion, genetic diversity, high nature value farmland, renewable energy production.

**Assessment of Environmental State**

The Thematic Strategy for Soil Protection states that soil is subject to a series of degradation processes or threats, including: erosion, decline in organic matter, local and diffuse contamination, sealing, compaction, decline in biodiversity, salinisation, floods and landslides. These soil threats cover all three parameters: physical (e.g. erosion, sealing, compaction, floods and landslides), chemical (e.g. decline in organic matter, local and diffuse contamination, salinisation) and biological (e.g. decline in biodiversity).

Some datasets related to soil threats as they have been identified by the Thematic Strategy for Soil Protection are available under the Joint Research Centre, European Soil Data Centre (ESDAC) For example:

- For salinisation: salinisation is the process that leads to an excessive increase of water-soluble salts in the soil. The accumulated salts include sodium (Na+), potassium (K+), magnesium (Mg2+) and calcium (Ca2+), and chloride, (Cl−);
- For soil erosion by water: soil loss rate (t ha−1 yr1−);
- For topsoil soil organic carbon (LUCAS): topsoil organic carbon content (g C kg−1).

The Thematic Strategy for Soil Protection does not introduce any indicators; and there is no any official guidance document on indicators yet. Nevertheless, most relevant could be the agri-environmental indicators used at operational level within the EU statistical system EUROSTAT (see the state/impact indicators, such as: *soil quality, water quality – nitrate pollution, water quality –*

*pesticide pollution, landscape – state and diversity).*

**Assessment of Status**

The Thematic Strategy for Soil Protection describes the 'state' of Europe's soils, identifying soil degradation as a serious problem in Europe. It states that anthropogenic pressures drive the degradation of soil and have a negative impact, preventing the soil from performing its broad range of functions and services to humans and ecosystems. The results include the loss of soil fertility, carbon and biodiversity, lower water-retention capacity, disruption of gas and nutrient cycles and reduced degradation of contaminants. The Thematic Strategy indicates that soil degradation processes vary considerably among Member States, including different threats to soil (as they have been identified in the Thematic Strategy for Soil Protection), which have different degrees of severity. Even though, soil degradation is an issue all over the EU. The 2010 Status of the Environment Report of the European Environment Agency (EEA) demonstrates that soil degradation is increasing.

The further reports describing the state of Europe's soils include, for example:

- Guidelines on best practice to limit, mitigate or compensate soil sealing (European Union, 2012)
- Risk Assessment Methodologies of Soil Threats in Europe. Status and options for harmonization for risks by erosion, compaction, salinization, organic matter decline and landslides.

However, the overall objective of the Thematic Strategy for Soil Protection is qualitative: 'protection and sustainable use of soil, by preventing further soil degradation and preserving its functions, and restoring degraded soils to a level of functionality consistent at least with current and intended use'. Concrete environmental objectives would have been the responsibility of the Member States, if the binding legislation (the Soil Framework Directive), proposed together with the Thematic Strategy for Soil Protection would have come into force.

Some datasets related to soil threats as they have been identified by the Thematic Strategy for Soil Protection are available under the Joint Research Centre, European Soil Data Centre (ESDAC) For example:

- For slainisation: salinisation is the process that leads to an excessive increase of water-soluble salts in the soil. The accumulated salts include sodium (Na+), potassium (K+), magnesium (Mg2+) and calcium (Ca2+), and chloride, (Cl−);
- For soil erosion by water: soil loss rate (t ha−1 yr1−);
- For topsoil soil organic carbon (LUCAS): topsoil organic carbon content (g C kg−1).

**Data**

1. Joint Research Centre, European Soil Data Centre (ESDAC): The European Soil Data Centre has exploited in detail the threats to soil as they have been identified in the Thematic Strategy for Soil Protection. http://esdac.jrc.ec.europa.eu/content/esdac-themes
2. EUROSTAT, Agri-environmental indicators (AEIs)

**Funding**

The report presenting the implementation of the Soil Thematic Strategy and ongoing activities (COM(2012) 46) lists the following activities carried out to implement the Strategy:

- EU funded information and training events, and specific soil deliverables for the rotating Presidencies of the Council (e.g. information material on national soil types).
- Supporting research projects, particularly in the areas of landslides, soil sealing, soil functions and their link to biodiversity, the soil carbon and nitrogen cycles (with a focus on peatland restoration), soil fertility, and nutrients recycling in agriculture. (Since the adoption of the Strategy, around 25 research projects have been funded under the 7th Framework Programme for Research – i.e. funded by DG Research).
- The Commission has proposed that the Cohesion Funds and the European Regional

Development Fund should continue to support the regeneration of brownfield sites in the next programming period 2014-2020. In addition, the EU macro-regional strategies include some specific actions on soil protection (particularly on solid waste).

Member States may grant State aid for carrying out soil remediation under the Environmental aid guidelines. However, such aid can be granted only if the 'polluter pays' principle is fully respected. Aspects of soil protection are integrated into the Common Agricultural Policy (CAP), under European Agricultural Fund for Rural Development (EAFRD) and the European Agricultural Guarantee Fund (EAGF): Good Agricultural and Environmental Conditions (GAEC) since the introduction of cross compliance in 2003. Rural development measures, in particular, for example agri-environment-climate schemes which may specifically support soil-protective operations. The "greening payment" of the first pillar of the CAP would improve the situation further, particularly in relation to erosion and soil organic matter.

Agricultural flood-relevant Natural Water Retention Measures (NWRM) can be financed by the European Agricultural Fund for Rural Development (EAFRD), and hence under the Rural Development Program (RDP – Pillar 2 of the CAP). The following table lists the articles of the Rural Development Regulation with relevance for NWRM implementation and gives examples of NWRM included in actions eligible for funding (CIS WG Agriculture, 2014)

| Rural Development Regulation – Articles | Examples of NWRM included in actions eligible for funding |
|---|---|
| **Art. 17 – Investments in physical assets** | Artificial wetlands for treatment and reuse of waste water; Reconnection of floodplains; Creation of natural banks; Re-meandering of rivers; Pond restoration and creation; Restoration of terraces |
| **Art. 18 – Restoring agricultural production potential damaged by natural disasters and catastrophic events, and introduction of appropriate prevention actions** | Flood prevention measures (e.g. afforestation upland to prevent erosion) |
| **Art. 22 – Afforestation and creation of woodlands** | Establishment of forests and their maintenance – if done in the right place with the right species can maintain stable water tables, protect and improve water quality, and slow down flows (reduce flash floods. Targeted woodland creation to improve water quality and flood alleviation, e.g., afforestation of mountain areas, of reservoir catchments, of riparian areas, and targeted planting in Mediterranean areas for catching precipitation.<br>Plant tree shelter belts on slopes. Preserve or re-establish native trees along river margins/buffers |
| **Art. 23 – Establishment of agro-forestry systems** | Establishment of agro-forestry systems in agricultural land and corresponding infrastructures – if done in the right place with the right species can maintain stable water tables, protect and improve water quality and slow down flash floods. |
| **Art. 28 – Agri-environment-climate** | Wetland creation, restoration and management Restoration/management/protection of sediment capture ponds; Riparian buffer strips (with vegetation or woodland)<br>Riparian trees in agricultural landscapes; Soil management practices, tillage methods, diversified crop rotations and patterns, catch crops, cover crops, winter cover crops, nitrogen fixing crops, choice of drought tolerant species or varieties; Planting hedgerows; reintroducing/maintaining terraces |
| **Art. 30 – Natura 200 and Water Framework Directive payments** | Large buffers, wetlands, conversion of arable to forestry/extensive grassland |

**Other issues to be aware of relevant for AQUACROSS?**

Soil Thematic Strategy remains a soft instrument, i.e. with no regulatory powers. The 7th EAP is

now being used by DG Environment to push the soil protection agenda forward. It's important to keep the 7th EAP in mind, even though it is not included in the directory. It has a stronger formal weight than the Soil Thematic Strategy at the moment.

# 3.18 Common Agricultural Policy

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## Common Agricultural Policy

**Name/Type of the Legal Act or Policy**

The Common Agricultural Policy (CAP) is built around two pillars: Pillar 1 includes the direct farm payments and market mechanisms whereas Pillar 2 is the rural development policy. The CAP is implemented in 7-year policy cycles, with the framework for the 2014 – 2020 period defined by four basic legislative acts (regulations):

- Rural Development: Regulation 1305/2013
- "Horizontal" issues such as financing, management and controls: Regulation 1306/2013
- Direct payments for farmers: Regulation 1307/2013
- Market measures: Regulation 1308/2013

In addition, the Regulation 1310/2013 lays down certain transitional provisions as regards the application of the four basic regulations in the year 2014. Beyond these, a number of other aspects form part of the CAP, each regulated in different ways (for example, there is a separate Regulation on organic farming, rules governing quality standards).

The CAP funding is fixed at maximum level for the 7 year period. Whereas the market mechanisms and direct payments (Pillar 1) are funded by EU budget alone, the rural development policy is implemented by multiannual programming and co-financed by Member States. The rules are set at EU level, but for the current programming period significant flexibility is built into the system so that the implementation can differ substantially across the Member States.

Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005 (hereinafter EAFRD Regulation).

Regulation (EU) No 1307/2013 of the European Parliament and of the Council of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009, Article 43. (hereafter the Horizontal Regulation)

Direct Payments: Regulation (EU) No 1306/2013 of the European Parliament and of the Council of 17 December 2013 on the financing, management and monitoring of the common agricultural policy and repealing Council Regulations (EEC) No 352/78, (EC) No 165/94, (EC) No 2799/98, (EC) No 814/2000, (EC) No 1290/2005 and (EC) No 485/2008. (Hereafter Direct Payments Regulation)

Common market organisation: Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007. (herafter CMO Regulation)

Regulation (EU) No 1310/2013 of the European Parliament and of the Council of 17 December 2013 laying down certain transitional provisions on support for rural development by the European Agricultural Fund for Rural Development (EAFRD), amending Regulation (EU) No 1305/2013 of the European Parliament and of the Council as regards resources and their distribution in respect of the year 2014 and amending Council Regulation (EC) No 73/2009 and Regulations (EU) No 1307/2013, (EU) No 1306/2013 and (EU) No 1308/2013of the European

Parliament and of the Council as regards their application in the year 2014.

Pillar 1 is defined by the Direct Payments and Market Measures Regulations, whereas the EAFRD Regulation defines the Pillar The Horizontal Regulation applies to both pillars. Since regulation 1310/2013 is about transitional provisions between 2007-2013 and 2014 – 2020 period, it is not dealt with in this template.

**Entry into force**

The European Agricultural Guidance and Guarantee Fund (EAGGF), originally adopted in 1964, was replaced by the European Agricultural Fund for Rural Development (EAFRD) and the European Agricultural Guarantee Fund (EAGF) in 2007 as the funding mechanisms of the CAP. As mentioned above, the CAP is governed in 7-year programming cycles. The overall structure can, however, be adjusted also through mid-term reviews within these cycles as, for example, was the case with the Health Check in 2008. The CAP has gone through major reforms over the years. The last programming cycle was delayed due to the co-decision process, i.e. the inter-institutional negotiations between the Council and European Parliament on various aspects of the CAP reform proposal submitted by the European Commission.

**Departments/Units in charge**

CAP at EU level is managed by a wide range of departments at DG Agriculture, each responsible for different aspects of the policy (see Organogram http://ec.europa.eu/dgs/agriculture/who-is-who/org_en.pdf). The most relevant for this project are Directorates F, G, and H (on rural development), and Directorate D (direct payments).

The key units are:

- H1 Consistency of rural development (HoU Martin Scheele)
- H4 Environment, forestry and climate change (HoU Mauro Poinelli)
- D2. Greening, cross-compliance and POSEI (HoU Richard Etievant)
- The project officers we have had contact with in the past (primarily through the DG Climate Action contracts) are Andreas Gumbert who is climate policy officer in H4, and Herwig Renner who is part of the climate negotiations team for DG Agriculture. We don't have previous contacts with biodiversity officers. If you would like to contact these officers, please check with Ana first to make sure we are not duplicating contacts at the same time. These are important units for us and we would like to manage the contacts well.

**Common Implementation strategy (CIS processes)**

Are there any Working Groups at EU level involved in the implementation of the act or policy? Please name them and briefly introduce the core role of the group.

Committees: DG Agriculture works with various committees (17 in total), made up of MS representatives, which are established to guide the implementation of the CAP. They cover the different key aspects of CAP, and include for example:

- Rural Development Committee[8]
- Committee for direct payments[9]
- Regulatory Committee for the Common Organisation of Agricultural Markets[10]
- Management Committee for the Common Organisation of Agricultural Markets

In addition, formal expert groups are also established by DG Agriculture which have the function of: assisting the COM in preparing legislation, or in policy definition, coordinating with MS and exchanging views, monitoring development of policeis and enforcement of legislation, preparation

[8] http://ec.europa.eu/agriculture/committees/rural-development_en.htm

[9] http://ec.europa.eu/agriculture/committees/direct-payments_en.htm

[10] http://ec.europa.eu/agriculture/committees/cmo-regulatory_en.htm

of delegated act, and providing expertise before COM submits drafts to a comitology committee. The following DG Agriculture expert groups are active at present[11]:

- E02260 Expert group EU School Fruit Scheme
- E02730 Expert Group for Agricultural Markets, in particular concerning aspects falling under the single CMO Regulation
- E02731 Expert Group for Direct Payments
- E02734 Expert Group for Horizontal Questions concerning the CAP
- E02789 Expert group for monitoring and evaluating the CAP
- E02732 Expert Group for Rural Development
- E02733 Expert Group for sustainability and quality of agriculture and rural development

DG Environment oversees the following expert groups:

Correspondence agriculture / environment ("informal communication between DG ENV and Member States on the whole range of issues relating to environment and agriculture, with a view to furthering environmental integration into agricultural policy".) Minutes are available online. [12]

Expert group on the implementation of the nitrates Directive (E03023): "The expert group for the implementation of the nitrates directive provides an informal forum of discussion between DG ENV and the Member States on technical aspects linked to the implementation of the nitrates directive and nutrients policy. Other Commission services, institutions and stakeholders may be associated to the work of the group on an ad-hoc basis. The group is created following the Lisbon treaty as a mean to continue the work in this area undertaken in the past by the Nitrates Committee." env-nitrates@ec.europa.eu

Civil dialogue groups meet regularly, providing a dialogue forum for different aspects of the CAP implementation – they are stakeholder groups. The role of CDGs is to[13]:

- to hold a regular dialogue on all matters relating to the common agricultural policy, including rural development, and its implementation;
- to bring about an exchange of experience and good practice;
- to assist the Commission and advise on policy;
- to deliver an opinion on specific matters;
- to monitor policy developments.

Based on an open call for applications, the COM set up 13 CDGs for the 2014 – 2020 period: Animal products, Arable crops, CAP, *Direct payments and greening*, *Environment and climate change*, Forestry and cork, Horticulture, olives and spirits, International aspects of agriculture, Milk, Organic farming, Quality and promotion, *Rural development*, Wine European Rural Development Network (ENRD) – is a platform for the exchange on the RDP implementation, where various working groups discuss different aspects of the implementation (with individual experts, not official MS representatives), and best practices are gathered and disseminated. (https://enrd.ec.europa.eu/en)

**Administrative body handling implementation in MS**

Implementing authorities for the CAP:

- National Authorities: national Ministries for Agriculture;
- Managing Authorities (MA): MAs are designated by the Member State and it may be a public or private body in charge of the management of the rural development

[11] Can be found by searching: http://ec.europa.eu/transparency/regexpert/index.cfm?do=search.search&searchType=advanced&page=search&resetValues=1

[12] http://ec.europa.eu/environment/agriculture/index.htm

[13] http://ec.europa.eu/agriculture/civil-dialogue-groups/index_en.htm

programmes at national or regional level. The MAs are responsible for ensuring that:

- projects for funding are selected in accordance to the criteria applicable to the rural development programmes;
- beneficiaries are aware of the obligations resulting from receiving the financial support;
- an adequate monitoring system to record information of the rural development programmes' implementation is in place;
- the programme evaluations are undertaken according to the rules;
- the Paying agency receives the necessary information to authorise payments

Furthermore the MAs lead the Monitoring Committee.

- Paying agencies: The payment systems set up to distribute the direct payments have special requirements for MS, including to distinguish an accredited agency ('paying agency') to handle the financing in cooperation with the Commission.[14] Paying agencies are the departments or bodies of the Member States who, in respect of those payments made by them, provide sufficient guarantees that:
  - the eligibility of requests and the procedure for allocating aid, as well as their compliance with Community rules, are checked before payment is authorised;
  - accurate and exhaustive accounts are kept of the payments made;
  - ensure that checks laid down by Community legislation are made; and
  - that documents are presented within the stipulated time-limits and form, etc.
- Farm advisory system: The Member States must establish a farm advisory system, addressing the SMRs and GAECs under cross-compliance, environmental and climate beneficial agricultural practices, and increasing on-farm competitiveness, among others.[15]

CAP Implementation authorities in Germany:

- On the national level: the German Federal Ministry of Food, Agriculture and Consumer Protection;
- On the level of Federal States (Länder): in some Federal States there is a stand-alone Ministry of Agriculture and Forestry. Often these Ministries cover in combination 'Food' and 'Consumer Protection' or 'Rural Areas' issues (e.g. in Baden-Württemberg, Bavaria, Lower Saxony); otherwise the issues of agriculture are combined with other sectors, e.g. environmental protection and nature conservation, economics and transport or spatial planning.

**Main Objective**

The aim of the CAP is threefold:

- To improve agricultural productivity and ensure a stable supply of affordable food
- Enable farmers to make a "reasonable living"
- Address climate change and sustainable management of natural resources

Under the Pillar 2: the EAFRD (Art. 4) aims to "Within the overall framework of the CAP, support for rural development, including for activities in the food and non-food sector and in forestry, shall contribute to achieving the following objectives: (a) fostering the competitiveness of agriculture; (b) ensuring the sustainable management of natural resources, and climate action; (c) achieving a balanced territorial development of rural economies and communities including the creation and maintenance of employment".[16]

[14] Regulation 1306/2013, Article 7.

[15] Regulation 1306/2013, Article 12.

[16] Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005, Article 4 (hereinafter EAFRD Regulation).

Six strategic priorities have been determined for rural development in the EU (the MS must include at least 4 in their RDPs):[17]

1) fostering knowledge transfer and innovation in agriculture, forestry, and rural areas;
2) enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm technologies and the sustainable management of forests;
3) promoting food chain organisation, including processing and marketing of agricultural products, animal welfare and risk management in agriculture;
4) restoring, preserving and enhancing ecosystems related to agriculture and forestry;
5) promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors; and
6) promoting social inclusion, poverty reduction and economic development in rural areas.

**Principles**

- Regulation 1305/2013: principle of subsidiarity (preamble 3), principle of proportionality (preamble 3, 38, Art. 49), polluter pays principle (preamble 5, 22),
- Regulation 1306/2013: principles of sound financial management, transparency and non-discrimination and budgetary principles (preamble 4), the audit principles (preamble 90), principle of proportionality (preamble 27, 72, 80, 106, Art. 40, Art. 41, Art. 42, Art. 46, Art. 65), principle of subsidiarity (preamble 106).
- Regulation 1307/2013: principle of subsidiarity (preamble 65), principle of proportionality (preamble 65). Report on the implementation of the Directive every six years (Art. 17), including assessment of the conservation status of species and habitats listed on the Annexes to the Directive.

**Other objectives/Key concepts/key elements of the legislation**

- Cross-compliance: cross-compliance is a mechanism that links direct payments to compliance by farmers with basic standards - Statutory Management Requirements (SMR) concerning the environment, food safety, animal and plant health and animal welfare, as well as the requirement of maintaining land in good agricultural and environmental condition (GAEC). Since 2005, all farmers receiving direct payments are subject to compulsory cross-compliance.[18]
- Greening measures: "Greening is one of the major novelties of the CAP reform finalised in 2013 aiming to enhance its environmental performance. The reform redesigned the structure of direct payments by incorporating a greening component. This rewards farmers for adopting and maintaining, as part of their everyday activities, a more sustainable use of agricultural land and caring for natural resources." "Green direct payment accounts for 30 % of Member States' direct payment envelope. Farmers entitled to an area-based payment are required to observe on their agricultural land a set of greening practices beneficial for the environment and climate action. These practices take the form of simple, generalised, non-contractual and annual actions: crop diversification, the maintenance of permanent grassland, and dedicating 5 % of arable land to ecologically beneficial elements (Ecological Focus Areas, EFA)." Regulation 1307/2013 specifies the direct payments for farmers (dependent upon their compliance with the cross-compliance scheme) and includes the new greening requirements under the 2014-2020 programming period.
- Common Strategic Framework ('CSF'): In order to promote the harmonious, balanced and sustainable development of the European Union, a 'CSF' was established by Article 10 of the

[17] The EAFRD Regulation, Art. 5.

[18] Regulation 1306/2013 includes the rules for cross-compliance with the Annex II table laying out the SMRs and the GAECs.

Regulation (EU) No 1303/2013[19]. "The CSF establishes strategic guiding principles to facilitate the programming process and the sectoral and territorial coordination of Union intervention under the 'European Structural and Investment Funds' (ESI Funds) and with other relevant Union policies and instruments, in line with the targets and objectives of the Union strategy for smart, sustainable and inclusive growth, taking into account the key territorial challenges of the various types of territories."

**Terminology**

The following are the key terms used in different CAP regulations:

- Rural development programme: the EAFRD Regulation defines rural development programmes as programmes to identify the needs of the area covered and describe a coherent strategy to meet those needs in the light of the Union priorities for rural development through a set of measures. Each Member State should prepare either a national rural development programme for its entire territory or a set of regional programmes or both a national programme and a set of regional programmes.
- Rural development measure: is defined as a set of operations contributing to one or more of the Union priorities for rural development and corresponding to Articles 15 – 40 of the draft EAFRD Regulation[20]
- Rural development operation: The draft EAFRD Regulation defines an operation as referring "to a project, group of projects, contract, or arrangement or other action selected according to criteria for the rural development programme concerned and implemented by one or more beneficiaries allowing achievement of one or more of the Union priorities for rural development."
- Direct payment: are defined as "payments granted directly to farmers under the support schemes listed in Annex I of the Regulation 1307/2013."[21] These payments are sought to ensure a safety net for farmers and are mainly granted in the form of a basic income support, decoupled from production, stabilising their income stemming from sales on the markets, which are subject to volatility.[22]
- Statutory management requirements: is one of the two elements composing the cross-compliance mechanism. These requirements refer to 13 legislative standards in directives and regulations in the field of the environment, food safety, animal and plant health and animal welfare. These standards apply therefore also to farmers not receiving the CAP support covered by cross-compliance.
- GAECs (standards on good agricultural and environmental condition): is one of the two elements composing the cross-compliance mechanism. This obligation to keep land in good agricultural and environmental condition refers to a range of standards related to soil protection, maintenance of soil organic matter and structure, avoiding the deterioration of habitats, and water management.
- Greening measures: 'Greening' is a new component designed in the structure of direct payments established by the 2013 CAP reform (Regulation 1307/2013) aiming to enhance its

[19] Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006.

[20] COM(2011) 627 final/2.

[21] Horizontal Regulation (1307/2013), Art. 1.

[22] http://ec.europa.eu/agriculture/direct-support/index_en.htm

environmental performance. It accounts for 30% of Member States' direct payment envelope. Farmers entitled to an area-based payment are required to observe on their agricultural land a set of greening practices beneficial for the environment and climate action. These practices take the form of simple, generalised, non-contractual and annual actions, including: crop diversification, the maintenance of permanent grassland, and dedicating 5% of arable land to ecologically beneficial elements (Ecological Focus Areas, EFA).[23]

**Derogations**

Derogations are not included explicitly; however, the principle of subsidiarity means that MS are given flexibility in how they define several aspects of the CAP at Member State level, including how they implement the greening measures and rural development programmes.

**Types of management measures**

The management measures include: direct payments[24], cross-compliance, greening measures[25], rural development programmes, GAECs, CMOs, various intervention measures for the CMOs

RDP measures of particular relevance to the priority 4 ("restoring, preserving and ehnanching ecosystems related to agriculture and forestry") and priority 5 ('Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors') include:

- Afforestation and creation of woodland, Establishment of agroforestry systems, Investments improving the resilience and environmental value as well as the mitigation of potential forest ecosystems (Art 21)
- Agri-environment-climate (Art 28)
- Organic farming (Art 29)
- Natura 2000 and Water framework directive payments (Art 30)
- Payments to areas facing natural or other specific constraints (Art 31)
- Forest-environmental and climate services and forest conservation (Art 34)
- Basic services and village renewal in rural areas (Art 20)
- LEADER (Art 42 – 44)

Impact assessments:

CAP is a very complex policy field, in large part because of the scope of the topics, regulations and instruments that it includes. Each new proposal is accompanied by impact assessments, and for the rural development programmes Ex-post and Ex-ante evaluations are regularly scheduled. For the current 2014-2020 period, the COM has also commissioned various so-called 'mapping studies' to identify the structure of CAP in each MS – i.e. how the MS are using the flexibilities allowed under the EU rules. Moreover, specific topical studies are also planned to the three general objectives[26]:

- viable food production
- balanced territorial development
- sustainable management of natural resources and climate action

**Spatial coverage**

Natural habitats and wild fauna and flora in the European territory of the Member States to which the Treaty applies. Most of CAP is focuesed on agricultural land (main land use types here being: grasslands, arable land, permanent crops) – i.e. Pillar 1 provides payments only for agricultural land, and forestry payments are not available. Under Pillar 2, RDP measures are available also for forest management, so forest land is also covered, but also for rural areas more broadly, since

[23] http://ec.europa.eu/agriculture/direct-support/greening/index_en.htm
[24] http://ec.europa.eu/agriculture/direct-support/direct-payments/docs/direct-payments-schemes_en.pdf
[25] http://ec.europa.eu/agriculture/direct-support/greening/index_en.htm
[26] http://ec.europa.eu/agriculture/calls-for-tender/index_en.htm

Agricultural and forestry land, rural areas.

**Reporting units – what are the specific transposition requirements**

For Pillar 2, the reporting for RDPs is done at Programme level (so usually the NUTS2 level) and at MS level. The ex-post evaluations are done for each RDP. Syntheses reports for ex-post evaluations are also available. For Pillar 1, the reporting is done at MS level. However, the reporting is usually not public reporting – i.e. the reports and figures are not necessarily published by DG Agriculture. CAP governance has not been a focus of any recent Commission-funded studies, including not governance setting for reporting.

**Management unit**

The overall implementation of RDPs is set either at national level, or NUTS2 level (regions). In federal states, such as Germany, this means federal states, in the UK, for example, England, Scotland, Wales and N Ireland, and in some smaller states NUT2 this is the national level (e.g. in Slovenia). Each NUTS2 region therefore has a Managing Authority and a Payment Agency that administer the payments. On the other hand, payments are administered to individual farm holdings, which are defined as "all the units used for agricultural activities and managed by a farmer situated within the territory of the same Member State". (Art 4 Regulation 1307/2013). Farm holdings are the basic management unit.

**Key planning steps**

- Reform proposal (usually in form of a communication from the Commission) and public consultation
- Impact assessment and legislative proposals
- Negotiations among the Council and European Parliament (co-decision process)
- Political agreemend and formal adoption of legislative proposals
- Delegated acts by the Commission
- MS select options for Pillar 1, and draft RDPs – multiple stages of revision by the COM and the MS
- MS public national implementing regulations
- The policy is evaluated for its effects at the mid-term and end of the policy cycles, and these evaluations feed into the new reform proposal.

**Timelines**

In the second half of the previous programming period, a reform / structure proposal is published together with an impact assessment, which then goes through political negotiations before legislative acts are adopted[27]. For the 2014 – 2020 period, the COM published the Communication "The CAP towards 2020: Meeting the food, natural resources and territorial challenges of the future" in 2010[28] which outlines policy options for the 2014 – 2020 period, and providing the basis for a public consultation process. The stakeholder inputs from this consultation were integrated in the impact assessment which accompanied the legislative proposals published in October 2011[29]. Following these proposals, the Parliament and Council were both involved in the negotiations process to agree on the final set of legislative documents, the so called co-decision process, which extended over nearly two years. The political agreement was reached in June 2013, and the formal legislative documents, four basic Regulations, were formally adopted by the Commission in June 2013. Following this, the Commission prepares implementing rules, or delegated acts, for several aspects of the policy, or also working documents to guide the

[27] See http://ec.europa.eu/agriculture/policy-perspectives/impact-assessment/index_en.htm

[28] http://ec.europa.eu/agriculture/cap-post-2013/communication/index_en.htm

[29] http://ec.europa.eu/agriculture/cap-post-2013/legal-proposals/index_en.htm

implementation of instruments (for example, see http://enrd.ec.europa.eu/enrd-static/policy-in-action/cap-towards-2020/rdp-programming-2014-2020/legislation-and-guideline/en/legislation-and-guideline_en.html).
MS began submitting their RDPs to the COM mostly in 2014; after which the RDPs go through inter-institutional consultation and possibly several rounds of revisions and resubmission. Useful website for RDPs: http://enrd.ec.europa.eu/en/policy-in-action/cap-towards-2020/rdp-programming-2014-2020

**Integration/coordination issues with other related pieces of legislation**

The cross-compliance mechanism is the main way in which compliance with other legislative acts is ensured. The Statutory Management Requirements list all legislative acts & their provisions which need to be respected in order to receive CAP payments.
CAP remains the main funding mechanism for WFD, in particular through the RDPs. However, RDPs have in the past also been used to support investments, in particular for irrigation, that may not automatically have positive effects on achieving WFD objectives.

**Coordination issues with the EU Biodiversity Strategy**

Agriculture is a key sector for the EU Biodiversity Strategy. Target 3 of the Biodiversity Strategy focuses on increasing the contribution of agriculture (and forestry) to maintain and enhance biodiversity and ecosystem services. This target is set to maximize areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP in order to ensure the "conservation of biodiversity and bring about a measurable improvement in the conservation status of species and habitats linked to agriculture, and in the provision of ecosystem services." Actions foreseen to contribute to the achievement of this target are enhancing direct payments for environmental public goods under CAP, better targeting of rural development to biodiversity conservation, and increasing the uptake of practices under the agri-environmental-climate measure to support agricultural diversity and sustainable management.
DG Environment runs an expert group on Agriculture and environment, where issues of agriculture and biodiversity are discussed.

**Relevance to ecosystems/habitats?**

*Ecosystems/habitats addressed explicitly by the legal act/policy:* The EAFRD Regulation addresses explicitly the broad category of 'ecosystems that are related to agriculture and forestry'. It sets 6 strategic priorities, of which the most important is Priority Nr 4: "restore, preserve and enhance ecosystems related to agriculture and forestry, with a focus on the following areas: (a) restoring, preserving and enhancing biodiversity, including in Natura 2000 areas, and in areas facing natural or other specific constraints, and high nature value farming, as well as the state of European landscapes; (b) improving water management, including fertiliser and pesticide management; and (c) preventing soil erosion and improving soil management. "
So the three focus points are:

- Restoring and preserving biodiversity (including in NATURA 2000 areas and areas of High Nature Value farming) and the state of European landscapes.
- Improving water management.
- Improving soil management.

'European Innovation Partnership network' foresees one task of the EIP network to "facilitate the setting up of cluster initiatives and pilot or demonstration projects which may relate, inter alia, to [...] (iii) biodiversity, ecosystem services, soil functionality and sustainable water management (art 53)
Under the Direct Payments Regulation, the Art. 12 foresees that the farm advisory system may also cover (among others) the information related to climate change mitigation and adaptation, biodiversity and protection of water. The information on biodiversity include: information on the

positive correlation between biodiversity and agro-ecosystem resilience, and information on how to best prevent the spread of alien invasive species and why this is important for the effective functioning of the ecosystem and for its resilience to climate change.
The Horizontal Regulation does not mention 'ecosystems' in the text.
*Ecosystems affected by relevant policies:* Agricultural management has influence on nearly all EU ecosystems, including aquatic ecosystems. It is the key driver of negative environmental impacts on biodiversity. Various studies have been published by DG Env which examine the influence of CAP on the environment, and in particular biodiversity.
See: http://ec.europa.eu/environment/agriculture/studies.htm
*Links to Aquatic Biodiversity and Ecosystem Services:* There are many and both positive and negative links. See the link to the studies commissioned by DG environment: http://ec.europa.eu/environment/agriculture/studies.htm DG Agriculture also commissioned the study: "Provision of public goods through agriculture in the European Union" carried out by IEEP which examines the links to ecosystem services in more detail. http://ec.europa.eu/agriculture/analysis/external/public-goods/index_en.htm
Biodiversity and ecosystem services are mentioned in the Regulations; and direct links are made. The WFD CIS also has a working group on agriculture and WFD which looks at these links directly.
In principle, the direct payments should not be a direct driver for intensification of production because they are largely decoupled from what farmers produce (type and amount of what they produce), however their distribution is largely still based on historical distribution and larger and more intensive farms tend to be encouraged. Other perverse incentives, for example, are provided under the RDP payments for irrigation or for biogas production (which encourages maize monoculture). The key issue is that the Pillar 1 payments do not have sufficiently strict cross-compliance requirements, and that they are not linked to the provision of public goods / ecosystem services, but tend to function more as income support, which in turn is perverse in itself since the payments are skewed towards larger producers. The RDP payments are targeted, but the distribution of funds is skewed in favour of Pillar 1, and the RDPs are often also designed in such a way that there is a bias toward production-focused incentives and farm restructuring, rather than the support for agri-environment-climate or other environment-focused measures.

**Drivers**

*Definition of Drivers:* Agriculture and forestry are the two key drivers which are the focus of the policy.
*Drivers addressed in legal text : A*griculture and Forestry.
*Indicators :* The Common Monitoring and Evaluation Framework (CMEF) is core part of the official evaluation system for CAP. The framework sets out four broad types of indicators[30]:

- Output indicators report on the degree of activity of a policy measure (e.g., the number of projects funded); they are linked to individual policy interventions.
- Result indicators measure the direct, immediate effect of the policy measure (e.g., the number of jobs created), in relation to the specific policy objectives.
- Impact indicators look at the effect in the longer term (e.g. rural unemployment rate). Overall, impact indicators are linked to the general objectives of the CAP.
- Context indicators reflect relevant aspects of the general contextual trends in the economy, environment and society that are likely to have an influence on the implementation, achievements and performance of the CAP.

These indicators are used primarily in the RDP programming process; Implementing regulation for CMEF is http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0834&from=en

[30] http://ec.europa.eu/agriculture/cap-indicators/index_en.htm

Other relevant docs:
http://ec.europa.eu/agriculture/cap-2014-2020/monitoring-evaluation/leaflet-monitoring-evaluation-framework-cap-2014-2020_en.pdf
*http://ec.europa.eu/agriculture/cap-indicators/output/working-document-rd-monitoring-implementation-report-tables_en.pdf*
*http://ec.europa.eu/agriculture/cap-post-2013/monitoring-evaluation/index_en.htm*
The Commission and EEA have been working on developing IRENA agri-environment indicators to "analysing the relationship between agriculture and the environment and identifying trends in this evolving interaction" http://ec.europa.eu/agriculture/envir/indicators/index_en.htm

**Pressures**

*Definition Pressures:* There are no clear, single definitions available.
The key relevant pressures caused by agriculture, and addressed by Pillar 1 (greening, cross-compliance) and Pillar 2 (RDPs):[31]

- emissions from agriculture
- water abstraction in agriculture (million $m^3$/year)
- – soil erosion by water (Tonnes/ha/year)

**Assessment of Environmental State**

Environmental state is not addressed by CAP in any detail, except with reference to the impact indicators – i.e. broadly areas where CAP is expected to have an impact

**Assessment of Status**

The CMEF impact indicators for environment include[32]:

- farmland bird index
- high nature value (HNV) farming
- water quality (increased nutrient loads (N, P), pesticide loads )
- soil organic matter in arable land
- Those indicators listed in Implementing Regulation for CMEF include:
- farmland bird index
- high nature value (HNV) farming
- water quality (increased nutrient loads (N, P), pesticide loads )
- - soil organic matter in arable land

**Data**

There is no single collection point at EU level; DG Agriculture receives all the information about RDPs, and Pillar 1 implementation. The RDPs are available through their website: http://ec.europa.eu/agriculture/rural-development-2014-2020/country-files/index_en.htm

**Funding**

The European Agricultural Guidance and Guarantee Fund (EAGGF), originally adopted in 1964, was replaced by the European Agricultural Fund for Rural Development (EAFRD) and the European Agricultural Guarantee Fund (EAGF) in 2007 as the funding mechanisms of the Common Agricultural Policy (CAP). The CAP is a funding mechanism in itself.

[31] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0834&from=en
[32] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0834&from=en

# 3.19 Sustainable Use of Pesticides Directive

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## Sustainable Use of Pesticides Directive

**Name/Type of the Legal Act or Policy**

Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (Text with EEA relevance) (hereafter SUPD)

With the Directive 2009/128/EC, the European Union established a Community's framework for the sustainable use of pesticides. It includes measures on: monitoring, training and information of users as well as specific measures for the use of pesticides. The Framework Directive on Sustainable Use of Pesticides was originally one of two legislative proposals accompanying a Thematic Strategy on the Sustainable Use of Pesticides (the 2006 Communication). The other legislative proposal led to the adoption of Regulation (EC) No 1107/2009 concerning the placing of plant protection products on the market.

Implementation of the Framework Directive on Sustainable Use of Pesticides is of particular importance for the aquatic environment, protected areas and areas with organic farming as it yields benefits in all these areas. The following EU legal acts are related to the Framework Directive on Sustainable Use of Pesticides:

- Water Policy: The Water Framework Directive (2000/60/EC) and the Groundwater Directive (2006/118/EC) – the aquatic environment is especially sensitive to pesticides. It is therefore necessary to avoid pollution of surface water and groundwater by taking appropriate measures;
- Nature Conservation Policy: The Wild Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC) – use of pesticides can be particularly dangerous in very sensitive areas, such as Natura 2000 sites protected in accordance with the Wild Birds and Habitats Directives
- The Food Safety Policy: Regulation on maximum residue levels of pesticides in or on food and feed of plant and animal origin (EC, No 396/2005); Regulation on the placing of plant protection products on the market (EC, No 1107/2009);

The Common Agricultural Policy (CAP):The Organic Production Regulation (EC, No 834/2007) – organic farming applies low pesticide-input pest management, which gives wherever possible priority to non-chemical methods, so that professional users of pesticides switch to practices and products with the lowest risk to human health and the environment; EAFRD Regulation (EU, No 1305/2013).

**Entry into force**

The Sustainable Use of Pesticides Directive 2009/128/EC came into force on 25 November 2009 and had to be transposed by the Member States in two years, i.e. by 26 November 2011, as mandated in Art. 23.1). Member States had three years to adopt their National Action Plans to reduce risks and impacts of pesticide use on human health and the environment (by December 2012), which they have to communicate to the Commission and to other Member States (Art. 4).

**Departments/Units in charge**

Framework Directive on Sustainable Use of Pesticides: DG for Health and Food Safety (SANTE), Dir. E Safety of the Food Chain (Michael Flueh, Acting Director), E3 – Pesticides and Biocides (Michael Flueh, Head of Unit)

**Common Implementation strategy (CIS processes)**

EFSA's Scientific Committee and ten Scientific Panels deliver scientific advice for Europe's decision-makers in the areas of food and feed safety, nutrition, animal health and welfare, plant protection and plant health.

The Scientific Committee has the task of supporting the work of the Panels on cross-cutting issues and scientific matters of a horizontal nature. It focuses on developing harmonised risk assessment methodologies in fields where EU-wide approaches are not yet defined.

- Scientific Committee working groups are set up to develop draft scientific opinions on specific issues. They consist of EFSA scientists and external experts with the required specialisations.

EFSA's Scientific Panels are responsible for EFSA's risk assessment work including delivering scientific opinions. Each Panel focuses on a different area of the food and feed chain.

**Administrative body handling implementation in MS**

German implementation (BMELV, 2012; EU, Reports, 2016):

- The Federal Ministry of Food, Agriculture and Consumer Protection: National co-ordination; funding innovation research programme in (among other themes) agriculture, both for integrated plant protection and for organic farming;
- German Federal States: The plant protection services; Laboratory facilities; Provide support to research programmes that particularly assist integrated plant protection and plant protection in organic farming;
- The Federal Ministry for Economic Cooperation and Development: Undertakes resistance research in developing countries; The Julius Kühn-Institut is responsible for scientific support and the development of IPM guidelines.
- The Federal Ministry of Food, Agriculture and Consumer Protection and the German Federal States review their respective research and study programmes regularly and inform one another on developments.
- The Federal Ministry of Food, Agriculture and Consumer Protection, the German Federal States and relevant associations provide support to the introduction of innovative integrated plant protection measures into practice.
- Producer associations provide support to the introduction of innovative integrated plant protection measures, as well as to the breeding and market introduction of resistant varieties.

Poland implementation:

- The Ministry of Agriculture and Rural Development: Coordination; implementation of integrated pest management;
- The State Plant Health and Seed Inspection Service: subordinate and supervised units of the Ministry, responsible for implementation; prevention of risks associated with trading and use of plant protection products; control of entities producing plant protection products; conducting the register of regulated activity in the field of marketing or packaging of plant protection products; certification; training; monitoring
- National research institutes (scientific results are the basis for the development and updating of the methodologies of integrated pest management, plant protection programmes): 1. Crop protection with regard to food safety and reducing yield losses and risks to human health, animals and the environment, carried out by the Institute of Plant Protection – the National Research Institute in Poznań; 2. Development of sustainable methods of horticultural production to provide high biological and nutritional quality of horticultural products and preserve biodiversity of the environment and protect its resources, implemented by the Institute of Horticulture in Skierniewice; 3. Supporting action on the development of the agricultural environment and the sustainable development of agricultural production in Poland, carried out by the Institute of Soil Science and Plant Cultivation – the National Research Institute in Puławy; 4. Improvement of plants for sustainable agro-ecosystems, high-quality food and crop production for non-food purposes, carried out by the Institute of

Plant Breeding and Acclimatization – the National Research Institute in Radzików; 5. Improving domestic sources of vegetable protein, their production, trading and use in animal feed, carried out by the Institute of Soil Science and Plant Cultivation – National Research Institute in Puławy, Institute of Plant Genetics, Polish Academy of Sciences in Poznań, Poznań University of Life Sciences and Institute of Technology and Life Sciences in Falenty.

- The framework of a of agricultural public advisory structure: the Agricultural Advisory Centre (AAC) in Brwinów with 3 branches in Poznań, Radom, and Kraków (under the Minister of Agriculture and Rural Development ) and 16 voivodeship agricultural advisory centres (under voivodeship self-governments). Tasks of AAC in particular focus on improving the advisory staff. In the framework of voivodeship centres operate headquarters, branch offices and local services. Local services are substantially supported by specialists at headquarters and branch offices. The basic activities of AAC are trainings for farmers and rural residents and advising, especially in the form of individual and group advisory.

UK implementation:

- Department for Environment, Food & Rural Affairs (Defra) is responsible for sustainable farming policy including IPM with regional input from Scotland/Wales/Northern Ireland administrations.
- The Chemicals Regulation Directorate also has a role in coordination of approaches under its management of the NAP for Defra and devolved administrations.

Much of the research is funded by the sectoral divisions of the Agricultural and Horticultural Development Board (AHDB). The Board also provides crop specific advice to producers at both regional and national levels based upon Government/industry R&D.

**Main Objective**

The overall objective of the SUPD (according to Art. 1) is to establish "… a framework to achieve a sustainable use of pesticides by reducing the risks and impacts of pesticide use on human health and the environment and promoting the use of integrated pest management and of alternative approaches or techniques such as non-chemical alternatives to pesticides".

**Principles included in the legal text**

'principles of integrated pest management' are laid down in Annex III of this directive (and mentioned in Art. 14, Annex I and Preamble 18 and 19), 'subsidiarity principle' (Preamble 19, 22), 'principle of proportionality' (Preamble 22), 'principle of sustainable development' (Preamble 23), 'precautionary principle' (Art. 2), 'organic farming principles' (Annex I).

**Other objectives/Key concepts/key elements of the legislation**

The Directive introduces a number of instruments to regulate sustainable use of pesticides:

- National Action Plans (NAPs): Member States shall adapt NAPs that contain objectives, targets, measures and timetables to reduce risks of pesticide use on human health and the environment and include indicators to monitor the use of plant protection products containing active substances of particular concern. They should also foster the use of alternative ecological approaches or techniques.
- Training, sales of pesticides, and information: Member States shall set up systems of training for professional users, distributors and advisors (proven by certificate). Sellers of pesticides for professional use must hold such certificate. Member States shall inform the public and promote information and awareness-raising programmes regarding the risks for human health, non-target organisms and the environment arising from pesticide use.
- Inspection of pesticide application equipment: pesticide application equipment used by professionals must be inspected every five years by bodies designated by Member States. From 2020, the frequency of inspections will increase to once every three years. The purpose of these inspections is to check that equipment functions reliably and is used properly for its intended purpose, ensuring that pesticides can be accurately dosed and distributed.

- Aerial spraying of pesticides: the activity is prohibited, though derogations are nevertheless possible where there is no viable alternative, or exist advantages in terms of reduced impacts on human health and the environment as compared with land-based application. In case a derogation is granted, information and protection measures must be taken.
- Protection of the aquatic environment and drinking water: "Member States shall adopt specific measures to protect the aquatic environment and drinking water supplies. These measures give priority to the use of the least toxic products, the most effective techniques, equipment limiting drift of products, and the establishment of buffer zones along surface waters. These measures also aim at reducing or prohibiting spraying near roads or railways, or surfaces likely to be contaminated by the seepage or run-off of surface water or groundwater."
- Protection of sensitive areas: "in certain sensitive areas, the use of pesticides is prohibited or strictly limited. This measure aims at protecting areas covered by the "Birds" and "Habitats" Directives, and areas used by the general public or by sensitive groups of the population (parks, public gardens, sports grounds, recreation grounds, etc.)."
- Integrated pest management: "integrated pest management prioritises the least dangerous solutions for health and the environment. Professionals must therefore take into consideration all plant protection methods in order to eradicate pests. They must in particular give priority to those which cause the least disruption to agricultural ecosystems and encourage natural pest control mechanisms."

Risk indicators: "The Commission establishes harmonised indicators according to statistics collected by the Member States. These indicators allow trends in risks from pesticide use to be estimated. Member States may use their own national indicators in addition to the indicators harmonised at Community level."

**Terminology**

Art. 3 'Definitions' of this Directive introduces the following key terms/definitions that apply in this Directive: 1. 'professional user' means any person who uses pesticides in the course of their professional activities, including operators, technicians, employers and self-employed people, both in the farming and other sectors; 2. 'distributor' means any natural or legal person who makes a pesticide available on the market, including wholesalers, retailers, vendors and suppliers; 3. 'advisor' means any person who has acquired adequate knowledge and advises on pest management and the safe use of pesticides, in the context of a professional capacity or commercial service, including private self-employed and public advisory services, commercial agents, food producers and retailers where applicable; 4. 'pesticide application equipment' means any apparatus specifically intended for the application of pesticides, including accessories that are essential for the effective operation of such equipment, such as nozzles, manometers, filters, strainers and cleaning devices for tanks; 5. 'aerial spraying' means application of pesticides from an aircraft (plane or helicopter); 6. 'integrated pest management' means careful consideration of all available plant protection methods and subsequent integration of appropriate measures that discourage the development of populations of harmful organisms and keep the use of plant protection products and other forms of intervention to levels that are economically and ecologically justified and reduce or minimise risks to human health and the environment. 'Integrated pest management' emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms; 7. 'risk indicator' means the result of a method of calculation that is used to evaluate risks of pesticides on human health and/or the environment; 8. 'non-chemical methods' means alternative methods to chemical pesticides for plant protection and pest management, based on agronomic techniques such as those referred to in point 1 of Annex III, or physical, mechanical or biological pest control methods; 9. the terms 'surface water' and 'groundwater' have the same meaning as in Directive 2000/60/EC; 10. 'pesticide' means: (a) a plant protection product as defined in Regulation (EC) No

1107/2009; (b) a biocidal product as defined in Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing on the market of biocidal products (OJ L 123, 24.4.1998, p. 1.).

**Derogations**

The Directive allows derogations for two issues:

- Art. 8: 'Inspection of equipment in use': Member States shall ensure that pesticide application equipment in professional use is a subject to inspections at regular intervals. By way of derogation, Member States may apply different timetables and inspection intervals. Article provides a list of equipment for which this derogation does not apply.
- Art. 9: 'Aerial spraying': aerial spraying should generally be prohibited with derogations possible where it represents clear advantages in terms of reduced impacts on human health and the environment in comparison with other spraying methods, or where there are no viable alternatives, provided that the best available technology to reduce drift is used.

**Types of management measures**

The National Action Plans (NAPs) of the Member States shall define objectives, targets, measures and timetables to reduce risks of pesticide use on human health and the environment and include indicators to monitor the use of plant protection products containing active substances of particular concern. They should also foster the use of alternative ecological approaches or techniques. The following measures aims for environmental objectives:

- Protection of the aquatic environment and drinking water: "Member States shall adopt specific measures to protect the aquatic environment and drinking water supplies. These measures give priority to the use of the least toxic products, the most effective techniques, equipment limiting drift of products, and the establishment of buffer zones along surface waters. These measures also aim at reducing or prohibiting spraying near roads or railways, or surfaces likely to be contaminated by the seepage or run-off of surface water or groundwater."
- Protection of sensitive areas: "in certain sensitive areas, the use of pesticides is prohibited or strictly limited. This measure aims at protecting areas covered by the "Birds" and "Habitats" Directives, and areas used by the general public or by sensitive groups of the population (parks, public gardens, sports grounds, recreation grounds, etc.)."
- Integrated pest management: "integrated pest management prioritises the least dangerous solutions for health and the environment. Professionals must therefore take into consideration all plant protection methods in order to eradicate pests. They must in particular give priority to those which cause the least disruption to agricultural ecosystems and encourage natural pest control mechanisms."

**Spatial coverage**

The SUPD applies on the national level for 'professional users', 'distributors' and 'advisors' (as defined in the Directive) of pesticides that are plant protection products.

**Reporting units – what are the specific transposition requirements**

National Action Plans (required by Art. 4) is the key instrument of the Directive, consisting of all measures prescribed in the Directive (Art. 5-15), and describing how these measure will be implemented to achieve the objectives set in the NAPs. A reporting unit of the NAP is a national level. According to Art. 4.2, Member States shall communicate their NAPs to the Commission and to other Member States by 14 December 2012, and afterward (at least) every five years, after obligatory review of the NAPs or earlier in case of any substantial changes to the NAPs. In 2011, the Commission issued a report (EC, 2011) that collated information on the state of the art with respect to the implementation of the main measures foreseen by the Directive at MS level. This report deemed also to facilitate the exchange of information among MS.

**Management unit**

The SUPD does not refer to any 'operational management unit' as such. The Directive applies to

'professional users', 'distributors' and 'advisors' (as defined in the Directive) of pesticides (that are plant protection products) at the national level. The National Action Plan must contain quantitative objectives, targets, measures of risk-reduction and timetables for the reduction of risks and adverse impacts of the use of plant protection products on human and animal health and also on the environment. The target requirements relate to the area of plant protection, operator protection, consumer protection and protection of the environment. In Germany, for example, the plant protection products may be used if they are approved and in the respective valid areas of application stated in the approval. Pesticide application areas can be agricultural and non-agricultural, i.e. public use areas, for example, parks. For example, the targets set in the German NAP include:

- Increase in the proportion of agricultural area on which work is performed according to the directive on organic farming (National Sustainability Strategy);
- Increasing the proportion of agricultural and horticultural farms working according to guidelines of integrated plant protection that are specific to crops or to sectors;
- Reduction of use of chemical plant protection products that significantly deviate from the necessary minimum value (data set: network of reference farms)
- No exceedings of the limit of 0.1 µg/l (single active substance; asset to be protected: drinking water) or respectively 0.5 µg/l (total of all individual active substances; asset to be protected: drinking water) for all active substances in plant protection products and relevant metabolites in the groundwater
- Creation of buffer zones, permanently covered with vegetation and at least 5 m in width, at all surface waters, particularly in protected areas for drinking water, nature reserves and in sensitive areas identified by hot-spot analyses
- Increasing the utilized agricultural area on which, within the framework of various support programs (agri-environmental programs, contract-based nature protection services, production-integrated compensation measures, fields designated for special protection, etc.), adapted farming measures are carried out (including activities to protect the diversity of wildflowers in the peripheral field area)
- Creation of ecological focus areas not using plant protection products (coordinated with the resolutions related to the CAP reform)

**Key planning steps**

Main actions for sustainable use of pesticides:

- National Action Plans (NAPs): EU countries adopt them setting objectives and timetables to reduce risks and impacts of pesticide use; review every five years.
- Training: professional pesticide users, distributors and advisors get proper training;
- EU countries establish competent authorities and certification systems;
- Information and awareness raising: Member States shall take measures to inform the general public and put in place systems to gather information on acute poisoning incidents and chronic poisoning developments;
- Aerial spraying: Aerial spraying is prohibited. Member States may allow it under strict conditions after warning people;
- Minimising or banning – Member States minimise or ban the use of pesticides in critical areas for environmental and health reasons;
- Inspection of equipment in use – all pesticides application equipment will have to be inspected at least once by 2016 to grant a proper efficient use of any plant protection product;
- Integrated pest management – Member States prepare general principles of IPM to promote low pesticide-input management including non-chemical methods, which is obligatory for professional users starting on 1 January 2014.
- Establishment of risk indicators

- Handling and storage of pesticides and treatment of their packaging and remnants
- Reporting on implementation

**Timelines**

1. The SUPD follows a five-year cycle. National Action Plans (required by Art. 4) is the key instrument of the Directive, consisting of all measures prescribed in the Directive (Art. 5-15), and describing how these measure will be implemented to achieve the objectives set in the NAPs. Member States shall communicate their NAPs to the Commission and to other Member States by 14 December 2012, and afterward (at least) every five years, after obligatory review of the NAPs or earlier in case of any substantial changes to the NAPs.
2. According to Art. 8.2, starting on 14 December 2016, only pesticide application equipment having successfully passed inspection is allowed to be used professionally. New equipment shall be inspected at least once within a period of five years after purchase.
3. According to Art. 14.4, professional users will have to apply general principles of integrated pest management (IPM) from 1 January 2014. The country reports on IPM are available on EU website.
4. Reporting: Reporting on NAP in 2012 and every five years afterward. The first NAPs of the MSs are available on the EU Website. In addition, in 2011, the Commission issued a report (EC, 2011) that collated information on the state of the art with respect to the implementation of the main measures foreseen by the Directive at MS level. This report deemed also to facilitate the exchange of information among MSs.

**Integration/coordination issues with other related pieces of legislation**

The SUPD interacts with water, nature conservation and agriculture (organic farming) polices. It refers explicitly in its text to the WFD (2000/60/EC); the Birds Directive 79/409/EEC, the Habitats Directive (92/43/EEC) and Council Regulation (EC) No 834/2007 on organic production and labelling of organic products. The SUPD requires accordingly:

- For the water policy: the NAPs to take into account plans under other Community legislation on the use of pesticides, and refers in this regard to the planned measures under the WFD (Art. 4). Member States to ensure appropriate measures to protect the aquatic environment and drinking water supplies from the impact of pesticides which support and are compatible with the WFD (Art. 11). For example: giving preference to pesticides that are not classified as dangerous for aquatic environment; giving preference to most efficient application techniques such as the use of low-drift pesticide application equipment; or using buffer zones which minimise the risk of off-site pollution caused by pesticides spraying (drift, drain-flow or run-off). Furthermore, the directive requires Member States to minimise or prohibit the use of pesticides in certain specific areas, including protected areas as defined in the WFD (Art. 12).
- For nature conservation policy: the directive requires Member States to minimise or prohibit the use of pesticides in certain specific areas, including areas identified for the purposes of establishing the necessary conservation measures in accordance with the provisions of the Birds and Habitats Directives (Art. 12).
- For agriculture policy: Member States shall take all necessary measures to promote low pesticide-input pest management. Low pesticide-input pest management includes integrated pest management and organic farming according to Regulation on organic production and labelling of organic products (Art. 14).

**Coordination issues with the EU Biodiversity Strategy**

In order to comply with the requirements of the SUPD to minimise or prohibit the use of pesticides in certain specific areas (including protected areas as defined in the WFD or the areas identified for the purposes of establishing the necessary conservation measures in accordance with the provisions of the Birds and Habitats Directives ) or promoting low pesticide-input pest management, including integrated pest management and organic farming, MSs take the following

measures (examples from the German NAP) that contribute to the implementation of the SUPD and directly affect the target 2 of the EU biodiversity strategy, thus maintaining and enhancing ecosystems and their services:

- Increase in the proportion of organic agricultural area; of agricultural and horticultural farms working according to guidelines of integrated plant protection;
- Not exceedings of the limit of 0.1 µg/l (of single active substance in drinking water) or respectively 0.5 µg/l (of total of all individual active substances in drinking water) for all active substances in plant protection products and relevant metabolites in the groundwater;
- Creation of buffer zones, permanently covered with vegetation and at least 5 m in width, at all surface waters, particularly in protected areas for drinking water, nature reserves and in sensitive areas;
- Increasing the utilized agricultural area on which, within the framework of various support programs (agri-environmental programs, contract-based nature protection services, production-integrated compensation measures, fields designated for special protection, etc.), adapted farming measures are carried out (including activities to protect the diversity of wildflowers in the peripheral field area)
- Creation of ecological focus areas not using plant protection products.

**Relevance to ecosystems/habitats?**

'Agro-ecosystems' are explicitly addressed by the SUPD (Art. 3).

A 'habitats' term is not mentioned, the 'biodiversity' in general terms is addressed in Art. 12 on 'Reduction of pesticide use or risks in specific areas' and in Annex I. Aquatic (freshwater) and terrestrial ecosystems can be impacted by the SUPD, though this is not explicitly stated in the SUPD. The requirements of the Directive (Art. 12) – to minimise or prohibit the use of pesticides in certain specific areas, including protected areas as defined in the WFD or the areas identified for the purposes of establishing the necessary conservation measures in accordance with the provisions of the Birds and Habitats Directives – show the Directive considers a possible impact on the two ecosystem groups (out of the three major ecosystem groups – terrestrial, freshwater, and marine). Links to Aquatic Biodiversity and Ecosystem Services: There is definitely a link to Aquatic Biodiversity and Ecosystem Services. The Directive mentions explicitly 'Aquatic environment' in Art. 11 on 'Specific measures to protect the aquatic environment and drinking water' and in Preamble 15; as 'biodiversity' is an integral part of the 'aquatic environment'. Biodiversity is important in all ecosystems, including "natural" such as nature conservation areas and also in those that are managed by humans, such as farms or even urban parks. Therefore, the directive addressing agricultural and non-agricultural areas as well as protected areas also addresses biodiversity. The term 'ecosystem services' is not mentioned in the Directive, though, biodiversity is the basis of the multiple benefits provided by ecosystems to humans and in this way ecosystems services are also addressed.

**Drivers**

There is no specific definition of 'drivers' provided. The Directive applies to professional use of pesticides (plant protection products) on agricultural and non-agricultural areas. Therefore, agriculture sector (intensive agriculture) is the key driver.

Drivers which the legal act/policy address: Agriculture, forestry, horticulture sectors and non-agricultural activities (parks). Driver indicators would be an amount (kg, tonne) of pesticide applied on specific agricultural area (ha). According to Art. 4.1, the NAPs shall include indicators to monitor the use of plant protection products containing active substances of particular concern. On the basis of such indicators, timetables and targets for the reduction of use shall also be established. The report of the Commission (EC, 2011) indicates that indicators to monitor the use of plant protection products were used in 8 out of 20 MS. For example, the German NAP reviews the Progress made with the National Action Plan with the help of a comprehensive set of indicators

and targets. These indicators follow the OECD/EEA concept: "Driving Force – Pressure – State – Impact – Response". However, the indicators do not have a direct reference to plant protection, as plant protection is merely one of a whole range of factors that can influence the value of such indicators. The driver indicators defined in the German NAP include, e.g.:

- Extent of infestation that retrospectively describes the annual level of infestation of important crops/sectors by typical harmful organisms or groups of harmful organisms;
- Agricultural area indicates the area used for agriculture, divided into arable land, grassland, special crops, and set-aside areas;
- Domestic issue of active substances states the total quantity of active substances, divided according to their areas of operation and chemical classes, sold in professional and non-professional (home gardens and allotments) areas of application in one year in Germany.

**Pressures**

There is no specific definition of 'pressure' provided. The SUPD considers chemical pressure, i.e. the water or terrestrial ecosystems pollution with pesticides. The directive notes in its preamble (15) that the aquatic environment is especially sensitive to pesticides and particular attention should be paid to avoid surface and groundwater pollution by taking appropriate measures, "such as the establishment of buffer and safeguard zones or planting hedges along surface waters to reduce exposure of water bodies to spray drift, drain flow and run-off".

For example, the German NAP reviews the Progress made with the National Action Plan with the help of a comprehensive set of indicators and targets. These indicators follow the OECD/EEA concept: "Driving Force – Pressure – State – Impact – Response". However, the indicators do not have a direct reference to plant protection, as plant protection is merely one of a whole range of factors that can influence the value of such indicators. The pressure indicators defined in the German NAP include, e.g.:"Plant protection products in surface waters: the pollution of surface waters by plant protection products is recorded by means of assessing the instances that exceed the environmental quality standards (EQS) relating to plant protection products; these standards were introduced with regard to the chemical and ecological status of water bodies as defined in the Water Framework Directive; note that when abstracting drinking water, the drinking-water threshold value is also assessed." "Residues of plant protection products in small water bodies Compilation of the measurement results obtained from small water bodies."

**Assessment of Environmental State**

As it is seen from the overall objective of the SUPD (according to Art. 1, see below) – chemical parameters are of relevance, i.e. pollution with pesticides. The overall objective of the SUPD (according to Art. 1) is to establish "… a framework to achieve a sustainable use of pesticides by reducing the risks and impacts of pesticide use on human health and the environment and promoting the use of integrated pest management and of alternative approaches or techniques such as non-chemical alternatives to pesticides". The Directive requires (in Art. 15) to establish harmonised risk indicators as referred to in Annex IV; however, Member States may continue to use existing national indicators or adopt other appropriate indicators in addition to the harmonised ones. According to Art. 3 'risk indicator' is used to evaluate risk of pesticides on human health and the environment. For example, the German NAP sets an indicator on 'plant protection products in the groundwater' that present the pollution of the groundwater by means of plant protection products by assessing the instances of exceeding the threshold value for groundwater, namely 0.1 µg/l. According to Eurostat on Pesticide Risk: "The progress achieved in the reduction of risks and adverse impacts from pesticide use for human health and the environment should be measured using harmonised risk indicators that should be established at Community level (according to Art. 15 and Annex IV)). Member States should use those risk management indicators at national level and for reporting purposes, while the Commission should calculate indicators to evaluate progress at Community level. Statistical data collected on plant

protection products (as required by relevant legislation) should be used for this. However, a set of harmonised risk indicators have not yet been agreed on the EU level."

**Assessment of Status**

The Directive requires MS to measure risk indicators used to evaluate risk of pesticides on human health and the environment. Harmonised risk indicators should be developed on the EU level (in accordance to Art. 15 and Annex IV of the Directive on the Sustainable Use of Pesticides). As for today, a set of harmonised risk indicators have not yet been agreed on the EU level.

Currently (status of 2013) the European Commission measure the only risk indicator – pesticides pollution of water – that are indicated by current values, exceedances and trends in the concentrations (µg/l) of selected pesticides in groundwater and rivers.

A set of harmonised risk indicators have not yet been agreed on the EU level.

The EU, Eurostat collects the data, i.e. agri-environmental indicator for:

- water quality: on pesticide pollution of water that consists of an overview of recent data (2013). Pesticides in water are indicated by current values, exceedances and trends in the concentrations (µg/l) of selected pesticides in groundwater and rivers. (Though this indicator is still in the process of development). Two main indicators include: "groundwater with pesticide concentrations above Environmental Quality Standards (EQS)" and "rivers with annual average pesticide concentrations above Environmental Quality Standards (EQS)"
- consumption of pesticides: (here plant protection products, excluding biocides and disinfectant products) in agriculture is indicated by both the applied rates by the farmers and the amounts sold and is measured by the main indicator "application rates of different pesticide categories" and two supporting indicators "used quantities of different pesticide categories" and "sold quantities of different pesticide categories"

**Data**

1. National Action Plans – Member States adopt them setting objectives and timetables to reduce risks and impacts of pesticide use,
2. Integrated pest management –Member States reports on promotion of low pesticide-input management including non-chemical methods. Professional users have to apply general principles of IPM from 1 January 2014,
3. Survey on Status of Implementation (2011) of the Directive in the Member States,
4. Information and awareness raising, the relevant national links on sustainable use of pesticides,
5. The use of plant protection products in the European Union

**Funding**

The Directive does not have a fund attached to it; instead the CAP and national funds are used to support its implementation indirectly.

The European Agricultural Fund for Rural Development to support relevant rural development measures:

- through the agro-environmental and organic farming measures: organic and integrated plant protection measures (IPM); Consolation on plant protection matters in organic farms; Non-chemical plant protection measures in organic farming; Creation of buffer zones for protection of water bodies that are permanently covered with vegetation or in agricultural use without the application of plant protection products (this applies solely to farming measures that are classified as being eligible for funding in the context of agri-environmental measures)
- "Effective integrated plant protection measures are often not used in practise because the costs exceed the economic benefit of the measures. Within the framework of funding programmes (e.g. agri-environmental measures) the possibility exists to create a certain financial indemnification, thereby providing support to the introduction of guidelines for integrated plant protection or of individual measures, or the introduction of plant protection measures in organic farming."

- Through other rural development measures aid to buy new pesticide application equipment

National funding: for innovative integrated plant protection and organic farming measures; research

# 3.20 Waste Framework Directive

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## Waste Framework Directive

**Name/Type of the Legal Act or Policy**

Waste Framework Directive / Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives

Amended by:

Commission Regulation (EU) No 1357/2014 of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives Text with EEA relevance

Commission Directive (EU) 2015/1127 of 10 July 2015 amending Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives (Text with EEA relevance)

Subsequent Legal Acts: *Regulations*

Commission Regulation (EU) No 1357/2014 of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives Text with EEA relevance

Commission Regulation (EU) No 715/2013 of 25 July 2013 establishing criteria determining when copper scrap ceases to be waste under Directive 2008/98/EC of the European Parliament and of the Council

Council Regulation (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council

Commission Regulation (EU) No 1179/2012 of 10 December 2012 establishing criteria determining when glass cullet ceases to be waste under Directive 2008/98/EC of the European Parliament and of the Council

*Directives*:

Commission Directive (EU) 2015/1127 of 10 July 2015 amending Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives (Text with EEA relevance)

*Decisions:*

Commission Decision of 18 November 2011 establishing rules and calculation methods for verifying compliance with the targets set in Art. 11(2) of Directive 2008/98/EC of the European Parliament and of the Council (notified under document C(2011) 8165)

2014/955/EU: Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council Text with EEA relevance

Please note that there is a handbook on waste legislation:

FUTURE: Review of Policy and legislation

2 July 2014: the European Commission adopted a legislative proposal and annex to review recycling and other waste-related targets in the EU Waste Framework Directive 2008/98/EC and other related Directive: Proposal for a Directive of the European Parliament and of the Council amending Directives 2008/98/EC on waste, 94/62/EC on packaging and packaging waste, 1999/31/EC on the landfill of waste, 2000/53/EC on end-of-life vehicles, 2006/66/EC on

batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment.

**Entry into force**

12-12-2008

**Departments/Units in charge**

Directorate General for the Environment, DG ENV
Directorate A-Green Economy
Unit 2. Waste Management & Recycling
Julio García Burgués (Head of Unit)
Avenue de Beaulieu 5/ Beaulieulaan 5
1160 Bruxelles/Brussel (Belgium)
Tel: +32 229-91111 (Switchboard)
Internet: http://ec.europa.eu/environment

**Common Implementation strategy (CIS processes)**

No evidence of a specific CIS Working Group. Yet, Art. 29(5) of the Directive calls upon the Commission to create a system for sharing information on best practice regarding waste prevention and to develop guidelines in order to assist the Member States in the preparation of their waste prevention programmes. See guidelines and EIONET Website for sharing information on National Waste Prevention Programmes. There is also a specific Guidance document on the Directive for supporting its proper implementation.

**Administrative body handling implementation in MS**

The Directive required that by 12 December 2013 Member States establish national waste prevention programmes: Spain (Ministry of Agriculture, Food and the Environment, MAGRAMA), Portugal (Portuguese Environment Agency, APA, public agency within the scope of the Portuguese Ministry of the Environment, Spatial Management and Energy), Italy (Ministry of the Environment). WMP (Waste Management Plans): Regional waste management plans only: Germany. Italy: Regional/provincial level. Belgium (Flanders): regional/municipal (EC, Community Waste Implementation. 2015).

**Main Objective**

"To lay down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use" (Art. 1)

**Principles included in the legal text**

- General environmental protection principles of precaution and sustainability, technical feasibility and economic viability, protection of resources as well as the overall environmental, human health, economic and social impacts; Principles of clarity, comprehensibility and accessibility for users; Polluter-pays principle; Extended producer responsibility; Precautionary principle and the principle of preventive action; Self-sufficiency and proximity

**Other objectives/Key concepts/key elements of the legislation**

- Waste hierarchy (art.3): prevention, re-use, recycling, recovery for other purposes such as energy and disposal.
- By-products (art. 5) and waste distinction.
- End-of-waste status
- Self-sufficiency in waste disposal (art. 5).
- Waste management planning (art. 7) (to be carried out by competent national authorities setting up waste management plans and waste prevention programmes)
- Permit requirements (art. 9 and 10) (producers/holders of waste must treat it themselves or have it handled by an officially recognised operator holding a permit and submitted to periodical inspections.

- Recovery, re-use and recycling (arts. 10 and 11). (Specific recycling and recovery targets to be achieved by 2020 are set up for household waste (50%) and construction and demolition waste (70%).)
- Record keeping (art. 14).
- Polluter-pays principle (the original waste producer must pay for the costs of waste management).
- 'extended producer responsibility' (it may include duty on manufacturers to accept and dispose of products returned after use)
- Waste management to be carried out without any risk to water, air, soil, plants or animals, without causing a nuisance through noise or smells, or harming the countryside or places of special interest.
- Special conditions applied to hazardous waste, waste oils and bio-waste.

**Terminology**

Waste: any substance or object which the holder discards or intends or is required to discard;
Hazardous waste: waste which displays one or more of the hazardous properties listed in Annex III;
By-products (art. 5): A substance or object, resulting from a production process, the primary aim of which is not the production of that item, may be regarded as not being waste as referred above but if the following conditions are met: a) further use of the substance or object is certain; (b) the substance or object can be used directly without any further processing other than normal industrial practice; (c) the substance or object is produced as an integral part of a production process; and d) further use is lawful.
Waste oils: any mineral or synthetic lubrication or industrial oils which have become unfit for the use for which they were originally intended, such as used combustion engine oils and gearbox oils, lubricating oils, oils for turbines and hydraulic oils
Bio-waste: degradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants;
Waste producer: anyone whose activities produce waste (original waste producer) or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste;
Waste holder: the waste producer or the natural or legal person who is in possession of the waste;
Dealer: any undertaking which acts in the role of principal to purchase and subsequently sell waste, including such dealers who do not take physical possession of the waste;
Broker: any undertaking arranging the recovery or disposal of waste on behalf of others, including such brokers who do not take physical possession of the waste;
Waste management: the collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including actions taken as a dealer or broker;
Collection: the gathering of waste, including the preliminary sorting and preliminary storage of waste for the purposes of transport to a waste treatment facility;
Separate collection: the collection where a waste stream is kept separately by type and nature so as to facilitate a specific treatment;
Prevention: measures taken before a substance, material or product has become waste, that reduce: a) the quantity of waste, including through the re-use of products or the extension of the life span of products; (b) the adverse impacts of the generated waste on the environment and human health; or c) the content of harmful substances in materials and products;
Re-use: any operation by which products or components that are not waste are used again for the same purpose for which they were conceived;
Treatment: recovery or disposal operations, including preparation prior to recovery or disposal;

Recovery: any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II sets out a non-exhaustive list of recovery operations;
Preparing for re-use: checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing;
Recycling; any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations;
Regeneration of waste oils: any recycling operation whereby base oils can be produced by refining waste oils, in particular by removing the contaminants, the oxidation products and the additives contained in such oils;
Disposal: any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy
Best Available Techniques: best available techniques as defined in Art. 2(11) of Directive 96/61/EC. i.e. the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole.

**Derogations**

The Directive is addressed to the Member States (obliged to bring into force the laws, regulations and administrative provisions necessary to comply with it by December 12 December 2010). Art. 24 sets up the context for exemptions for Member States allowing exceptions regarding Art. 23 (in terms of from permit requirements laid down in Art. 23(1) establishments or undertakings for the following operations: disposal of their own non-hazardous waste at the place of production; or recovery of waste).

**Types of management measures**

Member States are obliged to guarantee that their competent authorities establish one or more waste management plans and to establish waste prevention programmes (examples of specific measures listed on Annex IV).

**Spatial coverage**

The whole territory of the Member State: "(Art.28: Waste Management Plans shall, alone or in combination, cover the entire geographical territory of the Member State concerned.")

**Reporting units - what are the specific transposition requirements**

The reporting is carried out every three years. Member States shall submit a sectoral implementation report (Art. 37) regarding meeting the targets of Art. 11 (50% preparing for re-use and recycling of household and similar waste: 70% preparing for reuse and recycling of construction and demolition waste) by 2020. If targets are not met, reasons for failure and future actions to be taken by the Member States should also be included.

**Management unit**

Member State territory, managed by means of waste management plans set up by competent authorities. These can be set at different scales according to the specific Member State. For example, only national (e.g. Netherlands, Malta, Latvia, Slovenia, Slovakia), national and regional/municipal plans (e.g. Spain, Greece and Finland -national/regional-, Poland -national/provincial-, Czech Republic, Denmark and Estonia -national/regional/municipal-), only regional (e.g. Germany -at Länder scale-, Italy -regional/provincial- and UK).

**Key planning steps**

The WsFD requires that Member States adopt waste management plans and waste prevention programmes. These programmes are evaluated every sixth year and revised as appropriate. They shall be integrated either into the waste management plans or into other environmental policy programmes, but may also function as stand-alone programmes. If any programme is integrated into the waste management plan or into other programmes, the waste prevention measures shall be clearly identified. Programmes, in turn, should set out waster prevention objectives. There is specific EC methodological guidance note on preparing a waste management plan.

**Timelines**

- Directive entering into force: 12-12-2008.
- Transposition (deadline): 12-12-2010.
- Establishment of Waste prevention programmes (deadline): 12-12-2013.
- By 2015: Member States separate set up for at least the following: paper, metal, plastic and glass.
- By 2020, (Member States) the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight;
- By 2020, (Member States) the preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70 % by weight.

**Integration/coordination issues with other related pieces of legislation**

Directive 1999/31/EC on the landfill of waste; Directive 94/62/EC on packaging and packaging waste; Roadmap on a Resource Efficiency Europe (COM(2011)571); 7th Environment Action Programme through 2020 (Decision 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'); EU Raw Materials Initiative; Directive 94/62/EC on packaging and packaging waste; Directive 2000/53/EC on end-of-life vehicles; Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators; Communication: Towards a circular economy: A zero waste programme for Europe; Directive (EU) 2015/720 of the European Parliament and of the Council of 29 April 2015 amending Directive 94/62/EC as regards reducing the consumption of lightweight plastic carrier bags (Text with EEA relevance); Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources (Text with EEA relevance); Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste; Soil Thematic Strategy (COM (2012) 46); Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC (COM/2006/0232 final); Communication COM(2005) 666 final Thematic Strategy on the prevention and recycling of waste.

**Coordination issues with the EU Biodiversity Strategy**

As far as we are concerned there is not explicit recognition of coordination issues between the WsFD and the BS2020. Yet, this is not to say that there are no links to be explored. Food waste impact on biodiversity is definitely one linkage to be further researched and so is marine debris impacting marine biodiversity.

**Relevance to ecosystems/habitats?**

None specifically addressed (but "environment"). Ecosystems affected/impacted implicitly by the relevant policy: Terrestrial, freshwater, coastal, marine…

**Drivers**

Word 'drivers' is not used. Drivers which the legal act/policy address: Industry, agriculture, domestic (producing domestic waste), construction (generating construction and demolition waste). The UK Marine licensing impact assessments include relevant information.

**Pressures**

Indicators: These are not listed specifically, but need to be developed within the framework of the Waste Prevention Programmes. (Art. 29.3 and 29. 4: "Member States shall determine appropriate specific qualitative or quantitative benchmarks for waste prevention measures adopted in order to monitor and assess the progress of the measures and may determine specific qualitative or quantitative targets and indicators, other than those referred to in paragraph 4, for the same purpose. Indicators for waste prevention measures (Waste Prevention Programmes) may be adopted in accordance with the regulatory procedure referred to in Art. 39(3)."). The "development of effective and meaningful indicators of the environmental pressures associated with the generation of waste aimed at contributing to the prevention of waste generation at all levels, from product comparisons at Community level through action by local authorities to national measures" is considered in annex IV as an example of measures that can affect the framework conditions related to the generation of waste (example of waste prevention measure). The EEA includes a core set of indicators on waste referring to objectives and targets of this Directive and other relevant related ones/instruments: WST 004 Waste Generation (WST 005 waste recycling and WST 006 diversion of waste from landfill and WST 006 diversion of waste from landfill.

**Assessment of Environmental State**

The environmental state is not the focus of this Directive. No parameters specified.

**Assessment of Status**

The environmental status is not the focus of this directive.

**Data**

Waste Framework Directive implementation report to be submitted to DG Environment by Member States every three years and Waste Directive Target Report to Eurostat (every three years). There is a handbook for data collection on waste generation and treatment.

**Funding**

"In developing their national waste management strategies and planning investments in waste management infrastructure, Member States should make a sound use of the European Structural and Investment Funds in line with the waste hierarchy by promoting preparing for re-use and recycling" (Proposal of Directive amending Directives 2008/98/EC on waste).

# 3.21 Renewable Energy Directive

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## Renewable Energy Directive

**Name/Type of the Legal Act or Policy**

Renewable Energy Directive ("RED").
Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.
Amended by:

- Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewables
- Council Directive 2013/18/EU of 13 May 2013 adapting Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, by reason of the accession of the Republic of Croatia (Text with EEA relevance)
- Commission Regulation (EU) No 1307/2014 of 8 December 2014 on defining the criteria and geographic ranges of highly biodiverse grassland for the purposes of Art. 7b(3)(c) of Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels and Art. 17(3)(c) of Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources. Establishes a link between Directive 2009/28/EC with Council Directive 92/43/EEC and Directive 2009/147/EC of the European Parliament and of the Council.

**Entry into force**

25/06/2009

**Departments/Units in charge**

Directorate-General for Energy (DG ENER),
Dir C — Renewables, Research and Innovation, Energy Efficiency
Unit 1. Renewables and CCS policy
Abreu Marques, Paula
Rue Demot 24/Demotstraat 24
1040 Bruxelles/Brussel (Belgique)
Tel: +32 229-91111
Internet: http://ec.europa.eu/energy

**Common Implementation strategy (CIS processes)**

No evidence of a specific CIS Working Group. Yet, Art. 24 calls upon the Commission to establish an online public transparency platform in order to facilitate and promote cooperation between Member States (apart from fostering transparency), specially regarding statistical transfers (Art. 6) and Joint Projects (Arts. 7 and 9).

**Administrative body handling implementation in MS**

At national level: Ministry of Energy, Industry and Tourism (Spain); MAMAOT (Ministry of Agriculture, Sea, Environment and Regional Planning) (Portugal)/Ministry of Economic Development (Italy).

**Main Objective**

"To establish a common framework for the promotion of energy from renewable sources. [The

Directive] sets mandatory national targets for the overall share of energy from renewable sources in gross final consumption of energy and for the share of energy from renewable sources in transport. [The Directive] lays down rules relating to statistical transfers between Member States, joint projects between Member States and with third countries, guarantees of origin, administrative procedures, information and training, and access to the electricity grid for energy from renewable sources. It establishes sustainability criteria for biofuels and bioliquids" (Art. 1).

**Principles included in the legal text**

Sustainability; Subsidiarity; Proportionality

**Other objectives/Key concepts/key elements of the legislation**

- Creates a common framework for the use of renewable energy in the EU in order to limit greenhouse gas (GHG) emissions and promote cleaner transport by setting targets for all EU countries with the overall aim of making renewable energy sources account for 20% of EU energy gross final consumption and 10% share of energy from renewable sources in each Member State's transport energy consumption by 2020.
- National renewable energy action plans (covering: targets for the share of energy from renewable sources consumed in transport, electricity and heating and cooling, policy measures on energy efficiency on final consumption of energy, and adequate measures to be taken to achieve those national overall targets, including cooperation between local, regional and national authorities, planned statistical transfers or joint projects and national policies to develop existing biomass resources and promote new biomass resources for different uses) (Art. 4).
- Cooperation mechanisms (under the form of statistical transfers of renewable energy, joint renewable energy projects or joint renewable energy support schemes).
- Information transparency (and transparency platform).
- Training programmes.
- Guarantee of origin of electricity heating and cooling produced from renewable energy sources and access to/and operation of the grids.
- Sustainability criteria for biofuels and bioliquids.
- Voluntary schemes for biofuels producers (for showing sustainability criteria compliance).
- Non-discrimination.

**Terminology**

Art. 2 provides definitions for the following terms:

*Energy from renewable sources*: "energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases";

*Aerothermal energy*: "energy stored in the form of heat in the ambient air";

*Geothermal energy*: "energy stored in the form of heat beneath the surface of solid earth";

*Hydrothermal energy*: "energy stored in the form of heat in surface water";

*Biomass*: "biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste";

*Gross final consumption of energy*: "energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission.

*District heating/cooling*: "the distribution of thermal energy in the form of steam, hot water or chilled liquids, from a central source of production through a network to multiple buildings or sites, for the use of space or process heating or cooling";

*Bioliquids*: "liquid fuel for energy purposes other than for transport, including electricity and

heating and cooling, produced from biomass";
*Biofuels*: "liquid or gaseous fuel for transport produced from biomass";
*Guarantee of origin*: "electronic document which has the sole function of providing proof to a final customer that a given share or quantity of energy was produced from renewable sources as required by Art. 3(6) of Directive 2003/54/EC";
*Support scheme*: "any instrument, scheme or mechanism applied by a Member State or a group of Member States, that promotes the use of energy from renewable sources by reducing the cost of that energy, increasing the price at which it can be sold, or increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased".
*Renewable energy obligation*: "a national support scheme requiring energy producers to include a given proportion of energy from renewable sources in their production, requiring energy suppliers to include a given proportion of energy from renewable sources in their supply, or requiring energy consumers to include a given proportion of energy from renewable sources in their consumption".
*Actual value*: "the greenhouse gas emission saving for some or all of the steps of a specific biofuel production process calculated in accordance with the methodology laid down in part C of Annex V".
*Typical value*: "an estimate of the representative greenhouse gas emission saving for a particular biofuel production pathway;
*Default value*: "a value derived from a typical value by the application of pre-determined factors and that may, in circumstances specified in the Directive, be used in place of an actual value".
Definitions included in Art. 1 in the Commission Regulation (EU) No 1307/2014 on defining the criteria and geographic ranges of highly biodiverse grassland for the purposes of Art. 17(3)(c) of Directive 2009/28/EC (biofuels and bioliquids):
*Grassland*: "terrestrial ecosystems dominated by herbaceous or shrub vegetation for at least 5 years continuously. It includes meadows or pasture that is cropped for hay but excludes land cultivated for other crop production and cropland lying temporarily fallow. It further excludes continuously forested areas as defined in Art. 17(4)(b) of Directive 2009/28/EC unless these are agroforestry systems which include land-use systems where trees are managed together with crops or animal production systems in agricultural settings";
*Human intervention*: "managed grazing, mowing, cutting, harvesting or burning";
Natural highly biodiverse grassland: "grassland that: (a) would remain grassland in the absence of human intervention; and (b) maintains the natural species composition and ecological characteristics and processes";
*Non-natural highly biodiverse grassland*: "(a) would cease to be grassland in the absence of human intervention; and (b) is **not degraded,** that is to say it is not characterised by long-term loss of biodiversity due to for instance overgrazing, mechanical damage to the vegetation, soil erosion or loss of soil quality; and (c) is **species-rich**, that is to say it is: (i) a habitat of significant importance to critically endangered, endangered or vulnerable species as classified by the International Union for the Conservation of Nature Red List of Threatened Species or other lists with a similar purpose for species or habitats laid down in national legislation or recognised by a competent national authority in the country of origin of the raw material; or (ii) a habitat of significant importance to endemic or restricted-range species; or (iii) a habitat of significant importance to intra-species genetic diversity; or (iv) a habitat of significant importance to globally significant concentrations of migratory species or congregatory species; or (v) a regionally or nationally significant or highly threatened or unique ecosystem".

**Derogations**

Partial exemptions for insular and peripheral states (e.g. Cyprus, Malta) due to disproportionate consumption over the Community average in terms of their final consumption of energy in

national air transport and limitations for commercial use of biofuels in aviation (Art. 5 para. 6 subpara. 3; Recital 33).

**Types of management measures**

- National renewable energy actions plans for 2020.
- Cooperation mechanisms: Statistical transfers (Art. 6): arrangements for the statistical transfer of a specified amount of energy from renewable sources from one Member State to another Member State; Joint projects (Art. 7): two or more Member States may cooperate (with/without the participation of private operators) on all types of joint projects relating to the production of electricity, heating or cooling from renewable energy sources. This mechanism can entail the physical transfer of energy from one country to another; Joint support schemes (Art. 11): two or more Member States decide, on a voluntary basis, to join/partly coordinate their national support schemes. Then a certain amount of energy from renewable sources is produced in the territory of one participating MS count towards the national overall target of another participating MS involving measures such as a common feed-in tariff, a common feed-in premium, or a common quota and certificate trading regime.
- Guarantee of the origin of electricity, heating and cooling from renewable energy sources.
- Creation of specific infrastructure for using renewable energy sources in the transport sector.

Information measures to provide information to the public on energy from renewable sources in transport (if biofuels exceed 10% volume to be indicated at sales point)

**Spatial coverage**

The whole territory of the Member State but for certain measures dealing with biofuels, the spatial coverage also includes third countries that are a significant source of biofuels and bioliquids or of raw material (feedstock) for biofuels consumed within the territory of the EU. In these countries sustainability criteria determined in this Directive for the production of this kind of fuels also need to be fulfilled.

**Reporting units - what are the specific transposition requirements**

Member States report every two years on progress achieved towards the EU 2020 RES goals on the basis of their national reports. (See 6.2 for further information on reporting.)

**Management unit**

National territory.

**Key planning steps**

- Establishment of *mandatory national overall targets and measures* for the use of energy from renewable sources (Member States ensuring that the share of energy from renewable sources is calculated in accordance to the specifications detailed in the Directive (Art.s 5 to 11, Annex I) and measures to reach them (support schemes and cooperation). Same for the share of energy from renewable sources in transport (Art. 3).
- *Elaboration of National renewable energy actions plans* for 2020, covering (art. 4): targets for the share of energy from renewable sources consumed in transport, electricity and heating and cooling, policy measures on energy efficiency on final consumption of energy, and adequate measures to be taken to achieve those national overall targets, including cooperation between local, regional and national authorities, planned statistical transfers or joint projects and national policies to develop existing biomass resources and promote new biomass resources for different uses).

  Member States: a) publishing and notifying *forecast* 6 months before national plan is due a forecast document (with estimated excess production of energy from renewable sources compared to the indicative trajectory which could be transferred to other Member States and estimated potential for joint projects until 2020 and estimated demand for energy from renewable sources to be satisfied by means other than domestic production until 2020); and b) notifying their national renewable energy action *plans* to the Commission (by 30 June 2010) or

submitting an amended national renewable energy action plan (if share of energy from renewable sources fell below the indicative trajectory as determined by Directive) by 30 June 2011 (deadline).

- *Reporting* (see next section).
- Notification to the Commission on *agreements* with other countries on statistical transfers, joint projects and joint support schemes (see next section).
- Ensuring that national *administrative procedures, regulations and codes* (Art. 13) fullfil the following criteria: a) clear coordination/definition, transparent timetables, of responsibilities of administrative bodies for authorisation, certification and licensing procedures; (b) comprehensive information on the processing of authorisation, certification and licensing applications for renewable energy installations and available assistance to applicants; (c) streamlined administrative procedures at the appropriate administrative level; (d) objective, transparent, proportionate, non-discriminatory rules for authorisation, certification and licensing (e) transparent and cost-related administrative charges paid by consumers, planners, architects, builders and equipment and system installers and suppliers (f) simplified and less burdensome authorisation procedures.
- *Guarantees of origin of electricity, heating and cooling produced from renewable energy sources* by Member States (in accordance with objective, transparent and non-discriminatory criteria): standard size of 1 MWh (Art. 15).
- *Access to and operation of the grids*: implementing measures to develop transmission and distribution grid infrastructure, intelligent networks, storage facilities and the electricity system, in order to allow the secure operation of the electricity system for further development of electricity production from renewable energy sources (Art. 16). Member States review and take measures to improve the frameworks and rules for transmission/distribution system operators to bear and share costs to ensure the integration of new producers (by 30 June 2011 and every two years thereafter).
- Measures to guarantee *sustainability criteria for biofuels and bioliquids* (Art. 17) requiring economic operators to show the fulfilment of the sustainability criteria (by using a mass balance verification system as detailed in Art. 18.) and may require them to arrange for an independent auditing of the information submitted (providing evidence that this has been done)..

**Timelines**

- Entry into force: 25/06/2009.
- Date of transposition: 05/12/2010 (deadline).
- Commission adopting template for national renewable energy action plans: 30 June 2009 (deadline).
- Member States publishing and notifying to the Commission the forecast document (see previous section): 6 months before national renewable energy plan is due.
- Member States notify their national renewable energy action plans to the Commission: 30 June 2010 (deadline).
- Member States submit an amended national renewable energy action plan to the Commission (if share of energy from renewable sources fell below the indicative trajectory as determined by Directive): 30 June 2011 (deadline).
- Member States submit 1st their report to the Commission on progress in the promotion and use of energy from renewable sources: 31 December 2011 (deadline)
- Member States submit reports to the Commission on progress: every two years. Last report (6th) submission: 31 December 2021 (deadline).
- Member States notifying the Commission on agreements reached with other Member States on statistical transfers and joint support schemes: no later than three months after the end of each year in which they have effect (first case) and within three months of the end of each year

(second mechanism).

- Member States review and take measures to improve the frameworks and rules for transmission/distribution system operators to bear and share costs to ensure the integration of new producers: by 30 June 2011 and every two years thereafter.
- Member States submitting information to the Commission (to be published by on the transparency platform) on the reliable information submitted by economic operators on the fulfilment of the sustainability criteria for biofuels and bioliquids.
- Member States submitting the Commission report on areas of their territories (NUTS) where typical GHG emissions from cultivation of agricultural raw materials are presumable lower than or equal to the emissions reported in Directive (see Disaggregated default values for cultivation): March 2010.
- Commission reporting to the European Parliament and the Council on analysis and action plan on energy from renewable source: 1 December 2010.
- Commission presenting, if appropriate a) proposal permitting, subject to certain conditions, the whole amount of the electricity originating from renewable sources used to power all types of electric vehicles to be considered; b) proposal for a methodology for calculating the contribution of hydrogen originating from renewable sources in the total fuel mix: December 2011 (deadline).
- Commission reporting to the European Parliament and the Council regarding (third countries/Member States significant source of biofuels/raw material for biofuels) on national measures taken to respect the sustainability criteria in Directive for soil, water and air protection: every two years (first report in 2012).
- Commission reporting to the European Parliament and the Council regarding social/development issues linked to biofuels in the Community/third countries (impact on social sustainability in the Community of increased demand for biofuel, foodstuffs at affordable prices in developing countries, land-use rights, ratification of ILO Conventions, Cartagena Protocol and CITES Convention): every two years (first report in 2012).
- Commission reporting to the European Parliament and the Council regarding the effectiveness of the existing system for providing information on sustainability criteria on biofuels and the feasibility and appropriateness of introducing mandatory requirements in relation to air, soil or water protection: 31 December 2012.
- Commission submitting report to the European Parliament and the Council (regarding a review of the minimum GHG saving (biofuels) based on impact assessment; on measures to achieve share of energy from renewable sources of 10 % for transport; on the cooperation mechanisms): 31 December 2014.
- Commission presenting Renewable Energy Roadmap for the post-2020 period: 2018.

Commission presenting a Report on the implementation of the Directive: 2021.

**Integration/coordination issues with other related pieces of legislation**

- The Directive contributes to one of the 20-20-20 targets set up in the EU´s 2020 climate & energy package (which are: 20% energy of EU energy from renewables, 20% cut in GHG emissions -from 1990 levels-, 20% improvement in energy efficiency).

Provisions of the Directive refer to the following instruments:

- Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers, amending Regulations (EC) No 1290/2005, (EC) No 247/2006, (EC) No 378/2007 and repealing Regulation (EC) No 1782/2003
- Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics (Text with EEA relevance)
- European Parliament resolution of 25 September 2007 on the Roadmap for Renewable Energy in

Europe (2007/2090(INI))

- 2007/742/EC: Commission Decision of 9 November 2007 establishing the ecological criteria for the award of the Community eco-label to electrically driven, gas driven or gas absorption heat pumps (notified under document number C(2007) 5492)
- Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC
- Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications.
- Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council
- Directive 2004/8/EC of the European Parliament and of the Council of 11 February 2004 on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC.
- Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC.
- Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC.
- Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC – Statements made with regard to decommissioning and waste management activities.
- Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings.
- 1999/468/EC: Council Decision of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission.
- Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC.
- Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.
- The Energy Community Treaty.

Others:

- CDM of the Kyoto Protocol, under the conditions set out in Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community (17), for reductions in the fuel supply sector.
- Conventions of the International Labour Organisation (ILO): 29, 87, 98,100, 105, 111, 138 and 182.
- Cartagena Protocol on Biosafety.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Ramsar Convention: Convention on Wetlands of International Importance.

Instruments citing the Directive:

- Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure Text with EEA relevance
- Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning
- Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain

types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC

- Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC
- Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC
- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
- Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources
- Council Directive (EU) 2015/652 of 20 April 2015 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels
- Council Directive 2013/18/EU of 13 May 2013 adapting Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, by reason of the accession of the Republic of Croatia
- Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC
- Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009
- Commission Regulation (EU) No 1307/2014 of 8 December 2014 on defining the criteria and geographic ranges of highly biodiverse grassland for the purposes of Art. 7b(3)(c) of Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels and Art. 17(3)(c) of Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources
- Commission Regulation (EU) No 702/2014 of 25 June 2014 declaring certain categories of aid in the agricultural and forestry sectors and in rural areas compatible with the internal market in application of Art.s 107 and 108 of the Treaty on the Functioning of the European Union
- Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Art.s 107 and 108 of the Treaty
- Commission Regulation (EU) No 513/2013 of 4 June 2013 imposing a provisional anti-dumping duty on imports of crystalline silicon photovoltaic modules and key components (i.e. cells and wafers) originating in or consigned from the People's Republic of China and amending Regulation (EU) No 182/2013 making these imports originating in or consigned from the People's Republic of China subject to registration
- Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council
- Commission Regulation (EU) No 1014/2010 of 10 November 2010 on monitoring and reporting of data on the registration of new passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council
- Commission Decision 2010/335 of 10 June 2010 on guidelines for the calculation of land carbon stocks for the purpose of Annex V to Directive 2009/28/EC (notified under document

C(2010) 3751)

- Commission Decision 2009/548/EC of 30 June 2009 establishing a template for National Renewable Energy Action Plans under Directive 2009/28/EC of the European Parliament and of the Council (notified under document number C(2009) 5174)
- Commission Decision 2013/114/EU of 1 March 2013 establishing the guidelines for Member States on calculating renewable energy from heat pumps from different heat pump technologies pursuant to Art. 5 of Directive 2009/28/EC of the European Parliament and of the Council (notified under document C(2013) 1082)

**Coordination issues with the EU Biodiversity Strategy**

Closely linked to target 1 (Fully implement the Birds and Habitats Directives) due to the restrictions introduced by amending Regulation (Commission Regulation (EU) No 1307/2014) on the areas for the extraction of raw material for biofuels and bioliquids from highly biodiverse grassland.

Art. 17.3 of the Directive 2009/28/EC sets up sustainability criteria for biofuels and bioliquids establishing restrictions on the areas for the extraction of raw material: "3. Biofuels and bioliquids [...] shall not be made from raw material obtained from land with high biodiversity value, namely land that had one of the following statuses in or after January 2008, whether or not the land continues to have that status:(a) primary forest and other wooded land, namely forest and other wooded land of native species, where there is no clearly visible indication of human activity and the ecological processes are not significantly disturbed;(b) areas designated:(i) by law or by the relevant competent authority for nature protection purposes; or(ii) for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements or included in lists drawn up by intergovernmental organisations or the International Union for the Conservation of Nature, subject to their recognition in accordance with the second subparagraph of Art. 18(4); unless evidence is provided that the production of that raw material did not interfere with those nature protection purposes; (c) highly biodiverse grassland that is: (i) natural, namely grassland that would remain grassland in the absence of human intervention and which maintains the natural species composition and ecological characteristics and processes; or (ii)non-natural, namely grassland that would cease to be grassland in the absence of human intervention and which is species-rich and not degraded, unless evidence is provided that the harvesting of the raw material is necessary to preserve its grassland status. The Commission shall establish the criteria and geographic ranges to determine which grassland shall be covered by point (c) of the first subparagraph. Those measures, designed to amend non-essential elements of this Directive, by supplementing it shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Art. 25(4)."

Commission Regulation (EU) No 1307/2014 defines the criteria and geographic ranges of highly biodiverse grassland for the purposes of (among other related Directives) of Directive 2009/28/EC. Sets up that the following geographic ranges of the European Union shall always be regarded as highly biodiverse grassland: "(1) habitats as listed in Annex I (Natural habitat types of Community Interest whose conservation requires the designation of special areas of conservation) to Council Directive 92/43/EEC; (2) habitats of significant importance for animal and plant species of Union interest listed in Annexes II (animal and plant species of community interest whose conservation requires the designation of special areas of conservation) and IV (animal and plant species of community interest in need of strict protection) to Directive 92/43/EEC; (3) habitats of significant importance for wild bird species listed in Annex I to Directive 2009/147/EC.

**Relevance to ecosystems/habitats?**

Case of biofuels/bioliquids. Protected: 1. highly biodiverse grasslands; 2. primary forest and other wooded land: 3. legally protected natural areas and designated areas for the protection of rare, threatened or endangered ecosystems or species (recognised by international agreements or

included in lists drawn up by intergovernmental organisations or the IUCN); 4. Areas with high carbon stock (e.g. wetlands, Art. 17.4).

Ecosystems are affected that are not specifically protected. Protected: Terrestrial due to restrictions on the areas for the extraction of raw material for biofuels and bioliquids from highly biodiverse grassland (see amending Commission Regulation (EU) No 1307/2014) and Directive 2009/28/EC from primary forest and other wooded land; areas designated: (i) by law or by the relevant competent authority for nature protection purposes; or (ii) for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements or included in lists drawn up by intergovernmental organisations or the International Union for the Conservation of Nature. The legal text considers the links between Renewable energy and aquatic biodiversity and ecosystem services: *Wetlands* ("land that is covered with or saturated by water permanently or for a significant part of the year" as one type of lands with "high carbon stock", that had that status in January 2008 and no longer has that status) are specifically mentioned as non-allowed source for raw material for biofuels and bioliquids (Art. 17.4). Apart from that when concluding bilateral/multilateral agreements with third countries containing provisions on sustainability criteria (compliance with the sustainability criteria for biofuels and bioliquids) the Community will give (Art. 18.4) "due consideration to measures taken for the conservation of areas that provide, in critical situations, basic ecosystem services (such as watershed protection and erosion control)". The Directive also recognises (77) the need to take into account (where appropriate) the Millennium Ecosystem Assessment due the value of its data for data for conservation of at least areas providing basic ecosystem services in critical situations (e.g. *watershed protection and erosion control*). Besides, reports submitted by each Member State to the Commission (every 2 years) on the progress in the promotion and use of energy from renewable sources should include estimations on the impact of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within the Member State (Art. 22j).

**Drivers**

The term 'drivers' is not specifically mentioned in the Directive. Drivers that the legal act/policy address: Transport (road vehicles, and non-road mobile machinery -including inland waterway; vessels when not at sea-, agricultural and forestry tractors, and recreational craft when not at sea): fuel consumption; Agriculture (for producing biofuels); Energy (electricity generation); Heating and cooling (urban district, industry, households, services, agriculture, forestry and fisheries: for heating, cooling and processing purposes). No indicators used

**Pressures**

Word 'pressure' is not specifically mentioned in the Directive. Pressures that the legal act/policy address: Gas emissions (greenhouse -$CO_2$, $CH^4$ and $N_2O$- and other nature) from the combustion of transport fuels (petrol, diesel and gas-oil); (Direct/indirect) Land use change (due to biofuels production) leading to (impacts): loss of natural vegetation, fragmentation of ecosystems, greenhouse gas emissions, abstraction of water for crop irrigation, increased nutrient load due to the use of fertilizers. No indicators used

**Assessment of Environmental State**

Policy does not define the environmental condition of ecosystems in strict sense. Relevant terms/parameters to be measured in indicators: Annex I sets up national overall targets for the share of energy from renewable sources in gross final consumption of energy in 2020 (in %); Annex III sets up the energy content (by weight, lower calorific value, MJ/kg and MJ/l) of transport fuels; Annex V: determines the rules for calculating the greenhouse impact of biofuels, bioliquids and fossil fuels. Includes among others: a) typical and default values for biofuels if produced with no net carbon emissions from land-use change (typical GHG emissions saving and default GHG emission savings -in%-); b) disaggregated default values for biofuels and bioliquids: for

cultivation, for processing, for transport and distribution and with typical GHG emissions saving and default GHG emission savings -in $gCO_{2eq}/MJ$-); c) estimated disaggregated default values for advanced biofuels and bioliquids: for cultivation, for processing, for transport and distribution and with typical GHG emissions saving and default GHG emission savings -in $gCO_{2eq}/MJ$-).

**Assessment of Status**

The legal text reports on the origin of the biofuels and bio liquids consumed in the Community and the impact of their production also in third countries of supply (Art. 23.5), the Commission will analyse, among other issues: (a) the relative environmental benefits and costs of different biofuels, the effects of the Community's import policies thereon and (b) the impact of increased demand for biofuel on sustainability in the Community and in third countries, considering economic and environmental impacts, including impacts on biodiversity; f) indirect land-use changes in relation to all production pathways. At a national level, Member States have to report as well on the estimated impact of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within the Member State (Art. 22.f).

**Data**

MS have to submit their National Plans and periodic reports (every 2 years) on progress in the promotion and use of energy from renewable sources. Progress Reports are available at the EC Website on the Directive. Information requested include:

- Sectoral and overall shares and actual consumption of energy from renewable sources.
- Measures taken and/or planned at national level to promote the growth of energy from renewable sources taking into account the indicative trajectory for achieving the national RES targets as outlined in the National Renewable Energy Action Plan (NREAP)
- Support schemes and other measures in place that are applied to promote energy from renewable sources and report on any developments in the measures used with respect to those set out in the (NREAP)
- Information on how, where applicable, the support schemes have been structured to take into account RES applications that give additional benefits, but may also have higher costs, including biofuels made from wastes, residues, non-food cellulosic material, and ligno-cellulosic material?)
- Information on the functioning of the system of guarantees of origin for electricity and heating and cooling from RES, and the measures taken to ensure reliability and protection against fraud of the system.
- The developments in the availability and use of biomass resources for energy purposes.
- Information on any changes in commodity prices and land use in the MS associated with increased use of biomass and other forms of energy from renewable sources
- Development and share of biofuels made from wastes, residues, non-food cellulosic material, and lingo-cellulosic material
- Information on the estimated impacts of the production of biofuels and bio liquids on biodiversity, water resources, water quality and soil quality within your country.
- Estimation of the net greenhouse gas emission savings due to the use of energy from renewable sources
- Information on and estimate (for the following years up to 2020) the excess/deficit production of energy from renewable sources compared to the indicative trajectory which could be transferred to/imported from other Member States and/or third countries, as well as estimated potential for joint projects until 2020.
- Information on how the share for biodegradable waste in waste used for producing energy has been estimated, and what steps have been taken to improve and verify such estimates.

**Funding**

Investment support by means of EAFRD (European Agricultural Fund for Rural Development) and

the ERDF (European Regional Development Fund). Within the framework of MFF (Multiannual Financial Framework-European Commission) Member States have to devote between 12-20% of the of the ERDF budget to support low-carbon economy shift (this includes RES as well).
Communication from the Commission — Guidelines on State aid for environmental protection and energy 2014-2020, sets up aids to energy from renewable sources (section 3.3.): 1. Operating aid granted to energy from renewable sources: Aid for electricity from renewable energy sources, aid for energy from renewable sources other than electricity, aid for existing biomass plants after plant depreciation, aid granted by way of certificates. 2. Energy efficiency measures, including cogeneration and district heating and district cooling.
Related: 3.7. Aid in the form of reductions in or exemptions from environmental taxes and in the form of reductions in funding support for electricity from renewable sources. 1. Aid in the form of reductions in or exemptions from environmental taxes; 2. Aid in the form of reductions in the funding of support for energy from renewable sources; 3. Transitional rules for aid granted to reduce the burden related to funding support for energy from renewable sources; 4. Aid to energy infrastructure;
Framework programs, funds from the European Investment Bank and other public finance institutions, a risk sharing facility for investments in energy from renewable sources in the Community (similar to the Global Energy Efficiency and Renewable Energy Fund initiative aimed at third countries) and national funding.

# 3.22 Fuel Quality Directive

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## Fuel Quality Directive

**Name/Type of the Legal Act or Policy**

Fuel Quality Directive. Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC.

Subsequent Legal Acts: Council Directive (EU) 2015/652 of 20 April 2015 laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels: to be transposed at the 21st April 2017 at the latest. This document addresses the 5 elements referred to in Art. 7a(5) of the Directive 2009/30/EC on measures concerning the mechanism to monitor and reduce greenhouse gas (GHG) emissions (method for calculating GHG emissions of fuels and other energy from non-biological sources; method for calculating the baseline fossil fuel GHG intensity to be used as a reference for measuring compliance with the target -Annex; Calculation and verification of the GHG intensity of electric energy used in electric vehicles; Any rules necessary to give effect to the requirement that two or more suppliers from one or more Member States are allowed to report their GHG intensity jointly; Other measures necessary for implementing Art.7a.)

**Entry into force**

25/06/2009

**Departments/Units in charge**

Directorate General for Climate Action, DG CLIMA (presumably C.2)
Dir C — Mainstreaming Adaptation and Low Carbon Technology
C.2. Transport and Ozone
Owen, Philip (Head of Unit)
Avenue de Beaulieu 24/Beaulieulaan 24
1160 Bruxelles/Brussel (Belgique)
Tel: +32 229-91111
Internet: http://ec.europa.eu/clima/news

**Common Implementation strategy (CIS processes)**

No evidence on the existence of a specific CIS. However, in order to deepen into certain aspects to be implemented within the framework of the Directive, public consultation processes have been carried out: a) Consultation on the implementation of some Art. 7a (GHG emission reductions) issues; and b) (Restricted stakeholder) Pre-consultation on ILUC (indirect land use change from biofuels and bioliquids).

**Administrative body handling implementation in MS**

Responsible organizations for:

*a) Fuel Quality Monitoring System (FQMS) Administration* (the organisation responsible for monitoring and reporting on fuel quality in the Member State). Spain: Ministry of Industry, Energy and Tourism (with the participation of the Autonomous Regions as responsible for sampling and analysing the fuels); UK: Department for Transport (DfT); Portugal: Ministry of Environment, Spatial Planning and Energy, the Directorate General for Energy and Geology; Italy: Ministry of

Environment, Territory and Sea.

*b) Collection of sales data* (or who gathers data; by the responsible organisation, from fuel companies or other sources). Spain: Ministry of Industry, Energy and Tourism; UK: Department of Energy and Climate Change (DECC) Energy Statistics data; Portugal: companies report their sales to the Directorate General for Energy and Geology (DGEG); Italy (Ministry of Industry).

**Main Objective**

The Directive "sets, in respect of road vehicles, and non-road mobile machinery (including inland waterway vessels when not at sea), agricultural and forestry tractors, and recreational craft when not at sea (a) technical specifications on health and environmental grounds for fuels to be used with positive ignition and compression-ignition engines, taking account of the technical requirements of those engines; and (b) a target for the reduction of life cycle GHG emissions" (Art. 1)

**Principles included in the legal text**

Subsidiarity; Proportionality; Sustainability

**Other objectives/Key concepts/key elements of the legislation**

(According to EUR-Lex and DG Environment website) A framework for cleaner fuels for road transport. The Directive establishes a framework for monitoring and reducing fuel life cycle GHG emissions, contributing to achieve GHG reduction goals.

- *Fuel suppliers* are required to *report and reduce the life cycle GHG emissions of energy supplied for road transport*. The goal is a reduction of *life cycle GHG emissions* by 6 % (or up to 10 % if the EU country chooses) per unit of energy from fuel supplied by December 2020.
- *Biofuels* should be produced sustainably. For counting towards the GHG reductions in this directive the *sustainability criteria* (i.e. biofuels to not be produced on land with high biodiversity value, or to be made from materials with high carbon stock) has to be fulfilled.
- *Harmonisation of the rules for fuel* (amending number of elements of the petrol and diesel specifications by setting technical specifications based on health and environmental issues, such as reducing the sulphur content of diesel and petrol to 10 mg/kg max): environmental specifications for market fuels to be used for vehicles are detailed in Annexes.
- Promotion of *blending of bio components* in fuel (e.g. up to 10 % ethanol in petrol). Member States have to ensure that petrol and diesel placed on the market comply with the requirements set out in the Directive (Annex I and II) respectively.
- Appropriate *information* should be provided to consumers on the biofuel content of petrol and diesel.

Introduces (Art. 7a) a *requirement on fuel suppliers to reduce the GHG intensity* of energy supplied for road transport (Low Carbon Fuel Standard).

**Terminology**

- *Life cycle GHG emissions*: "net emissions of CO2, CH4 and N2O that can be assigned to the fuel (including any blended components) or energy supplied. Includes all relevant stages from extraction or cultivation, including land-use changes, transport and distribution, processing and combustion, irrespective of where those emissions occur" (art. 1);
- *Gas oils* "intended for use by non-road mobile machinery (including inland waterway vessels), agricultural and forestry tractors, and recreational craft" (art. 1);
- *Member States with low ambient summer temperatures*: "where the average temperature for a majority of their territory is below 12 °C for at least two of the three months of June, July and August" (Recital 6).
- *GHG* (- emissions per unit of energy): "the total mass of CO2 equivalent GHG emissions associated with the fuel or energy supplied, divided by the total energy content of the fuel or energy supplied (for fuel, expressed as its low heating value)" (art. 1);
- *Supplier*: "the entity responsible for passing fuel or energy through an excise duty point or, if no

excise is due, any other relevant entity designated by a Member State" (art. 1);

- *Biofuels*: same meaning as in Directive 2009/28/EC, i.e., "gaseous fuel for transport produced from biomass".
- Marine fuels: "any petroleum-derived liquid fuel intended for use or in use on board a vessel, including those fuels defined in ISO 8217, includes any petroleum-derived liquid fuel in use on board inland waterway vessels or recreational craft, as defined in Directive 97/68/EC and Directive 94/25/EC" (art. 2);
- *Sustainability criteria for biofuels* (art. 7b): "GHG emission saving from the use of biofuels taken into account for the purposes referred to in paragraph 1 shall be at least 35 % (art. 7b.2); shall not be made from raw material obtained from land with high biodiversity value (art. 7b.3); shall not be made from raw material obtained from land with high carbon stock (art. 7b.4); shall not be made from raw material obtained from land that was peatland in January 2008 (art. 7b.5); agricultural raw materials cultivated in the Community and used for the production of biofuels shall be obtained in accordance with the requirements and standards under the provisions referred to under the heading "Environment" in Part A and in point 9 of Annex II to Council Regulation (EC) No 73/2009 and in accordance with the minimum requirements for good agricultural and environmental condition defined pursuant to Art. 6(1) of that Regulation".
- *Land with high biodiversity value* (art. 7b): "a) primary forest and other wooded land, that is forest and other wooded land of native species, where there is no clearly visible indication of human activity and the ecological processes are not significantly disturbed; (b) areas designated:(i) by law or by the relevant competent authority for nature protection purposes; or (ii) for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements or included in lists drawn up by intergovernmental organisations or the International IUCN, subject to their recognition in accordance with the second subparagraph of Art. 7c(4); (c) highly biodiverse grassland".
- *Highly biodiverse grasslands* (art. 7b): "(i) natural grassland that would remain grassland in the absence of human intervention and which maintains the natural species composition and ecological characteristics and processes; or (ii) non-natural, namely, grassland that would cease to be grassland in the absence of human intervention and which is species-rich and not degraded, unless evidence is provided that the harvesting of the raw material is necessary to preserve its grassland status."
- *Land with high carbon stock* (art. 7b): "(a) wetlands (land that is covered with or saturated by water permanently or for a significant part of the year); (b) Continuously forested areas (land spanning more than one hectare with trees higher than five metres and a canopy cover of more than 30%, or trees able to reach those thresholds in situ); (c) land spanning more than one hectare with trees higher than five metres and a canopy cover of between 10% and 30%, or trees able to reach those thresholds in situ, unless evidence is provided that the carbon stock of the area before and after conversion is such that, when the methodology laid down in Part C of Annex IV is applied"

**Derogations**

- Art. 3 para. 4 subpara. 1 establishes a derogation from the maximum summer petrol vapour pressure applicable to those Member States with low ambient summer temperatures (i.e. where the average temperature for a majority of their territory is below 12 °C for at least two of the three months of June, July and August): Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Sweden and the United Kingdom (Art. 2 No. 5).
- For other Member States than those with low ambient summer temperatures, Art. 3 para. 4 subpara. 2 provides for the possibility of a derogation (conditional on compliance with Community legislation on air quality and air pollution) from the maximum summer vapour pressure for ethanol into petrol mixtures after an appropriate assessment by the Commission

Both derogations are subject to the further requirements specified in Art. 3 para. 5.

**Types of management measures**

"Suppliers should, by 31 December 2020, gradually reduce life cycle GHG emissions by up to 10% per unit of energy from fuel and energy supplied. This reduction should amount to at least 6% by 31 December 2020, compared to the EU-average level of life cycle GHG emissions per unit of energy from fossil fuels in 2010, obtained through the use of biofuels, alternative fuels and reductions in flaring and venting at production sites. Subject to a review, it should comprise a further 2% reduction obtained through the use of environmentally friendly carbon capture and storage technologies and electric vehicles and an additional further 2% reduction obtained through the purchase of credits under the Clean Development Mechanism of the Kyoto Protocol." (Recital 9)

For GHG emission reduction (art. 7a): Measures necessary for the implementation of this Article include (a) the methodology for the calculation of life cycle GHG emissions from fuels other than biofuels and from energy; (b) the methodology specifying (before 1 January 2011), the fuel baseline standard based on the life cycle GHG emissions per unit of energy from fossil fuels in 2010 for the purposes of paragraph 2; (c) any necessary rules to give effect to ensure that a group of suppliers may choose to meet the reduction obligations pursuant to paragraph 2 jointly; d) the methodology to calculate the contribution of electric road vehicles. Calculation of life cycle GHG emissions from biofuels: Member States should follow the calculation methodology detailed in art. 7.d, and submit (by March 2010) a report with a list of those areas (NUTS2 level) where the typical GHG emissions from cultivation of agricultural raw materials can be expected to be lower than or equal to the emissions reported under the heading "Disaggregated default values for cultivation" in Part D of Annex IV to this Directive, with a description of the method and data used to establish that list.

Regarding the Proposal for a Council Directive on laying down calculation methods and reporting requirements pursuant to Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels, was preceded by consultations with the interested parties and impact assessments.

**Spatial coverage**

The whole territory of Member States. For biofuels the spatial coverage also includes third countries that are a significant source of biofuels or of raw material for biofuels consumed within the territory of the Community. In these countries the sustainability criteria determined in this Directive for the production of the fuel need also to be fulfilled. Within the framework of the recently approved Council Directive (EU) 2015/652, suppliers shall report annually to the Member State, on the GHG intensity of fuel and energy supplied within each Member State by providing information: on the total volume of each type of fuel or energy supplied, indicating where purchased and its origin (and life cycle GHG emissions per unit of energy).

**Reporting units – what are the specific transposition requirements**

On which spatial unit is reporting carried out? E.g. river basin/ Member State – are you aware of any commission studies that discuss the issue of different governance settings for reporting. Include links to studies. Reporting is implemented on a Member State scale (Fuel Quality Monitoring). European Commission reports to European Parliament and Council on different issues with different periodicity (check 6.2).

**Management unit**

Territory of Member States

**Key planning steps**

On GHG emission reductions (Art. 7.a), Member States should:

- Designate the supplier or suppliers responsible for monitoring and reporting life cycle GHG emissions per unit of energy from fuel and energy supplied.

- Designate authority responsible for receiving annual reporting from suppliers on the greenhouse intensity of fuel and energy supplied within each Member State and ensure that reports are subject to verification.
- Require suppliers to reduce gradually life cycle GHG emissions per unit of energy from fuel and energy supplied by up to 10% by 31 December 2020, compared with the fuel baseline standard (referred to in paragraph 5b):
  (a) 6% by 31 December 2020. Member States may require suppliers, to comply with the following intermediate targets: 2% by 31 December 2014 and 4% by 31 December 2017;
  (b) an indicative additional target of 2% by 31 December 2020, subject to Art. 9(1)(h), to be achieved through one or both of the following methods: (i) the supply of energy for transport supplied for use in any type of road vehicle, non-road mobile machinery (including inland waterway vessels), agricultural or forestry tractor or recreational craft; (ii) the use of any technology (including carbon capture and storage) capable of reducing life cycle GHG emissions per unit of energy from fuel or energy supplied; c) an indicative additional target of 2% by 31 December 2020, subject to Art. 9(1)(i), to be achieved through the use of credits purchased through the CDM of the Kyoto Protocol, under the conditions set out in Directive 2003/87/EC (establishing a scheme for GHG emission allowance trading within the Community (17), for reductions in the fuel supply sector).
- Ensure that a group of suppliers may choose to meet the reduction obligations jointly. In such case they shall be considered as a single supplier.
- Implement measures necessary for the implementation of this article: (a) the methodology for the calculation of life cycle GHG emissions from fuels other than biofuels and from energy; (b) the methodology specifying (before 1 January 2011), the fuel baseline standard based on the life cycle GHG emissions per unit of energy from fossil fuels in 2010 for the purposes of paragraph 2; (c) any necessary rules to give effect to ensure that a group of suppliers may choose to meet the reduction obligations pursuant to paragraph 2 jointly; d) the methodology to calculate the contribution of electric road vehicles

On biofuels for GHG emission reductions (art. 7c): Member States shall require economic operators to show that the sustainability criteria (Art. 7b(2) to (5)) have been fulfilled, by using a mass balance system (fulfilling specific requirements) and shall take measures to ensure that economic operators submit reliable information and make available (requiring independent auditing of the information submitted) and shall submit this information to the Commission (in aggregated form).On calculation of life cycle GHG emissions from biofuels: Member States should follow the calculation methodology detailed in art. 7.d, and submit (by March 2010) a report with a list of those areas (NUTS2 level) where the typical GHG emissions from cultivation of agricultural raw materials can be expected to be lower than or equal to the emissions reported under the heading “Disaggregated default values for cultivation” in Part D of Annex IV to this Directive, with a description of the method and data used to establish that list.

**Timelines**

What are the agreed timelines for implementation?

- Date of effect: 25.06.2009;
- Date of transposition: 31.12.2010 (deadline)
- Reporting: By 30 June each year the Member States must submit a summary of fuel quality monitoring data collected during the period January to December of the previous calendar year, in accordance with Art. 8(1) of Directive 98/70/EC as amended by Directive 2009/30/EC.

- GHG emission reductions (see previous section): suppliers (by Members States requirement) to reduce life cycle GHG emissions per unit of energy from fuel and energy supplied by up to 10% per unit of energy compared to 2010 levels: 31 December 2020 (deadline) [33]
- GHG emission saving from biofuels use (fulfilling art. 7b. paragraph 1) shall be: at least 50 % by 1 January 2017, at least 60 % for biofuels produced in installations in which production has started on or after 1 January 2017, from 1 January 2018.
- Life Cycle GHG Emissions: 10 ppm sulphur limit on NRMM fuels effective from 2011.
- Report from the Commission to the European Parliament and the Council, in respect of both third countries and Member States that are a significant source of biofuels or of raw material for biofuels consumed within the Community, on national measures taken to respect the sustainability (Art. 7b, paragraphs 2-5) and for soil, water and air protection: every two years, fist report in 2012.
- Report from the Commission to the European Parliament and the Council on the operation of the mass balance verification method (for verifying compliance with sustainability criteria for biofuels as described in art. 7ca) and on the potential for allowing for other verification methods in relation to some or all types of raw material or biofuels: in 2010 and 2012 (art. 7c.2).
- Report from the Commission to the European Parliament and the Council on the verification of compliance with the sustainability criteria for biofuels on: a) the effectiveness of the system in place for the provision of information on sustainability criteria; and (b) whether it is feasible and appropriate to introduce mandatory requirements in relation to air, soil or water protection, taking into account the latest scientific evidence and the Community's international obligations: by 31 December 2012 (art. 7c.8).
- Report from the Commission to the European Parliament and the Council on the feasibility of lists of areas in third countries where the typical GHG emissions from cultivation of agricultural raw materials (biofuels) can be expected to be lower than or equal to the emissions reported under Annex IV: by 31 March 2010 (art. 7d.4).
- Report from the Commission to the European Parliament and the Council on the estimated typical and default values (calculation of life cycle GHG emission from biofuels that were not on the market/in negligible quantities in January 2008): by 31 December 2012 deadlines and every two years thereafter (art. 7d.5).
- Report from the Commission to the European Parliament and the Council on the impact of indirect land use change on GHG emissions and addressing ways to minimise that impact: by 31 December 2010 (art. 7d.6).
- Report MMT (methylcyclopentadienyl manganese tricarbonyl) in fuels (Art. 8a); from the Commission to the European Parliament and the Council, in respect the impact on social sustainability in the Community and in third countries of increased demand for biofuel, on the impact of Community biofuel policy on the availability of foodstuffs at affordable prices, in particular for people living in developing countries, and on wider development issues: every two years, fist report in 2012.
- Suppliers report to the authority designated by the Member State, on the GHG intensity of fuel

[33] At least 6% of this target is expected to be achieved via the increased use of biofuels, the increased use of alternative fuels, and/or reductions in flaring and venting emissions and fuel production and refining facilities (i.e. reduction in lifecycle emissions of conventional fossil petrol and diesel fuels). Subject to review, a further 2% reduction should be obtained through the use of environmentally friendly carbon capture storage technologies and electric vehicles. An additional further 2% reduction should be obtained through the purchase of credits under the Clean Development Mechanism of the Kyoto Protocol.

and energy supplied: yearly from January 2011 onwards.

- Assessment from the Commission of the risks for health and the environment from the use of metallic additives in fuel and, test methodology development. Conclusions reported to the European Parliament and to the Council: by 31 December 2012.

**Integration/coordination issues with other related pieces of legislation**

Legal instruments cited in the Directive:

- Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.
- Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery.
- Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission.
- Decision 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme.
- Interinstitutional agreement on better law-making.
- Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (amended by the analysed Directive).
- Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers, amending Regulations (EC) No 1290/2005, (EC) No 247/2006, (EC) No 378/2007 and repealing Regulation (EC) No 1782/2003.
- CDM of the Kyoto Protocol, under the conditions set out in Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for GHG emission allowance trading within the Community (17), for reductions in the fuel supply sector.
- Conventions of the International Labour Organisation (ILO): 29, 87, 98,100, 105, 111, 138 and 182.
- Cartagena Protocol on Biosafety.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Ramsar Convention: Convention on Wetlands of International Importance.

Legal instruments citing the Directive

- Council Decision (EU) 2015/1789 of 1 October 2015 on the position to be adopted, on behalf of the European Union, within the EEA Joint Committee concerning amendments to Annex II (Technical regulations, standards, testing and certification) and Annex XX (Environment) to the EEA Agreement (Fuel Quality Directive)
- Proposal for a Council Decision on the position to be adopted, on behalf of the European Union, in the EEA Joint Committee concerning an amendment Annex II (Technical regulations, standards, testing and certification) and Annex XX (Environment) to the EEA Agreement (Fuel Quality Directive).
- Commission Regulation (EU) No 1307/2014 of 8 December 2014 on defining the criteria and geographic ranges of highly biodiverse grassland for the purposes of Art. 7b(3)(c) of Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels and Art. 17(3)(c) of Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources.

- 2011/437/EU: Commission Implementing Decision of 19 July 2011 on the recognition of the 'Biomass Biofuels Sustainability voluntary scheme' for demonstrating compliance with the sustainability criteria under Directives 2009/28/EC and 2009/30/EC of the European Parliament and of the Council.
- 2012/210/EU: Commission Implementing Decision of 23 April 2012 on recognition of the 'Ensus voluntary scheme under RED for Ensus bioethanol production' for demonstrating compliance with the sustainability criteria under Directives 2009/28/EC and 98/70/EC of the European Parliament and of the Council.
- 2011/439/EU: Commission Implementing Decision of 19 July 2011 on the recognition of the 'Bonsucro EU' scheme for demonstrating compliance with the sustainability criteria under Directives 2009/28/EC and 2009/30/EC of the European Parliament and of the Council.
- 2011/440/EU: Commission Implementing Decision of 19 July 2011 on the recognition of the 'Round Table on Responsible Soy EU RED' scheme for demonstrating compliance with the sustainability criteria under Directives 2009/28/EC and 2009/30/EC of the European Parliament and of the Council.
- 2011/436/EU: Commission Implementing Decision of 19 July 2011 on the recognition of the 'Abengoa RED Bioenergy Sustainability Assurance' scheme for demonstrating compliance with the sustainability criteria under Directives 2009/28/EC and 2009/30/EC of the European Parliament and of the Council.
- 2011/438/EU: Commission Implementing Decision of 19 July 2011 on the recognition of the 'International Sustainability and Carbon Certification' scheme for demonstrating compliance with the sustainability criteria under Directives 2009/28/EC and 2009/30/EC of the European Parliament and of the Council.
- Communication from the Commission on voluntary schemes and default values in the EU biofuels and bioliquids sustainability scheme.
- Communication from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels.
- Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure Text with EEA relevance.

**Coordination issues with the EU Biodiversity Strategy**

It could have direct effect on target 1 (Fully implement the Birds and Habitats Directives) due to the restrictions introduced by Art. 7b in terms of sustainability criteria for biofuels (provided that the land with high biodiversity protected area designated by law is subject to the Habitats Directive).

**Relevance to ecosystems/habitats?**

Art. 7b sets up sustainability criteria for biofuels and imposes restrictions on two types of lands source of raw material: *with high biodiversity* value and with high carbon stock. "3. Biofuels shall not be made from raw material obtained from land with high biodiversity value, namely, land that had one of the following statuses in or after January 2008, whether or not the land continues to have such a status: (a) primary forest and other wooded land, that is forest and other wooded land of native species, where there is no clearly visible indication of human activity and the ecological processes are not significantly disturbed; (b) areas designated: (i) by law or by the relevant competent authority for nature protection purposes; or (ii) for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements or included in lists drawn up by intergovernmental organisations or the IUCN, [...] unless evidence is provided that the production of that raw material did not interfere with those nature protection purposes. (c) highly biodiverse grassland that is: (i) natural, namely, grassland that would remain grassland in the absence of human intervention and which maintains the natural species composition and ecological characteristics and processes; or (ii) non-natural, namely, grassland that would cease to

be grassland in the absence of human intervention and which is species-rich and not degraded, unless evidence is provided that the harvesting of the raw material is necessary to preserve its grassland status. "4. Biofuels taken into account for the purposes referred to in paragraph 1 shall not be made from raw material obtained from land with high carbon stock, namely, land that had one of the following statuses in January 2008 and no longer has that status: (a) Wetlands, namely, land that is covered with or saturated by water permanently or for a significant part of the year; (b) Continuously forested areas, namely, land spanning more than one hectare with trees higher than five metres and a canopy cover of more than 30%, or trees able to reach those thresholds in situ; (c) land spanning more than one hectare with trees higher than five metres and a canopy cover of between 10% and 30%, or trees able to reach those thresholds in situ, unless evidence is provided that the carbon stock of the area before and after conversion is such that, when the methodology laid down in Part C of Annex IV is applied, the conditions laid down in paragraph 2 of this Article would be fulfilled."

**Drivers**

Word 'drivers' is not specifically mentioned in the Directive. Drivers which the legal act/policy address: Transport (road vehicles, and non-road mobile machinery -including inland waterway vessels when not at sea-, agricultural and forestry tractors, and recreational craft when not at sea); Agriculture (for producing biofuels)

**Pressures**

"Pressures" are not specifically mentioned in the Directive. Pressures which the legal act/policy address: Gas emissions (greenhouse -$CO_2$, $CH^4$ and $N_2O$- and other nature) from the combustion of transport fuels (petrol, diesel and gas-oil); Emission of pollutants (e.g. metallic additives in fuels); (Direct/indirect) Land use change (due to biofuels production) leading to (impacts): loss of natural vegetation, fragmentation of ecosystems, GHG emissions, abstraction of water for crop irrigation, increased nutrient load due to the use of fertilizers.

**Assessment of Environmental State**

Not specifically referred to the state of an ecosystem. Annex I and II set up environmental specifications for market fuels to used for vehicles equipped with a) positive-ignition engines: minimum/maximum values; b) with compression ignition engines (e.g. Density, distillation properties, sulphur contents, FAME content, polycyclic aromatic hydrocarbons…). Annex III: sets up vapour pressure waiver permitted for petrol containing bioethanol (according to bioethanol content (%v/v)

**Data**

Country Annual Fuel Quality Reports (and XLS files) are available at EIONET Database whereas annual European ones are at DG Climate Action Website (and CIRCAB). By 30 June each year the Member States must submit a summary of fuel quality monitoring data collected during the period January to December of the previous calendar year (in accordance with Art. 8(1) of Directive 98/70/EC as amended by Directive 2009/30/EC). National reports include information on fuel availability, description of the monitoring systems in place, descriptions of the fuel quality monitoring system, compliance with sampling, reporting requirements and with Directive 98/70/EC limits; temporal trends, sales of fuels and statistical analysis.

Directive 2009/30/EC brings more demanding reporting obligations (programmed to be taken into account in the 2011 Fuel Quality Monitoring Report) but currently pending to be fully incorporated: suppliers shall report annually, to the authority designated by the Member State, on the GHG intensity of fuel and energy supplied within each Member State by providing, as a minimum, the following information: (a) the total volume of each type of fuel or energy supplied, indicating where purchased and its origin; and (b) Life cycle GHG emissions per unit of energy (Art. 7a). Members States will transpose council Directive (EU) 2015/652 providing methodological guidelines on these issues the 21st April 2017 at the latest.

**Funding**

Agricultural raw materials cultivated in the Community and used for the production of biofuels: direct support schemes for farmers under CAP (if fulfilling Council Regulation (EC) No 73/2009 of 19 January 2009, Annex II, Point A. Environment)

# 3.23 Energy Taxation Directive

Authors: Marta Rodriguez and Gonzalo Delacámara, IMDEA

Reviewers: Ennid Roberts, Ecologic Institute

## Energy Taxation Directive

**Name/Type of the Legal Act or Policy**

Energy Taxation Directive ("ETD")

Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.

*Amending Directives:*

- Directive 2004/74/EC of 29 April 2004 amending Directive 2003/96/EC as regards the possibility for certain Member States to apply, in respect of energy products and electricity, temporary exemptions or reductions in the levels of taxation
- Council Directive 2004/75/EC of 29 April 2004 amending Directive 2003/96/RV as regards the possibility for Cyprus to apply, in respect of energy products and electricity, temporary exemptions or reductions in the levels of taxation

*Related instruments*

- Europe 2020 Strategy and adopted Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency,
- Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources.
- Directive 2009/29/EC amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community
- EU Strategy on Adaptation to Climate Change

*Related instruments (instruments mentioning this instrument)*

- Regulation (EU) No 1286/2013 of the European Parliament and of the Council of 11 December 2013 establishing an action programme to improve the operation of taxation systems in the European Union for the period 2014-2020 (Fiscalis 2020) and repealing Decision No 1482/2007/EC
- Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Art. 107 and 108 of the Treaty Text with EEA relevance

*Further developments*

Revision of the Directive in order to make it coherent with the EU Emissions Trading System (EU ETS), tackle the discrimination of the RES against conventional sources due, mainly to the fact that minimum rates are based on the volume of energy consumed [34], make it coherent with climate change perspective in order to reduce $CO_2$ emissions (as taxation is more favourable for certain fossil fuels than cleaner options) and to introduce $CO_2$ component in order to prevent incoherent national policies $CO_2$ taxes (non applicable to RES) policies (and double taxation). After unsuccessful negotiations the proposal was withdrawn.

**Entry into force**

31.10.2003

[34] "…because they are taxed at the same rate as the energy source they are intended to replace (e.g. biodiesel is taxed the same as diesel etc). As this rate is based on volume, rather than energy content, products with lower energy content such as renewables carry a heavier tax burden compared to the fuels they are competing with."

**Departments/Units in charge**

Directorate General for Taxation and Customs Union (DG TAXUD)
Dir C — Indirect taxation and tax administration
2. Indirect taxes other than VAT
Zhivkov V. (Policy Officer-Energy and Environmental taxation)
Rue de Spa 3/Spastraat 3
1000 Bruxelles/Brussel (Belgique)
Tel: +32 229-59264
Internet: http://ec.europa.eu/taxation_customs

**Common Implementation strategy (CIS processes)**

Are there any Working Groups at EU level involved in the implementation of the act or policy? Please name them and briefly introduce the core role of the group. *If relevant, you can copy the structure of the topics created for the Common Implementation Strategy (CIS) processes for this policy.*

No evidence of a specific CIS Working Group. However, evidence of the participation of different working groups within the context of the first review and the amending proposal to the Directive: EUSD Group (Expert Group on Taxation and Savings), Working Party IV on Direct Taxation and Working Group on Administrative cooperation in the field of direct taxation.

**Administrative body handling implementation in MS**

National Ministries of Finance
Tax collection: Federal Public Service Finance (Belgium), relevant finance offices (Italy), Revenue Commissioners (Ireland); The tax rate/base and reliefs are set up by a central authority in the three cases.

**Main Objective**

"Member States shall impose taxation on energy products and electricity in accordance with this Directive" (Art.1)

**Principles included in the legal text**

Principle of tax neutrality; Environmental protection; Competitiveness; Flexibility; Subsidiarity

**Other objectives/Key concepts/key elements of the legislation**

According to EC (2011): Main aim was to avoid competitive distortions in the energy sector within the Internal Market by providing a framework for the taxation of energy products. The Directive sets out common rules on what should be taxed, when and what exemptions are allowed. It establishes "minimum rates" (energy volume consumed based) are laid down for products used in heating, electricity and motor fuels.

According to the EUR-LEX Website, the Directive sets minimum rates of taxation for motor fuel, motor fuel for industrial or commercial use, heating fuel and electricity (energy products are not taxed when used as raw materials or for the purposes of chemical reduction or in electrolytic and metallurgical processes). The "levels of taxation" applied by the Member States cannot be lower than these minimum rates laid down in the Directive. Main aim of the Directive is to improve the operation of the internal market by reducing distortions in competition between mineral oils and other energy products, encouraging environmental protection by a more efficient use of energy (in order to reduce dependence on imported energy products) and by limiting greenhouse gas emissions.

Energy products subject of the Directive are:

- Motor fuels (non industrial/commercial: Annex I, Table A): leaded petrol (*CN codes 2710 11 31, 2710 11 51 and 2710 11 59*), unleaded petrol (*CN codes 2710 11 31, 2710 11 41, 2710 11 45 and 2710 11 49*), gas oil (*CN codes 2710 19 41 to 2710 19 49*), kerosene (*CN codes 2710 19 21 and 2710 19 25*), LPG (*CN codes 2711 12 11 to 2711 19 00*), natural gas (*CN codes 2711 11 00 and 2711 21 00*)

- Motor fuels for industrial and commercial purposes (Annex I, Table B): gas oil (*CN codes 2710 19 41 to 2710 19 49*), kerosene (*CN codes 2710 19 21 and 2710 19 25*), LPG (*CN codes 2711 12 11 to 2711 19 00*), natural gas (*CN codes 2711 11 00 and 2711 21 00*)
- Heating fuels: Gas oil (CN codes 2710 19 41 to 2710 19 49), heavy fuel oil (CN codes 2710 19 61 to 2710 19 69), kerosene (*CN codes 2710 19 21 and 2710 19 25*), LPG (*CN codes 2711 12 11 to 2711 19 00*), natural gas (*CN codes 2711 11 00 and 2711 21 00*) coal and coke (CN codes 2701, 2702 and 2704)
- Electricity (Electricity (CN code 2716)

Industrial and commercial uses considered under the framework of the Directive (Art- 8.2) are: agricultural, horticultural or aquaculture works, and in forestry; stationary motors; plant and machinery used in construction, civil engineering and public works; vehicles intended for use off the public roadway or which have not been granted authorisation for use mainly on the public roadway.

**Terminology**

*Energy products* (Art. 2) subject to the Directive: products failing within CN codes: 1507 to 1518 ( if intended for use as heating fuel or motor fuel; 2701, 2702 and 2704 to 2715; 2901 and 2902; 2905 11 00 (which are not of synthetic origin if intended for use as heating fuel or motor fuel; 3403; 3811; 3817; 3824 90 99 (if intended for use as heating fuel or motor fuel).

*Electricity* (Art. 3): failing within CN code 2716.

Levels of taxation (Art. 4): total charge levied in respect of all indirect taxes (except VAT) calculated directly or indirectly on the quantity of energy products and electricity at the time of release for consumption.

*Mineralogical processes* (Art. 4): processes classified in the NACE nomenclature under code DI 26 "manufacture of other non-metallic mineral products" in Council Regulation (EEC) No 3037/90 of 9 October 1990 on the statistical classification of economic activities in the European Community(6).

Motor fuels (Art. 7/Annex I): leaded petrol (CN codes 27101131, 27101151 and 27101159); unleaded petrol (CN codes 27101131, 27101141, 27101145 and 27101149); gas oil (CN codes 27101941 to 27101949); kerosene (CN codes 27101921 and 27101925); LPG (CN codes 27111211 to 27111900); Natural gas (CN codes 27111100 and 27112100)

*Commercial gas oil used as propellant* (Art. 7): gas oil used as propellant for the following purposes: (a) the carriage of goods for hire or reward, or on own account, by motor vehicles or articulated vehicle combinations intended exclusively for the carriage of goods by road and with a maximum permissible gross laden weight of not less than 7,5 tonnes; (b) the carriage of passengers, whether by regular or occasional service, by a motor vehicle of category M2 or category M3, as defined in Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers.

*Industrial and commercial purposes* (Art. 8): (a) agricultural, horticultural or piscicultural works, and in forestry; (b) stationary motors; (c) plant and machinery used in construction, civil engineering and public works; (d) vehicles intended for use off the public roadway or which have not been granted authorisation for use mainly on the public roadway.

*Heating fuels* (Art. 9 / Annex I, Table C): Gas oil (CN codes 27101941 to 27101949); heavy fuel oil (CN codes 27101961 to 27101969), kerosene (CN codes 27101921 and 27101925); LPG (CN codes 27111211 to 27111900); Natural gas (CN codes 27111100 and 27112100); coal and coke (CN codes 2701, 2702 and 2704); electricity (CN code 2716).

*Business use* (Art. 11): the use by a business entity, identified in accordance with paragraph 2, which independently carries out, in any place, the supply of goods and services, whatever the purpose or results of such economic activities. The economic activities comprise all activities of

producers, traders and persons supplying services including mining and agricultural activities and activities of the professions.

*Biomass* (Art. 16): biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste.

*Energy-intensive business* (Art. 17): business entity, as referred to in Art. 11, where either the purchases of energy products and electricity amount to at least 3,0 % of the production value or the national energy tax payable amounts to at least 0,5 % of the added value

*Production value* (Art. 17): turnover, including subsidies directly linked to the price of the product, plus or minus the changes in stocks of finished products, work in progress and goods and services purchased for resale, minus the purchases of goods and services for resale.

Purchases of energy products and electricity (Art. 17): actual cost of energy purchased or generated within the business. Only electricity, heat and energy products that are used for heating purposes or for the purposes of Art. 8(2)(b) and (c) are included. All taxes are included, except deductible VAT.

*Value added* (Art. 17): total turnover liable to VAT including export sales minus the total purchases liable to VAT including imports

*Standard tanks and Special container* (Art. 24): tanks permanently fixed by the manufacturer to all motor vehicles of the same type as the vehicle in question and whose permanent fitting enables fuel to be used directly, both the purpose of propulsion and, where appropriate, for the operation, during transport, of refrigeration systems and other systems. Gas tanks fitted to motor vehicles designed for the direct use of gas as a fuel and tanks fitted to the other systems with which the vehicle may be equipped shall also be considered to be standard tanks;

**Derogations**

According to Art. 18.1 Member States are authorised (by way of derogation) to continue to apply the reductions in the levels of taxation or exemptions (by specific energy product) as set out in Annex II (expiring on 31.12.2006 or as specifically determined in Annex II for each specific country). Art. 18.2 specifies that countries with Member States with difficulties in implementing the new minimum levels of taxation are allowed a transitional period (until 1.1.2007).

Art. 15 indicates that Member States can also apply under fiscal control total or partial exemptions or reductions in the level of taxation of the following products: (a) taxable products used under fiscal control in the field of pilot projects for the technological development of more environmentally-friendly products or in relation to fuels from renewable resources; (b) electricity of the following origins: solar, wind, wave, tidal or geothermal, hydroelectric installations, biomass or from biomass produced products, methane emitted by abandoned coalmines, fuel cells. (c) energy products and electricity used for combined heat and power generation; (d) electricity produced from combined heat and power generation (if combined generators are environmentally friendly). (e) energy products and electricity used for the carriage of goods and passengers by rail, metro, tram and trolley bus; (f) energy products supplied for use as fuel for navigation on inland waterways (including fishing) other than in private pleasure craft, and electricity produced on board a craft; (g) natural gas in Member States in which the share of natural gas in final energy consumption was less than 15% in 2000 (deadline 2010 or until the national share of natural gas in final energy consumption reaches 25%. However, as soon as the national share of natural gas in final energy consumption reaches 20%, the Member States concerned shall apply a strictly positive level of taxation, which shall increase on a yearly basis in order to reach at least the minimum rate at the end of the period referred to above); (h) electricity, natural gas, coal and solid fuels used by households and/or by organisations recognised as charitable by the Member State concerned; (i) natural gas and LPG used as propellants; (j) motor fuels used in the field of the manufacture, development, testing and maintenance of aircraft and

ships; (k) motor fuels used for dredging operations in navigable waterways and in ports; (l) products falling within CN code 2705 used for heating purposes.
Art. 16 indicates that Member States can also apply exemption or reduced rate taxation on taxable products in Art. 2 (see previous section) if they are made of/contain ore/more of certain products: CN codes 1507 to 1518; 3824 90 55 and 3824 90 80 to 3824 90 99 for their components produced from biomass; 2207 20 00 and 2905 11 00 which are not of synthetic origin: products produced from biomass, including products falling within CN codes 4401 and 4402.

**Types of management measures**

Which are the types of measures considered and selected for the achievement of the objectives? Are there any impact assessments of their possible performance? Please give us your expert opinion and include web links.

- Fiscal arrangements.
- Establishment of differentiated rates of taxation (but fulfilling the minimum levels of taxation set up by the Directive) on the basis of product quality; quantitative consumption levels for electricity and energy products used for heating purposes; on type of use (local public passenger transport -including taxis-, waste collection, armed forces and public administration, disabled people, ambulances; commercial and non-commercial use).
- Establishment of specific (total/partial) exemptions or reduced levels of taxation and transitional periods.
- Establishment of "levels of taxation" (that may not be lower than the minimum rates established in the Directive).
- Member States may apply national definitions of 'environmentally-friendly' (or high efficiency) cogeneration production until the Council, on the basis of a report and a proposal from the Commission, unanimously adopts a common definition;
- Establishment on a national definition of 'environmentally-friendly' (or high efficiency) cogeneration production until the Council, on the basis of a report and a proposal from the Commission, unanimously adopts a common definition.

**Spatial coverage**

The whole territory of the Member State.

**Reporting units - what are the specific transposition requirements**

Member State

**Management unit**

Member State territory: certain energy products (see epigraph 3.3.)

**Key planning steps**

- According to Art. 28 of the Directive Member States must adopt and publish the laws, regulations and administrative provisions necessary to comply with the Directive not later than 31 December 2003, and that they must inform the Commission thereof immediately.
- Provisions (with the exception of except of provisions laid down in Art. 16 and 18(1), which to be applied by the Member States from 1 January 2003) are to be applied from 1 January 2004.
- Member States shall communicate to the Commission the schedule of tax reductions or exemptions applied in accordance with Art. 16 by 31 December 2004 and every 12 months thereafter.
- Member States shall inform the Commission of the levels of taxation which they apply to the products listed in Art. 2 (energy products subject to the application of the Directive): on 1 January each year and following each change in national law.

**Timelines**

Directive 2003/96/EC

- Entry into force: 31.10.2003
- Transposition in Member States (deadline): 31.12.2003

- Minimum levels of taxation applicable to motor fuels (according to Annex I, Table A): as from 1.1.2004 and from 1.1.2010
- Minimum levels of taxation applicable to gas oil January 2013 onwards set up: 11.2012 (deadline, Council).
- Minimum levels of taxation applicable to motor fuels for industrial and commercial purposes (according to Annex I, Table B): as from 1.1.2004
- Minimum levels of taxation applicable to heating fuels (according to Annex I, Table C): as from 1.1.2004
- Minimum levels of taxation applicable to electricity (according to Annex I, Table C): as from 1.1.2004
- Transitional period for Member States with difficulties in implementing minimum taxation levels: 1.1.2007 (deadline)
- Reductions in level of taxation or exemption or further transitional periods: specific per Member State (and per fuel type).
- Commission report to the Council on the fiscal, economic, agricultural, energy, industrial and environmental aspects of the reductions granted according to Art. 16: 31.12.2009 (deadline).
- Review by the Council of the exemptions and reductions and the minimum levels of taxation established in the Directive: periodically (on the basis of a report from the Commission).

*Amending Directives:* Directive 2004/74/EC and Directive 2004/75/EC

- Entry into force: 01.05.2004
- Transposition in Member States (deadline): 01.05.2004

**Integration/coordination issues with other related pieces of legislation**

*Mentioned legal instruments in the Directive*

- Treaty establishing the European Community
- Kyoto Protocol to the United Nations Framework Convention on Climate Change,
- Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers
- Council Directive 92/12/EEC of 25 February 1992 on the general arrangements for products subject to excise duty and on the holding, movement and monitoring of such products
- 1999/468/EC: Council Decision of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission.
- Commission Regulation (EC) No 2031/2001 of 6 August 2001, amending Annex I to Council Regulation (EEC) No 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff.

**Coordination issues with the EU Biodiversity Strategy**

Measures/aspects mentioned in next section could have direct/indirect effect on targets 1 (Fully implement the Birds and Habitats Directives), 2 (Maintain and restore ecosystems and their services) and 3 (Increase the contribution of agriculture and forestry to biodiversity).

**Relevance to ecosystems/habitats?**

No specific mention to ecosystems/habitat in the legal text

- Art. 16, lays down that Member States may apply a reduced rate of taxation under fiscal control on the taxable products referred to in Art. 2 where such products contain water (CN codes 2201 and 28510010).
- Art. 15.3 sets up that Member States may apply a level of taxation down to zero to energy products and electricity used for agricultural, horticultural or piscicultural works, and in forestry. These human activities can be fostered thus enhancing the pressures on aquatic ecosystems.
- There is an indirect link between $CO_2$ emissions, climate change and the impact of it on aquatic systems.

- Under the current framework of the Directive, certain fossil fuels are taxed more favourably than cleaner competitors. A review of the Directive creating a more supportive framework for renewable energy (e.g. hydro, biofuels) could increase the pressure on aquatic systems.

**Drivers**

Word 'drivers' is not specifically mentioned in the Directive. Drivers which the legal act/policy address: Transport, industry, commerce and agriculture. Minimum levels of taxation set up in the Directive are referred to litres, kg, gigajoule gross calorific value and MWh of fuel consumed.

**Pressures**

Word 'pressure' is not specifically mentioned in the Directive. According to EUR-LEX, the main aim of the Directive is to improve the operation of the internal market by reducing distortions in competition between mineral oils and other energy products, encouraging environmental protection by a more efficient use of energy (in order to reduce dependence on imported energy products) and by limiting greenhouse gas emissions. However, the revision of the Directive (see 2011 Commission proposal review) showed limitations of the Directive in this sense.

**Assessment of Environmental State**

No info on indicators.

**Assessment of Status**

The environmental status is not addressed in the Directive. No info on indicators.

**Data**

Excise Duty Tables: excise duty tables with updated information on excise duties rates applicable by products and by Member State and excise duty tables with receipts (revenues) from taxes on consumption of energy products and electricity. CIRCAB archive contains historic tables.

**Funding**

Aid in the form of reductions in environmental taxes [35]. The Directive authorises the Member States to grant tax advantages to businesses taking special measures to reduce their emissions, enabling EU countries to refund, fully or in part, taxes paid by businesses that have invested in the rationalisation of their energy use (as much as 100 % for energy intensive businesses, and up to 50 % for other businesses) (see, EUR-LEX Website).

35 Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty Text with EEA relevance. Article 44: "1. Aid schemes in the form of reductions in environmental taxes fulfilling the conditions of Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity shall be compatible with the internal market within the meaning of Article 107(3) of the Treaty and shall b exempted from the notification requirement of Article 108(3) of the Treaty, provided that the conditions laid down in this Article and in Chapter I are fulfilled; 2. The beneficiaries of the tax reduction shall be selected on the basis of transparent and objective criteria and shall pay at least the respective minimum level of taxation set by Directive 2003/96/EC; 3. Aid schemes in the form of tax reductions shall be based on a reduction of the applicable environmental tax rate or on the payment of a fixed compensation amount or on a combination of these mechanisms; 4. Aid shall not be granted for biofuels which are subject to a supply or blending obligation."

# 3.24 Industrial Emissions Directive

Authors: Ennid Roberts, Ecologic Institute

Reviewers: Gonzalo Delacámara, IMDEA

## Industrial Emissions Directive

**Name/Type of the Legal Act or Policy**

Industrial Emissions Directive (IED)

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

Subsequent Legal Acts, e.g. (hyperlinks provided)

- Corrigendum to Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) ( OJ L 334, 17.12.2010 )
- Communication from the Commission — European Commission Guidance concerning baseline reports under Art. 22(2) of Directive 2010/75/EU on industrial emissions
- Commission Decision of 16 May 2011 establishing a forum for the exchange of information pursuant to Art. 13 of the Directive 2010/75/EU on industrial emissions
- 2013/732/EU: Commission Implementing Decision of 9 December 2013 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the production of chlor-alkali (notified under document C(2013) 8589)
- 2012/249/EU: Commission Implementing Decision of 7 May 2012 concerning the determination of start-up and shut-down periods for the purposes of Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 2948)
- 2012/134/EU: Commission Implementing Decision of 28 February 2012 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the manufacture of glass (notified under document C(2012) 865) Text with EEA relevance
- 2013/163/EU: Commission Implementing Decision of 26 March 2013 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the production of cement, lime and magnesium oxide (notified under document C(2013) 1728)
- 2014/768/EU: Commission Implementing Decision of 30 October 2014 establishing the type, format and frequency of information to be made available by the Member States on integrated emission management techniques applied in mineral oil and gas refineries, pursuant to Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2014) 7517)
- 2014/738/EU: Commission Implementing Decision of 9 October 2014 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the refining of mineral oil and gas (notified under document C(2014) 7155)
- 2014/687/EU: Commission Implementing Decision of 26 September 2014 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the production of pulp, paper and board (notified under document C(2014) 6750)

Commission Implementing Decisions (hyperlinks provided)

- Commission Implementing Decision of 10 February 2012 laying down rules concerning the transitional national plans referred to in Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 612)
- 2012/119/EU: Commission Implementing Decision of 10 February 2012 laying down rules concerning guidance on the collection of data and on the drawing up of BAT reference documents and on their quality assurance referred to in Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 613)
- 2012/134/EU: Commission Implementing Decision of 28 February 2012 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the manufacture of glass (notified under document C(2012) 865)
- 2012/135/EU: Commission Implementing Decision of 28 February 2012 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for iron and steel production (notified under document C(2012) 903)
- 2012/249/EU: Commission Implementing Decision of 7 May 2012 concerning the determination of start-up and shut-down periods for the purposes of Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 2948)
- 2012/795/EU: Commission Implementing Decision of 12 December 2012 establishing the type, format and frequency of information to be made available by the Member States for the purposes of reporting on the implementation of Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 9181)
- 2013/84/EU: Commission Implementing Decision of 11 February 2013 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the tanning of hides and skins (notified under document C(2013) 618)
- 2013/163/EU: Commission Implementing Decision of 26 March 2013 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the production of cement, lime and magnesium oxide (notified under document C(2013) 1728)
- 2013/732/EU: Commission Implementing Decision of 9 December 2013 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the production of chlor-alkali (notified under document C(2013) 8589)
- 2014/687/EU: Commission Implementing Decision of 26 September 2014 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the production of pulp, paper and board (notified under document C(2014) 6750)
- 2014/738/EU: Commission Implementing Decision of 9 October 2014 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the refining of mineral oil and gas (notified under document C(2014) 7155)
- 2014/768/EU: Commission Implementing Decision of 30 October 2014 establishing the type, format and frequency of information to be made available by the Member States on integrated emission management techniques applied in mineral oil and gas refineries, pursuant to

Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2014) 7517)

- Commission Implementing Decision (EU) 2015/2119 of 20 November 2015 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the production of wood-based panels (notified under document C(2015) 8062)

Also relevant: European Commission Transposition checklist for Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (recast)

**Entry into force**

01/2011

**Departments/Units in charge**

DG ENV or DG Environment is responsible for the implementation of the IED at EU-level. The Commission organises and coordinates the exchange of information through the involvement of the European IPPC Bureau (EIPPCB) (within DG Joint Research Centre) and DG Environment.

**Common Implementation strategy (CIS processes)**

The IED Art. 13 Forum: According to Art. 13 of the Directive, in order to draw up, review and, where necessary, update BAT reference documents, the Commission shall organise an exchange of information between Member States, the industries concerned, non-governmental organisations promoting environmental protection and the Commission. Moreover, the Commission shall establish and regularly convene a forum composed of representatives of Member States, the industries concerned and non-governmental organisations promoting environmental protection and shall obtain and make publicly available the opinion of the forum on the proposed content of the BAT reference documents. The Commission shall take into account this opinion for the adoption of the BAT conclusions. This forum has been created as a formal expert group through Commission decision (2011/C 146/03) on the establishment of the Art. 13 Forum, which was adopted on 16 May 2011. According to this Decision, new members of the forum who are not Member States shall be appointed by the Director General of DG Environment.

Best available techniques Reference documents (BREFs): Ceramic Manufacturing Industry; Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector; Emissions from Storage; Energy Efficiency; Ferrous Metals Processing Industry; Food, Drink and Milk Industries; Industrial Cooling Systems; Intensive Rearing of Poultry and Pigs; Iron and Steel Production; Large Combustion Plants; Large Volume Inorganic; Chemicals – Ammonia, Acids and Fertilisers; Large Volume Inorganic Chemicals – Solids and Others Industry; Large Volume Organic Chemical Industry; Manufacture of Glass; Manufacture of Organic Fine Chemicals; Non-ferrous Metals Industries; Production of Cement, Lime and Magnesium Oxide; Production of Chlor-alkali; Production of Polymers; Production of Pulp, Paper and Board; Production of Speciality Inorganic Chemicals; Refining of Mineral Oil and Gas; Slaughterhouses and Animals By-products Industries; Smitheries and Foundries Industry; Surface Treatment Of Metals and Plastics; Surface Treatment Using Organic Solvents (including Wood and Wood Products Preservation with Chemicals); Tanning of Hides and Skins; Textiles Industry; Waste Incineration; Waste Treatment; Wood-based Panels Production

Reference Documents (REFs): Economics and Cross-media Effects; Monitoring of emissions from IED-installations.

The IED Art. 75 Committee: According to Art. 75 of the IED, the Commission shall be assisted by a committee, which has the competence to deliver opinions on implementing acts concerning the following: guidance under Art. 13(3)(c) and (d) of the IED, BAT conclusions (Art. 13(5)), implementing rules for large combustion plants (Art. 41) and the type, format and frequency of reporting by Member States (Art. 72(2)). The IED Art. 75 Committee operates in accordance with the examination procedure (Art. 5 of Regulation (EU) No 182/2011). The Rules of Procedure of the

Committee were adopted on 26 August 2011. The IED Art. 75 Committee has delivered a positive opinion on the following implementing decisions, which subsequently have been adopted by the Commission and published in the Official Journal:

Commission Implementing Decisions (hyperlinks provided) (see also above in section 1.1)

- Commission Implementing Decision of 10 February 2012 laying down rules concerning the transitional national plans referred to in Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 612)
- 2012/119/EU: Commission Implementing Decision of 10 February 2012 laying down rules concerning guidance on the collection of data and on the drawing up of BAT reference documents and on their quality assurance referred to in Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 613)
- 2012/134/EU: Commission Implementing Decision of 28 February 2012 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the manufacture of glass (notified under document C(2012) 865)
- 2012/135/EU: Commission Implementing Decision of 28 February 2012 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for iron and steel production (notified under document C(2012) 903)
- 2012/249/EU: Commission Implementing Decision of 7 May 2012 concerning the determination of start-up and shut-down periods for the purposes of Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 2948)
- 2012/795/EU: Commission Implementing Decision of 12 December 2012 establishing the type, format and frequency of information to be made available by the Member States for the purposes of reporting on the implementation of Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (notified under document C(2012) 9181)
- 2013/84/EU: Commission Implementing Decision of 11 February 2013 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the tanning of hides and skins (notified under document C(2013) 618)
- 2013/163/EU: Commission Implementing Decision of 26 March 2013 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the production of cement, lime and magnesium oxide (notified under document C(2013) 1728)
- 2013/732/EU: Commission Implementing Decision of 9 December 2013 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the production of chlor-alkali (notified under document C(2013) 8589)
- 2014/687/EU: Commission Implementing Decision of 26 September 2014 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the production of pulp, paper and board (notified under document C(2014) 6750)
- 2014/738/EU: Commission Implementing Decision of 9 October 2014 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the refining of mineral oil and gas (notified under document C(2014) 7155)

- 2014/768/EU: Commission Implementing Decision of 30 October 2014 establishing the type, format and frequency of information to be made available by the Member States on integrated emission management techniques applied in mineral oil and gas refineries, pursuant to Directive 2010/75/EU of the European Parliament and of the Council (notified under document C(2014) 7517)
- Commission Implementing Decision (EU) 2015/2119 of 20 November 2015 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the production of wood-based panels (notified under document C(2015) 8062)

Industrial Emissions Experts Group (IEEG): The IEEG (Industrial Emissions Experts Group, formerly known under IPPC as IEG - IPPC Expert Group) is an informal expert group to facilitate the exchange of experiences and good practises in the area on interpretation, transposition and implementation of the IED in the Member States and to advise the Commission in the preparation of delegated acts. The IEEG is composed of experts from EU Member States and EU acceding countries. Technical Working Groups (TWGs): for the drawing up or reviewing of a BREF document, a TWG is set up (or reactivated) by the Commission. Each TWG consists of technical experts representing Member States, industries, NGOs promoting environmental protection and the Commission. TWG members are nominated to participate in the information exchange primarily based on their technical, economic, environmental or regulatory expertise (especially in permitting or inspecting industrial installations) as well as on their ability to bring into the information exchange process the BREF end-user perspective. The experts for each TWG are nominated by the representatives in the Forum. To this end, Forum members send the names and contact details of their TWG nominees to the EIPPCB. In order to enhance the efficiency of participation of the industrial sectors concerned in TWGs, their nomination may be coordinated by the European industrial associations. The TWG draws up or reviews a BREF document recording the outcome of the exchange of information for a given sector. The TWG is the main source of information for the drawing up and reviewing of a BREF. A TWG generally consists of between 40 to 100 experts. TWG members are either nominated by their Member State, by a European industrial association (Business Europe) or by the environmental NGO EEB. Nomination is the only way of becoming a member of a TWG.

**Administrative body handling implementation in MS**

The European Member States are responsible for implementing the Directive at national level and for issuing operating permits to the installations concerned. National Implementing Measures (NIM) communicated by the Member States concerning the IED. The IED frequently refers to "competent authority" (e.g. regarding the right to grant temporary derogations from emission levels associated with the best available techniques, in the context of operators' duties to notify the competent authority of planned changes which might affect the environment etc.). The IED does not specify the competent authorities, as these depend on the Member State's structure and system.

In Ireland, the Environmental Protection Agency (EPA) is the competent authority for granting and enforcing Industrial Emissions (IE) licences for specified industrial and agriculture activities listed in the First Schedule to the Environmental Protection Agency Act 1992 as amended.

In Denmark, either the municipality or the Danish Environmental Protection Agency is the approval authority in relation to i-marked installations and activities. However, applications for environmental permits must always be sent to the municipality in which the installation is situated. Where relevant, the municipality will forward the application to the Danish Environmental Protection Agency.

I-marked installations and activities are covered by the EU's Industrial Emissions Directive.

In the UK, the Environment Agency issues permits under the Industrial Emissions Directive.

In Germany, there are several competent authorities at the Länder level. The Länder have published installation lists covering the respective federal state. Each installation has an assigned competent authority. Saxony's list, for instance, includes the following administrative authorities: Landesdirektion Sachsen – Chemnitz, Landesdirektion Sachsen – Leipzig, Landesdirektion Sachsen – Dresden, Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie, Landratsamt Bautzen, and several others.

**Main Objective**

The subject matter and objective of the IED is defined in Art. 1: "This Directive lays down rules on integrated prevention and control of pollution arising from industrial activities. It also lays down rules designed to prevent or, where that is not practicable, to reduce emissions into air, water and land and to prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole."

**Principles included in the legal text**

Principles of environmental law mentioned in the IED: polluter pays principle, principle of pollution prevention (recital 2). Other recognized principles mentioned: principle of subsidiarity, principle of proportionality (see Art. 5 TEU) (recital 44); principles recognised in particular by the Charter of Fundamental Rights of the European Union. In particular, the IED "seeks to promote the application of Art. 37 of that Charter [environmental protection]" (recital 45). In addition, the IED defines what it calls "general principles governing the basic obligations of the operator (see Art. 11 IED) and states that "Member States shall take the necessary measures to provide that installations are operated in accordance with the following principles: (a) all the appropriate preventive measures are taken against pollution; (b) the best available techniques are applied; (c) no significant pollution is caused; (d) the generation of waste is prevented in accordance with Directive 2008/98/EC; (e) where waste is generated, it is, in order of priority and in accordance with Directive 2008/98/EC, prepared for re-use, recycled, recovered or, where that is technically and economically impossible, it is disposed of while avoiding or reducing any impact on the environment; (f) energy is used efficiently; (g) the necessary measures are taken to prevent accidents and limit their consequences; (h) the necessary measures are taken upon definitive cessation of activities to avoid any risk of pollution and return the site of operation to the satisfactory state defined in accordance with Art. 22."

**Other objectives/Key concepts/key elements of the legislation**

The IED is based on several pillars, in particular (1) an integrated approach, (2) use of best available techniques, (3) flexibility, (4) inspections and (5) public participation. The integrated approach means that the permits must take into account the whole environmental performance of the plant, covering e.g. emissions to air, water and land, generation of waste, use of raw materials, energy efficiency, noise, prevention of accidents, and restoration of the site upon closure. The permit conditions including emission limit values must be based on the Best Available Techniques (BAT). In order to define BAT and the BAT-associated environmental performance at EU level, the Commission organises an exchange of information with experts from Member States, industry and environmental organisations. This work is co-ordinated by the European IPPC Bureau of the Institute for Prospective Technology Studies at the EU Joint Research Centre in Seville (Spain). This process results in BAT Reference Documents (BREFs); the BAT conclusions contained are adopted by the Commission as Implementing Decisions. The IED requires that these BAT conclusions are the reference for setting permit conditions. For certain activities, i.e. large combustion plants, waste incineration and co-incineration plants, solvent using activities and titanium dioxide production, the IED also sets EU wide emission limit values for selected pollutants. The IED allows competent authorities some flexibility to set less strict emission limit values. This is possible only in specific cases where an assessment shows that achieving the emission levels associated with BAT described in the BAT conclusions would lead to

disproportionately higher costs compared to the environmental benefits due to the geographical location or the local environmental conditions or the technical characteristics of the installation. The competent authority shall always document its justification for granting such derogations. Furthermore, Chapter III of the IED on large combustion plants includes certain flexibility instruments (Transitional National Plan, limited lifetime derogation, etc.). The IED contains mandatory requirements on environmental inspections. Member States shall set up a system of environmental inspections and draw up inspection plans accordingly. The IED requires a site visit to take place at least every 1 to 3 years, using risk-based criteria. The IED ensures that the public has a right to participate in the decision-making process, and to be informed of its consequences, by having access to permit applications, permits and the results of the monitoring of releases.
In addition, through the European Pollutant Release and Transfer Register (E-PRTR) emission data reported by Member States are made accessible in a public register, which is intended to provide environmental information on major industrial activities. Key points: The legislation covers the following industrial activities: energy, metal production and processing, minerals, chemicals, waste management and other sectors such as pulp and paper production, slaughterhouses and the intensive rearing of poultry and pigs; All installations covered by the directive must prevent and reduce pollution by applying the best available techniques* (BATs), efficient energy use, waste prevention and management and measures to prevent accidents and limit their consequences; The installations can only operate if in possession of a permit and have to comply with the conditions set therein; The BAT conclusions adopted by the Commission are the reference for setting the permit conditions. Emission limit values must be set at a level that ensures pollutant emissions do not exceed the levels associated with the use of BATs. However they may, if it is proven that this would lead to disproportionate costs compared to environmental benefits; Competent authorities need to conduct regular inspections of the installations; The public must be given an early opportunity to participate in the permitting process.

**Terminology**

Emission Limit Values (ELV), Best available techniques (BAT), BAT reference documents (BREFs), BAT conclusions

There are general definitions (Art. 3 IED) as well as definitions of specific relevance to subsections of the IED and its Annexes (with additional definitions in Art. 43 and 57 IED as well as in Annex VI). Some definitions in Art. 3 IED are identical to those found in other Directives. For example Art. 3(2) IED defining “pollution” is identical to Art. 2(2) of Directive 2008/1/EC, Art. 3(5) IED defining “emission limit value” is identical to the first part of Art. 2(6) of Directive 2008/1/EC or Art. 3(30) IED defining “biomass” is identical to Art. 2(11) of Directive 2001/80/EC. Details in: European Commission Transposition checklist for Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control).

The IED contains more than 50 definitions, all of which are relevant. A selection of 10-15 definitions can thus just cover certain aspects. However, against the background of the key pillars of the IED (see above) and its specific chapters (addressing i.e. combustion plants (Chapter III), waste incineration and co-incineration plants (Chapter IV), and organic solvents (Chapter V)) the following definitions are of particular importance:

*Substance* (Art. 2(1) IED): ‘substance’ means any chemical element and its compounds, with the exception of the following substances: (a) radioactive substances as defined in Art. 1 of Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation (b) genetically modified micro-organisms as defined in Art. 2(b) of Directive 2009/41/EC of the European Parliament and the Council of 6 May 2009 on the contained use of genetically modified micro-organisms (c) genetically modified organisms as defined in point 2 of Art. 2 of Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate

release into the environment of genetically modified organisms

*Pollution* (Art. 2(2) IED): 'pollution' means the direct or indirect introduction, as a result of human activity, of substances, vibrations, heat or noise into air, water or land which may be harmful to human health or the quality of the environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment;

*Installation* (Art. 2(3) IED): 'installation' means a stationary technical unit within which one or more activities listed in Annex I or in Part 1 of Annex VII are carried out, and any other directly associated activities on the same site which have a technical connection with the activities listed in those Annexes and which could have an effect on emissions and pollution;

*Emission* (Art. 2(4) IED): 'emission' means the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in the installation into air, water or land;

*Emission Limit Value* (Art. 2(5) IED): 'emission limit value' means the mass, expressed in terms of certain specific parameters, concentration and/or level of an emission, which may not be exceeded during one or more periods of time;

*Permit* (Art. 2(7) IED): 'permit' means a written authorisation to operate all or part of an installation or combustion plant, waste incineration plant or waste co-incineration plant;

*Best available techniques* (BAT) (Art. 2(10) IED): 'best available techniques' means the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole: (a) 'techniques' includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned; (b) 'available techniques' means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator; (c) 'best' means most effective in achieving a high general level of protection of the environment as a whole;

*BAT reference document* (Art. 2(11) IED): 'BAT reference document' means a document, resulting from the exchange of information organised pursuant to Art. 13, drawn up for defined activities and describing, in particular, applied techniques, present emissions and consumption levels, techniques considered for the determination of best available techniques as well as BAT conclusions and any emerging techniques, giving special consideration to the criteria listed in Annex III;

*BAT conclusions* (Art. 2(12) IED): 'BAT conclusions' means a document containing the parts of a BAT reference document laying down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, relevant site remediation measures;

*Operator* (Art. 2(15) IED): 'operator' means any natural or legal person who operates or controls in whole or in part the installation or combustion plant, waste incineration plant or waste co-incineration plant or, where this is provided for in national law, to whom decisive economic power over the technical functioning of the installation or plant has been delegated;

*Combustion plant* (Art. 2(25) IED): 'combustion plant' means any technical apparatus in which fuels are oxidised in order to use the heat thus generated;

*Waste incineration plant* (Art. 2(40) IED): 'waste incineration plant' means any stationary or mobile technical unit and equipment dedicated to the thermal treatment of waste, with or without recovery of the combustion heat generated, through the incineration by oxidation of waste as well as other thermal treatment processes, such as pyrolysis, gasification or plasma process, if the

substances resulting from the treatment are subsequently incinerated;
*Waste co-incineration plant* (Art. 2(41) IED): 'waste co-incineration plant' means any stationary or mobile technical unit whose main purpose is the generation of energy or production of material products and which uses waste as a regular or additional fuel or in which waste is thermally treated for the purpose of disposal through the incineration by oxidation of waste as well as other thermal treatment processes, such as pyrolysis, gasification or plasma process, if the substances resulting from the treatment are subsequently incinerated;
*Organic solvent* (Art. 2(46) IED): 'organic solvent' means any volatile organic compound which is used for any of the following: (a) alone or in combination with other agents, and without undergoing a chemical change, to dissolve raw materials, products or waste materials; (b) as a cleaning agent to dissolve contaminants; (c) as a dissolver; (d) as a dispersion medium; (e) as a viscosity adjuster; (f) as a surface tension adjuster; (g) as a plasticiser; (h) as a preservative.
Information about the definitions and their overlaps with other legal acts can be found in the European Commission Transposition checklist for Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (recast)

**Derogations**

The IED contains several provisions on possible derogations. Derogations are part of the key pillar "flexibility" (see above):
Recital 17: In order to enable operators to test emerging techniques which could provide for a higher general level of environmental protection, or at least the same level of environmental protection and higher cost savings than existing best available techniques, the competent authority should be able to grant temporary derogations from emission levels associated with the best available techniques.
Recital 32: In the case of a sudden interruption in the supply of low-sulphur fuel or gas resulting from a serious shortage, the competent authority should be able to grant temporary derogations to allow emissions of the combustion plants concerned to exceed the emission limit values set out in this Directive.
Recital 33: The operator concerned should not operate a combustion plant for more than 24 hours after malfunctioning or breakdown of abatement equipment and unabated operation should not exceed 120 hours in a 12-month period in order to limit the negative effects of pollution on the environment. However, where there is an overriding need for energy supplies or it is necessary to avoid an overall increase of emissions resulting from the operation of another combustion plant, competent authorities should be able to grant a derogation from those time limits.
Recital 40: The Commission should be empowered to adopt delegated acts in accordance with Art. 290 TFEU in respect of the setting of the date from which continuous measurements of emissions into the air of heavy metals and dioxins and furans are to be carried out, and the adaptation of certain parts of Annexes V, VI and VII to scientific and technical progress. In the case of waste incineration plants and waste co-incineration plants, this may include, inter alia, the establishment of criteria to allow derogations from continuous monitoring of total dust emissions. It is of particular importance that the Commission carry out appropriate consultations during its preparatory work, including at expert level.
The derogation possibilities enshrined in Art. 15 IED (Emission limit values, equivalent parameters and technical measures) are of particular relevance.
Art. 15 IED: "By way of derogation from paragraph 3, and without prejudice to Art. 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to: (a) the geographical location or the local environmental conditions of the installation concerned; or (b)

the technical characteristics of the installation concerned. The competent authority shall document in an annex to the permit conditions the reasons for the application of the first subparagraph including the result of the assessment and the justification for the conditions imposed. The emission limit values set in accordance with the first subparagraph shall, however, not exceed the emission limit values set out in the Annexes to this Directive, where applicable. The competent authority shall in any case ensure that no significant pollution is caused and that a high level of protection of the environment as a whole is achieved. The competent authority may grant temporary derogations from the requirements of paragraphs 2 and 3 of this Article and from Art. 11(a) and (b) for the testing and use of emerging techniques for a total period of time not exceeding 9 months, provided that after the period specified, either the technique is stopped or the activity achieves at least the emission levels associated with the best available techniques."
In case of derogations under Art. 15(4) IED, however, the competent authority shall make available to the public the specific reasons for that derogation (see Art. 24 (2)(f) IED Access to information and public participation in the permit procedure). Further rules on derogations can be found in Art. 30 Emission limit values, Art. 33 Limited life time derogation, Art. 37 Malfunction or breakdown of the abatement equipment, Art. 59 Control of emissions.

**Types of management measures**

See comment in section 11 (2nd question)
Environmental requirements: Any industrial installation which carries out the activities listed in Annex I to the Directive must meet certain basic obligations: preventive measures are taken against pollution; the best available techniques (BAT) are applied; no significant pollution is caused; waste is reduced, recycled or disposed of in the manner which creates least pollution; energy efficiency is maximised; accidents are prevented and their impact limited; sites are remediated when the activities come to an end.
Special provisions shall apply to combustion plants, waste incineration and co-incineration plants, installations using organic solvents and installations producing titanium dioxide.
Application of best available techniques: Industrial installations must use the best available techniques (BAT) to achieve a high general level of protection of the environment as a whole, which are developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions. The European Commission must adopt BAT conclusions containing the emission levels associated with the BAT. These conclusions shall serve as a reference for the drawing up of permit conditions.
Permit conditions: The permit must provide for the necessary measures to ensure compliance with the operator's basic obligations and environmental quality standards. These measures shall comprise at least: emission limit values for polluting substances; rules guaranteeing protection of soil, water and air; waste monitoring and management measures; requirements concerning emission measurement methodology, frequency and evaluation procedure; an obligation to inform the competent authority of the results of monitoring, at least annually; requirements concerning the maintenance and surveillance of soil and groundwater; measures relating to exceptional circumstances (leaks, malfunctions, momentary or definitive stoppages, etc.); provisions on the minimisation of long-distance or transboundary pollution; conditions for assessing compliance with the emission limit values.
Environmental inspections: Member States shall set up a system of environmental inspections of the installations concerned. All installations shall be covered by an environmental inspection plan. The plan shall be regularly reviewed and updated. Based on the inspection plans, the competent authority shall regularly draw up programmes for routine environmental inspections, including the frequency of site visits for different types of installations. The period between two site visits shall be based on a systematic appraisal of the environmental risks of the installations concerned. It shall not exceed one year for installations posing the highest risks and three years for installations

posing the lowest risks.[36]

**Spatial coverage**

Geographic coverage: Art. 84 IED (Addressees): This Directive is addressed to the Member States.
Industries covered: Activities Listed in Annex I (Art. 10 – 27 IED; Annex I specifies/covers certain energy industries, production and processing of metals, mineral industry, chemical industry, waste management, other activities); Combustion Plants (specified in Art. 28 – 41 IED); Waste Incineration Plants and Waste Co-Incineration Plants (specified in Art. 42 – 55 IED); Installations and Activities Using Organic Solvents (specified in Art. 56 – 65 IED); Installations Producing Titanium Dioxide (specified in Art. 66 – 70 IED)

**Reporting units – what are the specific transposition requirements**

See comment in section 11 (2nd question)
Reporting requirements addressed to operators: Reporting requirements (Baseline Report) addressed to operators under Art. 22 IED (see also Recital 24). Operators shall prepare and submit to the competent authority a baseline report before starting operation of an installation or before a permit for an installation is updated for the first time after 7 January 2013. In order to ensure that the operation of an installation does not deteriorate the quality of soil and groundwater, it is necessary to establish, through a baseline report, the state of soil and groundwater contamination. The baseline report should be a practical tool that permits, as far as possible, a quantified comparison between the state of the site described in that report and the state of the site upon definitive cessation of activities, in order to ascertain whether a significant increase in pollution of soil or groundwater has taken place. The baseline report should, therefore, contain information making use of existing data on soil and groundwater measurements and historical data related to past uses of the site. Reporting requirements addressed to operators under Art. 62 (Reporting on compliance). The operator shall supply the competent authority, on request, with data enabling the competent authority to verify compliance with either of the following: emission limit values in waste gases, fugitive emission limit values and total emission limit values; the requirements of the reduction scheme under Part 5 of Annex VII; or the derogations granted in accordance with Art. 59(2) and (3).
Reporting requirements addressed to the competent authorities: Reporting requirements addressed to the competent authorities under Art. 23(6) IED (Environmental inspections). Following a site visit, the competent authority shall prepare a report describing the relevant findings regarding compliance of the installation with the permit conditions and conclusions on whether any further action is necessary. The report shall be notified to the operator concerned within 2 months of the site visit taking place. The report shall be made publicly available by the competent authority in accordance with Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information within 4 months of the site visit taking place.
Reporting requirements addressed to the Member States: Reporting requirements addressed to the Member States under Art. 34 (Small isolated systems): Where there are, on the territory of a Member State combustion plants covered by this Chapter that are part of a small isolated system, that Member State shall report to the Commission before 7 January 2013 a list of those combustion plants, the total annual energy consumption of the small isolated system and the amount of energy obtained through interconnection with other systems. Reporting requirements addressed to the Member States under Art. 51 (Authorisation to change operating conditions) : Member States shall communicate to the Commission all operating conditions authorised under paragraphs 1, 2 and 3 and the results of verifications made as part of the information provided in

[36] IED (formerly IPPC), http://www.zopa.org/pg.php?id_menu=10.

accordance with the reporting requirements under Art. 72. Reporting requirements addressed to the Member States under Art. 59 (Control of emissions): Member States shall report to the Commission in accordance with Art. 72(1) on the progress in achieving the equivalent emission reduction referred to in Art. 59(1)(b) IED. Member States shall report to the Commission on the derogations referred to in Art. 59(2) and (3) IED in accordance with Art. 72(2). Reporting requirements addressed to the Member States under Art. 72 (Reporting by Member States) : Member States shall ensure that information is made available to the Commission on the implementation of this Directive, on representative data on emissions and other forms of pollution, on emission limit values, on the application of best available techniques in accordance with Art. 14 and 15, in particular on the granting of exemptions in accordance with Art. 15(4), and on progress made concerning the development and application of emerging techniques in accordance with Art. 27. Member States shall make the information available in an electronic format.

Reporting requirements addressed to the European Commission: Reporting requirements addressed to the European Commission under Art. 73 (Review). By 7 January 2016, and every 3 years thereafter, the Commission shall submit to the European Parliament and to the Council a report reviewing the implementation of the IED [...]. The Commission shall, by 31 December 2012, review the need to control certain emissions and report the results to the European Parliament and to the Council accompanied by a legislative proposal where appropriate. The Commission shall report to the European Parliament and the Council, by 31 December 2011, on the establishment in Annex I of: differentiated capacity thresholds for the rearing of different poultry species, including the specific case of quail; capacity thresholds for the simultaneous rearing of different types of animals within the same installation.

**Management unit**

See comment in section 11 (2nd question)

The IED covers industrial activities with a major pollution potential, defined in Annex I to the Directive (energy industries, production and processing of metals, mineral industry, chemical industry, waste management, rearing of animals, etc.). The Directive contains special provisions for the following installations: combustion plants (≥ 50 MW); waste incineration or co-incineration plants; certain installations and activities using organic solvents; installations producing titanium dioxide. This Directive does not apply to research activities, development activities or the testing of new products and processes.

**Key planning steps**

Environmental inspection plans (Art. 23 IED): Member States shall set up a system of environmental inspections of the installations concerned. All installations shall be covered by an environmental inspection plan. The plan shall be regularly reviewed and updated. Based on the inspection plans, the competent authority shall regularly draw up programmes for routine environmental inspections, including the frequency of site visits for different types of installations. The period between two site visits shall be based on a systematic appraisal of the environmental risks of the installations concerned. It shall not exceed one year for installations posing the highest risks and three years for installations posing the lowest risks. Art. 3(22) IED: "'environmental inspection' means all actions, including site visits, monitoring of emissions and checks of internal reports and follow-up documents, verification of self-monitoring, checking of the techniques used and adequacy of the environment management of the installation, undertaken by or on behalf of the competent authority to check and promote compliance of installations with their permit conditions and, where necessary, to monitor their environmental impact;"

Transitional National Plans (Art. 32 IED): During the period from 1 January 2016 to 30 June 2020, Member States may draw up and implement a transitional national plan covering combustion

plants which were granted the first permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003. For each of the combustion plants covered by the plan, the plan shall cover emissions of one or more of the following pollutants: nitrogen oxides, sulphur dioxide and dust. For gas turbines, only nitrogen oxides emissions shall be covered by the plan.

**Timelines**

07/01/2011 Entry into force
07/07/2011 Implementing rules concerning the determination of start-up and shut-down periods (Art. 3(26) and Annex V, Part 4, point 1) and Transitional National Plan
31/12/2011 Review on animal rearing activities; Review on combustion plants below 50 MW, intensive rearing of cattle and spreading of manure (Art. 73)
07/01/2013 End of transposition deadline (implementation date for articles mentioned in Art. 80(1) unless mentioned otherwise in Art. 82); New emission limit values for new combustion plants which co-incinerate waste
31/12/2013 Report on the need to establish Union-wide emission limit values and/or to amend the ELVs of Annex V for certain LCPs.
07/01/2014 Repeal of Directives 78/176/EEC, 82/883/EEC, 92/112/EEC, 1999/13/EC, 2000/76/EC, 2008/1/EC; Implementation date for articles mentioned in Art. 80(1) for installations already falling under the scope of Directive 2008/1/EC.
01/06/2015 Implementation of Art. 58 and 59(5) (use of organic solvents)
07/07/2015 Implementation date for Annex I activities not covered by Directive 2008/1/EC
01/01/2016 Implementation date for combustion plants falling under Art. 30(2) (new emission limit values); New emission limit values for existing combustion plants which co-incinerate waste; Repeal of Directive 2001/80/EC
07/01/2016 First report reviewing the implementation of the Directive
(every 3 years thereafter)
30/6/2020 Transitional National Plan provisions for large combustion plants end
31/12/2023 Limited lifetime derogation provisions for large combustion plants end

**Integration/coordination issues with other related pieces of legislation**

Coordination/Interaction (selection):

- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, recital 37 and Art. 2(3): reference to coordination of assessments – "where the obligation to carry out assessments related to environmental issues arises simultaneously from this Directive and from other Union legislation, such as [...] Directive 2010/75/EU [IED], Member States should be able to provide for coordinated and/or joint procedures fulfilling the requirements of the relevant Union legislation."
- Seveso Directive (2012/18/EU); coordination of inspections: "Where possible, inspections should be coordinated with those under other Union legislation, including Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control), where appropriate" (see recital 26).
- Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC; Several references to interaction, including, for example, reporting coordination: "When reporting under Directive 2010/75/EU, and without prejudice to Art. 9(2) of that Directive, Member States shall consider including information on energy efficiency levels of installations undertaking the combustion of fuels with total rated

thermal input of 50 MW or more in the light of the relevant best available techniques developed in accordance with Directive 2010/75/EU and Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control" (Art. 15(9)).

- Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy; strengthening coherence: " The progressive reduction of pollution from priority substances and the cessation or phasing-out of discharges, emissions and losses of priority hazardous substances, as required by Directive 2000/60/EC, may often be achieved most cost-effectively through Union substance-specific measures at source, for example pursuant to [...] Directive 2010/75/EU [IED]. Coherence between those legal acts, Directive 2000/60/EC and other relevant legislation should therefore be strengthened to ensure that source-control mechanisms are applied as appropriate." (see recital 12)
- EMAS Regulation (1221/2009/EC); Interaction: in the context of environmental inspections, IED notes that "The systematic appraisal of the environmental risks shall be based on at least the following criteria: [...] the participation of the operator in the Union eco-management and audit scheme (EMAS), pursuant to Regulation (EC) No 1221/2009" (see Art. 23 IED, Environmental Inspections).

References in the IED to Regulations and other legal texts (selection):

- Reference to Urban Waste Water Treatment Directive (91/271/EEC) Annex VI (Technical provisions relating to waste incineration plants and waste co-incineration plants, Part 5 of the IED (Emission limit values for discharges of waste water from the cleaning of waste gases) lists emission limit values for "Total suspended solids as defined in Annex I of Directive 91/271/EEC")
- Reference to Water Framework Directive (2000/60/EC); references regarding the mentioning of priority substances and the reduction of pollution from such substances, see, e.g. Annex II of the IED (List of Polluting Substances), No. 13 refers to "Substances listed in Annex X to Directive 2000/60/EC"
- Reference to National Emission Ceilings Directive (2001/81/EC); IED works towards meeting the requirements of the NEC Directive: "Large combustion plants contribute greatly to emissions of polluting substances into the air resulting in a significant impact on human health and the environment. In order to reduce that impact and to work towards meeting the requirements of Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants and the objectives set out in the Thematic Strategy on Air Pollution, it is necessary to set more stringent emission limit values at Union level for certain categories of combustion plants and pollutants." (see recital 29 of the IED)
- Reference to Landfill Directive (1999/31/EC); ANNEX I (Categories of activities referred to in Art. 10), para. 5.4. "Landfills, as defined in Art. 2(g) of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste, receiving more than 10 tonnes of waste per day or with a total capacity exceeding 25 000 tonnes, excluding landfills of inert waste"
- Reference to Environmental Liability Directive (2004/35/EC); references in the IED to the ELD in the context of environmental damage, see Art. 7 IED (Incidents and accidents) and Art. 22 IED (Site closure)
- Further references in the IED to other Directives include references to Directive 2003/87/EC, Directive 2009/41/EC, Directive 2001/18/EC, Directive 90/539/EEC or Directive 2008/98/EC

Regulations and other legal acts with references to the IED (selection):

- Commission Regulation (EU) No 813/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign

requirements for space heaters and combination heaters

- Commission Delegated Regulation (EU) No 811/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device
- Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty
- Commission Regulation (EU) 2015/1189 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel boilers, Article 1(1) Regulation (EU) 2015/1189

**Coordination issues with the EU Biodiversity Strategy**

See comment in section 11 (2nd question)

The IED does not refer to biodiversity or the Biodiversity Strategy. Obviously, however, (industrial) emissions have an impact on ecosystems, habitats etc. Direct/indirect links can be identified in particular with regard to targets 2 (Maintain and restore ecosystems and their services) and 3 (Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity) of the EU Biodiversity Strategy, but also to target 6 (Help avert global biodiversity loss). Further research would be needed to examine the links to the (other) targets (1. Fully implement the Birds and Habitats Directives, 4. Ensure the sustainable use of fisheries resources and 5. Help combat Invasive Alien Species) in detail.

Impacts of industrial emissions, e.g.: "Polluting substances are released through sewage, run-off and from industrial emissions. Some forms of pollution stimulate growth in selected organisms, but this changes the natural balance of ecosystems. Wastes like salts, heavy metals and acids inhibit growth and decrease natural diversity. Pesticides applied to target species can also kill or harm other species" (AEP, 2015). "Acid rain results in the destruction of forests and other plant life. It acts by washing vital nutrients out of the soil thus weakening the trees and limiting their growth. Even slight damage to a mature tree can be enough to kill it, because it reduces its resistance to extremes of weather, and also to fungi and pests. Damaged trees are usually too weak to ever recover" (IFA, 2015). "Wildlife is also suffering from the effects of acidification. Acid rain reacts with the soil releasing aluminium and other metals. These are washed into rivers and lakes where they increase to levels that are toxic to fish and other freshwater life. A lake may reach an acid level of pH 5 or less if the local soil has inadequate buffering capacity (its ability to neutralise acid rain). At pH 5 fish life and frogs begin to disappear. By pH 4.5 almost all aquatic life has disappeared" (IFA, 2015). Effects of air pollution on forests and agriculture, see e.g. Robert C. Szaro, Andrzej Bytnerowicz, Július Oszlányi (2002): Effects of air pollution on Forest Health and Biodiversity in Forests of the Carpathian Mountains. Impact on biodiversity through industrial emissions which cause water pollution that leads to species loss. Source: CBD (2010): Business and the 2010 Biodiversity Challenge: Exploring Private Sector Engagement in the Convention on Biological Diversity.

**Relevance to ecosystems/habitats?**

The IED does not mention the terms biodiversity, habitats, ecosystems or ecosystem services. It mentions air, water and soil (e.g. Recital 3: "integrated approach to prevention and control of emissions into air, water and soil") as well as soil and groundwater (e.g. Recitals 12 and 23-25). It does not address, e.g. forests or rivers. It also mentions water bodies, seas and oceans, prohibiting the disposal of certain waste "into any water body, sea or ocean" (Art. 67 IED).

"Industrial emissions of sulphur and nitrogen oxides (SO2, NO2), mainly a result of fossil fuel combustion, are the principal source of acid rain. [...] Acid rain has been shown to decrease species diversity in lakes and streams [...]. Source: Brian Groombridge, Martin Jenkins (2002):

World Atlas of Biodiversity: Earth's Living Resources in the 21st Century, p. 185.
Species and habitats are under a wide range of threats, from pollutants (point and diffuse) discharged to water, oil spills at sea, emissions to air causing acidification and eutrophication, pesticides in agriculture, etc. Therefore, much of the environmental acquis is relevant to biodiversity protection. [This includes the] Industrial Emissions Directive 2010/75/EU. Source: Farmer, A.M. (2012) (Editor). Manual of European Environmental Policy. 1043pp. Routledge, London.
Ecosystems are mentioned once in the IED: Art. 64 (Exchange of information on substitution of organic solvents): The Commission shall organise an exchange of information with the Member States, the industry concerned and non-governmental organisations promoting environmental protection on the use of organic solvents and their potential substitutes and techniques which have the least potential effects on air, water, soil, ecosystems and human health.
The exchange of information shall be organised on all of the following: fitness for use; potential effects on human health and occupational exposure in particular; potential effects on the environment; the economic consequences, in particular the costs and benefits of the options available.

**Drivers**

Industry (no generic definition provided)
The IED provides threshold values that generally refer to production capacities or outputs.
Annex II lists polluting substances and categorises them into substances polluting:

- Air (e.g. Sulphur dioxide and other sulphur compounds or Oxides of nitrogen and other nitrogen compounds
- Water (e.g. Organohalogen compounds and substances which may form such compounds in the aquatic environment, Organophosphorus compounds or Persistent hydrocarbons and persistent and bioaccumulable organic toxic substances)

As far as emission limits are concerned, Annex V (Technical provisions relating to combustion plants), for example, sets out: Part 1: Emission limit values (ELV) ($mg/Nm^3$) for combustion plants referred to in Art. 30(2); e.g. for $SO_2$ for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines, for $SO_2$ for combustion plants using gaseous fuels with the exception of gas turbines and gas engines, for $NO_x$ for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines. Part 2: Emission limit values ($mg/Nm^3$) for combustion plants referred to in Art. 30(3); e.g. for $SO_2$ for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines, for $SO_2$ for combustion plants using gaseous fuels with the exception of gas turbines and gas engines, for NOx and CO for gas fired combustion plants. ELV shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correction for the water vapour content of the waste gases and at a standardised O2 content of 6% for solid fuels, 3% for combustion plants, other than gas turbines and gas engines using liquid and gaseous fuels and 15% for gas turbines and gas engines. Annex VI sets out technical provisions relating to waste incineration plants and waste co-incineration plants, for example. Air emission limit values for waste incineration plants in Part 3. Annex VII sets out technical provisions relating to installations and activities using organic solvents, for example. Thresholds and emission limit values in Part 2. Annex VIII sets out technical provisions relating to installations producing titanium dioxide, for example. Emission limit values for emissions into water in Part 1 or emission limit values into air in Part 2.

**Pressures**

The IED addresses pollution arising from industrial activities and aims to reduce emissions into air, water and land and prevent the generation of waste. It covers industrial activities with a major pollution potential, defined in Annex I to the Directive (energy industries, production and processing of metals, mineral industry, chemical industry, waste management, rearing of animals,

etc.).
Furthermore it covers the following installations (see above 5.3): combustion plants (≥ 50 MW); waste incineration or co-incineration plants; certain installations and activities using organic solvents; installations producing titanium dioxide.
Some definitions specify these subject matters:
*Combustion plant* (Art. 2(25) IED): 'combustion plant' means any technical apparatus in which fuels are oxidised in order to use the heat thus generated;
*Waste incineration plant* (Art. 2(40) IED): 'waste incineration plant' means any stationary or mobile technical unit and equipment dedicated to the thermal treatment of waste, with or without recovery of the combustion heat generated, through the incineration by oxidation of waste as well as other thermal treatment processes, such as pyrolysis, gasification or plasma process, if the substances resulting from the treatment are subsequently incinerated;
*Waste co-incineration plant* (Art. 2(41) IED): 'waste co-incineration plant' means any stationary or mobile technical unit whose main purpose is the generation of energy or production of material products and which uses waste as a regular or additional fuel or in which waste is thermally treated for the purpose of disposal through the incineration by oxidation of waste as well as other thermal treatment processes, such as pyrolysis, gasification or plasma process, if the substances resulting from the treatment are subsequently incinerated;
*Organic solvent* (Art. 2(46) IED): 'organic solvent' means any volatile organic compound which is used for any of the following: (a) alone or in combination with other agents, and without undergoing a chemical change, to dissolve raw materials, products or waste materials; (b) as a cleaning agent to dissolve contaminants; (c) as a dissolver; (d) as a dispersion medium; (e) as a viscosity adjuster; (f) as a surface tension adjuster; (g) as a plasticiser; (h) as a preservative.

**Assessment of Environmental State**

The IED addresses the quality of soil and groundwater: "It is necessary to ensure that the operation of an installation does not lead to a deterioration of the quality of soil and groundwater. Permit conditions should, therefore, include appropriate measures to prevent emissions to soil and groundwater and regular surveillance of those measures to avoid leaks, spills, incidents or accidents occurring during the use of equipment and during storage. In order to detect possible soil and groundwater pollution at an early stage and, therefore, to take appropriate corrective measures before the pollution spreads, the monitoring of soil and groundwater for relevant hazardous substances is also necessary. When determining the frequency of monitoring, the type of prevention measures and the extent and occurrence of their surveillance may be considered.
In order to ensure that the operation of an installation does not deteriorate the quality of soil and groundwater, it is necessary to establish, through a baseline report, the state of soil and groundwater contamination. The baseline report should be a practical tool that permits, as far as possible, a quantified comparison between the state of the site described in that report and the state of the site upon definitive cessation of activities, in order to ascertain whether a significant increase in pollution of soil or groundwater has taken place. The baseline report should, therefore, contain information making use of existing data on soil and groundwater measurements and historical data related to past uses of the site.
In accordance with the polluter pays principle, when assessing the level of significance of the pollution of soil and groundwater caused by the operator which would trigger the obligation to return the site to the state described in the baseline report, Member States should take into account the permit conditions that have applied over the lifetime of the activity concerned, the pollution prevention measures adopted for the installation, and the relative increase in pollution compared to the contamination load identified in the baseline report. Liability regarding pollution

not caused by the operator is a matter for relevant national law and, where applicable, other relevant Union law."[37]

Pursuant to Art. 22 (Chapter II IED), baseline reports must be provided for certain activities mentioned in Annex I: "Where the activity involves the use, production or release of relevant hazardous substances and having regard to the possibility of soil and groundwater contamination at the site of the installation, the operator shall prepare and submit to the competent authority a baseline report before starting operation of an installation or before a permit for an installation is updated for the first time after 7 January 2013.

The baseline report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for under paragraph 3. The baseline report shall contain at least the following information: information on the present use and, where available, on past uses of the site; where available, existing information on soil and groundwater measurements that reflect the state at the time the report is drawn up or, alternatively, new soil and groundwater measurements having regard to the possibility of soil and groundwater contamination by those hazardous substances to be used, produced or released by the installation concerned

Where information produced pursuant to other national or Union law fulfils the requirements of this paragraph that information may be included in, or attached to, the submitted baseline report. The Commission shall establish guidance on the content of the baseline report."

**Assessment of Status**

See comment in section 11 (2nd question)

**Data**

In order to simplify reporting and reduce unnecessary administrative burden, the Commission should identify methods to streamline the way in which data are made available pursuant to the IED with the other requirements of Union law, and in particular Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register. (Recital 38 IED). European Pollutant Release and Transfer Register (E-PRTR). Emission data reported by Member States are made accessible in a public register, which is intended to provide environmental information on major industrial activities. "In E-PRTR, emission data reported by member states are made accessible in a public register, which is intended to provide environmental information on major industrial activities. E-PRTR has replaced the previous European Union-wide pollutant inventory, the so-called European Pollutant Emission Register (EPER). The competent authority can make information available via the internet, under Art. 24 (2) and 24 (3). In order to do so, referring to Art. 14 (1d), the operator has to supply to the competent authority (at least annually) (a) emission monitoring results and other required data and (b) a summary of the results of emission monitoring (Art. 15 (3b))."

E-PRTR: The register contains data reported by some 28 000 industrial facilities covering 65 economic activities within the following 9 industrial sectors: energy, production and processing of metals, mineral industry, chemical industry, waste and waste water management, paper and wood production and processing, intensive livestock production and aquaculture, animal and vegetable products from the food and beverage sector, and other activities.

Data is provided in the register for 91 pollutants falling under the following 7 groups: greenhouse gases, other gases, heavy metals, pesticides, chlorinated organic substances, other organic substances, inorganic substances.

A facility has to report data under E-PRTR if it fulfils the following criteria: the facility falls under at least one of the 65 E-PRTR economic activities. The activities are also reported using a

[37] IED, recitals 23 - 25.

statistical classification of economic activities (NACE rev 2); the facility has a capacity exceeding at least one of the E-PRTR capacity thresholds; the facility releases pollutants or transfers waste off-site which exceed specific thresholds set out in Art. 5 of the E-PRTR Regulation. These thresholds for releases of pollutants are specified for each media – air, water and land – in Annex II of the E-PRTR Regulation.

The data to be reported annually by each facility for which the applicable thresholds are exceeded are the following: Releases to air, water and land of any of the 91 E-PRTR pollutants; Off-site transfers of any of the 91 E-PRTR pollutants in waste water destined for waste-water treatment outside the facility; Off-site transfers of waste (reported as tonnes per year) for recovery or disposal. For transboundary movements of hazardous waste outside the reporting country, details of the recipients have to be provided. The reported releases include any introduction of any of the listed pollutants into the environment as a result of any human activity, whether deliberate, accidental, routine or non-routine, at the site of the facility. E-PRTR also contains information on releases from diffuse sources into water which will be upgraded and extended gradually.

**Funding**

LIFE Regulation Annex III: (e) Thematic priorities for Air quality and emissions, including urban environment: [...] support activities for the enhanced implementation of Directive 2010/75/EU of the European Parliament and of the Council (Industrial Emissions Directive) with a special emphasis on improving BAT definition and implementation process, ensuring easy public access to information and enhancing the contribution of the IED to innovation. The Industrial Emissions Directive (IED) is a key instrument for pollution prevention and control from large point sources. Experience with implementation of the IED (and its predecessor IPPC) has allowed for identifying additional needs in terms of public information and the introduction of emerging techniques. Priority will be therefore given to the following projects: Industrial Emissions Directive — Annex III, Section A, points (e)(iii)

Projects developing and testing pollution prevention and abatement techniques referred to in IED as emerging techniques. See LIFE multiannual work programme for 2014-2017, p. 16.

**Other issues to be aware of relevant for AQUACROSS?**

BAT Reference documents. Report from the Commission to the European Parliament and the Council, Report from the Commission on the reviews undertaken under Art. 30(9) and Art. 73 of Directive 2010/75/EU on industrial emissions addressing emissions from intensive livestock rearing and combustion plants, 17.5.2013, COM(2013) 286 final.

# 3.25 EU Adaptation Strategy

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## EU Adaptation Strategy

**Name/Type of the Legal Act or Policy**

EU Adaptation Strategy, Communication from the Commission to the European Parliament, the Council, the European Economics and Social Committee and the Committee of the Regions: An EU Strategy on adaptation to climate change, COM(2013) 216 final

No subsequent legal acts are adopted or planned to be adopted.

The EU Adaptation Strategy document was accompanied by further documents, including a green paper. Therefore, the set of documents is described at the official Commission-webpage as EU Adaptation Strategy package. But this terminology is not used in practice.

The accompanying documents include the impact assessment to the strategy and these further documents:

- COM (2013) 213 – Green paper on the insurance of natural and man-made disasters
- SWD (2013) 133 – Climate change adaptation, coastal and marine issues
- SWD (2013) 136 – Adaptation to climate change impacts on human, animal and plant health
- SWD (2013) 137 – Adapting infrastructure to climate change
- SWD (2013) 138 – Climate change, environmental degradation and migration
- SWD (2013) 135 – Technical guidance on integrating climate change adaptation in programmes and investments of Cohesion Policy
- SWD (2013) 139 – Principles and recommendations for integrating climate change adaptation considerations under the 2014-2020 rural development programmes
- SWD (2013) 134 – Guidelines on developing adaptation strategies

**Entry into force**

16 April 2013

**Departments/Units in charge**

DG Climate Action, Unit C.3 – Adaptation. Concrete Contacts can be found here.

**Common Implementation strategy (CIS processes)**

The Adaptation Steering Group (ASG) was created in September 2010 to assist the Commission. The ASG brings together member states, research institutions, business associations, NGOs and other organisations, and contributed to the preparatory work for the adaptation strategy. In addition, an inter-service group on adaptation has been set up and meets on a regular basis. It discusses progress towards mainstreaming adaptation into the EU policies and how to ensure effective synergies between the EU Strategy on Adaptation to Climate Change and other relevant work being undertaken by the Commission. The Working Group on the Knowledge Base (WGKB), which consists of researchers, scientists, academics and other stakeholders, also feeds into the ASG. The WGKB shares knowledge, experiences, information and research on climate impacts, vulnerability and adaptation, and provides advice on research needs. The different working groups supported the design and establishment of the EU Adaptation Strategy. Their involvement in the implementation process is unclear.

**Administrative body handling implementation in MS**

Germany: German Environmental ministry (BMU) at national level – BMU developed the German National Adaptation Strategy (which was already adopted 2009 by the German government and therefore before 2013). The responsibility for climate adaptation policy is situated in the

department for water management (WRI 1).,On regional (Länder) level the environmental ministries of the Länder are responsible. Several of them have already adopted an Adaptation Strategy. (Source: different Länder adaptation strategies)

Denmark: The Danish Ministry of Environment is responsible on national level. Denmark launched its first national climate adaptation strategy, Strategy for adapting to climate changes in Denmark, in 2008, in which climate adaptation was put on the agenda at national and local level. No specific obligations are attached. In 2012, this was followed up through an action plan, How We Manage Cloudbursts and Rains (Danish Government, 2012). The Action Plan requires each Municipality to map the territory of the municipality according to risk of flooding and develop a local plan by end 2013 that include actions to adapt to climate changes in a short and medium term perspective. In 2014, 59 of the 98 municipalities had a local adaptation plan.

Finland approved it first National Adaptation Strategy in 2005, which was prepared by the Finnish Ministry of Agriculture and Forestry. The work was coordinated by the Ministry of Agriculture and Forestry and representatives from the Ministry of Traffic and Communications, Ministry of Trade and Industry, Ministry of Social Affairs and Health, Ministry of the Environment, Ministry for Foreign Affairs, Finnish Meteorological Institute and Finnish Environment Institute took part in the preparation. Each Ministry was responsible for assessing the impacts and identifying adaptation measures in its own sector. Implementation in most of the natural resource and built environment related sectors covered by the NAS has been outlined in action plans prepared by the Ministry of Environment, Ministry of Agriculture and Forestry as well as the Ministry of Transport and Communications. In 2014, the Ministry of Agriculture and Forestry was responsible for the preparation of the "Finland's National Climate Change Adaptation Plan 2022". The practical work steered by a broadly-based coordination group appointed by the ministry. The adaptation plan also implements the EU Strategy on Adaptation to Climate Change within Finland.[38]

**Main Objective**

The overall aim of the EU Adaptation Strategy is to contribute to a more climate-resilient Europe. This means enhancing the preparedness and capacity to respond to the impacts of climate change at local, regional, national and EU levels, developing a coherent approach and improving coordination.

**Principles included in the legal text**

Principles of subsidiarity and proportionality and the rights enshrined by the Charter of Fundamental Rights of the European Union.

**Other objectives/Key concepts/key elements of the legislation**

The EU Adaptation Strategy focuses on three key objectives:

- Promoting action by Member States: The Commission will encourage all Member States to adopt comprehensive adaptation strategies (currently 18 have strategies) and will provide funding to help them build up their adaptation capacities and take action. It will also support adaptation in cities through the Mayors Adapt initiative, a voluntary commitment within the framework of the Covenant of Mayors.
- 'Climate-proofing' action at EU level by further promoting adaptation in key vulnerable sectors such as agriculture, fisheries and cohesion policy, ensuring that Europe's infrastructure is made more resilient, and promoting the use of insurance against natural and man-made

[38] Russel, D.; Anne Jensen, Eleni Karali, Helle Ørsted Nielsen, Muriel Bonjean, Benjamin Boteler, Alessio Capriolo, Sergio Castellari, Roos Den Uyl, Suraje Dessai, Francesca Giordano, Zuzana Harmáčková, Mikael Hilden, Maria João Coelho, Eliška Lorencová, Kirsi Mäkinen, Katriona McGlade, Gil Penha-Lopes, Paola Sakai, Luisa Schmidt, Jenny Troeltzsch, Sabine Weiland and Geoff Whitman (2014): D2.2 - Knowledge use, knowledge needs and policy integration in Member States. FP7-Project: BASE.

disasters.

- Better informed decision-making by addressing gaps in knowledge about adaptation and further developing the European climate adaptation platform (Climate-ADAPT) as the 'one-stop shop' for adaptation information in Europe.

**Terminology**

No key terms.

**Derogations**

In the EU Adaptation Strategy outermost regions are mentioned as one of the regions which are particularly vulnerable. In the Commission Staff Working Document on "Adapting infrastructure to climate change" (SWD (2013) 137) outermost regions are described as one of the main regions in which infrastructure is impacted by climate change. As consequences is described that special effort should go into adaptation measures to increase the resilience of infrastructure in these regions.

In the Commission Staff Working Document on "Climate change adaptation, coastal and marine issues" (SWD (2013) 133) adaptation activities in the outermost regions are summarised, e.g. developing of an Adaptation Strategy in the Canary Islands.

**Types of management measures**

Different Actions are mentioned in the strategy: Action 1: Encourage all Member States to adopt comprehensive adaptation strategies; Action 2: Provide LIFE funding to support capacity building and step up adaptation action in Europe. (2013-2020); Action 3: Introduce adaptation in the Covenant of Mayors framework (2013/2014); Action 4: Bridge the knowledge gap; Action 5: Further develop Climate-ADAPT as the 'one-stop shop' for adaptation information in Europe; Action 6: Facilitate the climate-proofing of the Common Agricultural Policy (CAP), the Cohesion Policy and the Common Fisheries Policy (CFP); Action 7: Ensuring more resilient infrastructure; Action 8: Promote insurance and other financial products for resilient investment and business decisions; Impact assessment for the strategy exists including the mentioned actions.

**Spatial coverage**

EU countries area

**Reporting units - what are the specific transposition requirements**

Member state level - Not aware of discussions on reporting level, but reporting is planned via an "adaptation preparedness scoreboard" which includes information for each Member State.

**Management unit**

Not mentioned.

**Key planning steps**

No clear planning steps are mentioned.

**Timelines**

2017 - report of Commission to European Parliament and the Council and propose the strategy's review if needed.

**Integration/coordination issues with other related pieces of legislation**

One priority and responsibility for the Commission is to mainstream adaptation measures into EU policies and programmes, as the way to 'climate-proof' EU action. Adaptation has already been mainstreamed in legislation in such sectors as marine waters, forestry, and transport; and in important policy instruments such as inland water, biodiversity and migration and mobility. The Commission staff working document on climate change, environmental degradation and migration companying this Communication provides further insight on the latter.

In addition, the Commission has tabled legislative proposals on integrating adaptation in agriculture and forestry, maritime spatial planning and integrated coastal management, energy, disaster risk prevention and management, transport, research, health, and the environment. These moves to mainstream climate change adaptation into EU policies will be pursued in priority

fields such as energy and transport.
In health policy, most human, animal and plant health measures and systems are already in place, but they need to be adjusted to whatever new challenges climate change will bring. The three Commission staff working documents on health, marine and coastal areas, and infrastructure, accompanying this Communication set out what the Commission is currently doing in this area. Forthcoming policy initiatives, in areas such as invasive alien species (2013), green infrastructure (2013), land as a resource (2014-15), and a new Forest Strategy (2013) are also expected to consider adaptation. Guidelines on adaptation and coastal zone management are being formulated (2014), and guidelines on adaptation and the Natura 2000 network are shortly to be issued (2013). Infrastructure projects, which are characterized by a long life span and high costs, need to withstand the current and future impacts of climate change. Building on the recent mandate to assess the climate change implications for Eurocodes, our work with standardisation organisations, financial institutions and project managers needs to analyse to what extent standards, technical specifications, codes and safety provisions for physical infrastructure should be strengthened to cope with extreme events and other climate impacts.
Disaster insurance has a generally low market penetration rate at the moment in Member States. Discussions should take place with stakeholders on the basis of the Green Paper on the insurance against natural and man-made disasters.
Action 6: Facilitate the climate-proofing of the Common Agricultural Policy (CAP), the Cohesion Policy and the Common Fisheries Policy (CFP). Guidance is being provided as part of the Strategy on how to further integrate adaptation under the CAP and the Cohesion Policy. Similar guidance will be issued in 2013 for the CFP. It is aimed at managing authorities and other stakeholders involved in 2014-2020 programme design, development and implementation. Member States and regions can also draw on the 2014-2020 Cohesion Policy and CAP to address the knowledge gaps and invest in the needed analyses, risk assessments, tools and build up capacities for adaptation.
Action 7: Ensuring more resilient infrastructure In 2013 the Commission will launch a mandate for European standardisation organisations to start mapping industry-relevant standards in the area of energy, transport and buildings, identifying standards to be revised for better inclusion of adaptation considerations. It will also provide with the Strategy guidelines for project developers working on infrastructure and physical assets, with a view to climate-proofing vulnerable investments. Drawing on the results of its Communication on Green Infrastructure, the Commission will in 2013 explore the need for additional guidance for authorities and decision makers, civil society, private business and conservation practitioners to ensure the full mobilisation of ecosystem-based approaches to adaptation.
Action 8: Promote insurance and other financial products for resilient investment and business decisions. The Green Paper on the insurance of natural and man-made disasters, adopted together with this Strategy, is a first step in encouraging insurers to improve the way they help to manage climate change risks. The Commission's aim is to improve the market penetration of natural disaster insurance and to unleash the full potential of insurance pricing and other financial products for risk-awareness prevention and mitigation and for long-term resilience in investment and business decisions (2014-2015).
The SWD (2013) 133 - Climate change adaptation, coastal and marine issues refers to several interlinkages between the EU Adaptation Strategy and further EU policies:
WFD: In the context of the implementation phase of this Directive, almost half of river-basin management plans specifically address specific climate change adaptation measures.
The Floods Directive: also provides attention to the impacts of coastal floods. In early 2012, Member States reported to the European Commission preliminary flood risk assessments of their river basins and associated coastal zones to identify areas where potential significant flood risk exists. The assessment of the reported data has started and should also draw attention to the

extent to which climate change has already been considered.

In 2009, the Water Directors of the EU Member States issued a guidance document on adaptation to climate change in water management72. The guidance provides approaches on how to take climate change into account in the implementation of the Water Framework Directive, the Floods Directive and the Strategy on Water Scarcity and Droughts. Moreover, the Common Implementation Strategy activity on "Climate Change and the EU Water Policy" aims to, among other things, "identify what can and should be done in the different upcoming River Basin Management planning cycles" in relation to climate change impacts and adaptation.

MSFD: The Marine Strategy Framework Directive, the environmental pillar of the Integrated Maritime Policy (IMP) is aiming for the implementation of an integrated, adaptive and ecosystem-based approach to the management of human activities at sea and on the coast. The objective is to achieve, by 2020, the Good Environmental Status (GES) of all European marine and coastal waters.

Integrated Coastal Management: In March 2013 the Commission adopted a proposal for a Directive establishing a framework for maritime spatial planning and integrated coastal management. The proposal aims to ensure that the growth of increasing maritime activities at sea and the use of resources at sea and on coasts remain sustainable. The proposed action will require Member States to establish maritime spatial plans and integrated coastal management strategies by applying an ecosystem-based approach that, among others, should contribute to ensuring climate resilient coastal and marine areas.

Natura 2000, Habitats and Birds Directives: The Natura 2000 network of areas of high biodiversity value, established under the Habitats and Birds Directives protects a large share of coastal and marine regions. The priority to protect marine ecosystems and their aquatic species has been reinforced by the EU 2020 Biodiversity Strategy. The effective management and restoration of Natura 2000 sites reduces non-climate pressures and increases resilience to climate change. The Commission services will shortly issue guidelines on climate change and Natura 2000 targeted at site managers and policy makers. This will underline benefits from Natura 2000 sites in mitigating the impacts of climate change, reducing vulnerability and increasing resilience, and how adaptation of management for species and habitats protected by Natura 2000 can be used to tackle the effects of climate change84. The establishment of green infrastructure and other ecosystem-based approaches to adaptation can be promoted by this framework, which can increase the resilience of coastal areas to climate change. The possible movement of species due to changing climate. There are also interlinkages with international processes, e.g. United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC reporting, for example, includes in the regular National Communications a section on climate impacts and adaptation.

**Coordination issues with the EU Biodiversity Strategy**

EU Adaptation Strategy's Action 7: "Ensuring more resilient infrastructure" includes the use of ecosystem-based approaches and interlinks with the Commission's Communication on Green Infrastructure. Refers to Target 2 of Biodiversity Strategy. In the Commission SWD (2013) 133 ecosystem-based approaches are also mentioned especially for adaptation of coastal areas. Also in SWD (2013) 133 green infrastructure and ecosystem-based approaches are mentioned as important adaptation measures. Refers to Target 2 of Biodiversity Strategy.

EU Adaptation Strategy's Action 6: "Facilitate the climate-proofing of the Common Agricultural Policy (CAP), the Cohesion Policy and the Common Fisheries Policy (CFP)" refers to Target 3 of Biodiversity Strategy.

Also EU Adaptation Strategy's Action 2: "Provide LIFE funding to support capacity building and step up adaptation action in Europe. (2013-2020) "includes as one vulnerable area: "mountain and island area, with emphasis on sustainable and resilient agricultural, forestry and tourism sectors" which also refers to Target 3 of Biodiversity Strategy.

**Relevance to ecosystems/habitats?**

Action 2: Provide LIFE funding to support capacity building and step up adaptation action in Europe. (2013-2020). The Commission will promote adaptation particularly in the following vulnerable areas: cross-border management of floods, fostering collaborative agreements based on the EU Floods Directive; trans-boundary coastal management, with emphasis on densely populated deltas and coastal cities; mainstreaming adaptation into urban land use planning, building layouts and natural resources management; mountain and island areas, with emphasis on sustainable and resilient agricultural, forestry and tourism sectors; sustainable management of water; combating desertification and forest fires in drought-prone areas.

The Commission will support the establishment of vulnerability assessments and adaptation strategies, including those with a cross-border nature. The Commission will promote awareness-raising on adaptation, including indicators, risk communication and management. Page 2/3: However, some regions are more at risk than others. The Mediterranean basin, mountain areas, densely populated floodplains, coastal zones, outermost regions and the Arctic are particularly vulnerable. Ecosystems and the services they provide are suffering from the adverse impacts of climate change, which is accelerating the decline of biodiversity and reducing their ability to buffer natural extremes. Climatic changes will have consequences for the availability of basic natural resources (water, soil) leading to significant changes in conditions for agriculture and industrial production in some areas.

In the SWD (2013) 133 - Climate change adaptation, coastal and marine issues the following concrete by climate change affected marine and coastal ecosystems are mentioned: coastal wetlands, coastal ecosystems as dunes and barrier beaches, salt marshes and mangroves, Marine fish populations (native species), non-native species to expand into regions where they previously could not survive with consequences on species composition of the different marine ecosystems.

Ecosystems affected/impacted by Adaption Strategy: All. Especially vulnerable areas: Alpine areas, coastal and marine ecosystem, rivers, forest in Southern Europe.

As mentioned above: rivers (especially in Southern Europe) and coastal and marine ecosystems are mentioned as affected ecosystems. But also the focus on agriculture, forestry, flood management will have an influence on aquatic biodiversity and ecosystem services (especially via mainstreaming in CAP).

**Drivers**

Drivers not especially defined in the strategy. Drivers which the legal act/policy address include activities which lead to increase of greenhouse gas emissions. No indicators.

**Pressures**

Pressures not especially defined in the strategy. Pressures which the legal act/policy address: Global climate Change -> increase of average global air temperature. No indicators.

**Assessment of Environmental State**

The following parameters are only mentioned very briefly in the strategy: Tropical nights (heat waves); Change in precipitation (droughts, flooding); Change in fire danger; Effects of floods; Coastal flooding. No indicators.

**Data**

A scorecard per Member State will be developed. The overall structure of the scoreboard is as follows: First, each Member State's policy framework will be recalled, indicating whether adaptation strategies and action plans have been adopted at national and sub-national level. Second, the scoreboard per se focuses on information to be collected for each of the "five steps" of adaptation policy making[39]: (i) preparing the ground for adaptation; (ii) assessing risks and

[39] See above for references to Adaptation Support tool on climate-ADAPT and to the guidelines on developing adaptation strategies. Please note however that for convenience, steps 3 and 4 of the "adaptation support tool" are here merged.

vulnerabilities to climate change; (iii) identifying and assessing adaptation options; (iv) implementing adaptation action; (v) monitoring and evaluation of adaptation activities. Within each of the five steps, main performance areas are defined. They form the core of the scoreboard and correspond to necessary components generally considered for an effective adaptation policy-making process. Fourth, within each area, key domains of relevance are highlighted. They provide details on an array of issues to be considered to successfully deliver on each performance area. Source: Note to the Working Group 6 on adaptation under the Climate Change Committee and to the national contact points on adaptation, The adaptation preparedness scoreboard, Final version. The scoreboard is under development and the data is not publicly available yet. The ClimateAdapt-web platform collects and publishes information on climate adaptation in Europe. The platform includes project results from large EU research projects but also smaller local initiatives can integrate their experiences and approaches. ClimateAdapt contains individual pages for the adaptation process in the EEA Member States including policy & legal framework, information & assessment, sectors & actions, engaging stakeholders. Information on the "countries section" is submitted by EEA Member countries based on official reporting towards the European Commission under the MMR regulation[40] and voluntary updating.

**Funding**

No funds are directly associated with the strategy. But the strategy has the objective to mainstream adaptation in other policies and their funding streams. LIFE programme is mentioned very prominent as one area of Action in the Strategy. The LIFE Programme for the Environment and Climate Action is the EU's key dedicated funding tool to support innovative climate action projects. The programme will provide €864 million in co-financing between 2014 and 2020 for climate action projects, including adaptation issues such as cross-border management of floods, trans-boundary coastal management, mountain and island areas, urban adaptation and sustainable management of water. Part of the funding will be allocated through a new financial instrument, the Natural Capital Financing Facility, to support innovative financing approaches for projects promoting the preservation of natural capital that address adaptation aspects (EU Adaptation Factsheet).

Improved access to funding will be a critical factor in building a climate-resilient Europe. Based on a proposal put forward by the Commission, the European Council concluded on 7-8 February 2013 that 'Climate action objectives will represent at least 20% of EU spending in 2014-2020 Multi-annual Financial Framework (MFF). It is strategically important for such investment to be climate-resilient. Specifically, the Commission has included climate change adaptation in its proposals for all relevant EU finance programmes for 2014-2020. The European Structural and Investment funds as well as Horizon 2020 and the LIFE programme will provide significant support to Member States, regions and cities to invest in programmes and projects on adaptation, especially in the framework of the dedicated Investment Priorities on adaptation in the ERDF and Cohesion Fund. A particular effort is made to mainstream climate action into the European structural and investment funds. These funds constitute about 43% of the budget of the Union in the period 2014-2020. Climate-related expenditure is estimated to amount to more than €110 billion, close to one quarter of the funds (EU Adaptation Factsheet).

Investments via Cohesion Fund could include: Construction of blue and green infrastructure in urban areas, Retrofitting existing infrastructure (e.g. schools, hospitals), Flood and coastal defence risk management, Leakage reduction in water distribution network, Construction of rain overflow basins and new drainage systems, Upgrading or construction of climate resilient waste disposal facilities, Construction of climate resilient rail and roads infrastructure, Realignment of

[40] Monitoring Mechanism Regulation (Regulation (EU) No 525/2013)

existing roads, and Enhancing institutional capacity and efficiency in program implementation (EU Climate Mainstreaming Factsheet 3). European Social Fund's investments can cover establishment of Community-led climate adaptation strategies, career guidance professionals/advisors, adapting educational training as well as tertiary education considering climate resilience in buildings, climate resilient urban environments and changes to climate resilient economy (EU Climate Mainstreaming Factsheet 5).

European Regional Development Fund's investments could go into Establishing and supporting adaptation-oriented clusters that combine research and business, Enhancing access to, use and quality of Information and Communication Technologies (ICT), Enhancing the competitiveness of SMEs, Supporting the shift towards the low-carbon economy, Supporting networks in coping with major incidents and disasters, Construction of green infrastructure in urban areas, Development and implementation of Adaptation strategies, Leakage reduction in water distribution networks, Construction of rain overflow basins, Upgrading or construction of waste disposal facilities, Construction of rail and road infrastructure, Realignment of existing roads, Development of business incubators and investment support for self-employment and business creation in new areas for growth, Investments in education and training Infrastructure, Enhancing institutional capacity and efficiency in programme implementation (EU Climate Mainstreaming Factsheet 2).

Investments via European Territorial Cooperation under the European Regional Development Fund (ERDF) could include Establishing and supporting adaptation-oriented clusters that combine research and business, Enhancing access to, use and quality of Information and Communication Technologies (ICT), Enhancing the competitiveness of SMEs, Supporting the shift towards the low-carbon economy, Supporting networks in coping with major incidents and disasters, Tackling cross-boundary adaptation challenges, Tackling transnational adaptation challenges, Tackling shared adaptation challenges, Adaptation planning tools for urban areas, Protecting biodiversity, soil protection and promoting ecosystem services including NATURA 2000 and green infrastructure, Ensuring transport infrastructure is climate-resilient, Development and implementation of macro-regional and sea-basin strategies (EU Climate Mainstreaming Factsheet 4).

European Agricultural Fund for Rural Development (EAFRD) could cover following adaptation investments: establishing Climate change sub-programmes, for example, developed on avoidance of damage from extreme events, avoidance of heat stress, improved water management and improved soil management, forest management and risk management. Sub-programmes may also refer to climate change hotspots, such as the condition of organic soil matter, the maintenance of wetlands and peat, lands, and the level of methane emissions. Furthermore, Knowledge transfer and information actions on new sowing cycles, climate change risks and adaptation tools. Advisory services, farm management and farm relief services could be adjusted to the mentioned topics. Investments in physical assets such as on-farm water storage installations for drought periods, highly efficient irrigation systems, investments in farm buildings and installations to cope with heat and water stress. Investments in hard and soft infrastructure to manage climate hazards (e.g. flood risk and volatility in water supply). Business plans including climate adaptation considerations and cost estimations. Climate proofing of local development plans, measures to adapt small scale infrastructure (water supply, energy production etc.). Forest management actions to preserve and improve the ecosystem services provided by forests which help with climate resilience. Establishment of agroforestry systems. Prevention and restoration of damage to forests from forest fires and natural disasters and catastrophic events. Investments improving the resilience, and environmental value of forest ecosystems. Actions which reduce the impact of climate hazards, such as introduction of resilient crops, crop rotation, intercropping, undersowing and cover crops, terrace cultivation, hedges and buffer strips. Organic farming. Natura 2000 and Water Framework Directive payments for actions which reduce the impact of climate hazard.

Development of risk analysis models and modus operandi for assessment and management of changing climate hazards; creation or modification of existing insurance and compensation funds and schemes according to changing hazards. Introduction of climate proofing and climate mainstreaming as an integral element of Local Development Strategies, promoting of "climate resilient regions" (EU Climate Mainstreaming Factsheet 6).

Moreover, several EU funds and international financing institutions, such as the European Investment Bank and the European Bank for Reconstruction and Development, also support adaptation measures. The Commission will explore further ways of accommodating some adaptation investment expenditure, such as expenditure co-financed by the EU in the assessment of Stability and Convergence Programmes. In addition, there are specific funds – including at national level – and public financial institutions that support adaptation action, e.g. on flood control and drought management. Climate-ADAPT will be providing more information on potential sources of funding. Member States can also use EU ETS auction revenues as a source of financial support for adaptation. To ensure successful implementation, authorities in the Member States are encouraged to develop synergies between the various funding streams, especially EU funding and support programmes in order to strengthen the impact of investments and avoid, where possible, funding gaps.

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**Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization** (IOC-UNESCO) | France
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**Fundación IMDEA Agua** (IMDEA) | Spain
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# Synergies and Differences between Biodiversity, Nature, Water and Marine Environment EU Policies

## Deliverable 2.1 – ANNEXES

## Threats and EBM Annex

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 642317.

| | |
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# About AQUACROSS

Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies (AQUACROSS) aims to support EU efforts to protect aquatic biodiversity and ensure the provision of aquatic ecosystem services. Funded by Europe's Horizon 2020 research programme, AQUACROSS seeks to advance knowledge and application of ecosystem-based management (EBM) for aquatic ecosystems to support the timely achievement of the EU 2020 Biodiversity Strategy targets.

Aquatic ecosystems are rich in biodiversity and home to a diverse array of species and habitats, providing numerous economic and societal benefits to Europe. Many of these valuable ecosystems are at risk of being irreversibly damaged by human activities and pressures, including pollution, contamination, invasive species, overfishing and climate change. These pressures threaten the sustainability of these ecosystems, their provision of ecosystem services and ultimately human well-being.

AQUACROSS responds to pressing societal and economic needs, tackling policy challenges from an integrated perspective and adding value to the use of available knowledge. Through advancing science and knowledge; connecting science, policy and business; and supporting the achievement of EU and international biodiversity targets, AQUACROSS aims to improve ecosystem-based management of aquatic ecosystems across Europe.

The project consortium is made up of sixteen partners from across Europe and led by Ecologic Institute in Berlin, Germany.


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# 4 Template for Drivers-Pressures-State (DPS) Analysis of Key Threats to Aquatic Biodiversity

## Instructions for the analysis of the Relevance Criteria

*This template aims to provide a common structure and ensure consistent reporting of the analysis proposed for the Relevance Criteria in WP2 of AQUACROSS.*

*Background*

*The key target outcome of the assessment of Relevance is an analysis of the ways in which European policies positively or negatively influence aquatic biodiversity conservation. Aquatic biodiversity is defined as the range of species and habitats existent in the freshwater, coastal and marine realm. However biodiversity conservation is not solely dependent on the protection of species and habitats, but also on the maintenance of environmental conditions conducive to species and habitats richness. A sole focus on direct threats to species and habitats (e.g. extraction of species, habitat loss) would have been too narrow, and a broader examination of threats was necessary. A review of key threats to European aquatic biodiversity was prepared (see background document). The assessment of Relevance aims to characterise how European policies influence these key threats -their temporal and spatial scale dynamics, the underpinning socio-economic drivers and how European policies influence them. The assumption is that, if a threat is minimised or reinforced, biodiversity is impacted, respectively, positively or negatively.*

*Overview of the approach*

*The assessment of Relevance will be carried out for each key threat identified in the background document. To structure the analysis and map policies against each threat, it is proposed to use the DPSIR framework, focusing in particular on the Drivers-Pressures and State components as well as Response.*

*Three steps are envisaged in the assessment of Relevance:*

- Step 1: description of Drivers and Pressures linked to each key threat. In the background document, key threats were associated with broad groups of Pressures. The objective of this step is to characterise the range of specific pressures within that group and the underpinning drivers.
- Step 2: Description of state (and status) link to each key threat. The objective of this step to characterise the environmental condition of freshwater, coastal and marine waters, with a focus on those parameters that are affected by the identified Pressures.
- Step 3: Mapping of European and international policies against the Drivers-Pressures-State. The objective of this step is to characterise how policies influence (positively or negatively) the key threat.

*Definitions*

*As a reminder, the following definition of Drivers, Pressures and State were developed in WP2 of AQUACROSS:*

***Drivers:*** *factors (human activities and uses of aquatic environments) that induce pressures on the environment. These are represented by socio-economic industry and sector activities (e.g. agriculture, fishing, shipping, water management, etc.), which may subsequently change an aspect of an aquatic ecosystem.*

***Pressures:*** *the direct or indirect effect of a driver (e.g. emissions of pollutants, alterations to flow or morphology). This effect can either have a positive or negative change to a physical, chemical or biological characteristic of an aquatic environment compared with its background levels. A pressure has the potential to impact any part of the ecosystem (e.g. its functioning, structure, provision of ecosystem services).*

***State:*** *the environmental condition of an aquatic ecosystem as described by its physical, chemical and biological parameters. Physical parameters encompass the quantity and quality of physical phenomena (e.g. temperature, light availability). Chemical parameters encompass the quantity and quality of chemicals (e.g. atmospheric $CO_2$ concentrations, nitrogen levels). Biological parameters encompass the condition at the ecosystem, habitat, species, community, or genetic levels (e.g. fish stocks or biodiversity).*

*Suggested sources*

*Much of the analysis can start from the templates completed in Autumn 2015, although additional information will need to be collected. Relevant EU Commission documents, together with relevant EEA reports and if necessary scientific publications*[1] *:*

- EC overview of Biodiversity Strategy implementation: http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm
- EC overview of Birds and Habitats Directive implementation:
- http://ec.europa.eu/environment/nature/knowledge/rep_habitats/index_en.htm
- http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:219:FIN
- EC overview of WFD implementation: http://ec.europa.eu/environment/water/water-framework/pdf/4th_report/COM_2015_120_en.pdf
- EC overview of WFD PoM implementation: http://ec.europa.eu/environment/water/water-framework/pdf/4th_report/CSWD%20Report%20on%20WFD%20PoMs.pdf
- EC overview of MSFD implementation: https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp
- EC guidance: http://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm
- EEA State of Nature: http://www.eea.europa.eu/publications/state-of-nature-in-the-eu/
- EEA biodiversity baseline indicators: http://www.eea.europa.eu//publications/eu-2010-biodiversity-baseline-revision
- EEA State of the Environment: http://www.eea.europa.eu/soer
- EEA State of Europe's water: http://www.eea.europa.eu/publications/european-waters-assessment-2012
- EEA state of Europe's seas: http://www.eea.europa.eu/publications/state-of-europes-seas
- Other thematic reports are likely to be available on the EC and EEA web-sites.

[1] As a starting point, please use references from the "Key threats to aquatic biodiversity" review.

Table 1: Template Used for the DPS Analysis of Key Threats to Aquatic Biodiversity

| Name of key threat to aquatic biodiversity |
|---|
| *Insert the name of the key threat explored in this template* |
| **1. Overview: what is the threat doing to aquatic biodiversity?** |
| *Describe the cause-and-effect link between the "threat" and biodiversity change. This description should include the state-of-the-art knowledge on the effect of specific Pressures on the loss of species and habitat diversity. The text should be qualitative in scope and focus on describing the relationship, so the reader can rapidly grasp how the threat can lead to biodiversity loss.*<br>*Specific quantitative information on Pressures (and sub-pressures) and biodiversity are presented respectively in Section 2.1 and Section 3.1.*<br>*Focus on the relationships that are prevalent in Europe.*<br>*Proposed length: half a page* |
| **2. Drivers and Pressures** |
| **2.1. Key Drivers and Pressures** |
| *Describe the specific pressures and their underpinning drivers associated with the "threat". Each "threat" represents a broad group of Pressures (e.g. input of nitrogen). Within this group several "sub-pressures" exist (e.g. discharge of wastewater, fertiliser application). In addition several Drivers are linked to each sub-pressure. For clarity, it may be useful to describe for each driver the range of sub-pressures it may impose (e.g. agriculture is associated with both fertiliser application and discharge of wastewater). The text should present quantitative information on the significance of each sub-pressure and drivers in the context of Europe.*<br>*Describe past, present and future trends of sub-pressures. The objective is to provide the reader with an understanding of the significance of the sub-pressure over time, in particular if trends are favourable or worsening.*<br>*The text should present quantitative information. The focus is on Europe as a whole, but significant regional differences should be highlighted. Where possible, information that provides an overview across aquatic realms should be presented although it is recognised that such level of information may not exist and figures specific for each realm may instead be acceptable.*<br>*Please limit the use of graphs/figures/table to one which is most informative/relevant.*<br>*Proposed length: half-a-page to one page* |
| **2.2. Socio-economic description of the Drivers** |
| *This section presents a snapshot of the sector (briefly describes what the sector does in general) and its significance for the European economy in terms of economic and production outputs, employment, etc.. This can provide a better understanding of the economic importance and political importance of the sector.*<br>*Proposed length: half-a-page to one page* |
| **2.3. Description of market condition and broad regulatory context of Drivers** |
| *This section aims to provide a more comprehensive view of what influences the drivers identified in section 2.1. This is thus not about the environmental (threats) dimensions of the sector but is broader in scope: it should provide an idea of the broad market and regulatory context (at European level) in which the sector evolves (the analysis of policies and specific instruments influencing the intensity of the "threat" is examined in Section 4). Here, the text should be an introduction with a very brief overview of how the regulations introduced above along with the demand for goods and services is shaping the trends in the sector.* |

*Proposed length: half-a-page to one page*

### 2.4. Trends in Pressures and Drivers

*Describe the past, current and future trends for drivers identified in Section 2.1. The objective is to provide the reader with an understanding of the significance of the driver over time, in particular if trends are favourable or worsening and the reasons why. The best is to focus on medium to long term trends, for example historical data if available can put the scale of the Driver or Pressure in perspective. Otherwise 5-10 years trends are most relevant. Shorter term would probably be too prone to contextual factors.*

*The text should present quantitative information. The focus is on Europe as a whole, but significant regional differences should be highlighted. Where possible, information that provides an overview across aquatic realms should be presented, although it is recognised that such level of information may not exist and figures specific for each realm may instead be used.*

*Please limit the use of graphs/figures/table to one which is most informative/relevant.*

*Proposed length: half-a-page to one page*

## 3. Analysis of State and status

### 3.1. Biodiversity State and status

*Describe the general condition of aquatic species and habitats. The objective is to provide the reader with an understanding of how significant identified Pressures (see Section 2.1) are for biodiversity -although it is recognised that biodiversity change is dependent on multiple factors and describing the quantitative impact of specific Pressures will be difficult.*

*The main source of information may come from scientific publications, the assessments and reporting made under the Habitat Directive, focusing on aquatic ecosystems and available EEA indicators.*

*The text should present quantitative information. The focus is on Europe as a whole, but significant regional differences should be highlighted. Where possible, information that provides an overview across aquatic realms should be presented, although it is recognised that such level of information may not exist and figures specific for each realm may instead be used.*

*Please limit the use of graphs/figures/table to one which is most informative/relevant.*

*Proposed length: half-a-page to one page*

### 3.2. State and status of freshwater

*Describe the condition of freshwater on relevant physical, chemical and biological parameters. The objective is to provide the reader with an understanding of how significant identified Pressures (see Section 2.1) are on those parameters.*

*The main source of information may come from scientific publications, the assessments and reporting made under the Water Framework Directive (and daughter directives) and available EEA indicators.*

*The text should present quantitative information. The focus is on Europe as a whole, but significant regional differences should be highlighted. Where possible, information that provides an overview across aquatic realms should be presented, although it is recognised that such level of information may not exist and figures specific for each realm may instead be used.*

*Please limit the use of graphs/figures/table to one which is most informative/relevant.*

*Proposed length: half-a-page to one page*

### 3.3. State and status of coastal water

*Describe the condition of freshwater on relevant physical, chemical and biological parameters. The objective is to provide the reader with an understanding of how significant identified Pressures*

*(see Section 2.1) are on those parameters.*

*The main source of information may come from scientific publications, the assessments and reporting made under the Water Framework Directive (and daughter directives) or Marine Strategy Framework Directive and available EEA indicators.*

*The text should present quantitative information. The focus is on Europe as a whole, but significant regional differences should be highlighted. Where possible, information that provides an overview across aquatic realms should be presented, although it is recognised that such level of information may not exist and figures specific for each realm may instead be used.*

*Please limit the use of graphs/figures/table to one which is most informative/relevant.*

*Proposed length: half-a-page to one page*

### 3.4. State and status of marine water

*Describe the condition of freshwater on relevant physical, chemical and biological parameters. The objective is to provide the reader with an understanding of how significant identified Pressures (see Section 2.1) are on those parameters.*

*The main source of information may come from science, the assessments and reporting made under the or Marine Strategy Framework Directive and available EEA indicators.*

*The text should present quantitative information. The focus is on Europe as a whole, but significant regional differences should be highlighted. Where possible, information that provides an overview across aquatic realms should be presented, although it is recognised that such level of information may not exist and figures specific for each realm may instead be used.*

*Please limit the use of graphs/figures/table to one which is most informative/relevant.*

*Proposed length: half-a-page to one page*

### 3.5. Trends in State and status of freshwater, coastal and marine water

*Describe the past, current and future trends of the key parameters discussed in 3.1-3.4. The objective is to provide the reader with an understanding of the evolution of State over time, in particular if trends are favourable or worsening and the reasons why.*

*The text should present quantitative information. The focus is on Europe as a whole, but significant regional differences should be highlighted. Where possible, information that provides an overview across aquatic realms should be presented, although it is recognised that such level of information may not exist and figures specific for each realm may instead be used.*

*Please limit the use of graphs/figures/table to one which is most informative/relevant.*

*Proposed length: half-a-page to one page*

## 4. Mapping of European policies against the DPS

### 4.1. Characterisation of policies

*This section aims to present the range of European policies and policy instruments that influences the threat under examination. The objective is to assess where key international/global and European policies may influence (positively or negatively) Drivers, Pressures or State identified in Section 2 and Section 3. To do so, please fill in the Table in the accompanying template, by:*

1. ***Identifying the relevant policies and their instruments***

*The analysis is focused on the Directives and Regulations established by the European institutions, and the specific instruments/measures set out within this overarching legislation. Please note the relevant Article if the reviewed policy is a Directive (see the accompanying filled-in template for examples). Please use one row per instrument found.*

*Instruments may include regulatory ones (e.g. targets, standards, permits/quotas, bans, planning, zoning), economic ones (e.g. tariffs, taxes, charges, subsidies, trading), information ones (e.g.*

*monitoring) and network ones (e.g. awareness-raising, engagement).*

*Information will be available in WP2 policy templates. However the review did not take into account all potentially relevant Directives and Regulations. It may thus be important to double check (e.g. on the European Commission web-site) the existence of other relevant policies and consider them in this analysis.*

2. ***Describing the key characteristic of the policy instrument and how it intensifies or reduces the threat***

*For each instrument, please provide a short description (2-4 lines) of how it is linked with the threat. This description should provide the necessary details to understand how a particular instrument may influence the threat.*

3. ***Indicating where the level at which the instrument influence the threat along the D-P-S***

*At the level of State, when the policy establishes relevant standards and targets on the environmental condition of an aquatic ecosystem as described by its physical, chemical and biological parameters, or aims to directly restore these environmental conditions (e.g. restoration of habitat).*

*At the level of Pressures, when the policy targets the direct or indirect effect of a driver (e.g. emissions of pollutants, alterations to flow or morphology). This includes for example end-of-pipe pollution measures (e.g. requirements for building wastewater treatment plant, incentives on using green infrastructure).*

*At the level of Drivers, when the policy influences the human activities and uses of aquatic environments that induce pressures. This includes for example influencing the type of production system (e.g. ban on phosphorus-rich detergents), land use (e.g. incentivising low intensive grassland in agriculture) or practices (e.g. restrictions on agricultural fertiliser use, taxing sediment removal/dredging in aquatic bodies).*

4. ***Concluding on whether the relationship between the instrument and the threat is "positive" or "negative".***

*A relationship is deemed "positive" when the instrument/measure reduces intensity of drivers or pressures or aims to restore state. A relationship is deemed "negative" when the instrument/measure increases intensity of drivers or pressures or aims to restore state. The relationship should be described qualitatively, but illustrative examples can be used to help the reader understand the concrete implementation of an instrument/measure envisaged in the European policy considered.*

# 5 Threats Analysis

## 5.1 Input of Nitrogen

Authors: Terri Kafyeke and Josselin Rouillard, Ecologic Institute

### Overview

Aquatic ecosystems in Europe and their biodiversity are being significantly damaged by **nitrogen enrichment** (ETC, 2010; EEA, 2015c). Because nitrogen is usually a limiting nutrient in aquatic environments, nitrogen enrichment can increase plant growth and lead to numerous disruptions, including changes in nutrient cycling, uncontrolled growth of algae, eutrophication and acidification, increase of organic matter settlement, stimulation of cyanobacteria blooms, oxygen depletion (hypoxia), and mortality of benthic fauna and fish (EEA, 2015). Nitrogen pollution has also been identified as a cause of Phaeocystis ('sea foam') blooms. If nitrogen leaches into groundwater, it ultimately reaches surface rivers and ends up impacting freshwater bodies such as wetlands, lakes and rivers, in addition to terrestrial ecosystems that interact with these water bodies (ETC, 2010). In addition to disrupting the food web and overall species composition (EEA, 2015c), these impacts can negatively impact fisheries, shellfish culture, tourism and biodiversity, most of these also leading to losses in revenue (Perrot et al., 2014 in EEA, 2015).

### Drivers and Pressures

#### Key Drivers and Pressures

Overall, human activities have historically more than tripled the supply of nitrogen into the environment in Europe (Erisman et al., 2011). Between 1985 and 2005, the greatest contributor to nitrogen load was agriculture (1800–3100 ktN/yr), followed by point sources (920–1030 ktN/yr), and atmospheric deposition, scattered dwellings and biological fixation (800–1200 ktN/yr) (EC JRC–IES, 2011). Nitrogen is released in the environment by multiple human activities.

**Agriculture** contributes more than half of nitrogen inputs to Europe's marine waters (EEA, 2015). Diffuse pollution from agriculture is considered a significant pressure in at least 40% of European river and coastal water bodies and 33% of lakes and transitional water bodies, most of which is linked to nitrate pollution (EEA, 2012). Point source nitrate pollution from agriculture is a significant pressure in 12 Member States (EC, 2015). Diffuse nitrogen pollution from agriculture mostly originates from leaching and run-off of nitrogen from mineral and organic nitrogen-based fertilisers on crops and pasture land, as well as from the manure of grazing cattle. Point source pollution mostly originates from the discharge of manure through wastewater outlets of cattle production barns and farm buildings.

In Europe, **mineral fertilisers** are the greatest source of nitrogen input into agricultural soils (representing close to half of total input), with manure being the second most important source (EEA, 2012). Nitrogen surpluses occur when more nitrogen is applied to agricultural land across than what is required by crops and grassland. Between 2008 and 2011 the average nitrogen surplus for the EU-28 amounted for 47 kg nitrogen per ha, with higher surpluses for Western Europe as opposed to Eastern Europe (EEA, 2015).

Point sources of nitrogen occur through discharges from **sewerage and wastewater** into surface water and leaching of sewerage and wastewater from scattered housing. With high levels of the population in the EU countries living in urban agglomerations, a significant fraction of wastewater is collected by sewers connected to public wastewater treatment plants. Urban wastewater treatment is a significant pressure in all member states (EC, 2015).

There are three types of treatment and they have different impacts on the nitrogen content of wastewater. Primary treatment is mechanical, and consists of removing suspended solids from the wastewater. This step does not remove ammonium from water. Secondary treatment is biological and removes organic matter and nutrients by using microorganisms (both aerobic and anaerobic). This leads to the removal of 20-30% of nutrients, which are retained by the microorganisms, and 75% of ammonium. Finally, tertiary treatment removes organic matter, and sometimes also nitrogen. The type of treatment used by a Member State is a good indicator of the purification of water and its potential effect on aquatic ecosystems. The same goes with compliance with the Urban Waste Water Treatment Directive (EEA, 2015b).

**The transport, industrial and energy sectors** contribute to nitrogen emissions through the combustion of fossil fuels and the subsequent atmospheric deposition, primarily during rain showers. Large parts of Europe are exposed to high levels of N-deposition. In 2013, the EU emitted over 8 million tones of nitrogen oxides into the atmosphere, with over 3 million of these from road transport and around half a million from non-road transport (Eurostat, 2016). The rest of the emission came from industrial processes such as energy production or transformation processes and from volatilised nitrogen from intensive agricultural systems. Atmospheric deposition can be very significant compared other sources of anthropogenic input (e.g. fertilizers). For example, deposition rates between 10 kg N /ha up to around 34 kg N /ha have been observed in countries such as Germany, Northern Italy, Belgium and the Netherlands (ETC 2010). About 25% of the overall nitrogen input to the Baltic Sea is caused by nitrogen deposition and 6% in the North Sea (EEA, 2015). In Europe in 2008, 34 million tonnes of nitrogen were produced industrially. One fourth was produced for the chemical industry, to produce rubbers and plastics or for further use in the oil and metal industry (Grizzetti et al., 2011).

**In aquaculture**, surplus feed can also be a source of nitrogen (EEA, 2015c). Aquaculture also leads to nitrogen pollution through another pathway: $N_2O$ emissions to the atmosphere.

## Socio-economic description of the Drivers

**Agriculture** is a major sector in Europe (Table 1), using 40% of the total land area of the EU (EU DG AGRI, 2013). In 2010, about 60% of EU-28 farmland was used as arable land, mainly to produce cereal, while 34% was meadow and permanent grassland. A further 6.1% was covered by permanent crops (e.g. vineyards, olive trees and orchards). Since the 2nd World War, European agriculture has undergone a process of intensification relying on increased use of fertiliser to boost production. Intensification is associated with specialisation of production system, increased crop monoculture and a consolidation of holdings towards fewer but larger and more competitive holdings. This process is still on-going at a high rate: the number of agricultural holdings stood decreased by 3.7% annually between 2005 and 2013 while the average farm size increased by 12.2% and Standard Output per holding, which is a measure of the economic farm size, increased by 21% between 2010 and 2013.

It is possible that fertilizer application in Europe may increase (Erisman et al., 2009), in particular due to increased demand for cereals. In terms of tonnage, cereal (including rice) production is already the biggest crop with 306 million tonnes in 2013, compared to about 109 million tonnes

of sugar beet and 53.9 million tonnes of potatoes (Eurostat, 2016d). Cereal production has followed an upward trend in recent years and is expected to grow to 320 million by 2025, mainly due to combination of feed demand, export markets and the expansion of biofuel use in transport (EU, 2015). However, large uncertainties remain and future evolution may vary significantly across Europe. For example, a recent study predicts that arable land will drop from 86 Mha to 76 Mha in Western Europe, while increasing from 266 Mha to 273 Mha in Eastern Europe (Bouwman et al., 2005 in Grizzetti et al., 2011).

EU agriculture also produces a range of different agricultural products from animals; mainly, dairy products and meat. In 2013, a total of 141 million tonnes of cow milk were collected in the EU-28, while about 22 million tonnes of pig meat and about 7 million tonnes of beef and veal meat were produced (Eurostat, 2016d). EU poultry meat production is expected to expand over the outlook period by close to 4%, while consumption could increase only marginally (EU, 2015). More intensive cattle farming could lead to increased nitrogen emissions from farms.

Table 2: Economic Importance of the Sector for the European Economy

| | Significance to European economy |
|---|---|
| Agriculture | 10.8 million farms operated in the EU-28 in 2013<br>Gross value-added of the sector at basic prices (Mio EUR) in 2012 is around 160 billion Euro<br>Share of agriculture in EU 27's GDP (GVA/GDP): 1.2%<br>Regular agricultural workers account for 22 million jobs in 2013 (EU DG AGRI, 2013) or 5% the EU's total civilian working population (including agriculture, forestry, fishing and hunting sectors)<br>*Source: EU DG AGRI, 2013; EU DG AGRI, 2015* |
| Water services | Turnover of €95 billion in 2010; Top five companies (Suez, Veolia, SAUR, Abgar and RWE) representing 32% of the global market are European |
| Chemical industry | 1.2 million employees; generates €551 billion; fifth largest industry of Europe; contributes 7% of Europe's manufacting added value; 17% of global production.<br>Source: CEFIC, 2016 |
| Transport | Turnover for road freight transport: €312 Billion; 2 945 700 employees<br>Turnover for road passenger transport: €121 Billion; 1 988 500 employees<br>EU DG MOVE, 2015 (2012 figures)<br>Value of this transport mode to overall trade: 1,733.7 billion EUR, or 50.7% of trade in the EU<br>Source: EC, 2015a |
| Aquaculture | Gross value added of aquaculture: EUR 1.500 million (EU 28)<br>80 000 employees in a full time equivalent of around 27 000 jobs<br>Source: STECF 2013b and 2013c in EEA, 2015c<br>8th biggest aquaculture producer in the world; Source: EC, 2016b |

**The wastewater treatment market** is greatly dependent on population, and the EU's population (507 million in 2013) is expected to slowly grow by about 5% by 2050[2] before hitting a peak and slowly declining. This means that in the next three decades an increasing number of people will be generating nutrient-rich wastewater that will require some form of treatment before being released in the environment. Most of this population growth is happening in cities (EEA, 2016b). This means that the sized of agglomerations falling within the urban wastewater treatment requirement is growing, resulting in a direct expansion of the waste water treatment market.

[2] http://ec.europa.eu/economy_finance/structural_reforms/ageing/demography/index_en.htm

Currently, Central European Member states have the highest rate of connection to waste water treatment (90%), which is ten percent more than their Northern and Southern European counterparts. Eastern Europe lags behind with a 67% connection, which is still better than South-East Europe's 40% average connection rate.[3]

**The chemical industry** is the main source of nitrogen from industrial activities (25% of direct N emissions to water). The chemical sector plays a large role in the EU economy (Table 1).

Nitrogen emissions from transport are mostly from **road transportation and shipping**. Road freight and passenger transport are important parts of the European economy as is shipping (Table 1). While road freight experienced a constant growth since the 2nd World War, shipping in Europe has significantly increased following the growth of the import and export market of raw materials and commodities through the combination of globalisation, EU enlargement and the steady growth of developing economies (i.e. China). Road transport accounted for 49.4% of total good transport within the EU while inland waterways for about 4% and intra-EU maritime transport 31% (EC, 2015b). Shipping represents about 75% of all imported and exported goods by weight in Europe (EC, 2015a).

The transport sector is likely to continue growing alongside economic development, as demonstrated by the recovery in traded goods through shipping in 2010 after the global financial crisis (Eurostat, 2010; COWI, 2015). This poses challenges with regards to the control of atmospheric nitrogen emissions.

24% of Europe's seafood supply came from **aquaculture** in 2011 (EUMOFA, 2014 in EEA, 2015c). 43% of aquaculture products consumed in the EU were also farmed in the EU (EC, 2016b). In 2011, half of farmed aquaculture products were molluscs and crustaceans. They were followed by seawater fish (27%) and freshwater fish (23%) (EC, 2016b). Globally, aquaculture is growing annually by 7% (FAO, 2014a and 2014 in EEA, 2015c). However, in Europe, consumption per capita has decreased in recent years while demand for organic aquaculture products has grown rapidly (EUMOFA, 2015).

## Description of market condition and broad regulatory context of Drivers

EU policies supporting the expansion of sectoral activities can contribute to intensifying the nitrogen threat onto aquatic ecosystems. The main mechanisms for supporting growth in the EU occur through a variety of financing mechanisms. The most significant policies for the intensification of the nitrogen threat are part of **the EU Common Agricultural Policy (CAP)** which aim is threefold: to improve agricultural productivity and ensure a stable supply of affordable food, to enable farmers to make a "reasonable living", and to address climate change and sustainable management of natural resources.

The CAP is defined by a number of basic legislative acts. The European Agricultural Guarantee Fund Regulation (1306/2013) (EAGF) and the Direct Payment Regulation (1307/2013) establishes the rules for financial support for farmers to stabilise their income (EU budget of about €290 billion between 2014 and 2020). The Market Regulations (1308/2013) establishes a set of rules which regulates agricultural markets in the European Union.[4] Although direct payment is

[3] http://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment/urban-waste-water-treatment-assessment-3

[4] These rules are part of the Common Market Organisation which builds on the rules for the common market in goods and services with specific policy tools that help improve the functioning of agricultural markets. The

decoupled from production –which reduces the incentive to intensify production (and thereby increasing nitrogen emissions through increased use of fertilisers), they together with market stabilisation maintain the viability of agricultural practices in several regions and therefore indirectly contributes to nitrogen emissions.

Through the European Agricultural Fund for Rural Development Regulation (1305/2013) (EAFRD), Member States must prepare Rural Development Programmes (RDPs) that outline activities for strengthening the competitiveness, social cohesion and environmental performance of agriculture and the rural economy (EU budget of €95 billion between 2014 and 2020). The general rules of the EAFRD are set at EU level, but significant flexibility is built into the system and RDPs are co-financed by Member States. Implementation can differ substantially across the Member States. This mechanism can contribute to maintaining (intensive) agriculture by encouraging investments and strengthening of the agricultural sector.

The EAFRD is part of the EU Structural and Cohesion Funds, of which three others are relevant for the nitrogen threat. The **Cohesion Fund Regulation (1300/2013)** is directed towards countries whose Gross National Income per capita is less than 90% of the EU average in order to reduce economic disparities in the EU. It supports investments in transport and the environment, including the promotion of energy derived from renewable sources. Investments under the Cohesion Fund can potentially lead to increased nitrogen emissions through increased transport (atmospheric emissions) and by promoting biofuel renewable energy, which is associated with an intensification of agriculture and the use of fertilisers. Similarly, the **European Regional Development Fund Regulation (1301/2013)** aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. It specifically supports productive investments in SMEs which create and safeguard employment, and can thus indirectly lead to an intensification of the nitrogen threat if leading to the intensification of e.g. industrial activity or transport. Together, the EU regional funds (Cohesion and Regional Development) amount to about €350 billion of EU budget.

Regarding marine policies, the **European Maritime and Fisheries Fund Regulation (508/2014)** promotes the development of fisheries and maritime activities and the strengthening of their competitiveness to safeguard jobs. **It provides financial support for the implementation of the** Common Fisheries Policy Regulation (1380/2013). In both regulations, aquaculture – which can contribute to nitrogen pollution – is a major activity targeted, although emphasis is given on the need for promoting more sustainable forms.

In the field of **energy and transport**, the Directive on the promotion of the use of energy from renewable resources (2009/28/EC) requires national renewable energy action plans setting targets for the share of energy from renewable sources and sets a target of 20% renewable energy by 2020. Because Member States are likely to increase bio-energy crops to meet targets and "bio-energy crops require Nr for their growth, it is possible that the directive leads to increased emissions of nitrogen (ENA, 2011). The Fuel Quality Directive (previously 98/70/EC, now 2009/30/EC) introduces Low Carbon Fuel Standard which may encourage the increased use and demand for biofuels.

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CMO sets out the parameters for intervening on agricultural markets and providing sector-specific support (e.g. for fruits and vegetables, wine, olive oil sectors, school schemes). It also includes rules on marketing of agricultural products (e.g. marketing standards, geographical indications, labelling) and the functioning of producer- and interbranch organisations. Finally, it covers issues related to international trade (e.g. licenses, tariff quota management, inward and outward processing) and competition rules

## Trends in Pressures and Drivers

There is no doubt that success has been achieved regarding the control of nitrogen emission from a variety of sources. The total nitrogen export in Europe has decreased by 9% from 1991 to 2005 (based on estimates) (EC JRC-IES, 2011). Primarily, this is due to **improved wastewater treatment** across Europe. Between 1990 and 2005, many Western European countries significantly decreased their point source emissions from domestic and industrial sources such as the Nethelands (60% decrease) and Germany (40%) (Bouraoui and Grizzeti, 2011). In other countries, point source emissions dramatically increased, such as Spain (100%), largely due to improved connection of population to wastewater treatment plant (100% of the population in 2005, as opposed to 42% in 1990) (Bouraoui and Grizzeti, 2011).

**Trends in agricultural nitrogen emissions** have also generally been positive. Average nitrogen surpluses dropped by 32% between 1990 and 2005 thanks to decreased fertiliser application and increased nitrogen use efficiency (improved application) (Bouraoui and Grizzeti, 2011). The strongest decreases are observed in Denmark, Netherlands and Germany where the surpluses are back to 1970 level (Grizzetti et al., 2011). Recent trends observed regarding the reduction of nitrogen input into the aquatic environment are expected to continue in the short term. However, there are a number of challenges in the future regarding further reduction on the nitrogen threat. For example, **climate change** is expected to have an impact on nitrogen in freshwater, through several factors. The most obvious one is the increase of temperature associated with climate change. Nutrient cycling is expected to accelerate due to higher temperatures, especially in southern Member States where higher temperature will combine with reduced run-off (Grizzetti et al., 2011). In the northern Member States, the combination of higher precipitation and higher temperatures may respectively lead to greater nutrient loads and greater nitrogen mineralisation (Grizzetti et al., 2011).

Figure 1: Change of Anthropogenic Nitrogen Pressure for EU-15 between 1990 and 2005.

| | Point source nitrogen 1000 tons | | Manure nitrogen 1000 tons | | Mineral nitrogen 1000 tons | |
|---|---|---|---|---|---|---|
| | 1990 | 2005 | 1990 | 2005 | 1990 | 2005 |
| Finland | 4 | 4 | 56 | 55 | 199 | 175 |
| Sweden | 10 | 10 | 142 | 161 | 215 | 202 |
| UK | 184 | 208 | 1180 | 1044 | 1541 | 1113 |
| Denmark | 17 | 8 | 265 | 352 | 382 | 229 |
| Ireland | 12 | 15 | 466 | 426 | 390 | 349 |
| The Netherlands | 55 | 23 | 455 | 477 | 392 | 284 |
| Luxembourg | 1 | 2 | 10 | 9 | 13 | 9 |
| Belgium | 9 | 32 | 224 | 251 | 160 | 150 |
| Germany | 191 | 114 | 1359 | 1375 | 1820 | 1786 |
| Austria | 21 | 10 | 147 | 174 | 137 | 116 |
| France | 165 | 131 | 1267 | 1452 | 2495 | 2283 |
| Italy | 230 | 218 | 642 | 769 | 752 | 753 |
| Greece | 24 | 28 | 268 | 219 | 592 | 268 |
| Portugal | 27 | 26 | 141 | 146 | 144 | 88 |
| Spain | 100 | 222 | 755 | 1211 | 937 | 1192 |
| Total | 1047 | 1051 | 7378 | 8121 | 10169 | 8997 |

Source: Bouraoui,and Grizzetti (2011)

## Analysis of State and status

**Nitrogen concentration in European waters** has undergone positive trends over the last 30 years. Between 1992 and 2010, average nitrate levels in rivers have decreased by 11%, down to 2.2 mg/l while a decrease of 15% has been observed in lakes (EEA, 2012). Nitrogen loads to the Baltic Sea have reduced by 16% reduction between 1994 and 2010 while a 30% drop since 1985 is observed for the North Sea (EEA, 2015). While a decrease in nitrogen concentration in coastal and marine waters is visible in the Baltic Sea and the North Sea, these encouraging trends are not necessarily reflected widely as most stations show essentially unchanged concentrations between 1985 and 2010 (EEA, 2012). European air emissions of nitrogen oxides have gone down by one-third over the last 15 years and the deposition of nitrogen on inland surface waters has also declined. Nitrogen loads to the Mediterranean and Black Seas may even be increasing (EEA, 2015). All MS managed to maintain their river nitrate concentrations below the limit prescribed by the Nitrates and Drinking Water Directives (11.3 mg N/l limit, equivalent to 50 mg $NO_3$/l), both at country scale and river basin scale (Eurostat,2015b). Nonetheless, in most European coastal waters there is still enough nitrogen in water to lead to eutrophication. In freshwaters, there remains enough nitrate to lead to the loss of biodiversity (more than 1.5 to 2 mg N r per litre) (ENA, 2011).

Shallow wells often exceed nitrate standards – 29% of wells in the case of Belgium (OECD, 1997). This is problematic for water supply in rural areas. In the 1990s, up to 80% of Bulgarian citizens drank water than exceeded legal nitrate concentrations (OECD, 1995). A third of groundwater bodies exceeded the recommended limit. European groundwater is still affected by nitrogen pollution and not much progress has been made to tackle that issue (EEA, 2003). Based on information provided by Member States for the years 2000-2003, 40% of monitored groundwaters reported concentrations greater than 25 mg $NO_3$/l, and 50% of monitored surface waters showed concentrations greater than 10mg $NO_3$/l (EC, 2007a). It should be considered that monitoring stations are not always homogeneously distributed within a territory.

From 1992 to 2010, the average nitrate levels in European rivers dropped from 2.5 mg/l to 2.2 mg/l, an 11% decrease (EEA, 2012). In European lakes (which usually contain much less nitrogen than rivers), average nitrate levels decreased by 15%. From 1985 to 2005, oxidized nitrogen concentrations remained stable in 85% of measuring stations in transitional, coastal and marine waters. In regard to ammonium concentration, there was a decrease in concentrations in European rivers between 1992 and 2005. This can be correlated to advances in wastewater treatment. The highest ammonium concentrations are found in rivers located in the southern, south-eastern and eastern parts of Europe (EEA).[5]

In 84% of reported stations in European seas, nitrogen concentrations remained essentially unchanged between 1985 and 2010. Unfortunately data availability is problematic, especially for the Mediterranean and Black Seas, which makes trend estimation difficult. Based on available data, it appears that winter oxidised nitrogen concentrations decreased in 14% of all the reported stations. This decrease is mainly visible in the Baltic Sea and in the southern coasts of the Greater North Sea. Only 2% of the reporting stations showed an increase in concentrations, mainly on the coast of Croatia.

Despite progress over the last decades, nitrogen concentration in aquatic ecosystem remains very high across Europe. In freshwater, nitrate still leads to the loss of biodiversity while enough nitrogen remains in most European coastal waters to lead to eutrophication (ENA, 2011). The highest ammonium concentrations are found in rivers located in the southern, south-eastern and

[5] http://www.eea.europa.eu/data-and-maps/indicators/freshwater-quality/freshwater-quality-assessment-published-may-2010

eastern parts of Europe.[6] In groundwaters, 40% of stations reported concentrations greater than 25 mg $NO_3$/l between 2000 and 2003 (EC, 2007a). The situation for European marine waters is particularly alarming. For example, in the last 115 years, the Baltic sea's hypoxic area has increased tenfold (Carstensen et al., 2014 in EEA, 2015). Many coastal waters of the North Sea are naturally nutrient rich, but nitrogen enrichment has led to increased frequency of eutrophication events. The beaches of Brittany (France) display enormous green macro algae blooms every single year since the 1970s, mainly due to nitrogen pollution. Nutrient enrichment affects several areas of the Mediterranean sea and Black sea (EEA, 2015).

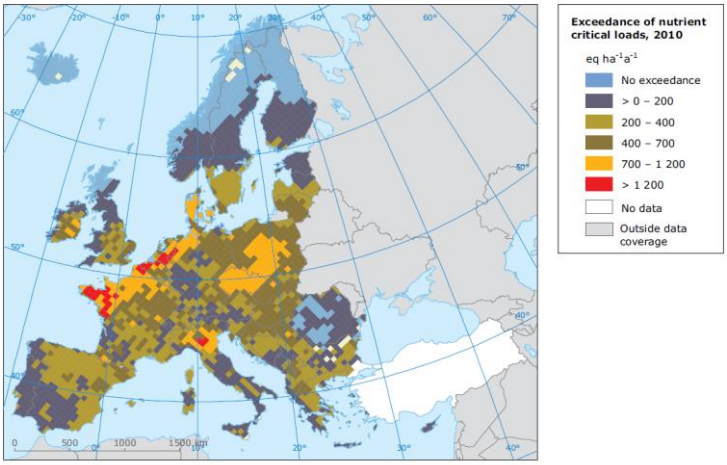
The conditions of European aquatic habitats are in unfavourable or inadequate conditions in regard to conservation. Open ocean habitats are the most at risk (75%), followed by marine inlets (71%), rivers and lakes (63%), wetland habitats (58%), coastal habitats (54%) and shelf habitats (35%)[7] (EEA, 2015). In the period 2007-2012, merely 9% of marine habitats were assessed to have a favourable conservation status, the exact same proportion as in the period 2001-2006. However, the number of marine habitats with an unfavourable conservation status jumped from 40% between 2001 and 2006 to 66% in the 2007-2012 time period, showing concerning deterioration of habitats that are under the protection of the Habitats Directive. This hints that many seabed habitats are moving away from Good Environmental Status rather than towards it (EEA, 2015). Nitrogen negatively impacts biodiversity through **eutrophication** and atmospheric deposition, and it has been recognised as one of the main causes of biodiversity loss.

**Critical loading** is 'a quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge' (Nilsson and Grennfelt, 1988) and it varies by ecosystem and by pollutant. It can be used to measure and compare the sensitivity to nitrogen. If the critical load is exceeded in an ecosystem, its biodiversity might be adversely affected. While several Member States exceed their critical loads for nitrogen, some zones are particularly at risk: in France, Belgium, the Netherlands, and Italy, some areas surpass the critical load by more than 1,200 equivalents nitrogen per ha and year.

[6] http://www.eea.europa.eu/data-and-maps/indicators/freshwater-quality/freshwater-quality-assessment-published-may-2010

[7] Large uncertainties exist: 6% wetlands, 21% of rivers and lakes, 27% of marine inlets, 42% of coastal habitats, 46% of shelf habitats and 75% of open ocean habitat have unknown status. The conservation status of the majority of species of European interest is also assessed in unfavourable or inadequate although large unknown exist in particular for coastal and marine habitats.

Figure 2: Exceedance of Critical Loads for Eutrophication due to Deposition of Nutrient Nitrogen in 2010




- The critical load of nutrient nitrogen is exceeded by more than 1 200 equivalents nitrogen per hectare and year in western France, some parts of Belgium, the Netherlands, and the North of Italy.

An EEA assessment revealed that several areas are affected by nutrient enrichment: "within the coastal zones, bays and estuarine areas of some parts of southern coasts of the Greater North Sea, particularly those near major European river deltas; in the Gulf of Riga and the Gulf of Finland as well as along southern coastal areas of the Baltic Sea; in the Celtic Seas along Irish coastal waters; along the North Atlantic and Mediterranean coastal waters of France; and in areas close to river deltas or large urban agglomerations in the southern Adriatic Sea (along the Balkan coastal waters)and Black Sea" (EEA, 2012).

An ecological assessment required by the Water Framework Directive revealed that many European areas need to achieve further nutrient reductions. The assessment focused on "the quality of the structure and functioning of surface water ecosystems, based upon assessment of biological elements (phytoplankton (often chlorophyll-a), phytobenthos, benthic fauna, macrophytes and fish), and supporting elements: hydromorphology, physico-chemical quality, and non-priority pollutants like nutrients" (EEA, 2015). The WFD's target is to achieve good status in all waterbodies by 2015, but there is a long way to go: in the 2009 two thirds of transitional waterbodies and half of coastal waterbodies fell short of achieving good status (EEA, 2015).

Nutrient pollution and hydromorphological pressures led to these shortcomings. The Mediterranean Sea displayed the best ecological status results, but with notable exceptions in some water bodies in France, Italy and Greece. Most water bodies in the Baltic Sea, the continental North Sea coast, the coast of Ireland and in the Black Sea did not achieve good environmental status (EEA, 2015). Pollution from point and diffuse sources was the main reason for this failure, except in the North Sea coast of Germany, the Netherlands and Belgium where hydromorphological pressures were the main obstacle to good ecological status (EEA, 2015). Unfortunately the MSFD reported information did not allow the compilation of a consistent overview of the status of marine waters (Peterlin et al., 2014).

In the last 115 years, the Baltic Sea's hypoxic area has increased tenfold. Hypoxia is a natural phenomenon that is caused in part by the physical characteristics of the sea, but excessive eutrophication has brought it to alarming levels. In 1961-1990 the hypoxic area maintained an average surface area of 49,000 km$^2$ (Carstensen et al., 2014 in EEA, 2015). Hypoxia damages ecosystems in many ways: "changes in nutrient cycling, stimulation of cyanobacteria blooms, mortality of benthic fauna and reproduction of fish" (EEA, 2015). According to the EEA (2015),

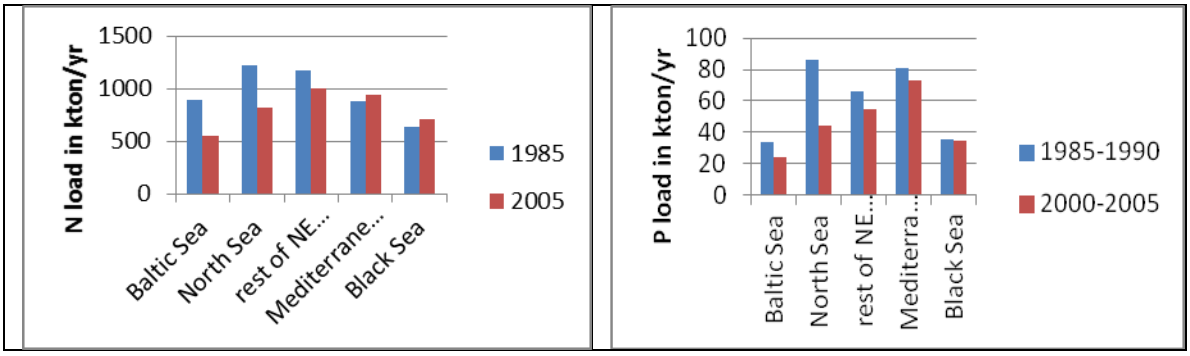
"harmful blooms of cyanobacteria during summer lower the aesthetic and recreational value of the marine environment, but are also potentially toxic to animals as well as humans." Several other ecosystem services of the Baltic Sea are hindered: biodiversity, recreation and fisheries (EEA, 2015).

Many coastal waters of the North Sea are naturally nutrient rich and thus affected by algal blooms when eutrophication occurs (Billen et al., 2011 in EEA, 2015). The beaches of Brittany (France) display enormous green macro algae blooms every single year since the 1970s, mainly due to nitrogen pollution. These algae blooms negatively impact shellfish culture, tourism and biodiversity, most of these also leading to losses in revenue (Perrot et al., 2014 in EEA, 2015).Nitrogen pollution has also been identified as a cause of Phaeocystis ('sea foam') blooms. In addition to disrupting the food web, these large amounts of foam can negatively impact fisheries and recreation (Lancelot et al., 2011 in EEA, 2015).

The Mediterranean Sea is an oligotrophic sea, meaning that it has low nutrient concentrations (in its natural state).Nonetheless, some areas are being affected by nutrient enrichment: "some near-coastal zones, in the Gulf of Lion, the Adriatic Sea and the northern Aegean Sea" (EEA, 2015). The northern part of the Adriadic Sea is currently afflicted by "algal blooms, the production of mucilaginous substances and the occurrence of hypoxia" due to nutrient discharge from the river Po (EEA, 2015). This is detrimental to the ecosystems and economic activities such as tourism and fisheries. There have been some signs of improvement in the last ten years.(Billen et al., 2011; Giani et al., 2012 in EEA, 2015).

The Black Sea is affected by eutrophication in the area where the Danube and Dniepr rivers discharge nutrients, in the northwestern part. This leads to hypoxia and is a threat to the survival of benthic fauna. Fortunately, a decline in fertilizer use in the Danube area showed positive effects in the affected area of concern (Mee et al., 2005; Billen et al., 2011 in EEA, 2015). Because it is stratified, the Black Sea has a permanent anoxic area below 125-200 meters of depth (Oguz, 2008 in EEA, 2015). Nitrogen is the exception to the rule as it has not decreased following legislation, unlike all other regulated air pollutants (EEA, 2015).

Figure 3: Nutrient Loads to Europe's Seas (including Atmospheric Deposition).




Source: Right: nitrogen; Left: phosphorous. Based on data from Bouraoui *et al.* 2011.[8]

[8] These table are originally from one of the earlier drafts of the EEA state of seas report. But the original info comes from: http://www.detstorebedrag.dk/media/11861/europakommissionens_kv_lstofrapport_2011.pdf

## Mapping of European policies against the DPS

Several elements of the broader policy framework support action against the nitrogen threat. This includes the current **Decision on the 7th Environment Action Programme of the European Union** (2013-2020), which actively supports further efforts to manage the nutrient cycle, calling for more cost-effective, sustainable and resource-efficient approaches, in particular regarding the efficient use of fertilisers, as well as policies relating to the protection of the natural heritage, in the form of the **Habitats Directive (92/43/EEC)** and the **Birds Directive (2009/147/EC)**. In addition, policies relating to the protection of freshwater and coastal waters are perhaps the most complete regarding the control of the nitrogen threat. They include the **Water Framework Directive (2000/60/EC)** (WFD) and two "daughter" directives to the WFD: **the Urban Waste Water Directive (91/271/EEC) (UWWTD)** and the **Nitrates Directive (91/676/EEC)** (ND). Three other water-related directives are relevant: the **Drinking Water Directive (98/83/EC)**, the **Bathing Water Directive (previously 76/100/EEC, now 2006/7/EC)** and the **Groundwater Directive (2006/118/EC).** Several other policies are relevant, and they are described in detail in the table below.

There are also policies that may increase the threat of nitrogen in aquatic ecosystem. These includes policies such as Regulation 1380/2013 **Common Fisheries Policy** that promotes aquaculture and policies that promote the expansion of agriculture such as the Common Agricultural Policy (analyzed by pillar below) and the 2009/28/EC **Directive on the promotion of the use of energy from renewable resources** which encourages the cultivation of crops to be used as bio fuels.

### Table 3: DPS Policy Analysis of Input of Nitrogen Threat

| Relevant Instruments | Relationships | Impact |
|---|---|---|
| ***Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC)*** | | |
| Creation of Special Protection Areas (Article 3.2, BD) and Special Areas of Conservation (Art. 3.1, HD) | These instruments create a network of protected areas; called Special Protection Areas (SPAs) and Special Areas of Conservation (SAC), part of the Natura 2000 network. | S (+) |
| Take steps to avoid the deterioration of natural habitats in SACs (Article 6.2, HD) and assess the impacts of plans and projects on an SAC before approving it (Art. 6.3, HD)<br><br>Take appropriate steps to avoid pollution in protection areas (Art. 4.4, BD). | The Birds and Habitats Directives imply restrictions on human activities within and around the Natura 2000 areas. Widely established restrictions include infrastructural, industrial, and agricultural activities in and near to Natura 2000 sites." (ENA chapter 4, p. 69). This instrument can reduce the intensity of drivers (e.g. human activities) in SPAs and SACs. | D (+)<br>P (+) |
| ***Water Framework Directive (2000/60/EC)*** | | |
| Production of a River Basin Management Plan (RBMP) for each river basin within the territory (Article 13 & Annex VII) | The WFD does not explicitly mention diffuse or point sources from nutrient pollution, but aims to tackle all pressures significantly impacting the good status of European water bodies. The WFD places special emphasis on tackling drivers underpinning pressures of water deterioration: it may thus broaden approaches to eutrophication abatement. For example, the WFD may seek not only improved wastewater treatment (as in UWWTD) but also changes in household behaviour or technologies to reduce nutrient | D (+)<br>P (+) |

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| | loads. | |
| Article on environmental objectives (Art. 4) | The WFD sets a comprehensive ecological status assessment, aiming for "good status" of all freshwater, transitional, groundwater and coastal water bodies by 2015. It has the potential for a more consistent and integrated approach to managing nutrient inputs to water taking fully into account the requirements of previous EU legislation. | S (+) |
| Basic measures:<br>Requirement for prior regulation, prior authorization or registration for point source discharges liable to cause pollution (Article 11(3)g).<br>Measures to prevent or control the input of pollutants from diffuse sources (Article 11(3)h).<br>Prohibition of direct discharges of pollutants into groundwater (Article 11(3)j).<br>Measures to eliminate pollution of surface waters (Article 11(3)k). | Several articles refer to basic measures, which are essentially requirements from other European legislation. These basic measures can be considered in the WFD programme of measures and their contribution to obtaining the environmental measures should be assessed. Basic measures will help reduce nitrate discharge in rivers and lakes and nitrate loading into marine waters by limiting the number of point sources of pollution through the implementation of prior regulation, prior authorization and registration, by prohibiting direct discharges of pollutants into groundwater, and through measures preventing or controlling the input of pollutants and by eliminating pollution of surface waters. Basic measures are not well defined and are a matter of debate between the EC and MS. In the field of nitrogen abatement, basic measures can be mostly linked to requirements of the Nitrates Directive and the Urban Wastewater Directive. | D (+)<br>P (+) |
| Supplementary measure:<br>Emission controls (Annex VI, Part B, v).<br>Codes of good practice (Annex VI, Part B, vi).<br>Rehabilitation projects (Annex VI, Part B, xiii). | Supplementary measures refer to those measures that go beyond basic measures (and existing requirements of other European legislation) in order to reach the environmental objectives of the WFD. The Annexes of the Directive specifically refer to emission controls, codes of good practice, and rehabilitation projects –all of which can contribute to nitrogen abatement through for example changing farm practices, further control on the use of fertilizers and restore degraded habitat such as wetland. | D (+)<br>P (+)<br>S (+) |
| ***Nitrates Directive (91/676/EEC)*** | | |
| Designate vulnerable zones (Art. 3) | Member States must designate catchment areas of all water bodies that are eutrophic (i.e. water with nitrate concentration of 50 $mgL^{-1}$) or will become eutrophic if no measures are taken. NVZs can cover either particular areas or the entire territory of the country. Some MS have designated the whole territory (e.g. Slovenia), while others not (e.g. UK). This instrument places control on the chemical state of water bodies. | S (+) |
| Establish a code of good agricultural practice to be implemented by farmers on a voluntary basis throughout the Member State territory | Codes of Good Agricultural Practices (CGAP) include limiting periods of nitrogen fertilizer application, conditions for fertilizer application | P (+) |

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| (Art. 4) | (e.g. on steeply sloping ground, frozen or snow covered ground, near water courses), minimum storage capacity for livestock manure, and the establishment of crop rotations, soil winter cover or catch crops. CGAPs are voluntary, except in all areas where a Nitrate Action Programme is in place where they must become compulsory. This instrument mainly places restrictions on the pressure (e.g. timing of application). | |
| Set up action programmes for designated vulnerable zones (Art. 5) | Member States establish and implement Nitrate Action Programmes (NAPs) for Nitrate Vulnerable zones (NVZs). A number of pre-defined measures to be applied in NAPs are outlined in the legislation such as limiting total fertilizer application (mineral and organic) and maximum amount of livestock manure to be applied (i.e. 170 kg N $ha^{-1}$). This instrument mainly places restrictions on the pressures (e.g. timing of application). | P(+) |
| ***Urban Waste Water Treatment Directive (91/271/EEC)*** | | |
| Collecting systems for urban waste water in all agglomerations (Art. 3).<br>Subject waste water to secondary treatment before discharging it (Art. 4). | Secondary treatment of waste water treatment has to be ascertained for settlements of 2,000 inhabitants and more. These instruments reduce the intensity of a pressure by preventing nutrient-rich waste water from being directly released into the environment. | P (+) |
| Identify sensitive areas and less sensitive areas (Art. 5-6). | Sensitive areas are water bodies in a eutrophic state (or future state without measures), taking into account both parameters, nitrate and phosphorous. This instrument places control on the chemical state of water bodies. | S (+) |
| Maximum concentrations of nitrogen in water discharged in sensitive areas (Annex I, Table 2).<br><br>Urban waste water entering collecting systems shall before discharge into sensitive areas be subject to more stringent treatment" Article 5(2). | In sensitive areas, targets on nitrogen concentration in discharged water must be set. In addition, advanced treatment (nitrogen and phosphorous removal) needs to be established for settlements of 10,000 inhabitants and more unless this more stringent treatment is implemented in the entire Member State. This instrument reduces the intensity of the nitrate discharge in rivers and lake (pressure). | P (+) |
| Subject the disposal of waste water to regulations and authorizations (Article 12(2). | This measure controls the amount of nitrogen that can be released in rivers and lake through regulations and authorizations. Thus the instrument aims to reduce the intensity of a pressure (nitrate discharge in rivers and lakes). | P (+) |
| Re-use of treated waste water whenever appropriate (Article 12 (1)).<br>Re-use of sludge from waste water treatment when appropriate (Article 14(1) and phasing out of disposal of sludge to surface waters (Article 14(3)). | Treated wastewater can potentially be used for agriculture (irrigation), aquaculture (as fertilizer to grow fish feed) or industry (e.g. for cooling towers)[9]. The re-use of treated waste water that still contains nitrogen removes the need to dispose of it in aquatic environments, and thus this reduces the intensity of the pressure of | P (+) |

[9] UNEP, retrieved from http://www.unep.or.jp/ietc/publications/freshwater/sb_summary/12.asp

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| | nitrate discharge in rivers and lakes. In addition, the re-use of sludge from wastewater treatment as fertilizer reduce the direct discharge of nitrogen into water bodies and will encourage nitrogen fixation by crops. | |
| ***Bathing Water Directive (2006/7/EC) Previously 76/100/EEC*** | | |
| Carry out bathing water quality assessments & classify the bathing water as poor, sufficient, good or excellent (Art. 4-5). | This instrument obligates member states to observe and monitor the state of their bathing waters, more specifically by measuring the concentration of intestinal enterococci and *Escherichia coli* in inland , coastal and transitional waters. "The presence of *E.coli* bacteria in drinking water indicates a pathway exists from a waste source (e.g. animal feedlot, septic tank, cesspool leadage, etc.) to the well."[10] and is therefore an indicator of the likelihood of also having high nitrate concentrations, as nitrate comes from similar drivers: agriculture and wastewater. This forces Member States to determine the state of their waters. | S (+) |
| Apply management measures in case of proliferating macro-algae or phytoplankton (Art. 9). | This instrument aims to reduce algae or phytoplankton proliferation which can be associated with nitrogen pollution. The instrument does not prescribe which specific approach or measures to use. One can assume that if macro-algae or phytoplankton are proliferating, Member States will need to reduce the intensity of drivers such as agriculture and wastewater and limit pressures such as nitrate discharge in water. | D (+)<br>P (+) |
| ***Groundwater Directive (2006/118/EC)*** | | |
| Establishment of national threshold values for good chemical status (Art. 3).<br>Observe a quality standard of 50mg/l for nitrate (Annex I). | These instruments obligate Member States to establish targets for chemical status and remain below a certain level of nitrate concentration in water. If quality standards are not reached, MS will need to reduce the intensity of drivers such as agriculture and limit pressures such the use of fertilisers. | D (+)<br>P (+)<br>S (+) |
| ***Marine Strategy Framework Directive (2008/56/EC)*** | | |
| Develop a marine strategy for the Member State's marine waters (Art. 5 Para. 1)<br>Establish a programme of measures to achieve or maintain good environmental status (Art. 5 Para.2(b)) | The programme of measures will vary based on each Member State's strategy, but it will most likely aim to reduce the intensity of pressures such as nitrate loading into marine waters. Annex VI lists a few examples of possible measures, such as "Input controls: management measures that influence the amount of a human activity that is permitted.", "Output controls: management measures that influence the degree of perturbation of an ecosystem component that is permitted", and "Mitigation and remediation tools: management tools which guide human | D (+)<br>P (+) |

[10] http://www.shl.uiowa.edu/env/privatewell/faq.xml#20

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| | activities to restore damaged components of marine ecosystems." | |
| Determine good environmental status for the marine waters of the country and establish a series of environmental targets and associated indicators (Art. 5 Para. 2 (a)) | This measure aims at achieving and maintaining "good environmental status" by 2020. The good environmental status refers to the intrinsic conditions of the ecosystem and also includes a sustainable use of it by means of qualitative descriptors detailed in the Directive's Annex. One of these directly includes eutrophication abatement for reaching the good status. | S (+) |
| ***Regulation (EU) (1255/2011) on integrated maritime policy*** | | |
| RERM marine resources milestone: "By 2020, good environmental status of all EU marine waters is achieved | Is one of the tools that can help to address the pressures and that the Commission will further develop jointly with the Member States | S(+) |
| IMP refers to are Maritime Spatial Planning and Integrated Coastal Zone Management | Through integrated planning to reduce the negative environmental impact of economic activities carried out in the marine and coastal areas. These activities include tourism, fishing and maritime transport. | P(+) |
| ***Directive (2008/1/EC) on Industrial Emissions concerning Integrated Pollution Prevention and Control*** | | |
| Installations need a permit to operate, taking into account limits for oxides of nitrogen and other nitrogen compounds. (Art. 4) & Annex III | This instrument obligates installations to remain below a set limit of NOx and other nitrogen compounds in order to have permission to operate. Therefore the measure reduces the intensity of driver and pressure (industrial combustion processes). | D (+)<br>P (+) |
| Installations need to apply best available techniques (Art. 2) | This instrument obligates installations to apply the best available techniques to limit their emissions which contribute to reducing N-deposition from the atmosphere. | P (+) |
| ***National Emission Ceilings Directive (2001/81/EC)*** *(being reviewed as part of the Clean Air Policy Package)* | | |
| Limit NOx emissions to a ceiling laid out in the Annex. (Art. 4) | This measure obligates Member States to keep NOx emissions – in addition to three other pollutants – under specific levels ("ceilings") in 2010 and 2020. Member States are free to determine how to remain below these ceilings. In order to achieve this, they need to control their industrial combustion processes that generate these emissions. The revision of the directive (for the Clean Air Policy Package) set new commitments for 2020 and 2030. | D (+)<br>P (+) |
| Draw up a national programme for the progressive reduction of NOx emissions (Art. 6) | This measure obligates Member States to draw up a strategy to decrease NOx emissions, in other word | D (+)<br>P (+) |
| ***Ambient Air Quality Directive (2008/50/EC)*** | | |
| If nitrogen dioxide levels are below the threshold, maintain these levels. (Art. 12)<br>If the threshold level of nitrogen dioxide is exceeded, establish an air quality plan to achieve the limit value (Art. 23). | This directive, of which the latest version was approved in 2008, sets quantitative limit values for nitrogen oxides (NO x ), in ambient air (and other pollutants) (ENA, 2011). The directive focuses on the health of city dwellers and air pollution from combustion. There are no limit | D (+)<br>P (+) |

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| | values for NH 3 , however ozone is included. Particulate matter is also included in the directive due to its interaction with the N cycle (ENA, 2011).<br>This directive is one of three important policies addressing nitrogen atmospheric pollution in Europe. (EC, 2010f, ENA, 2011) | |
| If the level of nitrogen dioxide exceeds the 'alert threshold', draw up a short-term action plan. (Art. 24) | This measure obligates Member States to take urgent action to decrease NOx emissions. These may involve temporarily interrupting activities that emit NOx. Thus the measure aims at drastically and rapidly decreasing a driver.<br>Author (year) identified four types of short-term measures used by Member States: speed limits, driving restrictions (e.g. ban of heavy trucks), commercial and residential measures, and other traffic-related measures (e.g. free public transport). | D (+) |
| ***Regulation (1907/2006) concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)*** | | |
| The main objectives of REACH are to protect human health and the environment while fostering a competitive and innovative market, with free circulation of substances within Europe | The obligation to comply with environmental restrictions should help develop more nitrogen-efficient products. | D (+) |
| ***Decision (1386/2013/EU) General Union Environment Action Programme to 2020*** | | |
| "In order to protect, conserve and enhance the Union's natural capital, the 7th EAP shall ensure that by 2020 a) the loss of biodiversity and the degradation of ecosystem services, including pollination, are halted, ecosystems and their services are maintained and at least 15 % of degraded ecosystems have been restored; (c) the impact of pressures on marine waters is reduced to achieve or maintain good environmental status, as required by the Marine Strategy Framework Directive, and coastal zones are managed sustainably" Annex (Article 28) | The 7th EAP requires the protection of biodiversity and good environmental status for marine waters, both of which mean that the input of nitrogen must be kept at an acceptable level. | S (+) |
| Priority objective 1: To protect, conserve and enhance the Union's natural capital mentions that the EAP shall ensure that by 2020 "the nutrient cycle (nitrogen and phosphorus) is managed in a more sustainable and resource-efficient way" (Art. 28) | This measure should lead to an increase of industrial drivers and pressures as Member States must been the goal of a well-managed nitrogen cycle. | D (+)<br>P(+) |
| ***Regulation (1293/2013) of the European Parliament and of the Council of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE)*** | | |
| The thematic priorities of the sub-programme for the Environment (Art. 9) are described in Annex III. The priority area "Environment and Resource Efficiency" has some thematic priorities for water, which | See the two mentioned policies. This measure could help decrease drivers and pressures. | D(+)<br>P(+) |

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| include activities and approaches that *help implement the Water Framework Directive (2000/60/EC) and the Marine Strategy Framework Directive (2008/56/EC)*, as well as "activities to ensure safe and efficient use of water resources, improving quantitative water management, preserving a high level of water quality and avoiding misuse and deterioration of *water resources*". (Annex 3, section A(a)) | | |
| ***Regulation (1305/2013) European Agricultural Fund for Rural Development*** | | |
| "Advisory services for the improvement of the economic and environmental performance as well as the climate friendliness and resilience of their holding, enterprise and/or investment" (Article 15(1)a) | This instrument helps promote more environmentally-friendly agriculture, and thus aims to reduce the impact of a driver (agriculture) and pressures (nitrate pollution from agriculture) | D (+)<br>P (+) |
| Investments in physical assets. Art. 17<br>1. Support under this measure shall cover tangible and/or intangible investments which:<br>[...] (c) concern infrastructure related to the development, modernisation or adaptation of agriculture and forestry, including access to farm and forest land, land consolidation and improvement, and the supply and saving of energy and water; [...] | Infrastructure supported can lead to modernisation and reduced nitrogen emissions or intensification of activities. | D(+/-)<br>P(+/-) |
| Investments in tangible and intangible assets which "are non -productive investments linked to the achievement of agri-environment -climate objectives as pursued under this regulation, including biodiversity conservation status of species and habitat as well as enhancing the public amenity value of a Natura 2000 area or other high nature value systems to be defined in the programme." (Article 17(1)d) | This instrument can lead to investments relevant to abating eutrophication (e.g. installations for waste water treatment on farms and in processing and marketing; modernisation of manure storage and handling facilities; investment related to hedgerow/wetland creation and landscape features for erosion control). | D (+)<br>P (+) |
| Establishment of agroforestry systems (Article 23) | Agroforestry can represent an alternative agricultural activity which requires lower input of fertilizers. It also can work as buffers and reduce the run-off of polluted waters into water bodies. | D (+)<br>P (+) |
| Convert to or maintain organic farming practices (Article 29) | Organic farms have lower nutrient losses than conventional farms. This instrument helps limit or reduce nitrogen application. | D (+) |
| Financial support to implement Natura 2000 and Water Framework directive measures (Article 30) | Farmers are compensated when the cost of implementing the Birds and Habitats Directive or the WFD is high. | D (+)<br>P (+) |
| Designation of areas facing natural and other specific constraints (Article 32) | This instrument can maintain grazing systems and other low-intensive farming. It thus helps avoid the establishment of more intensive practices. However, this instrument can also maintain nitrogen input as low intensive farming may use fertilisers. | D (+/-) |
| Agri-environment-climate scheme (Article | Agri-environment-climate schemes are perceived | D (+), P |

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| 28) | as having most potential as it funds changes in farming practices (e.g. fertiliser use, soil management, winter catch crops, reduced livestock density, manure management) and compensate farmers for land use changes for environmental purposes (e.g. riparian margins, buffer strips, hedgerows, conversion to grassland/pastures). | (+) |
| ***Regulation (1306/2013) on financing, management, monitoring of common agricultural policy*** | | |
| "Member States shall establish a system for advising beneficiaries on land management and farm management ('farm advisory system'). (Article 12) | The farm advisory system shall cover "the agricultural practices beneficial for the climate and the environment" (Article 12(2)b) and may cover "the information related to climate change mitigation and adaptation, biodiversity and protection of water" (Article 12(3)d). This will help reduce the intensity of pressures (nitrogen pollution from agriculture). | D (+)<br>P(+) |
| Cross-compliance with statutory management requirements and good agricultural and environmental condition of the land (Article 93). | The specific design of cross-compliance requirements are set at national or regional level depending on local contexts. Substantial variations thus exist between Member States.<br>Two types of cross-compliance must be differentiated.<br>Statutory management requirements" (SMRs) include 18 regulatory requirements stemming from other European directives and regulations. Relevant to eutrophication, the requirements set out through the Nitrates Directive (i.e. compulsory measures set out in NVZs) must be complied with in order to secure subsidy payments. Several SMRs are directly relevant to eutrophication abatement: SMR 1 "Nitrate Vulnerable Zones". SMR2 "protection of groundwater against pollution", SMR3 "use of sewage sludge in agriculture", SMR4 "protection of waters against pollution caused by nitrates from agricultural sources".<br>"Good agricultural and environmental condition of land" (GAECs) include 15 standards on farms receiving CAP payments. Several GAECs are directly or indirectly relevant to eutrophication abatement: minimum soil cover, minimum land management reflecting site specific conditions to limit erosion, the establishment of riparian buffer strips, and adequate soil organic matter and soil structure. | D (+)<br>P (+) |
| ***Regulation (1307/2013) establishing rules for direct payments to farmers under support schemes*** | | |
| Direct payments | Direct payments encourage agricultural activities and are hence potentially use of fertilisers. | D(-) |
| ***Common Fisheries Policy Regulation (1380/2013)*** | | |
| Promotion of sustainable aquaculture (Art. 34) | Promoting aquaculture (driver) leads to an increase in a pressure (N release in water), as fish farming releases significant amounts of nitrogen in water. However, the "sustainable" component | D (-) |

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| | could lead to a small increase,but probably not a decrease. | |
| ***Regulation (1300/2013) on Cohesion Fund*** | | |
| The fund supports investments for the environment, TEN-T (program to improve transport infrastructure in Europe), and technical assistance (Article 2).<br>The regulation mentions several investment priorities, including: "promoting the production and distribution of energy derived from renewable sources"; "taking action to improve the urban environment, to revitalise cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures"; „developing and improving environmentally-friendly (including low-noise) and low-carbon transport systems, including inland waterways and maritime transport, ports, multimodal links and airport infrastructure, in order to promote sustainable regional and local mobility;" (Article 4) | Promoting renewable energy can lead to an increase of agriculture and the associated nitrogen leaching.<br>Efforts to decontaminate cities and reduce their air pollutions can lead to decreases in NOx emissions in the air and better wastewater treatment.<br>The promotion of maritime shipping can increase NOx emissions. | D (+/-)<br>P(+/-) |
| ***Regulation (1301/2013) on Regional Development Funds*** | | |
| The ERDF supports "(a) productive investment which contributes to creating and safeguarding sustainable jobs, through direct aid for investment in SMEs; (b) productive investment, irrespective of the size of the enterprise concerned, which contributes to the investment priorities set out in points (1) and (4) of Article 5, and, where that investment involves cooperation between large enterprises and SMEs, in point (2) of Article 5; (c) investment in infrastructure providing basic services to citizens in the areas of energy, environment, transport and ICT; (d) investment in social, health, research, innovation, business and educational infrastructure;" Investment priorities are essentially the same as ECF. | Promoting renewable energy can lead to an increase of agriculture and the associated nitrogen leaching.<br>Efforts to decontaminate cities and reduce their air pollutions can lead to decreases in NOx emissions in the air and better wastewater treatment. The promotion of maritime shipping can increase $NO_x$ emissions. | D (+/-)<br>P(+/-) |
| ***Directive (2009/28/EC) on the promotion of the use of energy from renewable resources*** | | |
| Adopt national renewable energy action plans setting targets for the share of energy from renewable sources (Art. 4) | This measure will increase in the intensity of a driver (agriculture) because Member States will increase bio-energy crops to meet targets and "bio-energy crops require Nr for their growth and release various compounds to the boarder environment during and following their growth and utilization" (ENA chapter 4, p. 70). | D (-) |
| Comply with sustainability criteria when cultivating crops for biofuels and bioliquids (Art. 17 (6) ) | Agricultural raw materials cultivated in the Community and used for the production of biofuels and bioliquids taken into account for the | P (+) |

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| | purposes referred to in points (a), (b) and (c) of paragraph 1 shall be obtained in accordance with the requirements and standards under the provisions referred to under the heading 'Environment' in part A and in point 9 of Annex II to Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers and in accordance with the minimum requirements for good agricultural and environmental condition defined pursuant to Article 6(1) of that Regulation." The compulsory standard of establishing buffer strips along water courses helps decrease the intensity of a pressure (pollutant emission in water) through the protection of the buffer zone. | |

*Communication (COM 2004 453 final) on Short Sea Shipping*

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| This legislative document presents short sea shipping as having "a higher energy-efficiency than other modes of transport and [being], in general, less harmful to the environment" (Art. 3). The document presents several ongoing strategies to promote short sea shipping (e.g. identifying bottlenecks, clarifying customs procedures, creating a network) and insists that "expected growth in European goods transport makes it necessary for Short Sea Shipping to expand even further so as to make its full contribution towards alleviating current and future transport problems in Europe" (Art. 9). | "NOx emissions from shipping are relatively high because most marine engines operate at high temperatures and pressures without effective reduction technologies."[11]<br>Expanding maritime shipping will lead to an increase of NOx emissions from shipping. | D (-) |

*White paper on transport (COM 2011 144 final)*

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| The EU's genereal transport policy is described in the white paper "Roadmap to a single European transport area – towards a competitive and resource-efficient transport system". The paper cites the vision of "Growing Transport and supporting mobility while reaching the 60% emission reduction target" (2.1), and states that "Curbing mobility is not an option" (18). However, rail transport is presented as an alternative to long distance road transport in one of the Ten Goals: "30% of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50% by 2050, facilitated by efficient and green freight corridors" (Goal 3) | Road transport is a driver as the combustion of fuel engines generates NOx emissions. The EU's strategy to improve connectivity and mobility could increase the number of vehicles on the road. However, the strategy also mentions plans to replace long-distance road transport with rail or waterborne transport and other sustainability objectives, which would help decrease NOx emissions from road transport. Whether this will offset the increase in the road transportation network is hard to predict at this stage. | D (+/-) |

[11] http://www.pa.op.dlr.de/~VeronikaEyring/Eyringetal_IMOBriefSummary_FINAL.pdf

*Energy 2020 ( COM 2011 639 final)*

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| The goal of this strategy is to achieve the ambitious goals set by Europe 2020: "to reduce greenhouse gas emissions by 20%, rising to 30%if the conditions are right, to increase the share of renewable energy to 20% and to make a 20% improvement in energy efficiency." | Growth in the energy sector will be driven by a switch to renewable energies and an aim to decrease GHG emissions.<br>The switch to cleaner energies will decrease the NOx emissions to the atmosphere associated to electricity generation from fossil fuels. The measure s created to respond to this strategy will therefore decrease a driver. | D (+) |

*Fuel Quality Directive (2009/30/EC) (amended 98/70/EC)*

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| The amendment introduces the Low Carbon Fuel Standard and sets sustainability criteria for biofuels. The main aim of the policy is to reduce carbon emissions associated with fuel consumption. | Some stakeholders consider that the best way to decrease carbon emissions is to turn to biofuels. "In a number of statements made in spring [2018], the oil industry trade organization, Europia, said that the only way to achieve a 10% reduction in emissions of $CO_2$ from fuels over the period 2010–2020 was with the aid of biofuels and/or emissions trading."[12] This interpretation of the directive would lead to more biofuel crops and thus, to more nitrogen discharge because of agriculture. | D (–) |

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[12] http://www.airclim.org/sites/default/files/acidnews_pdf/AN2-08.pdf

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## 5.2 Extraction of Species

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### Overview

Extraction of aquatic species is the basis of a water-based economy that provides sources of food, income and job opportunities for hundreds of millions of people worldwide, and affects species biodiversity (as a result of removal of living organisms) and habitats (as a result of the processes involved in extractive activities, e.g. trawling, mechanical seaweed harvesting). These living organisms from freshwater, coastal and marine ecosystems are the source of food consumption, production of goods and services and the exploration of innovative technologies.

While **recreational fishing, aquaculture** and **the extraction of genetic material** (blue biotechnology) also involve species extraction, commercial (marine) fishing by far has the biggest overall impact on marine biodiversity due to its scale, and lack of selectivity. This lack of selectivity is inherent to many commercial fishing methods and implies that in addition to impacts on target species populations, other species are also removed from the ecosystem. This affects population abundance and parameters (including age, and sex ratios), which in turn can impact the entire makeup of the food web in highly unpredictable ways. Generally, these impacts include, inter alia, changes in populations of dependent species (predators and/or prey of the affected species), trophic downgrading, and the entry of invasive species into the ecosystem. In extreme cases, the extraction of species can cause (in tandem with other pressures such as increased nutrient output and climate change) collapses of fish stocks, and irreversible regime shifts, such as those seen in the Black Sea and the Baltic Sea, in the 1970s and 1980s (EEA, SOES 2015).

It is important to note that focusing on individual species unearths additional and more specific types of impacts on biodiversity, however for the purposes of this exercise the focus will be on broader impacts of species extraction. In addition to the biological implications of species extraction (the focus of this exercise), associated activities (namely commercial fishing and aquaculture) involve other pressures that impact aquatic ecosystems, including damage to the seafloor, the introduction of non-indigenous species, and inputs of organic matter as feed for fish farming, pollution, marine noise and traffic, etc.

### Drivers and Pressures

#### Key Drivers and Pressures

Extraction of living organisms is the basis for 3 main economic activities: **commercial fishing, aquaculture** and **blue biotechnology**, in order of relevance for this threat. As these economic activities are reliant on living resources, any promotion of economic growth in these industries will intensify these activities at driver level, with negative impacts on aquatic ecosystems. This is one example of the conflict between EU economic and environmental objectives, where a trade off is required, especially in the context of the long economic crisis.

In addition, the supply and demand of aquatic species for consumption is also dependent on a complex set of drivers ranging from demographic (population change, settlement patterns), to economic (GDP, income, standards of living), and global trends (international trade, climate

change, geopolitical factors, governance, advances in science, technology and innovation triggered by ecological and social adaptive processes) (see OECD, 2016).

The most relevant economic activity to species extraction, **commercial fishing,** can pose a threat for marine, coastal and inland waters. In marine and coastal ecosystems, commercial fishing is the main human activity responsible for the extraction of aquatic species, due to intensive fishing methods like trawling, that potentially affect the genetic structure of a species population, subsequently impacting food-web dynamics, stock resilience and overall stock levels (EEA, SOES 2015). As a result, EU-27 total catches in all fishing regions have been in steady decline over the past ten years. The EU is increasingly dependent on imports of the most widely consumed species: tuna, cod and salmon. In 2014 and 2015, EU was the single largest market for fish imports, followed by the USA and Japan (FAO, 2016).

Unlike marine fishing**,** inland fishing does not represent a significant pressure nor a relevant economic activity for most or the European rivers, lakes and other freshwater bodies. Inland fishing has not made a significant contribution to the diet of most Europeans since the 14th century. The radical change in the capacity of freshwaters to provide fish for human consumption can be traced back to the drastic changes experienced in land use, the over-exploitation of natural resources, the alteration and engineering of river systems and the changes in the quantity and the quality of European waters. Similar to other developed areas, the productivity of EU inland fisheries is nowadays only a fraction of what it presumably was in the distant past and of what it currently represents is in less modified rivers in the developing world (see FAO, 2016, Figure 33).

Today, inland fishing is mostly recreational and/or undertaken by family SMEs with low impact, producing small quantities for private consumption or for sale at local markets. According to Ernst and Young (2011) the number of businesses licensed for commercial inland fishing in the entire EU is below 18 000 and a similar figure can be given by the total of full and part-time jobs. Contrary to ocean-based fishing which is a global activity, threats to freshwater resources are driven by local and specific factors that must be analysed on a case-by-case basis. Where commercial fisheries exist they are prone to overexploitation, such as the case in the Danube. Particular protected species are being driven to the brink of extinction due to massive illegal fishing and black trade, such the eel in French rivers (ICES, 2015; Smith, 2014). On the other hand, fishing may resurge prompted by emerging business opportunities linked to the proliferation of rewarding invasive species (such as the red crab in Isla Mayor in Southern Spain, with 4 000 tonnes landed that may yield EUR 20m and 500 full-time employment opportunities (Archy World News, 2016)).

Globally, 2014 marked a milestone in the fishing industry as farmed fish overtook wild fish for the supply of fish for human consumption (FAO, 2016). Though **aquaculture** reduces capture fishing pressure, wild fish are necessary for feedstock. Thus, increasing aquaculture activity increases pressure of fish stocks that are used as feed, as well as the competition for space caused by aquaculture installations. Non-biological impacts include the input of organic matter in the ecosystem and alterations to marine environments caused by aquaculture installations.

Finally, **blue biotechnology** as threat to biodiversity may still be in its early stages, but the European industry for blue biotechnology currently has a growth rate of over 10% per year. The extraction of aquatic genetic resources can be used to in applications such as fragrances, flavours and medicine and has a substantial estimated future growth potential (EEA, SOES 2015).

## Socio-economic description of the Drivers

The patterns of global trade, which impact **commercial fisheries**, are determined not only by market fundamentals and international trade rules, but also to a growing extent by other subtler dynamics. These include areas such as quality and safety, but are increasingly also related to technical standards and labelling and, more recently, to voluntary certification for biological sustainability as well as social and labour conditions within the industry and its suppliers However, private companies, whether retailers, processors or restaurant chains, are increasingly setting their own specifications that producers have to meet. The high dependence on imports to satisfy domestic consumption of developed countries is a major reason for their low import tariffs on fish, especially for the three largest import markets, the EU, the United States of America and Japan.

Fishing regulations in coastal and marine waters are dominated by quotas and fishing limits which are the basis of the Common Fishing Policy. Stock assessments of the main commercial fish species are regularly conducted. These assessments are the basis for fishing quotas, which are decided at European level and determine how much of each stock can be caught in the coming year. The stock assessments deliver information on fishing mortality rates and reproductive capacity. These assessments are mostly made for fish species in the North-east Atlantic Ocean and the Baltic Sea, whereas stocks in the Mediterranean and Black Seas remain largely unassessed (EEA, SOES 2015). Regulations on inland fishing depend on local, regional and national governments. Resources of EU inland commercial fisheries are state or publicly owned but some member states allow commercial exploitation of privately owned fishing grounds (Austria, Sweden, Finland and the UK). The number of commercial fishermen is not officially known, catches are poorly monitored as it is the quality of data at EU level.

In addition to importing seafood the EU highly depends on **aquaculture** to cover its increasing demand, with 43% of consumed aquaculture products farmed within the EU territory, making the EU the 8th largest producer for aquaculture worldwide. Not only fish are subject to aquaculture, but other aquatic species, such as seaweed for use in i.e. agriculture and cosmetics are harvested as well, even though this trend has declined in Europe over the past decade. As for **blue biotechnology**, no legal framework has yet been universally accepted to protect and regulate the mechanisms, thus enabling socio-economic pressures on genetic resource extraction (EEA, SOES 2015).

## Description of market condition and broad regulatory context of Drivers

**Fishing** has been altering marine and coastal ecosystems at least since the Roman Empire but it has only been regulated and managed within scientific boundaries for less than 40 years (EEA, SOES 2015; Roberts, 2007; Jackson et al., 2001, Erlandson and Rick, 2010). Symptoms of stock depletion were already evident in the downward trend in many fisheries at the brink of the 20th century; however this was not enough to halt the intensification of fishing practices. Instead, investment in capacity and improvements in capture efficiency powered by advances in technology accelerated fishing practices in the second part of the past century, eventually leading to the major collapses occurred in fish stocks in the 70s and 80s (Roberts, 2007; Gartside et al., 2002). In Europe, this lead first to moratoria on fishing and then to the surge of the European Common Fisheries Policy (CFP) in 1983 aimed at setting and enforcing the total tonnage of fish landed from European waters.

In relevance to managing **aquaculture**, the EU put forth the Common Fisheries Policy (CFP) and the Blue Growth Agenda to promote aquaculture within the EU, while the Maritime Spatial Planning Directive regulates human activities at sea. Furthermore, council regulations concerning the issue of alien and locally absent species in aquaculture ***(Council Regulation (EC)*** No 708/2007*)* and on

the rules for organic aquaculture animal and seaweed production (*Commission Regulation (EC)* No 710/2009*)*, and labelling and controls regarding organic products (*Regulation (EC)* No 889/2008 also*)* exist. Despite the expected growth of the industry, in particular in the context of the Blue Growth Initiative, no legal framework has yet been implemented to extract **marine genetic resources** in a regulated manner within the EU (EEA, SOES 2015).

### Trends in Pressures and Drivers

Surging demand for fish and fishery products will mainly be met by growth in supply from **aquaculture production**, which is expected to reach 102 million tonnes by 2025, a 39% higher than the base period level. Industrialised countries will rely increasingly on imports to meet rising demand due to lack of capacity for increased capture fisheries (fully or overfished stocks), in addition to increasing aquaculture output. According to FAO (2016) the global fishery production (capture plus aquaculture) is projected to expand over this period, reaching 196 million tonnes in 2025. In absolute terms this represents an increase of 29 million tonnes by 2025 compared to the average 2013–15 level. Almost all of the increase in production will originate from developing countries with a small contribution from the EU (just 0.7 million tonnes mostly from aquaculture). Accordingly, the average price for wild fish (excluding fish for reduction) is projected to grow by more than that for farmed fish (7% as compared with 2%). Aquaculture may however not lead to lower incentives for fishing; the overall price of captured fish will remain lower than that of farmed fish due to the combined effect of increasing share of lower-value fish in overall catches, the improved productivity of aquaculture and the likely decline in feed prices (FAO, 2016). On the supply side, fish for human consumption will increasingly come from aquaculture, with the year 2014 marking the first year that farmed fish overtook wild fish. It is expected that world fisheries and aquaculture will increase by 15% from 2009–2011 average reaching 172 million tonnes while there has been a general reduction in fishing by larger trawlers and beam trawlers in the past decade in the EU (OECD, 2015; EEA, SOES 2015).

On the demand side, fish is expected to remain predominantly utilized as food source. Worldwide fish consumption is projected to increase by 31 million tonnes in the next decade to reach 178 million tonnes in 2025. On a per capita basis, apparent fish consumption will be 21.8 kg (live weight equivalent) in 2025, 8% above the base period level of 20.2 kg. The driving force behind this increase will be a combination of rising incomes and urbanization interlinked with the expansion of fish production and improved distribution channels. However, consumption will grow at a slightly slower pace than in the historical period, in particular in the second half of the outlook period, when fish will start to become more expensive in comparison with meat. The annual growth rate of per capita apparent fish consumption is projected to decline from 1.9% in the past decade to 0.8% over the next ten years. With human consumption of farmed species exceeding that of capture fisheries for the first time in 2014, aquaculture is expected to further increase its share and provide 57% of fish for human consumption in 2025. The alternative uses include fishmeal and oil production, selling for ornamental species aquaculture (fingerlings, fry, etc.), bait, pharmaceutical purposes and feed for aquaculture, livestock and other animals. It is estimated that European countries to be main importers of fish oil to 2025 (57% of market share) (OECD, 2016).

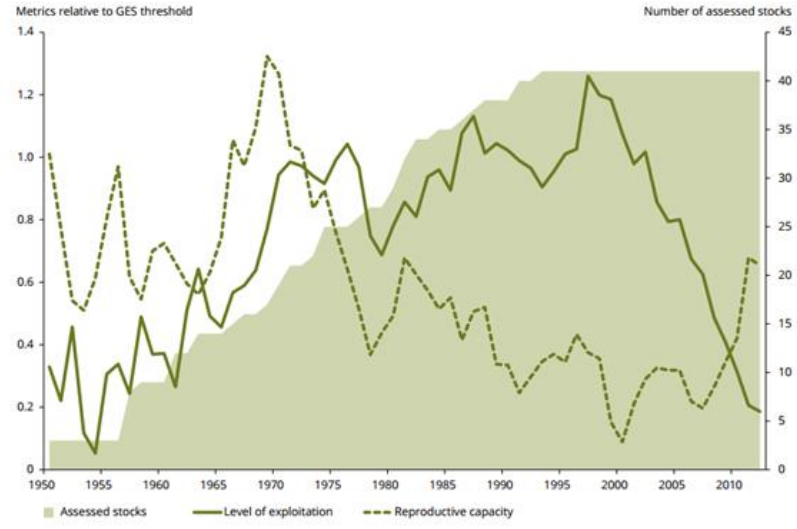
## Analysis of State and status

Species extraction through fishing in the marine environment has had severe repercussions within the EU waters and overfishing has triggered regime shifts in Europe's seas already beyond recovery. Fishing and harvesting of aquatic resources is also the largest threat for coastal biodiversity. In coastal areas, the fishing industry has significantly shifted since the 1970s due to overfishing as well as the introduction of alien species, eutrophication and habitat change/damage. For inland species extraction, data is very scarce and it remains difficult to make assumptions on the extent of effects the threat has on aquatic biodiversity (EEA, SOES 2015).

Overfishing of assessed stocks (i.e. stocks fished above Maximum Sustainable Yield — MSY) has been a long-standing problem in European waters. However, there are signs of improvement. In 2007, 94% of assessed fish stocks in the EU North-east Atlantic Ocean and the Baltic Sea were fished above MSY rates. Promising trends have been observed since then, with the number of overfished stocks falling from 94% in 2007 to 39% in 2013 in those regional seas (EC, 2014a). However, in 2014, the number of overfished stocks rose again to 41%.

In the Mediterranean and Black Seas, the level of knowledge is still very limited, making it impossible to assess change over time. The small numbers of stocks that are assessed in these waters do not show positive signs: 91% of the assessed stocks in the Mediterranean are overfished and 5 of the 7 assessed stocks in the Black Sea are overfished. It is crucial to reduce fishing pressure above sustainable levels otherwise there is a risk of depleting fish populations to their eventual collapse. However, reaching sustainable levels of exploitation for all fish stocks is not enough on its own to improve the status of fish stocks. To improve the status of fish stocks, the level of fishing pressure has to be to be looked at in conjunction with other indicators such as the reproductive capacity of the fish stock. However, stock assessments that provide time trends for both of these indicators are only available for a limited number of stocks. Figure 4.4 shows such an analysis — including both reproductive capacity and level of exploitation — for a small subset of stocks in the North-east Atlantic Ocean and Baltic regional seas. It shows how, on average, the level of exploitation increased over time, from slightly above sustainable levels in the 1950s until a maximum of overfishing was reached in the late 1990s. This was then followed by a steep decline back towards sustainable levels. The increase in overfishing until the early 2000s resulted in a gradual decrease in the reproductive capacity of these stocks. Reproductive capacity reached its lowest level soon after the overfishing peak, at which point it was almost at risk of being impaired. However, since the early 2000s, reproductive capacity began to recover for a number of stocks. This recovery in reproductive capacity is strongly linked to the decrease in fishing pressure. This analysis shows that properly implemented management measures have a positive effect on the state of fish stocks. However, it also shows that there is a considerable time lag between a management action and a biological response (EEA, SOES 2015).

Figure 4: Average Deviation of Status of Fish Stocks Compared to Policy Thresholds




**Note:** (*) Fish stocks belong to the North-east Atlantic Ocean and Baltic Sea.

For the level of exploitation, 0 is a target representing Maximum Sustainable Yield, above which exploitation is unsustainable. For reproductive capacity, 0 is a precautionary limit below which there is high risk that reproductive capacity is impaired and hence a need for management measures to recover stocks. Period covered 1950–2012. The figure is based on stocks for which both indicators could be estimated against reference points. Also indicated is the number of assessed stocks, which is stable from 1993 onwards.

Source: EEA, SOES (2015)

## Mapping of European policies against the DPS

In terms of regulating and reducing species extraction, several European policies are in place already. The Regulation 1380/2013 **Common Fisheries Policy** leads this effort by restricting fishing activities and promoting measures to increase selectivity, to reduce unwanted catches, and decrease negative impacts of fishing pressure on marine ecosystem and environment. Furthermore, the policy implements the adoption of multi-annual plans that contain conservation measures to restore and maintain fish stocks at levels capable of producing Maximum Sustainable Yield (MSY) and enables monitoring to ensure the enforcement of measures. The **Marine Strategy Framework Directive (MSFD), Birds Directive (BD)** and **Habitat Directive (HD)** aim to implement protected areas in which human activities are restricted, and effectively decrease species extraction and enhance the status of the environment and related biodiversity. The **European Maritime and Fisheries Fund** aims to reduce impact of fisheries on the marine environment by avoiding unwanted catches and promoting the enhancement and restoration of aquatic biodiversity and ecosystem related to aquaculture and the promotion of resource-efficient aquaculture.

The majority regulations and policies include commercial fishing as driver of species extraction, and some mention aquaculture, but for the most part regulations fail to include blue biotechnology within their frameworks. Solely the **CBD Aichi Targets** include the minimizing of genetic erosion and safeguarding the genetic diversity of species in their directive. In addition to addressing drivers, policies consider the state of biodiversity through implementation of protected areas and strive towards good environmental status. However, this does not take into account biodiversity from aquaculture.

While the policies in place aim to reduce species extraction, the socio-economic aspects of the threat are not addressed adequately yet and economic growth is even promoted in some. The Regulation 1380/2013 **Common Fisheries Policy** promotes small-scale coastal fishing and

sustainable aquaculture to contribute to food security and supplies, growth and unemployment, which could lead to an increase in activity. The same is true for the **Blue Economy** strategy that promotes the growth of the aquaculture and marine biotechnology sector. Additionally, aquaculture is one of the pillars for the **EU's Blue Growth Strategy**, and its development can contribute to the Europe 2020 Strategy.

Table 4: DPS Policy Analysis of Extraction of Species Threat

| Relevant Instruments | Relationships | Impact |
|---|---|---|
| ***Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC)*** | | |
| Creation of Special Protection Areas (Article 3.2, BD) and Special Areas of Conservation (Art. 3.1, HD) | These instruments create a network of protected areas; called Special Protection Areas (SPAs) and Special Areas of Conservation (SAC), part of the Natura 2000 network. | S (+) |
| Take steps to avoid the deterioration of natural habitats in SACs (Article 6.2, HD) and assess the impacts of plans and projects on an SAC before approving it (Art. 6.3, HD)<br><br>Take appropriate steps to avoid pollution in protection areas (Art. 4.4, BD). | The Birds and Habitats Directives imply restrictions on human activities within and around the Natura 2000 areas. Widely established restrictions include infrastructural, industrial, and agricultural activities in and near to Natura 2000 sites. This instrument can reduce the intensity of drivers (e.g. human activities) in SPAs and SACs. | D (+)<br>P (+) |
| ***Water Framework Directive (2000/60/EC)*** | | |
| Article on environmental objectives. Art. 4 | The WFD sets a comprehensive ecological status assessment, aiming for "good status" of all freshwater, transitional, groundwater and coastal water bodies by 2015. For this threat, biological elements of water bodies are pertinent (composition and abundance of fish and other marine species). | S(+) |
| Establishment of register(s) of all areas that were designated as requiring special protection under specific Community legislation for conservation of habitats and species dependent on water. Art. 6. | This measure allows for the appropriate management of protected areas where human activity is restricted/prohibited. | D(+)<br>P(+) |
| ***Marine Strategy Framework Directive (2008/56/EC)*** | | |
| Perform initial assessment of essential features and characteristics, current environmental status of waters; predominant pressures and impacts; socioeconomic analysis of use of waters. *Art. 8(1)* | These measures aim at achieving and maintaining "good environmental status" by 2020. The good environmental status refers to the intrinsic conditions of the ecosystem and also includes a sustainable use of it by means of qualitative descriptors detailed in the Directive's Annex. Pertinent Descriptors for this threat (1) biodiversity, (2) non-indigenous species introduced by human activities, (3) populations of commercially exploited fish and shellfish, (4) marine food webs. | D(+)<br>P(+)<br>S(+) |
| Determine good environmental status (GES). *Art. 9(1)* | | S(+) |
| Establish a series of environmental targets and associated indicators to reach GES. *Art. 10(1)* | | S(+) |
| Develop a marine strategy for the Member State's marine waters. *Art. 5(1)*<br>Establish a programme of measures to achieve/maintain GES. *Art. 13(1)* | This measure aims at achieving GES by MS putting in place tailored PoMs that address identified pressures and impacts in order to enhance/restore aquatic ecosystems. This includes managing fishing practices, aiming to | S(+)<br>P(+) |

| | | |
|---|---|---|
| | reduce pressures. | |
| Establish marine protected areas (MPAs). *Art. 13(4)* | This measures aims to establish a spatial network of protected areas coherent with the nature directives | S(+) |
| Adoption of measures to reduce risk to the environment. Art. 13(5) | Restriction of fishing activities in these areas | D(+)<br>P(+) |
| ***Regulation (EU) (1255/2011) on integrated maritime policy*** | | |
| RERM marine resources milestone: "By 2020, good environmental status of all EU marine waters is achieved | Is one of the tools that can help to address the pressures and that the Commission will further develop jointly with the Member States | S(+) |
| IMP refers to are Maritime Spatial Planning and Integrated Coastal Zone Management | Through integrated planning to reduce the negative environmental impact of economic activities carried out in the marine and coastal areas. These activities include fishing. | P(+) |
| ***Common Fisheries Policy Regulation (1380/2013)*** | | |
| Promote coastal fishing activities, taking into account socio-economic aspects. *Art. 2(5,i).* | May cause increase in small scale fishing activity on the coast. | D(-) |
| Minimum conservation reference sizes. *Art. 7(1,g)* | This measure aims at ensuring the protection of juveniles and marine organisms (Regulation 85/98 Technical measures for the protection of juveniles of marine organisms). | S(+) |
| Technical measures. *Art. 7(2).* | Measures to increase selectivity reduce unwanted catches, decrease negative impacts of fishing pressure on marine ecosystem and environment (including rules concerning fishing gear and its use; specifications on the construction of said gear; limitations/prohibitions of certain gear in certain areas at certain times of year). | P(+) |
| Establishment of fish stock recovery areas. *Art. 8(1)* | Restriction/prohibition of fishing activities to contribute to conservation of living aquatic resources, in particular biologically sensitive areas, spawning grounds, and areas with evidence of heavy concentrations of fish below minimum conservation reference size. A number of regulations exist on specific species of commercial interest. | S(+) |
| Adoption of Multiannual plans. *Art. 9(1)* | These plans contain conservation measures to restore and maintain fish stocks at levels capable of producing MSY. | P(+) |
| Set quantifiable targets with clear time-frames for multiannual plans for stocks and fisheries. *Art. 10(1c,d)* | This measure aims at restoring/enhancing/maintaining fish stocks at sustainable levels. | S(+) |
| Landing obligation and catch limits. *Art. 15(1)* | All species which are subject to catch limits must be recorded, landed and counted against quotas to document and subsequently reduce unwatched catches. | P(+) |
| Adjustment and management of fishing capacity. *Art. 22 (1)* | Creating a stable enduring balance between fishing capacity and fishing opportunities over time, taking into account trends and scientific evidence | P(+) |

| | | |
|---|---|---|
| Allocation of fishing opportunities. *Art. 16 (1)* | This measure ensures the relative stability of fishing activities of each MS for each fish stock or fishery. | D(+) |
| Entry/Exit scheme. *Art. 23(1)* | Maintaining balance of size of fleets according to targets aiming at preventing additional pressure | P(+) |
| Fishing fleet registers. *Art. 24(1)* | Information for the management of fishing activities allowing for the adjustment and management of fishing capacity. | P(+) |
| Promotion of sustainable aquaculture to contribute to food security and supplies, growth and unemployment. *Art. 34.* | May cause an increase in aquaculture, and thus pressure on fish stocks used for feed production. | D(-) |
| ***Regulation (508/2014) on the European Maritime and Fisheries Fund*** | | |
| Reduction of impact of fisheries on the marine environment, including avoidance and reduction of unwanted catches. Art. 6(1)a) | This measure aims at reducing the pressure of fishing activities | P(+) |
| Promote a sustainable balance between resources and the fishing capacity of the Community fishing fleet. Art. 6(1)c) | Aid for MS to make changes to fishing fleet with positive and negative implications for intensity of activity. Measure can include on-board safety and working improvement, more selective gear, small-scale coastal fisheries, socioeconomic measures (early retirement and retraining etc.). | D(+/-)<br>P(+/-) |
| Enhancement of competitiveness and viability of fisheries enterprises, including small scale coastal fleet. Art. 6(1)d) | This encourages the increase in intensity of fishing activity in coastal ecosystems | D(-) |
| Provision of support to strengthen technological development innovation and knowledge transfer. Art. 6(2)a) | This measure supports the development of innovative technologies, which could include more selective fishing practices, non-fish based feeding for aquaculture | D(+)<br>P(+) |
| The enhancement of competitiveness and viability of aquaculture enterprises. Art. 6(2)b) | This measure supports the increase in aquaculture, which requires wild fish as feedstock, thus increasing the intensity of this threat | D(-) |
| The enhancement and restoration of aquatic biodiversity and ecosystem related to aquaculture and the promotion of resource-efficient aquaculture. Art. 6(2)c) | These measure aims to counteract the negative impacts of increasing aquaculture activities | P(+) |
| The promotion of aquaculture having a high level of environmental protection, and the promotion of animal welfare and health. Art. 6(2)d) | | P(+) |
| The promotion of economic growth, social inclusion and job creation in coastal and inland communities which depend on fishing, including diversification of activities within fisheries, and into other sectors of maritime economy. Art. 6(4) | This measure could increase intensity of fishing activity in coastal and inland communities as a result of diversification of fishing activities. This measure could decrease intensity of fishing activity through diversification into other maritime economic activities. This in turn may have additional positive and negative impacts, depending on the activity. | D(+/-) |
| ***Decision on the 7th Environment Action Programme of the European Union (2013-2020)*** | | |
| Restoring biodiversity in so far as feasible, while stepping up the Union contribution to averting global biodiversity loss. | Aside from highlighting the environmental and social benefits, the 7th Environment Action Programme states the importance of restoring biodiversity due to the costs particularly for economic actors. | D(+)<br>P(+) |

| | | |
|---|---|---|
| ***Regulation (293/2013) of the European Parliament and of the Council of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE) and repealing Regulation (EC) No 614/2007*** | | |
| Natura 2000 network is to be restored or brought to adequate management, surface and type of ecosystems restored, and number and type of habitats and species targeted with improving conservation status. *Art. 3(3,a)* | Restrictions of human activity within the Natura 2000 network will limit species extractions within the respective boundaries. | D(+)<br>P(+) |
| ***Regulation (1300/2013) on Cohesion Fund*** | | |
| Preserving and protecting the environment and promoting resource efficiency by protecting and restoring biodiversity and soil and promoting ecosystem services, including through Natura 2000, and green infrastructure. *Art. 4(c, iii)* | Measures for protecting and restoring biodiversity could include a limitation of species extraction. | D(+)<br>P(+) |
| ***Regulation (1301/2013) on Regional Development Fund*** | | |
| Protecting and restoring biodiversity and soil and promoting ecosystem services, including through Natura 2000, and green infrastructure. *Art. 5(6,d)* | The investment priority of the ERDF to preserve and protect the environment and promoting resource efficiency through protecting and restoring biodiversity will enhance the state of species that are currently being extracted. | D(+)<br>P(+) |
| **Communication (COM (2004) 254 final/2) Innovation in the Blue Economy** | | |
| Strategy promoting the growth of the blue economy. 3 main components one of which is the development of sectors that have a high potential for sustainable jobs and growth (relevant for this threat: aquaculture, marine biotechnology). | This encourages increase in intensity of activities that involve extraction of species from marine environment. In the case of aquaculture, this involves increased need for wild fish for feedstock. | D(–) |
| ***Strategic guidelines for sustainable development of EU aquaculture (COM(2013)229 Final)*** | | |
| Aquaculture is one of the pillars for the EU's blue growth strategy, and its development can contribute to the Europe 2020 Strategy. | This places a heavy emphasis on the need to increase aquaculture development in the EU, which increase the need for wild fish for feedstock. | D(–) |
| The Commission intends to help national and regional administrations to implement EU environmental legislation without imposing unnecessary burdens on producers. | This refers to the trade-off between environmental objectives and economic activities. | D(+) |
| ***Europe 2020*** | | |
| Promoting smart, sustainable and inclusive growth to address structural weaknesses in Europe's economy, long term global challenges (globalisation, pressure on resources, ageing populations etc.).<br>1) Smart: knowledge, technology and innovation<br>2) Sustainable: resource efficiency, greener and more competitive economy<br>3) Inclusive: employment, social and territorial cohesion | This cross-cutting policy aim to help Europe emerge from the economic crisis, turning the EU into an economy that deliver high levels of employment, productivity and social cohesion. This strategy influences industries that depend on species extraction in a number of ways, including promoting innovative technologies to reduce environmental impact of commercial activities, fostering development and growth of coastal and inland fisheries etc.<br>This produces a range of positive and negative relationships with the intensity of the threat, which will depend on the range of instruments put into place. | D(+/–)<br>P(+/–) |

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## 5.3 Water Abstraction

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### Overview

The over-abstraction of water resources for **consumptive uses** from both surface water and groundwater bodies can lead to **reduced river flows**, **lower lake and groundwater levels**, and the **drying-up of wetlands** (EEA, 2010a, 2012a and 2015b). Where often exceeding availability, water demand leads to significant degradation of freshwater biodiversity (EEA, 2010a and 2012a). EEA (2016a) states that water abstraction is a major pressure on freshwater ecosystems with a high observed impact on biodiversity.

Water abstractions can influence the **flow regime**, which is the most important determinant for rivers and wetland ecosystems. Various flow features (e.g. magnitude, frequency, duration, timing, and rate of change or river flows) can lead to different responses in ecosystem components and the overall ecosystem function (Forslund et al., 2009). The links between natural flow regimes and aquatic biodiversity in river and floodplain ecosystems are described by Bunn and Arthington (2002; cited in Forslund et al., 2009 and EC, 2015a): (1) the flow regime is the dominant factor which determines the habitats in a river and the surrounding freshwater ecosystems – which in turn will determine the composition of species; (2) aquatic species have developed life history strategies in response to the natural flow regime; (3) maintaining the natural pattern of longitudinal and lateral connectivity is essential to the viability of populations of many riverine species; (4) also the invasion and successes of exotic and introduced species in rivers is facilitated by the alteration of flow regime.

EC (2015a) states many examples of how the quantity of water in ecosystems (in particular the seasonal variation in river flow and water level fluctuations; EEA, 2012a) can impact biodiversity. Environmental conditions in estuaries and coastal waters are affected by freshwater flows from the upper catchment, "due to their impact on salinity gradients, estuarine circulation patterns, water quality, flushing, productivity and the distribution and abundance of many plant and animal species" (Batzer and Sharitz, 2006, in: EC, 2015a). "A reduction in flow alters the width, depths, velocity patterns and shear stresses within the system (Statzner and Higler, 1986; Armitage and Petts, 1992). This can modify the distribution and availability of in-stream habitat, which can have detrimental effects on invertebrates and fish populations (Wood *et al.*, 1999)" (EC, 2015a).

Low flows control the water chemistry, concentrate prey species, dry out low-lying areas in the floodplain, and are often associated with higher water temperature and lower dissolved oxygen conditions (TNC, 2011a). These low flows also control connectivity, thereby restricting movement of some aquatic organisms as different river flow levels support different ecologic functions (Forslund et al., 2009)..

Aquatic biodiversity can be altered through water abstraction from surface water bodies, but also through **groundwater abstraction**. Especially in the summer, groundwater typically provides critical base-flow to rivers, lakes and wetlands (EEA, 2010a). The natural outflow of groundwater is a stable flow component, which is particularly important in low flow and drought situations. Furthermore, as it is chemically different from flows stemming from the surface, it is essential for meeting specific biological requirements (EC, 2015a). Groundwater outflow is a critical input for many temporal rivers and lakes, which occur often especially in southern Europe. Habitats and

species can depend on groundwater outflow "both in terms of quantity (e.g. providing long term stable refuge on the flood plains essential for survival during extreme low flows) and quality (e.g. stable temperature, oxygenated habitats in river sediments, essential chemical habitat aspects for adapted species such as in alkaline rivers)" (EC, 2015a).

Excessive abstraction of water can also negatively influence **water quality**, as less water is available to dilute pollutants. In coastal areas, over-abstraction of aquifers often results in salt-water intrusion, which alters the quality and use of groundwater (EEA, 2010a). However, it must nevertheless be kept in mind that water flows and availability are also naturally fluctuating, and that they will furthermore be strongly influenced by climate change. The impact of water abstraction on biodiversity in the future will also depend on the impacts of climate change.

The present pamphlet will focus on the *consumptive* extraction of water (from both surface water bodies and groundwater). It does therefore not further consider the non-consumptive abstraction for cooling purposes or any temporary storage of water (like in the case of hydropower use).

## Drivers and Pressures

### Key Drivers and Pressures

Water is extracted for multiple human activities, either from surface water bodies (rivers and lakes) or from groundwater. The present pamphlet focuses on consumptive uses (i.e. neither the temporary abstraction for cooling purposes or for temporary storage – e.g. linked to hydropower use – nor the water demand for water transfers to other water bodies or river basins will not be further looked at). The main drivers for consumptive use of water are: agriculture (irrigation), public water supply (households and industry), industry, and tourism (service industries). The specific sector needs for water lead either to regular abstraction (e.g. for households) or to seasonally varying abstractions (e.g. for irrigation or tourism). More than 80 % of the total water demand in Europe is covered by rivers (46.5 %) and groundwater resources (35.4 %). 16.2 % stems from artificial reservoirs, the rest (1.9 %) from lakes (EEA, 2016b)[13]. Abstracted volumes are varying over the year. Water abstraction from rivers, groundwater and lakes during summer is almost twice the volume compared to water abstracted during winter (EEA, 2016b). EEA (2012, cited in 2016a) identifies over-abstraction of water as part of the major pressures on Europe's freshwater. It is especially severe in the Mediterranean, with agriculture being the main consumer (64 %) (Mediterranean Wetlands Observatory, 2012; cited in EEA, 2016a). On average, 13% of all renewable and accessible freshwater in Europe is abstracted from natural water bodies (including surface waters and groundwater) (EEA, 2015b).

The **agricultural sector** accounted for 36 % of total water use on an annual scale in Europe (between 2002 and 2012). However, seasonal variations are high. During winter, "the same sector accounted for just 5 % of total water use in Europe, while in spring and summer this figure increased to 44 % and 60 %, respectively. Irrigation for crop growing is the main use of water in the Mediterranean – the region whose agriculture accounts for 75 % of all agriculture related water use – followed by the Continental (14 %) and Atlantic (5 %) biogeographical regions. This high irrigation related water demand, coupled with water resources being less renewable in spring and summer, results in water stress in the Mediterranean region" (EEA, 2016b). In 2010, the total

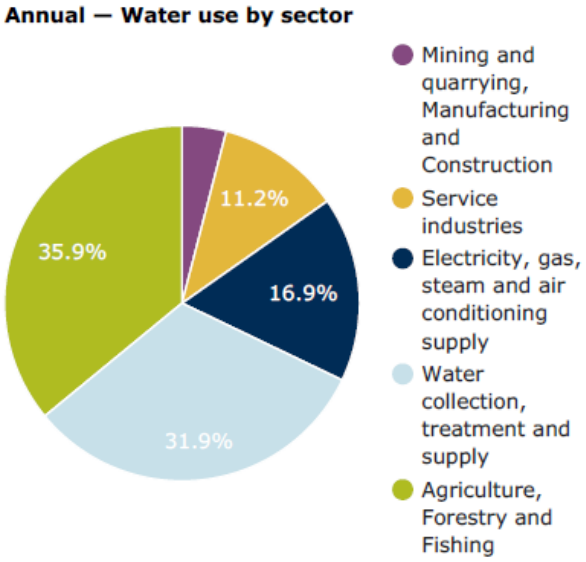
[13] Please note: All percentages shown for water use from EEA (2016b) consider also non-consumptive abstractions for cooling purposes.

water used for irrigation by agricultural holdings in Europe was around 40 billion m3 (Survey on agricultural production methods, cited in EC, 2015b).

**Public water supply** is the second biggest water abstractor after agriculture, accounting for 32 % of total water use, with 61% of total annual water supplied by the public water system in Europe (EEA, 2016b). Needs for drinking water supply depends directly on the population. Pressures on water resources are particularly high in areas with high population density. Abstraction levels remain more or less stable throughout the year, increasing only slightly during summer and decreasing in winter (EEA, 2016b).

**Industry (mining, quarrying, manufacturing and construction)** abstracts 4% of freshwater in Europe, while the **service industry (tourism)** accounts for about 11% (EEA, 2016b). The water use from tourism is attributed to accommodation and food service activities and the pressure is particularly high in the Mediterranean islands as the average number of tourists is 16 times higher than the local population (EEA, 2016b).

Figure 5: EU Annual Water Use by Sector




Source: EEA (2016a)

## Socio-economic description of the Drivers

In 2014, **agriculture** employed 9.5 million people, which represented 4.4% of total employment in the EU-28 (Labour Force Survey, cited in EC, 2015b). The total number of farms, the average size of the agricultural areas as well as economic size differs significantly among member states. In 2013, the greatest number of farms could be found in Romania, followed by Poland and Italy. In terms of utilised agricultural area (UAA), the most important EU member states are France, Spain and the UK (EC, 2015b). In 2013, two-thirds of all farms in the EU-28 had less than 5 ha of UAA, whereas only 6.7% had more than 50 ha of UAA. The total UAA was 174 million ha in the EU-28, out of which 60% were used for arable crops, one third for permanent grassland and meadow, and 6% for permanent crops (EC, 2015b). The size of the irrigated area gives an indication of the pressure of agriculture on water resources. In 2013, it comprised 10.3 million ha (5.8% of the total UAA). Southern European countries like Spain, France, Italy, Greece and Portugal show the highest

amounts of irrigated land, whereas irrigated areas in Denmark and the Netherlands are well below 3% of the UAA.

The water collection, treatment and supply sector for **public water** in Europe (EU-28) involved 75 400 enterprises in 2012 and employed 1 500 000 persons. The sector has an added value of 97.5 billion EUR (Eurostat, 2016a).

In 2012, 19 000 enterprises in EU-28 employed 614 400 persons in the **mining** and **quarrying industry**, reaching a turnover of 260 222 million EUR and an added value of 85 903 million EUR (Eurostat, 2016c). Mining and quarrying concerns the extraction of fossil fuels, ferrous and non-ferrous metal ores, construction materials (e.g. stone and sand) and other industrial materials (e.g. salt, phosphates and germstones) as well as mining support service activities (Eurostat, 2016c). The industry branch of **manufacturing** includes a very vast range of activities and production techniques, from small-scale enterprises using traditional production techniques to very large enterprises manufacturing complex products (Eurostat, 2016d). In 2012, 2 100 000 enterprises employed 30 million persons retrieving a turnover of 7 080 000 million EUR and 1 620 billion EUR value added (Eurostat, 2016d). **Construction** includes the construction of buildings, civil engineering and specialist activities such as site preparation, installation activities (e.g. of electrical wiring), completion and finishing activities (e.g. painting) and other specialist activities (e.g. roofing) (Eurostat, 2016e). The output and employment in the construction sector fell sharply due to the financial crisis. In 2012, 3.3 million enterprises employed 12.7 million persons, securing a turnover of 1 545 459 million EUR and 492 897 million EUR of value added (Eurostat, 2016e).

Europe's **service industry tourism** remains a strong economic branch making up 10 % of EU GDP (Eurostat 2013). In 2013, 2.2 million tourism industries employed 12 million persons. The turnover of the tourism industry amounted to 941 075 million EUR, and the added value at factor cost was 344 198 million EUR (Eurostat, 2016b).

## Description of market condition and broad regulatory context of Drivers

At European level, the **agricultural sector** is primarily regulated by the Common Agricultural Policy (CAP) which aims to improve agricultural productivity and ensure a stable supply of affordable food, to enable farmers to make a "reasonable living", and to address climate change and sustainable management of natural resources. Sustainable management includes environmental issues relating to resource efficiency, soil and water quality and threats to habitats and biodiversity. Even though water extraction is not specifically mentioned, its negative effects are accounted for by the CAP. Addressing and regulating water abstraction directly is of the utmost importance as more farmers in Europe are cultivating water-intensive crops as they offer higher yields (EEA, 2010a).

The provision of drinking water is under the responsibility of the public authorities in the different EU member states and generally in the hand of local authorities (EC, 2014). At EU level, the provision of drinking water through the **public water supply** sector is mainly regulated via the Drinking Water Directive, which laid down essential water quality standards at EU level. Ensuring that the requirements of the drinking water directive are met forms also part of the WFD requirements. The special status of drinking water as a good has been acknowledged in international law and has enabled the development and upgrading of infrastructures in Europe (EC, 2014). The WFD requires that the price paid for supplying water reflect the true costs of water use (cost-recovery-principle), in order to encourage the sustainable use of water. However, affordability is a very important issue linked to drinking water, and national authorities can decide

about support actions to safeguard disadvantaged people and to tackle water-poverty issues (EC, 2014).

Policies which are limiting the environmental impact of **industries** focus on limiting industrial pollution. They include in particular the Industrial Emissions Directive (IED), the European Union's Emission Trading System (EU ETS), the Water Framework Directive and the Urban Waste Water Treatment Directive (UWWTD)[14]. Furthermore, different sustainability initiatives aim at helping to reduce the impacts of industry on the environment. They include the European Eco-Management and Audit Scheme (EMAS) and ISO14001 as well as Voluntary Corporate Social Responsibility (CSR) initiatives[15]. The European Commission aims to bring about an industrial renaissance in Europe by developing policies and legislations to support the industry sector, implementing a competition policy and setting up task forced to promote the need for investment (EC, 2016b).

In 2010, the European Commission adopted the Communication, 'Europe, the world's No. 1 tourist destination – a new political framework for tourism in Europe' to set out a new strategy and action plan for EU tourism (EC, 2016a).The Commission aims to increase tourism demand, but also to enhance tourism quality and sustainability (EC, 2016a).

## Trends in Pressures and Drivers

Since the 1990s, water abstraction in Europe has generally decreased. In the **industrial sector**, for example, water abstraction has decreased by 27 % since the 1990s through improvements in water efficiency, whereas water abstraction in the **agricultural sector** has decreased by 22% (see Fig. 4). Abstraction by the **public water supply** sector has only slightly declined by 5%. In eastern and western Europe the reduction has been significant, however, in southern Europe and the Balkans public water supply has increased (EEA, 2016b[16]). In the **tourism sector**, the number of tourists rose by 30% across Europe between 2002 and 2012. Between 2002 and 2008, water use by the service sector increased steadily by 7%. Afterwards, until 2012, however, it decreased by 1.5% (EEA, 2016b). However, it is uncertain if improvements occurred due to water saving or awareness raising among users and suppliers in the industry (EEA, 2016b). The **water exploitation index** (WEI) states that from 2002-2012 in the Mediterranean region areas around big cities are affected by water stress **especially during summer** due to extraction while for the most parts of Europe no significant changes were visible (ETC/ICM, 2015b).

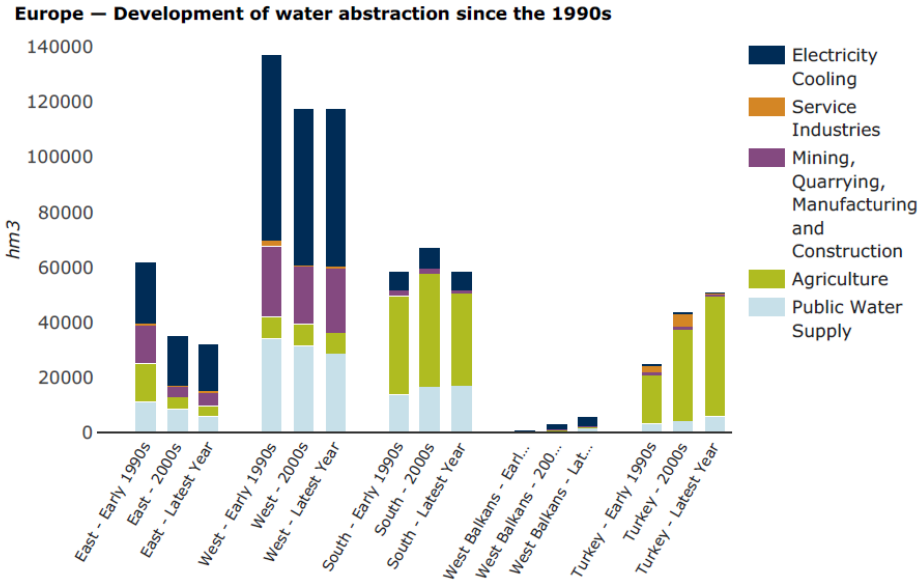
With regards to **agriculture** in particular, irrigated agricultural land decreased by 1.1% at European level between 2007 and 2013 (EC, 2015b). Irrigation methods significantly improved in Europe over the past decade and have led to a decrease in water abstraction, even though adoption of such techniques can also lead to an increase in cultivated area (MARM/BPIA 2009, EEA 2010a).

With regards to future developments, EEA (2015b) is expecting that in the next 5 to 10 years water use will be decreasing for most sectors and in most regions. However, **agricultural water use, in particular in southern Europe, will remain problematic**. In view of a 20+ years outlook, it is expected that water stress will remain a concern in some regions, and that improvements in efficiency will not be able to offset all impacts of climate change. Water scarcity and droughts are expected to continue to affect freshwater ecosystems (EEA, 2015b). In the **agricultural sector** in

[14] http://www.eea.europa.eu/soer-2015/europe/industry (accessed 22/08/2016)
[15] http://www.eea.europa.eu/themes/industry/intro (accessed 22/08/2016)
[16] To be noted that all indications of percentages from EEA 2016b take also water abstraction for electricity as well as Turkey into account.

particular, the increasing trend in demand for food and bioenergy may lead to increasing demand for water for the agricultural sector (EEA, 2010d).

Figure 6: Europe- Development of Water Abstraction since the 1990s




Source: EEA, 2016b

Currently, efforts are made at EU level to promote wastewater reuse, amongst others through providing minimum quality standards for water reused for irrigation (and groundwater recharge) (EC, 2016c). This might reduce the demand for freshwater. It needs to be noted that pressures like water abstraction will strongly be influenced by **climate change**, by changing both the available water quantity and the water demand (EEA-JRC-WHO, 2008). This change will negatively affect water demand for **public sector supply** and **tourism** due to the water intensity of summer activities that may increase as the average temperature grows hotter and the heightened water supply needed to ensure snow for winter tourism (EEA, 2010a).

## Analysis of State and status

Over 40% of European rivers and lakes related birds species remain under the population status threatened, near threatened, declining or depleted (EEA, 2015c). Rivers and lake ecosystems are largely in an unfavorable state, given that a large share (around half) of the **assessments of conservation status for rivers and lakes habitats and species** from the Habitats Directive is unfavorable-inadequate (EEA, 2015c). With regards to the identified responsible pressures, the "modification of natural conditions", and more specifically changes in water body conditions have the highest impact (EEA, 2015c). Water abstractions can be expected to contribute to these pressures. Managing water abstraction is listed among the top five conservation measures for non-bird species and habitats associated with rivers and lakes ecosystems (EEA, 2015c).

The biodiversity status of **coastal ecosystems** is largely unknown in comparison to terrestrial ecosystems, but the status for most species and habitats is estimated to be unfavorable (EEA, 2015c). Fishing and harvesting aquatic resources is the most important pressure, followed by pollution. Changes in water bodies' conditions (which can be linked to water abstraction pressures) are the third most important pressure for habitats in coastal ecosystems. However,

water abstraction has not been identified as being a significant pressure for coastal water bodies, but only for **transitional water** bodies (EC, 2013). Ecological status or potential in transitional waters is also the worst among all surface water body types, with two thirds of the water bodies having less than good ecological status or potential (EEA, 2012a).

Three groups of quality elements are used by the WFD to describe good ecological status or good ecological potential, respectively: biological elements, hydromorphological elements supporting the biological elements and chemical and physical-chemical elements supporting the biological elements. The hydrological regime – which can amongst others be altered by water abstractions – forms part of the hydromorphological quality elements. The hydrological regime is a relevant variable that affects the ecological status of all categories of surface water bodies (rivers, lakes, transitional and water coastal waters) (EC, 2015a). It is estimated that 8 % of European river water bodies are affected by water abstraction pressures while for four Member States more than 20 % of river water bodies were estimated to be affected by water abstraction (EEA, 2012).The extraction of water does not have a significant impact on marine ecosystems and biodiversity. Marine waters are therefore not further looked at in this template

Assessments undertaken for the **Birds and Habitats Directives** indicate the following trends: Regarding the EU population status of rivers and lakes related birds, the share of assessments reported as decreasing is high (31%). At the same time, similarly large shares of assessments are increasing (27%) and stable/fluctuating (29%) (EEA, 2015c). With regards to the conservation status for rivers and lakes habitats and species, there is a significant declining trend (around a third of assessments). An improvement is only reported for 5% of assessments for both non-bird species and habitats (EEA, 2015c).

Regarding the EU population status assessments for coastal area bird species trends show that populations are mostly decreasing, with over half of all species affected (EEA, 2015c). Regarding the conservation status for coastal ecosystem habitats, unfavorable declining assessments make up 28% of assessments, while unfavorable stable (18%) and unfavorable improving assessments (11%) make up larger shares as well (EEA, 2015c).

## Mapping of European policies against the DPS

The **Water Framework Directive (WFD)** builds the policy framework for reducing and regulating water abstraction. However it is stated in the directive that it is not explicitly designed to address any quantitative water issues aside from those related to groundwater. The **WFD**'s main objectives are for Member States to prevent deterioration of the status of all water bodies and to protect, enhance and restore all water bodies, with the aim of achieving good ecological status by 2015 at the latest. The Regulation 1305/2013 **Rural Development** addresses water-related issues in the agricultural sector, the main driver for water abstraction. The policy aims to improve water management and increase sustainable water use by i.e. providing advisory services on improved water management and monitoring irrigation methods in place. Several policies such as the **European Innovation Partnership on Water** and the **EU's Seventh Environment Action Programme to 2020** promote transboundary cooperation among Member States to control the amount of water extracted within the EU.

While the main two drivers (agriculture and public water supply) are largely covered by European legislation concerning water abstraction, the industrial sector is for the most part overlooked. Solely the **WFD** states the need for efficiency and reuse measures, promoting water-efficient technology in the industry sector as well as water-saving techniques. The state of water as a resource is not often addressed within the different policies, but the **Seventh Environment Action**

**Programme** has the objective to ensure protection, conservation and enhancement of the EU's natural capital and to improve resource efficiency by means of monitoring of the efficiency of water use in the different economic sectors.

Even though political action has promoted a reduction in water abstraction within the EU, economic welfare is still the focus of most Member States. Most water related policies that focus on economic growth go against a decrease in water abstraction. For instance, the Communication **'Towards an Industrial Renaissance'** and the Communication **'Europe, the world's No. 1 tourist destination – a new political framework for tourism in Europe'** clearly promote the sustaining of competitiveness in Europe's economy. These actions will lead to an intensification of the driver. Even the Regulation 1305/2013 **Rural Development** promotes energy crops that increase water demand and supports infrastructure to increase agricultural output, which could also intensify water use.

Table 5: DPS Policy Analysis of Water Abstraction Threat

| Relevant Instruments | Relationships | Impact |
|---|---|---|
| ***Birds Directive (2009/147/EC) & Habitats Directive (92/43/EEC)*** | | |
| Creation of Special Areas of Conservation (Art. 3.1, HD) and Special Protection Areas (Article 3.2, BD) | These instruments create a network of protected areas; called Special Protection Areas (SPAs) and Special Areas of Conservation (SAC), part of the Natura 2000 network. | S (+) |
| Take steps to avoid the deterioration of natural habitats in SACs (Article 6.2, HD) and assess the impacts of plans and projects on an SAC before approving it (Art. 6.3, HD)<br><br>Take appropriate steps to avoid pollution in protection areas (Art. 4.4, BD). | The Birds and Habitats Directives imply restrictions on human activities within and around the Natura 2000 areas. Widely established restrictions include infrastructural, industrial, and agricultural activities in and near to Natura 2000 sites. This instrument can reduce the intensity of drivers (e.g. human activities) in SPAs and SACs. | D (+)<br>P (+) |
| ***Water Framework Directive (2000/60/EC)*** | | |
| Environmental objectives. Art.4 | WFD's main objectives are for Member States to prevent deterioration of the status of all water bodies and to protect, enhance and restore all water bodies, with the aim of achieving good ecological status by 2015 at the latest. The hydrological regime is explicitly identified in the Directive as an element of ecological status. "Article 4.7 of the WFD requires that all practicable steps be taken to mitigate the adverse impacts of new infrastructure on the status of water bodies, and that the projects should have overriding public/societal interest and/or benefits to the environment and society (EC, 2006a)" (EEA, 2012a). Member states shall ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater status. | P(+)<br>S(+) |
| Basic measures. Art. 11(3) & supplementary measures Art. 11(4) Annex VI (B) | Basic measures required under the WFD include measures aiming at controlling and reducing water demand.<br>Many supplementary measures affect water abstraction, either by influencing demand (e.g. abstraction controls, improving efficiency), by providing alternative water sources (e.g. desalination plants), or by mitigating the environmental effects | D(+)<br>P(+)<br>S(+) |

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| | of water abstraction (e.g. artificial recharge of groundwater bodies).<br>Other supplementary measures can potentially also have an impact on water abstractions (e.g. negotiated environmental agreements, recreation and restoration of wetland areas) | |
| Recovery of costs for water services. Art. 9 | MS shall take account of the principle of recovery of the costs of water services, which include water supply. Cost recovery shall consider environmental and resource costs, and hence the impact of water abstraction on the environment. The cost-recovery principle is implemented via water pricing, which provide incentives for users to use water resources efficiently. | D(+)<br>P(+) |
| ***Communication (2007) Addressing the challenge of water scarcity and droughts in the European Union*** | | |
| Identified policy options<br>Putting the right price tag on water<br>Allocating water and water-related funding more efficiently<br>Improving drought risk management<br>Considering additional water supply infrastructures<br>Fostering water efficient technologies and practices<br>Fostering the emergence of a water-saving culture in Europe<br>Improve knowledge and data collection | The communication "sets out the measures needed if Europe is to move towards a water-efficient and water-saving economy, including full implementation of the WFD with water pricing, moving towards sustainable land-use planning, giving priority to water savings and water efficiency measures over any others, and further integrating water issues into all sectoral policies." (EEA, 2010a) | D(+)<br>P(+) |
| ***Decision on the 7th Environment Action Programme of the European Union (2013-2020)*** | | |
| (Water Exploitation Index plus (WEI+)) | The objective is to ensure the protection, conservation and enhancement of the EU's natural capital and to improve resource efficiency. Monitoring of the efficiency of water use in the different economic sectors is necessary to achieve this. There is an international consensus about the use of the indicator water exploitation index plus (WEI+), which is published by UNEP, OECD, EUROSTAT and the Mediterranean Blue Plan (EEA, 2016b). | S(+) |
| ***Regulation (1293/2013) of the European Parliament and of the Council of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE)*** **and repealing Regulation (EC) No 614/2007** | | |
| Activities to ensure safe and efficient use of water resources, improving quantitative water management, preserving a high level of water quality and avoiding misuse and deterioration of water resources. *Annex III* | Improving water management could lead to a decrease in pressure of drivers of water abstraction. | D(+)<br>P(+) |

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|---|---|---|
| ***EU Policy document on Natural Water Retention Measures[17]*** | | |
| Promoting the uptake of natural water retention measures | "Natural water retention measures (NWRMs) [...] aim to restore natural water storage capacities by increasing soil and landscape water retention and groundwater recharge." (EEA, 2012a) | S(+) |
| ***Blueprint to Safeguard Europe's Water Resources[18]*** | | |
| Promotion of water reuse<br>Promotion of Natural Water Retention Measures<br>Promotion of ecological flows and water accounts<br>Promoting the identification of illegal abstraction | "The Communication "Blueprint to safeguard Europe's water resources" highlighted water reuse as a concrete and valid alternative supply option to address water scarcity issues" (EC, 2016c). Water accounts at river basin level can inform the management of abstraction and the need to increase water use efficiency (EEA, 2016a). | D(+)<br>P(+)<br>S(+) |
| ***Communication (COM/2015/0614 final) Closing the loop –An Action plan for the Circular Economy*** | | |
| Promoting wastewater reuse and groundwater recharge | The Circular Economy Package proposed in 2015, establishes a programme of action with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials.<br>The Communication mentions in its Annex[19]: Proposed legislation setting minimum requirements for reused water for irrigation and groundwater recharge – by 2017; Promotion of safe and cost-effective water reuse, including guidance on the integration of water reuse in water planning and management, inclusion of best practices in relevant BREFs, and support to innovation (through the European Innovation Partnership and Horizon 2020) and investments – by 2016-2017 | P(+)<br>S(+) |
| ***Regulation (1305/2013) European Agricultural Fund for Rural Development*** | | |
| Union priorities for rural development: restoring, preserving and enhancing ecosystems related to agriculture and forestry, with a focus on the following areas:improving water management, including fertiliser and pesticide management. promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors, with a focus on the following areas: increase efficiency in water use by agriculture; facilitate the supply and use of renewable sources of energy, of by-products, wastes and residues and of other non food raw material, for the purposes of the bio-economy | Improving water management and increasing efficiency in water use by agriculture forms part of the priorities and can help reducing water demand.<br>The promotion of energy crops, on the other hand, might increase water demand. | D(+/-) |

[17] https://circabc.europa.eu/sd/a/2457165b-3f12-4935-819a-c40324d22ad3/Policy%20Document%20on%20Natural%20Water%20Retention%20Measures_Final.pdf
[18] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012DC0673&from=EN
[19] http://www.eip-water.eu/water-%E2%80%9Ccircular-economy-package%E2%80%9D

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| Advisory services, farm management and farm relief services. Art. 15<br>[...] Advice may also cover other issues and in particular the information related to climate change mitigation and adaptation, biodiversity and the protection of water as laid down in Annex I to Regulation (EU) No 1307/2013 or issues linked to the economic and environmental performance of the agricultural holding, including competitiveness aspects. | Support provided for advisory services can cover advice on improved water management. | D(+)<br>P(+) |
| Investments in physical assets. Art. 17<br>1. Support under this measure shall cover tangible and/or intangible investments which:<br>[...] (c) concern infrastructure related to the development, modernisation or adaptation of agriculture and forestry, including access to farm and forest land, land consolidation and improvement, and the supply and saving of energy and water; [...] | Infrastructure supported can concern either supply or saving of water. | D(+/-)<br>P(+/-) |
| Natura 2000 and Water Framework Directive payments. Art. 30 | Some WFD related measures can be supported, under certain conditions. | D(+)<br>P(+) |
| Co-operation. Art. 35 | Support shall be granted in order to promote forms of co-operation involving at least two entities and in particular [...]<br>(g) joint approaches to environmental projects and ongoing environmental practices, including efficient water management, the use of renewable energy and the preservation of agricultural landscapes; [...] | P(+) |
| Investments in irrigation. Art. 46 | [...] in the case of irrigation in new and existing irrigated areas, only investments that fulfil the conditions in this Article shall be considered as eligible expenditure: [...]<br>3. Water metering enabling measurement of water use at the level of the supported investment shall be in place or shall be put in place as part of the investment. 4. An investment in an improvement to an existing irrigation installation or element of irrigation infrastructure shall be eligible only if it is assessed ex ante as offering potential water savings of a minimum of between 5 % and 25 % according to the technical parameters of the existing installation or infrastructure. If the investment affects bodies of ground- or surface water whose status has been identified as less than good in the relevant river basin management plan for reasons related to water quantity:<br>(a) the investment shall ensure an effective reduction in water use, at the level of the investment, amounting to at least 50 % of the potential water saving made possible by the investment;<br>(b) in the case of an investment on a single agricultural holding, it shall also result in a reduction to the holding's total | P(+) |

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|---|---|---|
| | water use amounting to at least 50 % of the potential water saving made possible at the level of the investment. The total water use of the holding shall include water sold by the holding. None of the conditions in paragraph 4 shall apply to an investment in an existing installation which affects only energy efficiency or to an investment in the creation of a reservoir or to an investment in the use of recycled water which does not affect a body of ground or surface water.5. An investment resulting in a net increase of the irrigated area affecting a given body of ground or surface water shall be eligible only if: (a) the status of the water body has not been identified as less than good in the relevant river basin management plan for reasons related to water quantity; [...] Derogations to the provisions are possible under certain conditions. | |
| European Innovation Partnership network. Art. 53 | 3. The tasks of the EIP network shall be to [...] (c) facilitate the setting up of cluster initiatives and pilot or demonstration projects which may relate, inter alia, to [...] (iii) biodiversity, ecosystem services, soil functionality and sustainable water management; [...] | P(+) |
| ***Regulation (1306/2013) on financing, management, monitoring of common agricultural policy*** | | |
| "Member States shall establish a system for advising beneficiaries on land management and farm management ('farm advisory system'). Art.12 | The farm advisory system shall cover "the information related to climate change mitigation and adaptation, biodiversity and protection of water, as set out in Annex I to this Regulation". Annex I Protection of water: Information on sustainable, low-volume irrigation systems and how to optimise rain-fed systems, in order to promote efficient water use. Information on reducing water use in agriculture, including crop choice, on improving soil humus to increase water retention and on reducing the need to irrigate | D(+)<br>P(+) |
| Cross-compliance with statutory management requirements and good agricultural and environmental condition of the land (Article 93). | From 2010 the Good Agricultural and Environmental Condition (GAEC) framework under cross-compliance (i.e. the attachment of environmental conditions to agricultural support policies) includes the requirement that, where use of water for irrigation is subject to authorization, procedures for authorizing irrigation have to be complied with. This should give Member States a tool for controlling illegal wells." (EEA, 2010a) | D(+)<br>P(+) |
| ***Regulation (1307/2013) establishing rules for direct payments to farmers under support schemes*** | | |
| Direct payments | Direct payments encourage agricultural activities and are hence promoting agricultural water demand. | D(−) |
| ***Cohesion Fund Regulation (1300/2013)*** | | |
| Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements. *Art. 4(c, ii)* | Investments towards sustainable water abstraction may decrease the pressure, but investing in extending the water supply will result in more water abstraction. | D(+/−)<br>P(+/−) |
| ***Regulation (1301/2013) on Regional Development Funds*** | | |
| Thematic Objective 6 "Preserving and protecting the environment and promoting resource efficiency". Art. 5<br>"[The ERDF shall support [...] | Structural and cohesion funds provide some means to co-finance capital-intensive investments in water infrastructure and help EU Member States comply with water legislation. There are three different categories of funding covered that relate to water efficiency: 'Risk prevention', 'Other measures to | P(+/−) |

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| preserving and protecting the environment and promoting resource efficiency through investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment going beyond those requirements ." Art.5(6,b) | preserve the environment and prevent risks', and 'Management and distribution of drinking water'.<br>Management of water resources includes: reducing leakage rates, connecting to water supply, additional supply and improving infrastructure. | |
| ***Directive (2009/28/EC) on the promotion of the use of energy from renewable resources*** | | |
| Adopt national renewable energy action plans setting targets for the share of energy from renewable sources. Art. 4 | This measure will increase in the intensity of a driver (agriculture) because Member States will increase bio-energy crops to meet targets and bio-energy crops need water for their growth. | D(-) |
| Sustainability criteria when cultivating crops for biofuels and bioliquids. Art. 17(6) | In order to comply with sustainability criteria farmers need to provide information, amongst others on measures taken for soil, water and air protection and the avoidance of excessive water consumption in areas where water is scarce (Art. 18). | P(+) |
| ***Communication (2010) 'Europe, the world's No. 1 tourist destination – a new political framework for tourism in Europe'*** | | |
| Four priorities for action were identified (EC, 2016a):<br>- To stimulate competitiveness in the European tourism sector<br>- To promote the development of sustainable, responsible, and high-quality tourism<br>- To consolidate Europe's image as a collection of sustainable, high-quality destinations<br>- To maximise the potential of EU financial policies for developing tourism. | The actions aim at increasing tourism demand in Europe, and will therefore intensify the driver. | D(-) |
| ***Communication (2014) "Towards an Industrial Renaissance"*** | | |
| Key priorities (EC, 2016d):<br>• mainstreaming industrial competitiveness in other policy areas to sustain the competitiveness of the EU economy;<br>• maximising the potential of the internal market;<br>• implementing the instruments of regional development in support of innovation, skills, and entrepreneurship;<br>• promoting access to critical inputs in order to encourage investment;<br>• facilitating the integration of EU firms in global value chains. | The actions will lead to an intensification of the driver. | D(-) |

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# 5.4 Invasive Alien Species

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## Overview

Alien species are species that are transported, outside of their natural range across ecological barriers, due to direct or indirect human action. Some of these species cannot adapt to the new environment and die out quite rapidly, but others may survive, reproduce and spread. A percentage of the species that become established can have a significant negative impact on the ecology of their new location as well as serious economic and social consequences: these are Invasive Alien Species (IAS) (EC, 2013).

Invasive alien species (IAS) are widely considered as one of the five main threats to aquatic biodiversity in the world (Keller et al, 2011). The presence of IAS has multi-faceted effects on aquatic ecosystems and by consequence, their ecosystem services and their benefits to human well-being (CBD, 2000; EEA, 2015).

IAS can affect biological diversity in various ways encompassing the gene, species and ecosystem levels. Competition, predation and transmission of diseases between alien and native species are frequent and can pose a major threat to native species. This is particularly true on islands and isolated continental ecosystems, such as freshwaters, where IAS are known to cause cascading effects across all levels of the food web (EEA, 2015).

The highest number of IAS is found in aquatic ecosystems with high levels of connectivity with other ecosystems, high human frequency and high levels of disturbance. Such areas include harbours, canals, and recreational areas along rivers or coasts and at lakes. The highest rates of establishment are found in coastal zones due to a combination of number and frequency of pathways, tidal movements, and availability of empty niches and presence of different substrates available for settlement. Isolated areas such as islands, mountain lakes and headwater streams are therefore least and often last to be invaded. However, these more isolated ecosystems are the most affected by the presence IAS (Keller et al., 2011).

IAS causes a decrease in native species richness and abundance. It is estimated that their presence in Europe costs 2.2 billion EUR per year (Keller et al., 2011). Economic and social impacts include negative impacts to human health and decreases in economic production related to aquatic resources and activities such as fisheries, aquaculture, tourism and aquatic infrastructure (Bax et al., 2003).

## Drivers and Pressures

### Key Drivers and Pressures

Invasive Alien Species may be introduced intentionally or come into Europe accidentally, through different pathways (EC, 2013). The pathways of introduction of IAS into aquatic ecosystems are generally less well known than those in terrestrial ecosystems. This is partly because many aquatic species have been introduced unintentionally and therefore there are few records of their introduction. What's more, the difficulty of sampling in marine and freshwater environments means that a species may be well established, and may have spread from its initial site of introduction, before it is recorded (Keller et al., 2011). There are three general means through

which IAS may enter new habitats: **importation** (intentionally for commercial purposes or unintentionally with other commodities), **arrival via a transport vector** or **self-propagated dispersal** either aided (through the presence of canals) or unaided (Keller et al., 2011). Pressures resulting from IAS include: translocation of species, input of contaminants, introduction of diseases, and change in morphology through connection of previously disconnected habitats (e.g. through construction of canals). The three main key drivers of IAS are shipping, fish stocking/aquaculture and trade.

**Shipping** is the most prominent pathway for the introduction of IAS to the European Atlantic coast (47% of established non-native species) and to the Baltic Sea (45%). This pathway has also been a significant factor in freshwater animal introductions to Europe (25% of established non-native species) (Keller et al., 2011). Shipping networks create connections among aquatic ecosystems across the globe, where organisms are frequently transported in the ballast water of ships, or attached to hulls as fouling organisms (Keller et al., 2011). The opening of canals that link previously isolated water bodies has created many opportunities for the introduction and spread of non-native species. In the Mediterranean Sea, 54% of established non-native species arrived by dispersing through the Suez Canal. Canals have also had a profound impact on the establishment and spread of non-native freshwater species in Europe and this impact is tightly linked to shipping (Keller et al., 2011).

Despite the influence of shipping and canals, the most important pathways for the introduction of non-native freshwater animal species to Europe have been **stocking** (30% of species) and **aquaculture** (27%). Stocking has been largely of fish to create new wild populations, while aquaculture introductions have arisen from the unintended escape of farmed species and their associated organisms (e.g. parasites). Aquaculture has been particularly important for introductions of marine species to the Atlantic coast, Baltic Sea, and Mediterranean, accounting for 24%, 18%, and 11% of established species, respectively (Keller et al., 2011). The aquaculture trade has unintentionally introduced a large number of non-native aquatic species as contaminants of intentionally introduced species such as fish or shellfish in both marine and freshwater habitats. For example, the unintentional introduction and spread of the brown algae *Sargassum muticum*, the Japanese kelp *Undaria pinnatifida*, and the snail *Ocinebrellus inornatus*, as well as the oyster parasites *Mytilicola orientalis* and *Myicola ostreae*, all occurred because these species inadvertently arrived associated with marine shellfish imported from Asia to Europe for aquaculture (Keller et al., 2011).

**Trade in ornamental** (mainly aquarium and water-garden) and **aquaculture species** is another key pathway for IAS introduction. Freshwater ecosystems, particularly freshwater plants, are deeply affected by ornamental introductions as it accounts for 8% of established non-native species (Keller et al., 2011). The marine ornamental fish trade (MOFT) is a worldwide industry that targets a remarkable quantity and diversity of reef fish species and provides an important source of revenue for exporting countries, particularly developing nations in Southeast Asia (Leal et al., 2015). The MOFT therefore holds a prominent role in introducing IAS globally.

## Socio-economic description of the Drivers

**Shipping** is an important economic sector both globally and within the EU, and continues to grow each year (UNCTAD, 2014). Over recent decades, globalisation, EU enlargement and the steady growth of developing economies (i.e. China) have contributed to significant increases in both the import and export of raw materials and commodities. This resulted in unprecedented growth in shipping and its supporting industries (Douglas-Westwood Limited, 2005). Despite a substantial decline in production, trade and shipping activities caused by the global financial crisis, European

ports (gross weight of seaborne goods handled in European ports) experienced a clear recovery in 2010, demonstrating that shipping is continuing its growth (Eurostat, 2010). In 2013, the vast majority of goods in the EU were shipped via sea transport, amounting to 75.3% of all imported and exported goods by weight (or 1,690.2 million tonnes) (EC, 2015a). The value of this transport mode to overall trade equated to 1,733.7 billion EUR, or 50.7% of trade in the EU (EC, 2015a). The Baltic Sea is a major trade route for the export of Russian petroleum and it is estimated that about 2,000 ships are at sea at any one time, while 150—200 large oil tankers are harboured in twenty ports around the sea each day (HELCOM, 2010a). In addition to transporting goods, the Baltic Sea also has some of the highest passenger rates, with eight of the top twenty ports for passengers embarking and disembarking located in the Baltic region (Eurostat, 2015).

In terms of volume, the EU is the 8th biggest **aquaculture** producer in the world (EC, 2016b). In 2012, the EU produced 1.235.537 tonnes of fish through aquaculture (EUMOFA, 2015). In Europe, 43% of aquaculture products consumed were also farmed in the EU (EC, 2016). In 2011, half of farmed aquaculture products were molluscs and crustaceans. They were followed by seawater fish (27%) and freshwater fish (23%) (EC, 2016). In terms of value, the UK is the main producer in the EU 28, followed by France and Greece. In terms of volume, Spain is in the lead, followed by France and the UK. Italy is also an important producer (EC, 2016b).

Total value of **imports for ornamental fish** into the EU has experienced an overall decline over the last decade, peaking at around 93.4 million € in 2006 and decreasing by about 22.6% to the present (72.3 million €).In 2014, imports of freshwater species into the EU accounted for 82.9% of the total value of imports for the year, with the remaining 17.1% attributed to the import of marine species. Imports of marine ornamental fish arrived into the EU from 42 different countries, whereas freshwater fish were supplied by 37 different countries (Ornamental Aquatic Trade Association, 2015).

## Description of market condition and broad regulatory context of Drivers

The marked increase in mobility and economic trade observed in Europe after World War II, as well as by the development of advanced aquaculture techniques and the opening of major inland waterway canals in Europe, are likely to have played a role in the rise in the introduction of invasive alien species in Europe in the last 60 years (Nunes et al., 2015).

Globalisation and economic growth are widely recognised as important drivers of biological invasions (EEA, 2012). There is a vast array of trade-related activities that cause the movement of species, and consequent introduction of IAS (EEA, 2012). Such activities range from direct trade of live animals and plants as food, to movement of marine and freshwater species for aquaculture, commerce with pets and horticultural species, to the movement of species for research, fur farming, hunting, angling, etc. (EEA, 2012) Globalisation — opening new trade routes, increasing trade with new partners and new commercial products, expanding tourism — increases opportunities for potential IAS to be moved between continents and into, within and from the EU. More than 90 % of world trade is carried by sea and by 2018, the world fleet could increase by nearly 25 % with volumes nearly doubling compared to 2008 (EEA, 2012). On the other hand, the number of travellers crossing international borders every year is approximately 650 million (EEA, 2012).

**Shipping** is an important economic sector both globally and within the EU, and continues to grow each year (UNCTAD, 2014). Over recent decades, globalisation, EU enlargement and the steady growth of developing economies (i.e. China) contributed to significant increases in both the import and export of raw materials and commodities. This resulted in unprecedented growth in

shipping and its supporting industries (Douglas-Westwood Limited, 2005). The shipping industry is legislated by different governance levels: international governance, EU governance, national governance and governance specific to each sea (SHEBA). Important regulations from the International Maritime Organization include: The International Convention for the Prevention of Pollution from Ships (MARPOL), and the International Convention for Control and Management of Ships' Ballast Water and Sediments (BWMC), which aims to act as the global instrument to regulate the management, treatment and release of ballast water.Non-binding instruments include: Guidelines for the control and Management of Ships' Ballast Water to minimize the transfer of Harmful aquatic Organisms and Pathogens.

The non-binding IMO Globallast Partnerships Project (launched in 2007) promotes national and regional action to meet the BWM Convention's objectives. The Globallast Regional Task Force for the Mediterranean is open to all MS that are Mediterranean riparian States and held its first meeting in September 2008.[20] EU strategies related to shipping include: C*OM (2004) 453 final Communication on Short Sea Shipping* and *COM (2011) 144 final White paper on transport.*

The Food and Agriculture Organisation of the United Nations predicts world seafood consumption will continue to rise. This demand cannot entirely be met by fish from the wild. Even if wild stocks were recovered to Maximum Sustainable Yield levels, the rapidly expanding demand will also have to be met from **aquaculture production**. In response to this, the EU has set out policy directions to promote the growth of aquaculture and prepare for demands for fish (EC, 2009).

Two important strategic documents include aquaculture: the Common Fisheries Policy (CFP) and the Blue Growth Agenda. The Maritime Spatial Planning Directive (MSFD) is also crucial as it regulates human activities at sea. The Common Fisheries Policy reform is intended to boost aquaculture in Europe, and identifies four priorities to do so:

- Simplify administrative procedures
- Ensure access to space through coordinated spatial planning
- Enhance the competitiveness of EU aquaculture
- Promote a level playing field for EU operators

There are several other relevant policies within EU frameworks that address aquaculture.

The recent growth of **aquarium trade** underlines the need to implement specific regulations to prevent further invasions in Europe (Nunes et al., 2015). At present, only a recommendation (154/2011) on a European code of conduct on pets and IAS exists (Nunes et al., 2015). Some of the possible management options are the implementation of enhanced education programmes targeting the general public, particularly retailers and consumers; the improvement of regulation and monitoring of the pet/aquarium industry; and the development of thorough monitoring systems for targeted contaminant species in aquarium trade (Nunes et al., 2015).

In addition to these drivers, an additional 'meta-driver' to consider is **climate change**. Some IAS are expected to thrive and proliferate thanks to new opportunities offered by extreme weather events, and changing weather patterns (e.g. reduction in winter frost severity) (EEA, 2012). Extreme events such as floods, droughts and fires may serve as major triggers for biological invasion by killing or displacing native species, by facilitating the escape of potential IAS from captivity and by aiding dispersal of IAS in general (EEA, 2012).

[20] http://ec.europa.eu/environment/nature/invasivealien/docs/Shine2008_IAS_Task%202.pdf

**Shipping** is an important economic sector both globally and within the EU, and continues to grow each year (UNCTAD, 2014). Over recent decades, globalisation, EU enlargement and the steady growth of developing economies (i.e. China) contributed to significant increases in both the import and export of raw materials and commodities. This resulted in unprecedented growth in shipping and its supporting industries (Douglas-Westwood Limited, 2005). Despite a substantial decline in production, trade and shipping activities caused by the global financial crisis, European ports (gross weight of seaborne goods handled in European ports) experienced a clear recovery in 2010, demonstrating that shipping is continuing its growth (Eurostat, 2010). In 2013, the vast majority of goods in the EU were shipped via sea transport, amounting to 75.3% of all imported and exported goods by weight (or 1,690.2 million tonnes) (EC, 2015). The value of this transport mode to overall trade equated to 1,733.7 billion EUR, or 50.7% of trade in the EU (EC, 2015). The Baltic Sea is a major trade route for the export of Russian petroleum and it is estimated that about 2,000 ships are at sea at any one time, while 150—200 large oil tankers are harboured in twenty ports around the sea each day (HELCOM, 2010a). In addition to transporting goods, the Baltic Sea also has some of the highest passenger rates, with eight of the top twenty ports for passengers embarking and disembarking located in the Baltic region (Eurostat, 2015).

Considering species trade, the total value of imports for **ornamental fish** into the EU has experienced an overall decline over the last decade, peaking at around 93.4 million € in 2006 and decreasing by about 22.6% to the present (72.3 million €). In 2014, imports of freshwater species into the EU accounted for 82.9% of the total value of imports for the year, with the remaining 17.1% attributed to the import of marines. Imports of marine ornamental fish arrived into the EU from 42 different countries, whereas freshwater fish were supplied by 37 different countries (ORNAMENTAL AQUATIC TRADE ASSOCIATION, 2015). Despite overall decline in value, the pet trade, a pathway that has usually received less attention, especially in Europe, represents a multi-billion dollar industry responsible for the introduction of numerous alien plants, fishes and invertebrates worldwide (Nunes et al., 2015).

Taking into focus the development of the driver **aquaculture**, 24% of the EU27's seafood supply came from aquaculture in 2011, which was 5% less than the previous year (EUMOFA, 2014 in EEA, 2015c). 14% came from outside of the EU and this portion is increasing along with demand (EUMOFA, 2014 in EEA, 2015c). Aquaculture generated 1.24 million tones of products in 2011, which is 1% less than the previous year (EUMOFA, 2014 in EEA, 2015c). This goes against the global trend, which shows a 7% annual growth in aquaculture production (FAO, 2014a and 2014 in EEA, 2015c).The decreasing trend in Europe can be attributed to environmental concerns and lack of policy (Nunes et al., 2011; Guillen et al., 2012 in EEA, 2015c). In 2011, the GVA of aquaculture was EUR 1 500 million for the EU 28 (STECF, 2013c in EEA, 2015c). This activity employed 80 000 people in a full time equivalent of around 27 000 jobs (STECF 2013b and 2013c in EEA, 2015c).

## Analysis of State and status

Invasive species are considered one of five major threats to aquatic biodiversity worldwide, with particularly large impacts on freshwater habitats (Keller et al., 2011). The isolated nature of most freshwater habitats means that natural spread of aquatic organisms into new habitats occurs at low frequencies. In turn, this means that aquatic communities tend to be more different to each other, and thus that the increased rates of species movement caused by human pathways have large potential for impacts on biodiversity (Keller et al., 2011). It is estimated that 262 non-native

freshwater animal species are now established in Europe. These comprise a wide range of taxa, including fishes, arthropods, molluscs, platyhelminthes, and annelids.

For aquatic plants, it is estimated that at least 260 species not native to any part of Europe are established in inland waterways. The number and diversity of non-native species is variable across different regions of Europe. For example, in Great Britain the 134 established non-native species in freshwater ecosystems are dominated by plants, fishes , non-decapod crustaceans, platyhelminths, and amphibians. In Italy, the patterns are somewhat different, with the 112 nonnative species from inland aquatic systems being dominated by fishes, non-decapod crustaceans, and gastropods. (Keller et al, 2011).

In the Mediterranean, over a fifth (21%) of all threatened and Near Threatened freshwater fish species are currently being threatened by invasive alien species (IUCN, 2014). At least 20 species of alien freshwater fish are introduced and established to the Eastern Mediterranean region. Species such as *Carassius auratus*, *Carassius gibelio*, *Chelon haematocheilus*, *Gambusia holbrooki*, *Hemiculter leucisculus*, *Heteropneustes fossilis*, *Lepomis gibbosus*, *Poecilia latipinna*, *Pseudorasbora parva*, and *Rhinogobius similis* are all invasives that have expanded their ranges within the region and are believed to negatively impact native fish communities where they exist (IUCN, 2014).

European aquatic ecosystems containing the highest numbers of non-native species tend to be those with high connectivity to other ecosystems, high frequency of human access (e.g. for transportation or recreation), and high disturbance. These include boat harbours, recreational areas at lakes (jetties etc.), and the many canals that now cross Europe (Keller et al, 2011).

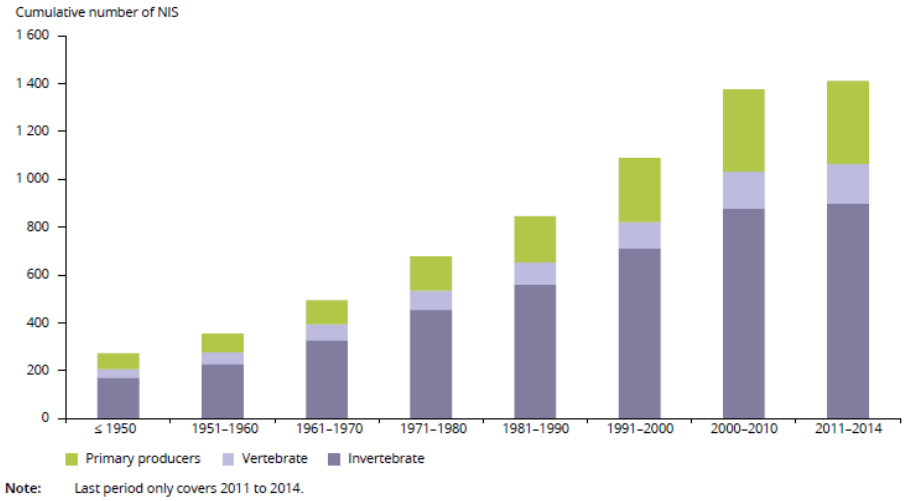
In marine ecosystems, the number and frequency of pathways, tidal movements, availability of empty niches, and availability of different substrate types for settlement are the main factors that determine susceptibility to invasion, with highest rates of non-native species establishment typically found in shallow coastal zones. Consequently, marine ecosystems with high numbers of established species in Europe include the eastern Mediterranean with hundreds of introductions through the Suez Canal, as well as the Gulf of Finland, the Gulf of Riga, the coastal lagoons, and the Oosterschelde Estuary (Keller et al., 2011).

In marine habitats, negative effects of non-native species include declines in native species richness and abundance. These impacts have been associated with the invasion of *Caulerpa taxifolia* into the Mediterranean, and with the high mortality rates of European oysters (*Ostrea edulis*) due to competition with introduced Pacific oysters (*Crassostrea gigas*) and damage from introduced parasites. Despite these examples, there is little comprehensive evidence for most impacts of invasive marine species, and there are some examples of economic benefits. For example, the release of the red king crab (*Paralithodes camtschaticus*) into the Barents Sea and its southward spread along the Norwegian coast has provided an additional fishery and income for fishermen. Nonetheless, negative impacts of invasive aquatic species in Europe are high and have been estimated to cost at least 2.2 billion EUR per year. (Keller et al, 2011).

Non-indigenous species (NIS) are being introduced in Europe's seas with increasing regularity (Figure 4.5). Currently, Europe's seas harbour around 1 400 NIS, 80% of which have been introduced since 1950 (EEA, 2015i). The Mediterranean is the European sea with the largest number of NIS. Of these, 63% of are invertebrates — mostly crustaceans and molluscs. Primary producers such as marine plants and algae make up 25%, while 12% are vertebrates — mostly fish. The current rate of introductions of NIS is unprecedented although there are important regional differences. The Aegean-Levantine Sea in the eastern Mediterranean Sea is the most affected

region, while the lowest rates are recorded for the Celtic and Baltic Seas (EEA, 2015i. There is little comprehensive evidence for most impacts of invasive marine species in Europe (Keller et al., 2011). The known impacts are based on the study of a few examples, which have shown that impacts can be quite severe. Such examples are the invasion of the algae *Caulerpa taxifolia* into the Mediterranean or of the jellyfish *Mnemiopsis leidyi* in the Black and Caspian Seas (Dumont et al., 2004). These introductions caused strong alterations to native biodiversity, disrupted food-web dynamics, and lowered ecosystem resilience. In the case of *Mnemiopsis leidyi*, it ended up strongly influencing a regime shift (together with other anthropogenic pressures such as overfishing (EEA, 2015).

Figure 7: Cumulative Number of NIS in Europe's Seas, 1950-2014




Source: EEA (2015)

The main economic and social impacts of invasive alien marine species are negative impacts on human health and decreases in economic production of activities based on marine environments and resources such as fisheries, aquaculture, tourism and marine infrastructure. These effects have related social impacts through decreases in employment, in economic activities directly affected by invasive alien species but also through decreases in people's welfare due to the reduced quality of their environments and natural surroundings *(Bax et al., 2003).* There is an associated opportunity cost to economies and societies from the foregone benefits of financial resources, labor and scientific and technical capacities diverted to the management of invasive alien marine species (Bax et al., 2003).

Though less frequent, alien marine species may also have positive impacts, such as the improvement of aesthetic values, the creation of new economic activities (fisheries and aquaculture for example) and increased employment in invasive alien marine species management projects and programs. Knowledge gained on ecosystem processes and resource dynamics and interactions could also be seen as a positive impact (Bax et al., 2003).

## Mapping of European policies against the DPS

The main framework addressing the threat of alien species invasion into European waters is the Regulation No 1143/2014 **on invasive alien (non-native) species** which seeks to address the issue in a comprehensive manner so as to protect native biodiversity and ecosystem services, as well as

to minimize and mitigate the human health or economic impacts that these species can have. The Regulation foresees three types of interventions: prevention, early detection and rapid eradication, and management. The Regulation No 304/2011 **concerning use of alien and locally absent species in aquaculture** aims to create a framework governing aquacultural practices in order to ensure adequate protection of the aquatic environment from the risks associated with the use of non-native species and locally absent species in aquaculture. Aside from these Regulations, the **Birds Directive (BD), Habitat Directive (HD), Water Framework Directive (WFD)** and **Marine Strategy Framework Directive (MSFD)** all directly or/and indirectly address respective invasive species. The BD and HD promote the creation of a network of protected areas and places restrictions on deliberate introductions of alien species into the wild. The WFD indirectly addresses invasive alien species by including 'other significant anthropogenic impacts on the status of surface water bodies' in the list of specific pressures in Annex II. The MSFD relates to monitoring of biological disturbances resulting from the introduction of non-indigenous species. Furthermore, the Council Directive (29/2000) **on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community** aims to protect plants from harmful organisms (pests and diseases) by both preventing their import into the EU and limiting their spread if they do enter.

Most of the implemented regulations, policies and directives focus on decreasing drivers and related pressures, as they restrict and regulate IAS introduction into the wild. The main drivers (shipping, trade and aquaculture) are all targeted within these policies, however they fail address the economy-based policies in place in the EU that promote the contrary. Only some policies go beyond addressing the management of pressures and additionally focus on securing and improving the state of the ecosystem by means of i.e. implementing a protected area network and aiming for good environmental status by 2020 (BD, HD, MSFD).

As mentioned, there are regulations and policies in place that indirectly increase drivers and pressures of invasive species aliens. Especially policies concerning maritime transport such as the COM (2004) 453 final Communication on **Short Sea Shipping** and the COM (2011) 144 final **White paper on transport** advise to increase transport and trade within Europe and thus to promote the introduction of IAS rather than regulate it. It should also be noted that the WFD fails to directly address invasive alien species within the directive and thus lowers its potential for minimizing the threat; however guidance from the European Commission as well as further work on this subject within the Commission's ECOSTAT group clearly supports the inclusion of alien species data in work to implement the WFD.

Table 6: DPS Policy Analysis of Invasive Alien Species Threat

| Relevant Instruments | Relationships | Impact |
|---|---|---|
| *Birds Directive (2009/147/EC) & Habitats Directive (92/43/EEC)* | | |
| Creation of Special Areas of Conservation (Art. 3.1, HD) and Special Protection Areas (Article 3.2, BD) | These instruments create a network of protected areas; called Special Protection Areas (SPAs) and Special Areas of Conservation (SAC), part of the Natura 2000 network. | S (+) |
| Take steps to avoid the deterioration of natural habitats in SACs (Article 6.2, HD) and assess the impacts of plans and projects on an SAC before approving it (Art. 6.3, HD) | The Birds and Habitats Directives imply restrictions on human activities within and around the Natura 2000 areas. Widely established restrictions include infrastructural, industrial, and agricultural | D (+)<br>P (+) |

| | | |
|---|---|---|
| Take appropriate steps to avoid pollution in protection areas (Art. 4.4, BD). | activities in and near to Natura 2000 sites. This instrument can reduce the intensity of drivers (e.g. human activities) in SPAs and SACs. | |
| ***Water Framework Directive (2000/60/EC)*** | | |
| | No explicit mention of alien species in Directive, however Annex II lists specific pressures to which water bodies may be subjected, including '…other significant anthropogenic impacts on the status of surface water bodies'. In the knowledge that many alien species have been deliberately or accidentally introduced, such species should be considered as a potential 'anthropogenic impact' on the biological elements listed in Annex V1. Guidance from the European Commission as well as further work on this subject within the Commission's ECOSTAT group clearly supports the inclusion of alien species data in work to implement the WFD.[21] | D(+) |
| ***Marine Strategy Framework Directive (2008/56/EC)*** | | |
| Develop a marine strategy for the Member State's marine waters. Art. 5(1)<br>Establish a programme of measures to achieve or maintain good environmental status. Art. 5(2) (b) | The programme of measures will vary based on each Member State's strategy, but it will most likely aim to reduce the intensity of pressures such as the introduction of IAS. Annex VI lists a few examples of possible measures, such as "Input controls: management measures that influence the amount of a human activity that is permitted.", "Output controls: management measures that influence the degree of perturbation of an ecosystem component that is permitted", and "Mitigation and remediation tools: management tools which guide human activities to restore damaged components of marine ecosystems." | D(+) P(+) |
| Determine GES for the marine waters of the country and establish a series of environmental targets and associated indicators. Art. 5(2) (a) | This measure aims at achieving and maintaining "good environmental status" by 2020. The good environmental status refers to the intrinsic conditions of the ecosystem. | S(+) |
| ***Regulation (2014/1143) on invasive alien (non-native) species*** | | |
| This Regulation sets out rules to prevent, minimise and mitigate the adverse impact on biodiversity of the introduction and spread within the Union, both intentional and unintentional, of invasive alien species. Art. 1<br>Risk assessments in relation to the current and potential range of invasive alien species. Art. 5 | Seeks to address the problem of invasive alien species in a comprehensive manner so as to protect native biodiversity and ecosystem services, as well as to minimize and mitigate the human health or economic impacts that these species can have. The Regulation foresees three types of | D(+)<br>P(+) |

[21] http://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Alien%20species%20guidance%20modified%20from%20Feb%2004%20-%20March%202013.pdf

| | | |
|---|---|---|
| Restriction on transport, breeding trade of IAS. Art. 7<br>Development of management measures Art. 10 | interventions; prevention, early detection and rapid eradication, and management. | |
| ***Directive (29/2000) on protective measures against the introduction of organisms harmful to plants or plant products and their spread within the Community*** | | |
| This Directive concerns protective measures against the introduction into the Member States from other Member States or third countries of organisms which are harmful to plants or plant products. Art. 1 | The directive aims to protect plants from harmful organisms (pests and diseases) by both preventing their import into the EU and limiting their spread if they do enter. | D(+)<br>P(+) |
| ***Council Regulation (EC 338/1997) on the protection of species of wild fauna and flora by regulating trade therein*** | | |
| The object of this Regulation is to protect species of wild fauna and flora and to guarantee their conservation by regulating trade therein in accordance with the following Articles. Art. 1 | The regulation lays down the provisions for import, export and re-exports as well as internal EU trade in specimens of species listed in its four Annexes. It provides for procedures and documents required for such trade (import and export permits, re-export certificates, import notifications and internal trade certificates) and it regulates the movement of live specimens. It also sets out specific requirements for Member States to ensure compliance with the Regulation and to impose adequate sanctions for infringements. Annex D includes some non-CITES species in order to be consistent with other EU regulations on the protection of native species, such as the Habitats Directive and the Birds Directive. The regulation affects the trade of species (driver of IAS) and sets objectives to preserve fauna and flora (state). | D(+)<br>S(+) |
| ***Regulation (EU) (1255/2011) on integrated maritime policy*** | | |
| RERM marine resources milestone: "By 2020, good environmental status of all EU marine waters is achieved | Is one of the tools that can help to address the pressures and that the Commission will further develop jointly with the Member States | S(+) |
| IMP refers to are Maritime Spatial Planning and Integrated Coastal Zone Management | Through integrated planning to reduce the negative environmental impact of economic activities carried out in the marine and coastal areas. These activities include tourism, fishing and maritime transport. Invasive alien species however is not directly mentioned | P(+) |
| ***Common Fisheries Policy Regulation (1380/2013)*** | | |
| Promotion of sustainable aquaculture. *Art. 2*<br>. | The CFP shall ensure that fishing and aquaculture activities are environmentally sustainable in the long-term and are managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and of contributing to the availability of food supplies | P(+) |
| ***Regulation (304/2011) concerning use of alien and locally absent species in aquaculture*** | | |

| | | |
|---|---|---|
| Measures for avoiding adverse effects - Member States shall ensure that all appropriate measures are taken to avoid adverse effects to biodiversity, and especially to species, habitats and ecosystem functions which may be expected to arise from the introduction or translocation of aquatic organisms and non-target species in aquaculture and from the spreading of these species into the wild. Art. 4; Aquaculture operators intending to undertake the introduction of an alien species or the translocation of a locally absent species not covered by Article 2(5) shall apply for a permit from the competent authority of the receiving MS. Art. 6(1) | The Regulation aims to create a framework governing aquacultural practices in order to ensure adequate protection of the aquatic environment from the risks associated with the use of non-native species and locally absent species in aquaculture. This legal framework provides in particular for the application of a procedure for obtaining a special permit. These regulations could help to minimize spread of IAS through aquaculture. | D(+)<br>P(+) |
| ***Directive (88/2006) on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals*** | | |
| Member States shall ensure that the placing on the market of ornamental aquatic animals does not jeopardise the health status of aquatic animals with regard to the diseases listed in Part II of Annex IV. Art. 21(1) | Addresses risk of non-native species affecting health of other aquatic species. | D(+) |
| ***Decision (1386/2013/EU) General Union Environment Action Programme to 2020*** | | |
| Target 18: The EU Biodiversity Strategy to 2020 sets out targets and actions needed to reverse those negative trends, to halt the loss of biodiversity and the degradation of ecosystem services by 2020 and restore them as far as feasible. | In the target it is stated that "invasive alien species pose greater risks to plant, animal and human health, the environment and the economy than previously estimated", implementing IAS as a primary objective of the Programme | P(+)<br>D(+)<br>S(+) |
| ***Regulation (293/2013) of the European Parliament and of the Council of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE)*** | | |
| Enhancing science-policy integration and transfer of results in support to Member States for preparing river basin management plans. Annex II(3.1) | Science-policy integration as a priority area of action for the principle objective 'Water' will increase knowledge on the pressure IAS. | P(+) |
| ***Regulation (1300/2013) on Cohesion Fund*** | | |
| Promoting sustainable transport and removing bottlenecks in key network infrastructures. Art. 4(d, II) | Developing and improving environmentally-friendly (including low-noise) and low-carbon transport systems, including inland waterways and maritime transport in order to promote sustainable regional and local mobility | D(-) |
| ***Regulation (1301/2013) on Regional Development Funds*** | | |
| Article 4 shall not apply to the specific additional allocation for the outermost regions. Art. 12(1) | Improved and sustainable transport is not an objective for the outermost regions, possibly increasing IAS transported from those regions. | D(-) |
| ***Regulation (710/2009) on organic aquaculture animal and seaweed production (amending Regulation (EC) No 889/2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007)*** | | |
| Sets conditions for the aquatic production environment and impacts on other species. It deals with the separation of organic and non-organic units and specifies animal welfare conditions. | The share of the organic agricultural sector is on the increase in most Member States. Growth in consumer demand in recent years is particularly remarkable. Recent reforms of the common agricultural policy, with its emphasis on market-orientation and the supply of quality products to meet | D(+/-) |

| | | |
|---|---|---|
| | consumer demands, are likely to further stimulate the market in organic produce. Against this background the legislation on organic production plays an increasingly important role in the agricultural policy framework and is closely related to developments in the agricultural markets.[22] | |
| ***Communication (COM 2004 453 final) on Short Sea Shipping*** | | |
| The document presents several ongoing strategies to promote short sea shipping (e.g. identifying bottlenecks, clarifying customs procedures, creating a network) and insists that "expected growth in European goods transport makes it necessary for Short Sea Shipping to expand even further so as to make its full contribution towards alleviating current and future transport problems in Europe". Art. 9 | Expansion of maritime shipping can lead to increases in IAS introductions. | D(-) |
| ***White paper on transport (COM 2011 144 final)*** | | |
| "30% of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50% by 2050, facilitated by efficient and green freight corridors" Goal 3 | The strategy mentions plans to replace long-distance road transport with rail or waterborne transport. Increases in waterborne transport could drive IAS. | D(-) |
| ***Strategic Guidelines for the sustainable development of EU aquaculture (COM 229/2013)*** | | |
| On the basis of the guidelines, the Commission and EU countries are collaborating to help increase the sector's production and competitiveness. EU countries have been asked to set up multiannual plans to promote aquaculture. | | D(-) |
| ***A new impetus for the Strategy for the Sustainable Development of European Aquaculture (COM 2009/0162 final)*** | | |
| "The EU should promote a competitive and diverse aquaculture industry (including equipment and technology providers), supported by the most advanced research and technology, covering the whole supply chain and meeting consumer demands in a sustainable manner. "; "The EU is committed to a high level of environmental protection and Community legislation is based on the precautionary principle. Technologies for cleaning water by removing wastes and contaminants are available and the further development of new technologies to decrease effluent is also likely to be significant in the coming years. Compliance with Community water legislation is also crucial to ensuring the water quality needed to produce quality and safe food. The Commission will continue to emphasise the importance of environmentally sustainable development of aquaculture in its policies and actions; Continue to monitor developments in terms of escapees and if necessary, assess the added value of possible action at the EU level" | Calls for promotion of aquaculture, also highlights need for industry to grow sustainably. Acknowledges need to monitor 'escapees'. | D(-/+) |

[22] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:189:0001:0023:EN:PDF

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# 5.5 Alteration to Hydromorphology

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## Overview

The hydromorphological conditions of aquatic habitats are fundamental in defining the structure and function of ecosystems. In the context of the WFD, hydromorphological alterations have been defined as the changes to the natural flow regime (e.g. quantity and dynamics of water flow), continuity (ability of sediments and migratory species to pass freely) and morphology of surface waters (e.g. physical habitats, width and depth variations, structure and substrate of a river bed, riparian/interdital zone or lakeshore) (ETC/ICM, 2012). Similar alterations can happen to the seafloor of marine waters. Hydromorphology is a key determinant for habitat creation and any alterations can thus threaten aquatic ecosystems, e.g. fish and mycrophytes (REFORM, 2013). In the marine environment, the geomorphologic features of the sea floor are the basis for particular types of benthic habitats (Harris & Baker 2012). The focus of this template will be on examining morphological alterations as most hydrological and continuity alterations are closely related to those.

Alterations to the morphology are linked to a range of human activities, from flood protection to transport (e.g. navigation), energy, mineral extraction and recreation. These activities lead to pressures on aquatic ecosystems in the form of cross-profile constructions (e.g. dams, weirs), longitudinal profile constructions (e.g. dykes and leves), bank reinforcement and embankments, the channelization, straightening, deepening or dredging of river beds and estuaries, and mineral extraction from rivers and sea floors (EEA 2012).

The effects of these anthropogenic interferences with the natural morphology are manifold and can negatively impact biodiversity in a direct and indirect manner (Nilsson & Berggren 2000). Cross-profile constructions such as dams fragment habitat and migration opportunities for many freshwater species (Liermann et al. 2012). Dams modify flow dynamics, either directly through reduced water flow or indirectly through water abstraction and evaporation losses from the reservoir created. When the flow of a river is hindered, bed material may be trapped and coarsened, which consequently leads to the depletion of spawning gravels (Kondolf 1997). Changes in water depths, currents, and deposition patterns lead to senescence in fish prior to the opportunity for reproduction and can thus cause species extinction (Kruk & Penczak 2003; McLaughlin et al. 2006). Changes in morphology can also be detected in monitoring data of macrophytes (REFORM, 2014).

Longitudinal manmade structures changing lateral connectivity, such as dykes, levees and embankments disconnect rivers and transitional waters (estuaries) from floodplains, wetlands, and oxbow lakes, causing loss of seasonal flood pulses and alluvial aquifer recharge in riparian zones. Changed water regime in the riparian zone may cause disturbance for the present biodiversity and enable new species to invade (Planty-Tabacchi et al. 1995).

Manmade incisions in the natural morphology, such as dredging and mineral extraction, may also lower groundwater tables along a river, making access more difficult for the plant roots that rely on groundwater to survive (UNEP 2014). This indirectly harms aquatic and riparian fauna, as many species use plants as shelter and food source. The process of dredging directly destroys species and habitats because of direct sediment removal (OSPAR Commission, 2009). In addition, the

alterations to morphology caused by dredging create physical stress on species and changes of habitats such as the decline of individual densities and species abundances or biomass in benthic communities (OSPAR Commission, 2009).

Rivers transport sediments from upland areas and deposit it in alluvial floodplains and coastal areas. Sediment deposition is critical to the balance of marine flora. A change in this process by means of dam construction or gravel mining can negatively impact coastal areas through erosion of deltas or through increased sedimentation due to larger sediment loads from freshwater systems (EEA 2012).

## Drivers and pressures

### Key drivers and pressures

Several human activities lead to alterations of the morphology of freshwater, estuarine, coastal and marine habitats: agriculture, energy prodution, urban areas, mineral extraction, transport, recreation and aquaculture. While morphological pressures are known to be significant across Europe (ETC/ICM, 2012), there remains few comprehensive inventories of these pressures and yet even fewer available at European level. The text below thus focuses on describing the link between drivers and the pressures they put on aquatic ecosystems in a qualitative way. Whenever possible, quantified estimates Europe-wide are provided.

Many European freshwater habitats underwent morphological alterations because of **agriculture** (ETC/ICM, 2012). For example, the expansion of agriculture in floodplain and coastlines is often accompanied with land reclamation and drainage to avoid water logging and to manage high groundwater tables (Feick et al., 2005). Many transitional and coastal waters, and wetlands, were subject to land reclamation, though it should be noted that land reclamation was not always initiated because of agriculture, even when agricultural activities benefited from it (ETC/ICM, 2012). Agriculture may lead to the straightening, deepening and widening of rivers to facilitate land drainage and prevent local flooding (ETC/ICM, 2012). For similar reasons, river banks may be reinforced and embankments raised. Agricultural activities may also result to the construction of cross-profile constructions and impoundments in order to abstract water for irrigation purposes.

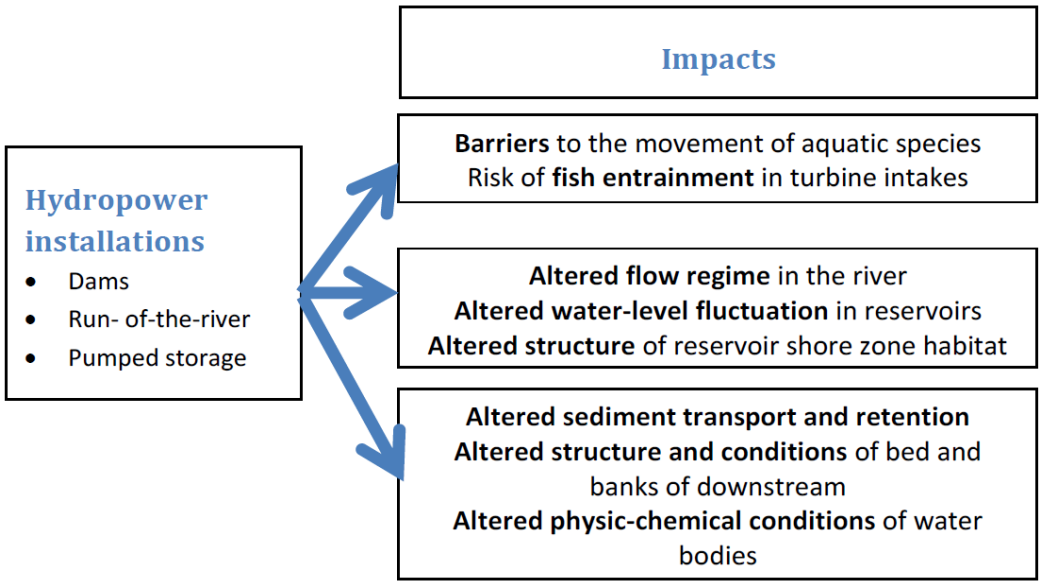
The **energy sector** is also a major driver underpinning morphological changes. The construction of oil and gas infrastructure (off-shore platforms, oil terminals and drilling facilities, pipelines) leads to pressures on coastal waters through dredging and direct physical modifications to the sea bed (UK TAG, 2003). Land-based power stations require cooling water which is abstracted from rivers through cross-profile constructions, impoundment and derivations. So-called renewable energies can led to significant morphological pressures on aquatic habitats. For example, hydropower stands out as one of the main drivers overall with a range of possible impacts (ETC/ICM, 2012) (Figure 6). Hydropower installations often require cross-profile constructions that directly modify morphological characteristics of rivers and lead to impoundments in the form of an upstream reservoir, therefore submerging and destroying riparian habitats (UK TAG, 2003). Other renewable energy systems, such as tidal energy and off-shore wind, create pressures on coastal water morphology (UK TAG, 2003).

**Urban areas** are another significant driver of alterations to morphology. Urban areas are home to close to three quarters of the EU 28 population (Eurostat, 2015) and historically, cities have been founded close to water bodies. In fact, almost all cities around the world were built along waterways, or along a coast of an ocean, sea or lake (ETC/ICM, 2016). In order to create living space in cities and protect urban dwellers from floods, the morphology of water bodies often gets

altered (ETC/ICM, 2016). Urban areas are thus linked to several pressures, including inland and coastal protection, land reclamation (bank reinforcement/embankments, deepening/dredging, cross profile constructions, channelisation and straightening) and longitudinal profile constructions. The key ecologic impacts of these physical modifications are (1) lack of habitat and biotope network function, (2) lack of permeability/passability, (3) lack of retention areas and (4) pollution and contamination (ETC/ICM, 2016).

Many European surface waters have their morphology threatened due to the **mineral extraction industry**. Sand used for coastal reinforcement is often extracted from marine waters, whereas the flood plains of rivers are often the site of mining for clay and sand for construction (ETC/ICM, 2012). In addition gravel mining has occurred in several European river basins e.g. in north-eastern Italy, and some rivers of the Carpathians (ETC/ICM, 2012). The mineral extraction industry is linked to the deepening/dredging, and naturally mineral extraction, both of which are pressures leading to the alteration of morphology. In the case of gravel mining, that specific industry led to "widespread channel adjustments in the last 100 years, in particular incision and narrowing" (ETC/ICM, 2012).

Figure 8: Impacts of Hydropower Installations on Biology, Flow Conditions and Sediment Transport




Source: ETC/ICM (2012)

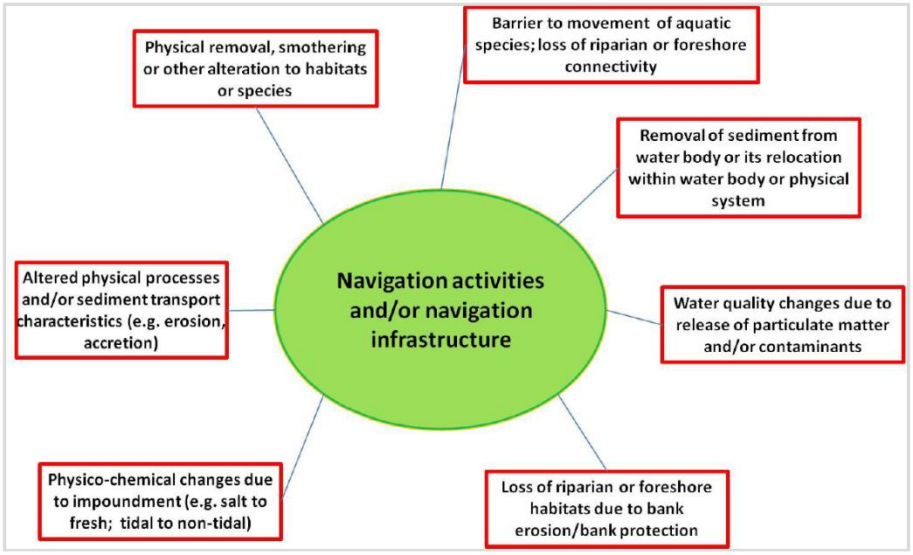
Two types of **transport**-related activities can affect the morphology of inland water bodies: navigation (ports, channels, etc.) and infrastructure (e.g. bridges). Inland navigation in Europe is often associated with the modification of water bodies, through processes such as dredging (to maintain water depth at a certain level), channelization and straightening (to maintain channels), river maintenance (e.g. weed-cutting) as well as bank reinforcements and embankment (ETC/ICM, 2012). These physical, intentional changes to the morphology of water bodies lead to several pressures on aquatic biodiversity, as illustrated in Figure 7 below. The construction of infrastructure for transportation (e.g. bridge supports, causeways, boat slipways) has also been identified as a pressure on the morphology of rivers, lakes, and transitional and coastal waters (UK TAG, 2003). It is often linked to the pressure of deepening/dredging. While seas cannot be as heavily modified as their freshwater counterparts, marine transport can still be a driver of

alterations to morphology in marine water bodies. Navigation in European seas can lead to physical damage of the seabed due to abrasion (EEA, 2015). In addition, the construction of ports can lead to changes in the morphology of freshwater habitats and coastlines.

**Recreational activities** often require the construction of infrastructure in lakes, rivers and transitional waters. Recreation is mainly linked to the following pressures artificial structures along shoreline and cross-profile constructions. The following constructions, which can be associated with recreational activities, can lead to alterations in morphology: Building intertidal and subtidal structures for a range of purposes –structures include outfalls, jetties, piers, sea-locks, boat slipways, bridge supports, causeways (UK TAG, 2003). On European coasts, tourism tends to alter the natural environment "through the development of previously pristine areas, altering existing biophysical characteristics, and replacing the original landscape with concrete surfaces (WWF, 2014). This impact is particularly important because tourist sites often overlap with fragile ecosystems (EEA, 2015). Changes in siltation are also a problem associated with tourism, as an increased number of visitors implies more sewage runoff which can be a significant disturbance to the organisms in coastal environment (EEA, 2015).

**Aquaculture** can also be a driver of alterations to morphology. It is linked to the pressure of change in sediment transport and erosion. Aquaculture structures (e.g. fish cages and trestles) could have an impact on both the hydrological and geomorphological features of estuaries and coasts by impeding water flow (La Jeunesse and Elliott 2004) (Environment Agency, 2009). Bottom trawling, fisheries-related dredging and bottom-culture mussels have been identified as aquaculture-related activities that are particularly likely to impact morphology due to their invasiveness (Northern Ireland Environment Agency).

Figure 9: Illustrative Range of Possible Alterations Typically Associated with Navigation Activities and/or Navigation Infrastructure with Subject to Biological Alterations




Source: ETC/ICM (2012)

## Socio-economic description of the drivers

**Agriculture** is a very important activity in Europe: 10.8 million farms operated in the EU-28 in 2013 (EU DG AGRI, 2015). The gross value-added of the sector at basic prices (Mio EUR) in 2012 is

around 160 billion Euro (EU DG AGRI, 2013). The share of agriculture in the EU 27's GDP (GVA/GDP) is 1.2% (EU DG AGRI, 2013). Regular agricultural workers account for 22 million jobs in 2013. Around 5% of the EU's total civilian working population works in the agriculture, forestry, fishing and hunting sectors (EU DG AGRI, 2013). In 2012 the utilized agricultural area in the EU accounted for over 170 Million hectares, some 40.0 % of the total land area of the EU (EU DG AGRI, 2013).

In 2010, 59.7% of EU-28 farmland was used as arable land, mainly to produce cereal, while 34% was meadow and permanent grassland. A further 6.1% was covered by permanent crops (e.g. vineyards, olive trees and orchards). 0.2% of farmland was used as kitchen gardens. 24.9% of farms had specialist field crops in the EU-28 in 2010, and 20.1% had specialist permanent crop holding. Close to half (46.7%) of agricultural holdings fell within one of these categories: specialist grazing livestock holdings (with ruminants), granivore holdings (pigs, poultry), mixed livestock holdings and mixed crop-livestock holdings (Eurostat, 2016).

**Energy** production is also a major activity in the European Union, though its socio-economic importance varies greatly based on the type of energy produced. As evidenced in Figure 8 below, about a quarter of primary energy production in Europe comes from renewable sources. Crude oil and gas accounted for 9.1% and 15.5%, respectively.

Hydropower is an important and well-established source of energy in Europe. It accounted for 16.6% of total primary energy production of renewable energy in Europe in 2013, making it the EU 28's largest renewable energy resource (Eurostat, 2016c). While hydropower is often associated with large dams, smaller installations also make a non-negligible contribution to the energy mix in the EU. In fact, the Small Hydropower (SHP) industry has 29,000 direct employees and around 4,200 companies work in that sector (ESHA).

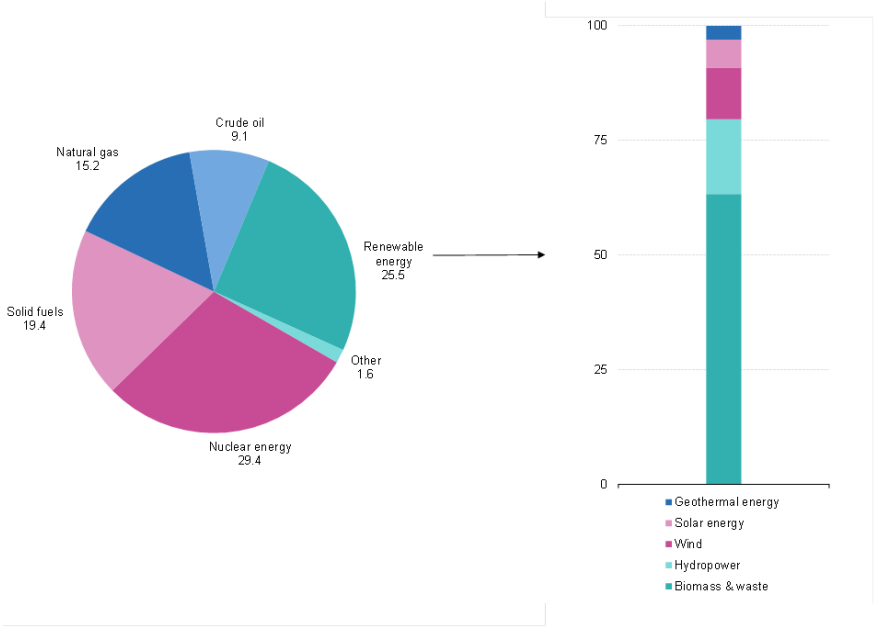
Off-shore wind also has an important socio-economic impact in Europe. 10% of total wind energy in Europe is produced in offshore wind farms, most of which are located in the North-East Atlantic (EEA, 2015). Off-shore wind employs 35 000 (full-time equivalent) and accounts for a GVA of 2.4 billion EUR (EEA, 2015). On the other hand, the contribution of tidal energy is still marginal. However, experts believe that wave and tidal could provide 15% of energy consumption in Europe (EEA, 2015).

In regard to non-renewable sources of energy, oil and gas still play an important role with an estimated GVA between EUR 107 billion and EUR 133 billion in 2011, and between 25 000 and 50 000 employees. (EEA, 2015).

**Urban centres** are where most Europeans live. Around three quarters (72.4%) of the EU's population lives in cities, towns and suburbs, which all fall under the umbrella term of "built-up areas" (Eurostat, 2015).

**Mineral extraction** is an important source of income and employment for Europe. In 2012, approximately 19 thousand enterprises in the EU 28 listed mining and quarrying as their main activity. These companies employed 614 thousand people and generated a value added of EUR 85.9 billion. This accounts for 0.5% of all employment and 1.4% of value added in the non-financial business economy (Eurostat, 2016). DG MARE describes seabed mining as activity that can ensure security of supply; and fill a gap in the market where either recycling is not possible or adequate, or the burden on terrestrial mines is too great. Closer to the surface, sea **transport** plays an important economic role in Europe.

Figure 10: Production of Primary Energy in the EU 28 in 2014



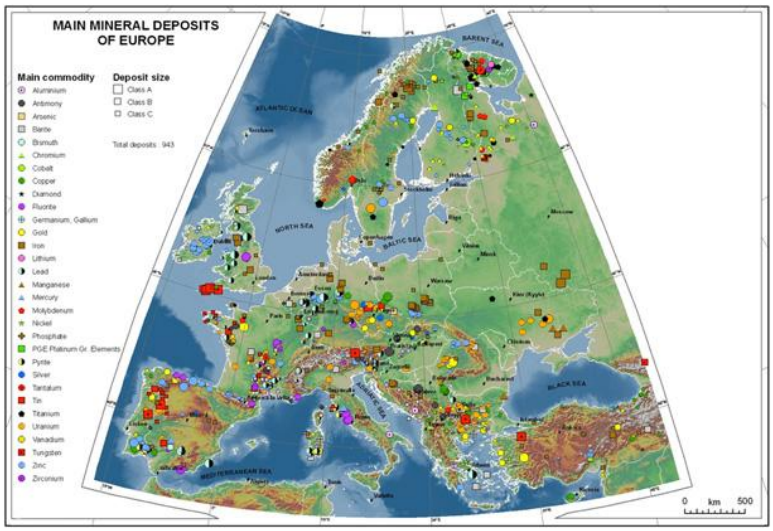

Source: Eurostat (2016b)

Three quarters of all imported and exported goods in the EU (by weight) were shipped by sea transport in 2013. Sea transport accounts for 50.7% of trade in Europe (Boteler et al., 2015). Transport can also take place on freshwater bodies, in which case the routes are known as inland waterways. Inland water ways are unevenly distributed in Europe. The densest inland waterway regions can be found in the Netherlands, Germany and France (Eurostat, 2015d).

**Recreation** also provides a livelihood to many people in Europe. For instance, tourism provides income to regions that would otherwise lack resources due to their remoteness or lack of other economic activities (EEA, 2015). Coastal and maritime tourism accounts for over 3.2 million jobs and **€ 183 billion** in gross value added, which is over one third of the EU's maritime economy. In fact, half of bed capacity in hotels across Europe are located in close to sea borders (EC, 2016b). Recreational activities in marine and coastal areas are numerous: bathing, whale-watching, diving and several others. Unfortunately, they are not well documented which makes it difficult to identify socio-economic data. Yachting and marinas, however, are well documented. Together, they employed 371 000 people and had a GVA of 38 billion in 2011 in Europe (EEA, 2015).

24% of the EU27's seafood supply came from **aquaculture** in 2011, which was 5% less than the previous year (EUMOFA, 2014 in EEA, 2015c). 14% came from outside of the EU27 and this portion is increasing along with demand (EUMOFA, 2014 in EEA, 2015c). Aquaculture generated 1.24 million tones of products in 2011, which is 1% less than the previous year (EUMOFA, 2014 in EEA, 2015c). This goes again the global trend, which shows a 7% annual growth in aquaculture production (FAO, 2014a and 2014 in EEA, 2015c).The decreasing trend in Europe can be attributed to environmental concerns and lack of policy (Nunes et al., 2011; Guillen et al., 2012 in EEA, 2015c).In 2011, the GVA of aquaculture was EUR 1 500 million for the EU 28 (STECF, 2013c in EEA, 2015c). This activity employed 80 000 people in a full time equivalent of around 27 000 jobs (STECF 2013b and 2013c in EEA, 2015c).

Figure 11: Main Mineral Deposits of Europe




Source: Euromines (2016)

## Description of market condition and broad regulatory context of drivers

The most important legal framework for **agriculture** in Europe is the Common Agricultural Policy (CAP). The aims of the CAP are threefold: to improve agricultural productivity and ensure a stable supply of affordable food, to enable farmers to make a "reasonable living", and to address climate change and sustainable management of natural resources. The CAP is built around two pillars: Pillar 1 includes the direct farm payments and market mechanisms whereas Pillar 2 is the rural development policy. The CAP is implemented in 7-year policy cycles, with the framework for the 2014 – 2020 period defined by four basic legislative acts (regulations): Rural Development (Regulation 1305/2013), "Horizontal" issues such as financing, management and controls (Regulation 1306/2013), Direct payments for farmers (Regulation 1307/2013) and Market measures: (Regulation 1308/2013).

The Common Agriculture Policy (CAP) reform agreement of June 2013 carries forward the principle that there is a link through the cross-compliance (CC) system between receipt of CAP support by farmers and respect of a set of basic rules related to the main public expectations on environment, public and animal health, as well as, animal welfare. Introduced in 2003, cross-compliance covers direct payments, certain rural development and wine sector payments. The 2013 reform was being designed to achieve continued food security and safety in Europe, whilst also ensuring a sustainable use of land and maintaining natural resources, preventing climate change and addressing territorial challenges.

Cross-compliance covers two elements:

1 Statutory Management Requirements (SMRs): These requirements refer to 13 legislative standards in the field of the environment, food safety, animal and plant health and animal welfare.
2 Good agricultural and environmental conditions (GAECs): The obligation of keeping land in good agricultural and environmental condition refers to a range of standards related to soil protection, maintenance of soil organic matter and structure, avoiding the deterioration of habitats, and water management.

In regard to Market measures (Regulation 1308/2013), the Common Market Organisation (CMO) is a set of rules which regulates agricultural markets in the European Union. It builds on the rules for the common market in goods and services with specific policy tools that help improve the functioning of agricultural markets. The CMO sets out the parameters for intervening on agricultural markets and providing sector-specific support (e.g. for fruits and vegetables, wine, olive oil sectors, school schemes). It also includes rules on marketing of agricultural products (e.g. marketing standards, geographical indications, labelling) and the functioning of producer- and interbranch organisations. Finally, it covers issues related to international trade (e.g. licenses, tariff quota management, inward and outward processing) and competition rules.

In addition, the Regulation 1310/2013 lays down certain transitional provisions as regards the application of the four basic regulations in the year 2014. Beyond these, a number of other aspects form part of the CAP, each regulated in different ways (for example, there is a separate Regulation on organic farming, rules governing quality standards). The CAP funding is fixed at maximum level for the 7 year period. Whereas the market mechanisms and direct payments (Pillar 1) are funded by EU budget alone, the rural development policy is implemented by multiannual programming and co-financed by Member States. The rules are set at EU level, but for the current programming period significant flexibility is built into the system so that the implementation can differ substantially across the Member States.

Market conditions for **energy** vary from one energy source to another. The leaders in hydropower production are outside of the EU: China (18%), Canada (12%), Brazil (11%) and the United States (9%). Together, these four countries account for roughly half of the world's hydropower production (OECD/IEA, 2010). According to The Organisation for Economic Co-operation and Development (OECD) and the International Energy Agency (2010), the term small hydropower (SHP) is used to designate hydropower installations with a capacity of 10 MW or less. In Europe, SHP currently contributes 8% of renewable electricity and have 13,000 of total installed capacity (ESHA). In 2015, Germany had the most **wind energy** installations in Europe (47%), followed by Poland (9.9%), France (8.4%) and the UK (7.6%). 38% of new installations in Germany were offshore. In terms of regulatory context, the Renewable Energy Directive (2009/28/EC) sets ambitions targets for Europe: "It requires the EU to fulfill at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020" (EC, 2016d).

**Mineral extraction** still has great potential in Europe, according to some scientists. While the majority of surface deposits have been exhausted, scientists believe that there is up to €100 billion in unexploited minerals at a greater depth (500-1000m) (Szczepanski, 2012). In 2012, no less than 19 000 enterprises were active in mining and quarrying in the EU 28 (Eurostat, 2016). In terms of value added, the UK is the most important member state for mining and quarrying, followed by the Netherlands, Poland, Denmark and Germany (Eurostat, 2016).The second pillar of the Raw materials initiative (COM(2008) 699 final) is to "Foster sustainable supply of raw materials from European sources" (which could increase the driver), while the third is to "Reduce the EU's consumption of primary raw materials" (which could decrease the driver). Mineral Planning Policies, however, tend to be regulated at the national level rather than European.

Inland waterways are increasingly being promoted by the European Commission as an environmental alternative to other modes of **transport** (railway; road). They are working to increase the market share of that mode of transportation. "The European Commission aims to promote and strengthen the competitive position of inland waterways in the transport system, and to facilitate its integration into the intermodal logistics chain" (EC, 2016c). The Rhine is the most

important shipping axis in Europe. On an annual basis, 330 million t of freight are transported on the Rhine, which represents around two thirds of all inland waterway transport in Europe (CCNR, 2016). The second most important inland waterway is the "North-South axis" which connects the Netherlands, Belgium and France (CCNR, 2016). Two other important waterways are the Moselle (linking Germany, France and Luxembourg) and the Danube.

The **recreation** market is thriving in Europe, and concentrated in specific regions. The rivers Rhine and Danube are the main waterways for cruises, and three quarters of cruise vessels in Europe are earmarked for those two rivers (CCNR, 2016). The Blue Growth Agenda (COM(2012) 494 final) mentions "Maritime, coastal and cruise tourism" as one of its focus areas. Several measures to promote the growth of the sector are suggested, including investments in infrastructure (e.g. ports, berths), higher education programs to train workforce in this sector and an increased offer for low-season tourism.

The relevant strategic document for tourism is "Europe, the world's No 1 tourist destination – a new political framework for tourism in Europe" (COM (2010) 352 final). The document sets four priorities: four priorities:

1 Stimulate competitiveness in the European tourism sector;
2 Promote the development of sustainable, responsible and high-quality tourism;
3 Consolidate the image and profile of Europe as a collection of sustainable and high-quality destinations;
4 Maximise the potential of EU financial policies and instruments for developing tourism."

According to the FAO (2014), the combination of two factors is currently contributing to the growth of the **aquaculture** sector: stagnating catches from capture fisheries and "demand from an emerging global middle class". "Demand for organic aquaculture products has grown rapidly over the last years, mostly through imports from outside the EU" (EUMOFA, 2015). In 2012, 88.39% of the world's total aquaculture production occurred in Asia, far ahead of Europe's 4.32% and the EU 28's 1.89% (FAO,2014). China is the biggest producer in the world and accounts alone for 61.69% of global production (FAO, 2014). In terms of volume, the EU is the 8$^{th}$ biggest aquaculture producer in the world (EC, 2016b). Within the EU, in terms of value, the UK is the main producer in the EU 28, followed by France and Greece. In terms of volume, Spain is in the lead, followed by France and the UK. Italy is also an important producer (EC, 2016b).

Several regulations set the context for aquaculture. Two important strategic documents include aquaculture: the Common Fisheries Policy (CFP) and the Blue Growth Agenda. The Maritime Spatial Planning Directive (MSFD) is also crucial as it regulates human activities at sea.

The Common Fisheries Policy reform is intended to boost aquaculture in Europe, and four priorities were indentified to do so (EC, 2016b):

- Simplify administrative procedures
- Ensure access to space through coordinated spatial planning
- Enhance the competitiveness of EU aquaculture
- Promote a level playing field for EU operators

As for the Blue Growth Agenda (COM(2012) 494 final), it containes several "blue growth focus areas", one of which is aquaculture. A few potential measures are mentioned such as "an 'open method of coordination' based on non-binding strategic guidelines, multiannual national strategic plans and the exchange of best practice", improving licensing and other administrative practices

and raising awareness of sustainable aquaculture and marine spatial planning. The Blue Growth Agenda also states that the Commission will "Working collaboratively with Member States to develop best practice and agree on Strategic Guidelines on Aquaculture in the EU to be adopted in early 2013."

## Trends in pressures and drivers

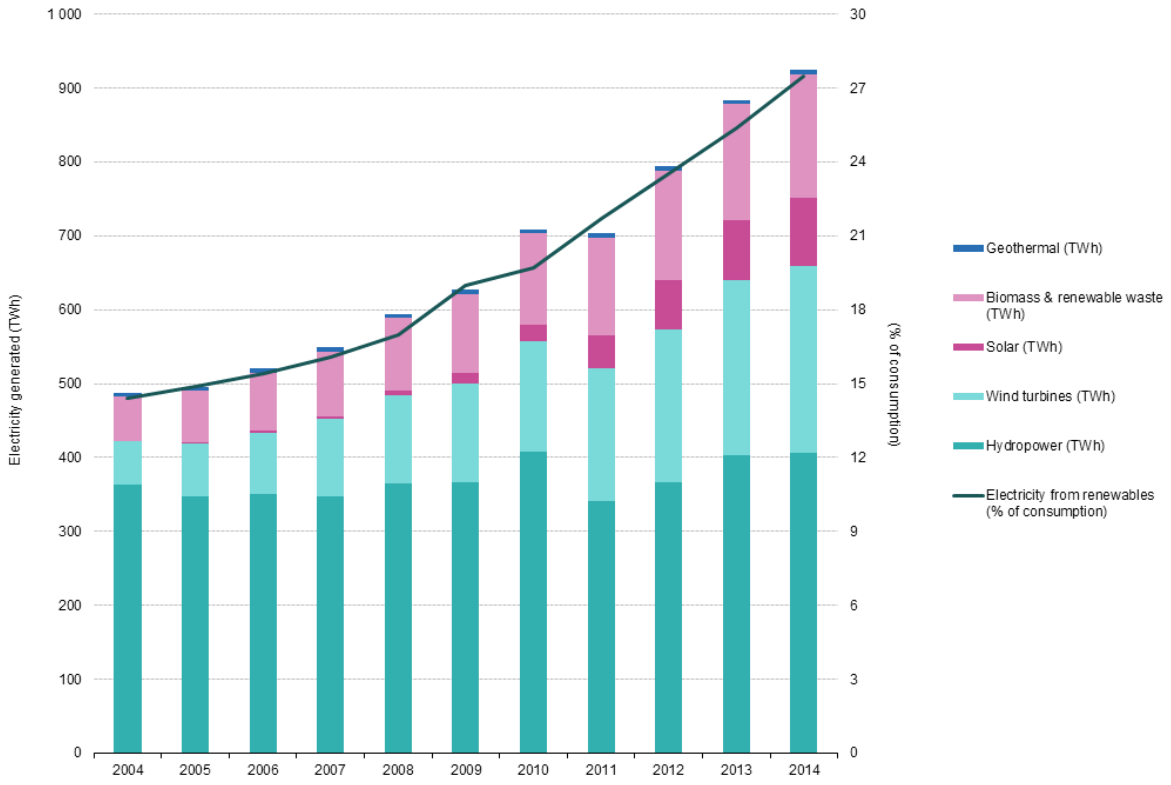
In **agriculture** the total number of farms in the EU is down from 12 million farms from 2010 to 2013 (-11.5%). There is a long-term decline in the number of agricultural holdings - between 2005 and 2013 the average annual rate of decline stood at -3.7%. A consolidation process towards larger, more competitive farms is taking place across the EU, with an increase in the average farm size from 14.4 to 16.1 ha of agricultural land (+12.2%) between 2010 and 2013. Farms are growing even more in economic terms. The Standard Output per holding, which is a measure of the economic farm size, increased by 21%. The EU-28's production of cereals in 2013 was 20.9 million tonnes higher than in 2012 (+7.3 %). Oilseeds (rape and turnip rape, and sunflower seeds) production has followed an upward pattern in recent years mainly due to the increased use of oilseeds for bioenergy production. In 2013, 21.0 million tonnes of rape and turnip rape and 9.2 million tonnes of sunflower seeds were produced (9.2% increase from 2012)" (EU DG AGRI, 2015).

EU cereals production is expected to grow further, to around 320 million t by 2025. Demand is driven by feed demand and good export prospects, in particular for wheat and barley. Growth is constrained by a steady reduction in arable land and slow yield growth in the EU as compared with other regions. It is assumed that maize stocks will recover from their current low level and wheat and barley stocks remain significantly above the 2012 level over the outlook period, albeit below historic levels (EU, 2015). This trend in agriculture must also face challenges associated with changes in water availability due to climate change. Decrease in rainfall in some regions is expected to shift rain-fed agriculture to irrigation, thus increasing irrigation requirements and networks. This shift necessitates alterations to morphology of land and riverine systems to accommodate expansion of irrigation and drainage networks (EEA, 2015b).

Increased biofuels production is expected to drive additional demand only for domestic maize because most of it should stem from non-agricultural feedstock and imports. It is assumed that biofuels will represent only 6.5 % of liquid transport fuels by 2020 (as counted under the Renewable Energy Directive (RED)). Trends in recent years combined with policy uncertainty and a general declining trend in transport fuel use seem to limit the further expansion of biofuels. Production is set to increase by around 15 % by 2020 (EU, 2015). Though lower than in the last decade, the expected 2 % annual increase in world imports and rising EU domestic demand for dairy products are expected to support an increase in deliveries of close to 1 % per year to 164 million t in 2025" (EU, 2015). "EU poultry meat production is expected to expand over the outlook period by close to 4%, while consumption could increase only marginally (EU, 2015).

The amount of **energy** generated in the EU has been steadily increasing and the trend is expected to continue. The share of electricity from renewable increased from around 15% in 2004 to 27% in 2014.The amount of electricity from hydropower has remained relatively stable whereas electricity from wind turbines is visibly increasing. Offshore wind installations are booming in Europe. From 2014 to 2015, the number of offshore wind power installations doubled (WindEurope, 2016).Oil and gas production, however, is experiencing a slowdown in Europe. Between 2001 and 2012, natural gas production declined by 37% and crude oil production declined by 52% (EEA, 2015).

Figure 12: Renewable Energy Generated in the EU




Source: Eurostat (online data codes: nrg_105a and tsdcc330)

**Urban areas** are also showing an upwards trend. The share of Europe's population that lives in urban areas is expected to increase from 73% to over 80% in 2050 (UN, 2014). Similarly, marine **mineral extraction** is expected to increase in the next years. By 2020, it is estimated that 5% of the mined supply of metals such as cobalt, copper, zinc, and rare earths metals (e.g. neodymium) will come from ocean floors. This is expected to grow to up to 10% of total mined supply by 2030 (Ecorys et al., 2012).

**Transport** is also on the rise in Europe's water bodies. The volume of freight handled in the EU's over 1200 ports is steadily increasing. In conjunction to this, there are plans for seaport development. These plans are necessary to keep up with the increase of marine cargo (ETC/ICM, 2012). An analysis commissioned by DG Transport forecasted a baseline scenario with an overall increase of 19.4% in cargo transport over the next decade (2012-2025). In particular, it is foreseen that SSS cargo transport will reach 2,387 million tonnes" (COWI, 2015). The growth will vary from one European sea to another, with the largest growth is expected in the Baltic Sea (annual average growth rate of 2.10% and the Mediterranean Sea (average annual rate 1.95%) (COWI, 2015). On the other hand, inland waterway transport has been very volatile since the economic downturn in 2008, showing a modest increase between the years 2002 to 2012 (Eurostat, 2015e). However, trends for inland water transport vary between countries, with some trends highlighting negative growth between the years 2012 to 2013 (Eurostat, 2015e).

The **recreation** sector is also experiencing growth. The European recreational boating industry experienced a slowdown due to the economic crisis that started in 2009 but the situation is are expected to improve in the next few years (ECSIP, 2015). Mass-market tourism is expanding,

which in turn leads to an increase in building activity in coastal regions of the EU (Eurostat, 2015c).

According to the FAO (2014), **aquaculture** is "one of the fastest-growing food producing sectors". Half of the world's fish supply came from aquaculture in 2012 and the FAO (2014) expects this proportion to reach 62% by 2030. EUMOFA (2015) reports a 3% decrease in per capita consumption of seafood in the EU between 2012 and 2011, which fits into a downward trend that started in 2008. However, they report that European consumers "buy less seafood but spend more for it, which indicates a change in consumption preferences as well as fish prices." (EUMOFA, 2015)

Besides all these drivers, an overarching trend might also contribute to furthering the alteration of morphology: **climate change**. Several observed changes in the climate system are symptoms of human-induced climate change. "The period from 1983 to 2012 was very likely the warmest 30-year period of the last 800 years in the Northern Hemisphere" (IPCC, 2014). Between 1971 and 2010, the upper 75m of the ocean warmed by 0.11°C every decade (IPCC, 2014). There is a clear trend for temperatures to continue increasing as climate forcing continues to occur as a consequence of anthropogenic activities. The European Commission (2016) lists four broad ways in which climate change will affect Member States: high temperatures; water availability; floods, droughts, landslides and other effects; and sea-level rise and coastal areas. The solutions to many of these problems include the creation of reservoirs for water abstraction, flood protection infrastructure and dykes and levees, all of which are pressures on morphology.

## Analysis of state and status

Nearly half (47.3%) of natural river bodies have at least good ecological status, while only 15% of the heavily modified and 26% of artificial river water bodies have at least good ecological potential. More than 60% of natural lake bodies have at least good ecological status while only 29% of heavily modified and 28% of artificial lake water bodies have at least good ecological potential. Around 40% of transitional waters have at least good ecological status, while less than 20% of the heavily modified and artificial transitional water bodies have at least good ecological potential. More than half of (53%) of the coastal water bodies have at least good ecological status, while one third (35%) of the heavily modified and artificial coastal water bodies have good ecological potential.

Table 7: Summary of the Extent of Morphological Alterations to Freshwater

| Source/Report | Year | Information on morphologic alterations to freshwater |
|---|---|---|
| EEA Water Report | 2012 | *Hydromorphological* pressures are reported for 48.2% of all rivers, 21.9% for all *lake* water bodies, and 12.2% of all coastal waters for EU member states. Hydropmorphological pressures are significant in the *transitional water bodies*, affecting 41.2% of classified transitional water bodies reported by 11 Member States. Hydropmorphological pressures in rivers and lakes are reported to be most severe for river basin districts in: Netherlands, Germany, Poland, Hungary and south-east England. The highest share of affected transitional water bodies has the Greater North Sea and the Mediterranean Sea regions (both 44%). The Celtic Seas, Bay of Biscay and the Iberian Coast region has 40%. No hydromorphological pressures were reported for the Baltic Sea and Black Sea regions. 'Hydromorphological' changes, such as dams, straightening and dredging can also damage ecosystems, preventing migration and spawning. This affects around 40 % of rivers and transitional |

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| | | water bodies and 30 % of the lakes. |
| SedNet | 2002 | Erosion rates range from 100tkm$^{-2}$year$^{-1}$ in humid environments (northern Europe) to 500tkm$^{-2}$year$^{-1}$ in semiarid regions (southern Europe). The total amount of rocks and soils delivered to rivers (sediment production) through erosion is ca. 1800x10$^{6}$t year$^{-1}$. This does not include bedload (i.e. coarse-grained sediment) which makes up 10-20% of eroded mass on average, but can reach up to a total of 50% in mountainous areas. |

Table 8: Summary of the Extent of Morphological Alterations to Coastal Water

| Source/Report | Year | Information on morphologic alterations to coastal water |
|---|---|---|
| EEA Water Report | 2012 | Coastal waters generally have the lowest level of hydromorphological pressures and impacts, with only 12.5% of European coasts affected. The highest share of coastal water bodies affected has the Black Sea (50%), The Greater North Sea and the Mediterranean Sea regions have almost 20%. The Celtic Seas, Bay of Biscay and the Iberian Coast region has 12%. The Baltic Sea region has 8% of such water bodies. |
| EUROSION | 2004 | Today, about 70 out of 455 million citizens of the enlarged European Union, i.e. 16% of the EU population, live in coastal municipalities. This proportion keeps increasing. All European coastal states are to some extent affected by coastal erosion. About twenty thousand kilometres of coasts, corresponding to 20%, face serious impacts in 2004. Most of the impact zones (15,100 km) are actively retreating, some of them inspite of coastal protection works (2,900km). In addition, another 4,700 km have become artificially stabilised. The area lost or seriously impacted by erosion is estimated to be 15 km2 per year. |
| SedNet | 2002 | The total amount of sediment transported by rivers towards the lowermost land areas (deltas, harbours, estuaries, etc.) is 714 x 10$^{6}$ t year$^{-1}$. This does not include bedload, which could be 10% of the total sediment load (coarse and fine) reaching depositional zones in the lowlands. |

## Mapping of European policies against the DPS

The main framework addressing alterations to morphology in European waters is the **Water Framework Directive** (2000/60/EC) which defines "good ecological and chemical status" including hydromorphological elements. For marine waters, the **Marine Strategy Framework Directive** (2008/56/EC) sets the standards for good environmental status. Most of the major rivers in Europe (Rhine, Danube, Elbe) also have conventions which protect their ecological integrity, which includes morphology.

However, several other regulations or strategic documents, even environmental ones, can increase the threat of alteration to morphology. They are directly related to three drivers: flood protection, energy and navigation. The policies that promote an increase of those drivers are the **Floods Directive** (2007/60/EC), the **Directive on the promotion of the use of energy from renewable resources** (2009/28/EC) the **Communication on Short Sea Shipping** (COM (2004) 453 final).

Table 9: DPS Policy Analysis of Alteration to Hydromorphology Threat

| Relevant Instruments | Relationships | Impact |
|---|---|---|
| *Birds Directive (2009/147/EC) & Habitats Directive (92/43/EEC)* | | |

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|---|---|---|
| Creation of Special Areas of Conservation (Art. 3.1, HD) and Special Protection Areas (Article 3.2, BD) | These instruments create a network of protected areas; called Special Protection Areas (SPAs) and Special Areas of Conservation (SAC), part of the Natura 2000 network. | S (+) |
| Take steps to avoid the deterioration of natural habitats in SACs (Article 6.2, HD) and assess the impacts of plans and projects on an SAC before approving it (Art. 6.3, HD)<br><br>Take appropriate steps to avoid pollution in protection areas (Art. 4.4, BD). | The Birds and Habitats Directives imply restrictions on human activities within and around the Natura 2000 areas. Widely established restrictions include infrastructural, industrial, and agricultural activities in and near to Natura 2000 sites. This instrument can reduce the intensity of drivers (e.g. human activities) in SPAs and SACs. | D (+)<br>P (+) |
| ***Water Framework Directive (2000/60/EC)*** | | |
| Production of a River Basin Management Plan (RBMP) for each river basin within the territory (Art. 13 & Annex VII) | The WFD aims to tackle all pressures significantly impacting the good status of European water bodies. The WFD places special emphasis on tackling drivers underpinning pressures of water deterioration: it may thus broaden approaches to the preservation of morphology. | D (+)<br>P (+) |
| Article on environmental objectives (Art. 4)<br>Designation of of heavily modified water bodies, to be mentioned in the RBMP:<br>"Member States may designate a body of surface water as artificial or heavily modified, when:<br>(a) the changes to the hydromorphological characteristics of that body which would be necessary fo r achieving good ecological status would have significant adverse effects on: (i) the wider environment; (ii) navigation, including port facilities, or recreation; (iii) activities for the purposes of which water is stored, such as drinking-water supply, power generation or irrigation; (iv) water regulation, flood protection, land drainage, or (v) other equally important sustainable human development activities; 22.12.2000 L 327/9 Official Journal of the European Communities EN<br>(b) the beneficial objectives served by the artificial or modified characteristics of the water body cannot, for reasons of technical feasibility or disproportionate costs, reasonably be achieved by other means, which are a significantly better environmental option"<br>Heavily modified & artificial water bodies are exempt from normal quality criteria and have their own, described in Annex V table 1.2.5 | The WFD sets a comprehensive ecological status assessment, aiming for "good status" of all freshwater, transitional, groundwater and coastal water bodies by 2015.<br>The WFD's classification system identifies three hydromorphological elements: hydrological regime, continuity and morphology (ETC/ICM, 2012). A number of derogations are allowed (e.g. new modifications) if justifications are provided<br>Heavily modified water bodies are defined in article 2(9): "Heavily modified water body means a body of surface water which as a result of physical alterations by human activity is substantially changed in character, as designated by the Member State in accordance with the provisions of Annex II."<br>Artificial water bodies are defined in article 2(8): "Artificial water body means a body of surface water created by human activity". Overall the provisions require more transparent justification as to why a water body cannot be restored, but still allows derogations to restoration objectives.<br>Water bodies that are designated as heavily modified or artificial have a different objective, namely good ecological potential, than natural waters | S (+/-) |
| ***Marine Strategy Framework Directive (2008/56/EC)*** | | |

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|---|---|---|
| Develop a marine strategy for the Member State's marine waters (Art. 5(1))<br>Establish a programme of measures to achieve or maintain good environmental status (Art. 5(2) (b)) | The programme of measures will vary based on each Member State's strategy, but it will most likely aim to reduce the intensity of pressures. Annex VI lists a few examples of possible measures, such as "Input controls: management measures that influence the amount of a human activity that is permitted.", "Output controls: management measures that influence the degree of perturbation of an ecosystem component that is permitted", and "Mitigation and remediation tools: management tools which guide human activities to restore damaged components of marine ecosystems." | D(+)<br>P(+) |
| Determine good environmental status for the marine waters of the country and establish a series of environmental targets and associated indicators (Art. 5(2) (a)) | This measure aims at achieving and maintaining "good environmental status" by 2020. The good environmental status refers to the intrinsic conditions of the ecosystem and also includes a sustainable use of it by means of qualitative descriptors detailed in the Directive's Annex I. One of these directly includes morphology: "Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected" | S(+) |
| ***Regulation (EU) (1255/2011) on integrated maritime policy*** | | |
| RERM marine resources milestone: "By 2020, good environmental status of all EU marine waters is achieved | Is one of the tools that can help to address the pressures and that the Commission will further develop jointly with the Member States | S(+) |
| IMP refers to are Maritime Spatial Planning and Integrated Coastal Zone Management | Through integrated planning to reduce the negative environmental impact of economic activities carried out in the marine and coastal areas. These activities include tourism, fishing and maritime transport. | P(+) |
| ***Directive (2014/89/EU) establishing a framework for maritime spatial planning*** | | |
| Member States must establish maritime spatial plans (Article 4) which contribute to a set of objectives. One of these is "the preservation, protection and improvement of the environment, including resilience to climate change impacts." (Art. 5). | The measure obligates Member States to maintain the state of their seas, which includes morphology. They must therefore prevent alterations to the state. | S(+) |
| ***Environmental Impact Assessment Directive (2011/92/EU, amended by 2014/52/EU)*** | | |
| For projects listed in Annex I of 2011/92/EU, an assessment is required. (Art. 4 of 2011/92/EU) | The project list in in Annex I includes inland waterways and ports, trading ports, works for the transfer of water resources, petroleum and gas extraction, dams and other installations holding back or permanently storing water, all of which can drive alteration of morphology. Thus the measure will require an assessment of their environmental impacts, which will determine whether the project can happen and if it does, how impacts should be mitigated or compensated. | D(+)<br>P(+) |
| ***Strategic Environmental Assessment Directive (2001/42/EC)*** | | |

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| | "An SEA is mandatory for plans/programmes which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town & country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive or have been determined to require an assessment under the Habitats Directive. Broadly speaking, for the plans/programmes not included above, the Member States have to carry out a screening procedure to determine whether the plans/programmes are likely to have significant environmental effects."[23] | D(+) |
| ***Decision (1386/2013/EU) General Union Environment Action Programme to 2020*** | | |
| "In order to protect, conserve and enhance the Union's natural capital, the 7th EAP shall ensure that by 2020 a) the loss of biodiversity and the degradation of ecosystem services, including pollination, are halted, ecosystems and their services are maintained and at least 15 % of degraded ecosystems have been restored; […] (c) the impact of pressures on marine waters is reduced to achieve or maintain good environmental status, as required by the Marine Strategy Framework Directive, and coastal zones are managed sustainably" Annex (Art. 28) | The 7th EAP requires the protection of biodiversity and good environmental status for marine waters, both of which mean that the state of morphology must be preserved or improved. | S (+) |
| Climate change will further aggravate environmental problems by causing prolonged droughts and heat waves, floods, storms, forest fires, soil and coastal erosion, as well as new or more virulent forms of human, animal or plant disease. Dedicated action should be taken to ensure that the Union is adequately prepared to face the pressures and changes resulting from climate change, and to strengthen its environmental, economic and societal resilience. Since many sectors are and will be increasingly subject to the impact of climate change, adaptation and disaster risk management considerations need to be further integrated into Union policies." (Annex Art. 52) | Typical flood defence measures such as river channelling and dykes are pressures which lead to alteration of morphology (ETC/ICM, 2012). Thus this instrument could increase a driver, though the explicit requirement to take into account ecological requirements might mitigate this effect by limiting pressures. | D (+/–)<br>P (+/–) |
| ***Regulation (1293/2013) of the European Parliament and of the Council of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE)*** | | |
| The thematic priorities of the sub-programme for the Environment (Art. 9) are described in Annex III. The priority area | See the three mentioned policies. This measure could help decrease drivers and pressures (preservation of water bodies) | D (+)<br>P (+) |

[23] http://ec.europa.eu/environment/eia/sea-legalcontext.htm

| | | |
|---|---|---|
| "Environment and Resource Efficiency" has some thematic priorities for water, which include activities and approaches that help implement the Water Framework Directive (2000/60/EC), the Floods Directive (2007/60/EC) and the Marine Strategy Framework Directive (2008/56/EC), as well as "activities to ensure safe and efficient use of water resources, improving quantitative water management, preserving a high level of water quality and avoiding misuse and deterioration of water resources". (Annex 3, section A(a)) | | |
| The sub-programme for Climate Action has three priority areas: climate change mitigation, climate change adaptation and climate governance and information (Article 13). "The priority area Climate Change Mitigation should contribute to the development and implementation of Union climate-related policy and legislation, in particular with regard to greenhouse gas monitoring and reporting, policies related to land use, land-use change and forestry, conservation of natural carbon sinks, the emissions trading system, Member States' effort to reduce greenhouse gas emissions, carbon capture and storage, renewable energy, energy efficiency, transport and fuels, ozone layer protection and fluorinated gases." (Preamble (19)) | The measure aims to drive a shift to renewable energy. Hydropower, wind and tidal energy all create pressures on morphology. | D (-)<br>P (-) |
| ***Communication (2013/0249 final) on Green infrastructure -Enhancing Europe's natural capital*** | | |
| | Green infrastructure should contribute to the good morphological conditions of freshwaters. | P(+)<br>D(+) |
| ***Floods directive (2007/60/EC)*** | | |
| Establish flood risk management plans for areas identified as having flood risks (Art. 7) | Typical flood defence measures such as river channelling and dykes are pressures which lead to alteration of morphology (ETC/ICM, 2012). If flood defence measures are designed using principles of nature-based solutions, such as natural water retention measures (e.g. room for the river), this decreases pressures which lead to alteration of morphology. | P(+/-) |
| ***Regulation (508/2014) on the European Maritime and Fisheries Fund*** | | |
| The EMFF supports investments "in equipment that limits and, where possible, eliminates the physical and biological impacts of fishing on the ecosystem or the sea bed" (Art. 38) | This measure helps reduce pressure on the morphology of marine water bodies by encouraging the purchase of equipment that minimizes or eliminates those pressures. | P(+) |
| ***Regulation (1305/2013) European Agricultural Fund for Rural Development*** | | |
| "Advisory services for the improvement of the economic and environmental | This instrument helps promote more environmentally-friendly agriculture, and thus | D (+)<br>P (+) |

| | | |
|---|---|---|
| performance as well as the climate friendliness and resilience of their holding, enterprise and/or investment" (Article 15(1)a) | aims to reduce the impact of a driver (agriculture) and pressures. | |
| Investments in physical assets. Art. 17<br>1. Support under this measure shall cover tangible and/or intangible investments which:<br>[...] (c) concern infrastructure related to the development, modernisation or adaptation of agriculture and forestry, including access to farm and forest land, land consolidation and improvement, and the supply and saving of energy and water; [...] | Infrastructure supported can lead to modernisation and intensification of activities. | D(-)<br>P(-) |
| Investments in tangible and intangible assets which "are non -productive investments linked to the achievement of agri- environment -climate objectives as pursued under this regulation, including biodiversity conservation status of species and habitat as well as enhancing the public amenity value of a Natura 2000 area or other high nature value systems to be defined in the programme." (Article 17(1)d) | This instrument can lead to investments related to hedgerow/wetland creation and landscape features for erosion control). | D (+)<br>P (+) |
| Establishment of agroforestry systems (Article 23) | Agroforestry can represent an alternative agricultural activity along water bodies, thereby reducing need for embankment etc in riparian areas. | D (+)<br>P (+) |
| Financial support to implement Natura 2000 and Water Framework directive measures (Article 30) | Farmers are compensated when the cost of implementing the Birds and Habitats Directive or the WFD is high. | D (+)<br>P (+) |
| Designation of areas facing natural and other specific constraints (Article 32) | This instrument can maintain grazing systems and other low-intensive farming. It thus helps avoid the establishment of more intensive practices. | D (+/-) |
| Agri-environment-climate scheme (Article 28) | Agri-environment-climate schemes are perceived as having most potential as it funds changes in farming practices (e.g. soil management, winter catch crops, reduced livestock density) and compensate farmers for land use changes for environmental purposes (e.g. riparian margins, buffer strips, hedgerows, conversion to grassland/pastures). | D (+), P (+) |
| ***Regulation (1306/2013) on financing, management, monitoring of common agricultural policy*** | | |
| "Member States shall establish a system for advising beneficiaries on land management and farm management ('farm advisory system'). (Art. 12) | The farm advisory system shall cover "the agricultural practices beneficial for the climate and the environment" (Article 12(2)b) and may cover "the information related to climate change mitigation and adaptation, biodiversity and protection of water" (Article 12(3)d). This will help reduce the intensity of pressures. | P(+) |
| Cross-compliance with statutory management requirements and good agricultural and environmental condition of | The specific design of cross-compliance requirements are set at national or regional level depending on local contexts. Substantial | P(+) |

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| the land (Art. 93). | variations thus exist between Member States. Two types of cross-compliance must be differentiated. Statutory management requirements" (SMRs) include 18 regulatory requirements stemming from other European directives and regulations. "Good agricultural and environmental condition of land" (GAECs) include 15 standards on farms receiving CAP payments. Several GAECs are directly or indirectly relevant to alteration of morphology: establishment of buffer strips along water courses (GAEC1), here use of water for irrigation is subject to authorisation, compliance with authorisation procedures (GAEC2), minimum land management reflecting site specific conditions to limit erosion (GAEC5), retention of landscape features (GAEC7). | |
| ***Regulation (1307/2013) establishing rules for direct payments to farmers under support schemes*** | | |
| Direct payments | Direct payments encourage agricultural activities and are hence promoting agricultural land use. | D(-) |
| ***Common Fisheries Policy Regulation (1380/2013)*** | | |
| Promotion of sustainable aquaculture (Art. 34) | Promoting aquaculture (driver) leads to an increase in a pressure. However, the "sustainable" component could lead to a smaller increase,but probably not a decrease. | D (-) |
| Set "targets for the conservation and sustainable exploitation of stocks and related measures to minimise the impact of fishing on the marine environment" and "pilot projects on alternative types of fishing management techniques and on gears that increase selectivity or that minimise the negative impact of fishing activities on the marine environment" (Art. 7 para. 1 (b)&(h)) | This measure will lead to a decrease in the intensity of pressures. | P (+) |
| ***Directive (2009/28/EC) on the promotion of the use of energy from renewable resources*** | | |
| Adopt national renewable energy action plans setting targets for the share of energy from renewable sources (Art. 4). Energy from renewable sources is defined in Art. 2 as "nergy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases" | This measure will increase in the intensity of a driver (energy) because hydropower is currently the biggest source of renewable electricity in Europe (ETC/ICM, 2012) and more installations might be built as a response to this measure. Hydropower installations are associated with several kinds of pressures on water bodies (e.g. cross-profile constructions) which ultimately lead to the alteration of morphology (ETC/ICM, 2012).Increases in wind energy and ocean energy can also lead through an increase in pressures and thus alteration of morphology. | D(-) |
| ***Communication (COM 2004 453 final) on Short Sea Shipping*** | | |
| This legislative document presents short sea shipping as having "a higher energy-efficiency than other modes of transport and [being], in general, less harmful to the environment" (Art. 3). The document presents several ongoing strategies to promote short sea shipping (e.g. identifying | The Communication calls for increased short sea shipping and thus an intensification of water transport and need for related infrastructure. | D(-)<br>P(-) |

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| bottlenecks, clarifying customs procedures, creating a network) and insists that "expected growth in European goods transport makes it necessary for Short Sea Shipping to expand even further so as to make its full contribution towards alleviating current and future transport problems in Europe" (Art. 9). | | |
| ***Regulation (1300/2013) on Cohesion Fund*** | | |
| The fund supports investments for the environment, TEN-T (program to improve transport infrastructure in Europe), and technical assistance (Article 2).<br>Article 4 of the regulation lists several investment priorities, including: "promoting the production and distribution of energy derived from renewable sources"; "promoting investment to address specific risks, disaster resilience and developing disaster management systems ensuring";"investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements";"developing and improving environmentally-friendly (including low-noise) and low-carbon transport systems, including inland waterways and maritime transport, ports, multimodal links and airport infrastructure, in order to promote sustainable regional and local mobility" | These measures will have different impacts on morphology.<br>Promoting renewable energy can lead to an increase of hydropower, wind and tidal energy and the associated alterations to morphology.<br>Typical flood defence measures such as river channelling and dykes are pressures which lead to alteration of morphology (ETC/ICM, 2012).<br>Meeting the requirements of the Union's environmental acquis should help reduce pressures on morphology.<br>An increased shift to maritime transport and inland water ways will increase the pressures on morphology. | D (-)<br>P(+/-) |
| ***Regulation (1301/2013) on Regional Development Funds*** | | |
| The ERDF supports<br>"(a) productive investment which contributes to creating and safeguarding sustainable jobs, through direct aid for investment in SMEs; (b) productive investment, irrespective of the size of the enterprise concerned, which contributes to the investment priorities set out in points (1) and (4) of Article 5, and, where that investment involves cooperation between large enterprises and SMEs, in point (2) of Article 5;<br>(c) investment in infrastructure providing basic services to citizens in the areas of energy, environment, transport and ICT; (d) investment in social, health, research, innovation, business and educational infrastructure;" Investment priorities are essentially the same as ECF. | Promoting renewable energy can lead to an increase of hydropower, wind and tidal energy and the associated alterations to morphology.<br>The promotion of maritime shipping can create pressures that lead to the alteration of morphology. | D (-)<br>P(-) |

**Directive (1100/2007/EC) on establishing measures for the recovery of the stock of European eel**

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| "The objective of each Eel Management Plan shall be to reduce anthropogenic mortalities so as to permit with high probability the escapement to the sea of at least 40 % of the silver eel biomass relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock."<br><br>Eel Management Plans can include "structural measures to make rivers passable and improve river habitats, together with other environmental measures" (Art. 8). | Implementation of the regulation leads to the adoption of national eel management plans. In the eel management plans, structural measures to make rivers passable for eel (fish passes) and improve river habitats can play an important role to improve river hydromorphology. | P(+) |

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# 5.6 Plastic Waste

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## Overview

Marine litter is widely recognised as a significant threat to the marine environment, causing environmental and socio-economic damage on a global scale (Leslie, H. A.; Van der Meulen, M. D.; Kleissen, F. M.; Vethaak 2011). It includes a wide range of items, such as plastic bags, bottles, cigarette butts, abandoned fishing gears, metal pieces, treated woods and glasses. The large majority is plastic coming from land-based activities that find its way into the oceans (European Environmental Agency (EEA), 2015b).

Due to its longevity, low cost and versatility, plastic is a common material that has been highly used since the beginning of the 20th century to manufacture an enormous range of products all over the world. Unfortunately, these characteristics, also makes it problematic when it comes to its end of life phase. Once in the in the marine environment – plastic wastes can persist for hundreds of years (Mudgal et al., 2011). Despite the efforts to recycle plastic material, dozens of millions of tonnes of plastic debris in the EU are still discarded ending up floating in the oceans thereby triggering important ecological impacts (European Commission (EC), 2016e).

The impacts on the wildlife and sensitive ecosystems are well recognized (UNEP, 2009). Plastic debris are one of the greatest threat to the marine biodiversity. Individual marine animals can be injured and die due to the entanglement in floating debris very often but not exclusively related to fishing gear. This problem affects all several marine mammals, reptiles, birds and fish to different extents. Marine animals can also mistake plastics as food and ingest it (UNEP, 2016). With time, plastic items fragment into smaller pieces, some of which cannot be seen with the naked eye. Microplastics can be ingested by a wider range of smaller animals, affecting marine food-webs. Research shows that these microplastics can also attract toxic chemical pollutants to their surface, harming further the animals that ingest them (European Environmental Agency (EEA), 2015b).

There are also evidences that plastics can be responsible for the increase of range of non-native species through transportation of organisms and the creation of novel habitat. They also allow the dispersal of pathogens that can pose threats to humans and marine animals (UNEP, 2016)

## Drivers and pressures

### Key drivers and pressures

Plastic waste is a global problem derived by multiple human activities. The generation of the plastic wastes is driven by the high level demand for food, energy, transport, housing and leisure. The plastic wastes, both as macroplastics and microplastics, result in pressures on the aquatic ecosystems, that can directly enter into the marine environment, posing a risk to biota (Cole et al. 2011; GESAMP 2015; UNEP 2016;). Identifying and quantifying the sources of marine litter is difficult as many types of items can come from multiple sources (OSPAR, 2009a). Plastic wastes associated pressures are derived from land-based sources such as accidental and intentional

discharges as well as public littering on the beaches; or sea-based sources such as recreational and commercial fishing, shipping and marine industries.

**Coastal tourism** and **maritime tourism** have been recognised as a significant source of plastic wastes which usually end up as marine litter. It is estimated that tourist facilities account for up to 16% of the waste generated by shoreline and recreational activities (UNEP / MAP – United Nations Environment Programme, 2007). A wide quantity of plastic items is discarded, either intentionally or accidentally by the public at the beaches, estuaries, recreational harbours into the marine environment. Plastic waste derived by tourism industry are mostly food and drinks packaging (e.g. containers for drinks, bags, lolly sticks), cigarettes and plastic beach toys (Allsopp et al. 2016; UNEP 2016). Coastal tourism related waste is specially worrying in the Baltic Sea (HELCOM, 2015) and Mediterranean Sea (European Commission – Joint Research Centre (EC/JRC), 2011).

**Solid waste disposal** and **landfills** are also responsible for debris from waste collection, transportation and disposal sites entering the marine environment (Mouat & Lozano, 2009). Riverine transport of waste from landfills along rivers, and municipal landfills located on the coast are of a particular concern. The degree to which the land-based plastic waste reach the ocean will depend on the effectiveness of solid waste management (United Nations Environment Programme (UNEP), n.d.).

**Discharges of untreated municipal sewage,** including storm water and sewer overflows which loads discharge waste water directly into the rivers or sea during heavy rainfall, are a major source of plastic pollution in the marine environment. The majority of the waste is treated in the service area before being discharged. However partly treated or even untreated sewage is sometime discharged into surface waters including the coastal waters. In addition, conventional wastewater treatment fails to fully remove microplastics from wastewater (Carr, Liu, & Tesoro, 2016) Human sewage and wastewater originates primarily from domestics, commercial and industrial sources. Storm drains directly discharge the wastewater into nearby streams, rivers and coastal waters. Street litter can be washed into the storm drains and it then discharged straight into the ocean. Sewer overflows occur during the heavy rains when the capacity of the wastewater treatment system may be exceeded and the sewage plus storm water is then not treated, but is directly discharged into nearby rivers or oceans (Allsopp et al., n.d.). Examples of plastic waste that frequently are discharged on coastal waters are street litter, condoms and syringes. River run-offs and storm drains have been recognized as a major source of plastic waste in the Black Sea (European Commission – Joint Research Centre (EC/JRC), 2011).

**Industrial plastic waste** may become marine debris if they are not properly treated on land or if they are lost during transport or loading /unloaded at port facilities. An example of plastic waste released into the marine environment from accidental spillage during production, processing, transport and handling are the plastic resin pellets which are raw material used for the manufacture of plastic products (US EPA 2002; Allsopp et al. 2016).

In addition to the previous mentioned land-based drivers of plastic as a threat to aquatic biodiversity, several sea-based sourced are to be considered as well. Plastic wastes generated by **fishing activity** (both recreational and commercial) and **aquaculture** activity, includes items associated to the fishing gear (nets, floats, fishing line), strapping bands, storage boxes, packaging and personal goods of the fisherman's. These items are usually accidentally lost or they are intentionally left in the shores and open-sea. Abandoned, lost, or otherwise discarded fishing gear (ALDFG) is considered the largest category in terms of volume and potential impact out of all the sea-based sources with significant impact on depleting commercial fish and selfish stocks and

causing unnecessary impacts on non-target species and habitats (Macfadyen, Huntington, and Cappell 2009; STAP 2011; UNEP 2016).

Additionally, all forms of **shipping activities** are major source of marine litter. Recreational boaters may deposit garbage such as plastic bags, food packaging and fishing gear. Merchant, military and research vessels are also responsible for generating solid wastes, either illegal disposal due to the loss of cargo particularly containers and equipment (UNEP, 2016) or the waste generated by the crew members of the vessels which may carry supplies for several months ending up as a marine litter (US EPA 1999; Allsopp et al. 2016). Plastic wastes derived by the fishing boats and fishing industry are in general the main sea-based sources in the North Sea (OSPAR, 2009a). In the Baltic Sea Marine litter enters the seas from both land-based thought sea or coast through storm drains and sewer overflows, and sea-based sources such as shipping and fishing industry (European Commission – Joint Research Centre (EC/JRC), 2011).

**Offshore oil, gas platforms** and **other offshore industries** inevitably generates several waste streams during exploration and production activities. Unwanted materials that are stored on the installation and accidentally or intentionally be discarded and discharged into the sea. Examples of items are hard hats, gloves, containers, auxiliary materials and personal waste generated by oil and gas workers. This source is particularly important in the North Sea (OSPAR, 2009a).

## Socio-economic description of the drivers

**Coastal tourism** and beach-based tourism include recreation activities for which the proximity of the sea is an advantage, such as coastal walks and wildlife watching. **Maritime tourism** covers predominantly water-based activities, e.g. sailing and nautical sports (often carried out in coastal waters) and cruising, where marine regions such as the Mediterranean or Baltic can be covered in the course of a week's holiday (European Commission (EC), 2014a). This in Europe is an important economic sector and it is expected to grow by 2%-3% by 2020. The beauty, cultural wealth and great diversity of EU's coastal areas have made them the preferred destination for many European citizens and abroad, making coastal and maritime tourism an important tourism sector. Over 3.2 million people are employed in the tourism sector and generates a total of € 183 billion in gross value added and representing over one third of the maritime economy (European Commission (EC), 2016a).

**Solid waste treatment** in Europe is a key resource to the circular economy. Solid-waste management and recycling industries currently have a turnover of around 137 billion EUR which is just over 1.1% of the EU's Gross Domestic Product. Together, these areas create over 2 million jobs. Overall, municipal waste recycling increased from 19% to 38% between 1998 and 2007. If Member States recycled 70% of their waste, it could create at least half a million new jobs across Europe (European Commission (EC), 2010). Although Europe have managed to improve their waste management, there is still a long way to go to ensure that the waste produced is recycled. The total waste production in the EU amounted to 2,5 billion tons in 2010. From this total only a limited share (36%) was recycled, with the rest was landfilled or burned, of which some 600 million tons could be recycled or reused (European Commission (EC), 2016i). The materials wasted sent to landfill could have an annual commercial value of around €5.25 billion. In particular, nearly 50% of plastic waste in the EU is still landfilled. Therefore, much energy and processed raw material is lost instead of being recycled into new products (European Commission (EC), 2016g). Total generation of plastic waste in EU-27, Norway and Switzerland was 25.2 Mt in 2012. Packaging is by far the largest contributor to plastic waste at 63%. The plastics recycling rate was 26% in 2012, helping to drive total recovery (energy recovery and recycling) to 62.3%. The lowest rates of

landfill (below 10%) is seen in Germany, Norway, Austria, Switzerland, Sweden, Belgium and the Netherlands (Association of Plastic Manufacturers in Europe, 2014).

In 2010 the EU **water and wastewater treatment** (W&WWT) industry generated €95 billion. In fact, the top five companies in this industry (Suez, Veolia, SAUR, Abgar and RWE) – which represented 32% of the global market that year – are based in Europe (EPEC, 2011). In Europe, the waste water management in the goods and services sector represents more than 600,000 jobs, an annual production value of more than 100 billion € and an annual added value of about 42 billion € (investments, maintenance, operation, export of technology and knowledge) (European Commission (EC), 2016h).

**Plastic waste derived from industries** in Europe essentially comes from the packaging industries (near 15%), followed by the building and construction industries (near 10%) (European Parliamentary (EP), 2013). Europe is the second largest producer of plastic material (near 25%) all over the world. The packaging industry covers a wide range of production sectors from food and drink, healthcare, cosmetics, to other consumer goods (Mudgal et al., 2011). It play an important role in the EU economy, with its usage growing broadly in line with the global economy (WPO, 2008). European plastic industry (including plastic raw material producers, plastic converters and plastics machinery) gives direct employment to over 1.45 million people in Europe. Over 62.000 companies across Europe produce plastics. In 2013, the plastic industries generated a turnover of 350 billion EUR (Eurostat data in Association of Plastics Manufacturers in Europe 2015). A 10% increase in the value added of the European plastics sector could lead to a 4.4% increase in the value added to the overall EU manufacturing sector. It is fifth most innovative sector in the EU (Association of Plastic Manufacturers in Europe, 2014).

According to the Annual Economic report on the EU Fishing fleet (2015) the **fishing sector** plays a key role for economy and employment. The amount of Gross Value Added (GVA) and gross profit (all excl. subsidies) generated by the EU fishing fleet (excl. Bulgaria, Cyprus, Greece and Malta) in 2013 was €3.4 billion and €1.3 billion, respectively. Fishing industry generates a net profit of 506 million EUR for the EU fleet in 2013. Sixteen out of nineteen member states (excludes Bulgaria, Cyprus, Greece and Malta) generated net profits in 2013; the remaining three MS (Belgium, Finland and Portugal) generated net losses. In some European coastal communities half the local jobs are in the fishing. Employment in the fishing sector is mainly concentrated in Spain, Italy, Greece and Portugal. Over 149 thousand people is employment is generated by fleet.

The **aquaculture sector** is also significant in socio-economic terms. In 2011, the GVA of aquaculture was EUR 1 500 million for the EU 28 (STECF, 2013c in European Environmental Agency (EEA) 2015a). This activity employed 80 000 people in a full time equivalent of around 27 000 jobs (STECF 2013b and 2013c in European Environmental Agency (EEA) 2015a). 24% of the EU27's seafood supply came from aquaculture in 2011, which was 5% less than the previous year (EUMOFA, 2014 in European Environmental Agency (EEA) 2015a). 14% came from outside of the EU27 and this portion is increasing along with demand (EUMOFA, 2014 in European Environmental Agency (EEA) 2015a). Aquaculture generated 1.24 million tons of products in 2011, which is 1% less than the previous year (EUMOFA, 2014 in European Environmental Agency (EEA) 2015a). This goes again the global trend, which shows a 7% annual growth in aquaculture production (FAO, 2014a and 2014 in EEA, 2015c). The decreasing trend in Europe can be attributed to environmental concerns and lack of policy (Nunes et al., 2011; Guillen et al., 2012 in European Environmental Agency (EEA) 2015a).

**Shipping** enables trade and contacts between all European nations. It ensures the security of supply of energy, food and commodities and provides the main vehicle for European imports and

exports to the rest of the world (European Commission (EC), 2012a). Over recent decades, globalisation, EU enlargement and the steady growth of developing economies (i.e. China) contributed to significant increases in both the import and export of raw materials and commodities. This resulted in unprecedented growth in shipping and its supporting industries (Douglas-Westwood Limited, 2005). In 2013, the vast majority of goods in the EU were shipped via sea transport, amounting to 75.3% of all imported and exported goods by weight (or 1,690.2 million tonnes). The value of this transport mode to overall trade equated to 1,733.7 billion EUR, or 50.7% of trade in the EU (European Commission (EC), 2015). The Baltic Sea is a major trade route for the export of Russian petroleum and it is estimated that about 2,000 ships are at sea at any one time, while 150 200 large oil tankers are harboured in twenty ports around the sea each day (HELCOM, 2010).

After the coastal tourism sector, the offshore oil and gas sector has the second highest revenue of the maritime activities in Europe (European Commission (EC), 2012a). Over 90% of the oil and 60% of the gas produced in the European Economic Area (EEA) comes from offshore operations. Offshore operations (exploration and exploitation) are ongoing in the territorial waters of 11 Member States. In addition, other MS plan to commence drilling in the near future. Currently there are over 1,000 offshore installations operating in European waters. These numbers are growing despite an overall decline in hydrocarbon production. The value of the EU offshore sector is very high in terms of revenues and employment (European Commission (EC), 2011b).

## Description of market condition and broad regulatory context of drivers

According to the EU's Blue Growth strategy and the Blue Growth Study, the **coastal and maritime tourism sector** has been identified as an area with special potential to foster a smart, sustainable and inclusive Europe. Coastal and maritime tourism is the largest sub-sector of tourism, the largest single maritime economic activity and the key economic driver in many coastal regions and islands in Europe. It employs almost 3.2 million people; generating a total of € 183 billion for EU's GDP (2011 figures for 22 EU Member States with a coast, without Croatia) (ECORYS, 2013). Only in 2012, cruise tourism alone generated a direct turnover of € 15.5 billion and employed 330,000 people(European Commission (EC), 2014a).

Maritime and coastal tourism is essentially a cross-cutting theme and because the inclusion of tourism as EU competence is relatively recent, there is no specific regulatory framework for it. Cross cutting issues are covered by international organisations (e.g. UNECE, IMO) and existing regulations at EU level already (e.g. Visa regime, Bathing Waters Directive, Water Framework Directive, Port Reception Facilities Directive, Marine Strategy Framework Directive, ICZM and several others) (ECORYS, 2013).

In 2014, the European Commission adopted a strategy to enhance coastal and maritime tourism in Europe in order to unlock the potential of coastal tourism. The "European Strategy for more Growth and Jobs in Coastal and Maritime Tourism" aims to bring all stakeholders together to develop innovative and smart solutions to the multiple challenges facing the sector. This strategy sets out 14 targeted actions involving national, regional and industry level partners(European Commission (EC), 2014a).

The Integrated Coastal Zone Management (ICZM) (2002/413/EC) recommendation defines the principles of sustainable management and use of coastal zones. These include the need to base planning on sound and shared knowledge, the need to take a long-term and cross-sector (e.g. tourism, fisheries) perspective, to pro-actively involve stakeholders and the need to take into account both the terrestrial and the marine components of the coastal zone. ICZM

recommendation does not mention the plastics waste issue, however it the can help reducing the negative environmental impact of activities carried out in the coastal areas, including those activities which are sources of marine litter (European Commission (EC), 2002)

Until now there is no comprehensive policy response to the plastic waste in Europe. Specific aspects are addressed in various pieces of legislation, like the ***Waste Framework Directive*** and the ***Packaging and Packaging Waste Directive*** have a specific plastic waste target (European Commission (EC), 2016f).

The ***Packaging and Packaging Waste Directive*** requires Member States to ensure that preventive measures are implemented by, for example, national programmes, extended producer responsibility programmes, and to develop packaging reuse systems for the reduction of the impact of packaging and packaging waste on the environment. Under the Article 4 – Prevention, all the Member States shall take measures to achieve a sustained reduction in the consumption of lightweight plastic carrier bags on their territory. After the latest revision of the Packaging and Packaging Waste Directive in 2015 (with the adoption of the Directive (EU) 2015/720) specific measures were developed to achieve a sustained reduction in the consumption of lightweight plastic carrier bags (European Parliament (EP), 2015).

The **wastewater treatment sector** is regulated by the ***Urban Waste Water Directive***. It requires a collection system in all agglomerations and the subjecting of water to secondary treatment (biological) before being discharged. It aims to protect the environment from not only domestic waste water but also water from certain industrial sectors (mainly agro-food). The regulation also encourages the use of sludge and the re-use of treated waste water. Implementation of the UWWD is challenging due to the financial and planning aspects linked to the construction of waste water infrastructure. To help meet these challenges, the EU dedicated a significant amount of funding under the EU Cohesion Policy funds (17.8 billion EUR in the 2007-2013 programming period, which is still subject to changes) (European Commission (EC), 2016h). The wastewater treatment market is greatly dependent on population, and the EU's population is expected to grow in the next years, both naturally (births) and due to migration. This trend is not evenly distributed among the Member States, according to Eurostat (Eurostat/EC, 2016b): "The current demographic situation in the EU-28 is characterised by continuing population growth. While the population of the EU-28 as a whole increased during 2014, the population of 12 EU Member States declined." Most of this population growth is happening in cities: "Urbanisation in Europe is an ongoing phenomenon, both in terms of urban land expansion and increasing population share" (European Environment Agency (EEA), 2016). This means that the sized of agglomerations falling within the UWWT requirement is growing, resulting in a direct expansion of the waste water treatment market.

The largest market in the world in 2004 was the **shipping and transport sector** (€343 billion), a position it still held through to 2009. However, shipping has experienced a decline in Euro terms over the period to 2009, averaging 1.8% per year as shipping rates moderate somewhat (Douglas-Westwood Limited, 2005). In Europe, almost 90 % of the external freight trade is seaborne. Short sea shipping represents 40 % of intra-EU exchanges in terms of ton-kilometres. Ensuring a good quality of life on Europe's islands and in peripheral maritime regions depends on good maritime transport services. Each year, more than 400 million passengers embark and disembark at European ports. Overall, maritime industries are an important source of employment and income for the European economy. According to the Blue Growth Communication, deep-sea shipping, short-sea shipping and passenger ferry services occupy the upstream sectors in terms of employment and gross value added (European Commission (EC), 2012a).

The **shipping industry** is legislated by different governance levels: international governance, EU governance, national governance and governance specific to each sea (SHEBA). At European Level, both the ***Ship-source Pollution Directive*** and ***Port Reception Facilities Directive*** incorporate international ship-source pollution standards: The International Convention for the Prevention of Pollution from Ships (MARPOL 7378) and the London Convention (1972 and the 1996) protocol (European Commission (EC), 2012b).

The ***Ship-source Pollution Directive*** adopted a set of rules to reinforce maritime safety and help prevent pollution from ships. The Directive requires Member States to consider discharges of polluting substances from ships in all sea areas, including the high seas, as a criminal offence if they are committed with intent, recklessly or by serious negligence. Minor discharges are infringements, but shall not automatically be considered as criminal offences, except where their repetition leads to deterioration in the quality of the water, including in the case of repeated discharges (European Parliament (EP), 2009).

The ***Port Reception Facilities Directive*** aims to reduce discharges of ship-generated waste and cargo residues into the sea, especially illegal discharges, by improving the availability and use of port reception facilities in all EU ports. The Directive applies to all ships, including fishing vessels and recreational craft, irrespective of their flag. The Directive brings international requirements (MARPOL 73/78) into EU law and provides for additional obligations and mechanisms, especially the obligation on ports to develop and implement waste reception and handling plans, and the obligation on ships in deliver their waste at each port call within the EU.

In terms of volume, the EU is the 8th biggest **aquaculture** producer in the world(European Commission (EC), 2016b). In 2012, the EU produced 1.235.537 tonnes of fish through aquaculture (EUMOFA - EC, 2015). 43% of aquaculture products consumed in the EU were also farmed in the EU (European Commission (EC), 2016b).In 2011, half of farmed aquaculture products were molluscs and crustaceans. They were followed by seawater fish (27%) and freshwater fish (23%) (. In terms of value, the UK is the main producer in the EU 28, followed by France and Greece. In terms of volume, Spain is in the lead, followed by France and the UK. Italy is also an important producer(European Commission (EC), 2016b). Two important strategic documents include aquaculture: The ***Common Fisheries Policy*** (CFP) and the ***Blue Growth Agenda***. The ***Maritime Spatial Planning Directive*** (MSFD) is also crucial as it regulates human activities at sea.

The ***Common Fisheries Policy*** reform is intended to boost aquaculture in Europe, and four priorities have been identified to do so (European Commission (EC), 2016b):

- Simplify administrative procedures
- Ensure access to space through coordinated spatial planning
- Enhance the competitiveness of EU aquaculture
- Promote a level playing field for EU operators

**Fossil fuels** such as oil, gas, and coal are non-renewable resources that account for around three quarters of the energy consumption in the EU. The majority of oil and gas production in Europe takes place offshore. They are used for the generation of electricity and heat, the powering of transport, and as materials in certain industrial processes (European Commission (EC), 2016c).

Until now the policy regulation regarding the offshore oil and gas activity refers to the safety. This directive aims to vigorously check the safety rules of the offshore installation to avoid accidents and ensure a proper response if they do. Under the ***Safety of Offshore Oil and Gas Operations Directive (2013/30/EU)*** , the EU has put in place a set of rules to help prevent accidents, as well as respond promptly and efficiency should one occur (European Parliament (EP), 2013). Under these

rules, companies will be fully liable for environmental damages caused to protected marine species and natural habitats. For damage to marine habitats, the geographical zone will cover all EU marine waters including exclusive economic zones and continental shelves.

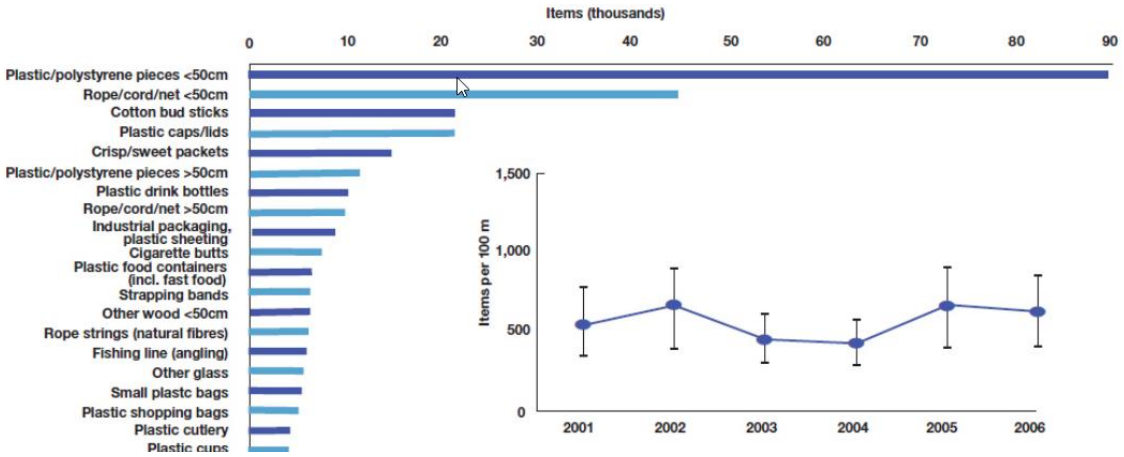
## Trends in pressures and drivers

Among the multiple human pressures on aquatic ecosystems, the accumulation of plastic debris constitutes one of the key pressures. Plastics in the marine environment are of great concern because of their persistence and effects on the oceans, wildlife and potentially humans. Recycling and recovery rates may be improving, but the actual amount of plastic waste produced remains roughly the same and adds to existing waste. There is little information on the amounts, rates or impacts of plastic waste on land, whereas there is a major effort to quantify impacts on shorelines and sea (Barnes et al. 2009 in EC 2011).

In order achieve Good Environmental Status of EU marine water by 2020, the Marine Strategy Framework Directive (2008/56/EC) propose eleven qualitative descriptors which describe what the environment will look like when GES has been achieved. One of those descriptors, concerns the Marine litter – descriptor 10, and identified four indicators for marine litter including plastic wastes in the marine environment. The Marine Litter related indicators (EC, 2016d) aims to (10.1) monitor the litter in the marine and coastal environment i.e. characteristics, amounts and spatial distribution in the coastal and marine environment (trends on coastlines, water column, and seafloor) and (10.2) the impacts of litter on marine life.

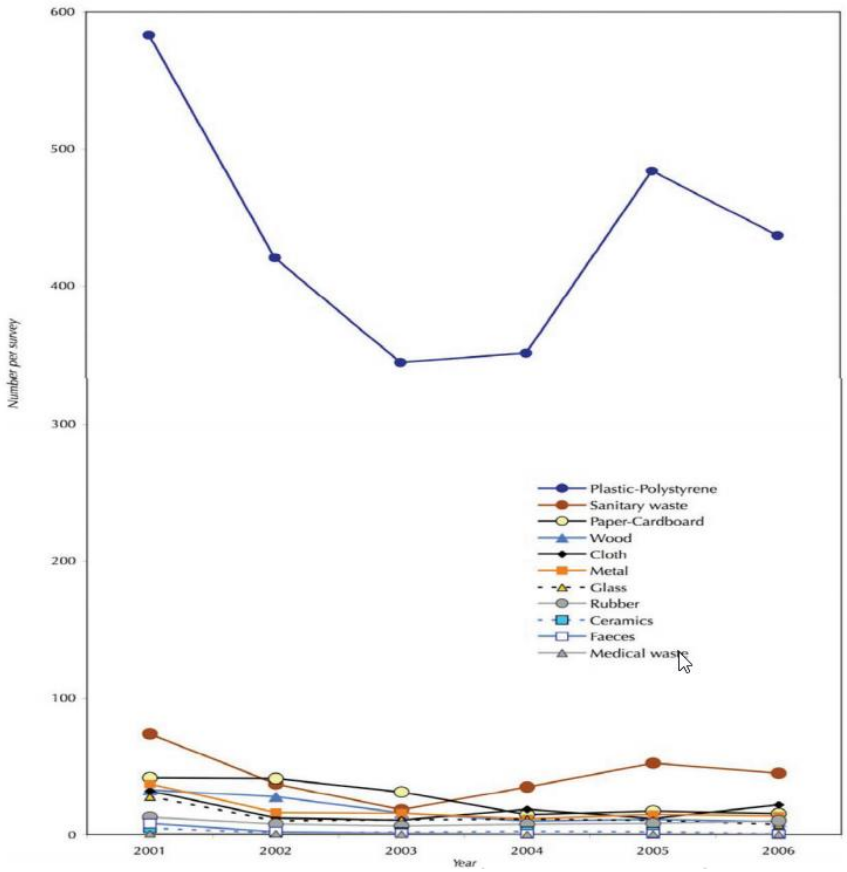
In parallel, OSPAR has developed and is developing indicators, with a particular focus on EU MSFD requirements covering the marine litter among other issues. OSPAR has recognized the beach surveys and bottom trawl surveys, the most important methods for monitoring the marine litter MSFD descriptor 10 (OSPAR 2012 ; Sherrington et al. 2016). The OSPAR Beach Litter Monitoring Programme in the North Sea was one of the first projects in Europe to develop a method to monitor the marine litter found in beaches, identifying the sources of the litter and quantitative trends in marine litter on the beaches of OSPAR network countries. In the North Sea, plastic litter were dominant with the highest level in the North with it made up to 80% of beach litter; on average there were 900 items of litter per 100m of beach. Lower percentages of plastic were found further south, where it made up 75 % of items on the Southern North Sea coast (out of 400 items per 100m), 70 per cent on the Celtic Sea Coast (out of 650 items per 100m) and 62 % on the Iberian Coast and Bay of Biscay (out of 200 items per 100m) (OSPAR 2007 in European Commission (EC) 2011). These plastic items were classified according to type, with plastic/polystyrene pieces smaller than 50cm dominating. Overall quantities of plastic waste on OSPAR beaches fluctuated between 2001 and 2006 with no discernible pattern (Figure 13). The composition of the plastic waste also changed, particularly for plastic/polystyrene (Figure 13). It was difficult to find a consistent trend over time for plastic waste both on beaches and at sea. This lack of pattern could be partly due to the fact that plastic debris in the marine environment are always moving (EC, 2011a).

Figure 13: Composition and Numbers of Marine Litter Items Found on Beaches within OSPAR Network.




Source: OSPAR (2009b)

Figure 14: Changes in Composition of Marine Items Found on Beaches within OSPAR Network.




Source: OSPAR (2009b)

Regarding plastic waste in terrestrial aquatic ecosystem, European study on riverine input of Marine Litter revelled that plastic litter was found in all of the rivers sampled, even in the rivers

with low population pressures. From this study it has been also concluded that rivers play an important role in **transporting** all sorts of litter items from the terrestrial to the marine environmental (Van Der Wal et al., 2015).

Traditional land-based and **sea-based industries** are growing and new industries have emerged in Europe. These industries are essential to the European economy and society with an estimated gross value added (GVA) of at least EUR 460-485 billion and employ at least 6.6-7 million people (European Environment Agency (EEA), 2015b).

**Coastal tourism** and recreation are important drivers of the European Blue Economy, with significant added value and employment. Coastal and maritime tourism is the largest sub-sector of tourism, the largest single maritime economic activity and the key economic driver in many coastal regions and islands in Europe. It employs almost 3.2 million people; generating a total of € 183 billion for EU's GDP (2011 figures for 22 EU Member States with a coast, without Croatia). Almost one third of all tourism activity in Europe takes place in coastal regions, and around 51 % of bed capacity in hotels across Europe is concentrated in regions with a sea border. The number of available bed-places in coastal areas has been growing over the last few years, especially in EU Member States on the southern flank of the EU (Bulgaria, Spain, France, Croatia and Italy) (European Commission (EC), 2014b). Regarding **maritime tourism**, in 2012, cruise tourism alone generated a direct turnover of €15.5 billion and employed 330,000 people whilst European ports had 29.3 million passenger visits. Over the past 10 years, the demand for cruising has roughly doubled worldwide whilst the cruise industry grew in Europe by more than 10% each year. In 2012, the boating industry (boat builders, equipment manufacturers for boats and water sports, trade & services such as chartering) made up to more than 32,000 companies in Europe (EU not including Croatia, European Economic Area and Switzerland), representing 280,000 direct jobs (European Commission (EC), 2014b). Tourism is a growing business, and Europe continues to lead the market. There were 534 million tourist arrivals in Europe in 2012 increasing to 608 million in 2016 (51 % of arrivals worldwide – market share) whilst revenue reached € 356 billion (43% of the world total) in 2012 and 451 billion in 2015 (36% of the world total) (World Tourism Organization (UNWTO) 2013; World Tourism Organization (UNTWO) 2016) (Figure 14).

As with most materials, **global plastics production** is estimated to have fallen from 245 Mt in 2008 to around 230 Mt in 2009 as a result of the financial and economic crisis. Trends shows that plastic production has increased globally while in Europe has remained stable (Figure 15). The EU accounts for around 25% of world production; China alone accounts for 15%. A study published in 2011 by the Directorate-General for Environment from the European Commission (DG ENV/EC) on Plastic Waste in the Environment shows that the Baseline scenario of future plastic waste generation, indicates an increase of 23% between 2008 and 2015, mainly driven by the packaging sector (Mudgal et al., 2011).

Figure 15: International Tourist Arrivals (in Millions), Market Share and Changes (these Figures Refer to the Total Tourism Arrivals).

| | International tourist arrivals (million) | | | | | | | Market share (%) | Change (%) | | | Average a year (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990 | 1995 | 2000 | 2005 | 2010 | 2014 | 2015* | 2015* | 13/12 | 14/13 | 15*/14 | 2005-'15* |
| **World** | **435** | **527** | **674** | **809** | **950** | **1,134** | **1,186** | **100** | **4.6** | **4.2** | **4.6** | **3.9** |
| Advanced economies[1] | 299 | 339 | 424 | 470 | 516 | 622 | 653 | 55.0 | 4.6 | 5.7 | 5.0 | 3.3 |
| Emerging economies[1] | 136 | 188 | 250 | 339 | 434 | 512 | 533 | 45.0 | 4.6 | 2.4 | 4.1 | 4.6 |
| **By UNWTO regions:** | | | | | | | | | | | | |
| **Europe** | **261.5** | **304.5** | **386.6** | **453.2** | **489.4** | **580.2** | **607.7** | **51.2** | **4.8** | **2.3** | **4.7** | **3.0** |
| Northern Europe | 28.7 | 36.4 | 44.8 | 59.9 | 62.8 | 70.8 | 75.9 | 6.4 | 2.4 | 5.3 | 7.3 | 2.4 |
| Western Europe | 108.6 | 112.2 | 139.7 | 141.7 | 154.4 | 174.4 | 180.0 | 15.2 | 2.8 | 2.1 | 3.2 | 2.4 |
| Central/Eastern Europe | 33.9 | 57.9 | 69.6 | 95.3 | 98.9 | 120.2 | 126.6 | 10.7 | 7.7 | -6.2 | 5.3 | 2.9 |
| Southern/Medit. Europe | 90.3 | 98.0 | 132.6 | 156.4 | 173.3 | 214.8 | 225.2 | 19.0 | 5.6 | 6.9 | 4.8 | 3.7 |
| -of which EU-28 | 230.1 | 268.0 | 330.5 | 367.9 | 384.3 | 454.1 | 478.4 | 40.3 | 3.9 | 4.8 | 5.4 | 2.7 |

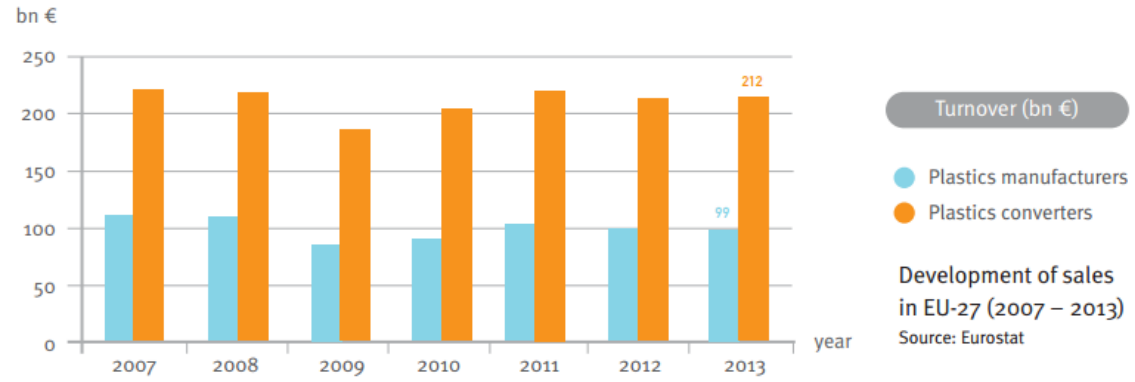
Source: World Tourism Organization (UNTWO) (2016)

In Europe the amount of waste generated has been increasing and nature of the waste itself is changing, due to the dramatic rise in the use of hi-tech products. As a result, the waste now contains complex materials, including plastics, precious metals and hazardous materials that are difficult to deal (European Commission (EC), 2010). In 2012, plastics recycling and energy recovery reached 62%. 38% of the plastic waste has been landfilled. Since 2006 recycling and energy recovery have increase: plastic waste recycling has increase 40%; energy recovery derived from plastic waste has increased 27%, while the disposal of waste in landfills has decreased 26% .

Although the management of that waste continues to improve in the EU, in some countries more than 50% of the plastic waste is still going to landfill. This is the case of Malta, Cyprus, Lithuania, Greece, Bulgaria, Latvia, the UK, Romania, Poland, Hungary, Spain and Portugal. On the contrary, the EU countries that have banned landfill disposal in the past, such Switzerland, Germany, Austria, Luxemburg, Belgium, Denmark, Sweden, the Netherlands and Norway have seen more than 90% of the plastics waste recycled or used in energy recovery. According to the Baseline scenario of plastic waste, it is foreseen an overall decline from 49% to 43% in the level of disposal of plastics waste with a significant drop seen in packaging (Mudgal et al., 2011). The energy recovery will also increase from 30% to 34%. Overall, the recovery of plastic waste will increase 36% in 2015. Summarizing, the following trends are considered to be of most significance (Mudgal et al., 2011): rising use of plastics; rising levels of plastics waste generation; and increasing levels of recycling.

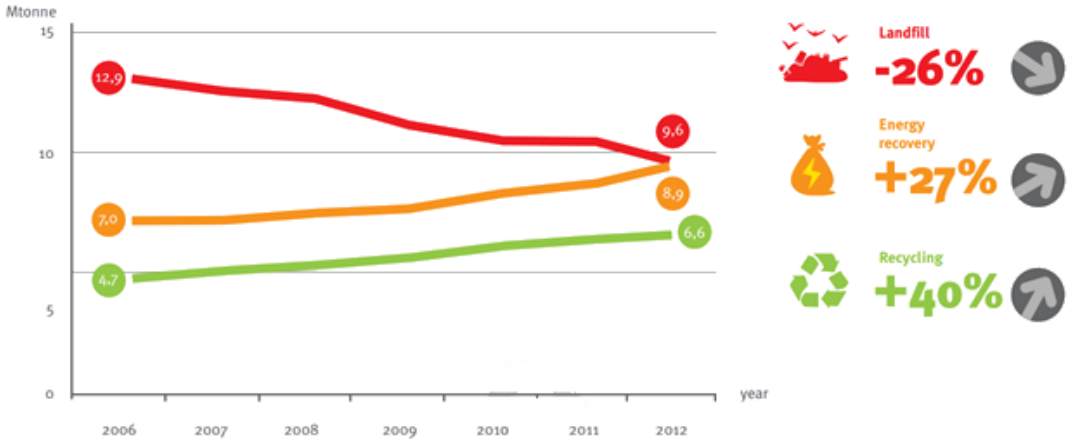
Overall the population connected to the Urban Wastewater Treatment (UWWT) plants has been increasing in Europe. In the northern and southern part of Europe over 80% of the population is connected to wastewater treatment, whereas in the central part of Europe the proportion exceeds 90%. In the Eastern Europe, over 67% of total population is connected to wastewater treatment and in the South-Eastern Europe (Turkey, Bulgaria and Romania) the proportion of population connected to the wastewater treatment is even lower, reaching only 40%. For the remaining countries the value of percentage of population connected to collecting systems without treatment ranges from 1,5 to 5,6 (European Environment Agency (EEA), 2013).

Figure 16: Development of Sales in EU-27 between 2007 and 2013: Trends of Plastics Production Manufactures and Converters



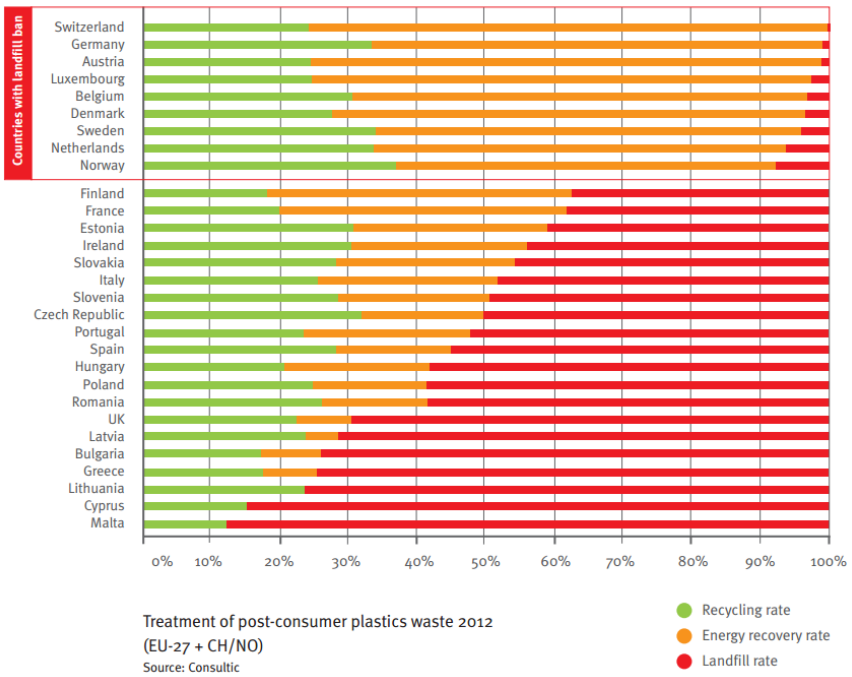

Source: Association of Plastic Manufacturers in Europe (2014)

Figure 17: Total Plastic Waste Recycling and Recovery, 2006- 2012



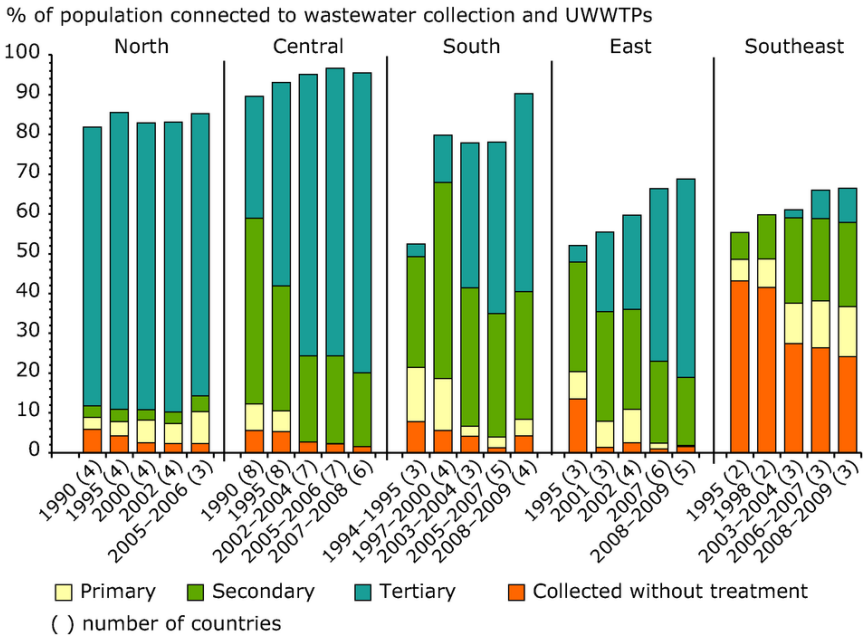

Source: Association of Plastic Manufacturers in Europe (2014)

Figure 18: Treatment of Post-consumer Plastics Waste 2012 across the EU-27 MS, Switzerland and Norway




Source: Association of Plastic Manufacturers in Europe (2014)

Figure 19: Changes in Wastewater Treatment in Regions of Europe between 1990 and 2012



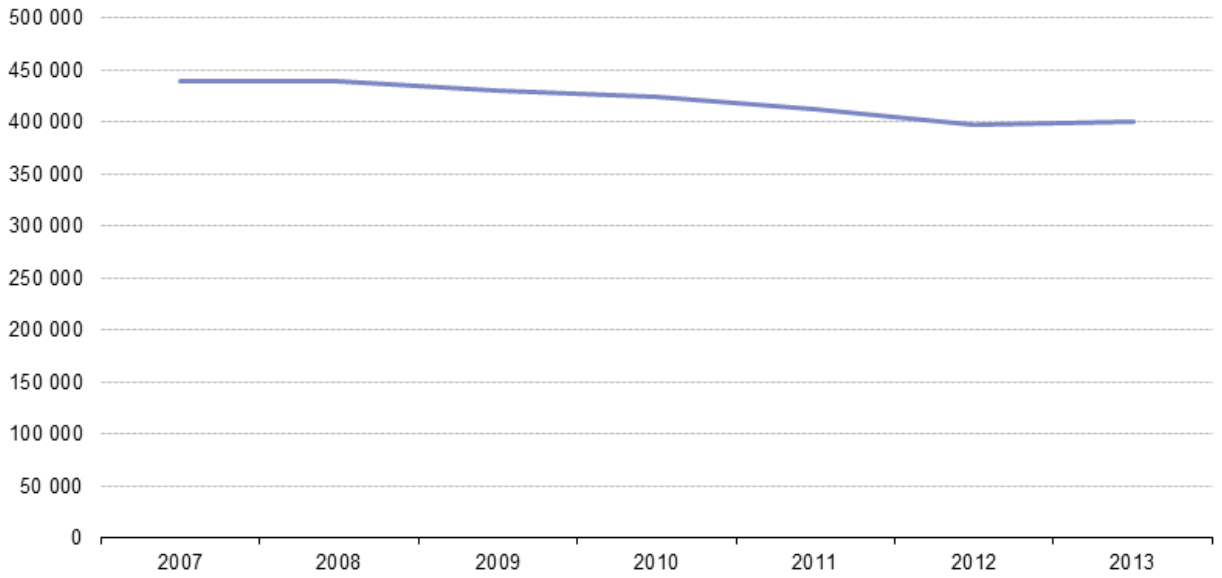

Source: EEA (2013)

Data reported by Eurostat/ European Commission shows that in 2013, 3.7 billion tonnes of goods were handled in EU maritime ports. Between 2004 and 2007 the total gross weight of goods handled at EU ports increased from 3.59 to 3.97 billion tonnes. This steady upward trend, which had been followed since 2002, started to reverse between 2007 and 2008, due to the global financial crisis and economic crisis. The total gross weight of goods transported by sea fell by 12.1%. Despite a substantial decline in production, trade and shipping activities caused by the global financial crisis, European ports (gross weight of seaborne goods handled in European ports) experienced a clear recovery in 2010, demonstrating that shipping is continuing its growth. From 2009 onwards, the total gross weight increased from 3.47 to around 3.70 billion tonnes in 2013, where it seems to have stabilised. With 548.4 million tonnes, the Netherlands held the highest share (14.8 %) of goods handled in EU ports, followed by the United Kingdom (13.5 %), Italy (12.3 %) and Spain (10.9 %) (Eurostat/EC, 2015). In 2013, around 400 million passengers passed through EU ports, split almost evenly between embarking and disembarking persons. Italy was the leading country with 73.2 million passengers or 18.3 % of all passengers at EU ports, followed closely by Greece at 73.0 million (18.2 %). Danish ports came in third in terms of passenger transport, with 10.2 % of all passengers at EU ports (41.0 million). Figure 20 shows the maritime transport of passenger in EU ports. Overall the number of passengers has decrease between 2007 and 2012 (from 439 million to 398 million). This figures are influenced by the progressive use of new routes (e.g. 'Charilaos Trikoupis' bridge linking the Greek mainland with Peloponnese) and the rapid expansion of low-cost airlines (Eurostat/EC, 2015).

European **aquaculture production** has been rapidly increasing since the early 1990s, mainly due to the expansion of marine production (Figure 20). Salmon production in Norway is the main responsible for the marine production increase. Other types of production remain stable since 2000's (European Environment Agency (EEA), 2015a). From 2002 to 2012 the level of aquaculture production in tonnage in the EU-28 remained relatively stable during the period, with output within the range of 1.23 and 1.36 million tonnes. The fourth largest aquaculture producers among the EU Member States were Spain (29.5 %), the United Kingdom (22.7 %), France (19.1 %), Italy and Greece (12.6 %). which together accounted for just over three quarters (83.9%) of the EU-28 total in 2012 (Eurostat/EC, 2016a).

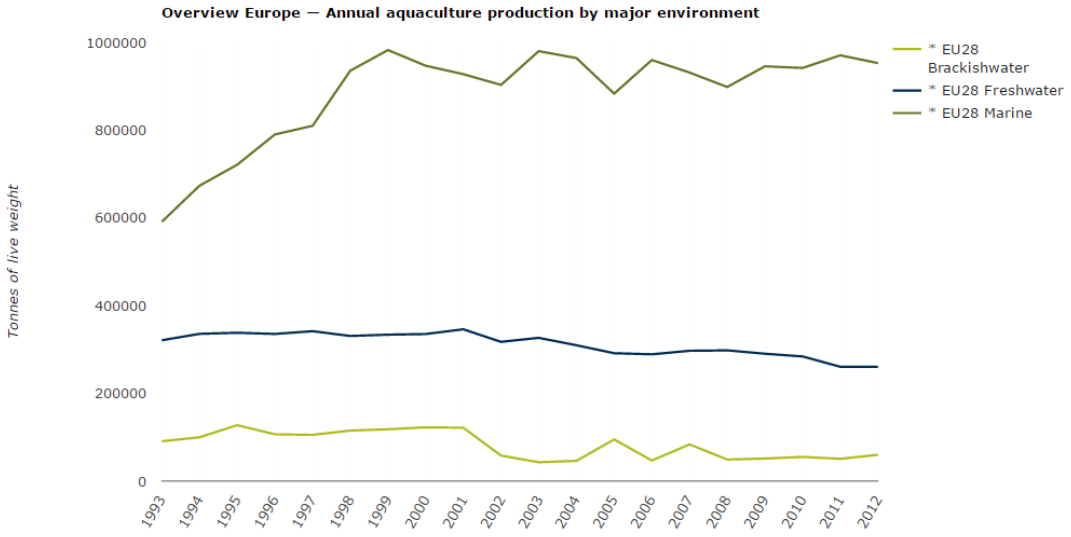
From 1995 the total EU-28 **fishing** catch fell almost every year although it was relatively stable between 2007 and 2011. The total catch in 2013 was 15.8 % less than 10 years earlier and 37.1 % lower than in 1995. Total catches by the fishing fleets of Denmark, Spain, the United Kingdom and France accounted for more than half (56.1 %) of all the catches made by the fishing fleets of the EU Member States in 2013. Among the 13 EU Member States that had a catch of at least 100 thousand tonnes in 2003, the largest percentage falls in the catch between 2003 and 2013 were recorded in France (-24.3 %), Denmark (-35.2 %), the Netherlands, Sweden (both -38.1 %), Italy (-40.6 %) and Lithuania (-51.8 %). On the contrary Finland, Poland and Spain recorded the only substantial increases, their catches rising by 68.2 %, 29.0 % and 10.5 % respectively (Eurostat/EC, 2016a).

Figure 20: Maritime Passengers in EU Ports, EU-28, 2007-2013.



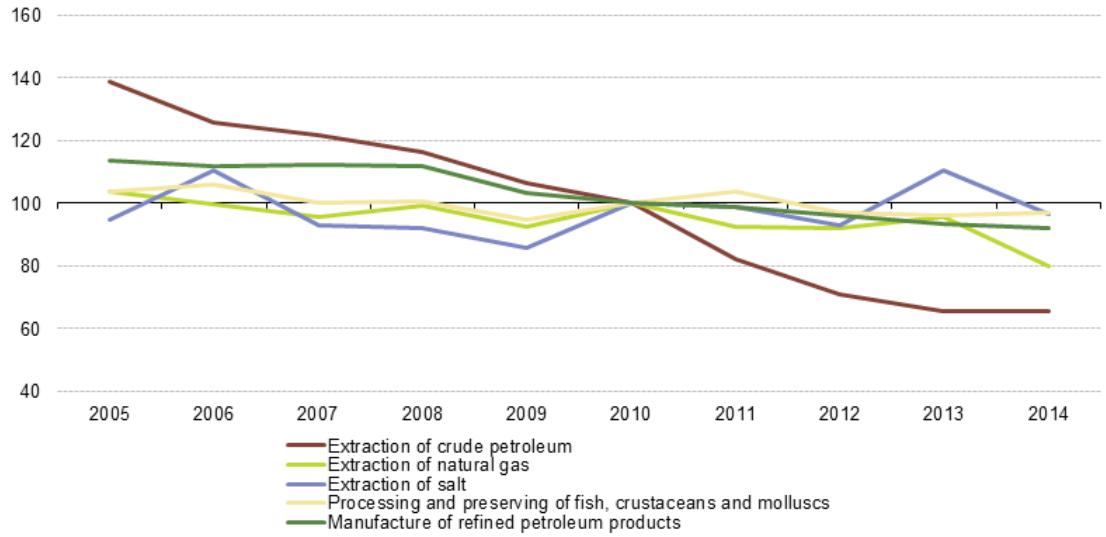

Source: Eurostat/EC (2015)

Figure 21: Annual Aquaculture Production by Major Environment across EU-28.




Source: Graphic provided by the European Environmental Agency (European Environment Agency (EEA), 2015a) using data from Food and Agriculture Organization of the United Nations (FAO)

Figure 22: Production in Main Maritime Industry NACE Rev 2 Activities, EU-28, between 2005 and 2014.




Source: Eurostat/EC (2015)

**Oil and gas extraction** has declined by 4.8% GVA in the period 2003-2008 in Europe as a whole (Ecorys, Deltares, and Oceanic Development 2012). The sector remains a vital part of the economy, as new fields are discovered in the Barents Sea and Mediterranean Sea (European Environment Agency (EEA), 2015b). More than 80% of Europe's oil and gas extraction takes place offshore, and concentrations of activity are found in the North Sea, the Adriatic Sea, as well as locations in the central and eastern Mediterranean and in the Black Sea. Its importance will reduce in the years to come due to the exhaustion of existing oil fields. Offshore gas exploration will stabilise still in the next 15-20 years, with methane hydrates extraction providing new opportunities, including those within or adjacent to the European waters (Ecorys et al., 2012). According to the maritime activities statistics from Eurostat (Eurostat/ EC, 2015) the production in the maritime sectors has tended to decline between 2005 and 2014. The industry of crude extraction is the industry that has suffered the highest losses over the last ten years, declining almost 58%. The extraction of natural has also declined between 2005 and 2014, however in 2010 this sector has slightly recovered from the economic crisis (Figure 21).

## Analysis of state and status

Marine debris in this list highlights its importance as a factor considered to contribute toward biodiversity loss. Marine debris can impact biodiversity in a number of ways, namely through entanglement in, or ingestion of, debris items by individuals, through facilitation of the transport of organisms via rafting on marine debris, through the provision of new habitat for colonization, and through effects at an ecosystem level. Impacts vary depending on the type and size of the marine debris items and the organisms that encounter it (Secretariat of the Convention on Biological Diversity and the Scientific and Technical Advisory Panel—GEF, 2012).

A recently published study by UNEP report on Marine plastic debris guide provides some figures on how the ecological impacts of the plastic debris UNEP, 2016). It states that: over 50% of humpback whales in US waters show scarring from entanglement (Robbins et al. 2007). between 57 000 and 135 000 pinnipeds and baleen whales globally are entangled each year (Butterworth et al. 2012); countless fish, seal, birds and turtles, affected by entanglement in ingestion of marine

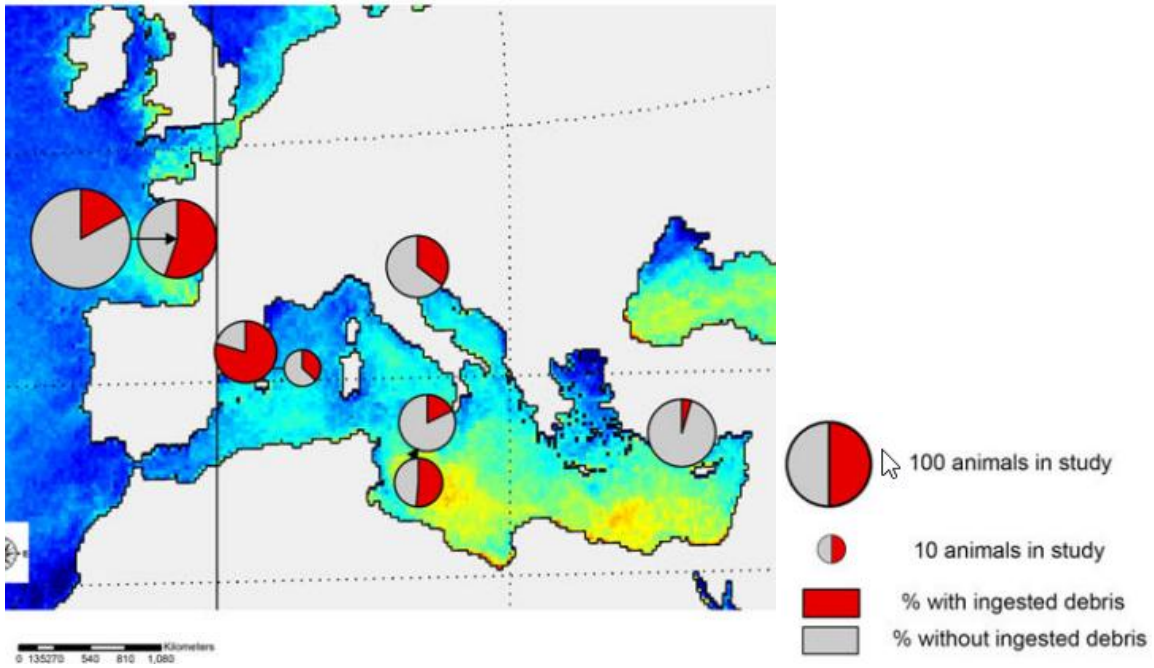
plastic; Injury is both a welfare issue and a cause of increased mortality, for example in seals (Allen et al. 2012) and turtles (Nelms et al. 2015), may be critical for the success of several endangered species; Ingestion of debris has been reported in 46 (56%) of cetacean species with rates as high as 31% in some species (Baulch & Perry, 2014); Turtles and toothed whales frequently are found to have large quantities of plastic sheeting and plastic bags in their gut compartments (e.g. Campani et al. 2013, de Stephanis et al. 2013, Lazar & Gracan, 2011, CMS 2014a); Plastics have been found in the guts of Loggerhead turtles in the Adriatic Sea (Lazar and Gracan 2011) and western Mediterranean (Camedda et al. 2014), the eastern Atlantic around the Azores (Barreiros and Raykov 2014) and in the SW Indian Ocean around Reunion Island (Hoarau et al. 2014); and Seabirds appear to be particularly susceptible at mistaking plastics for their natural prey (CMS 2014a).

In terms of population impacts, the Scientific Technical and Advisory Panel (STAP) of the GEF, in collaboration with the Secretariat of the Convention on Biological Diversity (CBD 2012), concluded that 663 species had been reported as having been entangled in or ingested plastic debris, an increase of 40% in the number of species since the previous global estimate (Laist 1997); Plastic debris was responsible for 88% of recorded events; and 15% of species affected were on the IUCN Red List. Figure 22 shows an enlargement of the location of studies of ingested debris by sea turtles worldwide (Shumyler et al. 2013). The results of this sturdy suggested that 96.8% of the 31 studies reported that sea turtles ingested plastic. Rope, fishing line, Styrofoam, tar, and fishhooks were other commonly ingested.

Plastic pollution in **freshwater ecosystems** have received less attention despite most plastic litter being produced onshore and introduced into marine environments by rivers (Dris et al., 2015). This is very much related to the fact that the water quality assessment is under the Water Framework Directive (2006/60/EC, WFD (European Parliament (EP), 2000)). Since the WFD does not include litter, plastic litter in freshwater systems is not included in any of the EU freshwater legislation (Van Der Wal et al., 2015).

As a consequence, there are very few studies on plastic pollution in freshwater ecosystems at European Level and absolutely none long-term monitoring programs on litter in freshwater systems in Europe (Van Der Wal et al., 2015). National and regional studies investigating plastic pollution in freshwater claim the urgent need for data for long-term monitoring (Breuninger et al., 2016). Furthermore, because of a lack of standardization, results are difficult to compare among the different studies. Some Member State are already taking measures to reduce the input of litter from the rivers. For example, France has proposed a target to "reduce the amount of waste transported by rivers"; or the HELCOM action plan mention that Member States "[…] should develop indicators and associated targets to quantifies, composition, sources and pathway of marine litter, including riverine inputs […]" (Van Acoleyen et al., 2013).

Figure 23: Locations of Studies of Ingested Debris by Sea Turtles in Europe Overlaid on a 30-year Model of Global Debris Distribution.




Source: red and yellow areas on maps, high debris concentration) (Lebreton et al. 2012). Circles are sized relative to the total number of turtles necropsied (large, 100 turtles; small, 10 turtles). Red areas in circles indicate the percentage of turtles in each study found with ingested debris (Source: Debris Ingestion by Sea Turtles Shumyler et al. 2013

A recent study for the European Commission DG Environment on the assessment of riverine input of (Marine) Litter investigates the contribution of rivers in marine litter. This study is based on data for monitoring of meso- to microsized floating litter items in four large rivers, discharging into different regional seas (North Sea, Baltic Sea, Mediterranean Sea and Black Sea). The results showed that the plastic litters were found in all of the rivers samples in the study, even in the river with low population pressure. Up to now there is not thresholds values for litter items, making it difficult to establish whether the concentrations found are a cause for immediate alarm from an environmental perspective. Up-to-date overviews of the results of litter surveys on the coastline include the results of different regional studies.

For the North-East Atlantic Region, the highest levels of marine litter recorded during the OSPAR Pilot Project were in the Greater North Sea Region with 600-1400 items per 100m of beach surveyed in the Northern North Sea and 200-600 items per 100m in the Southern North Sea. In the Celtic Seas levels were also high with 600-800 items per 100m. However, levels were higher in the south, as shown by the "MCS Beachwatch Survey 2007" where 3,230 items per km were monitored in the south west of England compared to 1,057 items per km in Northern Ireland. Marine Litter levels on beaches in the Bay of Biscay and Iberian Coast were much lower with only 100-300 items per 100m. In France anecdotal evidence from local authorities suggests that on average around 30 tonnes of marine litter are collected per km per year. Whilst the Wider Atlantic and Arctic Waters are likely to have the lowest levels, however due to lack of quantitative data for these areas it is not possible to carry out an assessment. Amounts of marine litter at sea have also remained constant but show varied spatial distribution with litter on the seabed varying significantly from 0 to 101000 pieces of litter per $km^2$, due to topological and tidal differences. In

the Greater North Sea, the background study into the EcoQO on plastic particles in Fulmars' stomachs showed that there was a reduction in the amount of litter at sea during the late 1990's with the average amount of plastic per bird falling from 0.5g to 0.3g. This reduction levelled off around the year 2000 and there has been no downward trend in recent years. In the Bay of Biscay strong seasonal variation was noted with 7 times more litter found on the seabed in winter compared to summer.

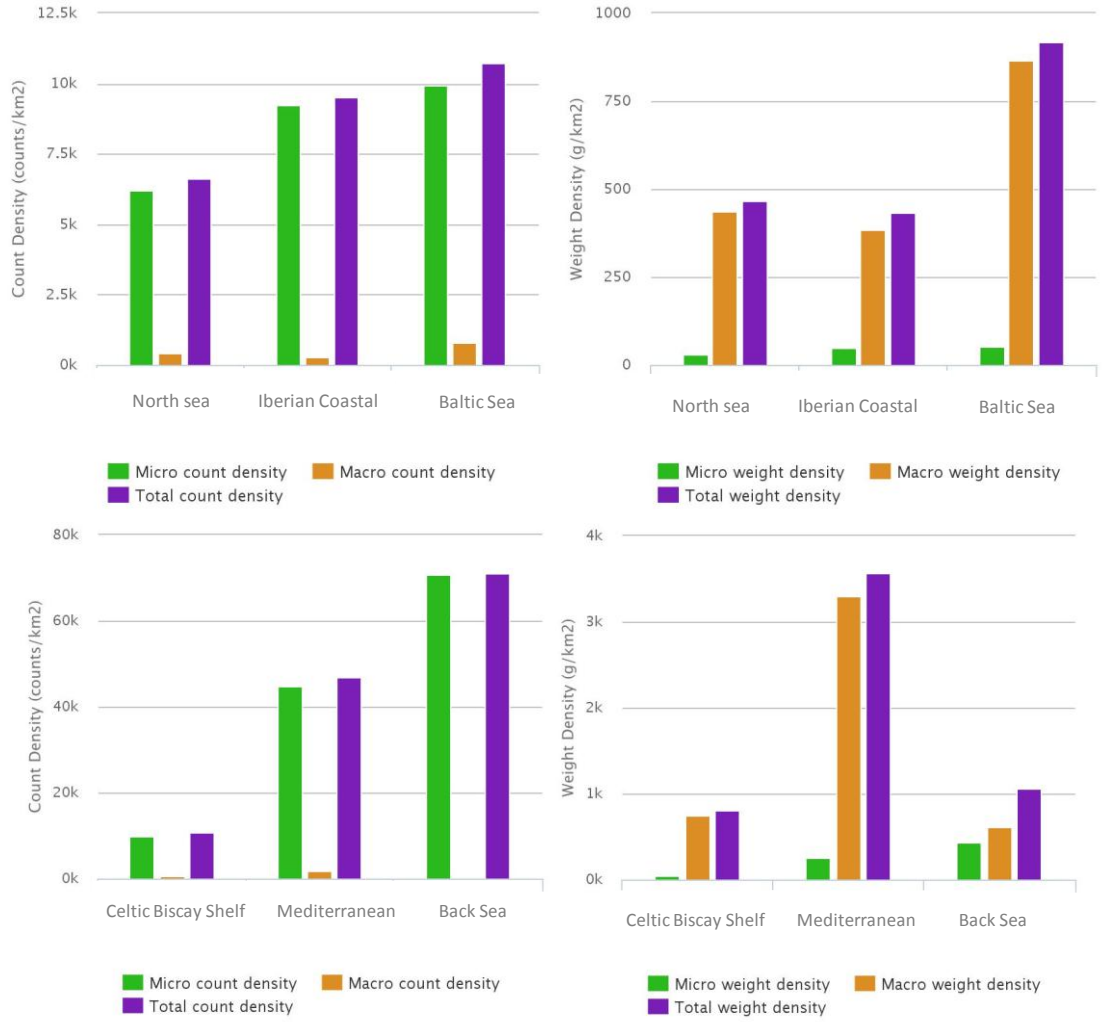
The amounts of marine litter in the Baltic Sea Region reported by the countries and the information provided by NGOs suggest that there is no clear descending or ascending trend in the marine litter found on coasts of the Baltic Sea. The amounts could be substantial in some specific sites near the sources of litter (e.g. shipping routes, rivers, public beaches). The highest amounts in the data from the Baltic Sea were between 700 and 1200 pieces per 100 m of a coast, which is the similar level found on the beaches of the Northern North Sea. However, in many cases the average amount of litter found on the coasts varied between 6 and 16 pieces of litter per 100 m of coast.

Data on marine litter in the Black Sea Region from vessel-based line transect showed that quantitative values of floating plastic was estimated as 6.6 and 65.7 pieces/km2 in the Ukrainian Black Sea and Kerch Strait, correspondingly and within the entire 12-miles-wide territorial waters. The density of beachfront pollution by polymeric garbage varied from 333 to 6,250 kg/km2, relativity higher than density of glass marine litter (222 and 1,455 kg/km2). Most pieces of the litter recorded were manufactured from glass (31%), plastic (25%) and metal (21%). A tendency of ML accumulation on the bottom of certain areas was observed. The abandoned fishing nets were found (and removed). Some representatives of the marine fauna (including cephalopods and crustaceans) were recorded to be by-caught in the "ghost" fishing gear. The concentration of marine litter collected in different places of the Turkish Black Sea coast varied from 58 to 1,395 kg per linear kilometre of the coastline.

Previous deductions that most of marine litter in the Mediterranean originates from land -based rather than sea -based sources, were confirmed. Marine litter on beaches in the Mediterranean originates from tourism and recreational activities and is composed mainly of plastics (bottles, bags, caps/lids, etc.), aluminium (cans, pull tabs) and glass (bottles). Marine litter from smoking related activities may locally account for 40% (collected items on beaches) which is considerably higher than the global average. In terms of marine litter floating in the sea, plastics account for more than 85% and litter densities are generally comparable to those reported from many other coastal areas worldwide. As for litter on the sea-floor plastics are predominant ranging from 45% to 95%. Fishing related litter, including ghost nets, prevail in commercial fishing zones. There are insufficient empirical estimates of abundances of floating micro- or macro-plastics for all Large Marine Ecosystems (LMEs). Therefore the data presented here on the relative abundances of floating micro- (<4.75 mm in diameter) and macro-plastics (>4.75 mm) in each LME were estimated through a model that uses coastal population density, shipping density and the level of urbanization within major watersheds, to develop proxy sources of plastics (Kershaw and Lebreton 2015). The results of the modelled data presented in the Figure 22 revelled that: the North Sea has relative moderate levels of plastic concentration. The abundance of floating plastic in this category was estimated to be on average over 12 times lower than those of LMEs; the Iberian Coast, Baltic Sea and the Celtic Biscay Shelf LMEs are in the group with relatively high levels of plastic concentration. Furthermore, the abundance of floating plastic in this category was estimated to be on average over 100 times higher than those LMEs with lowest values; and the Mediterranean and the Black Sea LMEs are in the group with the highest plastic concentration.

Furthermore, the abundance of floating plastic in this category was estimated to be on average over 400 times higher than those LMEs with lowest values.

Figure 24: European LMEs Micro, Macro and Total Plastics in counts/km² and g/km² Units.




Source: IOC-UNESCO (2016)

Massive accumulation of plastics has lately been reported in the ocean, nevertheless, freshwater ecosystems have received less attention despite the reality that the majority of plastics found in coastal and ocean waters have been introduced to these water realms by the rivers. Although the magnitude varies across European countries, packaging waste represents the major source of plastic pollution, plastic represents 19% of the shares of packaging waste generated by weight in EU28 in 2013 (European Commission, 2016).

In 2014, the European Parliament registered different questions about pollution of European rivers and lakes with plastic pellets attending the general concern about the increased pollution of the environment with raw materials for plastic manufacturing (pellets, flakes and spherules) (E-003937/2014) (European Parliament (EP), 2014). The majority of the questions registered in the European Parliament were answered by the members of the European Commission emphasizing the responsibility of Member States to ensure compliance with other environmental legislation

relevant to plastic pollution, such as the Packaging and Packaging Waste Directive (European Parliament (EP), 1994) (94/62/EC) (European Parliament (EP), 2015) (2015/720 (EC)) and the Waste Framework Directive (2008/98/EC) (European Parliament and Council, 2008) which list the penalties to be applied in accordance with the provision of the legislation.

At river basin district, the EU Strategy for the Danube Region includes in the framework of the priority action on water quality, a specific action to establish buffer strips along the rivers to retain nutrients and to promote alternative collection and treatment of waste in small rural settlements. The proposal for a directive of the European Parliament and the Council amending Directive 94/62/EC (European Parliament (EP), 1994) (European Parliament (EP), 2015)on packaging and packaging waste to reduce the consumption of lightweight plastic carrier bags included a survey of the situation of management of solid waste in small rural settlements in all Danube countries resulted to demonstrate the need to strengthen the coordination of the different administrations, going from the regular exchange of information, to performing, joint monitoring and implementation efforts, combined with increased public participation.

Land-based, and to some extent sea-based human activities, are the major drivers of pollution of coastal waters. Pollution from floating plastics, persistent organic pollutants (POPs) and nutrients entering regional seas from river basins is currently under a detailed assessment by the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) under the coordination of IOC-UNESCO. A clear message from the GESAMP working group is that micro-plastics are far more abundant than micro-plastics, but the latter represent a much higher mass.

Larger items of plastic debris have been shown to have significant detrimental impacts on many species of marine organisms, due mainly to entanglement and ingestion (Cózar et al., 2014).Very little, however, is known about the effects of micro-plastics on marine organisms. Plastics in the coastal and marine environment can also cause significant economic loss and may pose a threat to navigation and human safety. The risk of floating plastic debris in coastal and marine areas is based on the amount of plastic debris per unit area of each regional sea or large marine ecosystem, estimated from models.

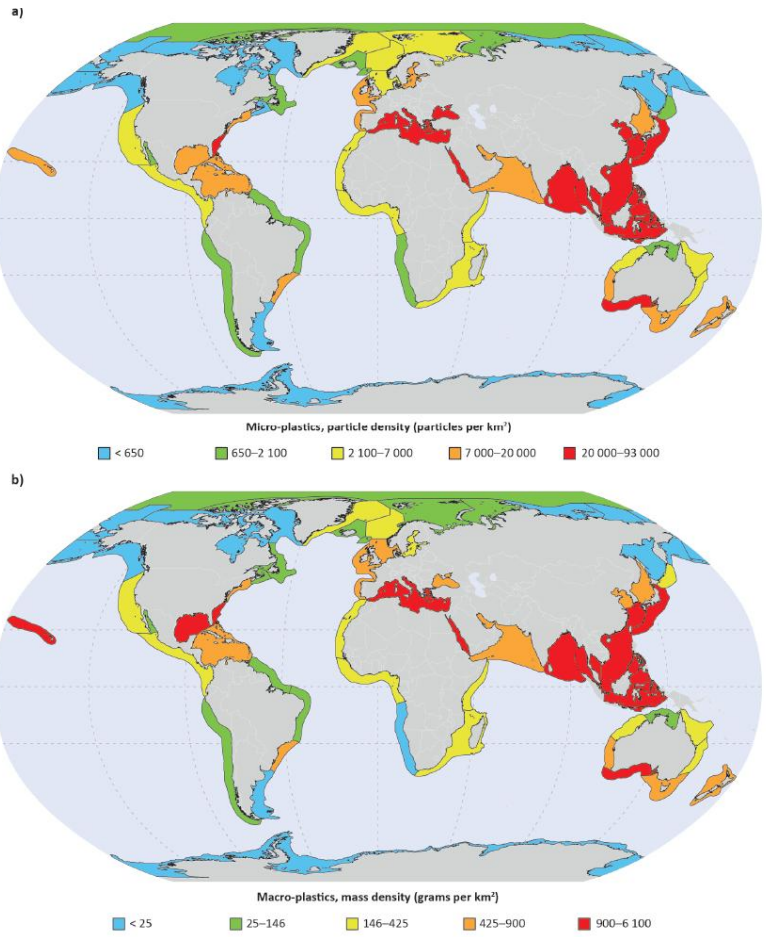
IOC-UNESCO analysed the status and trends of the large marine ecosystems at global scale in the context of the Transboundary Water Assessment Programme, including amongst other pollutants related to plastics. The main aim of the analysis was to identifying potential hotspots of coastal and marine plastics that can then become the focus of more specific investigation, leading to the identification and introduction of measures to control existing sources.

Relative quantities of floating plastics were estimated using a combination of hydrodynamic and particle-tracking models (HYCOM/NCODA and Pol3DD). The results of model runs using all three proxies (shipping density, coastal population density and the level of urbanization within major river basin districts) were combined (Eriksen et al., 2014). Separated estimates for micro-plastics (smaller than 4.75 mm) and macro-plastics (largest than 4.75 mm) were computed.

The Mediterranean and the Black sea are included in the list of regional seas (large marine ecosystems) with the highest estimated levels of plastic concentration, comparable to the South China Sea, Bay of Bengal, Indonesian Sea, Gulf of Mexico and Yellow Sea. The rest of European regional seas present medium to very high estimated levels. The Mediterranean and the Black Sea have extremely limited exchange with the open ocean, so floating plastic will tend to be retained for a long time, although the majority of the coastal countries in both regional seas are not part of the European Union and their legal framework to combat plastic waste and pollution is considerably weak.

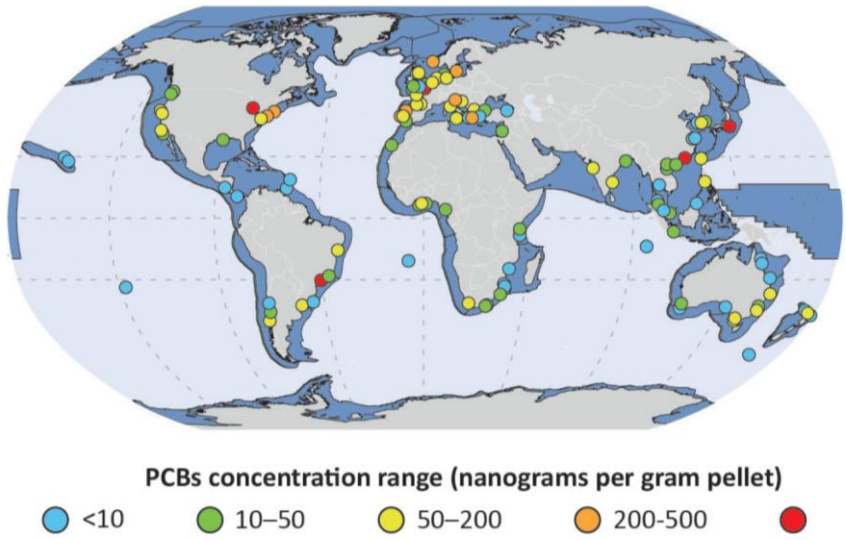
With regards to persistent organic pollutants (POPs), its global distribution has spread around the global ocean, including remote areas. Analysis of three common types of POPs in beached plastic pellets indicates current or recent use of release of banned POPs in some regions (e.g. European Union). However, the highest concentrations are registered in European regions such as the North Sea and the Mediterranean.

Figure 25: Floating Plastic Debris Risk Categories per Large Marine Ecosystems.




Source: IOC-UNESCO (2016)

Figure 26: PCBs Concentration Range (nanograms per gram pellet)




Source: IOC-UNESCO (2016)

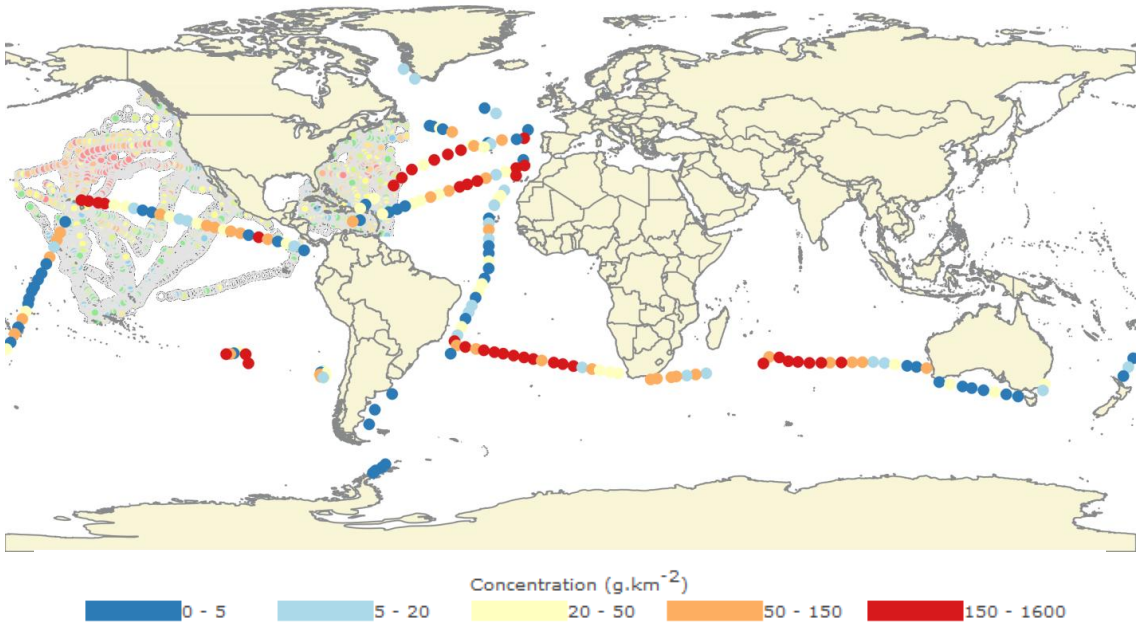
The diversity of plastic pollution's sources poses difficulties in designing and implementing cost-effective measures to reduce inputs to water systems. In most of the cases, solutions will need a multisector approach at transnational scale in order to be effective. Jambeck et al (2015) predict that, without waste management infrastructure improvements, the cumulative quantity of plastic waste available to enter the coastal areas and the ocean from land will increase by an order of magnitude by 2025. Therefore a reliable and consistent observational monitoring data on floating plastics may be establish, this would prevent reliable quantitative estimations of the amounts and trends (in space and time) of floating micro- and macro-plastics, currently lacking (Jambeck et al., 2015).

While the estimates of plastic concentration derived from modelling are imperfect, they provide information for focusing efforts to improve predictive capacity, assess potential socio-economic consequences, and target mitigation measures. Further improvement to these model estimates should be made if data become available on key sources of plastics (such as fishing, aquaculture, and coastal tourism, which are not accounted) and on actual quantities of plastics entering the ocean and how this may be influenced by the level of economic development in the different countries of the European Union and its neighbourhood.

Scientific knowledge of pollution in areas beyond national jurisdictions (open ocean) is steadily improving and some important advances have been made in the past decade. As a relevant example, Spain has played a leading role in the exploration of the planet's resources, and remains a benchmark in international oceanographic research. With the Malaspina Circumnavigation Expedition 2010, Spain aimed to foster platforms for cooperation within the marine research community in Spain, and to bring science and research on global change closer to the public. The objective of Malaspina Circumnavigation Expedition 2010 was to assess the impact of global change on the oceans, exploring biodiversity of the deep ocean, assess the impact of the original expedition of Alejandro Malaspina and raising interest for marine sciences within the Spanish, European and Iberoamerican young scientists.

Once floating plastic reaches the open ocean, either by direct input or by transport from coastal regions, the distribution becomes dominated by the surface ocean circulation, with highest relative concentrations found in the sub-tropical gyres of the North and South Pacific, the North and South Atlantic and the Indian Oceans. Overall concentrations are highest in the northern hemisphere, due to greatest contributions from a wide variety of sources. Despite the upsurge in interest, IOC-UNESCO still know little about floating plastic pollution in many regions of the ocean. Even in regions with relatively good coverage, such as the Northeast Pacific or the European Atlantic façade, a high degree of variability in distribution has been noted thanks to ocean circulation and wind and wave effects. The difficulty and expense of sampling in remote regions increases the level of uncertainty. It has proved very difficult to find trends over time, even with two datasets that extend over one or two decades.

Figure 27: Global Sampling of Floating Plastic Debris.




Source: Malaspina Circumnavigation: Ministry of Defence, Ministry of Science and Innovation, Kingdom of Spain

## Mapping of European policies against the DPS

There are several directives and policies that are in place to limit and eliminate plastic waste. The ***Waste Framework Directive*** sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. The ***Packaging and Packaging Waste Directive*** requires Member States to ensure that preventive measures are implemented by, for example, national programmes, extended producer responsibility programmes, and to develop packaging reuse systems for the reduction of the impact of packaging and packaging waste on the environment. The wastewater treatment sector is regulated by the ***Urban Waste Water Directive***. It requires a collection system in all agglomerations and the subjecting of water to secondary treatment (biological) before being discharged.

The legislative framework in place covers the drivers and pressures of plastic waste. As for the state, the *Communication* ***Resource Efficient Europe*** sets out concrete actions on marine litter by

establishing Special Areas for Conservation together with the ***Birds*** and ***Habitats Directive*** Natura 2000 Network and designating for instance that by 2020, market and policy incentives reward business investments in efficiency.

However, even though plastic waste is regulated directly by the above mentioned regulations and policies, plastic pollution in freshwater and marine ecosystems has received less attention despite most plastic litter being produced onshore and introduced into marine environments by rivers. This is very much related to the fact that the water quality assessment is under the ***Water Framework Directive*** (WFD). Since the WFD does not include litter, plastic litter in freshwater systems is not included in any of the EU freshwater legislation.

Table 10: DPS Policy Analysis of Plastic Waste Threat

| Relevant Instruments | Relationships | Impact |
|---|---|---|
| ***Birds Directive (2009/147/EC) & Habitats Directive (92/43/EEC)*** | | |
| Creation of Special Areas of Conservation (Art. 3.1, HD) and Special Protection Areas (Article 3.2, BD) | These instruments create a network of protected areas; called Special Protection Areas (SPAs) and Special Areas of Conservation (SAC), part of the Natura 2000 network. | S (+) |
| Take steps to avoid the deterioration of natural habitats in SACs (Article 6.2, HD) and assess the impacts of plans and projects on an SAC before approving it (Art. 6.3, HD)<br><br>Take appropriate steps to avoid pollution in protection areas (Art. 4.4, BD). | The Birds and Habitats Directives imply restrictions on human activities within and around the Natura 2000 areas. Widely established restrictions include infrastructural, industrial, and agricultural activities in and near to Natura 2000 sites. This instrument can reduce the intensity of drivers (e.g. human activities) in SPAs and SACs. | D (+)<br>P (+) |
| ***Marine Strategy Framework Directive (2008/56/EC)*** | | |
| Implementation of strategies by Member States so that all of the EU's marine regions and sub-regions attain 'Good Environ-mental Status' (GES) by 2020, in specifc Marine Litter – Descriptor 10 | GES is defined by means of eleven qualitative 'descriptors'. Descriptor 10 relates directly to marine litter: "Properties and quantities of marine litter do not cause harm to the coastal and marine environment" | D(+)<br>P (+)<br>S (+) |
| ***Regulation (EU) (1255/2011) on integrated maritime policy*** | | |
| RERM marine resources milestone: "By 2020, good environmental status of all EU marine waters is achieved" | Is one of the tools that can help to address the discharges and that the Commission will further develop jointly with the Member States | P (+) |
| IMP refers to are Maritime Spatial Planning and Integrated Coastal Zone Management | Through integrated planning to reduce the negative environmental impact of economic activities carried out in the marine and coastal areas. These activities include tourism, fishing and maritime transport, all sources of marine litter. | P (+) |
| ***Water Framework Directive (2000/60/EC)*** | | |
| WFD requires that Member States establish river basin districts together with a river basin management plan for each of them. There are four distinct elements to the river basin planning cycle: characterisation and assessment of impacts on river basin districts; environmental monitoring; the setting of environmental objectives, and; the design and implementation of the programme of measures needed to achieve them. Measures could relate to litter as it has an impact on water quality. | | D(+)<br>P (+)<br>S (+) |

*Bathing Water Directive (2006/7/EC)*

| | | |
|---|---|---|
| This directive provides that bathing waters must be inspected visually for pollution such as tarry residues, glass, plastic, rubber or any other waste as part of the beach profile. All bathing waters in the EU must be at least of sufficient quality by the end of the 2015 bathing season. | Some of the plastic items discarded accidentally or intentionally in public beaches, will most probably end up in as marine litter. If quality is poor and/or when waste is visually detected, Member States must adopt the necessary measures to manage and reduce pollution, and to protect and inform bathers. | P (+)<br>S (+) |

*Communication (COM (2011)571) Resource Efficient Europe*

| | | |
|---|---|---|
| RERM boosting efficient production: "By 2020, market and policy incentives that reward business investments in efficiency are in place. These incentives have stimulated new innovations in resource efficient production methods that are widely used. All companies, and their investors, can measure and benchmark their lifecycle resource efficiency. Economic growth and wellbeing is decoupled from resource inputs and come primarily from increases in the value of products and associated services." | A reduction in material usage during product manufacture will lead to a direct reduction in the amount of end-of-life material accumulating in the environment. | D(+) |
| By 2020, waste is managed as a resource Waste generated per capita is in absolute decline. Recycling and re-use of waste are economically attractive options for public and private actors due to widespread separate collection and the development of functional markets for secondary raw materials. More materials, including materials having a significant impact on the environment and critical raw materials, are recycled. Waste legislation is fully implemented. Illegal shipments of waste have been eradicated. Energy recovery is limited to non-recyclable materials, landfilling is virtually eliminated and high quality recycling is ensured." | Improving waste management makes better use of resources lower impacts on the environment. Plastic litter can be recycled and used for energy recovery reducing the amount of waste landfilled, thus contributing to a reduction of materials ending up in the waste stream. | P (+) |

*Communication COM (2008)699) on Raw Materials Initiative*

| | | |
|---|---|---|
| It is proposed that the EU should agree on an integrated raw materials strategy. One of the pillars in which is based the strategy aims to: 'boost overall resource efficiency and promote recycling to reduce the EU's consumption of primary raw materials and decrease the relative import dependence' | The communication proposes several measures to improve the recycling markets, thus contributing to a reduction of materials ending up in the waste stream | P(+) |

*Communication (COM (2012)60) Innovating for Sustainable Growth: A Bioeconomy for Europe*

| | | |
|---|---|---|
| The accompanying Action Plan for Bio-based Products foresees actions ranging from improving the implementation of the present targets for bio-based products over standardisation, labelling and certification to ensure the quality and consumer information on the new products to harnessing the purchases of public authorities to set the example. | Moving to a bio-based economy may hold the potential of creating less waste that ends up in the marine environment and may increase the use of products with less lasting impacts on our oceans | D(+)<br>P(+) |

*Communication (COM (2014)254) Innovation in the Blue Economy*

| | | |
|---|---|---|
| Among other issues, the Communication on Innovation in the Blue Economy, aims to address: 'gaps in knowledge and data about the state of our oceans, seabed resources, marine life and risks to habitats and ecosystems'; | Higher quality and more readily available marine data would facilitate implementation of the Marine Strategy Framework Directive. It would also help the public and private sectors manage risks and uncertainties connected with the sea – for example, the weather, major transport accidents, marine pollution or loss of critical infrastructure. | S(+) |
| ***Waste Framework Directive (2008/98/EC)*** | | |
| Article 11 / Re-use and recycling: 'by 2015 separate collection shall be set up for at least the following: paper, metal, plastic and glass' In specific, Member States shall take the necessary measures designed to achieve the following targets: (a) 'by 2020, the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight ' | Waste Framework Directive with its 2015 separate plastic waste collection target or its 50% household waste collection target by 2020, thus contributing to a reduction of materials ending up in the waste stream. | P(+) |
| ***Landfill Directive (1999/31/EC)*** | | |
| The objective of the Directive is to prevent or reduce as far as possible negative effects on the environment, by introducing stringent technical requirements for waste and landfills. A revision of the directive in 2014 proposed clear targets for reduction of waste and establishes an ambitious and credible long-term path for waste management and recycling. The revised waste proposal includes specific targets addressing the plastics: 'A common EU target for recycling 65% of municipal waste by 2030; A common EU target for recycling 75% of packaging waste by 2030; A binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2030; A ban on landfilling of separately collected waste;' In addition, the Directive, requires that the location of landfill sites takes into account factors such as the proximity of water bodies and coastal waters and that wind-blown materials are minimised. | Landfills are responsible for debris from waste collection, transportation and disposal sites entering the marine environment Riverine transport of waste from landfills along rivers, municipal landfills located on the coast are a particular concern. Reducing land landfilled will consequently reduce the disposal or marine litter.<br>Specific measures concerning the location of the landfills should reduce potential dispersal of plastic packaging waste and other debris in the marine environment. | P(+) |
| ***Packaging and Packaging Waste Directive (94/62/EC)*** | | |
| The Directive requires Member States to ensure that preventive measures are implemented by, for example, national programmes, extended producer responsibility programmes, and to develop packaging reuse systems for the reduction of the impact of packaging and packaging waste on the environment. Under the Article 4 – Prevention Member States shall take measures to achieve a sustained reduction in the consumption of lightweight plastic carrier bags on their territory. In specific, MS shall include either or both of the following: '(a) The adoption | Full implementation of the Directive by the Member States will play an important role in closing loopholes in the plastic packaging cycle, with important attendant benefits for the generation of marine litter. | D(+)<br>P(+) |

| | | |
|---|---|---|
| of measures ensuring that the annual consumption level does not exceed 90 lightweight plastic carrier bags per person by 31 December 2019 and 40 lightweight plastic carrier bags per person by 31 December 2025, or equivalent targets set in weight. Very lightweight plastic carrier bags may be excluded from national consumption objectives; (b) the adoption of instruments ensuring that, by 31 December 2018, lightweight plastic carrier bags are not provided free of charge at the point of sale of goods or products, unless equally effective instruments are implemented. Very lightweight plastic carrier bags may be excluded from those measures. | | |
| ***Urban Waste Water Directive (91/271/EC)*** | | |
| The UWWTD requires that all sewerage discharges serving populations over 10,000 in coastal areas and 2,000 in estuarine areas, must receive secondary (biological) treatment prior to discharge. | Discharge of urban waste water is one of the sources of marine litter. Sewage related marine debris includes, among other things, sanitary towels, tampons and plastic cotton wool bud sticks. In pre-treatment, stones, sand and other relatively large elements are removed; in this particular case, retained particles may range between 200 µm and even be above 100 mm of diameter. Micro-plastics and fibres from clothes washing might pass the waste water treatment plant. Also storm water overflows may be a significant source | P(+) |
| ***Ship-source Pollution Directive (2009/123/EC)*** | | |
| "This directive adopted a set of rules to reinforce maritime safety and help prevent pollution from ships. It also aims to incorporate international ship-source pollution standards into EU law: The International Convention for the Prevention of Pollution from Ships (MARPOL 7378) and the London Convention (1972 and the 1996) protocol. The Directive requires Member States to consider discharges of polluting substances from ships in all sea areas, including the high seas, as a criminal offence if they are committed with intent, recklessly or by serious negligence. Minor discharges are infringements, but shall not automatically be considered as criminal offences, except where their repetition leads to deterioration in the quality of the water, including in the case of repeated discharges. | Shipping discharges is one of the main sources of marine litter. This Directive aims to prevent and reduce the shipping discharges and develop methods to identify a discharge as originating from a particular ship. | P(+) |
| ***Port Reception Facilities Directive (2000/59/EC)*** | | |
| This directive aims to reduce discharges of ship-generated waste and cargo residues into the sea, especially illegal discharges, by improving the availability and use of port reception facilities in all EU ports. The Directive applies to all ships, including fishing vessels and recreational craft, irrespective of their flag. The Directive brings international requirements (MARPOL 73/78) into | Several types of waste are generated on board ships. Oily wastes, sludge, drainage from the bilges, sewage and garbage, among others, are produced, along with cargo residues during loading and unloading operations (EMSA, 2016). Shipping discharges is one of the main sources of marine litter. This Directive aims to prevent and reduce the | P(+) |

| | | |
|---|---|---|
| EU law and provides for additional obligations and mechanisms, especially the obligation on ports to develop and implement waste reception and handling plans, and the obligation on ships in deliver their waste at each port call within the EU. | shipping discharges through the obligation to deliver their waste generated in ports. It provides for the implementation of a cost recovery system (applying a waste fee), that should provide no incentive for ships to discharge their waste at sea. The final aim is to reduce pollution from the waste produced by ships. | |
| ***Recommendation (2002/413/EC) on Integrated Coastal Zone Management (ICZM)*** | | |
| ICZM defines the principles of sustainable management and use of coastal zones. These include the need to base planning on sound and shared knowledge, the need to take a long-term and cross-sector (e.g. tourism, fisheries) perspective, to pro-actively involve stakeholders and the need to take into account both the terrestrial and the marine components of the coastal zone. | ICZM can help reducing the negative environmental impact of activities carried out in the coastal areas, including those activities which are sources of marine litter. | D(+)<br>P(+) |

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# 6 Template Used for Mapping Policies against EBM Principles

Table 11: Template used for the Mapping of Key Policies against EBM Principles

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
|---|---|---|---|---|---|---|
| 1 | Ecological integrity, biodiversity, ecosystem services and resilience | | | | | |
| 2 | Development and use of multi-disciplinary knowledge | | | | | |
| 3 | Appropriate spatial scales | | | | | |
| 4 | Social-ecological interactions, stakeholder participation and transparency | | | | | |
| 5 | Policy coordination | | | | | |
| 6 | Adaptive management | | | | | |

**Note:** The table represents the summary of a more detailed assessment. It only mentions the most important elements.

# 7 EBM Mapping Analysis

## 7.1 Nature Directives

Author: Helen Klimmek, IUCN

Table 12: Mapping the HD and BD against EBM Principles

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
|---|---|---|---|---|---|---|
| 1 | Ecological integrity, biodiversity, ecosystem services and resilience | HD: Partially<br>BD: Partially<br><br>- Ecosystem integrity, resilience and ecosystem services are not explicitly mentioned in either directive.[24] However biodiversity conservation is the primary objective – the BD aims at conserving populations of species, while the HD | HD: Partially<br>BD: Partially<br><br>- HD&BD contain provisions on biodiversity conservation at species/habitat level, but also at ecosystem level by contributing to N2000. By contributing to a European-wide | HD: Yes, fully<br>BD: Yes, fully<br><br>-MS are required to provide information on threats and pressures for the assessment of conservation status for species and habitats (Art. 12 BD, Art. 17 HD)<br><br>Summary rating HD: Supporting | HD: Yes, fully<br>BD: Yes, fully<br><br>*Habitats Directive:*<br>- MS must adopt measures to maintain or restore, at FCS, natural habitats and species of Community Interest (Art.2). This includes measures to conserve and manage Natura 2000 sites (Art.6, e.g. development of management plans, administrative | Overall, the directives support this principle – they calls for measures which promote biodiversity conservation, ecosystem connectivity and take into account social and economic needs.<br>Implementation issues: MS have progressed at different rates in developing and implementing action plans for species and Natura 2000 |

[24] These terms were uncommon when the directives were adopted.

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
|---|---|---|---|---|---|---|
| | | aims at biodiversity conservation in a broader sense.<br><br>- Together, the HD&BD contribute to the protection of species and habitats and development of the N2000 network, fostering ecosystem-level environmental protection and ecological coherence<br><br>*Habitats Directive*<br>- HD aims to achieve FCS for all habitat types and species of community interest FCS aligns with the EBM principle.[25]<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | network of protected areas, the directives contribute to ecological coherence.<br><br>*Habitats Directive*<br>- The conservation status of natural habitat types and species present on a site is assessed according to a number of criteria[26] both at site and network level.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | **Summary rating BD: Supporting** | measures) and measures to manage protected animal and plant species (e.g. establish system to monitor the incidental capture and killing of the animal species) (Articles 12-16).<br><br>*Birds Directive:*<br>-Measures to protect bird species but also to preserve, maintain or re-establish a sufficient diversity and area of habitats for certain bird species. Possible measures include e.g. creation of protected areas, re-establishment of destroyed biotopes. These measures can have a positive impact not only on bird species but also have the potential to have a positive effect on wider ecosystem. Art. 4.4 also requires MS to strive to avoid | site management plans. In 2012, only 58 % of Natura 2000 sites had management plans, or had such plans in development (Mid-term review of Biodiversity Strategy). This indicates a gap between policy and implementation. |

[25] FCS describes a situation where a habitat type or species is prospering in both quality and extent/population- and has good prospects to do so in the future as well.

[26] Criteria established by Article 1 of the directive

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
|---|---|---|---|---|---|---|
| | | | | | the pollution or deterioration of habitats outside SPAs.<br>- BD also states that the decline in Bird populations represents a serious threat to the conservation of the natural environment, acknowledging threat to biological balance.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | |
| 2 | Development and use of multi-disciplinary knowledge | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- The development of a protection regime for habitats and species, and designation of protection sites, as set out in the objectives of the directives, is done on scientific grounds taking into account social and economic considerations. | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>*Habitats Directive*<br>-Calls for trans-boundary cooperative research between Member States (Art.18(2). Also acknowledges that threats to habitats and species are often of a transboundary nature, | **HD: Partially**<br>**BD: Partially**<br><br>- There is no explicit mention of state of the art models and tools, or traditional/local knowledge in either directive. The designation of protection areas must take into account social and economic considerations which | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- Knowledge of species (range, occurrences, biology, ecology, threats & sensitivity, conservation needs, etc.) and habitats is needed in order to implement meaningful conservation measures in accordance with both directives.[27] | On the whole, the HD and BD support this principle. They contribute to the development of a better understanding of ecosystem functions and structure, and the roles of the components of biological diversity in ecosystems, and threats to biodiversity. Both directives include consideration for social and economic issues. Local and traditional |

[27] http://ec.europa.eu/environment/nature/conservation/species/guidance/pdf/guidance_en.pdf

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
|---|---|---|---|---|---|---|
| | | *Habitats Directive*<br>- Preamble states that improvement of scientific and technical knowledge is essential for the implementation of the Directive.<br><br>*Birds Directive*<br>- Preamble states that conservation of birds and, in particular, migratory birds still presents problems which call for scientific research.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | which necessitates measures at Community (i.e. EU) level.<br><br>*Birds Directive*<br>- BD encourages research into protection, management and use of certain bird species. Migratory bird species are acknowledged to be trans-frontier environmental issue 'entailing common responsibilities', suggesting need for transboundary collaboration.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | implies the need for multidisciplinary knowledge. Directives require reporting on conservation status of habitats and species and highlight need for research.<br><br>*Habitats Directive*<br>- Recital 19: "the improvement of scientific and technical knowledge is essential for the implementation of this Directive. Art.18 also stresses need for research.<br><br>*Birds Directive*<br>- MS should promote research for the purposes of the management, protection and wise exploitation of species of wild birds particularly in relation to topics such as the impacts of chemical pollution on population levels.<br><br>**Summary rating HD:** | *Habitats Directive*<br>-Measures under the HD must take into account economic, social and cultural requirements and regional and local characteristics of the area concerned (Art.2 (3))<br><br>*Birds Directive*<br>- Measures to maintain the population of certain bird species must take into account ecological, scientific and cultural requirements (Art.2), which would assumedly entail multidisciplinary knowledge.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | knowledge are however not explicitly considered within the Directives. |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
|---|---|---|---|---|---|---|
| | | | | Supporting<br>Summary rating BD: Supporting | | |
| 3 | Appropriate spatial scales | HD: Yes, fully<br>BD: Yes, fully<br><br>- The objectives support a multi-level approach to biodiversity conservation by promoting species/habitats level actions as well contributing to a protected area network.<br>- HD aims to protect biodiversity by conserving natural habitats fauna and flora. The BD not only applies to birds but also their habitats.<br><br>Summary rating HD: Supporting<br>Summary rating BD: Supporting | HD: Yes, fully<br>BD: Yes, fully<br><br>- The directives do not specify management units. They target species, habitats, and the wider ecosystem through the creation of protected area network. This multi-level, flexible approach seems to support the EBM principle, though the directives do not actively support or hinder it.<br><br>Summary rating HD: Supporting /Neutral<br>Summary rating BD: Supporting/Neutral | HD: Yes, fully<br>BD: Yes, fully<br><br>*Habitats Directive:*<br>- MS must propose a list of sites hosting habitats and species listed in Annexes, this list provides basis for selection of SACs. For animal species ranging over wide areas the sites correspond to 'the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction. For aquatic species which range over wide areas, such sites will be proposed only where there is a clearly identifiable area representing the physical and biological factors essential to their life and reproduction.' (Art.4) | HD: Yes, fully<br>BD: Yes, fully<br><br>- The definition, adoption and implementation of measures fall within the competence of national authorities. The HD and BD enable MS to implement provisions in a proportionate and appropriate manner. Whether measures support or hinder this principle depends on the MS.<br><br>*Habitats Directive:*<br>- The directive allows for flexibility in the type of conservation measures which have to be established for SACs – 'appropriate statutory, administrative or contractual measures…' or management plans.' Contractual measures will often involve a relationship between the competent authorities and individual landowners. | The HD and BD are flexible in regards to spatial scales. In practice, cooperation will likely vary from Member State to Member State. According to the mid-term review of the Biodiversity Strategy, the Natura 2000 biogeographical process has been successful in encouraging cooperation between Member States. |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | | | *Birds Directive:*<br>- MS are free to designate the most suitable territories as special protection areas for the conservation of species in the geographical sea and land area where this Directive applies.<br><br>**Summary rating HD: Supporting /Neutral**<br>**Summary rating BD: Supporting/Neutral** | *Birds Directive*<br>- Measures relate to protection of specific species (e.g. probation of hunting, capture), but also to protection of habitats. Designation of protected areas contribute to N2000. Therefore multiple scales are applied.<br><br>**Summary rating HD: Supporting /Neutral**<br>**Summary rating BD: Supporting/Neutral** | |
| 4 | Social-ecological interactions, stakeholder participation and transparency | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- Both directives allow for derogations under certain circumstances, taking into account social concerns.<br><br>*Habitats Directive*<br>- MS may derogate in the interests of public health and public safety, or for other imperative reasons of overriding public | | **HD: Partially**<br>**BD: Partially**<br><br>- Both directives include consideration for social and economic concerns. They do not indicate when it is appropriate to obtain the opinion of the general public. However, public consultation is required for site assessments under Directive 85/337/EEC.<br><br>**Summary rating HD:** | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- Measures must take into account economic, social and cultural requirements and regional and local characteristics. MS report to the EC on positive changes in public acceptance towards biodiversity protection; Improved cooperation between authorities, nature conservationists and other interest groups and | Overall, the Directives do consider social-ecological interactions. However, they do not explicitly call for analyses of ecosystem service flows or assessment of trade-offs of different management options. Stakeholder consultations are not explicitly foreseen in the directive. |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | interest, including those of a social or economic nature. Derogations may be issued provided that there is no other satisfactory alternative and that they are not detrimental to the maintenance of the species populations at a FCS in their natural range.<br><br>*Birds Directive*<br>- BD acknowledges that the conservation of birds is necessary in order to attain the Community's objectives regarding the improvement of living conditions and sustainable development. It thereby acknowledges socio-ecological interactions.<br>- MS may derogate from certain provisions in the interest of public health or safety, air safety, for the protection of flaura and fauna and to prevent | | Supporting/Neutral<br>Summary rating BD:<br>Supporting/Neutral | initiatives.<br><br>Summary rating HD:<br>Supporting<br>Summary rating BD:<br>Supporting | |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | damage to crops, livestocks, fisheries and water.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | | | | |
| 5 | Policy coordination | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- HD and BD are largely coherent, internally and with each other, despite some differences in scope and operational measures. Ultimately, both aim to ensure to protect biodiversity in coordination with other instruments.<br>- The Directives directly contribute to implementation of the Biodiversity Strategy (Target 1) and to global conservation targets.<br>- The directives aim to achieve "favourable conservation status" – or equivalent – of the listed | | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>-The protection regime for SCIs, SACs and SPAs has been harmonised through Art.7 of HD. Although management provisions of Art.6(1) of the Habitats Directive do not apply to SPAs, Articles 4(1) and (2) of the Birds Directive provide for a similar approach. In practice, MS apply management plans for both SACs and SPAs.<br>-The implementation of the HD is supported by the Habitats Committee which comprises representatives from all member states and the EU Commission. The ORNIS Committee | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- There has been a change from a 3-year to 6-year reporting cycle for the BD. BD and HD are now reasonably synchronized so that information is available in policy-relevant cycles and can give strong input to the overall biodiversity debate.<br>- There are many EU funding opportunities for financing biodiversity and Natura 2000 across different instruments. However, only the LIFE programme provides dedicated support to biodiversity and Natura 2000 as a primary objective, whereas other EU funding instruments are primarily | The HD and BD provide ample opportunity for policy coordination – they directly contributes to the objectives of the Biodiversity Strategy, and reporting procedures for BD and HD are aligned. Objectives also align with those of other environmental directives. There are also significant funding opportunities linked to the directive. Evidence is mixed on the extent to which nature and biodiversity are successfully integrated into the funding programmes however, as this depends on priority-setting at national and regional level and capacity of stakeholders to absorb |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | habitats and species which they seek to protect.<br>- While the scope and terminology is different, this aligns with the objectives of other environmental directives (Good Ecological Status, Good Environmental Status)<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | | assists the Commission in the implementation of the Birds Directive.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | targeted to deliver EU goals on rural, regional, infrastructural, social and scientific development.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | funds.[28] |
| 6 | Adaptive management | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- Directives allow for amendment of annexes based on technical and scientific progress.<br><br>*Habitats Directive* | | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- The Habitats and Ornis Committees have an important advisory role and regularly discuss all aspects of the implementation of the | **HD: Yes, fully**<br>**BD: Yes, fully**<br><br>- Reporting on implementation of provisions is required every six years and reviewed by the Commission. Reporting requirements for BD and HD | The Directives seems to encourage a forward-thinking approach which supports adaptive management by allowing MS a certain margin of manoeuvre, or flexibility. Further research would be needed to investigate to |

28 http://ec.europa.eu/environment/nature/legislation/fitness_check/docs/consultation/Fitness%20Check%20final%20draft%20emerging%20findings%20report.pdf

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | - The Commission periodically reviews the contribution of Natura 2000 towards achievement of the directive's objectives. In this context, a special area of conservation may be considered for declassification where this is warranted by natural developments.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | | Directive.<br><br>*Habitats Directive*<br>- MS can propose adaptation of the list of SACs in light of results of surveillance of conservation status of habitats and species.<br>*Birds Directive*<br>- MS may introduce stricter protective measures than those provided for under the Directive.<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | were initially not aligned. The change signifies an adaptive approach.<br><br>*Habitats directive*<br>- HD states that 'Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration... as well as disturbances…' of species and habitats. (Art.6) This article stresses the need to go beyond the simple management measures necessary to ensure conservation and highlights the need for anticipatory action. This suggests a preventive, adaptive and forward-thinking management approach. [29]<br>-HD does not define in detail the concrete measures needed to fulfil the obligations arising from its various provisions and allows | what extent management plans are adapted on the ground to reflect outcomes of monitoring processes by the relevant authorities. |

[29] http://ec.europa.eu/environment/nature/conservation/wildbirds/hunting/docs/hunting_guide_en.pdf

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | | | | the Member States a certain margin of manoeuvre, or flexibility. Targets can vary and can also evolve (e.g. due to better scientific knowledge).[30]<br><br>*Birds Directive*<br>– MS must avoid pollution or deterioration of habitats or any disturbances affecting birds in protected areas, and also strive to avoid pollution outside these protection areas, suggesting a preventive approach. Stringency of adopted measures should be adapted to the particular situation of the various species (Recital 6).<br><br>**Summary rating HD: Supporting**<br>**Summary rating BD: Supporting** | |

[30] http://ec.europa.eu/environment/nature/conservation/species/guidance/pdf/guidance_en.pdf

## 7.2 Water Framework Directive

Author: Verena Mattheiß, ACTeon.

Table 13: Mapping the WFD against EBM Principles

| N° | Principle | Principle reflected in objectives and targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
|---|---|---|---|---|---|---|
| 1 | Ecological integrity, biodiversity, ecosystem services and resilience | **Partially**<br><br>- None of the terms ecological integrity, biodiversity, ecosystem services or resilience is mentioned in the WFD. However, they are partly implicitly reflected:<br>- Achieving good status of water bodies is the key objective of the WFD. Ecological status is an expression of the quality of the structure and functioning of aquatic ecosystems. Biodiversity (in terms of species diversity) is implicitly included in the definition of "good ecological status".<br>- Some critical thresholds | **Partially**<br><br>- Management and reporting units of the WFD are defined based on "natural" boundaries (water bodies, river basins). The river basin scale allows a comprehensive view, going beyond individual ecosystems. However, the focus on water bodies might not necessarily coincide with the right boundaries for ecological integrity (e.g. floodplains are not considered in the WFD). Furthermore, EBM requires reflections on the right spatial scales on a case-by-case basis (e.g. in order to maximise | **Partially**<br><br>- Some ecosystem services are considered within the WFD (in particular consumptive and non-consumptive uses of water).<br>- The WFD asks for the characterization of each river basin district (including pressure and impact analysis, economic analysis of water uses, delineation of water bodies and the establishment of the typology and reference conditions for surface water bodies).<br><br>**Summary rating: Neutral / supporting** | **Yes, fully**<br><br>- The WFD requires the identification and mapping of protected areas (Art.6; Annex IV). Protected areas support the protection of ecological integrity.<br>- The following WFD supplementary measures are in line with the principle (Annex VI): recreation and restoration of wetland areas; rehabilitation projects.<br>- It can be assumed that in general, all measures against water pollution, measures to control water abstraction and measures to improve hydromorphology of water bodies have a positive impact on biodiversity conservation | Although the WFD recognizes or promotes selected ecosystem services (e.g. drinking water provision, benefits from fish populations), it does neither consider the whole set of ecosystem services nor is it focused on the provision of these services in general. Also biodiversity protection as such is not the focus of the WFD. However, some supporting elements can be identified. The WFD fixes some framework conditions (e.g. linked to requirements regarding drinking water provision, or minimum standards set through status descriptors), and it can be assumed that through aiming |

| N° | Principle | Principle reflected in objectives and targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | are defined by the WFD. These include pollution thresholds, thresholds provided by status descriptors and ecological flows (resulting from the CIS process).<br>- The WFD is not based on the ecosystem services concept and does therefore not aim at the maximization of the joint value of all ecosystem services. However, ensuring drinking water supply is part of the WFD ambitions. It is furthermore recognized in the WFD that protecting water status will lead to benefits from protecting fish populations.<br>- Member States (MS) shall prevent deterioration of the status of all water bodies and shall protect, enhance and restore all surface water bodies. The definition of good status is linked to "undisturbed conditions" (Annex V 1.2). This contributes to preserving | ecosystem services provision). By fixing management scales, the WFD might make it more difficult for EBM approaches to focus on different, but more appropriate scales for the specific site.<br><br>**Summary rating: Neutral / hindering** | | and on the conservation of ecological integrity.<br>- Multi-benefit measures can be implemented under the WFD (e.g. see recent efforts to promote natural water retention measures).<br>- The WFD promotes negotiated environmental agreements among its supplementary measures. Collaborative decision making processes among different stakeholders allow for taking different interests (including different ecosystem services) into account.<br><br>**Summary rating: Supporting** | at a good ecological status the WFD generally supports the provision of ecosystem services and does – a priori – not impede attempts of maximizing their joint value. |

| N° | Principle | Principle reflected in objectives and targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | the ecological integrity of water bodies.<br><br>**Summary rating: Neutral / supporting** | | | | |
| 2 | Development and use of multi-disciplinary knowledge | | **Partially**<br><br>- The WFD provides for the establishment of international river basin districts, in case river basins concern more than one country. This stimulates the exchange and use of information from both sides of a border.<br><br>**Summary rating: Neutral** | **Partially**<br><br>- The WFD supports the collection of knowledge from different sectors (e.g. agriculture, industry, hydropower, etc.) and scientific disciplines (e.g. biology, chemistry, ecology, hydrology, economy). However, it does fully undertake the integration of this knowledge in view of EBM (which would for example require a detailed understanding of ecosystem functions and structure, and the roles of the components of biological diversity in ecosystems). However, the WFD provisions do not prevent from going further.<br>- The WFD includes stakeholder consultations, but the extent to which stakeholder knowledge is | **Partially**<br><br>- Research, development and demonstration projects form part of the WFD supplementary measures (key type of measures pre-identified for reporting under the second river basin management plans include "Research, improvement of knowledge base reducing uncertainty"). However, there are no further specifications regarding requirements for increasing or using multi-disciplinary knowledge in research projects.<br>- The possible supplementary measures include also negotiated environmental agreements. These promote the use of local and possibly traditional knowledge.<br><br>**Summary rating: Supporting** | The WFD supports the development and use of multi-disciplinary knowledge. The main challenge is to build upon this basis and to go further in the understanding of ecosystem functions and structure, the roles of components of biological diversity in ecosystems, etc. |

| N° | Principle | Principle reflected in objectives and targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | | | considered within the final decision making process is not specified in the WFD and depends on the competent authorities.<br><br>Summary rating: Supporting | | |
| 3 | Appropriate spatial scales | | Partially<br><br>- Although the WFD fixes the primary management unit at the level of the water bodies and the river basin districts (RBD), it provides for some flexibility to consider additional aspects and to make more detailed plans (e.g. per sub-basin, sector, issue, water type) to deal with particular aspects of water management.<br>- Also the establishment of international river basins is promoted.<br><br>Summary rating: Neutral | Partially<br><br>- The WFD allows for each member state to decide on the most appropriate competent authority which is responsible for the implementation of the WFD. However, they have been designated in the beginning phase of the WFD implementation. Ideally EBM would require the possibility to decide on the right decision making unit on a case-by-case basis.<br><br>Summary rating: Neutral | Yes, fully<br><br>- Measures do not necessarily target the whole river basin district. They can focus on individual water bodies and areas.<br><br>Summary rating: Supporting | On the one hand, the management units of the WFD can be seen as quite rigid (RBDs, water bodies, transboundary RBDs) and not necessarily adapted for EBM (to be decided case by case). On the other hand, it is up to the implementing authorities to use the flexibility of the WFD and to establish (additional) management plans at the right scale for EBM. However, the fact that the WFD fixes the obligation of developing management plans at least at the RBD scale might be a barrier to develop other plans in addition. |
| 4 | Social-ecological interactions, stakeholder | Partially<br><br>- Discussions about trade-offs between ecosystem | | Partially<br><br>- The WFD foresees stakeholder consultation. | Yes, fully<br><br>- The WFD supplementary measures listed in Annex VI | EBM puts forward the importance of social agreements and consensus on the scope of ecosystem |

| N° | Principle | Principle reflected in objectives and targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | participation and transparency | services are not foreseen by the WFD. However, some ecosystem services are considered for the designation of heavily modified or artificial water bodies, which have lower environmental objectives.<br>- Socio-economic concerns (disproportionate costs) are considered for the designation of heavily modified or artificial water bodies, as well as for exemptions (extensions of deadlines or less stringent objectives).<br>- Arguments of overriding public interest are considered.<br><br>Summary rating: Neutral / supporting | | However, the extent to which stakeholder knowledge is considered within the final decision making process is not specified in the WFD and depends on the competent authorities.<br>- The WFD considers both ecological and socio-economic concerns (the latter within the economic analysis of water uses and with regards to exemptions).<br><br>Summary rating: Neutral / supporting | (Part B) include "negotiated environmental agreements". These can take the form of river contracts, which are voluntary agreements among several stakeholders of the same river basin.<br>- Educational projects, which are also part of the supplementary measures, can contribute to increasing transparency and awareness about consequences of decisions.<br><br>Summary rating: Supporting | services which shall be ensured from a given ecosystem, taking trade-offs into account. By fixing the good ecological status of water bodies (with its defined characteristics) as the objective, including the obliged non-deterioration of the current status, the WFD is restraining potential discussions around the ideal set of ecosystem services. However, this is not necessarily in contradiction to EBM, because (1) EBM also considers ecological limitations, in particular linked to resilience thinking / critical thresholds, and (2) EBM supports collective decisions, and it could be discussed whether the WFD can be interpreted as a collective decision taken at EU level (however, it is not clear in how far all relevant stakeholders have been involved in the decision making process). |
| 5 | Policy | Yes, fully | Partially | Yes, fully | Yes, fully | Policy coordination is clearly |

| N° | Principle | Principle reflected in objectives and targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | coordination | - The WFD makes direct reference to the compliance with other directives within its objectives, linked to protected areas.<br>- The WFD specifies that the environmental objectives shall be reached by operationalising the programme of measures (PoM), which on his part includes basic measures, which are going back to other directives.<br><br>Summary rating: Supporting | - The WFD foresees the possibility to establish international river basin districts, where appropriate. Coordination among MS and with non-MS is explicitly promoted in this context.<br><br>Summary rating: Supporting | - The WFD promotes an integrated water management approach and policy coordination is an explicit aim. This is reflected amongst others through the integration of basic measures in the PoM of the river basin management plans and through the work done within the CIS working groups (e.g. coordination with the PoM of the Floods Directive or MSFD). It is also recognized that the development of the RBMPs provides an opportunity to interact with different sectors which have potentially important impacts on water resources (e.g. land use planning, agriculture, urban development, hydropower, navigation, etc.).<br><br>Summary rating: Supporting | - Relevant measures from other directives are included in the PoM (basic measures) and can – to a certain extent – be tailored to the needs of both policies.<br>- Natural water retention measures (NWRM) are put forward in the current policy process. A NWRM can have multiple benefits, including water resource management, biodiversity, flood protection, $CO_2$ storage, etc.<br><br>Summary rating: Supporting | promoted by the WFD. However, it is dependent on the MS to which extent this is implemented. With regards to the basic measures, for example, more or less efforts can be undertaken to make them suitable for reaching both the objectives of the original directive and the ones of the WFD. It is similar regarding the creation of cross-cutting working groups. It is up to the competent authorities to build them and establish for example programmes of measures or management plans in a coordinated way (but within existing constraints linked for example to differing time tables). |
| 6 | Adaptive management | Partially<br><br>- MS shall prevent deterioration of the status | | Yes, fully<br><br>- The WFD is organized in planning cycles and provides | Yes, fully<br><br>- The WFD provides for some flexibility with regards to the | The WFD includes provisions for adaptive management. It is not as comprehensive as required under the EBM |

| N° | Principle | Principle reflected in objectives and targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | of all water bodies and shall protect, enhance and restore all surface water bodies.<br>- The WFD mentions the precautionary principle and includes several provisions to preserve water stocks in order to cope with droughts.<br><br>**Summary Rating: Supporting** | | for the establishment of a monitoring system. Monitoring and evaluation of effectiveness of measures lead to adaptations and link one planning cycle with the next.<br>- The CIS-process is organized in multi-annual work programmes, and hence flexible over time. It includes the possibility to create new CIS working groups to cover emerging issues.<br>- The WFD requires the development of a baseline scenario. It takes possible developments into account which are independent from the WFD. Climate change is considered for the 2nd RBMP.<br><br>**Summary rating: Supporting** | measures which can be included in the PoM. Whereas the basic measures are fixed, a series of supplementary measures can be included, if deemed necessary for reaching the WFD objectives.<br>- Integrating uncertainty requires identifying areas where uncertainty plays an important role and trying to reduce it. The key type of measures pre-identified for reporting under the second RBMP include "Research, improvement of knowledge base reducing uncertainty".<br>- All measures promoting the efficient use of resources increase robustness against risks and form part of a strategy to deal with uncertain future events. Several relevant measures of the WFD include, e.g. measures to promote an efficient and sustainable water use, or measures to prevent the impact of accidental pollution incidents.<br>**Summary rating: Supporting** | approach, but the WFD does not hinder going further. Challenges exist also regarding the actual implementation. It remains to be checked in how far for example monitoring results from the first WFD planning cycle have effectively been used to adapt management measures for the second RBMP. |

## 7.3 Marine Strategy Framework Directive

Author: Katrina Abhold, Ecologic Institute

Table 14: Mapping the MSFD against EBM Principles

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
|---|---|---|---|---|---|---|
| 1 | Ecological integrity, biodiversity, ecosystem services and resilience | **Yes, fully**<br><br>- The main objective of the MSFD is the protection, preservation and restoration of the marine environment, with the ultimate aim of maintaining biodiversity and providing diverse and dynamic oceans and seas which are clean, healthy and productive (Art, 1.2; par. 3).<br>- To reach GES, MS must take into account the ecological functions, structure, biodiversity and resilience of the marine ecosystem in question (Art. 3.5; Annex I).<br>- All terms and their concepts are, if not explicitly mentioned, covered in the | **Yes, fully**<br><br>- Management and reporting units for the MSFD are based on marine regions for the marine waters of a MS. These waters also take into account the seabed and subsoil of the marine environment. Coastal areas are included, but only those not already covered by the WFD (Art. 3.1).<br>- The MSFD includes within its definition of 'environmental status' aspects that may affect a marine environment from both within and outside the area concerned (Art. 3.4).<br><br>**Summary Rating: Supporting** | **Partially**<br><br>- MS must undertake an Initial Assessment (Art. 8) of their marine environments, including an analysis of pressures and impacts. Drivers are not mentioned, but the use of the DPSIR framework is supported (DG ENV, 2011).<br>- The MSFD does not specifically state 'critical thresholds', but MS are required to apply the EBM approach to keep level of human activities within levels compatible with the achievement of GES (Art. 1.3).<br>- WG ESA undertakes an assessment of economic | **Yes, fully**<br><br>- The MSFD supports the establishment of marine protected areas, which contribute to ecological integrity (Art. 13.4).<br>- Qualitative GES descriptors make specific reference to biological diversity, safe biological limits, marine food webs and ecological integrity (structures and functions of ecosystems) (Annex I). Measures proposed by MS must take these descriptors into account and manage them appropriately (Art. 5.b.i).<br>- Types of PoM measures include input, output and spatial controls (Annex VI). | Overall, the MSFD supports this EBM principle. It specifically makes reference to ecological integrity, biodiversity, and resilience. Though it does not explicitly state ecosystem services (ESS), it is mentioned as 'goods and services' in the legal text. |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | MSFD.<br><br>Summary Rating: Supporting | | benefits from marine and coastal ecosystem services (EC, 2013).<br><br>Summary Rating: Supporting | These can be seen as measures to ensure that activities are conducted within the critical thresholds.<br><br>Summary Rating: Supporting | |
| 2 | Development and use of multi-disciplinary knowledge | | Yes, fully<br><br>- MS are required to ensure that all interested parties are included in the implementation of the MSFD, including existing management bodies or structures like Regional Sea Conventions, Scientific Advisory Bodies and Regional Advisory Councils (Art. 6.1; 19.1).<br>- MS are also encouraged to coordinate and cooperate with land-locked countries within the catchment area (Art.6.2).<br><br>Summary Rating: Supporting | Partially<br><br>- The MSFD does not call for 'science-based knowledge' or 'knowledge gaps', nor does it require MS to utilise state-of-the-art models and tools to compile or analyse data.<br>- MS are required to assess the ecological and socio-economic features of their marine areas (Art. 8.1), using existing data where available. However, this data may run the risk of being outdated or lack robustness/certainty when analysed.<br>- The Initial Assessment is a stock-taking exercise of existing information. MS will identify knowledge gaps- though this is not explicitly stated in the MSFD. This is | Yes, fully<br><br>- The MSFD suggested types of measures to include in the MS PoM also includes measures for communication, stakeholder involvement and raising public awareness (Annex VI).<br><br>Summary Rating: Supporting | The MSFD, overall, supports this EBM principle. The Directive calls for multiple parties to be involved in its development and implementation. It also calls for MS to undertake an Initial Assessment of their marine environments, a key part of the planning process. This assessment can be seen as a stock-taking exercise, supporting the identification of knowledge gaps.<br><br>However, the Directive encourages use of existing data rather than state-of-the-art, which poses some concerns regarding outdated/lacking data. It also does not encourage for decisions to be based on scientific knowledge or expertise, or call for the use |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | | | supported by the WG ESA in applying the precautionary principle (DE ENV, 2011).<br>- When determining characteristics of GES, MS are required to involve all interested parties. Though collecting and applying local and traditional knowledge is not explicitly stated.<br>- There is a Working Area on Cross-cutting Issues with activities on project coordination, scientific advice and science-policy interface, sharing information on cost-effective measures (EC, 2013).<br><br>**Summary Rating: Neutral/hindering** | | of "multi-disciplinary knowledge". |
| 3 | Appropriate spatial scales | | **Yes, fully**<br><br>- The MSFD designated marine regions as larger than the areas of individual MS, and the NE Atlantic and Mediterranean are further broken down to subregions. These reflect the larger | **Yes, fully**<br><br>- MS are required to ensure that their monitoring methods are consistent across marine regions or subregions and take into account transboundary impacts and features (Art. | **Yes, fully**<br><br>- PoMs can include spatial and temporal distribution control measures that influence where and when an activity is allowed to occur, as well as management coordination | The MSFD supports this EBM principle regarding appropriate spatial scales. It establishes marine regions that go beyond MS territorial boundaries and repeatedly encourages and requires international and transboundary cooperation |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | | ecosystems of EU marine areas spanning multiple MS. If a MS has multiple coasts that fall within different marine regions, they must develop plans according to that region (Art. 4; 5.1).<br>- The MSFD states multiple times the need for transboundary coordination of management through cooperation with other MS and third countries (Art. 6).<br><br>Summary Rating: Supporting | 11.2).<br>- MS must consider how their PoMs influence waters beyond their jurisdiction (Art. 13.8). This is supported by the CIS, which stipulates how different drivers and human-induced pressures vary across spatial, sectoral and temporal scales (DG EVN, 2011).<br>- MS must designate the authority or authorities that are required to implement the MSFD- including mechanisms to support regional or subregional coordination (Art. 7; Annex II).<br>- There is a Working Area on Cross-cutting Issues with activities on project coordination, scientific advice and science-policy interface, sharing information on cost-effective measures (EC, 2013).<br><br>Summary Rating: Supporting | measures, which can be seen to promote coordination across administrative and territorial boundaries (Annex VI).<br><br>Summary Rating: Supporting | from MS in the Directive's implementation. |
| 4 | Social- | Partially | | Partially | Yes, fully | The MSFD supports this EBM |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | ecological interactions, stakeholder participation and transparency | - There are no discussion of trade-offs between ecosystem services in the MSFD.<br>- MS do not need to take action if the marine ecosystem is considered to not have a 'significant risk' or if the costs to reach GES are deemed 'disproportionate' to the established risks (Art. 14.4). The CIS (EC, 2013) reviews the exemptions and provides examples for each case; however, some reasons listed as justifiable for exemption place social objectives first.<br><br>**Summary Rating: Supporting/neutral** | | - The Initial Assessment must include an analysis of the socio-economic uses of marine waters (Art. 8.1).<br>- PoMs must give due consideration to the social and economic impacts of the measures included (Art. 13.3).<br>- The CIS (DG EVN, 2011) incorporates into the Initial Assessment a suggestion to identify the groups of people in society who will be affected by changes in ESS from policies.<br>- MS are not required to ensure a 'regular exchange with key stakeholders', but must undertake public consultations and provide information to the public (Art. 19).<br>- MS must make publically available information on MPAs and protected areas, indicating how the measures included in their PoMs will be implemented and contribute to achieving GES | - Suggested types of PoM measures include social and economic measures in the form of: measures for communication, stakeholder involvement and raising public awareness and economic incentives (Annex VI).<br>- The CIS (EC, 2013) makes reference to the WISE-Marine portal as a platform to share data and information under the MSFD (by 2014). It also plans to exchange information on effectiveness of public participation processes and approaches and encourage best practices of MS public participation and information requirements, building on the WFD experience.<br>- The MSFD states that its implementation is supported by existing Community financial instruments and PoMs are to be co-financed by the EU. The CIS provides | principle. It specifically calls for the consideration of socio-economic concerns in not only the assessment of marine waters but also the measures to be included in MS' PoMs. In addition, the Directive states that interested parties should be included in multiple stages of its implementation, encouraging stakeholder participation and transparency.<br><br>However, some exemptions to implementing the Directive remain a bit unclear and perhaps too biased in regards to allowing social or economic objectives to override ecological considerations. |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | | | (Art. 13.6).<br>- MS are required to conduct CBA before the introduction of a new measure (Art. 13.3), which can be seen as a means to consider potential trade-offs between management options.<br><br>**Summary Rating: Supporting** | additional financial information, which includes the European Maritime and Fisheries Fund (EMFF), Cohesion Funds, (including through EMFF, etc. and through macro-regional strategies) (EC, 2013).<br><br>**Summary Rating: Supporting** | |
| 5 | Policy coordination | **Partially**<br><br>- Setting MSFD environmental targets for marine environments should take into account transboundary impacts and features, as well as other existing environmental targets at other scales (Art. 10.1).<br><br>**Summary Rating: Supporting/Neutral** | **Yes, fully**<br><br>- The MSFD states multiple times the need for transboundary coordination of management through cooperation with other MS and third countries (Art. 6).<br>- MS are required to ensure that all interested parties are included in the implementation of the MSFD, including existing management bodies or structures like Regional Sea Conventions, Scientific Advisory Bodies and Regional Advisory Councils (Art. 6.1; 19.1).<br><br>**Summary Rating: Supporting** | **Partially**<br><br>- The CIS established working groups for MSFD implementation: Marine Strategy Coordination Group (MSCG) that coordinates with WGs of other related policies; a Project Coordination Group (PCG); WG Data, Information and Knowledge Exchange (DIKE); WG Good Environmental Status (GES); WG Economic and Social Assessment (ESA); plus three technical sub-groups on Underwater Noise, Marine Litter, and Marine Data (under GES). (EC, 2013). These working groups help produce | **Yes, fully**<br><br>- Suggested types of PoM measures include management coordination measures. This is supported by the CIS (EC, 2015), which encourages MS to build upon measures under the WFD to support the MSFD, in addition to providing examples of additional measures.<br><br>**Summary Rating: Supporting** | Overall, the MSFD supports this EBM principle for policy coordination. It makes reference to multiple policies, both EU and international and promotes measures for coordination.<br><br>However, there is no mention of identifying discrepancies between these objectives, nor developing mechanisms to overcome or address them. More guidance could be given to clarify what MS should do in the event that national, EU or international objectives and targets clash with those included in the MSFD. |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | | | guidance docs for MS.<br>- MS may identify or establish administrative frameworks to support competent authorities in implementing the MSFD to ensure sustainable development is considered (Art. 13.3). This is also supported by the CIS WGs.<br>- PoMs must take into account relevant measures required under Community legislation, in particular WFD, Urban Waste Water Directive, Bathing Water Directive, and international agreements (Art. 13.2).<br>- The MSFD refers to multiple other policies, but does not address conflicts between policies or how MS should handle potential conflicts between different policy objectives (not covered in WGs or through guidance docs).<br><br>**Summary Rating: Supporting/Neutral** | | |
| 6 | Adaptive | **Yes, fully** | | **Partially** | **Partially** | The MSFD, overall, supports |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | management | - The MSFD calls for adaptive management on the basis of the ecosystem approach with the aim of attaining GES (Art. 3.5).<br>- MS must apply the precautionary principle, which indirectly incorporates uncertainty into MSFD objectives. This is supported through WG ESA (DG, ENV, 2011).<br>- The MSFD specifically calls for Marine Strategies to apply an ecosystem-based approach to the management of human activities, so that the capacity of marine ecosystems to respond to human-induced changes is not compromised (i.e. resilience) (Art. 1.3).<br><br>**Summary Rating: Supporting/Neutral** | | - MS must regularly update their marine environment assessments, their targets for GES, monitoring programmes and PoMs every 6 years (Art. 17). This allows for adaptive management over time to respond to new or emerging marine threats and to adjust response measures accordingly.<br>- MS are not required to (1) outline potential future scenarios or develop potential measures to respond to these scenarios, or (2) anticipate planned or coordinated responses to risk events. MS are should assess a BAU scenario to determine what the marine environment might be like in the absence of measures to achieve GES, as well as undertake impact assessment for new measures in PoMs (DG ENV, 2011; EC, 2014), but this is not deemed sufficient to fulfil this EBM principle, | - Suggested PoM measures include measures to improve the traceability of marine pollution, in addition to requiring MS to establish and implement monitoring programmes (Annex VI).<br>- There is no mention of mitigation; however, Annex VI includes "mitigation and remediation tools: management tools which guide human activities to restore damaged components of marine ecosystems."<br>- MS must include spatial protection measures in their PoMs (Art. 13.4), which can be seen as actions to increase ecosystem robustness and adaptability. Other Annex VI measures include input and output measures and spatial and temporal distribution controls. In combination, these can ensure ecosystem robustness and adaptability.<br>- MS are not required to | this EBM principle. It encourages the implementation of monitoring programmes, updating key areas of the Directive, and foremost puts EBM as the core tool for MS marine strategies.<br><br>However, the MSFD does not require MS to (1) outline potential future scenarios or develop potential measures to respond to these scenarios, (2) to adopt mitigation measures to respond to expected long-term changes ( it focuses on minimising the effects of Eutrophication and pollution to the marine environment) and (3) to anticipate planned or coordinated responses to risk events linked to water and climate change (the only risk mentioned is the risk to the marine environment from human-induced changes). |

| N° | Principle | Principle reflected in objectives/targets | Principle reflected in spatial scales | Principle reflected in planning steps | Principle reflected in management measures | Comments |
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| | | | | which focuses on adaptation to unexpected events (e.g. climate change, etc.).<br>- Uncertainty is not mentioned in the MSFD, but the CIS states that, "In order to address the potential uncertainty around future trends in uses of marine waters, sources of uncertainty should be explicitly identified within the BAU [business as usual scenario], and tested where possible" (DG ENV, 2011). This relates to the economic and social analysis in Art. 8.<br><br>**Summary Rating: Supporting/Neutral** | adopt mitigation measures to respond to expected long-term changes, such as climate change.<br><br>**Summary Rating: Supporting/ Neutral** | |

**Note:** The table represents the summary of a more detailed assessment. It only mentions the most important elements.

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