



European Union Action to
Fight Environmental Crime

Evaluation of the Costs and Impacts of Environmental Crime: CITES Trade of the Horsfieldii Tortoise

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LIST OF ABBREVIATIONS

CITES	Convention on International Trade in Endangered Species
IUCN	International Union for the Conservation of Nature
VU	Vulnerable

1 Introduction

1.1 Background Information on Horsfieldii

Testudo horsfieldii is a tortoise and is classified as Vulnerable (VU)¹ on the International Union for the Conservation of Nature (IUCN) Red List following an evaluation of its conservation status in the wild by the Tortoise and Fresh Water Turtle Specialist Group in 1996. For this reason the horsfieldii was categorized to Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) allowing for monitored trade of the species based on quotas self-designated by Parties to the Convention in a manner meant to sustain the species in the wild in its natural range.² The horsfieldii is native across Central Asia and can be found in Armenia, Iran, Afghanistan, Pakistan, northwest China, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.³

Since the mid 1970s the horsfieldii has been subject to heavy trading for the global pet market.⁴ Horsfieldii are either caught in the wild or bred in captivity and exported from its range into the pet trade in predominantly Western countries. The US, Japan and Europe are the main importers of the species.⁵ While there are many turtle and tortoise species involved in the pet trade, the horsfieldii is one of the most heavily traded⁶ and illegal trade is suspected to take place. Firstly, it is likely that more specimens are traded than are actually reported in CITES trade data.⁷ Secondly, it is suspected that the improper use of CITES labels that differentiate between wild and captive bred specimens results in a much higher number of wild caught specimens existing in trade than the data reported would suggest.⁸ Finally, tortoise is naturally found in a very vast range which includes countries that are not party to CITES (e.g. Tajikistan),

¹ To further understand the IUCN definitions and terminology used to evaluate a species conservation status see: http://www.iucnredlist.org/static/categories_criteria_2_3

² IUCN, "The Horsfieldii Trade - Wildlife Conservation Society," *IUCN Red List of Threatened Species*, 2014, <http://www.wcs.org/conservation-challenges/natural-resource-use/hunting-and-wildlife-trade/the-horsfieldii-trade.aspx>.

³ Katrina Smith and David Lee, "Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise," *Bull. Chicago Herp. Soc* 45, no. 1 (2010): 1–9.

⁴ European Commission, *Analysis of the Impact of EU Decisions on Trade Patterns. Report 3: Shifts in Sources of Specimens and Purposes of Trade* (Cambridge, 2014).

⁵ Smith and Lee, "Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise."

⁶ UNEP-WCMC, *Review of Species Selected on the Basis of a New or Increased Export Quota in 2008*, 2008, http://ec.europa.eu/environment/cites/pdf/reports/increased_export_quotas_200.

⁷ Smith and Lee, "Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise."

⁸ CITES, *Implementation of the Convention Relating to Captive-Bred and Ranches Specimens (Decision 16.65)*, CITES, Twenty-Seventh Meeting of the Animals Committee (Veracruz, Mexico, May 28, 2014).

which opens the possibility of illegal transport and smuggling through non-party countries or countries with less stringent environmental and enforcement standards.⁹

Despite that certain patterns in trade reveal potential illegality, it is difficult to calculate the rate of extinction of the species or its monetary value as a species because there is a serious lack of reliable data. This is a common reality for many species listed in CITES and therefore is not a justifiable reason for non-inclusion in such evaluations. Unlike the elephant and rhino that are also included in the CITES valuation study of the EFFACE project, the horsfieldii is an example of the omnipresent but invisible nature of illegal wildlife trade. This case is representative of many species that face the threat of unsustainable harvest but that are less emblematic and therefore risk drifting into population decline and possible extinction without notice. The commercial harvest of horsfieldii for the pet trade is regarded by conservation biologists as the foremost threat to its survival and existence in the wild.

For data, this study relied on publicly available trade data provided by CITES that indicate quotas and information on the quantity of exports and imports. Despite the many infrequencies that exist when using such data, it is possible to show how illegal trade may take place and at what scale. A significant challenge to understanding the impact of commercial trade on turtle and tortoise conservation status and that of the horsfieldii specifically, is the fact that there remains little data collection or information about their population status in the wild, which results from the fact that they are difficult to count in their vast range and also considered of lesser importance or reputation than some other flagship species (e.g. panda, rhino, elephant).¹⁰ The data limitation on population and replacement rate was a significant obstacle in the calculation efforts of this study to determine the rate of extinction and sustainability of the current trade.

1.2 Main Threats

Since the 1970s, the main threat to the horsfieldii in the wild is the pet trade for which specimens are collected and exported from their range for commercial purposes.¹¹ The pet tortoise and turtle industry is global and threatens numerous different chelonian species. Of the 266 known turtle and tortoise species in the world, more than one third are facing extinction.¹² The Horsfieldii is one of many chelonian species that

⁹ Tajikistan and Turkmenistan are not Parties and therefore do not report levels of trade and several other of the countries identified above do not provide self-reported data on exports nor do they set quotas, despite that they are likely involved in the trade as transit countries or collection countries.

¹⁰ George Amato, Rob DeSalle, and Oliver A. Ryder, *Conservation Genetics in the Age of Genomics* (Columbia University Press, 2013); Stephanie A. Zimmer-Shaffer, Jeffrey T. Briggler, and Joshua J. Millspaugh, "Modeling the Effects of Commercial Harvest on Population Growth of River Turtles," *Chelonian Conservation and Biology* 13, no. 2 (December 1, 2014): 227–36, doi:10.2744/CCB-1109.1.

¹¹ P. Bergmann, "The Natural History of the Central Asian Tortoise," *The Cold Blooded News* 28, no. 10 (2001); M. Anderson-Cohen, "Russian Tortoise, Testudo Horsfieldii," *Tortuga Gazette* 30, no. 11 (1994): 1–4.

¹² Ted Williams, "The Terrible Turtle Trade," *National Audubon Society* 101, no. 2 (1999), <http://nyttts.org/asia/twilliams.htm>.

are involved in the trade and are particularly unlikely to cope in the long term from commercial harvesting.¹³

For the pet trade, *horsfieldii* are either collected from the wild or bred/farmed in facilities using a stock-crop of tortoises collected from the wild. Currently, Uzbekistan is the main exporter of both wild caught and farmed tortoises, with Ukraine making up a smaller but not insignificant portion of the commercial trade.¹⁴ As a species listed in Appendix II, the *horsfieldii* are legally allowed to be traded and the volume of trade is usually established by each Party (member state). The responsibility for establishing a sustainable quota, therefore, remains within the authority of each Party member. Accordingly, CITES requires that the Scientific Authority of member states, “must be satisfied and advise that the proposed export will not be detrimental to the survival of the species (the so called ‘non-detriment finding in Article III, Paragraph 2 (a), and Article IV, paragraph 2 (a), of the convention).”¹⁵ Thus it is also important to have an independent reference of the conservation status of species other than the Scientific Authority of Parties.

¹³ Smith and Lee, “Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise.”

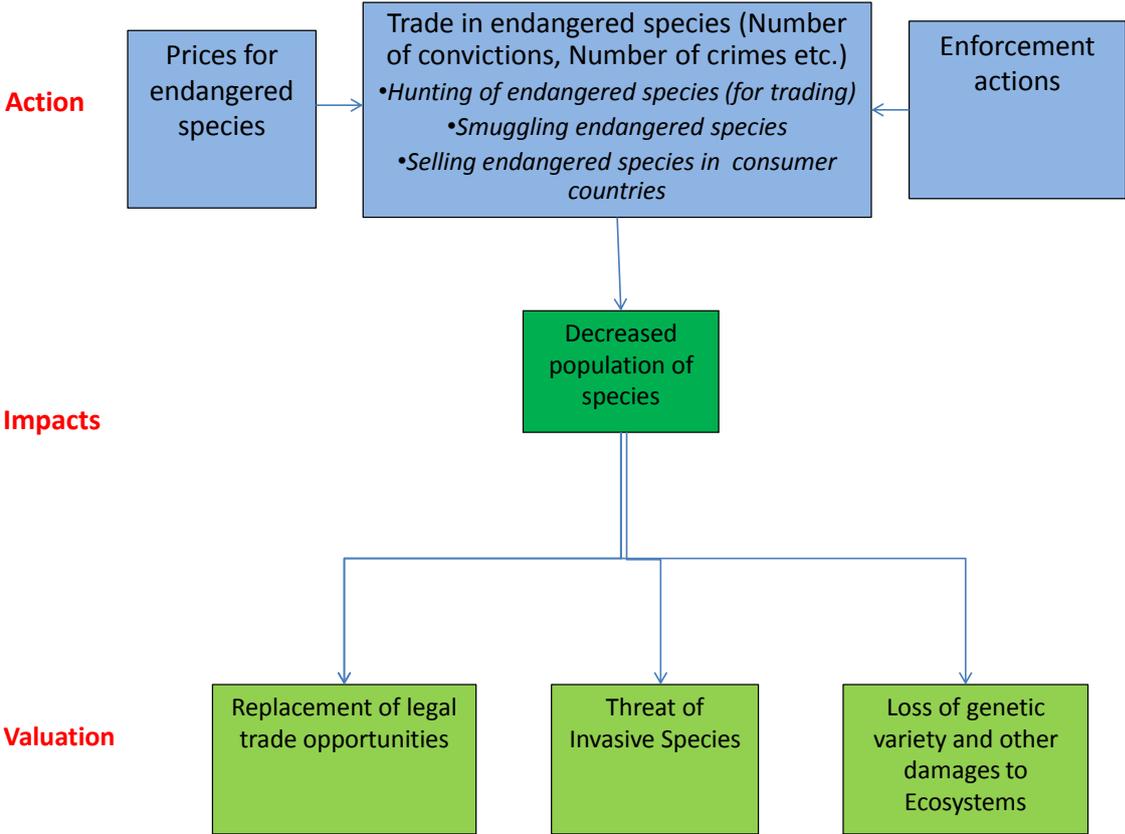
¹⁴ European Commission, *Analysis of the Impact of EU Decisions on Trade Patterns. Report 3: Shifts in Sources of Specimens and Purposes of Trade.*

¹⁵ CITES, “The CITES Export Quotas,” 2015, <http://www.cites.org/eng/resources/quotas/index.php>.

2 Methodology

The following methodology sets out to explain how the impacts of illegal trade in certain CITES protected species could be assessed and which data sources and methods will be deployed to achieve thorough estimates for those impacts. The methodology is thereby based on the impact chain illustrated in Figure 1, which was developed in task one of WP3.

Figure 1: Impact chain



The methodology has two distinct steps:

- In the first step the impact of illegal trade on population numbers of the species protected by CITES is assessed based on existing statistics on quotas, trade and population.
- In the second step the economic and environmental impacts will be assessed. For some of the impacts valuations will be undertaken.

2.1 Estimating the Impact of Illegal Trade on Population Numbers

The most direct effect of illegal trade in endangered species is the impact it has on the conservation status of the species in its natural habitat and then the ripple effect this has on ecosystem services and global biodiversity. For many species, some level of data can be obtained on the conservation status of certain populations and the volume of trade.

For our analysis we have chosen the *horsfieldii* tortoise, where it is possible to use available information to make estimates about the proportion of illegal trade as compared to the legal trade. We identified three potential avenues of illegal trade.

- 1) It is likely that many more species are involved in the trade than are actually reported in CITES data.¹⁶
- 2) It is suspected that the improper use of CITES labels that differentiate between wild and captive bred specimens, results in a much higher number of wild caught specimens existing in trade than the data reported would suggest.¹⁷ (See Figure 2)
- 3) Transport, smuggling and trade through countries that are not Party to CITES or countries with less stringent environmental and enforcement standards.¹⁸

In addition to illegal trade, this study also attempts to make the point that export quotas while legal, are not necessarily by any means sustainable. Thus, with the *horsfieldii* there is a parallel problem of a highly exploitative legal trade that operates within the rules and obligations of CITES but that nevertheless does not seem to accurately ensure the sustainable exploitation of the species.

For the *horsfieldii*, the available information on population and trade quotas is assessed to identify the causality between estimated illegal trade numbers and population figures. It is important to emphasize the fact that different datasets will have certain biases and are not complete. Therefore, we do not suggest to undertake a sophisticated statistical analysis, as the information on population developments is so poor that a broad range of statistics need to be used.

¹⁶ Smith and Lee, "Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise."

¹⁷ CITES, *Implementation of the Convention Relating to Captive-Bred and Ranched Specimens (Decision 16.65)*.

¹⁸ Tajikistan and Turkmenistan are not Parties and therefore do not report levels of trade and several other of the countries identified above do not provide self-reported data on exports nor do they set quotas, despite that they are likely involved in the trade as transit countries or collection countries.

2.2 Estimating and Valuing Impacts of Decreasing Population Numbers

To value the population loss, an understanding of both the value of the species in the pet trade and its value within the local ecosystem is required, which makes this analysis limited by two important factors.

The value/price of the species on the market is artificially low due to the overexploitation and the low barriers to circumvent the legislation. Currently, source countries could not build a significant income in a legal way as prices for the animals are negligible.

It is also worth noting that the value of the species for the overall ecosystem cannot be valued properly. The horsfieldii tortoise is not a keystone species and its particular existence on the Central Asian steppes is not well understood in terms of its role within this ecosystem. Compared to a shark or elephant, the loss of such a species in this particular ecosystem is not gauged at the same level, however, we are also limited in our evaluation of its role within the ecosystem. We did look into existing estimates for the value of the turtles and tortoises to ecosystems more generally but found there to be few studies applicable to the case.

3 Population Trends and Trade

3.1 Known Population Estimates

The first challenge to evaluating the impact of legal and illegal trade of *horsfieldii* is the fact that information on their population density is limited and outdated. This can be attributed on the one hand to the species' extensive range and reclusive habits and on the other to its perceived insignificance compared to a flagship or keystone species such as a panda, rhino or elephant. The most comprehensive population evaluation was done by the Tortoise and Freshwater Horsfieldii Specialist Group in 1996 on behalf of the IUCN, declaring the species vulnerable.¹⁹ In the European Commission 2008 Report on heavily traded species, the *horsfieldii* was noted as having once been abundant throughout Central Asia but cited that in more recent studies populations are found to be declining rapidly in all range states.²⁰

Independent studies on population data of *horsfieldii* have been assessed in some countries, however, they are scattered both in terms of the time period they were undertaken and the geographic location covered. While these studies are far from conclusive, they do provide insight of population figures before the ascent of the international pet trade and they also indicate a clear decline in population density since the pet trade.²¹

Kazakhstan: Population figures for Kazakhstan are the most comprehensive with estimates in the 1950s of 5-72 individuals per hectare (Paraskiv, 1956 as cited in Lee and Smith) and a similar study conducted between 1975-1979 found 0.2 to 29 individuals per hectare (Kubykin 1982 as cited in Lee and Smith). The last census in 2000 recorded densities in the same region of 3.9 to 10.3 tortoises per hectare (Kuzman 2002 cited in Lee and Smith 2010).²² Field studies undertaken in the 1980s in Kazakhstan indicate that harvest from the wild can lead to a complete population collapse from large areas cited in Traffic report (2000).²³

Uzbekistan: Unpublished studies indicate densities of 0.5 to 43 tortoises per hectare with a total population estimate of 20 million individuals in Uzbekistan. This has been provided by the Uzbekistani government in 1997 and again in 2011.²⁴ However, this study remains unpublished and was produced by a commercial exporter and may be subject to biased information to justify continued exploitation of the species.²⁵

¹⁹ IUCN, "The Horsfieldii Trade - Wildlife Conservation Society."

²⁰ Bonin, F., Devaux, B. & Dupré, A. 2006. *Horsfieldiis of the World*. English translation by P.C.H. Pritchard. Johns Hopkins University Press, 416 pp

²¹ Smith and Lee, "Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise."

²² Ibid.

²³ TRAFFIC Europe, *Ranching and Breeding of Horsfield Tortoises (Testudo Horsfieldii) in Uzbekistan*, 2000.

²⁴ Ibid.

²⁵ Smith and Lee, "Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise."

China: Studies undertaken in China where the species largely no longer exists reported the distribution area and population density of *horsfieldii* were observed in an area of 500km² with 4136 ± 2162 individuals/km² in the earlier 1960s; in an area of 270km² and 61.5±31 individuals/km² in the earlier 1980s; in an area of 180km² an 6.04 ind./km² in the earlier 1990s.²⁶ In China, populations of *horsfieldii* have collapsed and densities are 1% what they were in the 1950s (Luxmoore, Groombridge and Broad, 1988) cited in TRAFFIC Europe 2000).²⁷

3.2 Replacement Rates

Like many turtle and tortoise species, *horsfieldii* mature slowly and have modest reproduction capacities. For these reasons, *horsfieldii* are poor candidates for legal commercial trade and are easily susceptible to collapse in the presence of over harvesting which can happen when illegal trade takes place.²⁸ Adult females reach sexual maturity after 10 years but are not considered fully mature until 20 or 30 years of age.²⁹ A female will produce a clutch of two to three eggs and two to three clutches year. The hatchlings have a 70-90% predation rate during their first year.

Their slow generation means that specimens removed from the wild can seriously skew populations and have an impact on their ability to sustain population levels. Moreover, it is estimated that 95% of *horsfieldii* that enter the pet trade die within a year, thus harvest rates may be significantly higher than those corresponding to that which is documented in CITES trade data.³⁰

3.3 Potential Illegal Trade: Ukraine's Use of Various Source Codes for Export of *Horsfeildii*

A specific and noticeable example of potential illegal trade took place after the EU implemented a trade ban on wild caught *horsfieldii* from 1999 to 2006. This trade ban resulted in an unexpected supply of captive-bred specimens exported from the Ukraine to the EU. The dramatic shift in trade using various captive bred source codes to justify legal export and import from a non-range country with no prior evidence of hatching or breeding facilities flags the likelihood of illegal activity.³¹ A total of 83,293 non-wild

²⁶ Shi, Hai-tao. (1998). „Studies on Ecology of *Testudo Horsfieldii* Gray and Status of its Conservation,“ in Sichuan Journal of Zoology. Available at: http://www.scdwzz.com/viewmulu_en.aspx?qi_id=103&mid=4342

²⁷ TRAFFIC Europe, *Ranching and Breeding of Horsfield Tortoises (Testudo Horsfieldii) in Uzbekistan*.

²⁸ Smith and Lee, “Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise.”

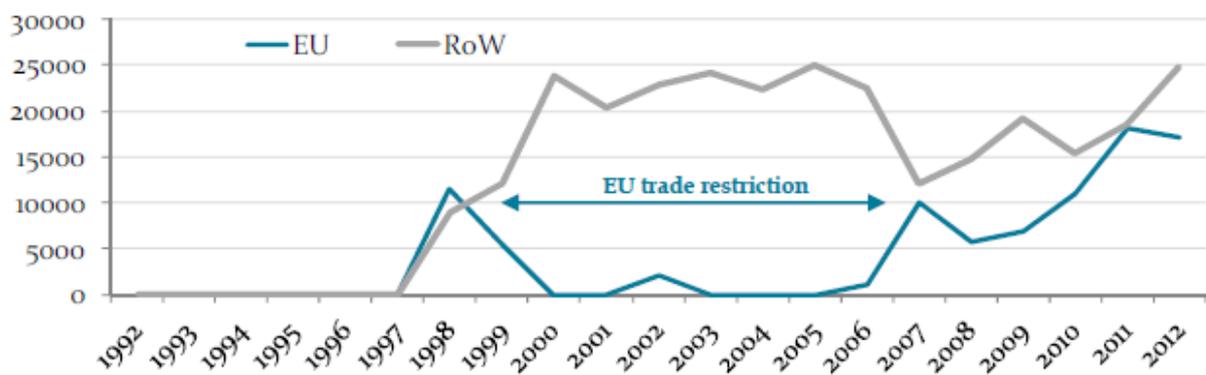
²⁹ Szczerbak, N.N. (2003) Guide to the reptiles of the eastern Palearctic. Krieger Publishing Company, Malabar, Florida.

³⁰ John Behler, “Troubled Times for *Horsfieldiis*,” in *IUCN/SSC Tortoise and Freshwater Horsfieldii Specialist Group (Conservation, Restoration, and Management of Tortoises and Horsfieldiis- An International Conference, Purchase, New York, 1993)*.

³¹ European Commission, *Analysis of the Impact of EU Decisions on Trade Patterns. Report 3: Shifts in Sources of Specimens and Purposes of Trade*.

specimens were imported into the EU between 2000 and 2006 of which more than 90% of them originated from Ukraine using the source code C (Captive Bred) and F (Farmed).³² The EU trade ban also had the unexpected consequence of increasing the overall specimens in trade.³³ During the 1999-2006 period, the number of specimens in trade nearly doubled, as Uzbekistan continued to export wild caught species to countries other than the EU. In addition, the “captive-bred” specimens coming from the Ukraine met the demands of the EU market for *horsfieldii*, thereby unintentionally doubling the total number of specimens in trade from Uzbekistan.

Figure 2 Direct Global Imports of Testudo Horsfieldii from Uzbekistan



Source: European Commission, *Analysis of the Impact of EU Decisions on Trade Patterns. Report 3: Shifts in Sources of Specimens and Purposes of Trade* (Cambridge, 2014). P12

Ukraine maintained its status as an export country of *horsfieldii* after the EU trade ban was removed. From 2008 to 2012, an additional 50,347 live *Horsfieldii* tortoises were imported by countries from the Ukraine and declared as F (farmed).³⁴ Importing countries reported an additional 21,365 individual *Horsfieldii* as being re-exported by Ukraine and declared W (wild) between 2008 and 2010. The fact that Ukraine could harvest and breed *horsfieldii* in such a quantity as its exports indicate is unlikely given that there were so few imports of live specimens. Ukraine had a one-time imports of 5000 wild *horsfieldii* specimens in 2001 from Uzbekistan and did not report additional imports of wild *horsfieldii* until 2008 when it reported importing 14,000 specimens from Tajikistan.³⁵

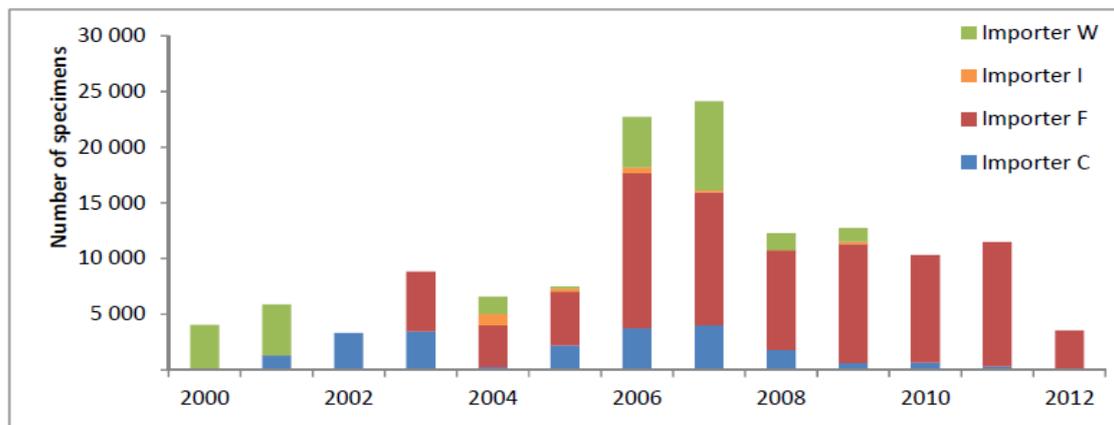
³² TRAFFIC, *Captive-Bred...or Wild-Taken? Examples of Possible Illegal Trade in Wild Animals through Fraudulent Claims of Captive-Breeding*.

³³ European Commission, *Analysis of the Impact of EU Decisions on Trade Patterns. Report 3: Shifts in Sources of Specimens and Purposes of Trade*.

³⁴ CITES, *Implementation of the Convention Relating to Captive-Bred and Ranched Specimens (Decision 16.65)*.

³⁵ Ibid.

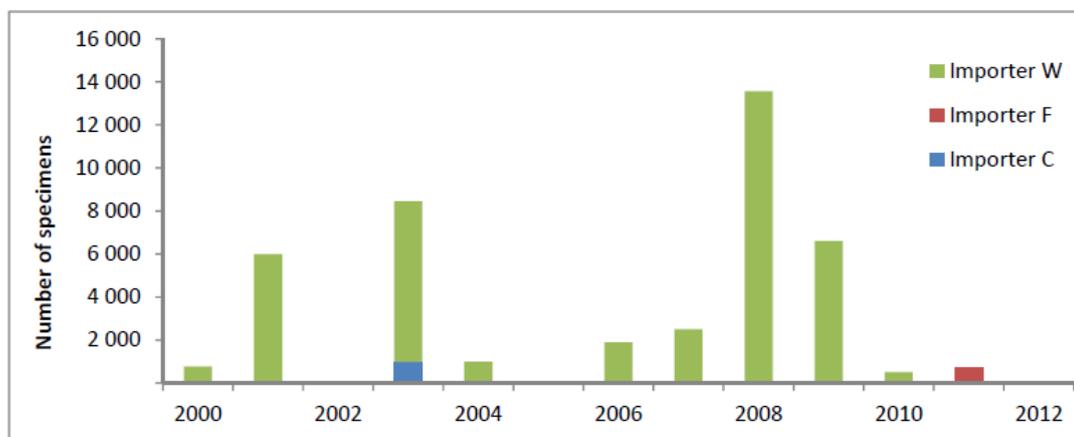
Figure 3 Exports of live *Horsfieldii* Tortoises from Ukraine as Reported by Importers (2000-2012)



Does not include re-exports. Data from some years may not be complete.

Source: <http://cites.org/sites/default/files/eng/com/ac/27/E-AC27-17.pdf>

Figure 4 Re-exports of Live *Horsfieldii* Tortoises from Ukraine as Reported by Importers (2000-2012)



Available data for 2012 may not be complete.

Source : <http://cites.org/sites/default/files/eng/com/ac/27/E-AC27-17.pdf>

It is therefore likely that illegal activity took place whereby specimens labelled ‘captive’ or ‘rancher’ from Ukraine were collected from the wild from range states and re-exported to the EU via Ukraine with incorrect source codes. This example of potential illegal trade encompasses two possible routes of illegality: 1) the manipulation of source codes wild caught versus captive-bred to meet export and import requirements 2) the smuggling and transportation of specimens through third party countries with less stringent enforcement or non-party CITES status.

3.4 Unsustainable Legal Trade: Uzbekistan and Self-Set Annual Quotas

As the main exporter of *horsfieldii* and a member of CITES, Uzbekistan has provided export quotas on a near annual basis for *horsfieldii* since 1999, and has also included information on the number of wild caught versus captive bred specimens in most circumstances.³⁶ Self-set quotas for Uzbekistan have increased substantially in the last decade from a total of 25,000 (wild and captive not distinguished) in 1998 to 100,000 (50,000 wild and 50,000 captive) in 2014. It is also possible to observe that in recent years export quotas have increased substantially from year to year and in some cases by over 30%. For example, in 2011 the quotas for wild specimens were increased to 40,000 when in 2010 a quota for 29,000 existed for live specimens.³⁷ Captive bred exports from 2011 were also increased from 22,000 in 2010 to 30,000 in 2011. These increases represent a 38% increase for assumed wild caught exports and 36% increase for ranched exports.³⁸

Due to the large number of specimens in trade, CITES has investigated and requested information on population figures of wild *horsfieldii* in Uzbekistan from the Uzbekistan government and scientific authority in 2008. During this consultation, the Uzbekistan commercial supplier reported to CITES that population estimates for the country were approximately 20 million tortoises.³⁹ If this number is correct, the legal trade in Uzbekistan would account for less than 1% of the total population of the species and therefore would be unlikely to pose a threat to its conservation status in the wild.⁴⁰ However, it is difficult to accept the accuracy of this population estimate. Firstly, the estimate has been provided by a single supplier, a company called the OOO ZooComplex that conducts its own research and publications.⁴¹ Moreover, the figure, 20 million has been provided three times over a fifteen year period in 2000, 2007 and 2013. The fact that the figure remains somewhat vague and is re-used as a population reference over thirteen years in spite of dramatically increased harvest rates over the same period makes this figure

³⁶ See Appendix 1 for a full list of exports of *horsfieldii*. Other countries involved in the trade such as Kazakhstan and Tajikistan have provided export quotas sporadically or inconsistently. Several countries that are likely to be involved in the trade have not provided quotas at all and some others are not members of CITES and therefore not required to provide quotas. For example, Tajikistan and Turkmenistan are not members of CITES. A complete list of the reported export quotas are available on the Species + database.

³⁷ The Uzbekistan export quota for *horsfieldii* in 2010 is 29000 live and 22000 live/ranched. The first figure does not distinguish whether the specimens were wild caught or bred.

³⁸ UNEP-WCMC, *Analysis of 2011 CITES Export Quotas (version Edited for Public Release)*, Prepared for the European Commission (Cambridge, 2011), http://ec.europa.eu/environment/cites/pdf/reports/analysis_export_quotas_2011.pdf.

³⁹ For a full list of Export Quotas see Annex 1

⁴⁰ DG Environment, *Analysis of 2013 CITES Export Quotas*, UNEP World Conservation Monitoring Centre. Available at: <http://ec.europa.eu/environment/cites/pdf/reports/SRG%2064%20Analysis%20of%202013%20CITES%20export%20quotas.pdf>

⁴¹ For more information see: <http://www.zoocomplex.com/science/>

questionable, which is unlikely given the high levels of harvest that has taken place annually over several decades.

3.5 Summary

The last independent evaluation of the population available on the IUCN Red List website of the *Horsfieldii* is from 1996, an evaluation that deemed the species vulnerable to exploitation and placed it in Appendix II of CITES. Export quotas at the end of the late 1990s were set in the range of 20,000 specimens from Uzbekistan and 20,000 for the entire Russian Federation. Now in 2014, the number of exported specimens is more than double those figures. From Uzbekistan, quotas for traded *horsfieldii* are around 100,000 with 50,000 labelled wild caught and 50,000 labelled bred in captivity. It is likely that a large proportion of those labelled as captive bred are actually wild caught. There are several indications:

1. Many adult specimens exist in trade;
2. It is unlikely that commercial facilities are able to produce annually that many specimens given the species slow reproductive functions and problems in captivity;
3. The responsible authority in Uzbekistan, the Customs and Biological State Control Agencies, estimated in the year 2000 that the annual illegal export was around 7,000 tortoises from Uzbekistan, 25,000 from Kazakhstan and 40,000 in total from Central Asian Countries (it is not clear how this information was obtained). However, the Uzbek government gave a much higher figure in 2007 of 35,000 *Horsfieldii* not accounted for in the trade statistics.⁴²

There is only one known *Horsfieldii* farm in Uzbekistan it is relatively safe to assume that at least 50-75% of the *horsfieldii* labelled as captive bred are actually illegally wild caught. Such estimates would mean that 20,000 to 30,000 specimens are illegally provided each year.⁴³

In addition to potential illegal trade, the level of the legal trade of wild caught tortoises in Uzbekistan has increased substantially in recent years without any evidence of an increased population. So if the quota of 22,000 (wild caught) was sustainable in 2006 it is not quite understandable how a quota of 50,000 (wild caught) can be sustainable for the same population in 2014.

It is therefore likely that the overexploitation of the tortoise populations runs to at least 20,000 to 30,000 animals a year in Uzbekistan and if the real replacement rate is close to the old quota of 22,000 as was reported in 2006 that would mean an exploitation of double the sustainable rate leading clearly towards a population decline.

Poor and unreliable data makes it not possible to gauge the rate of extinction, however, this situation of data availability is relevant for many traded CITES species.

⁴² UNEP-WCMC, *Review of Species Selected on the Basis of a New or Increased Export Quota in 2008*.

⁴³ UNEP-WCMC, *Review of Species Selected on the Basis of a New or Increased Export Quota in 2008*.

Figure 5 Number of *Horsfieldii* Traded and Quotas (CITES Data)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Traded animals - wild caught	62,964	38,674	58,850	45,467	31,157	40,387	42,794	45,606	
Traded animals bred	39,559	36,010	31,812	30,608	35,844	38,374	36,427	46,064	
Total traded animals	102,523	74,684	90,662	76,075	67,001	78,761	79,221	91,670	
Wild Quota Uzbekistan	22,000	22,000	22,000	29,000	Quota not given	40,000	42,100	45,000	50,000
Wild Quota Tajikistan	Quota not given	17,000	17,000	17,000	Quota not given				
Wild Quota total	22,000	39,000	39,000	46,000		40,000	42,100	45,000	50,000

4 Quantitative/Qualitative impacts

The numbers above show that it is likely, although impossible to prove, that the current rate of exploitation does lead to a decrease in population. This decline could be valued using the market value of the horsfieldii if sold legally and indirectly by the importance of the horsfieldii for the ecosystem and the value of the ecosystems as a whole. Additionally some qualitative information on the environmental impacts in the import countries is provided.

4.1 Market Value of Tortoises

A *Horsfieldii* tortoise is sold as a pet for between \$25 and \$100 USD, depending on geographic selling location and season (because of demand).⁴⁴ The price paid to exporters/collectors in source countries was estimated in 1997 at €0.45 per individual.⁴⁵ When comparing the final sale price to that of the wholesale price, it becomes clear that the majority of the earnings stay with the importing country and pet dealership.

From this information it is quite clear that the overall value of the pet trade for the source countries is negligible. Overall the countries are exporting around 80,000 live animals and this provides an overall value of less than €40,000. It is likely that in the case of properly regulated market and a sustainable rate of exploitation the value for exporting countries might increase due to greater scarcity but it is unlikely that this could ever grow into a significant income stream for the exporting countries.

4.2 Environmental Impacts

The main environmental impact is the decrease in overall tortoise population numbers and eventual digression of the population in the wild towards extinction. Due to the fact that there are not concrete population figures on the horsfieldii it is useful to compare the impact of wild harvesting on other tortoise and turtle species. There are currently 317 recognized species of turtles and tortoises in the world. Of those that have been assessed by the IUCN Red List, 63% are considered threatened, and 10% are critically endangered. 42% of all known turtle species threatened.⁴⁶ Turtle and tortoise diversity is particularly affected by commercial trading and it has been proven that many populations that experience a continual level of exploitation result in collapse.⁴⁷ Conservation biologists have cited examples of tortoise and turtle

⁴⁴ Big Apple Pet Supply, "Russian Tortoise (4' - 5')," March 13, 2015, <http://www.bigappleherp.com/Russian-TortoiseIgA>.

⁴⁵ TRAFFIC Europe, *Ranching and Breeding of Horsfield Tortoises (Testudo Horsfieldii) in Uzbekistan*.

⁴⁶ Kurt Buhlmann et al., "A Global Analysis of Tortoise and Freshwater Turtle Distributions with Identificaiton of Priority Conservation Areas," *Chelonian Conservation and Biology* 8, no. 2 (2009): 116–49.

⁴⁷ Frank Biermann et al., "The Fragmentation of Global Governance Architectures: A Framework for Analysis," *Global Environmental Politics* 9, no. 4 (2009), https://www.dropbox.com/sh/70r734b7iv9d8p9/f4qsp1YJTr/Biermann%20et%20al.%202009_The%20Fragmentation%20of%20Global%20Governance%20Architectures.pdf; Smith and Lee, "Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise."

species experiencing unsustainable harvests in their range. For example, Asian Box turtle, Roofed tortoise, and Asian Softshell turtles have experienced a precipitous decline as they have been hunted for markets, both pet and medicinal.⁴⁸ The Tortoise and Freshwater Turtle Specialist Group explained in a 2011 petition to CITES from the Centre for Biological Diversity that “natural populations of horsfieldiis are characterized by a suite of life history characteristics that may predispose these populations to rapid declines in the face of anthropogenic harvest.”⁴⁹

For the horsfieldii, It is not possible to gauge the rate of extinction because current population figures are extremely out dated and incomplete. Moreover, there is little information available regarding the role of the horsfieldii tortoise in the Central Asian steppe ecosystems. The horsfieldii is not for instance a keystone species or a predator and its excessive inactivity (9 months of the year) illustrates the tortoise's unique ability to survive in a harsh and desolate environment more than it illustrates its inherent purpose within this environment. Thus, the Horsfieldii is an example where the ecosystem value of the species is of lesser consequence and efforts for its conservation are based mostly on its intrinsic value. Overall it needs to be concluded that there is no evidence that the ecosystem as a whole and its ecosystem services would suffer if the horsfieldii tortoise population would decrease further⁵⁰.

In attempting to value its role in the ecosystem, we looked in the TEEB and EVRI databases but did not find relevant or similar studies that attempted to gauge the economic value of the existence of a similar species. While there were some examples of sea turtles and their value to island and coastal communities,⁵¹ these studies were not deemed comparable due to the sea turtles inhabitation of a very different marine ecosystem and its strong role within ecotourism for which cannot be attributed to the horsfieldii tortoise in Central Asia.

4.3 Environmental Impact in Consumer Countries

The main environmental side effect of illegal and legal wildlife trade of the horsfieldii tortoise relate to the risks associated with invasive species and pathogen pollution. Many horsfieldii that end up as pets in importing countries are at one point or another “let go” or abandoned by their owners, in particular, because of their long lifespan. At the point of release, many Horsfieldii are sick with disease from poor caretaking by pet owners and because of the dramatically different climatic conditions in host countries.⁵²

⁴⁸ Ted Williams, “The Terrible Turtle Trade.”

⁴⁹ Centre for Biological Diversity, *Re: Species Proposals for Consideration at CITES CoP16*, Petition, (2011), http://www.biologicaldiversity.org/campaigns/southern_and_midwestern_freshwater_Horsfieldiis/pdfs/Freshwater_Horsfieldiis-CITES_petition_Aug_8.pdf.

⁵⁰ Databases containing valuation studies of ecosystems and biodiversity were consulted to see if any similar studies attempted to put an economic value on conservation of a tortoise or turtle species, however, information was extremely limited and comparable studies were not found.

⁵¹ See: Clem Tisdell and Clevo Wilson. 2002 *Economic, Educational and Conservation Benefits of Sea Turtle Based Ecotourism: A Study Focused on Mon Repos*. Wildlife Tourism Research Report Series: No 20. Cooperative Research Centre for Sustainable Tourism.

⁵² Smith and Lee, “Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise.”

When released into a non-native habitat they pose the twofold impact of introducing a non-native species that could compete with local turtle and tortoise species and also pose the risk of introducing disease that affects local wildlife and potentially human beings.

There are several documented cases of imports of turtles and tortoises negatively affecting flora and fauna in importing countries. The red slider turtle is a common example of an invasive turtle species that is now found outside of its natural range in southern Europe, Africa, Asia and the US. Recognized as harming local species, the red slider was banned in 1997 by the EU for import because of the damage they brought on local European fresh water turtle populations.⁵³ According to a 2014 publication by Nature on invasive species, horsfieldii are in the first stage of invasive species introduction in the United States.⁵⁴

Invasive turtle species also pose health threats. Several examples of imported turtle species carrying salmonella with the potential to pass on to human populations has been documented in Spain.⁵⁵ While there is not a specific example of the Horsfieldii tortoise spreading disease, tracing such links are difficult and often studied after the fact on a case by case basis. In general, sick and imported tortoises transported in unsanitary and poor conditions carry a certain likelihood of spreading disease. The introduction of a non-native species and potential diseases effect both importing and exporting countries.⁵⁶ However, it is important to note that some of these impacts would occur through the release of tortoises which were farmed and imported legally as well as those which were traded illegally.

⁵³ O. Kopecý, L. Kalous, and J. Patoka, *Establishment Risk from Pet-Trade Freshwater Horsfieldiis in the European Union* (Suchdol, Czech Republic: Czech University of Life Sciences Prague, Facultal of Agriculture, Food and Natural Resources, 2013).

⁵⁴ Reuben P. Keller, Marc W. Cadotte, and Glenn Sandiford, *Invasive Species in a Globalized World: Ecological, Social, and Legal Perspectives on Policy* (University of Chicago Press, 2014).

⁵⁵ J. Hidalgo-Vila et al., *Salmonella in Free-Living Exotic and Native Horsfieldiis and in Pet Exotic Horsfieldiis from SW Spain* (Madrid, Spain: Laboratorio Central de Veterinaria, Ministerio de Agricultura, Pesca y Alimentación, 2008).

⁵⁶ Pro Wildlife. 2000. The decline of the Asian Horsfieldii.
<https://www.prowildlife.de/sites/default/files/Horsfieldii%20report.pdf>

5 Conclusions

The *Horsfieldii* tortoise is a heavily traded species of tortoise and its status in the wild is threatened by both legal CITES trade and illegal trade. This paper outlined several plausible circumstances where illegal trade had or currently was taking place. It identified three potential instances of illegality. 1) It is likely that many more species are involved in the trade than are actually reports.⁵⁷ 2) It is suspected that the improper use of CITES labels that differentiate between wild and captive bred specimens, results in a much higher number of wild caught specimens existing in trade than the data reported.⁵⁸ 3) It is likely that many individual tortoises are illegally transported and smuggled through non-Party countries or countries with less stringent environmental and enforcement standards.⁵⁹ One case of illegal trade that was especially obvious was the Ukraine. It became clear with the example of Ukraine exporting large quantities of ‘captive-bred’ *Horsfieldii* after the 1999 EU ban on wild caught specimens, that illegal trade took place, in this case involving both the manipulation of source codes and the smuggling of specimens from transit countries. An interesting and unexpected impact of the EU trade ban on wild caught specimens that was implemented in attempt to protect the species had the negative and unexpected result of actually, was the doubling the overall number of specimens in trade. This resulted from the fact that exports from Uzbekistan continued to non-EU countries (namely the US and Japan), while EU imports were met by Ukrainian exports of mislabelled “captive bred” specimens, which were likely wild caught specimens smuggled from Uzbekistan and other range states.

This report also found that the legal trade in *Horsfieldii* as dictated through annual CITES quotas was potentially threatening to the conservation status of the species. For Uzbekistan the quota continues to be increased year after year despite that no comprehensive and independent study of the tortoise population has been conducted since 1997. The way that CITES is designed, allows for the decision on the quota or legal harvest to be determined by each sovereign Party. When quotas are established in this way, they depend on the assumed interest and ability of the Party member to establish a sustainable rate of harvest. A species may then be legally over-harvested. Reasons for over harvesting are variable and depend on the specific species and country, but could include factors such as: a) low level of political will to address issue b) relative importance in society and/or awareness of species conservation status c) high profits incurred for the country harvesting and exporting d) inadequate resources to monitor population. These are some examples that could affect the assumption inherently made by CITES that states have an obligation and interest in accurately monitoring and reporting the conservation status of all relevant species and implementing sustainable quotas for harvest. It would be useful and important to have an independent

⁵⁷ Smith and Lee, “Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise”; UNEP-WCMC, *Review of Species Selected on the Basis of a New or Increased Export Quota in 2008*.

⁵⁸ CITES, *Implementation of the Convention Relating to Captive-Bred and Ranched Specimens (Decision 16.65)*.

⁵⁹ Tajikistan and Turkmenistan are not Parties and therefore do not report levels of trade and several other of the countries identified above do not provide self-reported data on exports nor do they set quotas, despite that they are likely involved in the trade as transit countries or collection countries.

census on the status of species in the wild to justify high levels of export.⁶⁰ Thus, the approval of increasing CITES quotas for the *Horsfieldii*, pose a problem for the species because there is inconclusive data on populations. Moreover, while it is not easy to gauge the level of illegal trading, it is acknowledged to exist parallel to the legal trade. The fact that several neighbouring or trade involved countries are not party to CITES or do not hand in their required annual reporting documents (e.g. Ukraine), which indicate potential issue areas for accurately understanding the trade and its impact on the conservation status of the species and biodiversity more generally.

While this study fell short of valuing the illegal *Horsfieldii* tortoise trade in monetary terms, it did illustrate how illegal and legal trade can lead to the unsustainable exploitation of a species that could, if continued, lead to its eventual extinction. There are three reasons why the valuation of the overexploitation of the *Horsfieldii* is so challenging:

- Firstly, the legal value of the specimen at the site of collection is monetarily insignificant therefore legal trade is not likely to provide a significant income stream and cannot therefore be used for valuation of the damages of illegal trade.
- Secondly, the value of the specimens to the local ecosystem is either not known or perceived to be small.
- Thirdly, there are not many studies on the value of whole ecosystems, which do not attract tourists or provide other known ecosystem services.⁶¹

In that respect the case of the *Horsfieldii* is an ordinary one and representative of many traded species. The silent majority of species traded in CITES are likely to be affected by lack of data, publicity and easily monetised value. For these species, it is difficult to use valuation techniques to support conservation efforts.

⁶⁰ Smith and Lee, "Testudostan: Our Post-Cold War Global Exploitation of a Noble Tortoise."

⁶¹ While *The Economics of Ecosystems and Biodiversity* (TEEB) database could be used to illustrate the economic value of a species to a specific ecosystem or ecosystem services, the amount of literature on these topics as they relate to turtles and tortoises in the downloadable TEEB and the EVRI (Environmental Valuation Reference Inventory) databases was extremely limited and comparable studies were not found.

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Annex A CITES EXPORT QUOTAS

YEAR	COUNTRY	QUOTA	NOTES
2014	Uzbekistan	50000	live, ranched
2014	Uzbekistan	50000	live, wild-taken
2013	Uzbekistan	45000	live, ranched
2013	Uzbekistan	45000	live wild-taken
2012	Uzbekistan	30000	live, ranched
2012	Uzbekistan	42100	live wild-taken
2011	Uzbekistan	30000	live, ranched
2011	Uzbekistan	40000	live, wild-taken
2010	Uzbekistan	29000	live
2010	Uzbekistan	22000	live, ranched
2009	Tajikistan	17000	wild-taken
2009	Uzbekistan	5000	eggs
2009	Uzbekistan	29000	live
2009	Uzbekistan	17000	live, ranched
2008	Tajikistan	17000	wild-taken
2008	Uzbekistan	5000	eggs
2008	Uzbekistan	22000	live
2008	Uzbekistan	2000	live, captive-bred
2008	Uzbekistan	17000	live, ranched
2007	Tajikistan	17000	wild-taken
2007	Uzbekistan	5000	eggs

YEAR	COUNTRY	QUOTA	NOTES
2007	Uzbekistan	13000	ranchered
2007	Uzbekistan	22000	wild-taken
2006	Uzbekistan	14000	ranchered
2006	Uzbekistan	22000	wild-taken
2005	Uzbekistan	13000	ranchered
2005	Uzbekistan	22000	wild-taken
2004	Uzbekistan	7000	ranchered
2004	Uzbekistan	23000	wild-taken
2003	Uzbekistan	1150	live (confiscated animals)
2003	Uzbekistan	5000	ranchered
2003	Uzbekistan	25000	wild-taken
2002	Kazakhstan	40000	live
2002	Uzbekistan	30000	live (wild-taken and ranchered)
2001	Kazakhstan	40000	live
2001	Tajikistan	20000	wild-taken
2001	Uzbekistan	30000	live (wild-taken and ranchered)
2000	Kazakhstan	39000	live
2000	Uzbekistan	35000	live
1999	Russian Federation	20000	as re-exports from Kazakhstan
1999	Russian Federation	15000	as re-exports from Tajikistan
1999	Uzbekistan	35000	



YEAR	COUNTRY	QUOTA	NOTES	
1998	Russian Federation	25000	re-export; Uzbekistan	origin
1998	Uzbekistan	25000		
1997	Russian Federation	20000	re-export; Uzbekistan	origin

