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Report on species/country combinations selected for review by the Animals Committee following CoP16

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Executive Summary

This report provides accounts for taxa that were selected in the CITES Review of Significant Trade (RST) process following CoP16 and were retained in the review following AC28. It aims to assist the Animals Committee in categorising species based on the effects of international trade on selected species/country combinations and to highlight problems concerning the implementation of Article IV.

The UN Environment World Conservation Monitoring Centre (UNEP-WCMC) was asked by the CITES Secretariat to compile reviews for 25 animal species/country combinations that were selected within the RST following CoP16. All range States were consulted, and were asked to provide information on the distribution, population status and threats of the relevant species within their country, as well as trade information, legal protection, and detailed of management and monitoring actions.

Species-country combinations were divided into three provisional categorisations (*'action is needed'*, *'unknown status'* and *'less concern'*), in accordance with paragraph 1e of Resolution Conf. 12.8 (Rev. CoP17) for review by the Animals Committee.

For the 25 species-country combinations included in the RST following CoP16:

- Eight were provisionally categorised as **'Action is needed'** on the basis that available information suggests that the provisions of Article IV, paragraph 2 (a), 3 or 6 (a), are not being implemented;
- Four were provisionally categorised as **'Unknown status'** on the basis that it could not be determined whether or not these provisions are being implemented;
- Thirteen were provisionally categorised as **'Less concern'** on the basis that the available information appears to indicate that these provisions are being met. The category 'Less concern' was also used where wild-sourced trade (codes W, R, U and source unreported) was not anticipated.

Full details of the categorisations for the 25 species/country combinations under review are provided in Table 1 (p. 3).

For seven species/country combinations included in the RST post CoP16, trade was predominantly reported in captive-produced sources (C, D, F and R), rather than wild-sourced. Following adoption of Resolution 17.7 on *'Review of trade in animal specimens reported as produced in captivity'*, it is recommended that the Animals Committee may consider discussing seven species/country combinations under Resolution 17.7 on the basis of high levels of captive-bred and/or ranched trade (*Centrochelys sulcata* from Ghana, Mali, Togo, and Sudan, *Testudo graeca* from the Syrian Arab Republic, and *Ornithoptera croesus* and *O. rothschildi* from Indonesia).

In relation to problems beyond the implementation of Article IV, direct exports of wild-sourced *Centrochelys sulcata* for commercial purposes were reported by five Parties (including one country that is not a range State) during 2006-2015. This trade is incompatible with the Appendix II listing for Testudinidae spp., which specifies a zero annual export quota for all specimens of *C. sulcata* removed from the wild and traded for primarily commercial purposes. Accordingly, the Animals Committee may wish to consider referral of these apparent non-compliance issues to the CITES Standing Committee. Nine importing countries also reported wild-sourced imports of this species for commercial purposes.

Table 1: Recommended categorisations for species/country combinations that were selected within the Review of Significant Trade following CoP16 based on the effects of international trade and problems concerning the implementation of Article IV.

Species	Range State	IUCN	Summary	Recommendation
Psittaciformes				
Psittacidae				
<i>Amazona festiva</i> (Festive Parrot)	Guyana	NT	Global population size is unknown, but considered 'uncommon' and declining at a moderately rapid rate. IUCN consider the subspecies occurring in Guyana (<i>A. f. bodini</i>) to be a recognised species (<i>A. bodini</i>), which is classified as Near Threatened globally. Occurs only in the north west of Guyana; no population information was located. One author considered the species rare, but in response to the consultation, Guyana noted that traders 'easily sourced' the species. Deforestation and trapping for the international trade are the main threats globally. Export quota of 520 annually since 2006; trade reported 2006-2015 was within quota (trade in the last 5 years ~30-60 birds per year, and 723 live wild individuals exported in total 2006-2015 as reported by Guyana). Annual reports were submitted by Guyana for all years 2006-2015. No surveys or monitoring has taken place and there is no management plan for the species, although harvesting is managed with closed seasons during the breeding and nesting season. The basis for non-detriment findings for export of wild-sourced specimens and the establishment of the high quota for this apparently uncommon and range-restricted species in Guyana does not appear to be robust, therefore categorised as Action is needed.	Action is needed
sSauria				
Agamidae				
<i>Uromastyx aegyptia</i> (Egyptian Spiny-tailed Lizard)	Global status	VU	Globally Vulnerable, with a widespread distribution. Population size unknown, but declining.	Less concern
	Jordan		Considered widespread in the deserts of Jordan, with some reports of being 'locally common' but declining in the eastern desert and 'sharp declines' observed in deserts of Wadi Rum and Wadi Araba in the south. Mainly threatened by habitat loss, but also by domestic and international use as a medicine and aphrodisiac, with international trade reported to have contributed to declines in the east. One unverified account of illegal smuggling was reported. Direct exports 2006-2015 were mainly live, captive-bred individuals and have declined in recent years, with no wild trade reported by exporters or importers since 2011. Whilst Jordan reported exports of 110 live specimens with no source specified in 2014, no corresponding imports were reported. Annual reports were submitted by Jordan for all years 2006-2015. Jordan responded to the consultation relating to the RST. No population surveys or monitoring has been undertaken and no management plan for the species exists. Unclear if recent legislation gives the species total protection from hunting and trade. However, given the lack of wild-sourced trade reported in the four most recent years (2012-2015), categorised as Less concern.	
	Syria		Reported to occur in the Syrian Desert, southern Syria, with a lack of information on localities, population size/status and threats. There is political instability in the country, and Syria does not appear to have functioning CITES Authorities. Low levels of trade 2006-2015 in captive-bred and ranched individuals, in the years 2011-2014 only, and no reported wild-sourced trade by Syria or importers. Annual reports were received from Syria 2006-2012, but none received since 2012. No information on management in Syria; the country did not respond to the consultation relating to the RST. However, given the lack of wild-sourced or ranched trade reported in the three most recent years (2013-2015) by Syria or importers, categorised as Less concern.	
			Whilst not related to the implementation of Article IV, re-exports by the UAE of live, captive-bred specimens originating in Syria appear to be substantially higher than reported imports to the country.	

Species	Range State	IUCN	Summary	Recommendation
<i>Trioceros montium</i> (Mountain Chameleon)	Cameroon	NT	Endemic to Cameroon and categorised by the IUCN as Near Threatened. Occurs in montane and submontane habitats only. Restricted in range to the south western highlands. Population size unknown, but considered declining, with local depletions reported at Mt. Cameroon where the species is collected for international trade. Considered vulnerable to a range of threats including habitat loss and international trade due to its limited range. Trade 2006-2015 mainly in live, wild-sourced individuals (897 individuals as reported by importers), although no reported trade in 2014 or 2015 (by either Cameroon or importers). Cameroon submitted annual reports for 2006, 2007, 2009 and 2011 only. Illegal trade reported. Cameroon did not respond to the consultation relating to the RST for this species. No information on management was located. The basis for non-detriment findings for export of wild-sourced specimens for this endemic and range restricted species has not been provided, and international trade appears to be impacting the species, therefore categorised as Action is needed.	Action is needed
Varanidae				
<i>Varanus ornatulus</i> (Ornate Monitor)	Togo	-	Not assessed globally by the IUCN, and no information on population size, status or trends available within Togo. Known to occur in the south of the country. Exploitation, including for international trade is the main threat to the species. Togo submitted annual reports for 2007-2015, but not for 2006. Exports 2006-2015 were predominantly in ranched specimens (5118 individuals as reported by importers), but trade in wild-sourced specimens was reported in 2014 and 2015. Export quotas appear high (1000 wild sourced and 7000 ranched). Recent research suggests the species is genetically indistinguishable from <i>V. niloticus</i> , which is exported in high volumes from Togo (27,442 ranched individuals 2006-2015 as reported by importers). Togo did not respond to the consultation relating to the RST; no information on the establishment of quotas or management of the species in Togo was located. The basis for non-detriment findings for export of wild-sourced and ranched specimens and the establishment of the high quotas for this species in Togo, for which conservation status is unknown has not been provided, therefore categorised as Action is needed.	Action is needed
Serpentes				
Elapidae				
<i>Ophiophagus hannah</i> (King Cobra)	Global status	VU	Assessed as globally Vulnerable, with a wide distribution, but not common and considered very rare in much of range. Population size unknown, but presumed to be declining due to over-harvesting across much of range (for pets, meat, skin, and medicinal use), combined with habitat loss and persecution. Demand for snakes and snake products was reported to be increasing.	Less concern
	Indonesia		Wide distribution in Indonesia (Sumatra, Java, Bali, Kalimantan, Sulawesi and Moluccas). No information on population size. Whilst considered rare in some locations, also reported to be locally common (although some accounts of status appear conflicting within the same location). Reported to occur in modified habitats (human settlements, palm oil and rubber plantations,) within the country. Harvested for the pet trade, in particular, in central Java and southern Sumatra. Illegal harvests reported. Annual export quota of 90 live, wild-sourced individuals considered sustainable by one expert. Annual reports were submitted by Indonesia for all years 2006-2015; the 2013 report appears to be incomplete for captive <i>Ophiophagus</i> . Low levels of trade 2006-2015, predominantly in live, wild-sourced snakes (817 as reported by Indonesia) within quota. Indonesia responded to the consultation relating to the RST. Harvest quotas set at 100-150 for last five years based on a wide distribution, habitat availability, and prey-base availability, although no information on population surveys or monitoring provided. Ranching programmes reported to be established, but no exports reported as ranched. This species is likely to be able to withstand offtake for trade at current levels given its wide distribution and reproductive capacity, therefore categorised as Less concern.	

Species	Range State	IUCN	Summary	Recommendation
<i>Ophiophagus hannah</i> (cont.)	Malaysia		Apparently widespread in Peninsular Malaysia, also occurs in Sabah and Sarawak. No information on population size, densities or trends, but considered common in Peninsular Malaysia and Sarawak, although small population sizes were reported. Reported to occur in modified habitats (palm oil plantations, human settlements) within the country. Utilized for meat and medicinal purposes in Malaysia, and some records of illegal trade reported. Low levels of trade 2006-2015 predominantly in live, wild-sourced animals (597 as reported by Malaysia). Annual reports were submitted by Malaysia for all years 2006-2015. One expert considered trade levels to be low and sustainable. Malaysia responded to the consultation relating to the RST. Protected under national legislation and harvest and trade allowed under licence only, although no information on population surveys or monitoring provided. The species is likely to be able to withstand offtake for trade at current levels given its wide distribution and reproductive capacity, therefore categorised as Less concern.	Less concern
Testudines				
Geoemydidae				
<i>Malayemys subtrijuga</i> (Mekong Snail-eating Turtle)	Global status	VU	<i>M. subtrijuga</i> was split at CoP14 to become two species: <i>M. subtrijuga</i> and <i>Malayemys macrocephala</i> . <i>M. subtrijuga</i> occurs in eastern Thailand, Lao PDR, Cambodia, southern Viet Nam, and Indonesia, and <i>M. macrocephala</i> occurs in central and southern Thailand, Cambodia and Malaysia. The species included within the RST from Malaysia was therefore considered to be <i>M. macrocephala</i> . <i>M. subtrijuga</i> was categorised globally Vulnerable [assessment made prior to taxonomic change]. <i>M. subtrijuga</i> and <i>M. macrocephala</i> were both provisionally assessed as Vulnerable in a draft assessment in 2011. Population sizes of <i>M. subtrijuga</i> unknown, but declining and with populations presumed to be “severely reduced” in parts of range. Populations of <i>M. macrocephala</i> were presumed to be relatively stable and common in parts of range.	
	Indonesia		Natural occurrence of the species in Indonesia unconfirmed, with some reports suggesting the species is introduced to the country. Limited distribution in parts of Java and Sumatra. Subpopulations reportedly small and restricted, and considered rare. Declines attributed to collection for trade and habitat loss. Reported to be commonly harvested from Central Java and West Java provinces. Annual export quota of 180 live wild-sourced individuals (2008-2017). Annual reports were submitted by Indonesia for all years 2006-2015. Trade 2006-2015 comprised live wild-sourced individuals (1669 as reported by Indonesia). Indonesia responded to the consultation relating to the RST. Trade was reportedly restricted to live individuals with a maximum carapace length (15 cm) to avoid harvest of adults, and for personal purposes only. Survey methods and population monitoring guidelines for turtles were developed in 2012, but no information on any completed field studies or surveys were provided. No national species management plan located. The basis for non-detriment findings for export of wild-sourced specimens for this rare and apparently declining species in Indonesia does not appear to be robust, and international trade appears to be impacting the species, therefore categorised as Action is needed.	Action is needed
	Lao PDR		Occurs in south-west and central Lao, PDR. No information on population size, but reported to be vulnerable and declining. Main threats are domestic consumption and international trade, as well as habitat alteration. No export quotas published. Trade 2006-2015 comprised one wild-sourced scientific specimen in 2009 and 1000 live ranched individuals in 2010 (all trade reported by countries of import only). No trade has been reported since 2010 by Lao PDR or importers. Lao, PDR was subject to recommendations to suspend all commercial trade in 2015 and 2016. Annual reports were submitted by Lao PDR for all years 2006-2015. Lao PDR did not respond to the consultation relating to the RST; no information on population surveys or monitoring was located. Species is listed under national legislation as a ‘managed’ wildlife species; local hunting for subsistence purposes is permitted but commercial trade is prohibited. The basis for non-detriment findings for possible previous exports of ranched specimens is unclear. However, there has been no wild-sourced trade over the ten years (aside from one scientific specimen), and no recent trade in ranched specimens in the last five years (2011-2015) and commercial trade in wild individuals is prohibited; therefore, categorised as Less concern.	Less concern

Species	Range State	IUCN	Summary	Recommendation
<i>[M. macrocephala]</i>	Malaysia		Malaysia responded to the consultation relating to inclusion of <i>M. subtrijuga</i> in the RST, noting that the species does not occur in the country. <i>M. macrocephala</i> occurs in the extreme north-west, and along the north-west coast of Peninsular Malaysia. No estimates of population size, and subpopulations reported to be small and restricted. One author considered the population to be relatively stable. Utilized for meat in Malaysia, with drainage of swamps and collection for international trade also considered a threat. Illegal trade reported. During 2006-2015, trade was reported in 2006 and 2007 only, consisting mainly of live, captive-bred and ranched individuals (348 animals as reported by Malaysia). Annual reports were submitted by Malaysia for all years 2006-2015. Zero quota published since 2007. Protected under national legislation and harvest and trade allowed under licence only. Species considered "fairly well protected" in Malaysia by one author. On the basis of of the protection within Malaysia and no anticipated legal trade due to the zero quota, categorised as Less concern.	Less concern
<i>Notochelys platynota</i> (Malayan Flat-shelled Turtle)	Indonesia	VU	Categorised as Vulnerable globally. Reported to have a relatively wide range in Indonesia, mainly occurring in Sumatra and Kalimantan. No estimates of population size or densities, but reported to have declined from "extremely common" in Indonesia in the late 1980s to "reasonably common" in 2000. Considered uncommon by some, and assessed as Endangered in Sumatra. Commonly traded for consumption, with habitat loss and fragmentation also considered serious threats. Annual export quotas in place, which increased from 450 in 2008-2015 to 810 in 2016 and 2017 (previous quotas of 1350 in 2006-2007). Trade 2006-2015 consisted of live, wild-sourced individuals (2112 as reported by Indonesia). Exports increased from 324 wild sourced individuals in 2015 to 753 (source not specified in 2016) in line with the increased quota. Annual reports were submitted by Indonesia for all years 2006-2015. Indonesia responded to the consultation relating to the RST. Harvest restricted to Sumatra and Kalimantan, and trade restricted to live individuals with a maximum carapace length (15 cm) to exclude adults, and for personal purposes only. Survey methods and population monitoring guidelines were developed in 2012, but no information on any completed field studies or surveys provided. No national species management plan located. Not protected by national legislation. Harvest appears to occur in Sumatra where the species was assessed as Endangered. The basis for non-detriment findings for exports of wild-sourced specimens and the establishment of the export quota has not been provided, and the impact of on-going trade on this apparently declining species is unclear, therefore categorised as Action is Needed	Action is needed
Testudinidae				
<i>Centrochelys sulcata</i> (African Spurred Tortoise)	Global status	VU	Categorised as Vulnerable globally, but provisionally reclassified as Endangered in a draft IUCN assessment in 2011. No current information on population size available, but considered declining, with extirpations and severe depletions noted. Remaining populations considered small and fragmented. Since 2000, the Appendix II listing for Testudinidae spp. has specified a zero annual export quota for all specimens of <i>Centrochelys sulcata</i> removed from the wild and traded for primarily commercial purposes. Potential compliance issues noted for several Parties in relation to the zero annual export quota.	
	Benin		Occurrence in Benin appears questionable; may occur in the north in National Parks, but no recent reliable reports confirm occurrence. Population status and trends in the country unknown. Export quota of 150 ranched individuals in 2006 but reduced to 10 ranched individuals from 2007-2017 and quota for 50 captive-bred <i>C. sulcata</i> (2010-2017). Trade 2006-2015 primarily comprised live, ranched and captive-bred individuals, including 200 ranched individuals in 2014 (reported by the importer, Ghana). Low levels of trade in live wild-sourced individuals for commercial purposes (10 in 2010). Annual reports were submitted by Benin in all years 2007-2015, but not for 2006. The species is not nationally protected. Benin did not respond to the consultation relating to the RST; no further information on management was located. The basis for non-detriment findings for recent exports of ranched specimens is unclear, therefore categorised as Unknown status.	Unknown status

Species	Range State	IUCN	Summary	Recommendation
<i>Centrochelys sulcata</i> (cont.)	Ghana		Not a range state for <i>C. sulcata</i> , as confirmed by Ghana in response to the consultation. Export quota for live, captive-bred individuals increased from 800 in 2008, to 4000 in 2017. High levels of trade 2006-2015 in live captive-bred individuals, with low levels of ranched, source F and wild-sourced individuals reported exported in the past 5 years (including 372 wild-sourced). Annual reports were submitted by Ghana in all years 2007-2015, but not for 2006. Illegal trade noted. On the basis that the species does not appear to occur naturally in Ghana, categorised as Less concern.	Less concern (Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)
	Guinea		Occurrence in Guinea very doubtful, with only one record of possible occurrence in the extreme north-east in 1995. Trade 2006-2015 reported by countries of import only, and comprised live captive-bred (281), wild-sourced (110) and source F (50) individuals for commercial purposes. No trade in <i>C. sulcata</i> reported since 2013. Guinea submitted annual reports for 2006, 2008, 2010, 2013 and 2014 only. Guinea did not respond to the consultation relating to the RST. On the basis that the species does not appear to occur naturally in Guinea, categorised as Less concern.	Less concern
	Mali		Reported from central, south-central and eastern Mali. Population size unknown, but species considered rare and declining with local extirpations and depletions noted. Harvested for local consumption (the main threat in the country) and illegal trade reported. Annual zero export quota for wild-sourced <i>C. sulcata</i> published 2006-2017. High levels of trade 2006-2015 predominantly comprised of live, source F individuals (19 464 as reported by Mali) and captive-bred individuals (1914 as reported by Mali). Low levels of wild-sourced trade in live individuals for commercial purposes were however reported (50 in 2010 as reported by Mali; 255 in 2012 according to importers). Mali submitted annual reports for 2006-2014, but not 2015. Testudines are partially protected nationally. Mali did not respond to the consultation relating to the RST; no further information on management was located. On the basis of no anticipated legal trade in wild-sourced specimens due to the zero quota, categorised as Less concern.	Less concern (Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)
	Sudan		Reported from central Sudan, but distribution data were considered poor. No current estimate of population size but considered 'endangered' in Sudan due to armed conflict and other pressures, including drought. Populations were reported to be far rarer, dispersed and restricted than previously thought. Zero export quota published for wild-sourced individuals 2006-2017. Trade 2006-2015 predominantly comprised live, captive-bred individuals (2696 as reported by Sudan) with some trade in wild-sourced individuals for commercial purposes (544 from 2009-2013 according to countries of import; 69 in 2011 as reported by Sudan). No wild-sourced trade reported 2014 or 2015 by Sudan or importers. Annual reports for 2008, 2009 and 2015 have not yet been submitted by Sudan. Sudan did not respond to the consultation relating to the RST; no information on management in the country was located. On the basis of no anticipated trade in wild-sourced specimens due to the published zero quota, categorised as Less concern.	Less concern (Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)
	Togo		Occurrence in Togo has been questioned, but has been reported from the extreme north of the country. No estimates of population size, but population considered rare and fragile. Apparently considered Fetish in the north. No information on specific threats in Togo were located. Export quota for captive-bred <i>C. sulcata</i> increased from 500 in 2006 to 700 in 2016-2017. Trade 2006-2015 predominantly comprised live captive-bred individuals (4830 as reported by Togo). Low levels of trade in live wild-sourced individuals (50 in 2014 as reported by Togo only) and ranched individuals (10 in 2015 according to countries of import) for commercial purposes also reported. Togo submitted annual reports for 2007-2015, but not for 2006. Testudines are partially protected nationally. Togo did not respond to the consultation relating to the RST; no further information on management was located. The species is considered rare, with questionable occurrence in Togo, and the basis for non-detriment findings for recent wild-sourced trade is unclear, therefore categorised as Unknown status.	Unknown status (Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)

Species	Range State	IUCN	Summary	Recommendation
<i>Chelonoïdis denticulatus</i> (Yellow-footed Tortoise)	Global status	VU	Categorised as Vulnerable globally, but provisionally reclassified as Near Threatened in a draft assessment in 2011. No information on population size available, but considered declining, with some evidence of depletions and extirpations.	
	Guyana		Apparently widespread in Guyana, occurring in rainforest and dryland forests, with habitat considered large and viable. No estimates of population size available. One author considered the species threatened due to increasing collection pressure for subsistence hunting and international trade. Current annual quota of 704 live specimens. High levels of trade 2006-2015 consisted of live, wild-sourced individuals (4969 as reported by Guyana), with trade consistently within quota. Annual reports were submitted by Guyana for all years 2006-2015. Guyana responded to the consultation relating to the RST; no population surveys or monitoring have been undertaken and no management plan for the species exists. The basis for non-detriment findings for export of wild specimens and for the establishment of the export quota does not appear to be robust, and international trade appears to be impacting the species, therefore categorised as Action is needed.	Action is needed
	Suriname		Reported from the north and south of the country and may still be widespread. Common in some areas, becoming rare in others due to capture for international trade. Other threats include bushmeat and illegal trade. Trade 2006-2015 consisted of live, wild-sourced animals (2014 individuals as reported by Suriname), with trade consistently well within quota. Annual reports were submitted by Suriname in all years 2006-2014, but 2015 has not yet been received. Suriname did not respond to the consultation relating to the RST; no information on management located. The basis for non-detriment findings for export of wild specimens is unclear and international trade appears to be impacting the species, therefore categorised as Action is needed.	Action is needed
<i>Testudo graeca</i> (Spur-thighed Tortoise)	Global status	VU	Globally Vulnerable, with a widespread distribution. Global population size unknown, but declining. Taxonomy considered complex and unresolved.	
	Jordan		Limited distribution, occurring in the west in Mediterranean habitats. Current population size unknown but reported to have declined over past 15 years. Considered rare and threatened by overgrazing, habitat loss, wild harvest by tourists and local trade; collection was reported to have affected the density and age structure of populations. Illegal trade reported, with 521 seizures reported by Jordan between 2014 and 2016. High levels of trade 2006-2015, mainly in captive-bred live individuals, but with high quantities of wild-sourced live individuals traded (> 14 000 according to importers, with wild-sourced trade last reported in 2013). Annual reports were submitted by Jordan for all years 2006-2015. Jordan responded to the consultation relating to the RST. No population surveys or monitoring has been undertaken and no management plan is in place for the species. The basis for a non-detriment finding for trade in this declining species does not appear to be robust, and collection for trade appears to be having an impact on this species; therefore, categorised as Action is needed.	Action is needed
	Syria		Occurs in northern and western Syria. Reported as common in north Syria in 1996, but no recent information on the population status available. There is political instability in the country, and Syria does not appear to have functioning CITES Authorities. Illegal trade has been documented. No annual reports received from Syria since 2012. High levels of trade 2006-2015 in captive-bred individuals (>19 000 according to importers) and ranched individuals (17 000), although no exports of ranched since 2012 as reported by importers. Lower levels of wild-sourced trade (6750 during 2006-2015, and none reported since 2011 by Syria or importers). No information on management available; the country did not respond to the consultation relating to the RST. Whilst the basis for non-detriment findings for previous exports of wild and ranched specimens is unclear, there has been no wild-sourced trade since 2012 (as reported by importers); therefore categorised as Less concern.	Less Concern (Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)

Species	Range State	IUCN	Summary	Recommendation
Lepidoptera				
Papilionidae				
<i>Ornithoptera croesus</i> (Wallace's Golden Birdwing)	Indonesia	EN	Endangered (assessment requires updating), with population size and trend unknown. Endemic to Indonesia and restricted to a few Moluccan islands. Primarily threatened by habitat loss and possibly trade; illegal trade in birdwing butterflies has been reported. Annual reports were submitted by Indonesia for all years 2006-2015, although the 2013 report appears incomplete for <i>Ornithoptera</i> . High levels of trade 2006-2015, predominantly in ranched specimens (29 885 as reported by Indonesia), with a peak in trade in 2011, although trade declined thereafter. A shift in source was observed in 2014, with recent trade predominantly reported as source code F. Indonesia responded to the consultation relating to the RST. Wild-sourced exports for commercial purposes are not permitted, although collection from the wild to augment breeding facilities occurs with harvest levels set annually. There are four current breeders of birdwing butterflies in Indonesia (species unspecified). Whilst in general, ranching of birdwings is widely considered not to impact on wild populations, no monitoring of the impact of offtake for captive production appears to take place in Indonesia. The species is currently under review for protected status nationally. It is unclear if ranching in the country is taking place (or captive breeding only). The basis for non-detriment findings for acquisition of specimens from the wild for ranching or captive breeding is unclear and the impact of offtake on wild populations of is uncertain; therefore, categorised as Unknown status.	Unknown status (Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)
<i>Ornithoptera rothschildi</i> (Rothschild's Birdwing)	Indonesia	VU	Vulnerable (assessment requires updating), population size and trend unknown. Endemic to Indonesia and restricted range in north western part of West Papua Province. Primarily threatened by habitat loss and possibly trade; illegal trade in birdwing butterflies has been reported. Annual reports were submitted by Indonesia for all years 2006-2015, although the 2013 report appears incomplete for <i>Ornithoptera</i> . High levels of trade 2006-2015, predominantly in ranched specimens (15 616 as reported by Indonesia) with a peak in trade in 2010, although trade declined thereafter. A shift in source was observed in 2015, with recent trade predominantly reported as source code F. Indonesia responded to the consultation relating to the RST. The species is nationally protected. Wild-sourced exports for commercial purposes are not permitted, although collection from the wild to augment breeding facilities occurs with harvest levels set annually. There are four current breeders of birdwing butterflies in Indonesia (species unspecified). Whilst in general, ranching of birdwings is widely considered not to impact on wild populations, no monitoring of the impact of offtake for captive production appears to take place in Indonesia. The basis for non-detriment findings for acquisition of specimens from the wild for ranching or captive breeding is unclear, and the impact of offtake on wild populations is uncertain; therefore, categorised as Unknown status.	Unknown status (Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)
Arhynchobdellida				
Hirudinidae				
<i>Hirudo medicinalis</i> (Northern Medicinal Leech)	Turkey	NT	Categorised as Near Threatened globally. <i>H. medicinalis</i> is the northernmost medicinal leech occupying the deciduous arboreal zone from the United Kingdom and southern Norway to the southern Urals and probably as far as the Altai Mountains. Turkey occurs far south of the known geographic range of <i>H. medicinalis</i> and does not appear to be a range State following a taxonomic split adopted at CoP15 (March 2010). Turkey has not published export quotas nor reported exports of <i>H. medicinalis</i> since 2011, although some importing countries continue to erroneously report imports using this name. On the basis that Turkey is not a range State for the species, categorised as Less concern. Molecular studies confirm that the medicinal leech occurring in commercial trade from Turkey is <i>H. verberna</i> ; hence, this species was also assessed.	Less concern

Species	Range State	IUCN	Summary	Recommendation
<i>Hirudo verbana</i>	Turkey	-	Occurs from Switzerland and Italy in the west, to Turkey and Uzbekistan, largely corresponding to the Mediterranean and sub-boreal steppe zone. Threatened by loss and deterioration of wetlands, reduction in availability of amphibian and mammalian hosts and localised over-collection. Widespread throughout the wetlands of Turkey, although populations thought to have declined. There are no national population estimates but surveyed wetlands in Eastern Anatolia were estimated to contain over 18.5 million medicinal leeches (equivalent to 24 845 kg). Turkey responded to the consultation relating to the RST. The majority of commercial exports are taken from two wetlands along the Black Sea coast and collection of leeches is prohibited for four months during the reproductive period. All leech collectors require a license and must submit origin certificates for all their products. Turkey published an annual export quota of 2000 kg for <i>H. verbana</i> 2014-2017. Exports are primarily in live, wild-sourced specimens, reported by weight and number. Combined exports of <i>H. medicinalis</i> and <i>H. verbana</i> have declined over the period 2006-2015 and have remained within quota. Annual reports were submitted by Turkey for all years 2006-2015. Available information indicates that a non-detriment finding in accordance with the provisions of Article IV is in place, therefore categorised as Less concern.	Less concern

Introduction

The Review of Significant Trade (hereafter abbreviated to RST) was established to ensure that the provisions of the Convention (specifically Article IV, relating to non-detriment findings) are properly applied for Appendix II species in order to ensure that international trade in CITES-listed species is maintained within biologically sustainable levels. The procedure for the RST is set out in Resolution Conf. 12.8 (Rev. CoP17). The resolution “Directs the Animals and Plants Committees, in cooperation with the Secretariat and experts, and in consultation with range States, to review the biological, trade and other relevant information on Appendix-II species subject to significant levels of trade, to identify problems and solutions concerning the implementation of Article IV, paragraphs 2 (a), 3 and 6 (a).”

Paragraph 1 (d) ii) directs the Secretariat to compile, or appoint consultants to compile, a report about the biology and management of trade in the species, including any relevant information from the range State. The UN Environment World Conservation Monitoring Centre (UNEP-WCMC) was asked by the CITES Secretariat to compile reviews for species/country combinations that were selected within the RST following CoP16 and retained in the review following AC28. This report provides an overview of conservation and trade status of 25 animal species-country combinations, provisionally classifying each into one of three categories defined in paragraph 1 (e) of Resolution Conf. 12.8 (Rev. CoP17) for review by the Animals Committee:

- **‘action is needed’** shall include species/country combinations for which the available information suggests that the provisions of Article IV, paragraph 2 (a), 3 or 6 (a), are not being implemented;
- **‘unknown status’** shall include species/country combinations for which the Secretariat (or consultants) could not determine whether or not these provisions are being implemented; and
- **‘less concern’** shall include species/country combinations for which the available information appears to indicate that these provisions are being met.

The recommendations for the 25 species-country combinations assessed can be found in Table 1 (p.3).

During the course of the review, it became clear that two species-country combinations that had been selected by the Animals Committee for inclusion within the RST following CoP16 did not appear to occur in the range State concerned. Although previous trade in *Hirudo medicinalis* originating in Turkey has been reported, Turkey is no longer considered to be a range State for this species following a taxonomic split. Molecular studies confirm that the medicinal leech occurring in commercial trade from Turkey is now considered to be *H. verbana*, hence this species was assessed for this report. *Malayemys subtrijuga* originating in Malaysia was also included in the RST following CoP16, although following a taxonomic split at CoP14 this species was recognised as *M. subtrijuga* (which does not occur in Malaysia) and *M. macrocephala* (occurs in Malaysia). Accordingly, *M. macrocephala* was assessed in this report.

Methods

Each taxon/country review provides the following information: history of the CITES Review of Significant Trade process; species characteristics, current distribution, conservation status, population trends and threats, recent trade (including CITES trade data and any available data on illegal trade), and management of the taxa in each range State, including any relevant legislation. The national legislation category as defined under the CITES National Legislation Project (CoP17 Doc. 22 Annex 3 (Rev.1)) for each range State is noted. Where there are multiple range States reviewed for a particular species, an overview of distribution, conservation status, threats, trade and management is also provided.

CITES trade data are provided for the period 2006-2015. Data were downloaded from the CITES Trade Database (trade.cites.org) on 21 March 2017. Unless otherwise specified, trade tables include all direct trade (i.e. excluding re-export data) in the taxa under review and include all sources, terms and units reported in trade. Trade volumes are provided as reported by both exporters and importers. Re-export data are noted separately, where appropriate. A list of CITES annual reports received from each range State included in the process, along with the date each became a Party to CITES, is provided in Table 2.

Table 2: Overview of annual report submissions by range States under review, 2006-2015

Country name	Entry into force of CITES	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Benin	28/05/1984	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cameroon	03/09/1981	✓	✓	x	✓	x	✓	x	x	x*	x
Ghana	12/02/1976	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
Guinea	20/12/1981	✓	x	✓	x	✓	x	x	✓	✓	x
Guyana	25/08/1977	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Indonesia	28/03/1979	✓	✓	✓	✓	✓	✓	✓	✓**	✓	✓
Jordan	14/03/1979	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lao People's Democratic Republic	30/05/2004	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Malaysia	18/01/1978	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mali	16/10/1994	✓	✓	✓	✓	✓	✓	✓	✓	✓	x
Sudan	24/01/1983	✓	✓	x	x	✓	✓	✓	✓	✓	x
Suriname	15/02/1981	✓	✓	✓	✓	✓	✓	✓	✓	✓	x
Syrian Arab Republic	29/07/2003	✓	✓	✓	✓	✓	✓	✓	x	x	x
Togo	21/01/1979	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
Turkey	22/12/1996	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key: ✓: annual report received. x: annual report not received; *Cameroon only submitted an annual report for Flora in 2014; **Indonesia's annual report submission in 2013 appears to be incomplete for *Ornithoptera* and captive reptiles; however this is unconfirmed.

All available Biennial reports to CITES¹ from each range State (from 2003 onwards, where available) were consulted for any information on confiscations/seizures. Two Parties reported significant seizures of species subject to this review; Jordan for *Testudo graeca* (no further details), and Malaysia for *Ophiophagus hannah* (details within species review).

The CITES Management and Scientific Authorities for each range State were contacted by post and email in February 2017. Authorities were asked to provide information relevant to the formation of non-detriment findings, including distribution, conservation status, trade and management of each taxon. Where possible, national experts were also contacted to provide additional country-specific information. While responses were received from six range States (Ghana, Guyana, Indonesia, Jordan, Malaysia and Turkey), nine range States did not respond to the consultation by the time of report submission (May 2017): Benin, Cameroon, Guinea, Lao Peoples Democratic Republic, Mali, Sudan, Suriname, Syrian Arab Republic, and Togo. A compilation of range State responses is provided in AC29 Doc. 13.2, Annex 2.

¹ Accessed from <https://cites.org/eng/resources/reports/biennial.php> on 10 May 2017.

Species reviews

Amazona festiva: Guyana

A. Summary

GUYANA:	Global population size is unknown, but considered ‘uncommon’ and declining at a moderately rapid rate. IUCN consider the subspecies occurring in Guyana (<i>A. f. bodini</i>) to be a recognised species (<i>A. bodini</i>), which is classified as Near Threatened globally. Occurs only in the north west of Guyana; no population information was located. One author considered the species rare, but in response to the consultation, Guyana noted that traders ‘easily sourced’ the species. Deforestation and trapping for the international trade are the main threats globally. Export quota of 520 annually since 2006; trade reported 2006-2015 was within quota (trade in the last 5 years ~30-60 birds per year, and 723 live wild individuals exported in total 2006-2015 as reported by Guyana). Annual reports were submitted by Guyana for all years 2006-2015. No surveys or monitoring has taken place and there is no management plan for the species, although harvesting is managed with closed seasons during the breeding and nesting season. The basis for non-detriment findings for export of wild-sourced specimens and the establishment of the high quota for this apparently uncommon and range-restricted species in Guyana does not appear to be robust, therefore categorised as Action is needed.	RECOMMENDATION: Action is needed
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RST Background

Amazona festiva (Festive Parrot) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *A. festiva* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, as well as an overall decrease in trade, on the basis of trade data presented in AC27 Doc. 12.5. Responses to the Secretariat’s consultation had been received from Brazil, Colombia and Peru at AC28 (August, 2015), (AC28 Doc. 9.4 (Rev.2)). Brazil, Colombia, Ecuador, Peru and the Bolivarian Republic of Venezuela were removed from the RST process, whilst Guyana was retained (AC28 Com. 8, AC28 Summary Record).

B. Species characteristics

Taxonomic note: Based on del Hoyo *et al.* (2014), BirdLife International (2016) recognise *A. bodini* as a new species that has been split from *A. festiva*. The CITES standard reference for this species does not consider *A. bodini* to be a separate species, although does consider that there are two subspecies *A. f. festiva* and *A. f. bodini* (Dickinson, 2003).

Biology: *Amazona festiva* is a parrot of approximately 35 cm length, with green plumage and dark red and blue feathers behind the eyes, a red coloured rump and a dark grey bill (Lopes *et al.*, 2015; BirdLife International, 2016). The species inhabits seasonally and permanently flooded forests in humid lowland primary forests near major rivers and swampy forest (Juniper and Parr, 1998; BirdLife International, 2016). The Scientific Authority (SA) of Guyana (*in litt.* to UNEP-WCMC, 2017) reported that the species occurred in swampy areas with an abundance of palms ‘Manicole’ (*Prestoea tenuiramosa*), ‘Cookrit’ and ‘ite’, which are used to roost. There are a few reports of this species occurring in gallery forest, cacao plantations and savannahs with scattered trees (Juniper and Parr, 1998). The upper elevation limit for the species [*A. bodini*] was reported to be 1000m (BirdLife International, 2016). *A. festiva* occur in pairs or flocks of up to 50 individuals, and form communal roosts in the tree canopy in late afternoon or evening (Juniper and Parr, 1998). *A. festiva* feed on cocoa, berries, fruits, nuts, seeds, leaves and on occasion, eggs and insects (Lopes *et al.*, 2015).

In captivity, sexual maturity is reached between three and four years old, with breeding behaviour observed between November to March, which coincides with the rainy season in the Amazon basin (Licht, 1968). The breeding and nesting season in Guyana was reported to be January to April (SA of Guyana, *in litt.* to UNEP-WCMC, 2017). The life span of *A. festiva* is 12.3 years on average (BirdLife International, 2016).

C. Country reviews

Guyana

Distribution: *A. festiva* occurs in Brazil, Bolivia, Colombia, Ecuador, Guyana, Peru and Venezuela (Lopes *et al.*, 2015). Juniper and Parr (1998) noted that *A. f. bodini* occupied north-west Guyana and Venezuela in the southern Apure on the Rio Meta and middle Orinoco to Delta Amacuro, and *A. f. festiva* occurred in eastern Colombia, Peru and Brazil.



Figure 1. The distribution of *A. festiva* [*A. bodini*] according to BirdLife International, 2017.

In Guyana, *A. festiva* [*A. bodini*] has been recorded in the capital city Georgetown (BirdLife International, 2016). O’Shea (pers. comms. to UNEP-WCMC, 2017) reported that a small population had become resident within a botanic garden in the city, but considered that only small numbers of *A.*

festiva may occur beyond Georgetown in Guyana, in a sporadic or seasonal pattern, perhaps along the large rivers or to the north west of Guyana. Figure 1 provides a range map for *A. festiva* [*A. bodini*] in Guyana. Forshaw (1989) also reported a sporadic occurrence of *A. festiva* to the North West of Guyana. Seasonal movements away from its outer range may explain its sporadic appearance (Juniper and Parr, 1998). Occurrence in the North Western District was confirmed by the SA of Guyana (*in litt.* to UNEP-WCMC, 2017). O'Shea (pers. comms. to UNEP-WCMC, 2017) stated that there were plausible but unconfirmed reports of *A. festiva* occurring along the Mahaicony and Abary Rivers. Of the species commonly in trade in Guyana, Hanks (2005) considered *A. festiva* to be the most range restricted.

Based on the revised taxonomy considered by BirdLife International (2016), Guyana is not included within the range of *A. festiva* according to the IUCN Red List assessment.

Population status and trends: *A. festiva* [*A. bodini*] was assessed by the IUCN as Near Threatened (BirdLife International, 2016). No global estimates of population size are available for *A. festiva* [*A. bodini*], although the population is considered to be decreasing at a moderately rapid rate approaching 30 per cent over three generations (37 years) owing to habitat loss and degradation, hunting and capture for trade (BirdLife International, 2016). The species was described as 'uncommon' (Stotz *et al.*, 1996, cited in Birdlife International, 2016), however, traders of *A. festiva* in Guyana reported that individuals of this species could be "easily sourced upon request" (SA of Guyana, *in litt.* to UNEP-WCMC, 2017). In an assessment of abundance for all traded birds of Guyana, Hanks (2005) ranked *A. festiva* as category 1, meaning 'most rare'.

No further population information was located for Guyana.

Threats: The main threats to *A. festiva* [*A. bodini*] were considered by the IUCN to be deforestation, and hunting and trapping for international trade (BirdLife International, 2016). However, the SA of Guyana (*in litt.* to UNEP-WCMC, 2017) stated that suitable habitat for the species was abundant and much of the ecosystem was "intact and fully functional"; thus habitat destruction was not thought to be a major risk for the species in Guyana.

Trapping for trade was not considered a major threat in Guyana on the basis of low demand (SA of Guyana, *in litt.* to UNEP-WCMC, 2017). In Mabaruma, northern Guyana, individuals were sold by harvesters for USD 22.35 to middle men, and these traders then sold individuals for approximately USD 46 on the general market (Hanks, 2005).

Trade: *A. festiva* was initially listed in CITES Appendix III on 26th February 1976 by Ghana, as part of the family listing for Psittacidae spp. The order Psittaciformes was subsequently listed in Appendix II on 6th June 1981. CITES annual reports were submitted for all years by Guyana for the period 2006-2015. Guyana's annual reports for 2011 and 2012 covered the period April 2011 to April 2012 and April 2012 to April 2013, respectively. The annual report received for 2013 covered April-December 2013. Guyana published export quotas for trade in live *A. festiva* in 2006 and then on an annual basis 2008-2017 (Table 1). Quotas published in 2010-2013 covered trade across multiple years.

The SA of Guyana (*in litt.* to UNEP-WCMC, 2017) stated that from 2005-2015, the national quota was set at 520 live specimens, but the higher quota in 2014 was a result of cutting the 2013 export year short, to align the licensing year with the calendar year. Trade in *A. festiva* did not exceed quotas published by Guyana for the period 2006-2015 (Table 1).

Table 1: CITES export quotas for live wild-sourced *Amazona festiva* from Guyana, 2006-2017, and global direct exports as reported by countries of import and Guyana, 2006-2015. Guyana has submitted all annual reports 2006-2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	520	-	520	520	520	520	520	520	888	520	520	520
Reported by importer	211	64	15	74	30	89	18	77	52	23		
Reported by Guyana	131	59	118	47	140	28	28	50	62	60		

According to data in the CITES Trade Database, direct trade in *A. festiva* from Guyana predominantly consisted of live, wild-sourced birds for commercial purposes, with 723 reported by Guyana and 599 reported by importing countries 2006-2015 (Table 2). Between 2006 and 2015 direct exports of live, wild-sourced birds declined by 54 per cent as reported by Guyana and 92 per cent according to importing countries.

Table 2: Direct exports of *Amazona festiva* from Guyana, 2006-2015. Guyana has submitted all annual reports 2006-2015. All direct trade was in wild-sourced birds. Quantities rounded to one decimal place, where applicable.

Term	Unit	Purpose	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	
feathers	-	S	Importer												
			Exporter		96										96
live	-	B	Importer								10	7	7	24	
			Exporter												
		T	Importer	211	64	15	74	30	89	18	67	15	16	599	
			Exporter	131	59	118	47	140	28	28	50	62	60	723	
		Z	Importer										30		30
			Exporter												
specimens	I	S	Importer										<0.1	<0.1	
			Exporter												
		T	Importer							<0.1					<0.1
			Exporter			<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
	-	M	Importer									10		10	
			Exporter												
		T	Importer							1					1
			Exporter			20					1				

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Low levels of indirect trade in *A. festiva* originating in Guyana were reported 2006-2014. Indirect trade primarily comprised live, wild-sourced and captive-bred *A. festiva* for commercial purposes (Table 3).

Table 3: Indirect exports of *Amazona festiva* originating in Guyana, 2006-2015. All indirect trade was in live birds.

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
B	W	Importer	4										4
		Exporter											
T	C	Importer											
		Exporter	42										42
	W	Importer	8			4							12
		Exporter	13						10		4		

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Hilty (2003) reported that Guyana was a demand centre for illegal traded Psittacidae species. Birds were reported to be smuggled from Venezuela by the Warao Indians across the Orinoco River (Desenne and Strahl, 1991). Over 50 000 Venezuelan Psittacid birds were estimated to be exported in high season

between February and June and the illegally traded birds were “highly likely” to contribute to the legal export quota of Psittacidae in Guyana (Desenne and Strahl, 1991).

Management: Guyana became a party to CITES on 29th May 1977, with entry into force on 25th August 1977. No existing species-specific management plan is in place for this species in Guyana (SA of Guyana, *in litt.* to UNEP-WCMC, 2017). Harvesting of *A. festiva* occurs annually from 1st June to 31st December in Guyana, and is not permitted during the closed season from 1st January until 31st May (coinciding with the breeding and nesting season)(SA of Guyana, *in litt.* to UNEP-WCMC, 2017).

Guyana’s ‘Wildlife Regulations’ of 1987 state that all trappers and commercial exporters, apart from those who trap for ‘sustenance’, must be licensed annually by the CITES Management Authority and accurate records must be kept (Government of Guyana, 1997). The ‘Wildlife Conservation and Management Bill’ of 2016 addresses the protection, management, sustainable use and trade of Guyana’s wildlife. The Act applies to all species included in three schedules, corresponding to CITES listings I, II and III, and specifies that a Commission will implement the advice of the Wildlife Scientific Committee on whether or not proposed exports of species specified in the three schedules will be detrimental to the survival of the particular species (Government of Guyana, 2016). *A. festiva* is included in the second Schedule, as part of the listing of Psittaciformes (Government of Guyana, 2016).

No conservation actions or research is known to be currently underway for *A. festiva* or *A. bodini* (BirdLife International, 2016). According to the SA of Guyana (*in litt.* to UNEP-WCMC, 2017), *A. festiva* occurs within protected areas and managed spaces within the country, although none were specified.

No further information was located relating to management of the species in Guyana.

Through its national legislation project, the CITES Secretariat categorised the national legislation in Guyana as legislation that is believed generally not to meet all of the requirements for the implementation of CITES. Whilst the 2016 Bill has not yet entered into force, a decree to give it legal effect is imminent, and the categorisation under the national legislation project is expected to change (CITES Secretariat, pers. comm, 2017).

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

None identified.

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Uromastyx aegyptia: Jordan, Syrian Arab Republic

A. Summary

Global status Globally Vulnerable, with a widespread distribution. Population sizes unknown, but declining.

JORDAN:	Considered widespread in the deserts of Jordan, with some reports of being 'locally common' but declining in the eastern desert and 'sharp declines' observed in deserts of Wadi Rum and Wadi Araba in the south. Mainly threatened by habitat loss, but also by domestic and international use as a medicine and aphrodisiac, with international trade reported to have contributed to declines in the east. One unverified account of illegal smuggling was reported. Direct exports 2006-2015 were mainly live, captive-bred individuals and have declined in recent years, with no wild trade reported by exporters or importers since 2011. Whilst Jordan reported exports of 110 live specimens with no source specified in 2014, no corresponding imports were reported. Annual reports were submitted by Jordan for all years 2006-2015. Jordan responded to the consultation relating to the RST. No population surveys or monitoring has been undertaken and no management plan for the species exists. Unclear if recent legislation gives the species total protection from hunting and trade. However, given the lack of wild-sourced trade reported in the four most recent years (2012-2015), categorised as Less concern.	RECOMMENDATION: Less concern
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SYRIAN ARAB REPUBLIC:	Reported to occur in the Syrian Desert, southern Syria, with a lack of information on localities, population size/status and threats. There is political instability in the country, and Syria does not appear to have functioning CITES Authorities. Low levels of trade 2006-2015 in captive-bred and ranched individuals, in the years 2011-2014 only, and no reported wild-sourced trade by Syria or importers. Annual reports were received from Syria 2006-2012, but none received since 2012. No information on management in Syria; the country did not respond to the consultation relating to the RST. However, given the lack of wild-sourced or ranched trade reported in the three most recent years (2013-2015) by Syria or importers, categorised as Less concern. Whilst not related to the implementation of Article IV, re-exports by the UAE of live, captive-bred specimens originating in Syria appear to be substantially higher than reported imports to the country.	RECOMMENDATION: Less concern
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RST Background

Uromastix aegyptia (Egyptian Spiny-tailed Lizard) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *U. aegyptia* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, on the basis of trade data presented in AC27 Doc. 12.5. At AC28 (August, 2015), responses to the Secretariat's consultation had been received from Iraq, Israel, Qatar, Saudi Arabia and United Arab Emirates (AC28 Doc. 9.4 (Rev.2)). Bahrain, Egypt, Islamic Republic of Iran, Iraq, Israel, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen were removed from the RST process, whilst Jordan and Syrian Arab Republic (hereafter referred to as Syria) were retained (AC28 Com. 8, AC28 Summary Record).

U. aegyptia was previously included in the RST following CoP10 (1998). At AC15 (July, 1999), *U. aegyptia* was retained in the process due to concerns about the origin of specimens, and the scientific basis for exports (AC15 Proceedings). Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Syria and United Arab Emirates were removed from the process whereas Egypt was retained. Recommendations to Egypt were given in document AC16 7.1, and at SC45 (June, 2001) it was concluded that no further action was needed (SC45 Summary Report).

The genus *Uromastix* spp. was also reviewed as a candidate for the RST (AC20 Doc. 8.5) for AC20 (March, 2004), however, only the five most-traded species [not including *U. aegyptia*] were selected for inclusion in the RST process, due to financial restrictions (AC20 WG1 Doc. 1, AC20 Summary Report).

B. Species characteristics

Taxonomic note: The current CITES standard taxonomic reference (Wilms *et al.*, 2009, adopted at CoP16 (CoP16 Doc. 43.1) recognises three subspecies of *U. aegyptia*: *U. a. aegyptia*, *U. a. leptieni* and *U. a. microlepis*; formerly only two subspecies were recognised (*U. a. aegyptia* and *U. a. microlepis*) (Wilms, 2005). The taxonomy of the genus *Uromastix* has been somewhat confused over the years, with new taxa described, various changes in taxonomic rank and some remaining uncertainty with regards to relationships between taxa (e.g. Wilms and Böhme, 2007; Wilms *et al.*, 2009).

Biology: *U. aegyptia* is a large bodied (700 mm), ground dwelling, diurnal lizard of the Agamidae family, which typically inhabits arid desert and semi-desert environments (Wilms *et al.*, 2010; 2012). *U. aegyptia* is primarily herbivorous, although it also consumes invertebrates (Wilms *et al.*, 2010; Castilla *et al.*, 2011) and has been found to scavenge on vertebrates (Castilla *et al.*, 2011). Food sources include buds, leaves, fruits, shrubs and other desert plants (Nemtzov, 2008; Monchot *et al.*, 2014).

U. aegyptia was reported to be predominantly a solitary species (Nemtzov, 2008), although Al-Ogily and Hussain (1983) reported that *U. aegyptia* lived in small groups of three to four individuals at Al-Kharj, Saudi Arabia, and Wilms *et al.* (2012) reported that the species lived in small colonies. The life span of *U. aegyptia* in the wild was reported to be up to 20 years, with sexual maturity at four to six years (Nemtzov, 2008). Bouskila (1984 in: Nemtov, 2008) observed that females lay one clutch of eggs (clutch size: 17- 41 eggs) in May or June with hatching occurring at the end of August; it was noted that females do not lay eggs every year. The species has low juvenile survivorship due to high rates of predation from raptors, including *Aquila chrysaetos* (B. Shalmon, pers. comm in: Nemtzov, 2008).

U. aegyptia provides an ecological role by disturbing the “compact, gravelly” substrate through burrowing behaviour; this facilitates seed germination, allowing plants to avoid the salty conditions of the surface soil layer (Disi, 1996; Nemtzov, 2008). *Uromastix* burrows also provide important refuges for a number of taxa, including birds, reptiles and invertebrates (Baha El Din, 2006; Wilms *et al.*, 2010).

Distribution: *U. aegyptia* has a wide distribution, ranging eastwards from Egypt (north east and to east of the Nile) across most of the Arabian Peninsula (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Yemen), Israel, Jordan, Lebanon, Syria, Iraq and into coastal Iran (Wilms and Böhme, 2007; Wilms *et al.*, 2009, 2012). Populations were reported to be very fragmented throughout its wide range (Wilms *et al.*, 2012).

Population status and trends: *U. aegyptia* is categorised as Vulnerable in the IUCN Red List due to a suspected population decline of over 30 per cent over three generations (15 years), with this decline expected to continue (Wilms *et al.*, 2012). The assessment considered that the decline could be as high as 50 per cent over the same time span (Wilms *et al.*, 2012). *U. aegyptia* was reported to be still locally common in parts of the Arabian Peninsula, especially in some protected areas, although overall was in decline (Wilms *et al.*, 2012). No global population estimates are available.

Robinson (1995) recorded a population density of 4.4 to 6.3 individuals per ha in Kuwait. Within the Arava Valley population density estimates have varied from 3.4 adults (Bouskila, 1984) to 10 individuals per ha (Molco and Ben-David, 2000) with 18.5 burrows per ha located with 51% use (Gottlieb and Vidan, 2007 in: Nemtov 2008). Kordges (1998 in: Nemtov 2008) observed 0.1 to 4 individuals per hectare in central Saudi Arabia.

Threats: The main threats to the species were considered to be habitat loss and overharvesting (Nemtov; 2008; Wilms *et al.*, 2012). Wilms *et al.* (2009) noted that *Uromastyx* spp. were “heavily hunted for food and for the production of souvenirs and traditional medicine”, and Nemtzov (2008) noted that the scale of exploitation in *Uromastyx* spp. could “lead to local depletions”. *U. aegyptia* was considered to be subject to “severe” collection pressure for the international pet trade (Baha El Din, 2006), with trade for medicinal use and illegal trade also reported (Wilms *et al.*, 2012). Illegal trapping for food consumption by foreign labourers, and for consumption and use of skins by local Bedouins was reported in Israel (Nemtzov, 2008); seasonal capture and domestic trade of *U. a. microlepis* for consumption was also noted to be at high levels in Saudi Arabia (Wilms *et al.*, 2010). The use of *U. aegyptia* capsules, oil, fat and skin has been noted in Malaysia for a variety of health purposes and traditional medicines (Ching and Chng, 2016). Illegal sale of *U. aegyptia* derivatives in medicinal products was reported to occur in Malaysia without the species being listed on the ingredients (possibly in order to avoid Malaysian legislation), despite *U. aegyptia* being advertised online as the main active ingredient (Ching and Chng, 2016).

Overview of trade and management: *U. aegyptia* was first listed in CITES Appendix III on 22nd April 1976 by Tunisia and was subsequently listed in Appendix II on 4th February 1977, as part of the genus listing for *Uromastyx*. According to data in the CITES Trade Database, global direct trade was predominantly in live, captive-bred animals for commercial purposes: 12 735 over the ten years as reported by exporters and 8843 as reported by importers. Direct export of live animals showed an overall decline 2006-2015, albeit with an increase in trade reported in 2011.

Several range States have taken a precautionary management approach and do not permit exports of wild-sourced individuals of this species, including Israel (Notification No. 2004/025) and Egypt (Notification No. 662, dated 1992). Whilst the species does occur in several protected areas across its range, the requirement for additional protected areas was identified, as was the need for additional research into captive breeding for the purpose of trade (Wilms *et al.*, 2012).

C. Country reviews

Jordan

Distribution: The subspecies *U. aegyptia microlepis* was reported to occur in Jordan (Disi *et al.*, 2014; Wilms and Böhme, 2007; Wilms *et al.*, 2009). Disi (1999) and the CITES Management Authority (MA) of Jordan (*in litt.* to UNEP-WCMC, 2017) reported the occurrence of *U. aegyptia* in north-eastern, eastern, southern and south-eastern Jordan. It was reported to occur east of the Arava valley (south of the Dead Sea Basin), east of the al-Jafr Basin in southeast Jordan and the Wadi Araba desert boarder region between Jordan and Israel (Disi *et al.*, 1999; Wilms and Böhme, 2007; McWhorter *et al.*, 2013; Monchot *et al.*, 2014). *U. aegyptia* was considered to be “widespread” in deserts in the country, however distribution was reported to be scattered (Modrý *et al.*, 2004).

Population status and trends: Wilms *et al.* (2012) noted that the species was declining in parts of Jordan. Whilst *U. aegyptia* was considered to be “only locally common” in Jordan (Modrý *et al.*, 2004), the subspecies *U. aegyptia microlepis* was described as “common” (being defined as “found in relatively large numbers”) within the wetland Aqaba of southern Jordan (Al-Quran, 2009). The CITES MA (*in litt.* to UNEP-WCMC, 2017) reported that there was no data on the population size, however, in the deserts of Wadi Rum and Wadi Araba (in the Southern Desert region), it was reported that a “sharp decline of *U. a. microlepis* was observed over the past 25 years”. The species was also reported to be diminishing in the eastern desert (CITES MA of Jordan, *in litt.* to UNEP-WCMC, 2017).

Threats: Disi *et al.* (2014) considered *U. aegyptia* in Jordan to require “urgent protection” due to habitat loss, namely the destruction of desert vegetation as a result of agricultural activities in the eastern and southern desert and Wadi Araba system. *U. aegyptia* was reported to be used for medicinal purposes in Jordan, to treat infertility, neurological failure and as a ‘sexual tonic’ (Aloufi and Eid, 2016). The CITES MA of Jordan (*in litt.* to UNEP-WCMC, 2017) reported that the declines in the eastern desert were due to extensive capture to supply the demand in neighbouring countries for use as an aphrodisiac, with individuals sold for up to USD 50.

An online report of illegal smuggling of live animals from Jordan into Malaysia without CITES documentation was reported by Ching and Chng (2016).

Trade: All CITES annual reports have been submitted by Jordan for the period 2006-2015. Jordan did not publish export quotas for *U. aegyptia* 2006-2015.

According to data in the CITES Trade Database, direct trade in *U. aegyptia* from Jordan primarily consisted of live individuals exported for commercial purposes, the majority of which were captive-bred. Jordan reported 10 230 live individuals exported 2006-2015, with importing countries reporting 5402. Lower levels of trade in live, wild-sourced individuals were also reported over the ten year period; total importer reported quantities were more than double that reported by Jordan (Table 1). A permit analysis identified a number of transactions in 2008 which Jordan reported to involve captive-bred individuals but were reported as wild-sourced by importing countries. The United States was the main importer of live *U. aegyptia* from Jordan.

Table 1: Direct exports of live *Uromastyx aegyptia* from Jordan, 2006-2014. Jordan has submitted all annual reports 2006-2015. No trade was reported in 2015.

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
T	C	Importer	746	2095	913	404	90	577	180	397		5402
		Exporter	2735	2790	2450	800	180	1275				10230
	W	Importer	300		1300							1600
		Exporter		380		75	25	200				680
-	-	Importer										
		Exporter									110	110

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *U. aegyptia* originating in Jordan was re-exported via the United States to Canada in 2006 only, and comprised very low levels of live captive-bred and wild-sourced animals re-exported for commercial purposes.

Management: Jordan became Party to CITES on 14th December 1978, with entry into force on 14th March 1979.

U. aegyptia was reported to be listed in Appendix III of Bylaw No. 43 of 2008, issued in accordance to article No. 57 of the Provisional Agriculture Law No. 44 of 2002 [since replaced by the Agriculture Law No. 13 of 2015] (Disi *et al.*, 2014; CITES MA of Jordan *in litt.* to UNEP-WCMC, 2017). This bylaw was reported to categorise reptiles and other wildlife banned from hunting and trade, according to the level of protection (Disi *et al.*, 2014). However, the bylaw itself could not be located and it is unclear whether there is a complete prohibition on hunting and trade.

Regulation No. Z 34 of 2003, issued under Article 57, paragraph (a) of the Provisional Agriculture Law No. 44 of 2002, regulates wildlife protection, hunting and trade (Ministry of Agriculture, 2003; Disi *et al.*, 2014).

This species is covered by the Jordanian Government strategy on the conservation and sustainable use of biological diversity (The Hashemite Kingdom of Jordan, 2001). Obstacles preventing the conservation of biodiversity were reported to include a lack of public awareness of the importance of environmental protection, updating legislations and sanctions, updating jurisdictional processes, law enforcement and lack of implementation of environmental strategies (The Hashemite Kingdom of Jordan, 2001). By overcoming these obstacles, this may improve management for *U. aegyptia* and the wider ecosystem. The CITES MA of Jordan stated that there were no current strategies to monitor current populations and no specialised management plans, although the species was reported to be present in some nature reserves (CITES MA of Jordan *in litt.* to UNEP-WCMC, 2017).

Through its national legislation project, the CITES Secretariat categorised the national legislation in Jordan as Category 2, meaning “legislation that is believed generally not to meet all of the requirements for implementation of CITES”.

Syrian Arab Republic

Distribution: The subspecies *U. aegyptia microlepis* was reported to occur in Syria (Wilms and Böhme, 2007; Wilms *et al.*, 2009), although there is a lack of detailed distribution information within the country. Disi *et al.* (1999) reported the species’ occurrence northwards of Jordan into the Syrian Desert [southern Syria] and Martens (1997) noted *U. aegyptia* to be present in the Syrian basalt desert east of Jebel ed Drouz [in the far south] and from Abu Kemal in eastern Syria.

Population status and trends: No specific information on the population status or trends in Syria could be located.

Threats: There is political instability in the country, and Syria does not appear to have functioning CITES Authorities. The domestic trade in *U. aegyptia* in Syria is thought to be mainly for food (Wilms *et al.*, 2012). Live *U. aegyptia* were observed being sold at an animal market in Damascus on multiple occasions (Amr *et al.*, 2007).

Trade: CITES annual reports have been submitted by Syria 2006-2012. Syria did not publish export quotas for *U. aegyptia* 2006-2015.

According to data in the CITES Trade Database, direct trade in *U. aegyptia* from Syria consisted of live captive-bred and ranched individuals exported for commercial purposes, reported 2011-2014 only (Table 2).

Table 2: Direct exports of *Uromastyx aegyptia* from Syria, 2011-2015. Syria has not submitted annual reports for 2013-2015. All direct trade was in live animals for commercial purposes.

Source	Reported by	2011	2012	2013	2014	2015	Total
C	Importer	300			400		700
	Exporter	300	10				310
R	Importer						
	Exporter	100	100				200

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *U. aegyptia* originating from Syria was solely in live, captive-bred individuals for commercial purposes, reported 2011-2014 (Table 3). Re-exports of live, captive-bred specimens originating in Syria were substantially higher than reported direct imports 2011-2015 (Table 3). The United Arab Emirates was the predominant re-exporter. The UAE became a party to CITES in 1990; no imports of *U. aegyptia* originating in Syria were reported by UAE prior to 2011, with 300 live captive-bred specimens reported imported in 2011. A permit analysis identified a number of transactions reported by UAE as re-exports originating in Syria which importers reported as direct exports from UAE.

Table 3: Indirect exports of *Uromastyx aegyptia* originating in Syria, 2011-2016. All direct trade was in live, captive-bred animals for commercial purposes.

Reported by	2011	2012	2013	2014	2015	Total
Importer		164	100			264
Exporter	750	320	700	120		1890

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Management: Syria became a Party to CITES on 30th April 2003, with entry into force on 29th July 2003. No detailed information on the management or permitted offtake of *U. aegyptia* in Syria was located. The CITES Authorities of Syria were consulted by email and post, however only one email address appeared to be functioning and the letter sent by post was returned undelivered.

Through its national legislation project, the CITES Secretariat categorised the national legislation in Syria as Category 3, meaning “legislation that is believed generally not to meet the requirements for implementation of CITES”.

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

Re-exports of live, captive-bred specimens originating in Syria from UAE were substantially higher than reported direct imports 2011-2015; the reason for this discrepancy is unclear.

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Trioceros montium: Cameroon

A. Summary

CAMEROON: Endemic to Cameroon and categorised by the IUCN as Near Threatened. Occurs in montane and submontane habitats only. Restricted in range to the south western highlands. Population size unknown, but considered declining, with local depletions reported at Mt. Cameroon where the species is collected for international trade. Considered vulnerable to a range of threats including habitat loss and international trade due to its limited range. Trade 2006-2015 mainly in live, wild-sourced individuals (897 individuals as reported by importers), although no reported trade in 2014 or 2015 (by either Cameroon or importers). Cameroon submitted annual reports for 2006, 2007, 2009 and 2011 only. Illegal trade reported. Cameroon did not respond to the consultation relating to the RST for this species. No information on management was located. The basis for non-detriment findings for export of wild-sourced specimens for this endemic and range restricted species has not been provided, and international trade appears to be impacting the species, therefore categorised as Action is needed.

RECOMMENDATION:

Action is needed

RST Background

Trioceros montium (Mountain Chameleon) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *T. montium* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, as well as in 2012, although also showed an overall decrease in trade, on the basis of trade data presented in AC27 Doc. 12.5. No response to the Secretariat's consultation had been received from Cameroon, its only range State by AC28 (August 2015) (AC28 Doc. 9.4 (Rev.2)), hence Cameroon was retained in the RST process (AC28 Com. 8, AC28 Summary Record).

B. Species characteristics

Taxonomic note: *T. montium* was formerly included in *Chamaeleo* spp. (Glaw, 2015), prior to a taxonomic change adopted at CoP16 (CoP16 Doc.43.1 (Rev.1) Annex 3). Four subspecies were recognised by Mertens (1964): *Chamaeleo montium feae*, *Chamaeleo montium montium*, *Chamaeleo montium camerunensis*, and *Chamaeleo montium grafi*, however *C. montium grafi* was considered an invalid subspecies (Klaver and Böhme, 1992).

Biology: *Trioceros montium* is a predominantly green chameleon with a lighter belly and darker head that reaches a maximum total length of 25 cm (Tilbury, 2010). Males have two large annulated horns on the snout and females have smaller conical growths (Klaver and Böhme, 1992). The species [*Chamaeleo montium*] preys almost exclusively on arthropods (Hofer *et al.*, 2003). Similar species that might be confused with *T. montium* are *Chamaeleo (T.) camerunensis*, *C. (T.) pfefferi* (Pfeffer's Chameleon), *C. (T.) cristatus* (Crested Chameleon), *C. (T.) feae* (Fe's Chameleon), *C. (T.) wiedersheimi*

(Mt. Lefo's or Peacock Chameleon), *C. (T.) quadricornis* (Four-horned Chameleon), and *C. (T.) balebicornutus* (Anderson *et al.*, 2005).

T. montium [*Chamaeleo montium*] inhabits sub-montane and montane areas between 700-1900 m above sea level (Gonwouo *et al.*, 2006) and 500-1300 m above sea level (Klaver and Böhme, 1992). It is found 1.5-3.5 m above the ground (Anderson and Van Heygen, 2013), with a mean perch height of 1.9 m (Gonwouo *et al.*, 2006). Individuals have been found in a variety of habitat types including montane forest, savannah (Gonwouo *et al.*, 2006), gallery forest (Hofer *et al.*, 2003; Gonwouo *et al.*, 2006), secondary forest, farm bush (Hofer *et al.*, 2003), forest edges, open landscape shrubbery, plantations and hedges along roads and gardens near and within human settlements (Klaver and Böhme, 1992). Despite having a wide distribution across different habitat types, *T. montium* [*Chamaeleo montium*] demonstrates a preference for degraded forest habitats such as mature secondary forest, disturbed farm bushes and plantations (Gonwouo *et al.*, 2006). Females reach sexual maturity at 6 months of age and produce clutches of 3-12 eggs with a mean of 6.5 eggs (Herrmann and Herrmann, 2005) every 2.5 months (Tilbury, 2010).

C. Country reviews

Cameroon

Distribution: *T. montium* [*Chamaeleo montium*] is endemic to the south western highlands of the Cameroon mountain chain (Gonwouo *et al.*, 2006). It is described as having a “small range size”, with a distribution size of approximately 10 000 km², although actual area of occurrence is considered to be much smaller (LeBreton and Carpenter, 2011). Specific locations where it is known to occur are the Bakossi Mountains (Tilbury, 2010), Mount Nlonako (Harbourt and Herrmann, 2002 in: LeBreton and Carpenter, 2011), Banyang-Mbo Wildlife Sanctuary, Mbulu Hills (Gonwouo *et al.*, 2006), Mount Manenguba (Tilbury, 2010; Klaver and Böhme, 1992), Takamanda Forest Reserve, Bamenda Highlands (Gonwouo *et al.*, 2006; Tilbury, 2010), Mount Kupe, Rumpi Hills, Mamfe District and Mount Cameroon (Klaver and Böhme, 1992; Gonwouo *et al.*, 2006; Tilbury, 2010).

Population status and trends: The IUCN Red List describes the global population of *T. montium* as decreasing and classifies it as Near Threatened due to localised loss of habitat leading to habitat fragmentation (LeBreton and Carpenter, 2011). *T. montium* [*Chamaeleo montium*] was found to be one of the most frequently encountered reptiles at Mt. Kupe (900-1200 m above sea level) during surveys in 1994 (Hofer *et al.*, 2000), and it was reported to be abundant at Mt Nlonako (Harbourt and Herrmann, 2002 in LeBreton and Carpenter, 2011). The species was also considered abundant at Mt. Cameroon in 2001 (Gonwouo, 2002), however, local people around Mount Cameroon who collect chameleons for the international pet trade described the population of *T. montium* [*Chamaeleo montium*] as declining, noting that at the time of the survey, May 2003 to December 2005, it took them longer to find the species than in previous years (Gonwouo *et al.*, 2006).

Threats: The main threats facing *T. montium* were considered to be a small range size, and specific habitat and elevation requirements which make the species vulnerable to habitat change and degradation, climate change and the international pet trade (LeBreton and Carpenter, 2011). Agricultural expansion in the Cameroon highlands was also considered to pose a threat to the species (LeBreton and Carpenter, 2011). *T. montium* [*Chamaeleo montium*] was reported to be collected in large numbers around Mount Cameroon and Mount Manenguba (Gonwouo *et al.*, 2006) and was considered to be the most harvested species in the area around Mount Cameroon, with a local value of approximately USD 2 per individual (Gonwouo, 2002). Several collectors noted the low survivorship of this species, meaning that a higher number of individuals would need to be collected than the number

ordered (Gonwouo, 2002). In the areas surrounding Mount Manenguba and Mount Kupe, *T. montium* was reported to be often killed by people when found, as it is believed to be poisonous (Tilbury, 2010).

Trade: *T. montium* was listed in CITES Appendix II on 4th February 1977 as part of the genus listing for *Chamaeleo* spp. prior to a taxonomic change at CoP16. For the period 2006-2015, Cameroon submitted CITES annual reports in 2006, 2007, 2009 and 2011. Cameroon published an export quota of 1500 live individuals each year 2006-2009 (Table 1); no quotas have been published since 2010. Reported trade remained within the export quotas published by Cameroon (Table 1).

Table 1: CITES export quotas for live, wild-sourced *Triceros montium* from Cameroon 2006-2017 and global direct exports of live, wild-sourced *T. montium* as reported by countries of import and Cameroon, 2006-2015. Cameroon has not submitted annual reports for 2008, 2010 and 2012-2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	1500	1500	1500	1500	-	-	-	-	-	-	-	-
Reported by importer	195	120	135	50	30	43	259	120				
Reported by Cameroon	225	265		30		280						

Direct trade in *T. montium* from Cameroon 2006-2015 primarily comprised live, wild-sourced animals for commercial purposes, with 800 reported by Cameroon and 897 reported by importers (Table 2). Trade was reported 2006-2013 according to importers and peaked in 2012 with an increase of more than six times compared to 2011; trade reported by Cameroon peaked in 2011.

Table 2: Direct exports of *Triceros montium* from Cameroon, 2006-2013. No trade was reported 2014-2015. Cameroon has not submitted annual reports for 2008, 2010 and 2012-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	Total
bodies	S	W	Importer							20		22
			Exporter						2	4		
live	P	W	Importer				55					55
			Exporter									
	T	C	Importer				20					20
			Exporter									
		W	Importer	195	65	135	50	30	43	259	120	897
			Exporter	225	265		30		280			800

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *T. montium* originating in Cameroon 2006-2015 comprised commercial trade in live, wild-sourced individuals in 2006 (reported by both re-exporters and importers) and live, source F individuals reported in 2014 and 2015 by importers only.

Illegal trade in the species was reported by Anderson (pers. comm. to WCMC 2017), who highlighted concerns regarding a 'significant level' of trade in Equatorial Guinea in chameleon species that do not occur in the country, including *T. montium*. In June 2013, individuals in trade from Equatorial Guinea were confiscated by the United States that were reported in trade to be *T. feae*, but were identified as *T. montium*, (Anderson, pers. comm. to WCMC 2017). Anderson (pers. comm. to WCMC 2017) believed that previous legal trade in *T. feae* reported from Equatorial Guinea was likely to represent *T. montium*, based on the lack of observations of *T. feae* in trade.

Direct exports of wild-sourced *T. montium* from Equatorial Guinea were reported by importers only, in 2000-2003, 2013 and 2015 (Table 3). This species is endemic to Cameroon and Equatorial Guinea have not reported any imports of this species. Equatorial Guinea submitted annual reports for 2000-2004, and met their reporting obligations 2005-2012, noting that no trade had occurred in these years. Equatorial Guinea have not submitted annual reports for 2013-2015.

Table 3: Direct exports of *Triceros feae* and *T. montium* from Equatorial Guinea, 2000-2015. All trade was for commercial purposes. Equatorial Guinea has not yet submitted annual reports for 2013-2015.

Taxon	Term	Source	Reported by	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
<i>Triceros feae</i>	live	W	Importer		416		386	483	1110	895	380	466	449	215	80	309				5189
			Exporter																	
<i>Triceros montium</i>	bodies	W	Importer																15	15
			Exporter																	
	live	I	Importer				1												85	86
			Exporter																	
		W	Importer	211	182	1048	445												20	1906
			Exporter																	

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 26/04/2017

Management: *T. montium* was listed in CITES Appendix II on 4th February 1977. Cameroon became a Party to CITES on 5th June 1981, with entry into force on 3rd September 1981. *T. montium* was included in Class B of Chapter I, Protection of Wildlife and Biodiversity Section 78 (3) of Law No. 94-01 of January 1994 (relating to forestry, wildlife and fisheries regulations), meaning that the species is “protected and may be hunted, captured or killed subject to the grant of a hunting permit” (Republic of Cameroon, 1994). Totally protected species are included within Class A of the same law.

The IUCN Red List assessment considered *T. montium* not to be present in any protected areas (LeBreton and Carpenter, 2011). However, of the ten specific locations listed previously where *T. montium* is known to occur, nine are currently under various forms of protection (Republic of Cameroon, 2014; Gardner, 2002; IUCN and UNEP-WCMC, 2014). Mount Manenguba, Mount Kupe, Rumpi Hills and the Bakossi Mountains are protected as Forest Reserves and Mount Cameroon, Takamanda Forest Reserve and Banyang-Mbo Wildlife Sanctuary are protected as National Parks and Wildlife Sanctuaries (Republic of Cameroon, 2014). The Bamenda Highlands are protected as Community Forests (Gardner, 2002), as are the Mbulu Hills (IUCN and UNEP-WCMC, 2014). Offtake of *T. montium* is allowed in these areas, subject to the grant of a hunting permit (Republic of Cameroon, 1994).

No further information on the management of the species within Cameroon was located. The CITES Authorities in Cameroon were consulted as part of this review, but no response was received.

The CITES Secretariat have included Cameroon’s legislation in Category 1, meaning “legislation that is believed generally to meet the requirements for implementation of CITES” (CoP17 Doc.22 Annex 3 Rev.1 2016).

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

Illegal trade in this species was highlighted (see ‘Trade’), with particular reference to Equatorial Guinea.

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Varanus ornatus: Togo

A. Summary

COUNTRY: Not assessed globally by the IUCN, and no information on population size, status or trends available within Togo. Known to occur in the south of the country. Exploitation, including for international trade is the main threat to the species. Togo submitted annual reports for 2007-2015, but not for 2006. Exports 2006-2015 were predominantly in ranched specimens (5118 individuals as reported by importers), but trade in wild-sourced specimens was reported in 2014 and 2015. Export quotas appear high (1000 wild sourced and 7000 ranched). Recent research suggests the species is genetically indistinguishable from *V. niloticus*, which is exported in high volumes from Togo (27,442 ranched individuals 2006-2015 as reported by importers). Togo did not respond to the consultation relating to the RST; no information on the establishment of quotas or management of the species in Togo was located. The basis for non-detriment findings for export of wild-sourced and ranched specimens and the establishment of the high quotas for this species in Togo, for which conservation status is unknown has not been provided, therefore categorised as Action is needed.

RECOMMENDATION:

Action is needed

RST Background

Varanus ornatus (Ornate Monitor) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *V. ornatus* was identified as a species that met a high volume trade threshold for globally threatened species in 2012, on the basis of trade data presented in AC27 Doc. 12.5. Angola, Benin, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Sao Tome and Principe, Senegal and Sierra Leone were removed from the RST process at AC28 (August, 2015), whilst Togo was retained (AC28 Com. 8, AC28 Summary Record).

B. Species characteristics

Taxonomic note: *V. ornatus* was considered a subspecies of *Varanus niloticus* until 1997, when Böhme and Ziegler clarified *V. ornatus* as a species in its own right (Houinsoude Segniagbeto *et al.*, 2015). Böhme (2003), who also recognised *V. ornatus* and *V. niloticus* as separate species, was adopted as the CITES standard reference for monitor lizards at CoP13 in 2004. Both species occur in Togo. More recently *V. ornatus* has been found to be genetically indistinguishable from *V. niloticus*, suggesting that the name *V. ornatus* is obsolete (Dowell *et al.*, 2016).

Biology: *V. ornatus* is a large monitor lizard (Pianka *et al.*, 2004) with an average length of 1.5-2.2m and a maximum length of 2.5 m (Spawls *et al.*, 2002). Adults are dark green and spotted yellow in colour with a lighter cream-coloured belly, a long, slim, cylindrical body, and a long, forked whitish-pink tongue (Spawls *et al.*, 2002). Juveniles found in Togo were brighter green in colour but had the same

yellow markings as adults (Harwood, 2003). *V. ornatus* is a terrestrial, diurnal species, (Pianka *et al.*, 2004). It lives in a variety of habitats from coastal mangroves and deltaic swamps [*V. n. ornatus*] (Bayless and Luiselli, 2000) to rainforests and coastal grasslands (Bennett, 1995) and forests near water up to an altitude of 1800 m above sea level. (Spawls *et al.*, 2002). *V. ornatus* has a varied diet; the species is able to forage on land and in water and will eat any suitable invertebrate or small vertebrates (Spawls *et al.* 2002). However, a study conducted in southern Nigeria's mangrove and swamp forests found the species to feed primarily on crabs (Luiselli *et al.*, 1999).

C. Country reviews

Togo

Distribution: *V. ornatus* has a wide distribution across west and central African lowland tropical rainforest (Pianka *et al.*, 2004). The distribution map in de Buffrenil (1991) suggested that within Togo, *V. ornatus* occurs in the south and southwest of the country. It was reported to occur in the localities of Bismarckburg in western Togo near the Ghanaian border, and in Aného on the southern coast (Mertens, 1942; Bayless, 2002). Houinsoude Segniagbeto *et al.* (2015) reported that the species is found in Togo in coastal marshlands and swamps, mangrove swamps, and in 'ecological zone IV', corresponding to tropical forests in the southern part of the country. A herpetological survey in the West African Togo Hills (Ghana-Togo border) documented the presence of *V. niloticus*, but *V. ornatus* was not observed (Leache *et al.*, 2006). Ineich (2006) noted that the occurrence of the species in the sub-region was not scientifically verified, but noted that the species is present in the area.

Population status and trends: No information could be found on population status and trends either globally, or locally.

The IUCN Red List has not assessed *V. niloticus*, and considers *V. ornatus* to be a synonym of *Varanus olivaceus* (Sy *et al.*, 2009), a species endemic to the Philippines.

Threats: Studies reported *V. ornatus* [*V. niloticus*] to be exploited for their skins (Luxmoore *et al.*, 1988), to be used as food (Akani *et al.*, 1998; Luxmoore *et al.*, 1988), for their organs and tissues for medical purposes (Bennett, 1995), and for the international pet trade (Houinsoude Segniagbeto *et al.*, 2015).

Jensen *in litt.* to Auliya and Koch (2017, *in litt.* to WCMC, 2017) reported that there are two exporters of the species in Lomé, Togo, who claim to export *V. ornatus* only after September, when the dry season ends. One was reported to charge EUR 10 per individual, the other charges USD 15 for juveniles.

Trade: *V. ornatus* was listed in CITES Appendix II on 1st July 1975, as part of the genus listing for *Varanus*. Togo have submitted annual reports for all years 2007-2015; no report had been submitted for 2006 at the time of writing. Togo has published export quotas every year since 2007 for ranched and wild animals (Table 1). Trade in *V. ornatus* did not exceed quotas published by Togo for the period 2007-2015 (Table 1).

Table 1: CITES export quotas for ranched and wild *Varanus ornatus* from Togo, 2006-2017 and all direct trade in *V. ornatus* as reported by countries of import and Togo, 2006-2015. Togo has submitted an annual report for all years except 2006. All trade was in live individuals for commercial purposes.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota (ranched)	-	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
Reported by importer		1340	470	368	336	360	315	300	376	1253	-	-
Reported by Togo		1425	70	300			400	400	570	938	-	-
Quota (wild-sourced)	-	2000	2000	2000	2000	2000	2000	2000	2000	2000	1000	1000
Reported by importer						215				50	-	-
Reported by Togo									200	200	-	-

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Table 2: Direct exports of *Varanus ornatus* from, 2007-2015. No trade was reported in 2006. Togo has submitted an annual report for all years except 2006. All trade was in live animals for commercial purposes.

Source	Reported by	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
R	Importer	1340	470	368	336	360	315	300	376	1253	5118
	Exporter	1425	70	300			400	400	570	938	4103
W	Importer					215				50	265
	Exporter								200	200	400

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

According to data in the CITES Trade Database, direct exports of *V. ornatus* from Togo 2006-2015 consisted of live animals exported for commercial purposes, the majority of which were ranched (Table 2). Togo reported the export of 4103 live, ranched individuals, while importers reported 5118 over the ten year period. Importing countries reported that trade in ranched animals declined in 2008, with trade levels remaining fairly constant until 2014, but increased in 2015. Lower quantities of wild-sourced live animals were also reported by Togo in 2014 and 2015 (200 per year) and by importing countries in 2011 and 2015 (215 and 50, respectively; Table 2).

Indirect exports of *V. ornatus* originating in Togo 2006-2015 comprised live trade in captive-bred and ranched animals for commercial purposes, reported in 2009, 2010 and 2015.

Houinsoude Segniagbeto *et al.*, (2015) considered that specimens of *V. ornatus* in Togo tended to be exported under the quota for *V. niloticus*. Accordingly, direct trade data for *V. niloticus* from Togo is also provided (Table 3). According to data in the CITES Trade Database, direct trade in *V. niloticus* from Togo 2006-2015 primarily consisted of live ranched animals exported for commercial purposes (Table 3). Over the period 2005-2016, Togo reported the export of 23 317 live, ranched individuals, while importers reported 27 442 animals (Table 3).

Table 3: Direct exports of *Varanus niloticus* from Togo, 2006-2015. Togo has submitted an annual report for all years except 2006.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	
leather products (small)	T	W	Importer							2			54	56	
			Exporter												
live	S	F	Importer				30							30	
			Exporter												
		W	Importer				30								30
			Exporter												
	T	F	Importer												
			Exporter											500	500
		R	Importer	4961	3017	2037	1885	1780	1613	2166	4410	2575	2998	27442	
			Exporter		1840	1076	2841	1350	825	3580	4130	4700	2975	23317	
W	Importer	300	81		114		300						795		
	Exporter							150		50	100		300		
skins	T	W	Importer								1000			1000	
			Exporter									10			10

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 20/04/2017

A high level of illegal transport of *Varanus* spp. between Benin and Togo was reported in the past (de Buffrenil, 1995, in UNEP-WCMC, 2005).

Management: *V. ornatus* was listed in CITES Appendix II in 1975 (as part of the genus listing for *Varanus*), and Togo became a Party to CITES in 1979. In Togo, *V. niloticus* was classified as a predatory species under the Ordinance on Wildlife Protection and Hunting, 16th January 1968 (Togo, 1968). An enabling decree, dated 4th June 1980, set out license fees for hunting and commercial capture, but there was no bag limit for *V. niloticus* (Luxmoore *et al.*, 1988).

It is not known if the species occurs within any protected areas in the country. However, in the south and south-west regions of Togo where the species was reported to occur (de Buffrenil, 1991), there are 41 nationally protected areas, all of which have management plans and no-take statuses (IUCN and UNEP-WCMC 2015). No further information could be found relating to the management and protection of populations of *V. ornatus* in Togo.

Harwood (2003) found that there were six reptile farms in Togo authorised to export animals, including *V. niloticus*, four of which were in operation. All four operating farms were located near Togo's capital city of Lomé.

The CITES Authorities in Togo were consulted as part of this review, but no response was received. Through its national legislation project, the CITES Secretariat categorised the national legislation in Togo as legislation that is believed generally to meet one to three of the four requirements for effective implementation of CITES.

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

None identified.

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Ophiophagus hannah: Indonesia, Malaysia

A. Summary

<p>Global status</p>	<p>Assessed as globally Vulnerable, with a wide distribution, but not common and considered very rare in much of range. Population size unknown, but presumed to be declining due to over-harvesting across much of range (for pets, meat, skin, and medicinal use), combined with habitat loss and persecution. Demand for snakes and snake products was reported to be increasing.</p>	
<p>INDONESIA:</p>	<p>Wide distribution in Indonesia (Sumatra, Java, Bali, Kalimantan, Sulawesi and Moluccas). No information on population size. Whilst considered rare in some locations, also reported to be locally common (although some accounts of status appear conflicting within the same location). Reported to occur in modified habitats (human settlements, palm oil and rubber plantations) within the country. Harvested for the pet trade, in particular, in central Java and southern Sumatra. Illegal harvests reported. Annual export quota of 90 live, wild-sourced individuals considered sustainable by one expert. Annual reports were submitted by Indonesia for all years 2006-2015; the 2013 report appears to be incomplete for captive <i>Ophiophagus</i>. Low levels of trade 2006-2015, predominantly in live, wild-sourced snakes (817 as reported by Indonesia) within quota. Indonesia responded to the consultation relating to the RST. Harvest quotas set at 100-150 for last five years based on a wide distribution, habitat availability, and prey-base availability, although no information on population surveys or monitoring provided. Ranching programmes reported to be established, but no exports reported as ranched. This species is likely to be able to withstand offtake for trade at current levels given its wide distribution and reproductive capacity, therefore categorised as Less concern.</p>	<p>RECOMMENDATION:</p> <p>Less concern</p>
<p>MALAYSIA:</p>	<p>Apparently widespread in Peninsular Malaysia, also occurs in Sabah and Sarawak. No information on population size, densities or trends, but considered common in Peninsular Malaysia and Sarawak, although small population sizes were reported. Reported to occur in modified habitats (palm oil plantations, human settlements) within the country. Utilized for meat and medicinal purposes in Malaysia, and some records of illegal trade reported. Low levels of trade 2006-2015 predominantly in live, wild-sourced animals (597 as reported by Malaysia). Annual reports were submitted by Malaysia for all years 2006-2015. One expert considered trade levels to be low and sustainable. Malaysia</p>	<p>RECOMMENDATION:</p> <p>Less concern</p>

responded to the consultation relating to the RST. Protected under national legislation and harvest and trade allowed under licence only, although no information on population surveys or monitoring provided. The species is likely to be able to withstand offtake for trade at current levels given its wide distribution and reproductive capacity, therefore categorised as Less concern.

RST Background

Ophiophagus hannah (King Cobra) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *O. hannah* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, as well as in 2012, on the basis of trade data presented in AC27 Doc. 12.5. Responses to the Secretariat's consultation had been received from Bangladesh, Myanmar, Nepal and Philippines at AC28 (August, 2015) (AC28 Doc. 9.4 (Rev.2)). Bhutan, Brunei Darussalam, China, Hong Kong SAR, India, Lao People's Democratic Republic, Myanmar, Nepal, Philippines, Singapore, Thailand and Viet Nam were removed from the RST process, whilst Indonesia and Malaysia were retained (AC28 Com. 8, AC28 Summary Record).

B. Species characteristics

Taxonomic note: The genus *Ophiophagus* is monotypic (Koch, 2012). However, it is suspected to form a species complex (R. Inger pers. comm. in Stuart *et al.*, 2012; Stuebing *et al.*, 2014).

Biology: *O. hannah* has been described as the largest venomous snake in the world, which can reach up to 6 m in length (Koch, 2012), although it was noted that this length is rarely met (de Lang and Vogel, 2005). The species is diurnal and terrestrial, with juveniles considered more arboreal than adults (Das, 2012). It typically inhabits primary forests, including evergreen, moist deciduous, tropical dipterocarp forests and mangrove swamps at altitudes of up to 2 181 m above sea level (Das, 2010), and is frequently found in the vicinity of water (de Lang and Vogel, 2005). In Indonesia, the species was reported to inhabit primary and secondary forests, palm oil and rubber plantations and areas of shrub near settlements (CITES Management Authority (MA) and Scientific Authority (SA) of Indonesia *in litt.* to UNEP-WCMC, 2017), occurring at altitudes up to 1 800 m above sea level (de Lang and Vogel, 2005). Although the species was reported to prefer undisturbed forests, particularly for nesting (Strine *et al.*, 2014), it has also been observed in more open areas, including alluvial grasslands (Das, 2010), agricultural lands (Strine *et al.*, 2014) and human settlements (Whitaker *et al.*, 2010). While the species was reported to be tolerant of some disturbance (Wanger *et al.*, 2011), its abundance was considered "strongly linked" to the availability of undisturbed forests (Das *et al.*, 2008; Stuart *et al.*, 2012); indicating that the loss of natural forests is likely to cause significant declines in populations (Stuart *et al.*, 2012). A home range size of 6.3 km² was tentatively reported for one individual of the species (Bhaisare *et al.*, 2010).

O. hannah is oviparous, with females laying clutches of 14-43 eggs in the wild (Das, 2012; Hrima *et al.*, 2014), which hatch after an incubation period of 63-77 days (Das, 2010). It is one of few snake species known to build nests (Pfaff, 2008), which the female defends (de Lang and Vogel, 2005). In captivity, reproductive age has been estimated at 5-6 years, but generation lengths in wild populations were considered likely longer than this (Stuart *et al.*, 2012). The species was considered not difficult to maintain in captivity (Pfaff, 2008), with a high reproductive capability and an average hatching success of 90 per cent in captivity reported (Sulaiman pers. comm. to the CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

Its diet has been reported to consist primarily of other snakes (Koch, 2012; Strine *et al.*, 2014), in addition to certain lizard species (Das, 2010; Strine *et al.*, 2014). Several distinct patterns and colour morphs of the species were reported to exist across its range (Vogel, 2006; Pfaff, 2008) and several variations in colour were reported from populations within Indonesia (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

Distribution: The species was reported to be widely distributed (Koch, 2012) throughout South and Southeast Asia (Wallach *et al.*, 2014; Auliya *in litt.* to UNEP-WCMC, 2017), ranging from India to Hong Kong, Indochina, Peninsular Malaysia, Singapore, Sumatra, the Philippines and Indonesia (Grismer, 2011).

Population status and trends: It was reported that little is known about the status or ecology of *O. hannah* in the wild, but the species is generally considered to be uncommon throughout much of its range (Pfaff, 2008). It occurs with low population densities (Pfaff, 2008), which may be natural (de Lang and Vogel, 2005; Pfaff, 2008; Bhaisare *et al.*, 2010), or the result of declines in wild population (Stuart *et al.*, 2012).

O. hannah was categorised as Vulnerable in the IUCN Red List on the basis that it is not common in any area in which it occurs (with the apparent exception of forested areas in Thailand), is very rare in much of its range, and has experienced local population declines of over 80 per cent over 10 years in Viet Nam (Stuart *et al.*, 2012). However, it was reported to be relatively common in some locations (Natusch, pers. comm. to UNEP-WCMC, 2017.) According to Stuart *et al.* (2012), no quantitative population data on the species is available, but the global population size was considered to have declined by at least 30 per cent over three generations (15-18 years). However, it was noted that more detailed population monitoring may find this to be a conservative estimate (Stuart *et al.*, 2012). According to Whitaker *et al.* (2010), the species has been extirpated from much of its former range and only a few healthy populations remained on the Indian subcontinent.

Threats: The main global threat was reported to be harvesting for meat, skin, medicinal value, and as pets (Stuart *et al.*, 2012). Throughout its range, the species was reported to occur in the domestic and international pet trade (Auliya pers. comm. 2010 in Stuart *et al.*, 2012) and be threatened by high levels of persecution (Stuart *et al.*, 2012).

O. hannah was also considered to be threatened by habitat loss (Stuart *et al.*, 2012; Strine *et al.*, 2014) due to logging and agricultural expansion (Stuart *et al.*, 2012). Whilst snakes can survive in degraded habitats, the extent to which degraded habitats can support viable populations of *O. hannah* was considered unknown (Stuart *et al.*, 2012). However, the species was reported to be relatively abundant in palm oil plantations in parts of the range (Natusch, pers. comm. to UNEP-WCMC, 2017). Deforestation was believed likely to “exert strong pressure at local scales, particularly where snakes are also hunted” (Lilley pers. comm. 2011 in Stuart *et al.*, 2012). Das (*in litt.* to UNEP-WCMC, 2017) considered habitat loss to be the major threat to *O. hannah*.

According to the IUCN SSC Boa and Python Specialist Group, demand for this species were reported to be increasing (AC28 Inf. 1). *O. hannah* was considered to be among the most commonly ‘farmed’ [production methods not specified] snakes in China and Viet Nam, with life history characteristics that were considered suitable for intensive production, including early maturity, rapid growth rates, high reproductive output, efficient food assimilation rates and undemanding space requirements (Aust *et al.*, 2016). Demand for snakes and snake products was reported to have increased in Asia since the 1990s, driven by a growing demand for luxury goods (Aust *et al.*, 2016) and exceeding supply by the beginning of the 21st century, increasing the risk of overexploitation of wild populations (Aust *et al.*, 2016). Aust *et al.* (2016) explored basic models for breeding snakes, including *O. hannah*, for meat and concluded that

the ease and profitability of snake farming in Viet Nam and China made it a viable substitute for harvesting wild snakes, with “apparently minimal threat to wild populations”. Conversely, farmers in Viet Nam considered *O. hannah* to be a difficult species to raise, which requires skill to handle and has demanding husbandry requirements; these factors were considered to limit the number and distribution of *O. hannah* facilities (AC28 Inf. 1).

Overview of trade and management: *O. hannah* was listed in CITES Appendix III by India on 13th February 1984 and was listed in Appendix II on the 18th January 1990. According to data in the CITES Trade Database, global trade in *O. hannah* principally comprised commercial trade in live snakes. Three thousand live, ranched snakes were reported in 2006 by importers; the majority of the remaining live trade was wild-sourced.

Shaney *et al.* (2016) noted that *O. hannah* had been “largely overlooked by conservation initiatives and wildlife management programmes” and that current understanding of population viability was lacking. However, according to Stuart *et al.* (2012), there are protected areas within the range of *O. hannah*, which likely provide some protection from harvesting.

Conservation measures were considered needed in order to reduce the rate of habitat loss within the species range and to manage trade levels (Stuart *et al.*, 2012). It was considered that “further research into, and monitoring of, the population status” of *O. hannah* was required, as was research into sustainable harvest levels (Stuart *et al.*, 2012). Auliya (*in litt.* to UNEP-WCMC, 2017) noted that it is currently not possible to assess the impact of trade on populations, but that detrimental impacts on populations “cannot be ruled out for certain regions” such as Java. In addition, research to determine the taxonomic status of the species was considered warranted in order to sustain and manage genetically distinct populations and, ideally, establish conservation units (Auliya *in litt.* to UNEP-WCMC, 2017). It was thought that educational programmes may help to reduce persecution of the species (Stuart *et al.*, 2012). The species was discussed at the Central Zoo Authority International conference in 2008, where it was noted for its biological uniqueness and the need for improved captive management techniques was highlighted (Pfaff, 2008).

In 2011, the CITES Secretariat convened an Asian snake trade workshop in Guangzhou, China (AC 25 Doc. 18). Among the findings and recommendations of the workshop presented in AC25 Doc. 18, the paucity of data available on life history traits for most Asian snake species and the difficulties this presented when forming non-detriment findings was noted.

C. Country reviews

Indonesia

Distribution: *O. hannah* was reported to have a wide distribution in Indonesia (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017), occurring on the main islands of Sumatra, Java, Bali, Kalimantan, and, Sulawesi (Wallach *et al.*, 2014; CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). It was also reported to occur on Seram Island in the Moluccas (CITES MA and SA *in litt.* to UNEP-WCMC, 2017), and on adjacent islands including Bangka, Belitung, Galang, Nias, Peleng, Simeulue (Wallach *et al.*, 2014), the Riau islands (Golay *et al.*, 1993), Mentawai, Natuna Islands, Buton and Banggai (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). A range map for the species is provided in Figure 1.



Figure 1. Distribution range of *O. hannah* in Indonesia (shown in green) (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

In **Sumatra**, the species appears to be widespread, and was reported from Aceh Province, Bengkulu Province, Jambi Province, Riau Province, Sumatera Barat (West) Province, Sumatera Selatan (South) Province and Sumatera Utara (North) Province (Teynié *et al.*, 2010), and from Kerinci Seblat National Park in West Sumatra (Kurniati, 2009). The species was reported to occur in East, Central and West **Java** by Hodges (1993) and has been reported from the Rajegwesi tourism area in Meru Betiri National Park, East Java (Raharjo and Hakim, 2015). Java was noted to have large areas of paddy fields that attract prey species of *O. hannah* (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017). In **Bali**, the species was reported to be definitively known only from Negara in the island's west and from Bali Barat (West Bali) National Park (Stuart *et al.*, 2012), however Natusch (pers. comm. to UNEP-WCMC, 2017) reported that it was widespread on the island.

In **Kalimantan**, it has been reported from Bulungan Research Forest, in the Malinau area of East Kalimantan (Iskandar, 2004). *O. hannah* was also reported to occur in mixed peat swamp forest in the Sabangau River catchment, Central Kalimantan (Borneo Nature Foundation, *in litt.* to UNEP-WCMC, 2017). In **Sulawesi**, the species has been observed near Luwuk (Central Sulawesi) (Koch, 2012) and occurs in the Lore Lindu National Park (LLNP) in Central Sulawesi (Wanger *et al.*, 2011). It has also been collected from North Sulawesi, and the Banggai Islands in East Sulawesi (de Lang and Vogel, 2005). According to de Lang and Vogel (2005), the occurrence of the species in southwest Sulawesi required confirmation. *O. hannah* has also been observed in the Lambusango and Kakenauwe Forest Reserves and adjacent areas on Buton Island, with the authors noting that the low encounter rate could reflect low densities or low detection probabilities (Gillespie *et al.*, 2015).

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) noted that bamboo forests, which are common habitats in all parts of Indonesia, provide a suitable habitat for *O. hannah*.

Population status and trends: No information on population size within Indonesia could be located. On the basis of the species wide distribution in Indonesia and that it can adapt to disturbed habitats, the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) considered wild populations of *O. hannah* to be relatively stable. Auliya (pers. comm. 2011 in Stuart *et al.*, 2012), considered the species to be very rare in Indonesia on the basis of trade data [presumably indicating low availability] and noted that the species was “very much less frequently seen than species of *Naja*”. Natusch (pers. comm. to UNEP-WCMC, 2017) noted that the species was relatively abundant in palm oil plantations in the country and although the species was recorded at lower densities than some other snakes, detectability did not necessarily equal relative abundance.

In **Sumatra**, van Hoesel (1959, in Auliya *in litt.* to UNEP-WCMC, 2017) previously indicated that the species was considered very common in various regions. At one survey site in Kerinci Seblat National

Park, (South Sumatra Province), the species was reported to be rare (Kurniati, 2009). In **Java**, the species was considered less common than the black cobra [*Naja sputatrix*] (van Hoesel, 1959 in Auliya *in litt.* to UNEP-WCMC, 2017). In East Java, the species was frequently found on display and for sale in restaurants and was therefore considered to be fairly common in the area at that time (Hodges, 1993). In **Bali**, Stuart *et al.* (2012) noted a lack of information on the status of *O. hannah*, but reported that subpopulations appeared to be small and fragmented. Lilley (pers. comm. 2011 in Stuart *et al.*, 2012) believed the species was likely declining on Bali due to hunting pressure and, particularly, deforestation for agriculture, however Natusch (pers. comm. to UNEP-WCMC, 2017) did not consider the population to be small or declining. In **Sulawesi** the species was assumed to be rare and threatened by de Lang and Vogel (2005), who noted that surveys of *O. hannah* should be carried out as a priority to determine its status. Yuwono (1998 in de Lang and Vogel, 2005) remarked that specimens were mainly collected in Java and Sumatra, “where it always seems available in adequate numbers”.

Iskandar and Erdelen (2006) noted that reptiles in Indonesia remain “poorly understood”, with data on species biology and ecology lacking, and population sizes being “unknown for virtually all species”.

Threats: Harvest of the species for the pet industry was reported to occur, in particular, in central Java and Lampung in southern Sumatra (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). There is also a domestic skin and pet market for this species in Indonesia (de Lang and Vogel, 2005), and the species was reported to be used for meat and venom for dart poison by local communities in the Malinau Research Forest in Kalimantan (Meijaard *et al.*, 2005) and for medicinal purposes in South Cianjur, West Java (Partasasmita *et al.*, 2016). Auliya (*in litt.* to UNEP-WCMC, 2017) reported observing single specimens of *O. hannah* in Western, Central and Eastern Java that were utilised for traditional medicine, as trophies, as pets, or intended for sale for the international pet trade. It was mentioned by WCS Indonesia (2015), that the species is illegally harvested in Indonesia, largely to supply pet markets.

According to Iskandar and Erdelen (2006), habitat loss and fragmentation is the main threat to reptile species in Indonesia, although bamboo forests, which *O. hannah* prefers for nest building, were reported to be common across Indonesia (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

On Bali, hunting of *O. hannah* was reported, primarily to supply zoos and international collectors (Lilley pers. obs. 2011 in Stuart *et al.*, 2012).

Trade: All CITES annual reports have been submitted by Indonesia for the period 2006-2015; the 2013 report may be incomplete for captive *Ophiophagus*. Indonesia published annual export quotas for the export of 90 live *O. hannah* for the period 2006-2017 (Table 1). Export quotas appear to have been exceeded in 2012 as reported by Indonesia, however additional information contained in Indonesia’s 2012 annual report notes that ten live snakes exported in 2012 were from the remaining export quota for 2011, therefore bringing reported trade within quota in all years.

Table 1: CITES export quotas for live, wild-sourced *Ophiophagus hannah* from Indonesia, 2006-2017, and global direct exports of live, wild-sourced *O. hannah* as reported by countries of import and Indonesia, 2006-2015. Indonesia has submitted all annual reports 2006-2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota (live)	90	90	90	90	90	90	90	90	90	90	90	90
Reported by importer	23	39	64	25	34	58	63	43	31	72	-	-
Reported by Indonesia	76	87	84	79	71	72	92	77	89	90	-	-

According to data in the CITES Trade Database, direct trade in *O. hannah* from Indonesia was predominantly in live, wild-sourced snakes for commercial purposes with 428 snakes reported by

importing countries and 817 snakes reported by Indonesia (Table 2). In addition, 100 live individuals (all sources) were exported in 2016 (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Table 2: Direct exports of *Ophiophagus hannah* from Indonesia, 2006-2015. All trade was reported by number. Indonesia has submitted all annual reports for 2006-2015; the 2013 report may be incomplete for captive *Ophiophagus*.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	
live	B	F	Importer						10					10	
			Exporter												
	P	W	Importer			4		8			6			18	
			Exporter												
	Q	W	Importer			2								2	
			Exporter												
	T	C		Importer											
				Exporter										32	32
		F		Importer									2	30	32
				Exporter					20	2	18		36		76
		W		Importer	23	39	58	25	26	58	57	39	31	72	428
				Exporter	76	87	84	79	71	72	92	77	89	90	817
	Z	W		Importer								4			4
				Exporter											
specimen	S	W	Importer									1		1	
			Exporter												

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *O. hannah* originating in Indonesia 2006-2015 comprised very low levels of live, wild-sourced individuals for commercial purposes reported in 2012, 2014 and 2015.

Management: Indonesia became a Party to CITES in 1979. *O. hannah* is not a nationally protected species in Indonesia. The species was reported to be managed in Indonesia through setting of annual harvest quotas, protected area management, and the use of ranching and captive-breeding (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). No information on any field studies or surveys could be located. There does not appear to be a national management plan for the species. Hodges (1993) noted that special conservation measures are needed for several species in Indonesia, including *O. hannah*, which was considered highly vulnerable due to its high value in trade.

Quota setting: The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that strict harvest quotas of 100-150 had been set for *O. hannah* for the last five years, which they considered sustainable based on the species wide distribution, and the availability of suitable habitat and prey (200 terrestrial snake species were reported to occur within the range of *O. hannah* in Indonesia). Natusch (pers. comm. to UNEP-WCMC, 2017) considered that the export quota of 90 specimens annually would have no meaningful impact on the species.

According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), provincial Management Authority officers propose harvest levels, which are then assessed by the CITES SA (Indonesian Institute of Sciences, LIPI). It was reported that 90 per cent of the national quota is typically allocated for export and the remainder for domestic trade (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). National quotas are set, with sub-quotas for specific provinces or regions, and these are reviewed annually (Stengel *et al.*, 2011).

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that harvest quotas for individual species are based on a range of available data, including information on the biology and distribution of the species, general land-use and potential threats in specific areas, and include various parameters, including environmental conditions. In setting the quotas, expertise is sought by the

Scientific Authority from other research organizations, universities and NGOs (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). The finalised quotas are issued in an annual decree by the Directorate General of Forest Protection and Nature Conservation (CITES Management Authority), which identifies the allowable harvest for each species at the national level down to the Provincial level (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), monitoring of the ‘chain of custody’ between the source region of species in trade and the point of collection is theoretically possible to “a certain degree of accuracy”, and each province was reported to be divided into a number of BKSDA jurisdictions, which are able to track the legality of specimens.

Stengel *et al.* (2011) noted that concerns had previously been raised regarding the process used to establish quotas, referring to previous research (by Newton and Soehartono, 2001 and Soehartono and Mardiasuti, 2002) that indicated that quotas had been set arbitrarily and were not scientifically based (Schoppe, 2009). Shepherd and Nijman (2007) also expressed concerns regarding the quota setting process, noting that quotas had previously been set for CITES-listed species without detailed NDF’s being made and that the process where harvest quotas may be allocated to one province, but not to the adjacent province, created a loophole for harvest in adjacent areas. Concerns were also raised that harvest and trade were not efficiently monitored and enforcement of wildlife laws was rare (Shepherd and Nijman, 2007).

Auliya (*in litt.* to UNEP-WCMC, 2017) noted Indonesia’s export quota of 90 specimens for *O. hannah* since 2006, but considered it was unknown whether this small number was established as a precautionary measure or as a result of the species’ scarcity.

Protected areas: According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), most primary forest in Indonesia is located within protected areas and such areas in Sumatra, Kalimantan, Sulawesi, Javi, Bali and Moluccas were important for the protection of *O. hannah*. The species occurrence has been reported from Kerinci Seblat National Park (West Sumatra) (Kurniati, 2009), Meru Betiri National Park (East Java) (Raharjo and Hakim, 2015), Bali Barat National Park (West Bali) (Stuart *et al.*, 2012), Bulungan Research Forest (East Kalimantan) (Iskandar, 2004), Lore Lindu National Park (LLNP) (Central Sulawesi) (Wanger *et al.*, 2011) and from the Lambusango and Kakenauwe Forest Reserves on Buton Island (Gillespie *et al.*, 2015).

Protected areas were reported to cover 5 383 243 hectares on Sumatra, 4 900 398 ha on Kalimantan, 1 601 198 ha on Sulawesi, 657 131 ha on Maluku, and 629 904 ha on Java and Bali (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017). These protected areas include National Parks, Nature Reserves, Game Reserves, Recreational Parks as well as other protected area categories managed by the Government of Indonesia, such as Hunting Parks and Grand Forest Parks (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017). With the exception of Grand Forest Parks, all protected areas are managed by central government (Ministry of Forestry) (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017). Whilst encroachment in the forms of wildlife poaching, illegal logging and land encroachment for shifting agriculture were reported to have become major issues in effective protected areas management, it was reported that further efforts had been made to utilise current resources for enforcement (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Ranching and captive-breeding: According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), ranching programmes have been established in central Java and north Sumatra. It was reported that the programme typically sources eggs from near human settlements (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017). The hatching rate in the ranching programme was reported to be 90 per cent and the survival rate between 80-90 per cent (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017). The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that

the national quota could be fulfilled by 3-5 females from the ranching programme. However, no exports have yet been reported with source code 'R' (ranching).

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that a captive breeding programme (PT Alam Nusantara Jayatama in Cibubur, Jakarta) has been initiated, supported by the Indonesian Government. A tool to control and monitor captive breeding operations, referred to as 'Maximum Estimated Production' (MEP) has been developed by the MA (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017). MEP is an estimate of breeding success for a particular species, by a particular breeder, for the forthcoming year (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017). Each breeder is required to submit an MEP of the species, which is subsequently checked by the CITES SA, taking into consideration the previous breeding success of the company and the biology of the species (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Legislation and enforcement: Through its national legislation project, the CITES Secretariat categorised the national legislation in Indonesia as "legislation that is believed generally to meet the requirements for implementation of CITES".

In order to apply for CITES export permits, collectors and exporters must be licensed and registered with the Directorate General of KSDAE and all shipments are checked and verified by the provincial office of KSDAE (BKSDA), whose officers are posted in designated international ports (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

Malaysia

Distribution: The species occurrence has been reported from Peninsular Malaysia, and the East Malaysian States of Sabah and Sarawak on the island of Borneo (Wallach *et al.*, 2014).

The species appears widespread across **Peninsular Malaysia**, having been reported from the north to the south, including the States of Johor, Kedah, Kelantan, Melaka, Negeri Sembilan, Perak, Perlis, Penang and Pehang (Wallach *et al.*, 2014). Within these States, *O. hannah* has been reported from Langkawi Archipelago [Kedah] (Lim *et al.*, 2010), Banjaran Bintang [Perak] (Grismer *et al.*, 2010), Tioman Island [Pahang state] in the Seribu Archipelago (Grismer *et al.*, 2004; Grismer and Youmans, 2006; Wallach *et al.*, 2014), the Pasoh Forest Reserve [Negeri Sembilan] (Lim and Norsham, 2003), and in the Mata Ayer Forest Reserve and the proposed Bukit Wang Mu Forest Reserve [both in the State of Perlis] (Sharma *et al.*, 1996). Anecdotal reports of the species occurrence on Jerejak Island [Penang] and on Pangkor Island [Perak] were recounted by Jaafar *et al.* (2013) and van Rooijen *et al.* (2011), respectively. A range map for the species in Peninsular Malaysia is provided in Figure 1.

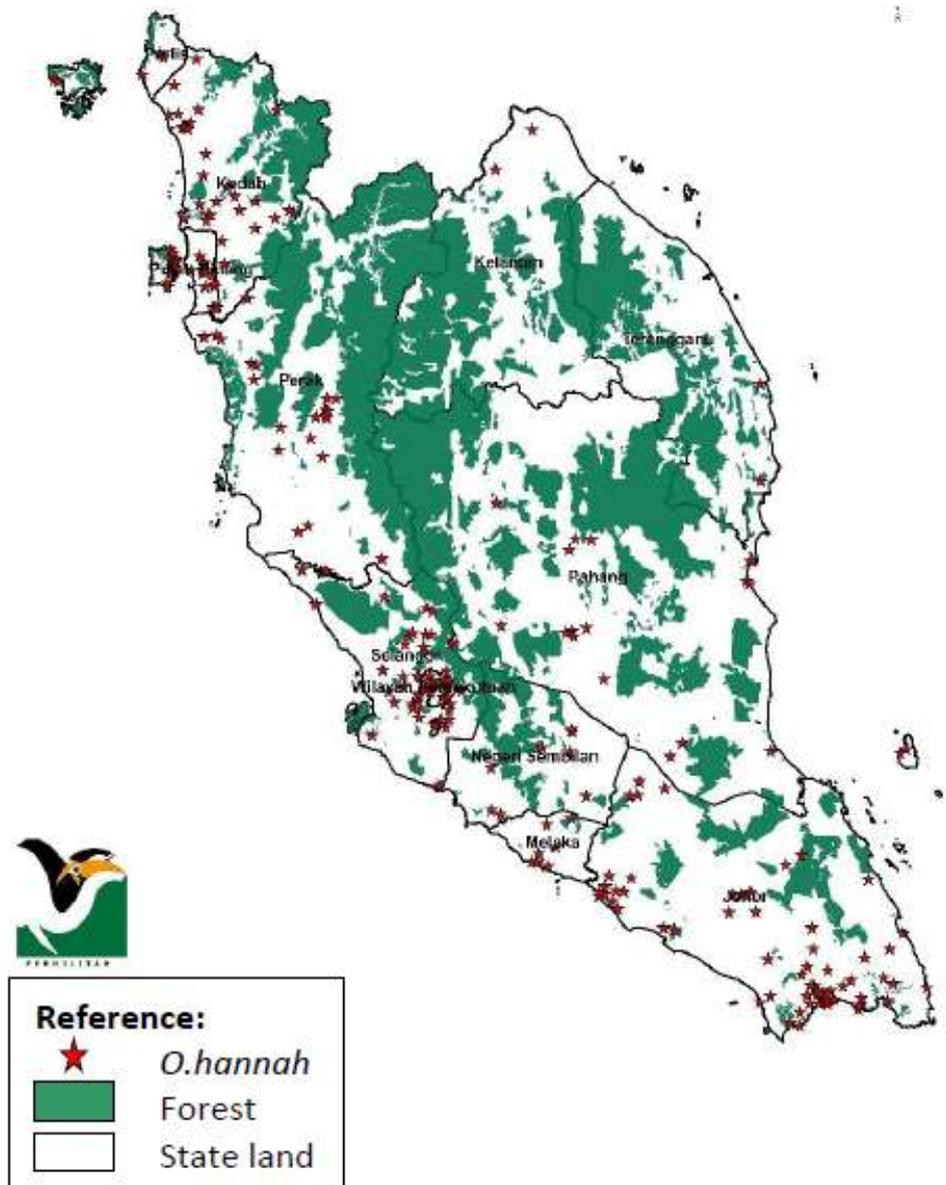


Figure 1. Distribution of *O. hannah* in Peninsular Malaysia (CITES MA of Malaysia *in litt.* to UNEP-WCMC, 2017).

The species has also been reported from Santubong Peninsula in **Sarawak** (van Rooijen, 2009) and the Crocker Range National Park in **Sabah** (Das, 2006). According to the CITES MA of Malaysia (*in litt.* to UNEP-WCMC, 2017), there are no documented observations of *O. hannah* collected in Sabah or Sarawak.

Population status and trends: Whilst Das *et al.* (2015) reported that *O. hannah* primarily inhabits forests, and that deforestation may affect population densities, the species was also reported to be common in Peninsular Malaysia and Sarawak within palm oil plantations, forested areas, and around human settlements. According to Auliya (*in litt.* to UNEP-WCMC, 2017), van Hoesel (1959) previously indicated that the species was very common in Peninsular Malaysia, and Tweedie (1954), noted that it could be found “throughout the whole of Malaya in forest and in populated areas” (Auliya *in litt.* to UNEP-WCMC, 2017). However, Grismer (pers. comm. 2011 in Stuart *et al.*, 2012) reported small population sizes in Peninsular Malaysia. The CITES MA of Malaysia (*in litt.* to UNEP-WCMC, 2017) reported that “there is little information on sightings of *O. hannah* collected via inventories and

patrolling within Protected Areas, as this species is cryptic, sedentary and often hiding in holes/burrows”.

Threats: The species was reported to be prized for its meat and for medicine in Malaysia (Das and Yaakob, 2007). According to Jaafar *et al.* (2013), pollution, habitat loss and over-harvesting were “strongly believed” to have a detrimental effect on Malaysian reptile populations, but it was noted that few studies on reptiles in Malaysia had been undertaken and that data were lacking. Janssen and Blanken (2016) mentioned that individuals of *O. hannah*, reported to have originated in Malaysia, were found on sale at an annual snake expo in the Netherlands in 2015. These individuals were reported to be captive-bred and were on sale for EUR 300-900 per individual (Janssen and Blanken, 2016). It was reported that many of the records of the species distribution in Peninsular Malaysia (Figure 2) were a result of human-wildlife conflict, which was considered “quite widespread” in the west of Peninsular Malaysia (CITES MA of Malaysia *in litt.* to UNEP-WCMC, 2017).

Trade: All CITES annual reports have been submitted by Malaysia for the period 2006-2015. No quotas have been published by Malaysia for *O. hannah*.

According to data in the CITES Trade Database, almost all direct trade in *O. hannah* from Malaysia comprised live animals, the majority of which were wild-sourced for commercial purposes, with 298 according to importers and 597 according to Malaysia (Table 3). Exports reported by Malaysia peaked in 2011 with 128 live animals exported. According to importers direct trade in live snakes peaked in 2007 with 78 live animals.

Indirect trade in *O. hannah* originating in Malaysia comprised very low levels of live animals, the majority of which were wild-sourced for commercial, breeding and zoological purposes.

Illegal trade in *O. hannah* from Malaysia has been reported. In 2009, 160 *O. hannah* were seized at Padang Besar in the northern state of Perlis, which were intended to be taken across the border to Thailand (TRAFFIC, 2011). According to Malaysia’s biennial reports for 2007-2008 and 2011-2012, confiscations of *O. hannah* were reported, comprising four individuals in one shipment and one specimen in other.

Table 3: Direct exports of *Ophiophagus hannah* from Malaysia, 2006-2015. Malaysia has submitted all annual reports 2006-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	
bodies	P	I	Importer				2							2	
			Exporter												
live	B	W	Importer					4	10					14	
			Exporter												
	Q	W	Importer	6			4							10	
			Exporter												
	T	C	Importer				5								5
			Exporter				5	6							11
		I	Importer								2				2
			Exporter												
	W	W	Importer	43	75	58	26	23	10	1	1	20	41	298	
			Exporter	50	99	77	48	53	128	54	1			87	597
Z	W	Importer		3		20		5			5			33	
		Exporter													
-	I	Importer			14									14	
		Exporter													
skins	T	W	Importer												
			Exporter				13								13

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Management: Malaysia became a Party to CITES in 1978. *O. hannah* is categorised as ‘Protected’ under Part 2 of the First Schedule of the Wildlife Conservation Act 2010 (Act No. 716) in Peninsular Malaysia, which prohibits hunting², possession, import or export of the species (or any parts or derivatives of), except under licence, or research or study of the species without a permit (Malaysia Wildlife Conservation Act, 2010). Under the Wildlife Conservation Act 2010 (Act No. 716), licensed hunters are permitted to catch *O. hannah* with a scoop net only; no shooting or destructive methods are allowed (CITES MA of Malaysia *in litt.* to UNEP-WCMC, 2017). Hunting is permitted between 7 am and 7 pm only, outside of Protected Areas, and within the respective State that issued the license, and States are allowed to impose hunting quotas according to the population status of the species in the respective States (CITES MA of Malaysia *in litt.* to UNEP-WCMC, 2017). Natusch (pers. comm. to UNEP-WCMC, 2017) considered that the low export levels from Malaysia would be sustainable.

According to the CITES MA of Malaysia (*in litt.* to UNEP-WCMC, 2017), any person who hunts or possesses the species, or any part of derivative, without a license is liable to a fine not exceeding MYR 50 000 and/or imprisonment for a term not exceeding two years. Any person who imports, exports or re-exports the species, or any part or derivative, without a license is liable to a fine between MYR 20 000-50 000, and imprisonment for a term not exceeding one year (CITES MA of Malaysia *in litt.* to UNEP-WCMC, 2017).

The species is listed on Schedule 2 of Sabah State’s Wildlife Conservation Enactment 1997 (Sabah Wildlife Department, 1997), which allows limited hunting and collection under license, and Part 2 (Protected Animals) of the First Schedule of Sarawak State’s Wildlife Protection Ordinance, 1998, which prohibits the hunting, killing, capture, sale, import, export, or possession of species (or any parts or derivatives of), except under licence (Legislature of Sarawak, 1998).

According to the CITES MA of Malaysia (*in litt.* to UNEP-WCMC, 2017), there is no captive breeding of *O. hannah* in Peninsular Malaysia. Very small numbers of captive-bred specimens were reported exported by Malaysia in 2009 (five) and 2010 (six).

Through its national legislation project, the CITES Secretariat categorised the national legislation in Malaysia as “legislation that is believed generally to meet the requirements for implementation of CITES”.

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

Illegal trade in this species originating from Malaysia was highlighted (see ‘Trade’).

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² During the open season. Hunting during the close season requires a special permit.

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Malayemys subtrijuga: Indonesia, Lao People's Democratic Republic, & M. macrocephala: Malaysia

A. Summary

Global status: *M. subtrijuga* was split at CoP14 to become two species: *M. subtrijuga* and *Malayemys macrocephala*. *M. subtrijuga* occurs in eastern Thailand, Lao PDR, Cambodia, southern Viet Nam, and Indonesia, and *M. macrocephala* occurs in central and southern Thailand, Cambodia, and Malaysia. The species included within the RST from Malaysia was therefore considered to be *M. macrocephala*.

M. subtrijuga was categorised globally Vulnerable [assessment made prior to taxonomic change]. *M. subtrijuga* and *M. macrocephala* were both provisionally assessed as Vulnerable in a draft assessment in 2011. Population sizes of *M. subtrijuga* unknown, but declining and with populations presumed to be “severely reduced” in parts of range. Populations of *M. macrocephala* were presumed to be relatively stable and common in parts of range.

INDONESIA: Natural occurrence of the species in Indonesia unconfirmed, with some reports suggesting the species is introduced to the country. Limited distribution in parts of Java and Sumatra. Subpopulations reportedly small and restricted, and considered rare. Declines attributed to collection for trade and habitat loss. Reported to be commonly harvested from Central Java and West Java provinces. Annual export quota of 180 live wild-sourced individuals (2008-2017). Annual reports were submitted by Indonesia for all years 2006-2015. Trade 2006-2015 comprised live wild-sourced individuals (1669 as reported by Indonesia). Indonesia responded to the consultation relating to the RST. Trade was reportedly restricted to live individuals with a maximum carapace length (15 cm) to avoid harvest of adults, and for personal purposes only. Survey methods and population monitoring guidelines for turtles were developed in 2012, but no information on any completed field studies or surveys were provided. No national species management plan located. The basis for non-detriment findings for export of wild-sourced specimens for this rare and apparently declining species in Indonesia does not appear to be robust, and international trade appears to be impacting the species, therefore categorised as Action is needed.

RECOMMENDATION:
Action is needed

LAO PEOPLE'S Occurs in south-west and central Lao, PDR. No information on population size, but reported to be vulnerable and declining. Main threats are domestic consumption and international trade, as well

RECOMMENDATION:

<p>DEMOCRATIC REPUBLIC:</p>	<p>as habitat alteration. No export quotas published. Trade 2006-2015 comprised one wild-sourced scientific specimen in 2009 and 1000 live ranched individuals in 2010 (all trade reported by countries of import only). No trade has been reported since 2010 by Lao PDR or importers. Lao, PDR was subject to recommendations to suspend all commercial trade in 2015 and 2016. Annual reports were submitted by Lao PDR for all years 2006-2015. Lao PDR did not respond to the consultation relating to the RST; no information on population surveys or monitoring was located. Species is listed under national legislation as a 'managed' wildlife species; local hunting for subsistence purposes is permitted but commercial trade is prohibited. The basis for non-detriment findings for possible previous exports of ranched specimens is unclear. However, there has been no wild-sourced trade over the ten years (aside from one scientific specimen), and no recent trade in ranched specimens in the last five years (2011-2015) and commercial trade in wild individuals is prohibited; therefore, categorised as Less concern.</p>	<p>Less concern</p>
<p>[<i>M. subtrijuga</i>]</p>	<p>MALAYSIA:</p> <p>Malaysia responded to the consultation relating to inclusion of <i>M. subtrijuga</i> in the RST, noting that the species does not occur in the country.</p> <p>[<i>M. macrocephala</i>]</p> <p><i>M. macrocephala</i> occurs in the extreme north-west, and along the north-west coast of Peninsular Malaysia. No estimates of population size, and subpopulations reported to be small and restricted. One author considered the population to be relatively stable. Utilized for meat in Malaysia, with drainage of swamps and collection for international trade also considered a threat. Illegal trade reported. During 2006-2015, trade was reported in 2006 and 2007 only, consisting mainly of live, captive-bred and ranched individuals (348 animals as reported by Malaysia). Annual reports were submitted by Malaysia for all years 2006-2015. Zero quota published since 2007. Protected under national legislation and harvest and trade allowed under licence only. Species considered "fairly well protected" in Malaysia by one author. On the basis of the protection within Malaysia and no anticipated legal trade due to the zero quota, categorised as Less concern.</p>	<p>RECOMMENDATION:</p> <p>Less concern</p>

RST Background

Malayemys subtrijuga (Mekong Snail-eating Turtle) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *M. subtrijuga* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, as well as in 2012, on the basis of trade data presented in AC27 Doc. 12.5. Cambodia, China, Thailand and Viet Nam were removed from the RST process at AC28 (August, 2015), whilst Indonesia, Lao People's Democratic Republic (hereafter referred to as Lao, PDR) and Malaysia were retained (AC28 Com. 8, AC28 Summary Record).

B. Species characteristics

Taxonomic note: On the basis of morphological traits (Ihlow *et al.*, 2016), the species *M. subtrijuga* underwent a taxonomic split at CoP14 (2007) to become two species, *M. subtrijuga* and *Malayemys macrocephala* (CoP14 Doc. 8.5; Fritz and Havaš, 2007). *M. subtrijuga* is restricted to populations from the eastern part of the former species distribution range (eastern Thailand, Lao, PDR, Cambodia and southern Viet Nam), and the western populations of *M. subtrijuga* prior to the split were allocated to *M. macrocephala* (central Thailand, south-eastern Thailand and Cambodia, and the Malay Peninsular in southern Thailand and northern Malaysia) (Brophy, 2004; Ihlow *et al.*, 2016).

On the basis of the geographical split described above, scientific literature published prior to the nomenclature change which refer to a species of *Malayemys* in Malaysia³ are assumed to refer to *M. macrocephala*, but for clarification, the nomenclature used in the cited source is given in square brackets. It should be noted that other literature⁴ on these taxa published prior to the revision of the genus *Malayemys* and the validation of *M. macrocephala*, may refer to either or both species.

Phylogenetic and morphological analyses of the taxonomy of *Malayemys* by Ihlow *et al.* (2016) suggested that the genus consists of three distinct taxa and that populations from the Khorat Basin (north-eastern Thailand) represent a third distinct species (Ihlow *et al.*, 2016). Furthermore, Sumontha *et al.* (2016), following analysis of the morphological features of specimens from the Mekong River Basin in north-eastern Thailand (Nong Bua Lamphu, Nong Khai and Udon Thani provinces) and the adjacent Vientiane area in Laos, concluded that this population of *Malayemys* represents a new taxon and that consequently, the known distribution range of *M. subtrijuga* required revision. However, the taxonomy accepted by the CITES Standard Reference, which recognises two species of *Malayemys*, is followed in this review (Fritz and Havaš, 2007).

Biology: Species of the genus *Malayemys* are small, slow-moving, freshwater turtles (Srinarumol, 1995 in Brophy, 2005), which exclusively inhabit lowland freshwater areas (Brophy, 2004). Habitats may be natural or anthropogenic, and include ponds, canals, streams, swamps, marshes and wet rice fields (Brophy, 2005). *Malayemys* feed primarily on molluscs (Srinarumol, 1995 in Brophy, 2005). The genus was reported to have poor dispersal abilities (Brophy, 2004).

The reproductive behaviour of *M. subtrijuga* was considered “unstudied” by (Das, 2010). Reports of clutch size for *M. subtrijuga* varied between three and 10 eggs (Lim and Das, 1999; Bonin *et al.*, 2006; Platt *et al.*, 2008). Clutches of *M. macrocephala* were reported to comprise three to six eggs, which hatch after an incubation period of 99-225 days (Das, 2010). As a result of differences in allometric growth between males and females, adults of *M. macrocephala* were found to be sexually dimorphic, with females larger than males (Brophy, 2006). Prior to the taxonomic split, it was noted that *M. subtrijuga*⁵ is “exceedingly difficult to maintain” in captivity (Hudson and Buhlmann, 2000). According to van Dijk (pers. comm. to UNEP-WCMC, 2017), this is true for all *Malayemys*.

Distribution: *M. subtrijuga* was reported to occur in the Mekong River Basin of eastern Thailand, Lao, PDR, Cambodia, southern Viet Nam and Java in Indonesia (Brophy, 2005). *M. macrocephala* was reported to occur in Chao Phraya and Mae Klong basins of central Thailand, the coastal areas of south-eastern Thailand and Cambodia, the Thai-Malay Peninsula comprising southern Thailand and northern

³ After consideration of the recent literature, Malaysia has been removed from Species+ (www.speciesplus.net) as a possible range State of *M. subtrijuga*.

⁴ General literature or referring to range States where both species occur.

⁵ Published prior to the validation of *M. macrocephala* and it is unknown whether this may refer to both species of *Malayemys*.

Malaysia (Brophy, 2005), and Myanmar (van Dijk *et al.*, 2014). Based on species point localities and coverage of suitable habitat (taking into account elevation and hydrology) Buhlmann *et al.* (2009) estimated the global range of *M. subtrijuga* and *M. macrocephala* to be 487 094 km² and 279 330 km², respectively.

Population status and trends: *M. subtrijuga* was categorised as Vulnerable in the IUCN Red List in 2000, however, it was noted that this assessment needs updating (Asian Turtle Trade Working Group, 2000). Sumontha *et al.* (2016) remarked that the original assessment had been made prior to the revision of the genus and the validation of *M. macrocephala* by Brophy (2004).

M. subtrijuga was considered Vulnerable in Cambodia, Lao, PDR and Viet Nam, and subpopulations in Indonesia and Malaysia were reported to be small and restricted (Asian Turtle Trade Working Group, 2000). Its status in Thailand was considered “not uncommon” (Asian Turtle Trade Working Group, 2000). *M. macrocephala* has not been assessed by the IUCN, although both *M. subtrijuga* and *M. macrocephala* were provisionally reclassified as Vulnerable in a draft reassessment by the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (TFTSG) in 2011 (van Dijk *et al.*, 2012, 2014).

The status of populations across the range of *Malayemys* species (with the exception of central Thailand) was considered poorly documented (Brophy, 2005). *M. subtrijuga* populations were reported to have been “severely reduced” in Laos, Cambodia, and Vietnam (Brophy, 2004), whilst populations of *M. macrocephala* were reported to be relatively stable (van Dijk and Thirakhupt, in press in Brophy, 2004) in Thailand and Malaysia (Brophy, 2004) and considered common in Thailand (Brophy, 2006). Bonin *et al.* (2006), reported that populations of *M. subtrijuga* were declining and the species range was becoming more limited.

In the 1991 Tortoises and Freshwater Turtles action plan, *M. subtrijuga* was rated as a species that was “believed to be in need of some conservation action” that ‘may be threatened over substantial parts of its range, or widespread but its status is insufficiently known’ (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991). For species rated as such, specific conservation projects and status surveys were considered to be needed (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991).

Threats: Intense harvesting and habitat alteration were reported to represent major threats to *M. subtrijuga* in Lao, PDR, Cambodia and Viet Nam (Brophy, 2004), and the species was considered impacted by habitat change in Thailand (Asian Turtle Trade Working Group, 2000). *M. macrocephala* was considered highly popular in the pet trade (Brophy, 2006).

Habitat loss was considered a significant threat to *M. subtrijuga* by Bonin *et al.* (2006). Other threats to the *M. subtrijuga*, were reported to include habitat degradation, pollution and drainage of wetlands (van Dijk *et al.*, 2000; Sharma and Tisen, 2000).

In the 1990s, the species was sold in local markets in Thailand and Cambodia in significant numbers (observations of 50+ animals in a provincial market was common (van Dijk, P.P. pers obs.)), mainly for release for merit-making [Buddhist practices], but also some consumption, particularly of large females with eggs in Cambodia in the 1990s and early 2000s (van Dijk *in litt.* to UNEP-WCMC, 2017). *M. subtrijuga* was reported to be among the most common species traded for consumption in Southeast Asia (van Dijk *et al.*, 2000). *M. subtrijuga* was been observed in markets in Hong Kong, Shenzhen and Guangzhou, Southern China in 2000-2003 (Cheung and Dudgeon, 2006) and in Chatuchak Market,

Bangkok between 2004 and 2013⁶ (Shepherd and Nijman, 2008; Nijman and Shepherd, 2015). *Malayemys* species were observed in Yuehe Pet market in China from 2006-2008 (Gong *et al.*, 2009). A number of confiscations of illegally traded *M. subtrijuga* have been reported (AC25 Doc. 19; CoP17 Doc. 73 Annex 2). *M. subtrijuga* and *M. macrocephala* were reported to be among the most frequently seized tortoises and freshwater turtles as live specimens globally 2000-2015, with more than 2707 seizures recorded (CoP17 Doc. 73).

Overview of trade and management: *M. subtrijuga* was listed in CITES Appendix II on 12th January 2005. According to data in the CITES Trade Database, nearly all global trade in *M. subtrijuga* 2006-2015 was in live animals for commercial purposes, the majority of which was wild-sourced according to exporters and ranches according to importing countries. Exports of live *M. subtrijuga* increased in 2007 and 2014, as reported by importers. In contrast, exporters reported a peak in trade in 2010. The main importers of live *M. subtrijuga* were the United States of America and Viet Nam (as reported by exporters and importers, respectively). *M. subtrijuga* was reported to be protected under national legislation in Cambodia and Thailand (van Dijk *in litt.* to UNEP-WCMC, 2017). No specific management measures or specific population monitoring efforts for *Malayemys*, in place or planned, were reported to be known in any of the Range States in 2004 (CoP13 Prop. 16), although Malaysia has since implemented restrictions on exports.

Resolution Conf 11.9 (Rev. CoP13) on the 'Conservation of and trade in tortoises and freshwater turtles' urges Parties, especially range States, to undertake a number of activities including enhancing enforcement and management efforts, implementing research programmes and management strategies, enacting legislation, and increasing public awareness. Range States that authorize trade in tortoises and freshwater turtles are required to provide information on their progress towards implementing this Resolution in their periodic reporting (Res. Conf. 11.9 [Rev. CoP13]). No specific information could be located on progress towards these activities in relation to the species under review in the biennial reports of Indonesia, Lao, PDR or Malaysia. Pursuant to CITES Decision 16.109, the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group produced a guide for CITES Scientific and Management Authorities on non-detriment findings and trade management for tortoises and freshwater turtles (AC28 Doc. 15 Annex 2).

C. Country reviews

Indonesia

Distribution: *M. subtrijuga* was reported to be an introduced species in Indonesia (Rhodin *et al.*, 2010; van Dijk *et al.*, 2012; van Dijk *et al.*, 2014; CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017), with a limited distribution in Java and Sumatra (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). However, van Dijk (pers. comm. to UNEP-WCMC, 2017) noted that the species occurrence in Java had been well documented in historical records (19th and 20th century museum specimens and literature) and considered that molecular phylogenetic work to determine the origins of the Javan population was needed.

In **Sumatra**, Iverson (1992) mapped only one location and Brophy (2005) referred to a single record from Duri, Riau Province, Sumatra. The species occurrence in Sumatra was also reported by Iskandar (2000), however, it was not confirmed during a number of other herpetological or trade surveys by Brophy (2004) (de Rooij, 1915; Fritz and Gaulke, 1997; Gaulke *et al.*, 1998; Shepherd, 2000). The species

⁶ The authors noted the recognition of *M. macrocephala* as a distinct species, but were not able to refine the species identification retrospectively and reported it as *M. subtrijuga*.

was assessed as vulnerable in Sumatra in 2003 during an expert workshop convened by the IUCN SSC Conservation Breeding Specialist Group (CBSG, 2003). Traders from Sumatra were not familiar with the species; as a result Shepherd (2000) concluded the species was apparently not traded in Sumatra and considered its presence “questionable”. van Dijk (pers. comm. to UNEP-WCMC, 2017) noted that the species occurrence in Sumatra had never been confirmed. According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), the species occurs in Riau in Sumatra.

In **Java**, three locations were mapped by Iverson (1992). The species was reported to occur in Banten (Banten Province), Cirebon, and Tasikmalaya (Jawa Barat Province), Jakarta (Jakarta Raya Province) [all West Java], Depok [Central Java], and Surabaya (Jawa Timur [East] Province) (Brophy, 2005). The CITES MA and SA of Indonesia confirmed records of occurrence in western Java (Banten, Jakarta, Serang, and Tasikmalaya) (based on records from the Museum Zoologicum Bogoriense (MZB)) and in Central Java (Mumpuni & Riyanto, pers. obs. to CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). A range map for the species is provided in Figure 1.



Figure 1. Distribution range of *M. subtrijuga* in Indonesia (shown in green) (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

The population in Java was believed to have been introduced by humans from a source population along the Mekong River (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). It was reported that the species is mainly found in paddy fields in Indonesia (Mumpuni & Riyanto, pers. obs. to CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

Population status and trends: Subpopulations of *M. subtrijuga* in Indonesia were reported to be small and restricted (Asian Turtle Trade Working Group, 2000) and the species was considered rare in the country (Samedi and Iskandar, 2000) and on Java (van Dijk and Thirakhupt, in press; Peter C. H. Pritchard, pers. comm. in Brophy, 2005). According to Samedi *et al.* (2002 in CoP13 Prop. 16), declines in trade figures over time, despite stable or increased demand, indicated population declines. Trade was implicated in declines (see ‘Threats’).

Iskandar and Erdelen (2006) noted that reptiles in Indonesia “remain poorly understood”. Data on species biology and ecology were considered to be lacking and population sizes “unknown for virtually all species” (Iskandar and Erdelen, 2006).

Threats: Habitat loss and fragmentation was considered to be “the most important factor affecting the indigenous amphibian and reptile species” in Indonesia (Iskandar and Erdelen, 2006). Samedi *et al.* (2002 in CoP13 Prop. 16) concluded that trade in freshwater turtles and tortoises, combined with habitat loss, had contributed to population declines in Indonesia. Samedi and Iskandar (2000) predicted that without further control on the trade, Indonesia’s native species of freshwater turtles, including

M. subtrijuga, ‘will certainly decline’. Individuals of *M. subtrijuga* were observed for sale in Jakarta in 2004 and 2010 (26 and 20 individuals, respectively) (Shepherd and Nijman, 2007; Stengel *et al.*, 2011). The species was reported to have a high turnover rate in trade (Shepherd and Nijman, 2007).

Trade: All CITES annual reports have been submitted by Indonesia for the period 2006-2015. Indonesia published export quotas for live *M. subtrijuga* 2006-2017 (Table 1). For 2009-2011 the published export quotas were subject to a maximum carapace size of 15 cm. Exports of *M. subtrijuga* were within quota for all years with the exception of 2013 where the quota appears to have been exceeded, according to trade reported by Indonesia (Table 1).

Table 1: CITES export quotas for live *Malayemys subtrijuga* from Indonesia, 2006-2017 and global direct exports as reported by countries of import and Indonesia, 2006-2015. Indonesia have submitted all annual reports 2006-2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	475	475	180	180	180	180	150	150	180	180	180	180
Reported by importer	35	122	62	21	68	16	30	16	47	15		
Reported by Indonesia	89	341	155	154	119	160	132	159	180	180		

Table 2: Direct exports of *Malayemys subtrijuga* from Indonesia, 2006-2015. Indonesia have submitted all annual reports 2006-2015. All trade was in wild-sourced, live *M. subtrijuga* for commercial purposes.

Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Importer	35	122	62	21	68	16	30	16	47	15	432
Exporter	89	341	155	154	119	160	132	159	180	180	1669

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

According to data in the CITES Trade Database, direct trade in *M. subtrijuga* from Indonesia 2006-2015 solely comprised live, wild-sourced individuals for commercial purposes, with 1669 animals reported by Indonesia and 432 animals reported by importing countries (Table 2). Trade peaked in 2007 according to both importers and exporters, with Indonesia reporting an increase of more than three times compared to trade reported in 2006. Quantities subsequently declined in 2008 and remained relatively constant for the period 2008-2015. Indonesia consistently reported higher levels of trade than importing countries. The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) provided more recent records of trade, reporting the export of 180 live individuals (all sources) in 2016. There are no records of indirect trade in *M. subtrijuga* originating in Indonesia.

Management: Indonesia became a Party to CITES on 28th March 1979. *M. subtrijuga* is not included in the list of protected animals in Indonesia (Schoppe, 2009; van Dijk *in litt.* to UNEP-WCMC, 2017; CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). The species was reported to be managed in Indonesia through setting of annual harvest quotas, restrictions on trade, training of law enforcement, and the use of captive breeding (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). No information on any field studies or surveys could be located. There does not appear to be a national management plan for the species.

Quota setting: The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that only trade in live individuals of *M. subtrijuga* that are traded as pets is permitted, and trade is limited to a maximum carapace length (15 cm) to avoid harvest of adults. The species was reported to be “commonly harvested from Central Java and West Java provinces” (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), provincial Management Authority officers propose harvest levels, which are then assessed by the CITES SA (Indonesian Institute of Sciences, LIPI). It was reported that 90 per cent of the national quota is typically allocated for export and the remainder for domestic trade (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). It was reported that national quotas are set per species, with sub-quotas for specific provinces or regions, and these are reviewed annually (Stengel *et al.*, 2011). The harvest quotas for *M. subtrijuga* by province were however, not provided.

The CITES Management and Scientific Authorities of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that individual species harvest quotas are based on a range of available data, including information on the biology and distribution of the species, general land-use and potential threats in specific areas, and include various parameters, including environmental conditions. In setting the quotas, expertise is sought by the Scientific Authority from other research organizations, universities and NGOs (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). The finalised quotas are issued in an annual decree by the Directorate General of Forest Protection and Nature Conservation (CITES Management Authority) (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017), which identifies the allowable harvest for each species at the national level down to the provincial level (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), monitoring of the ‘chain of custody’ between the source region and the point of collection is theoretically possible to “a certain degree of accuracy”, and each province was reported to be divided into a number of BKSDA jurisdictions, which are able to track the legality of specimens.

Stengel *et al.* (2011) noted that concerns had previously been raised regarding the process used to establish quotas, referring to previous research (by Newton and Soehartono, 2001 and Soehartono and Mardiasuti, 2002) that indicated that quotas had been set arbitrarily and were not scientifically based (Schoppe, 2009). Shepherd and Nijman (2007) also expressed concerns regarding the quota setting process, noting that quotas had previously been set for CITES-listed species without detailed NDF’s being made and that the process where harvest quotas may be allocated to one province, but not to the adjacent province, created a loophole for harvest in adjacent areas. Concerns were also raised that harvest and trade were not efficiently monitored and enforcement of wildlife laws was rare.

Protected areas: According to CoP13 Prop. 16, *Malayemys* has not been confirmed to inhabit protected areas in Java or Sumatra.

Captive-breeding: The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that a captive breeding programme (PT. Indoreptil in Sawangan Depok, West Java Province) had been initiated in 2016. However, as noted above, *Malayemys* are considered exceedingly difficult to maintain and breed in captivity (Hudson and Buhlmann, 2000; van Dijk pers. comm. to UNEP-WCMC, 2017).

Legislation and enforcement: Through its national legislation project, the CITES Secretariat categorised the national legislation in Indonesia as legislation that is believed generally to meet the requirements for implementation of CITES.

In order to apply for CITES export permits, turtle collectors and exporters must be licensed and registered with the Directorate General of KSDAE and all shipments are checked and verified by the provincial office of KSDAE (BKSDA), whose officers are posted in designated international ports (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

Population monitoring: According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), although population data for the species is lacking, it can be assumed that the wild population is stable on the basis of actual export levels. It was reported that efforts to address the information gap had been initiated, with a survey method and population monitoring guidelines for turtles developed by

the Indonesian Institute of Sciences in 2012 (CITES Management and Scientific Authorities of Indonesia *in litt.* to UNEP-WCMC, 2017). It is unclear whether any population surveys or monitoring has taken place since the establishment of these guidelines.

Lao People's Democratic Republic

Distribution: van Dijk *et al.* (2014) mapped the occurrence of *M. subtrijuga* to south-west and central Lao, PDR. It was recorded in the lowlands of the central and southern regions of Lao, PDR (Duckworth *et al.*, 1999) from the Vientiane Municipality, Attopeu, Bolikhamxay, Champasak, Khammouane, Savannakhet, and Vientiane provinces (Brophy, 2005), including Khammouan Limestone National Biodiversity Conservation Area, Dong Khanthung Proposed National Biodiversity Conservation Area (Stuart and Platt, 2004), Phou Khaokhoay National Biodiversity Conservation Area, Dong Phou Vieng National Biodiversity Conservation Area and Xe Pian National Biodiversity Conservation Area (Duckworth *et al.*, 1999). The species occurrence was also reported from Dong Kanth Protected Forest (Bhumpakphan, 2015) and from the Beung Kiat Ngong Wetland Ramsar site in Champasak Province (IUCN, 2012).

Population status and trends: No information on population size within Lao, PDR could be located. According to Nash (1997), *M. subtrijuga* was relatively common in Lao, PDR. In 1999, the species was considered “potentially at risk” by Duckworth *et al.* (1999) and in 2000, the species was assessed as Vulnerable in the country (Asian Turtle Trade Working Group, 2000). It was reported to be declining by Touch *et al.* (2000), and Brophy, (2004). Stuart and Timmins (2000) noted that the species continued to survive in appropriate habitat throughout Lao, PDR and was relatively common, but with reduced populations. Brophy (2004) also reported that populations of *M. subtrijuga* in Lao, PDR were vulnerable with “severely reduced population sizes”.

Threats: According to Stuart and Platt (2004) chelonians in Lao, PDR were threatened by widespread and intensive exploitation for food and traditional Chinese medicine. Stuart and Timmins (2000) reported that *M. subtrijuga* was observed frequently in markets in Lao, PDR where individuals were sold for domestic and regional consumption, as well as international trade (Duckworth *et al.*, 1999; Stuart and Timmins, 2000). Habitat alteration was also considered to be contributing to declines (Brophy, 2004).

M. subtrijuga was observed for sale in local food markets in Vientiane city and in Lomsaktay, Champasak Province in 2013 (Suzuki *et al.*, 2015). Individuals of *M. macrocephala* were also frequently observed in local food markets in Vientiane city (Suzuki *et al.*, 2015). The authors acknowledged that *M. macrocephala* had not been recorded from Lao, PDR, and it was unclear if the high levels of trade in this species was a result of imports from other countries, or indicated that the species is native to Lao, PDR (Suzuki *et al.*, 2015).

Trade: All CITES annual reports have been submitted by Lao, PDR for the period 2006-2015. Lao, PDR has not published export quotas for *M. subtrijuga*, but trade suspensions were in place for “all commercial trade in specimens of CITES-listed species” for Lao, PDR in 2015 and 2016.

According to data in the CITES Trade Database, direct trade in *M. subtrijuga* from Lao, PDR 2006-2015 comprised 1000 live, ranched individuals for commercial purposes exported to Viet Nam in 2010 and one wild-sourced specimen for scientific purposes exported to the United States, as reported by importers (Table 3). No trade in the species was reported by Lao, PDR.

Table 3: Direct exports of *Malayemys subtrijuga* from Lao People's Democratic Republic, 2006-2015. Lao, PDR have submitted all annual reports 2006-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
live	T	R	Importer					1000						1000
			Exporter											
specimens	S	W	Importer				1							1
			Exporter											

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *M. subtrijuga* originating in Lao, PDR consisted of 5000 live, ranched animals for commercial purposes, re-exported by Viet Nam in 2008 to China. There are no records of the original export from Lao, PDR or import of these specimens into Viet Nam in the CITES Trade Database. China did not report any imports of this species originating in Lao, PDR and re-exported from Viet Nam.

Management: Lao, PDR became a Party to CITES on 30th May 2004.

Under regulations issued in 2003, *M. subtrijuga* was listed as a 'managed' wildlife species, meaning that local hunting for subsistence purposes was permitted but commercial trade was prohibited, except for the purposes of breeding for conservation (Lao People's Democratic Republic, 2003). Through its national legislation project, the CITES Secretariat categorised the national legislation in Lao, PDR as legislation that is believed generally not to meet the requirements for the implementation of CITES.

Wildlife legislation in Lao, PDR was reported to be under review (van Dijk *in litt.* to UNEP-WCMC, 2017). van Dijk (*in litt.* to UNEP-WCMC, 2017) noted that current legislation in place did not protect freshwater turtles from exploitation and that legislation designating National Biodiversity Conservation Areas (NBCAs) did not prevent collection of turtles from these areas; observations of individuals of *M. subtrijuga* in villages within NBCA's were thought to indicate exploitation of the species in these areas (Duckworth *et al.*, 1999; CoP13 Prop. 16). Brophy (2004), also reported that populations of *M. subtrijuga* in Lao, PDR were poorly protected.

The species has been reported from a number of National Biodiversity Conservation Areas (NBCAs) and from Dong Kanth Protected Forest [south-west Lao, PDR] (Bhumpakphan, 2015) and from the Beung Kiat Ngong Wetland Ramsar site in Champasak Province [south-west Lao, PDR] (IUCN, 2012). In 2008-2009, 13 individuals of *M. subtrijuga* were rescued from the Nam Theun 2 Reservoir (Khammouane Province) and released into the adjacent Nakai-Nam Theun National Protected Area (Streicher, 2014).

No information on ranching of the species in Lao, PDR was located. The CITES Authorities in Lao, PDR were consulted as part of this review, but no response was received.

Malaysia

Distribution: Following a taxonomic split at CoP14, *M. subtrijuga* does not occur in Malaysia, as confirmed by the CITES Management Authority of Malaysia (*in litt.* to UNEP-WCMC, 2017). However, the species *Malayemys macrocephala* which was split from *M. subtrijuga* at CoP14, does occur in Malaysia and was therefore assessed for the RST.

M. macrocephala [*M. subtrijuga*] was reported to occur in Peninsular Malaysia in the northern States of Perlis and Kedah [extreme north-west Peninsular Malaysia] (Lim and Das, 1999; Sharma and Tisen, 2000; van Dijk and Thirakhupt, in press in Brophy, 2005) and along the [north] east coast in the *Melaleuca* swamps in Terengganu and possibly Kelantan (Sharma and Tisen, 2000; Brophy, 2005). van Dijk *et al.* (2014) mapped the species occurrence in the north of Peninsular Malaysia. *M. macrocephala* [*M. subtrijuga*] was considered unknown from the southern Malay Peninsula (Iverson, 1992).

Population status and trends: Subpopulations in Malaysia were reported to be small and restricted (Asian Turtle Trade Working Group, 2000). Sharma and Tisen (2000) noted that data on the population status and trends of *M. macrocephala* [*M. subtrijuga*] in Malaysia were unavailable. Within its restricted distribution, *M. macrocephala* [*M. subtrijuga*] was reported to be “fairly abundant in rice fields in the State of Perlis” (Sharma, 1999). While Aun (1990), considered *M. macrocephala* [*M. subtrijuga*] to be rare and endangered in Malaysia. A localised reduction in population numbers of *M. macrocephala* [*M. subtrijuga*] in Malaysia was considered possible due to its use as a source of meat (Sharma and Tisen, 2000). Brophy (2004) considered populations of *M. macrocephala* to be relatively stable in Malaysia.

Threats: Threats to *M. macrocephala* [*M. subtrijuga*] in Malaysia were reported to include drainage of the swamps in Terengganu and Kelantan and collection for international trade (Sharma and Tisen, 2000). Whilst no records of *M. macrocephala* [*M. subtrijuga*] were included in the official export data records for Peninsular Malaysia in 1999, observations were made of the species being held by traders who reported that they were mainly destined for the export market in that year (Sharma and Tisen, 2000). The species is also utilized as a meat source in Malaysia (Sharma and Tisen, 2000).

Trade: All CITES annual reports have been submitted by Malaysia for the period 2006-2015. Malaysia published a zero export quota for *M. macrocephala* in 2007-2017; there were no reported direct exports of wild-sourced *M. subtrijuga* from Malaysia in 2007 (Table 4).

According to data in the CITES Trade Database, direct trade in *M. subtrijuga* from Malaysia 2006-2015 solely comprised of live animals for commercial purposes sourced from captive-bred, ranched and wild stocks (Table 4), reported 2006 and 2007 only. Malaysia reported the export of eight captive-bred animals to the United Kingdom in 2006, whereas the United Kingdom reported trade in eight wild sourced animals in this year, all for commercial purposes. A permit analysis suggests that these two records may represent the same transaction. In 2007 Malaysia reported the export of 340 live animals to Japan, of which 200 were ranched and 140 captive-bred (Table 3). There was no trade reported as *M. macrocephala* from Malaysia 2006-2015. There are no records of indirect trade in *M. subtrijuga* originating in Malaysia.

One report of illegal trade was located. In June 2006, a single individual was seized at Don Muang Airport from a shipment in transit from Penang, Malaysia, to Lao, PDR (AC25 Doc. 19).

Table 4: Direct exports of *Malayemys subtrijuga* from Malaysia, 2006-2015. Malaysia has submitted all annual reports 2006-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	
live	T	C	Importer												
			Exporter	8	140									148	
		R	Importer												
			Exporter		200										200
		W	Importer	8											8
			Exporter												

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Management: Malaysia became a Party to CITES on 18th January 1978. *M. subtrijuga* is listed under Schedule three of the International Trade in Endangered Species Act 2008 (Malaysia, 2008), which regulates international trade in compliance with CITES obligations. It is categorised as ‘Protected’ under Part 2 of the First Schedule of the Wildlife Conservation Act, 2010 (Act No. 716) in Peninsular Malaysia,

which prohibits hunting⁷, possession, import or export of the species (or any parts or derivatives of), except under licence, or research or study of the species without a permit (Malaysia Wildlife Conservation Act, 2010).

Malaysia has published a zero quota for *M. macrocephala* since 2007, indicating that no international exports are anticipated.

The species was reported to inhabit rice fields in Perlis and *Melaleuca* swamps in Terengganu; neither habitat was protected by state or federal laws (Sharma and Tisen, 2000). Jambu Bongkok Forest Reserve in Terengganu, which was reported to be the only *Melaleuca* swamp habitat protected in the country by Sharma and Tisen (2000), was considered within the species range by Brophy (2005). Brophy (2004) considered populations of *M. macrocephala* to be “fairly well protected” in Malaysia.

Through its national legislation project, the CITES Secretariat categorised the national legislation in Malaysia as legislation that is believed generally to meet the requirements for implementation of CITES.

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

None identified.

E. References

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⁷ During the open season. Hunting during the closed season requires a special permit.

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Notochelys platynota: Indonesia

A. Summary

INDONESIA: Categorised as Vulnerable globally. Reported to have a relatively wide range in Indonesia, mainly occurring in Sumatra and Kalimantan. No estimates of population size or densities, but reported to have declined from “extremely common” in Indonesia in the late 1980s to “reasonably common” in 2000. Considered uncommon by some, and assessed as Endangered in Sumatra. Commonly traded for consumption, with habitat loss and fragmentation also considered serious threats. Annual export quotas in place, which increased from 450 in 2008-2015 to 810 in 2016 and 2017 (previous quotas of 1350 in 2006-2007). Trade 2006-2015 consisted of live, wild-sourced individuals (2112 as reported by Indonesia). Exports increased from 324 wild sourced individuals in 2015 to 753 (source not specified in 2016) in line with the increased quota. Annual reports were submitted by Indonesia for all years 2006-2015. Indonesia responded to the consultation relating to the RST. Harvest restricted to Sumatra and Kalimantan, and trade restricted to live individuals with a maximum carapace length (15 cm) to exclude adults, and for personal purposes only. Survey methods and population monitoring guidelines were developed in 2012, but no information on any completed field studies or surveys provided. No national species management plan located. Not protected by national legislation. Harvest appears to occur in Sumatra where the species was assessed as Endangered. The basis for non-detriment findings for exports of wild-sourced specimens and the establishment of the export quota has not been provided, and the impact of on-going trade on this apparently declining species is unclear, therefore categorised as Action is Needed.

RECOMMENDATION:

Action is needed

RST Background

Notochelys platynota (Malayan Flat-shelled Turtle) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *N. platynota* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011 as well as in 2012, and also showed a high variability in trade, on the basis of trade data presented in AC27 Doc. 12.5. A response to the Secretariat’s consultation was received from Myanmar at AC28 (August, 2015) (AC28 Doc. 9.4 (Rev.2)). Brunei Darussalam, Malaysia, Myanmar (distribution uncertain), Singapore, Thailand and Viet Nam were removed from the RST process, whilst Indonesia was retained (AC28 Com. 8, AC28 Summary Record).

B. Species characteristics

Biology: *N. platynota* is a semi-aquatic turtle, with a carapace length of up to 40 cm (Das, 2010). The species inhabits shallow water bodies, including streams, marshes and swamps (Das, 2010) in lowland

rainforest areas (Sharma and Tisen, 2000). It has been recorded at altitudes up to 1200 m above sea level in the Tengger mountains of Java (de Rooij, 1915). The reproductive behaviour of the species was reported to be poorly known (Buskirk, 1997). It is oviparous (Buskirk, 1997), and Bonin *et al.* (2006) reported clutch sizes of two to six eggs. The species diet was reported to comprise aquatic vegetation (Das, 2010), although Buskirk (1997) noted that the species also has carnivorous habits. The species was reported to be difficult to maintain in captivity (Buskirk, 1997; van Dijk *in litt.* to UNEP-WCMC, 2017).

C. Country reviews

Indonesia

Distribution: *N. platynota* was reported to range from southern Thailand through Malaysia, to Indonesia (Fritz and Havaš, 2007) and Brunei Darussalam (Asian Turtle Trade Working Group, 2000). The species occurrence has also been reported from Singapore, Viet Nam and possibly Myanmar (Iverson, 1992). However, it was noted that the species has previously been confused with *Cyclemys* and historical records from Myanmar and Viet Nam may have been erroneous (CoP13 Prop. 19). Based on species point localities and coverage of suitable habitat (taking into account elevation and hydrology) Buhlmann *et al.* (2009) estimated the global range of *N. platynota* to be 1 179 228 km².

According to the CITES Management and Scientific Authorities of Indonesia (*in litt.* to UNEP-WCMC, 2017), *N. platynota* has a relatively wide range in Indonesia. It was reported to occur in Java, Kalimantan and Sumatra (Iverson, 1992; Das, 2010; Teynié *et al.*, 2010; van Dijk *et al.*, 2014; CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017), as well as the Bangka islands (east of Sumatra) and the Bunguran islands (north west of Borneo) (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). Iverson (1992) mapped the species in five locations in Sumatra, in one location in each of Bangka and Kalimantan, two locations on the border between Kalimantan and Sarawak and Sabah, and one location in east Java.

In **Sumatra**, the species appears widespread, and has been reported from the Bungo District (Jambi Province, central Sumatra) (Yusuf, 2008), Bangka island (Buskirk, 1997), Deli, Sukaranda (Langkat Regency, north Sumatra), Indragiri, Taluk [Riau Province] (de Rooij, 1915), Bukit Barisan Selatan National Park and Siberut Conservation Programme on Siberut Island Biosphere Reserve (west Sumatra) (Widyananto, 2009), Aceh Province in the north, Sumatera Utara (North) Province, Bengkulu and Sumatera Selatan (South) Province (Teynié *et al.*, 2010). In **Java**, the species has been reported from the Tengger mountains (east Java) (de Rooij, 1915), however, Buskirk (1997) noted that the two records of this species from south-eastern Java may have been misidentified, an opinion supported by van Dijk (*pers. comm.* to UNEP-WCMC, 2017). In **Kalimantan** the species occurrence has been reported from Sebruang Valley [west Kalimantan] (de Rooij, 1915), Malinau and Maruwai in East Kalimantan (Iskandar, 2004), and Labanan Research Forest (Berau District, East Kalimantan) (Lestari *et al.*, 2013). A range map for the species is provided in Figure 1.



Figure 1. Distribution range of *N. platynota* in Indonesia (shown in green) based on available museum records and literature (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

Population status and trends: *N. platynota* was categorised as Vulnerable in the IUCN Red List on the basis of trends in range States and noting high global trade levels (Asian Turtle Trade Working Group, 2000). In Indonesia, the population had declined from “extremely common” in the late 1980s to “reasonably common” in 2000; in Malaysia, the species habitat was reported to have decreased while trade volumes had increased; and in Thailand, the species was considered at least Vulnerable (Asian Turtle Trade Working Group, 2000). It was noted that the species was traded at levels of two to three tons per day in East Asian food markets in 1999 (B. Chan and R. Kan, pers. comms. in Asian Turtle Trade Working Group, 2000) following “proportionally very high mortality during transport” (Asian Turtle Trade Working Group, 2000). The IUCN assessment for this species was considered in need of updating (Asian Turtle Trade Working Group, 2000), and the species was provisionally reclassified as Vulnerable in a draft reassessment by the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (TFTSG) in 2011 (van Dijk *et al.*, 2012, 2014).

Bonin *et al.* (2006) considered *N. platynota* to be globally scarce. In Indonesia, the species was reported to be uncommon (Samedi and Iskandar, 2000). Samedi and Iskandar (2000) noted that information from traders and collectors indicated that populations of *Notochelys* spp. had declined considerably in Indonesia. Iskandar (2004) described *N. platynota* as a “locally well-known” species that was regularly observed at a camp in Bulungan Research Forest in East Kalimantan. The species was assessed as ‘Endangered’ in Sumatra in 2003 during an expert workshop convened by the IUCN SSC Conservation Breeding Specialist Group (CBSG, 2003).

Iskandar and Erdelen (2006) noted that reptiles in Indonesia “remain poorly understood”. Data on species biology and ecology were considered to be lacking and population sizes “unknown for virtually all species” (Iskandar and Erdelen, 2006).

In the 1991 IUCN/SSC Tortoises and Freshwater Turtles action plan, *N. platynota* was rated as a species that was “believed to be in need of some conservation action” that ‘may be threatened over substantial parts of its range, or widespread but its status is insufficiently known’ (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991). For species rated as such, specific conservation projects and status surveys were recommended (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991).

Meijaard *et al.* (2004) considered *N. platynota* a “prime candidate” for inclusion on the Indonesian list of protected species.

Threats: The main threat to freshwater turtles in Indonesia was reported to be hunting for trade (Samedi and Iskandar, 2000). *N. platynota* was reported to be among the most common species traded for consumption in Southeast Asia (van Dijk et al., 2000). Habitat loss and fragmentation were also considered serious threats (Samedi and Iskandar, 2000; Iskandar and Erdelen, 2006).

Over-collection was reported in Kalimantan (Meijaard et al., 2006; Gunarso *et al.*, 2007), with domestic consumption noted to occur (Iskandar, 2004) and the species was observed for sale in markets in Jakarta (Stengel *et al.*, 2011). Iskandar (2004) noted that the species was commonly eaten by local people in Bulungan Research Forest in East Kalimantan. Local use of tortoises and freshwater turtles for medicinal purposes was also reported (Samedi and Iskandar, 2000).

It was reported that mortality rates after capture are high for this species (around 10 per cent prior to shipping), with exporters rarely trading juveniles as they die quickly after capture (Shepherd, 2000). The species was therefore reported to have a high turnover rate in trade (Shepherd and Nijman, 2007).

Trade: *N. platynota* was listed in CITES Appendix II on 12th January 2005. All CITES annual reports have been submitted by Indonesia for the period 2006–2015. Indonesia has published annual export quotas for live *N. platynota* since 2006 (Table 1). For 2009–2011 the published export quotas were subject to a maximum carapace size of 15 cm. Trade in *N. platynota* was well within the quota published by Indonesia for the period 2006–2017.

Table 1: CITES export quotas for live *Notochelys platynota* from Indonesia, 2006–2017, and global direct exports as reported by countries of import and Indonesia, 2006–2015. Indonesia has submitted all annual reports 2006–2015. All direct trade in *N. platynota* was in wild-sourced, live animals for commercial purposes.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	1350	1350	450	450	450	450	450	450	450	450	810	810
Reported by importer	121	7	12		1	21	62	13	10	39		
Reported by Indonesia	117	307	126	25	99	190	321	307	296	324		

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Table 2: Direct exports of *Notochelys platynota* from Indonesia, 2006–2015. Indonesia have submitted all annual reports 2006–2015. All trade was live, wild-sourced for commercial purposes.

Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Importer	121	7	12		1	21	62	13	10	39	286
Exporter	117	307	126	25	99	190	321	307	296	324	2112

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

According to data in the CITES Trade Database, direct trade in *N. platynota* from Indonesia 2006–2015 consisted of live, wild-sourced animals traded for commercial purposes, with 2112 animals reported by Indonesia and 286 animals reported by importers (Table 2). According to Indonesia, trade peaked in 2015, while importers reported highest trade in 2006. The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) noted that the export of this species is only permitted for personal use; however of the 203 direct export transactions reported by Indonesia 2006–2015 over 80 per cent were for five or more live individuals. No records of indirect trade in *N. platynota* originating in Indonesia were reported 2006–2015.

In addition, according to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), Indonesia issued export permits for 753 live individuals in 2016, but did not specify a source.

In 2001, 34 individuals of *N. platynota* were among an illegal shipment seized in Hong Kong (Ades and Crow, 2000; AC25 Doc. 19 CoP17 Doc. 73). Overall, more than 58 live individuals of *N. platynota* were reported to have been seized globally between 2000 and 2015 (CoP17 Doc. 73).

Management: Indonesia became a Party to CITES on 28th March 1979. *N. platynota* is not included in the list of protected animals in Indonesia (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). The species was reported to be managed in Indonesia through setting of annual harvest quotas, restrictions on trade, and training (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). No information on any field studies or surveys could be located. There does not appear to be a national management plan for the species.

Quota setting: The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that only trade in live individuals for the purposes of pets is allowed, and trade is limited to a maximum carapace length (15 cm). Harvest of the species was reported to be restricted to Sumatra and Kalimantan (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), provincial Management Authority officers propose harvest levels, which are then assessed by the CITES SA (Indonesian Institute of Sciences, LIPI). It was reported that 90 per cent of the national quota is typically allocated for export and the remainder for domestic trade (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). National quotas are set, with sub-quotas for specific provinces or regions, and these are reviewed annually (Stengel et al., 2011).

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017) reported that harvest quotas for individual species are based on a range of available data, including information on the biology and distribution of the species, general land-use and potential threats in specific areas, and include various parameters, including environmental conditions. In setting the quotas, expertise is sought by the Scientific Authority from other research organizations, universities and NGOs (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). The finalised quotas are issued in an annual decree by the Directorate General of Forest Protection and Nature Conservation (CITES Management Authority) (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017), which identifies the allowable harvest for each species at the national level down to the Provincial level (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017). According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), monitoring of the 'chain of custody' between the source region and the point of collection is theoretically possible to "a certain degree of accuracy", and each province was reported to be divided into a number of BKSDA jurisdictions, which are able to track the legality of specimens.

Stengel *et al.* (2011) noted that concerns had previously been raised regarding the process used to establish quotas, referring to previous research (by Newton and Soehartono, 2001 and Soehartono and Mardiasuti, 2002) that indicated that quotas had been set arbitrarily and were not scientifically based (Schoppe, 2009). Shepherd and Nijman (2007) also expressed concerns regarding the quota setting process, noting that quotas had previously been set for CITES-listed species without detailed NDF's being made and that the process where harvest quotas may be allocated to one province, but not to the adjacent province, created a loophole for harvest in adjacent areas. Concerns were also raised that harvest and trade were not efficiently monitored and enforcement of wildlife laws was rare.

Legislation and enforcement: Through its national legislation project, the CITES Secretariat categorised the national legislation in Indonesia as legislation that is believed generally to meet the requirements for implementation of CITES.

In order to apply for CITES export permits, turtle collectors and exporters must be licensed and registered with the Directorate General of KSDAE and all shipments are checked and verified by the

provincial office of KSDAE (BKSDA), whose officers are posted in designated international ports (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2017).

Population monitoring: According to the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2017), although population data for the species is lacking, it was assumed that the wild population is stable on the basis of actual export levels. It was reported that efforts to address this information gap had been initiated, with a survey method and population monitoring guidelines for turtles developed by the Indonesian Institute of Sciences in 2012 (CITES Management and Scientific Authorities of Indonesia *in litt.* to UNEP-WCMC, 2017). It is unclear whether any population surveys or monitoring has taken place since the establishment of these guidelines. Meijaard *et al.* (2006) stated that data on population densities and numbers of *N. platynota* were required to help ensure sustainable levels of harvest.

Resolution Conf. 11.9 (Rev. CoP13) on the ‘*Conservation of and trade in tortoises and freshwater turtles*’ urges Parties, especially range States, to undertake a number of activities including enhancing enforcement and management efforts, implementing research programmes and management strategies, enacting legislation, and increasing public awareness. Range States that authorize trade in tortoises and freshwater turtles are required to provide information on their progress towards implementing this Resolution in their periodic reporting (Res. Conf. 11.9 [Rev. CoP13]). No information on Indonesia’s progress on the recommended activities in relation to the species under review have been provided in biennial reports submitted for 2003-2012. Pursuant to CITES Decision 16.109, the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group produced a guide for CITES Scientific and Management Authorities on non-detriment findings and trade management for tortoises and freshwater turtles (AC28 Doc. 15 Annex 2).

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

It was reported that the species is very similar to members of the genus *Cyclemys* and has been widely confused in the literature (Mertens, 1942 in CoP13 Prop. 19).

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Centrochelys sulcata: Benin, Ghana, Guinea, Mali, Sudan, Togo

A. Summary

Global status: Categorised as Vulnerable globally, but provisionally reclassified as Endangered in a draft IUCN assessment in 2011. No current information on population size available, but considered declining, with extirpations and severe depletions noted. Remaining populations considered small and fragmented.

Since 2000, the Appendix II listing for Testudinidae spp. has specified a zero annual export quota for all specimens of *Centrochelys sulcata* removed from the wild and traded for primarily commercial purposes. Potential compliance issues noted for several Parties in relation to the zero annual export quota.

BENIN:	<p>Occurrence in Benin appears questionable; may occur in the north in National Parks, but no recent reliable reports confirm occurrence. Population status and trends in the country unknown. Export quota of 150 ranched individuals in 2006 but reduced to 10 ranched individuals from 2007-2017 and quota for 50 captive-bred <i>C. sulcata</i> (2010-2017). Trade 2006-2015 primarily comprised live, ranched and captive-bred individuals, including 200 ranched individuals in 2014 (reported by the importer, Ghana). Low levels of trade in live wild-sourced individuals for commercial purposes (10 in 2010). Annual reports were submitted by Benin in all years 2007-2015, but not for 2006. The species is not nationally protected. Benin did not respond to the consultation relating to the RST; no further information on management was located. The basis for non-detriment findings for recent exports of ranched specimens is unclear, therefore categorised as Unknown status.</p>	RECOMMENDATION: Unknown status
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GHANA:	<p>Not a range state for <i>C. sulcata</i>, as confirmed by Ghana in response to the consultation. Export quota for live, captive-bred individuals increased from 800 in 2008, to 4000 in 2017. High levels of trade 2006-2015 in live captive-bred individuals, with low levels of ranched, source F and wild-sourced individuals reported exported in the past 5 years (including 372 wild-sourced). Annual reports were submitted by Ghana in all years 2007-2015, but not for 2006. Illegal trade noted. On the basis that the species does not appear to occur naturally in Ghana, categorised as Less concern.</p>	RECOMMENDATION: Less concern (Species-country combination may be relevant to AC discussions under Conf. Res, 17.7.)
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<p>GUINEA:</p>	<p>Occurrence in Guinea very doubtful, with only one record of possible occurrence in the extreme north-east in 1995. Trade 2006-2015 reported by countries of import only, and comprised live captive-bred (281), wild-sourced (110) and source F (50) individuals for commercial purposes. No trade in <i>C. sulcata</i> reported since 2013. Guinea submitted annual reports for 2006, 2008, 2010, 2013 and 2014 only. Guinea did not respond to the consultation relating to the RST. On the basis that the species does not appear to occur naturally in Guinea, categorised as Less concern.</p>	<p>RECOMMENDATION:</p> <p>Less concern</p>
<p>MALI:</p>	<p>Reported from central, south-central and eastern Mali. Population size unknown, but species considered rare and declining with local extirpations and depletions noted. Harvested for local consumption (the main threat in the country) and illegal trade reported. Annual zero export quota for wild-sourced <i>C. sulcata</i> published 2006-2017. High levels of trade 2006-2015 predominantly comprised of live, source F individuals (19 464 as reported by Mali) and captive-bred individuals (1914 as reported by Mali). Low levels of wild-sourced trade in live individuals for commercial purposes were however reported (50 in 2010 as reported by Mali; 255 in 2012 according to importers). Mali submitted annual reports for 2006-2014, but not 2015. Testudines are partially protected nationally. Mali did not respond to the consultation relating to the RST; no further information on management was located. On the basis of no anticipated legal trade in wild-sourced specimens due to the zero quota, categorised as Less concern.</p>	<p>RECOMMENDATION:</p> <p>Less concern</p> <p>(Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)</p>
<p>SUDAN:</p>	<p>Reported from central Sudan, but distribution data were considered poor. No current estimate of population size but considered 'endangered' in Sudan due to armed conflict and other pressures, including drought. Populations were reported to be far rarer, dispersed and restricted than previously thought. Zero export quota published for wild-sourced individuals 2006-2017. Trade 2006-2015 predominantly comprised live, captive-bred individuals (2696 as reported by Sudan) with some trade in wild-sourced individuals for commercial purposes (544 from 2009-2013 according to countries of import; 69 in 2011 as reported by Sudan). No wild-sourced trade reported 2014 or 2015 by Sudan or importers. Annual reports for 2008, 2009 and 2015 have not yet been submitted by Sudan. Sudan did not respond to the consultation relating to the RST; no information on management in the country was located. On the basis of no anticipated trade in wild-sourced specimens due to the published zero quota, categorised as Less concern.</p>	<p>RECOMMENDATION:</p> <p>Less concern</p> <p>(Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)</p>

TOGO: Occurrence in Togo has been questioned, but has been reported from the extreme north of the country. No estimates of population size, but population considered rare and fragile. Apparently considered Fetish in the north. No information on specific threats in Togo were located. Export quota for captive-bred *C. sulcata* increased from 500 in 2006 to 700 in 2016-2017. Trade 2006-2015 predominantly comprised live captive-bred individuals (4830 as reported by Togo). Low levels of trade in live wild-sourced individuals (50 in 2014 as reported by Togo only) and ranched individuals (10 in 2015 according to countries of import) for commercial purposes also reported. Togo submitted annual reports for 2007-2015, but not for 2006. Testudines are partially protected nationally. Togo did not respond to the consultation relating to the RST; no further information on management was located. The species is considered rare, with questionable occurrence in Togo, and the basis for non-detriment findings for recent wild-sourced trade is unclear, therefore categorised as Unknown status.

RECOMMENDATION:

Unknown status

(Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)

RST Background

Centrochelys sulcata (African Spurred Tortoise) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *C. sulcata* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, as well as in 2012, on the basis of trade data presented in AC27 Doc. 12.5. The Central African Republic, Chad, Djibouti (distribution uncertain), Eritrea, Ethiopia, Mauritania, Niger, Nigeria, Senegal and Somalia (distribution uncertain) were removed from the RST process at AC28 (August, 2015), whilst Benin, Ghana, Guinea, Mali, Sudan and Togo were retained (AC28 Com. 8, AC28 Summary Record).

C. sulcata was previously included in the RST following CoP9 (November, 1994). At AC12 (September, 1995), it was noted that there was insufficient information to assess the sustainability of trade, and that further communication with principal exporting range States was needed (AC12 Summary Record). At AC14 (May, 1998) it was stated that a lengthy report had been received from Mali, but it gave no information on biological status, an increase in exports from Mali was noted and the Secretariat agreed to consult with the Management Authority of Mali to ascertain the scientific basis by which exports of this species were permitted (AC14 Summary Records). At CoP11 (April, 2000) it was reported that Mali had been subject to recommendations of the AC but that no response had been received (CoP11 Doc. 11.41.1). Further consideration of this species within the RST phase 'following CoP9' is unclear.

C. sulcata was also reviewed as a candidate for the RST (AC20 Doc. 8.5) for AC20 (March, 2004), however, the species was not selected (AC20 WG1 Doc. 1, AC20 Summary Report).

B. Species characteristics

Taxonomic note: The genus *Centrochelys* was previously included in *Geochelone* (Fritz and Havaš, 2007). At CoP17, a taxonomic change was adopted to split the genus *Centrochelys* from *Geochelone*, and accordingly the species *Geochelone sulcata* was transferred to the new genus (van Dijk *et al.*, 2014). Significant genetic variation between western, central and eastern populations have been noted, but no subspecies have yet been described (Branch, 2008).

Biology: *C. sulcata* is the largest species of tortoise to occur on the African mainland (Vetter, 2005; Branch, 2008; Trape *et al.*, 2012), with a carapace length up to 84.5 cm (Vetter, 2005). The species inhabits a wide variety of arid habitats (Vetter, 2005) recorded at altitudes up to 500 m above sea level (Ineich *et al.*, 2014). It was reported to be one of the few reptile species that can persist in sub-Saharan conditions (Vetter, 2005). During the hottest periods of the day, the species retreats into caves and tunnels to avoid over-heating and desiccation (Vetter, 2005). The species was reported to be most active during the rainy season from July to October (Branch, 2008). Lambert (1993), noting that the species' range in Mali did not appear to be influenced by temperature and sunshine, believed that it may have wide environmental tolerances.

C. sulcata was reported to reach sexually maturity at 10-12 years of age in females and at 13-15 years of age in males (Vetter, 2005). Mating activity was observed throughout the year, but more intensely between September and April with a peak in October and November (Vetter, 2005). Oviposition mainly occurs between November and April, with average clutch sizes of 15-20 eggs, which typically hatch after 90-180 days (Vetter, 2005). A female may produce several clutches per year (Vetter, 2005).

C. sulcata was considered to be an important component of the fauna of the afro-tropical region (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991). Its diet was reported to consist largely of plants, including succulents, herbs, grasses and "withered parts of plants", but was also reported to feed on carrion and faeces (Vetter, 2005). The species was reported to be able to survive seasonal shortages in food, losing only a minor percentage of body mass (Vetter, 2005).

The species was reported to breed successfully in captivity (Vetter, 2005). However, it has been categorised as 'not suitable for private husbandry' (Altherr and Freyer, 2001). A comparison of the growth rates of three captive individuals with published data for wild individuals of *C. sulcata* found that captive individuals display faster growth (Ritz *et al.*, 2010). The authors also suggested that faster growing individuals may reach sexual maturity earlier, with potential benefits for restocking programmes (Ritz *et al.*, 2010).

Distribution: *C. sulcata* was reported to have a wide but scattered distribution (Mallon *et al.*, 2015). It occurs in northern central Africa (Vetter, 2005) across the Sahelian region (Lambert, 1998) within a strip of land 8000 km in length and 500-700 km in width along the southern limits of the Sahara (Vetter, 2005). The species ranges from Ethiopia and Sudan, west through the dry regions of Chad and Mali to southern Mauritania and Senegal (Fritz and Havaš, 2007). Vetter (2005) considered a record of the species from southern Somalia by Iverson (1992) to be doubtful but thought it possible it occurs (or previously occurred) in the north-west of the country. Vetter (2005) noted that the exact southern limits of the species range were difficult to define due to the translocation of the species for food and as currency throughout the region. Isolated records from Togo and Kenya were considered to largely represent individuals that had been located in this manner (Vetter, 2005). Its presence in the Arabian Peninsular (Yemen and Saudi Arabia) (Gasperetti *et al.*, 1993), where it may have been introduced (CoP11 Prop. 38), was considered unconfirmed (van Dijk *et al.*, 2014). Based on species point localities and coverage of suitable habitat (taking into account elevation and hydrology) Buhlmann *et al.* (2009) estimated the global range of *C. sulcata* to be 4 980 407 km².

Population status and trends: *C. sulcata* was considered by several authors to be declining throughout its range (Lambert, 1993; Devaux, 2000; Cadi *et al.*, 2006; Branch, 2008; Petrozzi *et al.*, 2016a). The species was reported to have disappeared from much of its former range (Devaux, 2000), with extirpations reported from several areas (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991; Devaux, 2000). These included the Western Sahara (Geniez *et al.*, 2004; Branch, 2008) and possibly Cameroon (Chirio and LeBreton, 2007). The species was considered apparently rare at all sites where it was known to occur, with the exception of a few remote semi-desert areas in Mali and Niger (L.

Chirio, unpubl. data in Petrozzi *et al.*, 2016a). The species was reported to be on the verge of extinction in Nigeria (Petrozzi, 2015) and ‘critically endangered’ in Burkina Faso (Petrozzi *et al.*, 2016b). Remaining populations were reported to be small (Vetter, 2005; Mallon *et al.*, 2015) and fragmented (Devaux, 2000; Branch, 2008; Trape *et al.*, 2012; Petrozzi *et al.*, 2016a).

The species was considered relatively common throughout its range in the 1950’s (Villiers, 1958 in Cadi *et al.*, 2006; Trape *et al.*, 2012), with around 100 000 wild individuals existing in a continuous range from the south of Mauritania to Ethiopia and Eritria (Vetter, 2005). Lambert (1998) reported the species to be “very depleted” across most of its range. A total population estimate of between 18 000 and 20 000 specimens was included in CoP11 Prop.38 (2000), distributed as follows: Mauritania, 3000, Senegal, 2000; Mali, 1000; Burkina Faso, 50; Niger, 6000, Chad, 700; Central African Republic, 2000; Sudan, 4000 (perhaps more); Eritrea, 500.

The species was categorised as Vulnerable in the IUCN Red List, however, it was noted that this assessment needs updating (Tortoise & Freshwater Turtle Specialist Group, 1996). The species was provisionally classified as Endangered in a draft reassessment by the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (TFTSG) in 2013 (van Dijk *et al.*, 2014). According to Petrozzi (2015) the species was reassessed as Endangered on the basis of “sound evidence that the population had declined, given the high rates of habitat loss which is going on in much of its range”. In the 1991 ‘Tortoises and Freshwater Turtles action plan’, *C. sulcata* was rated as a species that was “believed to be in need of some conservation action” that may be threatened over substantial parts of its range, or widespread but its status insufficiently known (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991). For species rated as such, specific conservation projects and status surveys were recommended (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991).

The species is considered common only in captivity (Trape *et al.*, 2012), with more individuals reported to exist in captivity than in the wild (Vetter, 2005).

Threats: The main threats to *C. sulcata* were reported to be collection for the international pet trade and for subsistence (Lambert, 1998) and competition with livestock (for habitat and food) (Petrozzi *et al.*, 2016a), as well as increasing desertification and habitat loss (Lambert, 1993; Branch, 2008).

The species was reported to be frequently consumed by local people throughout much of its range (Chirio, 2009; Petrozzi *et al.*, 2016a). It has also been observed at markets for sale as pets and for meat in Asia, including Jakarta, Indonesia (Shepherd and Nijman, 2007), Hong Kong, and Shenzhen and Guangzhou, Southern China (Cheung and Dudgeon, 2006) and in Yuehe pet market, China (Gong *et al.*, 2009). *C. sulcata* was also reported to be among the most common species in trade in Chatuchak market in Bangkok, Thailand between 2004 and 2013 (536 individuals observed) (Nijman and Shepherd, 2015), with prices of around 143-244 USD (for medium sized individuals) in 2006-2007 (Nijman and Shepherd, 2007). The impact from illegal trade in the species was thought to be considerable, with most trade from north-west Africa reported to be illegal (Petrozzi *et al.*, 2016a). Records of 344 live individuals of *C. sulcata* seized globally between 2000 and 2015 were reported (CoP17 Doc. 73). The species was also reported to be a good luck charm (CoP11 Prop. 38).

Overview of trade and management: *C. sulcata* was listed in CITES Appendix II on 1st July 1975, as part of the genus listing for *Geochelone* (see ‘Taxonomic Note’ above). On 4th February 1977, *C. sulcata* was included in the Appendix II family listing for Testudinidae. A proposal to transfer the species from Appendix II to Appendix I was considered at CoP11 (2000). An amended proposal to include an annotation to the family listing of Testudinidae spp. in Appendix II to include a zero quota for *C. sulcata* for specimens removed from the wild and traded for primarily commercial purposes was adopted (CoP11 Com.I. 11.12).

According to data in the CITES Trade Database, global trade in *C. sulcata* 2006-2015 was predominantly in live, captive-bred and source F animals for commercial purposes, with 106 995 animals reported by importing countries and 157 413 animals reported by exporting countries. Wild-sourced trade primarily comprised low levels of live animals for commercial purposes (909 reported by importers and 551 reported by exporters). Direct exports of live *C. sulcata* increased by more than three hundred per cent 2006-2015, peaking in 2015 with 31 386 animals, according to data reported by exporters. Importers also reported increasing trade 2006-2014, however direct trade subsequently declined in 2015.

As part of a wider programme aimed at developing a unified approach to conservation and rural development in West Africa, a small-scale captive breeding programme was established in Burkina Faso (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991). It was recommended that further work on *C. sulcata* be integrated into this programme and extended to other parts of the species range and that initial status surveys should concentrate in Senegal, Mali, Burkina Faso, and Sudan (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991).

In 2009, the African Chelonian Institute (ACI) was established in Senegal, with the aim of promoting long-term conservation of turtle, tortoise and terrapin populations across Africa (Diagne, 2014), undertaking field surveys “to better understand the distributions and conservation needs of wild turtle populations throughout Africa” (Diagne, 2014). It was reported that a rescue and rehabilitation centre near Dakar had successfully re-introduced individuals to the wild (Diagne, 2014), with high (80 per cent) survival rates (Garrigues and Cadi, 2011).

Bombi *et al.* (2013) estimated that almost 16 per cent of the species range was protected. A lack of data on the species’ natural history and ecology, as well as political and social instability in the region were reported to have compromised effective management of West African populations (Petrozzi *et al.*, 2016b). Enforcement against fraud and smuggling was considered insufficient, in particular between Ghana, Mali and Togo (CoP11 Prop. 38).

Illegal trade in the species has been documented, with reports of seizures including individuals confiscated in Thailand in 2015 (TRAFFIC, 2016).

Resolution Conf. 11.9 (Rev. CoP13) on the ‘*Conservation of and trade in tortoises and freshwater turtles*’ urges Parties, especially range States, to undertake a number of activities including enhancing enforcement and management efforts, implementing research programmes and management strategies, enacting legislation, and increasing public awareness. Range States that authorize trade in tortoises and freshwater turtles are required to provide information on their progress towards implementing this Resolution in their periodic reporting (Res. Conf. 11.9 [Rev. CoP13]). No specific information on progress toward these activities have been provided in the biennial report submitted by Mali for 2003-2004. According to Benin’s biennial report to CITES 2007-2008, monitoring of birth rates of *C. sulcata* is undertaken by the CITES Scientific Authority. No biennial reports have been submitted by Ghana, Guinea, Sudan or Togo. Pursuant to CITES Decision 16.109, the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group produced a guide for CITES Scientific and Management Authorities on non-detriment findings and trade management for tortoises and freshwater turtles (AC28 Doc. 15 Annex 2).

C. Country reviews

Benin

Distribution: Occurrence in Benin appears questionable. The species was not confirmed in Benin by either Iverson (1992) or Broadley (1989) and it was not reported in country checklists by Loveridge and Williams (1957), Ullénbruch *et al.* (2010) or Luiselli *et al.* (2012) and it was not reported in a reptile

inventory of W Biosphere Reserve by Chirio (2009). Benin was not considered a range State by Devaux (*in litt.* to SSC, 1994 in IUCN *et al.*, 1996).

However, Lambert (*in litt.* to SSC, 1995 in IUCN *et al.* (1996)) considered it “probably” occurred in ‘W’ National Park in the north. Devaux (2000) stated that “the northern part of Benin adjoins Niger, particularly in the ‘W’ park, where tortoises are numerous, but the River Niger forms a great barrier. Undoubtedly, tortoises have existed between Kandi and the Niger border as the environment is satisfactory, but no recent data has been obtained. Benin cannot be excluded from this species’ distribution and a few specimens probably survive in the extreme north.” Brogard (2005) reported the species occurrence from the north of Benin. Ineich (2006), noting that the species occurrence in Benin was often challenged, reported that the species had been observed in several National Parks in the north of Benin (Pascal OUDE, comm. pers. in Ineich, 2006) and considered its occurrence in Benin as “accepted”. Petrozzi *et al.*, (2017), also mapped its presence from the extreme north of Benin.

Population status and trends: According to Ineich (2006), the population status of *C. sulcata* in Benin was unknown. No information on status and trends could be located

Threats: Uncontrolled capture and early dry-season burning were among the possible threats reported in the Parc National de ‘W’ (Moore, 1997).

Trade: CITES annual reports have been submitted by Benin for all years 2006–2015 with the exception of 2006. Benin published export quotas for ranched *C. sulcata* 2006–2009 and ranched and captive-bred animals 2010–2017 (Table 1). It appears that trade in *C. sulcata* exceeded the quota published for ranched animals in 2014 as reported by both Benin and importers, and for captive-bred animals in 2012 and 2014, as reported by Benin.

Table 1: CITES export quotas for ranched and captive-bred *Centrochelys sulcata* from Benin, 2006–2017 and global direct exports as reported by countries of import and Benin, 2006–2015. Benin has submitted an annual report for all years except 2006.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota: ranched	150	10	10	10	10	10	10	10	10	10	10	10
Reported by importer									200			
Reported by Benin						3	5		30			
Quota: captive-bred					50	50	50	50	50	50	50	50
Reported by importer												
Reported by Benin							60		70	20		

According to data in the CITES Trade Database, all direct trade in *C. sulcata* was in live captive-bred, ranched or wild animals for commercial purposes, with a total of 200 live animals reported by importing countries and 198 live animals reported by Benin (Table 2). Trade was only reported by Benin in 2008, 2011, 2012, 2014 and 2015 with highest levels of trade recorded in 2014. Importing countries only reported direct trade in 2014 (200 live ranched individuals imported to Ghana).

Table 2: Direct exports of *Centrochelys sulcata* from Benin, 2006-2015. All direct trade was in live animals for commercial purposes, reported by number. Benin has submitted an annual report for all years except 2006.

Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
C	Importer											
	Exporter							60		70	20	150
R	Importer									200		200
	Exporter						3	5		30		38
W	Importer											
	Exporter			10								10

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *C. sulcata* originating in Benin was reported in 2014 only. Indirect trade consisted of 150 live, captive-bred animals and 10 live, ranched animals, as reported by the re-exporters. All indirect trade was for commercial purposes.

Management: Benin became a Party to CITES on 28th May 1984. Under Decree No. 80-88 of 1984 (concerning hunting and capturing licences, bag limits, and professional hunters), tortoises such as *C. sulcata* are classified as small game (IUCN *et al.*, 1996). Through its national legislation project, the CITES Secretariat categorised the national legislation in Benin as legislation that is believed generally not to meet all of the requirements for the implementation of CITES.

Ineich (2006) reported that ‘several hundred’ individuals of *C. sulcata* existed in production centres in Benin, Ghana and Togo, and that the species breeds easily in captivity in these countries. Ranching of *C. sulcata* in Benin was considered unrealistic due to the large distance between production sites and natural populations (Ineich, 2006). According to Benin’s biennial report to CITES 2007-2008, monitoring of birth rates of *C. sulcata* is undertaken by the CITES Scientific Authority.

The CITES Authorities in Benin were consulted as part of this review, but no response was received.

Ghana

Distribution: The species occurrence was not confirmed in Ghana by Iverson (1992), Broadley (1989) or Vetter (2005). It was not reported in Ghana by Loveridge and Williams (1957), Leaché (2005), Ineich (2006), Leaché *et al.* (2006), Leaché and Boateng (2009) Luiselli *et al.* (2012), or van Dijk *et al.* (2014). The CITES Management Authority (MA) of Ghana (*in litt.* To UNEP-WCMC, 2017) confirmed that the country is not a range State.

Trade: CITES annual reports have been submitted by Ghana for 2007-2015. Ghana published export quotas for live, captive-bred animals in 2008, 2009, 2011, 2012 and 2014-2017 (Table 3). Quotas for captive-bred specimens increased from 800 individuals in 2008 to 4000 individuals in 2017. Direct exports of *C. sulcata* appear to have exceeded the published quota in 2008 and 2009, according to Ghana (Table 3).

Table 3: CITES export quotas for live, captive-bred *Centrochelys sulcata* from Ghana, 2006-2017 and global direct exports as reported by countries of import and Ghana, 2006-2015. Ghana has submitted an annual report for all years except 2006.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	-	-	800	1500	-	1500	1500	-	2500	2500	4000	4000
Reported by importer	1092	1220	652	1133	884	657	638	272	1209	919		
Reported by Ghana		1096	1052	1655	2095	1217	939	1547	2182	2345		

According to data in the CITES Trade Database, the majority of direct trade was in live, captive-bred *C. sulcata* for commercial purposes, with Ghana reporting exports of 14 128 animals and importers reporting 8676 animals 2006-2015 (Table 4). Quantities of captive-bred animals exported fluctuated over the 10 year period; exports reported by Ghana increased year on year since 2012, reaching the highest reported level in the ten year period in 2015. Lower quantities of ranched, source F and wild animals were also exported 2006-2015. Since the species was not confirmed to occur in Ghana, the reported exports of wild-sourced specimens in 2011-2012 of 372 are assumed to be erroneous.

Table 4: Direct exports of *Centrochelys sulcata* from Ghana, 2006-2015. Ghana has submitted an annual report for all years except 2006. All direct trade was in live animals for commercial purposes reported by number.

Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
C	Importer	1092	1220	652	1133	884	657	638	272	1209	919	8676
	Exporter		1096	1052	1655	2095	1217	939	1547	2182	2345	14128
F	Importer					2		48		320	50	420
	Exporter						137		150	30		317
R	Importer											
	Exporter			100	100					50		250
W	Importer											
	Exporter						50	322				372

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *C. sulcata* originating in Ghana 2006-2015 predominantly consisted of live, captive-bred animals for commercial purposes, with importing countries reporting exports of 232 animals and re-exporting countries reporting 1013 animals (Table 5).

Table 5: Indirect exports of *Centrochelys sulcata* originating in Ghana, 2006-2015. All indirect trade was in live animals reported by number.

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
P	C	Importer											
		Exporter	2	2						1			5
T	C	Importer					1		1	10	50	170	232
		Exporter		18	7		1		93	410	268	216	1013
	R	Importer				78							78
		Exporter											

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Ineich (2006), noting numerous exports of specimens of *C. sulcata* from Ghana, stated that these individuals had been sourced from other countries and brought into Ghana illegally.

The CITES MA of Ghana (*in litt.* to UNEP-WCMC, 2017), stated that Ghanaian exporters imported the species, principally from Mali, for captive breeding purposes.

Management: Ghana became a Party to CITES on 12th February 1976. Through its national legislation project, the CITES Secretariat categorised the national legislation in Ghana as legislation that is believed generally not to meet the requirements for the implementation of CITES.

Ineich (2006) reported that several hundred individuals existed in production centres in Benin, Ghana and Togo, and that the species is bred easily in captivity in these countries.

Guinea

Distribution: The species was considered possibly present in the extreme north-east by Lambert (*in litt.* to SSC, 1995 in IUCN *et al.*, 1996), but its occurrence was not confirmed in Guinea by Broadley (1989), Iverson (1992), Vetter (2005), Böhme *et al.* (2011), Luiselli *et al.* (2012) or van Dijk *et al.* (2014),

Trade: CITES annual reports have been submitted by Guinea for 2006, 2008, 2010, 2013 and 2014. Guinea has not publish export quotas for *C. sulcata*.

According to data in the CITES Trade Database, direct trade in *C. sulcata* from Guinea was reported by importing countries only 2006-2015. During this period, importing countries reported trade in live animals for commercial purposes: 281 captive-bred animals, 50 source F animals and 110 wild-sourced animals. Guinea reported the export of 626 live wild-sourced animals at the genus level *Geochelone* for commercial purposes in 2008.

Table 6: Direct exports of *Centrochelys sulcata* from Guinea, 2006-2015. Guinea has not submitted annual reports for 2007, 2009, 2011, 2012 and 2015. All direct trade was in live animals for commercial purposes, reported by number.

Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
C	Importer			170	15		96					281
	Exporter											
F	Importer								50			50
	Exporter											
W	Importer	100			10							110
	Exporter											

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *C. sulcata* originating in Guinea was reported in 2008, 2009 and 2012. Re-exports consisted of 104 live, captive-bred animals and 8 live, wild-sourced animals re-exported for commercial purposes over the 10 year period, as reported by exporters. Importers reported indirect trade in 24 live, wild animals for commercial purposes.

Management: Guinea became a Party to CITES on 20th December 1981. No information on the management of *C. sulcata* within Guinea was located.

Through its national legislation project, the CITES Secretariat categorised the national legislation in Guinea as legislation that is believed generally not to meet all of the requirements for the implementation of CITES.

The CITES Authorities in Guinea were consulted as part of this review, but no response was received.

Mali

Distribution: Brogard (2005) reported the species occurrence from central and south-central Mali and Petrozzi *et al.*, (2016a), mapped its presence across central Mali from the border with Mauritania (west) to the borders with Niger and Burkina Faso in the east. The species occurrence was also reported from the east, between Gao and Ménaka (Devaux, 2000), and from south of the Niger Loop in Dogon country [Mopti region, central Mali] (Vetter, 2005). It was recorded from Douentza, Madougou, Mondoro, Soum (mare) and Dounapen, along the border with Burkina Faso (Vetter, 2005). It was considered unlikely that the species occurred further south than Bamako (Lambert, 1993).

Population status and trends: Population surveys of *C. sulcata* in Mali were considered urgently needed (Petrozzi *et al.*, 2017).

The range of the species within Mali appears to have retracted. The species used to inhabit a wide savannah belt between Kayes in the west of Mali and Ménaka (east of Gao), with its northern limit at El Mraïti approx. 200 km north of Timbuktu (Devaux, 2000). It was reported that the species could be frequently found in the 1930s-1940s (Devaux, 1993 in IUCN *et al.*, 1996) and it was observed in the surroundings of Gao, Mopti and north to Anéfis up until the mid-1980's (Devaux, 2000; Vetter, 2005).

The centre of the species distribution was then reported from south of the River Niger loop, in Dogon country (Devaux, 2000). A local inhabitant in north central Mali reported that prior to 1985, the species was found frequently in the 'Cercle de Nara', but in the early 1990s, it was scarcer (Lambert, 1993). Devaux (1993 in IUCN *et al.*, 1996) reported that *C. sulcata* had become notably rare. "Several hundred" *C. sulcata* in the 'loop of Niger' and Dogon country were noted in CoP11 Prop. 38. Devaux (2000) reported "dramatic" declines in population numbers, including in Dogon country and the Niger loop, and noted a number of local extirpations. The only individuals observed in Mali in the late 1990s, were reported to be captive individuals or those in trade around Mopti or Gao (Devaux, 2000). Devaux (2000) mentioned that the species may be found in the east between Gao and Ménaka, but the species survival there was considered uncertain. Petrozzi *et al.* (2016a), recounted reports from experienced reptile traders, noting that *C. sulcata* was increasingly difficult to obtain from local hunters as it had become considerably rarer in traditional places of capture in Burkina Faso, Mali and Niger (G.H. Segniagbeto & L. Luiselli, unpubl. data).

Threats: Harvest of individuals for local consumption and drought were reported to pose a threat to the species in Mali (Lambert, 1993). Illegal trade has been reported. In 1991, 65 individuals believed to have originated from the region around Sokolo (north to the Mauritanian border) that were being transported for sale as food and for export were seized (Lambert, 1993).

Trade: CITES annual reports have been submitted by Mali for 2006-2014. Mali published a zero export quota for wild-sourced *C. sulcata* 2006-2017, although wild-sourced trade was reported by Mali in 2008 and 2010, and by importers in 2012 (Table 7).

Table 7: CITES export quotas for wild-sourced *Centrochelys sulcata* from Mali, 2006-2017 and global direct exports as reported by countries of import and Mali, 2006-2015. Mali has not yet submitted an annual report for 2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	0	0	0	0	0	0	0	0	0	0	0	0
Reported by importer							255					
Reported by Mali			2		50							

According to data in the CITES Trade Database, direct trade in *C. sulcata* from Mali 2006-2015 was predominantly in live, source F and captive-bred (source C) animals for commercial purposes, with Mali reporting export of 19 464 source F animals and importers reporting 12 453, 2006-2015 (Table 8). Exports were predominantly captive-bred 2006-2008 and source F 2008-2015. Exports increased by nearly five-fold between 2006-2014 as reported by Mali, while importers reported an increase in direct trade 2006-2011 followed by a subsequent decline (Table 8).

Table 8: Direct exports of *Centrochelys sulcata* from Mali, 2006-2015. Mali has not yet submitted an annual report for 2015. All direct trade was in live animals.

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
B	F	Importer							7		40		47
		Exporter							7		2		9
	W	Importer											
		Exporter			2								
P	F	Importer											
		Exporter						1		300	30		331
T	C	Importer	681	40	100				180		200		1201
		Exporter	1017	887			10						
	F	Importer			352	1080	412	3722	3271	1837	1339	440	12453
		Exporter			965	1285	550	3135	4202	4282	5045		19464
	W	Importer							255				255
		Exporter					50						

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *C. sulcata* originating in Mali over the ten year period 2006-2015 primarily comprised live, source F animals re-exported for commercial purposes, with 3465 animals reported by importing countries and 14 018 animals reported by re-exporting countries (Table 9).

Table 9: Indirect exports of *Centrochelys sulcata* originating in Mali, 2006-2015. All direct trade was in live animals reported by number.

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
B	C	Importer								20			20
		Exporter											
Q	W	Importer											
		Exporter			1								
T	C	Importer	60	37				405	94				596
		Exporter	50				100	410		100			660
	F	Importer				328	292	174	885	757	966	63	3465
		Exporter				400	563	845	3635	3438	2725	2412	14018
	R	Importer											
		Exporter										100	100
	W	Importer								20			20
		Exporter							110	180	25		315
Z	F	Importer						1					1
		Exporter					98						98

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Management: Mali became a Party to CITES on 16th October 1994. The Hunting Act of 1969, Ordonnance No. 60-C.M.L.N. partially protects Testudines, specifically referring to land and freshwater turtles (IUCN *et al.*, 1996). According to Lambert (1993), regulations prohibit the collection of tortoises. Through its national legislation project, the CITES Secretariat categorised the national legislation in Mali as legislation that is believed generally not to meet all of the requirements for the implementation of CITES. Systematic searches to determine whether the species occurred in reserves were considered necessary (Devaux, 2000).

The CITES Authorities in Mali were consulted as part of this review, but no response was received.

Sudan

Distribution: The species occurrence was mapped in Sudan by Iverson (1992) and Broadley (1989). Numerous observations of *C. sulcata* in Sudan have been published, including from Berber, Kassalâ, Dongola, Dârfûr and other regions along the River Nile, north almost to the border with Egypt and extending south to Al-Muglad, as indicated by Iverson (1992) (Devaux, 2000). The northern-most record from Wâdî Halfâ in the middle of the Sahara, where the species was considered “almost entirely absent”, was thought to represent translocation by humans (Devaux, 2000; Vetter, 2005). It was noted that there have been no reports of the species from the extreme southern part of the country (CoP11 Prop. 38). Petrozzi *et al.* (2016a) noted that distribution data for Sudan were poor.

Devaux (2000) considered it doubtful that all records from along the River Nile represented wild individuals, but instead were mostly introduced individuals or escapees from captivity. Populations in Sudan were reported to be connected with those in Chad via low-lying plateaus to the west of Al-Junaynah in West Darfur state (Vetter, 2005).

Population status and trends: *C. sulcata* [*T. sulcata*] was considered ‘endangered’ in Sudan as a consequence of conflict and other threats, including drought (Siddig, 2014). It was reported that the species was common in the colonial period (Devaux, 2000), but was considered a “rather uncommon inhabitant” of semi-desert scrub around Khartoum and Omdurman [central Sudan] by Cloudsley-Thompson (1970). Devaux (1993 in IUCN *et al.*, 1996) considered it was possible that “some substantial populations” still existed, but that local fauna had been depleted.

The only remaining areas considered favourable for *C. sulcata* were in the north of Kordofan, between Sodiri and Malha (central and west-central Sudan), and part of Darfour (at the extreme east) (Devaux, 2000). According to Devaux (2000), the species had apparently been extirpated from the south of Kordofan.

Devaux (2000) reported that populations of *C. sulcata* in Sudan were “far rarer, dispersed, and restricted” than previously thought.

Threats: Threats to *C. sulcata* in Sudan were reported to include subsistence hunting (Devaux, 1993 in IUCN *et al.*, 1996), armed conflicts, urban expansion, deforestation, annual burning, intensive grazing (Devaux, 2000) and drought (Siddig, 2014). Collection of *C. sulcata* for export was noted (Devaux, 2000). It was reported that some areas of occupancy, such as between Port Sudan and Musmar, were used as “storage areas” by exporters (Devaux, 2000).

Trade: CITES annual reports have been submitted by Sudan for 2006, 2007 and 2010-2014. Sudan published zero export quotas for wild-sourced *C. sulcata* 2006-2016 (Table 10). Quotas appear to have been exceeded in 2011 and 2012 according to both Sudan and importing countries and in 2009, 2010 and 2013 according to importers only.

Table 10: CITES export quotas for wild-sourced *Centrochelys sulcata* from Sudan, 2006-2017 and global direct exports as reported by countries of import and Sudan, 2006-2015. Sudan has not submitted annual reports for 2008, 2009 and 2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	0	0	0	0	0	0	0	0	0	0	0	-
Reported by importer				20	46	14	210	260				
Reported by Sudan						69	68					

According to data in the CITES Trade Database, direct trade in *C. sulcata* from Sudan 2006-2015 primarily comprised live, captive-bred animals for commercial and unspecified purposes (Table 11), with 2696 exported as reported by Sudan and 2279 as reported by importers. Wild-sourced trade over the 10 year period comprised 544 live individuals as reported by importers for commercial purposes; the only live wild-sourced trade reported by Sudan was 69 individuals for commercial trade in 2011 and 68 reported without a purpose in 2012. A permit analysis of these exports revealed 30 of the 68 individuals were reported by importers as being traded for commercial purposes. Trade in live animals increased from zero in 2006 to a peak in 2014 (as reported by Sudan) or 2013 (as reported by importing countries). Since the species is not considered to occur in South Sudan (van Dijk *et al.*, 2014), it is presumed that all trade reported prior to 2011 originated in Sudan.

Table 11: Direct exports of *Centrochelys sulcata* from Sudan, 2006-2015. Sudan has not submitted annual reports for 2008, 2009 and 2015. All direct trade was reported by number.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	
derivatives	-	I	Importer				1							1	
			Exporter												
live	B	C	Importer									84		84	
			Exporter												
	P	C	Importer					2				76	4	82	
			Exporter												
	-		Importer												
			Exporter						8						8
	Q	C	Importer			2									2
			Exporter												
	T	C	Importer			92			12	17	45	971	898	244	2279
			Exporter												
	F		Importer			10									10
			Exporter												
	W		Importer				20	40	14	210	260				544
			Exporter						69						69
	-		Importer												
			Exporter						72						72
Z	C	Importer											16	16	
		Exporter													
W		Importer						6						6	
		Exporter													
-	C	Importer													
		Exporter								150	1083	1463		2696	
W		Importer													
		Exporter								68				68	
-		Importer													
		Exporter						10						10	

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *C. sulcata* originating in Sudan 2006-2015 comprised entirely of live animals, with all re-exports reported 2011-2015 (Table 12). The vast majority of indirect trade was captive-bred for commercial purposes.

Table 12: Indirect exports of *Centrochelys sulcata* originating in Sudan, 2011-2015. All indirect trade was in live *C. sulcata*.

Purpose	Source	Reported by	2011	2012	2013	2014	2015	Total
B	C	Importer						
		Exporter					5	5
	W	Importer						
		Exporter	2					2
P	C	Importer			4			4
		Exporter			7	10	1	18
T	C	Importer	10	10		105	3	128
		Exporter		30	29	224	12	295
-	C	Importer						
		Exporter			22			22

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Management: Sudan became a Party to CITES on 24th January 1983. No information on the management of *C. sulcata* in Sudan was located. Through its national legislation project, the CITES Secretariat categorised the national legislation in Sudan as legislation that is believed generally not to meet all of the requirements for the implementation of CITES.

The CITES Authorities in Sudan were consulted as part of this review, but no response was received.

Togo

Distribution: Occurrence in Togo appears questionable. The species was not mapped in Togo by Iverson (1992), Broadley (1989), Vetter (2005) or Petrozzi *et al.* (2016a) and it was not reported in Togo by Branch (2008), Luiselli *et al.* (2012), or Segniagbeto *et al.* (2014). Devaux (2000) considered that *C. sulcata* did not occur in Togo. However, the Togo CITES MA previously reported that it apparently occurred in small numbers in the country (Togo CITES MA *in litt.* to the CITES Secretariat, 1995 in IUCN *et al.*, 1996) and unconfirmed reports of occurrence in the dry savannah region in the north were noted in CoP11 Prop. 38. van Dijk *et al.* (2014) also considered the species to be present in Togo.

Population status and trends: The species was reported to be rare in Togo, occurring in the north of the country only, where the population was described as “fragile” (Ineich, 2006). Interviewees in a survey of local communities rarely recognized the species (Harris, 2002). No further information on status and trends could be located.

Threats: The species was found on sale in small numbers at a Fetish market in Lomé in 2012 (Segniagbeto *et al.*, 2013). No further information on specific threats in Togo could be located.

Trade: CITES annual reports have been submitted by Togo for 2007-2015. Togo published export quotas for captive-bred *C. sulcata* 2006-2017, increasing from 500 in 2006 to 700 individuals in 2016 (Table 13). It appears that trade in *C. sulcata* exceeded published quotas in 2011 and 2014 according to both Togo and importers, and in 2013 and 2015 according to Togo only.

Table 13: CITES export quotas for captive-bred *Centrochelys sulcata* from Togo, 2006-2017 and global direct exports as reported by countries of import and Togo, 2006-2015. Togo has submitted an annual report for all years except 2006.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	500	500	500	500	500	500	500	500	500	500	700	700
Reported by importer		90	380	368	169	647	107	298	588	219		
Reported by Togo		255	194	464	430	815	326	784	648	915		

According to data in the CITES Trade Database, direct trade in *C. sulcata* from Togo entirely comprised live animals, which were primarily captive-bred for commercial purposes. Togo reported export of 4830 animals while importers reporting 2866 over the 10 year period (Table 14). Direct trade increased 2006-2015 as reported by Togo while importer reported trade fluctuated over the ten year period.

Table 14: Direct exports of *Centrochelys sulcata* from Togo, 2006-2015. Togo has submitted an annual report for all years except 2006. All indirect trade was in live animals reported by number.

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
P	C	Importer											
		Exporter						1					1
T	C	Importer		90	380	368	169	647	107	298	588	219	2866
		Exporter		255	194	464	430	814	326	784	648	915	4830
	F	Importer		22									22
		Exporter		240	90			100			100	330	860
	R	Importer										10	10
		Exporter											
	W	Importer											
		Exporter									50		50

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *C. sulcata* originating in Togo solely comprised 110 live, captive-bred animals re-exported for commercial purposes in 2011 and two live, wild-sourced animals re-exported in 2013, as reported by both exporters and importers.

Management: Togo became a Party to CITES on 21st January 1979. The 1968 Ordonnance No. 4 on wildlife protection and hunting in Togo lists Testudines as partially protected species and the decree implementing the Ordinance, No. 80-171 establishes limits to this partial protection (IUCN *et al.*, 1996). According to the CITES MA of Togo (*in litt.* to CITES Secretariat, 1995 in IUCN *et al.*, 1996), Togo suspended exports of *C. sulcata* [*G. sulcata*] in February 1994; presumably for wild-sourced individuals, but it is unknown whether this suspension is still in place, as wild-sourced specimens were reported exported 2006-2015. Through its national legislation project, the CITES Secretariat categorised the national legislation in Togo as legislation that is believed generally not to meet all of the requirements for the implementation of CITES.

Ineich (2006) reported that ‘several hundred’ individuals of *C. sulcata* existed in production centres in Benin, Ghana and Togo, and that the species bred readily in captivity. Adults and juveniles of *C. sulcata* were reported from reptile farms in Togo (Harris, 2002; SC67 Doc. 15 Annex 3). “North Togo” was reported to be the harvest area for the farms in Togo (Harris, 2002). Harris (2002) also reported that, in the far north, this species was apparently considered fetish, and so was generally protected, but it was unclear by which ethnic group.

The CITES Authorities in Togo were consulted as part of this review, but no response was received.

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

Several range States (Benin, Ghana, Mali, Sudan and Togo) have reported wild-sourced exports of the species for commercial purposes, which is not compatible with the Appendix II listing for Testudinidae spp., which specifies a zero annual export quota for all specimens of *C. sulcata* removed from the wild and traded for primarily commercial purposes. Accordingly, the Animals Committee may consider referral of these apparent non-compliance issues to the CITES Standing Committee. In addition, importers also reported wild-sourced imports of the species for commercial purposes, in potential

contravention of the Appendix II listing. Malaysia and Turkey reported imports from Guinea; Ghana and Niger reported imports from Mali; Thailand, South Africa, Qatar, United Arab Emirates and Republic of Korea reported imports from Sudan. As Ghana and Guinea are not considered range States of *C. sulcata*, this trade may be erroneous.

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Chelonoidis denticulatus: Guyana, Suriname

A. Summary

<p>Global status: Categorised as Vulnerable globally, but provisionally reclassified as Near Threatened in a draft assessment in 2011. No information on population size available, but considered declining, with some evidence of depletions and extirpations.</p>	
<p>GUYANA: Apparently widespread in Guyana, occurring in rainforest and dryland forests, with habitat considered large and viable. No estimates of population size available. One author considered the species threatened due to increasing collection pressure for subsistence hunting and international trade. Current annual quota of 704 live specimens. High levels of trade 2006-2015 consisted of live, wild-sourced individuals (4969 as reported by Guyana), with trade consistently within quota. Annual reports were submitted by Guyana for all years 2006-2015. Guyana responded to the consultation relating to the RST; no population surveys or monitoring have been undertaken and no management plan for the species exists. The basis for non-detriment findings for export of wild specimens and for the establishment of the export quota does not appear to be robust, and international trade appears to be impacting the species, therefore categorised as Action is needed.</p>	<p>RECOMMENDATION: Action is needed</p>
<p>SURINAME: Reported from the north and south of the country and may still be widespread. Common in some areas, becoming rare in others due to capture for international trade. Other threats include bushmeat and illegal trade. Trade 2006-2015 consisted of live, wild-sourced animals (2014 individuals as reported by Suriname), with trade consistently well within quota. Annual reports were submitted by Suriname in all years 2006-2014, but 2015 has not yet been received. Suriname did not respond to the consultation relating to the RST; no information on management located. The basis for non-detriment findings for export of wild specimens is unclear and international trade appears to be impacting the species, therefore categorised as Action is needed.</p>	<p>RECOMMENDATION: Action is needed</p>

RST Background

Chelonoidis denticulatus (Yellow-footed Tortoise) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *C. denticulatus* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, as well as in 2012, on the basis of

trade data presented in AC27 Doc. 12.5. At AC28 (August, 2015), responses to the Secretariat's consultation had been received from Brazil, Colombia, France and Peru (AC28 Doc. 9.4 (Rev.2)). The Plurinational State of Bolivia, Brazil, Colombia, Dominica, Ecuador, France, Peru, Trinidad and Tobago and Bolivarian Republic of Venezuela were removed from the RST process, whilst Guyana and Suriname were retained (AC28 Com. 8, AC28 Summary Record).

C. denticulatus [as *Geochelone denticulata*] was also reviewed as a candidate for the RST (AC20 Doc. 8.5) for AC20 (March, 2004), however, the species was not selected (AC20 WG1 Doc. 1, AC20 Summary Report).

B. Species characteristics

Taxonomic note: *Chelonoidis* was previously considered a subgenus of *Geochelone* (Walker, 1989), but was elevated to generic status following molecular phylogenetic analysis of testudinids by Le *et al.* (2006) and accepted as such in the CITES Standard Reference for Testudines (Fritz and Havaš, 2007). At CoP17, a taxonomic change was adopted to rename *Chelonoidis denticulata* to *C. denticulatus* (recognising the species name as masculine) (Olson and David, 2014). The taxonomy accepted by the supplementary CITES Standard Reference is followed in this review (Olson and David, 2014) and references to *Chelonoidis* (or *Geochelone*) *denticulata* are referred to as *Chelonoidis denticulatus*. Farias *et al.* (2007) found that *C. denticulatus* and *C. carbonarius* [*carbonaria*] showed high levels of haplotype sharing *in situ*, which may indicate hybridization or incomplete lineage sorting. According to van Dijk (*in litt.* to UNEP-WCMC, 2017), prior to the 1970s, *C. denticulatus* and *C. carbonarius* were frequently confused in the literature.

Biology: *C. denticulatus* was reported to be one of the largest South American mainland tortoises, with an average length of 40 cm in the wild (Rueda-Almonacid *et al.*, 2007). *C. denticulatus* typically inhabits tropical and subtropical forests (Vargas-Ramírez *et al.*, 2010), often in the vicinity of water (Ojasti, 1996), with a preference for dense forest habitats (Pritchard, 1979a). The species is understood to be a purely closed-canopy rainforest inhabitant, while *C. carbonarius* mainly inhabits forest edges, forest patches in savannah and scrub forests (van Dijk *in litt.* to UNEP-WCMC, 2017). It was reported that the species is generally restricted to “higher sections of the lowlands”, but may be found at altitudes up to 800 m above sea level (de Araujo, 1977 in Ojasti, 1996).

Estimates of reproductive age vary between eight to ten years (Conservation International, 2008) to 12-15 years (Rueda-Almonacid *et al.*, 2007). The species was reported to be capable of producing up to five clutches during the mating season (Ojasti, 1996). Clutches were reported to typically comprise three to ten eggs, with an average of five (Vinke *et al.*, 2008), which hatch following an incubation period of four to five months (Bonin *et al.*, 2006). Life expectancy was estimated at approximately 50 to 60 years (Conservation International, 2008), with 30 years considered to be the latest age for reproduction (Maldonado Rodríguez, 2010).

C. denticulatus was reported to be highly frugivorous, consuming fruit from a variety of plant species (Guzman and Stevenson, 2008) and the species was reported to fulfil an important role in forest dynamics as a seed disperser (Guzman and Stevenson, 2008; Jerozolinski *et al.*, 2009).

Distribution: *C. denticulatus* is widely distributed in northern South America east of the Andes including the Amazon basin and Atlantic fringe of Brazil and the Guiana shield region (van Dijk *et al.*, 2014). It was also reported to be found in Trinidad (Fritz and Havaš, 2007) and introduced populations were reported from Guadeloupe (van Dijk *et al.*, 2014) and Dominica (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1996).

Population status and trends: *C. denticulatus* was categorised as Vulnerable by the IUCN Red List, although it was noted that this assessment needs updating (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1996). It was provisionally reclassified as Near Threatened in a draft reassessment by the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group (TFTSG) in 2011 (van Dijk *et al.*, 2012, 2014). According to van Dijk (pers. comm. to UNEP-WCMC, 2017), this change of status originated from a general consensus among workshop participants assessing the Red List status of South American tortoises and freshwater turtles and was “based mainly on the extensive area of remaining suitable habitat, of which significant portions are protected by national or local law, or managed as sustainable reserves by national, local or indigenous governance mechanisms”. The population status was reported to be unknown, partially due to the secretive nature of the species (Bonin *et al.*, 2006) and Jerozolinski *et al.* (2009) considered the crypticity of the species had led to variable density estimates. Population densities in different parts of the Amazon basin have been estimated at between 5.1 and 41 individuals per km² (Peres *et al.*, 2003; Stevenson *et al.*, 2007). The population trend was reported to be declining (Montemaggiore *et al.*, 2005) and the species was reported to be “far scarcer in most areas” due to frequent capture (Ojasti, 1996). Large specimens of *C. denticulatus* were reported to be increasingly rare (Vinke *et al.*, 2008) and local extirpations and depletions have been reported (Pritchard and Trebbau, 1984 in Strong and Fragoso, 2006; Vinke *et al.*, 2008; Maldonado Rodríguez, 2010).

Morcatty and Valsecchi (2015) noted that hunters in the Brazilian Amazon found it increasingly difficult to capture *C. denticulatus*. In addition, it was noted that the price per kilogram of tortoises sold by hunters in urban markets had greatly increased (Morcatty and Valsecchi, 2015), which may indicate scarcity.

In the 1991 IUCN/SSC Tortoises and Freshwater Turtles action plan, *C. denticulatus* was rated as a species that was “believed to be in need of some conservation action” that ‘may be threatened over substantial parts of its range, or widespread but its status is insufficiently known’ (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991). For species rated as such, specific conservation projects and status surveys were recommended (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, 1991).

Threats: Hunting for food and degradation of habitat were considered the main threats to *C. denticulatus* (Bonin *et al.*, 2006). It was reported to have been heavily harvested throughout its range by rural and indigenous people (Pritchard and Trebbau, 1984 in Strong and Fragoso, 2006) and its meat is consumed throughout its range in South America (Alves *et al.*, 2012). According to Vinke *et al.* (2008), *C. denticulatus* is often consumed in the Guianas.

In the Brazilian Amazon, greater numbers of female *C. denticulatus* were found among hunted individuals and females were more highly valued at bushmeat markets (Morcatty and Valsecchi, 2015). Morcatty and Valsecchi (2015) cautioned that this preference for females may compromise population growth rates. The species was also reported to be used for medicinal purposes in some areas (Walker, 1989; Bonin *et al.*, 2006), for musical instruments (Walker, 1989) and for religious and ornamental purposes (in Brazil) (Alves *et al.*, 2012). It was also reported to be a popular pet species (Walker, 1989; Ojasti, 1996; Alves *et al.*, 2012).

C. denticulatus was considered to be vulnerable to excessive harvesting due to its slow growth and low reproduction rates (Ojasti, 1996), however, the secretive nature of the species was thought to afford it partial protection (Pritchard, 1979b; Bonin *et al.*, 2006). The species was reported to show high levels of gene flow, suggesting a high capacity to colonise new habitats or to re-colonise areas where populations had been depleted by hunting (Farias *et al.*, 2007). *C. denticulatus* was considered relatively difficult to breed in captivity, and the breeding of the species for food was not considered economically viable

(Ojasti, 1996). Vinke *et al.* (2008) stated that *C. denticulatus* generally grows quickly and has been bred successfully in captivity many times. van Dijk (pers. comm. to UNEP-WCMC, 2017) noted that the species has a relatively rapid growth rate compared with other similar-sized tortoises.

Overview of trade and management: *C. denticulatus* was first listed in CITES Appendix II on 1st July 1975, as part of the genus listing for *Geochelone*. On 4th February 1977, *C. denticulatus* was included in the family listing for Testudinidae. According to data in the CITES Trade Database, global direct trade in *C. denticulatus* predominantly comprised live animals with 12 033 animals reported by exporters and 9115 reported by importers 2006–2015. Trade in live *C. denticulatus*, reported by exporting countries, declined 2007–2010 and increased 2010–2015. Importing countries reported a decline in trade of live *C. denticulatus* post-2013. Illegal trade has been documented, with records of 197 live individuals of *C. denticulatus* seized globally between 2000 and 2015 were reported (CoP17 Doc. 73).

According to Morcatty and Valsecchi (2015), *C. denticulatus* has been rarely included in chelonian monitoring and conservation projects. Resolution Conf. 11.9 (Rev. CoP13) on the ‘*Conservation of and trade in tortoises and freshwater turtles*’ urges Parties, especially range States, to undertake a number of activities including enhancing enforcement and management efforts, implementing research programmes and management strategies, enacting legislation, and increasing public awareness. Range States that authorize trade in tortoises and freshwater turtles are required to provide information on their progress towards implementing this Resolution in their periodic reporting (Res. Conf. 11.9 [Rev. CoP13]). No specific information could be located on progress towards these activities in the biennial reports of Guyana 2003–2006. No biennial reports have been submitted by Suriname. Pursuant to CITES Decision 16.109, the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group produced a guide for CITES Scientific and Management Authorities on non-detriment findings and trade management for tortoises and freshwater turtles (AC28 Doc. 15 Annex 2).

C. Country reviews

Guyana

Distribution: *C. denticulatus* is apparently widely distributed in Guyana and has been recorded from the Baramita area in the northwest region of Barima-Waini (Reynolds and MacCulloch, 2012), the Rewa area of the Upper Takutu-Upper Essequibo region in central Guyana (Pickles *et al.*, 2009), the Iwokrama Rainforest Reserve (central Guyana) (Donnelly *et al.*, 2005; Bicknell *et al.*, 2013), the Konashen Community-Owned Conservation Area (COCA) [southern Guyana] (Señaris *et al.*, 2013; Shaffer *et al.*, 2017), including the Sipu-Acarai Mountains (in the COCA) (Alonso *et al.*, 2008). The species was not recorded during surveys in the Kanuku Mountains in southwestern Guyana (Parker *et al.*, 1993), nor was it reported from surveys by Alonso *et al.* (2013) in south-western Guyana or MacCulloch and Reynolds (2012) in Paramakatoi and Kato in west-central Guyana. Ernst and Leuteritz (1999) mapped the species occurrence in north and central Guyana. According to the CITES Management Authority of Guyana (*in litt.* to UNEP-WCMC, 2017), the species can be found locally in all natural regions of Guyana, including savannahs, rainforest and dryland forest. However, it is possible that the references to occurrence in savannah relate to *C. carbonaria*, as *C. denticulatus* does not occur in this habitat type.

Population status and trends: *C. denticulatus* was previously considered abundant in Guyana, absent only from the highlands (Pritchard and Trebbau, 1984 in Vinke *et al.*, 2008). However, the species was considered to be threatened in the country due to the heavy hunting pressure for food and for the international pet trade (Conservation International, 2008). The CITES MA of Guyana (*in litt.* to UNEP-WCMC, 2017) reported that whilst there is no available population or distribution data on the

C. denticulatus, the species was described as “very common in their habitat”, with sightings reported to be “fairly common” [although no details on encounter rates or locations of these observations were provided] and the species could be sourced easily upon request. Suitable habitat for the species was reported to be abundant and widely distributed, and many of the ecosystems in which the species inhabits are intact and fully functional (CITES MA of Guyana *in litt.* to UNEP-WCMC, 2017).

Threats: *C. denticulatus* was reported to be frequently hunted by local communities in Guyana (Henfrey, 2002; Alonso *et al.*, 2008). *C. denticulatus* was reported to be one of the main species traded for bushmeat in Guyana (van Andel *et al.*, 2003) and increasing levels of bushmeat trade were observed (Craig-Clark *et al.*, 2000 in van Andel *et al.*, 2003), particularly in markets in Georgetown (van Andel *et al.*, 2003). Despite noting that the species is consumed by indigenous people and other forest inhabitants, the CITES MA of Guyana (*in litt.* to UNEP-WCMC, 2017), did not consider the species to be very popular in the local wild meat trade. Alonso *et al.* (2008) stated that research was required on the status and distribution of tortoises harvested in the COCA by the local population in order to develop sustainable harvesting plans.

The CITES MA of Guyana (*in litt.* to UNEP-WCMC, 2017), did not consider the international pet trade to pose a threat to the species, and noted that the risk of mortality following capture and prior to export was considered low. Illegal trade in wildlife between Guyana and Suriname was also reported to be a problem (Duplaix, 2001). According to the CITES MA of Guyana (*in litt.* to UNEP-WCMC, 2017), the species is common in the local pet trade. The threat of habitat loss was considered minimal in Guyana by the CITES MA of Guyana (*in litt.* to UNEP-WCMC, 2017).

Trade: All CITES annual reports have been submitted by Guyana for the period 2006–2015. The 2011 annual report covered the period April 2011–April 2012 and the 2012 annual report covered April 2012–April 2013. The annual report received in 2013 covered April–December 2013. Guyana published export quotas for live *C. denticulatus* 2006–2017 (Table 1). Trade in *C. denticulatus* did not exceed quota values set by Guyana for the period 2006–2015 (Table 1).

The CITES MA of Guyana (*in litt.* to UNEP-WCMC, 2017) reported that the annual quota for the species was 704, with an increase in 2014 on the basis of a change in the calculation of quotas from licensing year to calendar year (and therefore including roll over from 2013, where the export year was cut short). There was however, no actual increase in trade in 2014.

Table 1: CITES export quotas for live, wild-sourced *Chelonoidis denticulatus* from Guyana, 2006–2017, and global direct exports in live, wild-sourced animals reported by countries of import and Guyana, 2006–2015. Guyana has submitted all annual reports 2006–2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	704	704	704	704	704	704	704	704	887	704	704	704
Reported by importer	277	622	475	559	431	384	485	535	378	454		
Reported by Guyana	331	704	663	576	377	397	520	425	391	591		

According to data in the CITES Trade Database, direct trade in *C. denticulatus* from Guyana 2006–2015 primarily consisted of live, wild-sourced animals exported for commercial purposes, with 4969 animals reported by Guyana and 4432 as reported by importers (Table 2). Direct exports from Guyana peaked in 2007 and then remained relatively stable for the rest of the ten year period (Table 2).

Table 2: Direct exports of *Chelonoidis denticulatus* from Guyana, 2006-2015. Guyana has submitted all annual reports 2006-2015.

Term	Unit	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total		
bodies	-	S	W	Importer									1		1		
				Exporter											1		1
carapaces	-	T	W	Importer													
				Exporter								2					2
live	-	B	W	Importer									2		2		
				Exporter													
		T	C	Importer				100									100
				Exporter													
		I	I	Importer		1					1		1	5			8
				Exporter													
		W	W	Importer	277	583	475	459	431	383	485	532	353	454	4432		
				Exporter	331	704	663	576	377	391	520	425	391	591	4969		
		Z	W	Importer											20		20
				Exporter							6						6
-	W	Importer		38											38		
		Exporter															
specimens	I	S	W	Importer													
				Exporter										<0.1		<0.1	
	T	W	Importer														
			Exporter										<0.1		<0.1		
	-	S	W	Importer										3		3	
				Exporter													
T	W	Importer															
		Exporter									9				9		

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *C. denticulatus* originating in Guyana 2006-2015 almost entirely comprised live, wild-sourced animals for commercial purposes which showed a gradual decline 2006-2015 (Table 3).

Table 3: Indirect exports of *Chelonoidis denticulatus* originating in Guyana, 2006-2015. All indirect trade was in live, wild animals.

Purpose	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
B	Importer						2			30		32
	Exporter											
P	Importer											
	Exporter		2									2
T	Importer	48	44	57	36	60	47	44	30	26	14	406
	Exporter	111	49	65	32	93	35	71	53	65	40	614

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Management: Guyana became a Party to CITES on 25th August 1977. According to the CITES MA of Guyana (*in litt.* to UNEP-WCMC, 2017), *C. denticulatus* was not considered a priority species for conservation concern.

There are no management plans in place for the species in Guyana, but efforts are currently being made by some exporters to breed *C. denticulatus* in captivity for the international wildlife trade (CITES MA of Guyana *in litt.* to UNEP-WCMC, 2017), however, no exports have been reported as captive-bred since 2009. According to the CITES MA of Guyana (*in litt.* to UNEP-WCMC, 2017) some protection is provided in protected areas and other managed areas. *C. denticulatus* was reported to occur in Iwokrama Rainforest Reserve (Donnelly *et al.*, 2005; Bicknell *et al.*, 2013) and Konashen Community-Owned Conservation area (Donnelly *et al.*, 2005; Alonso *et al.*, 2008; Señaris *et al.*, 2013), however, hunting may still be permitted in some conservation areas (Grimes *et al.*, 2008).

Grimes *et al.* (2008) raised concerns over the apparent lack of knowledge on the population status of most species for which export quotas had been issued in Guyana and noted that no baseline data was available to compare levels of harvesting against. Duplaix (2001) raised concerns that export quotas in Guyana were possibly set on levels of export rather than best information available.

Through its national legislation project, the CITES Secretariat categorised the national legislation in Guyana as legislation that is believed generally not to meet all of the requirements for the implementation of CITES. Whilst the 2016 Bill has not yet entered into force, a decree to give it legal effect is imminent, and the categorisation under the national legislation project is expected to change (CITES Secretariat, pers. comm, 2017).

Suriname

Distribution: *C. denticulatus* was previously reported to be widely distributed in Suriname, absent only from savannahs and high elevations (Pritchard and Trebbau, 1984 in Vinke *et al.*, 2008).

C. denticulatus occurrence was reported from the Kwamalasamutu Region [south-eastern Suriname] (O’Shea *et al.*, 2011), the Grensgebergte and Kasikasima regions [south-eastern Suriname] (Nielsen *et al.*, 2013), and southern Suriname (Heemskerk and Delvoye, 2007). The species was not found in surveys of the Mount Lely and Mount Nassau areas [eastern Suriname] (Ouboter *et al.*, 2007; Watling and Ngadino, 2007). Ernst and Leuteritz (1999) mapped the species occurrence in north and north-east Suriname.

Population status and trends: *C. denticulatus* was considered “rather common but very much appreciated as easy storable fresh food” by the Trio people, and others living and working in the Trio area [upper Sipaliwini-Corantijn River basin and Tapanahoni-Palumeu River, south Suriname] (Heemskerk and Delvoye, 2007). The species was reported to be becoming rare in readily accessible areas due to capture for the international pet trade and hunting for their meat (Ouboter, 2001 in van Andel *et al.*, 2003).

Threats: International trade was reported to be impacting populations (Ouboter, 2001 in van Andel *et al.*, 2003). Miglino *et al.* (2005) reported that illegal trade in wildlife continued to flourish in Suriname and may have increased; a particular problem was noted between Guyana and Suriname (Duplaix, 2001). Demand for bushmeat and the exotic pet market were considered to threaten wildlife in the country, with groups of people reported to catch reptiles in the interior (Miglino *et al.*, 2005). Live specimens of *C. denticulatus* were often for sale in markets in Paramaribo (Pritchard and Trebbau, 1984 in Vinke *et al.*, 2008).

Trade: CITES annual reports have been submitted by Suriname for the period 2005-2014; no annual report had been submitted for 2015 at the time of writing. Suriname published export quotas for live *C. denticulatus* 2006-2014 and 2016-2017 (Table 4). Export quotas for 2010-2014 were specified for wild-sourced animals. All direct exports of *C. denticulatus* from Suriname were within quota (Table 4).

Table 4: CITES export quotas for live, wild-sourced *Chelonoidis denticulatus* from Suriname, 2006-2014 and 2016-2017, and global direct exports as reported by countries of import and Suriname, 2006-2015. Suriname has not yet submitted an annual report for 2015.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota	692	692	692	692	692	692	692	692	692	-	692	692
Reported by importer	374	428	229	228	85	152	95	121	134	121		
Reported by Suriname	391	428	234	245	135	171		276	134			

According to data in the CITES Trade Database, direct exports of *C. denticulatus* from Suriname 2006-2015 were predominantly live, wild-sourced animals for commercial purposes, with Suriname reporting exports of 2014 animals and importers reporting trade in 1967 animals (Table 5). Overall, direct exports declined 2006-2015 (Table 5).

Table 5: Direct exports of *Chelonoidis denticulatus* from Suriname, 2006-2015. Suriname has not yet submitted an annual report for 2015. All direct trade was in live animals for commercial purposes.

Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
F	Importer									1		1
	Exporter					28						28
W	Importer	374	428	229	228	85	152	95	121	134	121	1967
	Exporter	391	428	234	245	135	171		276	134		2014

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *C. denticulatus* originating in Suriname 2006-2015 principally comprised low levels of live, wild-sourced animals for commercial purposes (Table 6).

Table 6: Indirect exports of *Chelonoidis denticulatus* originating in Suriname, 2006-2015. All indirect trade was in live animals.

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
P	W	Importer		4		11							15
		Exporter											
T	F	Importer									1		1
		Exporter									1		1
	W	Importer	19	37	10					4			70
		Exporter	67	41	15	35				4	12		174

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Management: Suriname became a Party to CITES on 15th February 1981. Wildlife protection in Suriname was reported to be subject to the Nature Conservation Act 1954, with game regulations passed in 2002 in order to comply with CITES regulations (Migliano *et al.*, 2005). However, no information was located on the protection status of *C. denticulatus* in Suriname.

Duplaix (2001) raised concerns that export quotas in Suriname were possibly set on levels of export rather than best information available. Migliano *et al.* (2005) considered monitoring and hunting control systems in Suriname to be inadequate.

Through its national legislation project, the CITES Secretariat categorised the national legislation in Suriname legislation that is believed generally not to meet all of the requirements for the implementation of CITES. The CITES Authorities in Suriname were consulted as part of this review, but no response was received.

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

Illegal trade in the species between Guyana and Suriname was previously reported to be a problem, although no recent records of seizures were located.

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Testudo graeca: Jordan, Syrian Arab Republic

A. Summary

Global status: Globally Vulnerable, with a widespread distribution. Global population size unknown, but declining. Taxonomy considered complex and unresolved.

JORDAN:	<p>Limited distribution, occurring in the west in Mediterranean habitats. Current population size unknown but reported to have declined over past 15 years. Considered rare and threatened by overgrazing, habitat loss, wild harvest by tourists and local trade; collection was reported to have affected the density and age structure of populations. Illegal trade reported, with 521 seizures reported by Jordan between 2014 and 2016. High levels of trade 2006-2015, mainly in captive-bred live individuals, but with high quantities of wild-sourced live individuals traded (> 14 000 according to importers, with wild-sourced trade last reported in 2013). Annual reports were submitted by Jordan for all years 2006-2015. Jordan responded to the consultation relating to the RST. No population surveys or monitoring has been undertaken and no management plan is in place for the species. The basis for a non-detriment finding for trade in this declining species does not appear to be robust, and collection for trade appears to be having an impact on this species; therefore, categorised as Action is needed.</p>	RECOMMENDATION:
		<p>Action is needed</p>

SYRIAN ARAB REPUBLIC:	<p>Occurs in northern and western Syria. Reported as common in north Syria in 1996, but no recent information on the population status available. There is political instability in the country, and Syria does not appear to have functioning CITES Authorities. Illegal trade has been documented. No annual reports received from Syria since 2012. High levels of trade 2006-2015 in captive-bred individuals (>19 000 according to importers) and ranched individuals (17 000), although no exports of ranched since 2012 as reported by importers. Lower levels of wild-sourced trade (6750 during 2006-2015, and none reported since 2011 by Syria or importers). No information on management available; the country did not respond to the consultation relating to the RST. Whilst the basis for non-detriment findings for previous exports of wild and ranched specimens is unclear, there has been no wild-sourced trade since 2012 (as reported by importers); therefore categorised as Less concern.</p>	RECOMMENDATION:
		<p>Less Concern</p> <p>(Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)</p>

RST Background

Testudo graeca (Spur-thighed Tortoise) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *T. graeca* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011 as well as in 2012, and a sharp increase in trade in 2011, on the basis of trade data presented in AC27 Doc. 12.5. At AC28 (August, 2015), responses to the Secretariat's consultation had been received from 12 range States (AC28 Doc. 9.4 (Rev.2)). Albania, Algeria, Armenia, Azerbaijan, Bulgaria, Cyprus, Egypt, France, Georgia, Greece, Islamic Republic of Iran, Iraq, Israel, Italy, Lebanon, Libya, Republic of Moldova, Montenegro, Morocco, Romania, Russian Federation, Serbia, Spain, The former Yugoslav Republic of Macedonia, Tunisia, Turkey and Turkmenistan were removed from the RST process, whilst Jordan and Syrian Arab Republic (hereafter referred to as Syria) were retained (AC28 Com. 8, AC28 Summary Record).

T. graeca was previously included in the RST following CoP7 (October, 1989). The species was considered at AC9 (September, 1993), and Morocco and Turkey were identified as of 'Possible Concern', with recommendations issued. At SC35 (March, 1995), no response had been received from Turkey and Parties were advised not to accept imports until a cautious quota had been set (SC35 Doc. 6.2). However, in Notification No. 887 of 30th November 1995, it was reported that Turkey would no longer authorize exports of this species, due to its endangered status in Turkey.

At AC21 (May, 2005) *T. graeca* from Lebanon was selected for the RST following CoP13, noting fluctuating trade levels and recent trade in wild specimens from Lebanon (AC21 Doc. 10.2, AC21 Summary Record). The population of Lebanon was eliminated from the RST at AC23 (April, 2008), following a review of the species and categorisation as 'Least Concern' (AC23 Doc. 8.4, AC23 Summary Record).

B. Species characteristics

Taxonomic note: The taxonomy of the *T. graeca* group was considered complex and unresolved by a number of authors (Fritz *et al.*, 1996; Türkozan and Olgun, 2005; Sindaco and Jeremcenco, 2008; Mikulíček *et al.*, 2013) and different species concepts are recognised in the literature (van Dijk *et al.*, 2004; Türkozan and Olgun, 2005). The CITES Standard Reference Fritz and Havaš (2007) recognises 17 subspecies of *T. graeca*.

Biology: *T. graeca* is a medium-sized tortoise that inhabits humid and mesic steppe, semi-steppe and forest habitats, including agricultural land (Disi *et al.*, 2001; Modrý *et al.*, 2004). The species was reported to be diurnal, terrestrial, and relatively slow moving (Disi *et al.*, 2001). It typically feeds on a variety of plant species (Disi *et al.*, 2001; Rouag *et al.*, 2008), but also occasionally on invertebrates (Rouag *et al.*, 2008) and animal carcasses (Disi *et al.*, 2001).

T. graeca occurs at altitudes up to 2700 m above sea level (Ayaz and Cicek, 2011). Whilst populations at higher altitudes and some lowland individuals were reported to hibernate from September-November to February-May, other lowland populations were reported to aestivate during the hot months (Ayaz and Cicek, 2011). Peak activity has been recorded in April and May, with a second lesser peak in September (Disi, 1998 in CITES Management Authority (MA) and Scientific Authority (SA) of Jordan *in litt.* to UNEP-WCMC, 2017).

Sexual maturity in females was observed at 10 years of age and in males at 8 years of age in Spain (Schleich *et al.*, 1996). The species is oviparous and clutches were reported to comprise three to five eggs (Disi *et al.*, 2001), laid two to three times per year (Disi *et al.*, 2001; van Dijk *et al.*, 2004). Hatching

rates in the wild have been found to be relatively low (AC23 Doc. 8.4), with an average hatchling survival rate in the first year of 39 per cent observed by Keller *et al.* (1998). In captivity, longevity of 116 years was reported (Schleich *et al.*, 1996), and breeding in captivity of *T. graeca* is feasible, given appropriate care and conditions (Kirsche, 1979, 1980; Evans, 1987; Willemsen *et al.*, 2002). van der Kuyl *et al.* (2005) thought that captive offspring could be used to replace wild animals in the pet trade.

Distribution: *T. graeca* is a widespread species (van Dijk *et al.*, 2014), which ranges from the Mediterranean basin, east to Iran, with populations in North Africa, southern Europe and West Asia (van Dijk *et al.*, 2004). It has been introduced to some northern Mediterranean islands (Fritz and Havaš, 2007), including Cyprus (Stubbs, 1989), as well as France and Italy (van Dijk *et al.*, 2014). Recent studies have suggested that populations in Spain may also have been introduced (Alvarez *et al.*, 2000; Fritz *et al.*, 2009). The species range was reported to extend approximately 6500 km west from easternmost Iran to the Moroccan Atlantic coast and about 1600 km southwards from the Danube Delta to the Libyan Cyrenaica Peninsula (Fritz *et al.*, 2009). Based on species point localities and coverage of suitable habitat (taking into account elevation and hydrology) Buhlmann *et al.* (2009) estimated the global range of *T. graeca* to be 3 222 988 km².

Population status and trends: *T. graeca* was categorised as Vulnerable by the IUCN (Tortoise & Freshwater Turtle Specialist Group, 1996), but it is noted that this assessment needs updating. *T. graeca* was reported to be declining in the wild (van der Kuyl *et al.*, 2005). *T. graeca* was classified as Vulnerable at the European and EU level in a draft regional assessment in 2004, on the basis that population declines had exceeded 30 per cent over three generations (van Dijk *et al.*, 2004).

Threats: The main threats to the species have been reported as habitat loss and collection for trade (Luxmoore *et al.*, 1988). Former heavy collection for the pet trade was considered likely to have had a serious impact on certain populations (Stubbs, 1989), with Schleich *et al.* (1996) noting that the species was heavily threatened by the trade. van Dijk *et al.* (2004) however, noted that the species was less important as a pet species in Europe than it had previously been. In addition to collection for trade, van der Kuyl *et al.* (2005) considered that agricultural developments had contributed to population declines.

T. graeca was reported to be among the most frequently seized tortoises and freshwater turtles as live specimens globally 2000-2015, with more than 4 276 seizures recorded (CoP17 Doc. 73).

Overview of trade and management: *Testudo graeca* was listed in CITES Appendix II on 1st July 1975, as part of the genus listing for *Testudo*. On 4th February 1977, *T. graeca* was included in the family listing Testudinidae. According to data in the CITES Trade Database, international direct trade in *T. graeca* for 2006-2015 was primarily in live, captive-bred animals for commercial purposes, with 111 542 animals reported by exporting countries and 130 813 reported by importers. Trade in live, captive-bred *T. graeca* for commercial purposes decreased 2006-2015, with exporting countries reporting a greater decline in trade than importing countries.

The species is listed under Annex A of EU Wildlife Trade Regulation EEC No. 338/97, which prohibits the import of wild sourced specimens for commercial purposes into the EU (most recently Commission Reg. (EU) No 2017/160 of 20 January 2017). The species is also listed on Appendix II of the Convention on the Conservation of European Wildlife and Natural Habitats (Council of Europe, 1979). In Europe, the species was reported to occur in a number of protected areas (van Dijk *et al.*, 2004). van Dijk *et al.* (2004) noted that, in Europe, in-situ conservation efforts (species and habitat level) were being made by a variety of non-governmental organisations and private individuals, in addition to ex-situ rescue efforts and captive breeding.

Due to the unknown systematics of the *T. graeca* complex and a lack of studies into the genetics of wild populations, conservation and reintroduction programmes were considered difficult to establish (van der Kuyl *et al.*, 2005).

Resolution Conf 11.9 (Rev. CoP13) on the ‘*Conservation of and trade in tortoises and freshwater turtles*’ urges Parties, especially range States, to undertake a number of activities including enhancing enforcement and management efforts, implementing research programmes and management strategies, enacting legislation, and increasing public awareness. Range States that authorize trade in tortoises and freshwater turtles are required to provide information on their progress towards implementing this Resolution in their periodic reporting (Res. Conf. 11.9 [Rev. CoP13]). No specific information could be located on progress towards these activities in the biennial report of Jordan 2003-2004 (confiscations involving ‘Greek tortoises’ were noted, but no further details were provided). No biennial reports have been submitted by Syria. Pursuant to CITES Decision 16.109, the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group produced a guide for CITES Scientific and Management Authorities on non-detriment findings and trade management for tortoises and freshwater turtles (AC28 Doc. 15 Annex 2).

C. Country reviews

Jordan

Distribution: *T. graeca* was reported to have a limited distribution in Jordan (Attum *et al.*, 2011), occurring in the west of the country (Iverson, 1992; Disi *et al.*, 2001; van Dijk *et al.*, 2004; Modrý *et al.*, 2004) and ranging from the border with Syria in the north to Petra in the south (Disi *et al.*, 2001; CITES MA and SA of Jordan *in litt.* to UNEP-WCMC, 2017). A historical record from Aqabah [south-west Jordan] was considered probably based on an introduced specimen (Disi *et al.*, 2001).

Within the Mediterranean habitats of western Jordan, *T. graeca* was reported to be widely distributed (Modrý *et al.*, 2004), occurring in numerous localities including Al Hammah, Al Karak, Mal, Amman, Anjarah, Ar Ramtha, As Salt, Ash Shawbak, At Tafilah, Ayn Abdah, Dana, Dibbin, Ibbin, Irbid, Jarash, Kufrinjah, in the vicinity of Ma’an, Madaba, Mu’tah, Petra, Safut, Sakhran, Shatana, Zubiya (Disi *et al.*, 2001). The species has been reported to occur in several nature reserves (CITES MA and SA of Jordan *in litt.* to UNEP-WCMC, 2017), including Dibbeen Nature Reserve in 2005 (Damhoureyeh *et al.*, 2009).

In 2007, eight individuals of *T. graeca* originating from Syria were released in Dibbeen Nature Reserve and in 2009, more than five individuals of *T. graeca* [*Testudo graeca terrestris*] were found in Azraq Nature Reserve (outside of the species natural range); the later were believed to have been released by visitors and may have been sourced from the mountainous areas of Jordan or from Syria (Khoury *et al.*, 2012).

Population status and trends: The current population size of *T. graeca* in Jordan is unknown, and although the species was previously considered common, population numbers were reported to have declined over the past 15 years (CITES MA and SA of Jordan *in litt.* to UNEP-WCMC, 2017).

In the late 1980s, the total population in Jordan was estimated at 10,000-15,000 (CITES MA of Jordan, *in litt.* to WCMC, 1986 in WCMC and IUCN/SSC Trade Specialist Group and TRAFFIC International, 1993). *T. graeca* [*T. g. terrestris*] was reported to be ‘vulnerable’ in Jordan by Disi (2002 in Damhoureyeh, 2011), but was considered common in southern Jordan following surveys in 2005-2007 (Al-Quran, 2009). Encounters with individuals of *T. graeca* outside of protected areas were reported to be most likely in northern Jordan, which was reported to contain the largest population and the greatest amount of available habitat (Attum *et al.*, 2011). Disi *et al.* (2014) considered *T. graeca* to be rare and threatened in Jordan, and noted that oak and pine forests provide the main refuge for the species in Jordan.

Threats: The main threats to the species in Jordan were reported to be overgrazing [presumably by livestock] and habitat loss (Disi *et al.*, 2001). Native forests in Jordan, which were considered an important habitat for the species during periods of activity and aestivation/hibernation, were reported to be “rapidly disappearing” and were considered in need of protection (Attum *et al.*, 2011). Other threats to the species were reported to include mortality on roads (Disi *et al.*, 2014), predation by feral dogs (mainly eggs and juveniles) (Disi *et al.*, 2001), and rapid increases in the human population (Bilbeisi, 2015). Aloufi and Eid (2016) reported that the species is also used for traditional medicinal purposes.

The CITES MA and SA of Jordan (*in litt.* to UNEP-WCMC, 2017), considered the main threats to *T. graeca* to be wild harvesting by tourists, local trade, mortality on roads during its active period, and habitat destruction for agricultural and urban development.

Whilst Disi *et al.* (2001) considered that the pet trade did not represent a significant threat to the species in Jordan, collection of *T. graeca* [*T. g. terrestris*] was reported to have affected the density and age structure of populations in Jordan, with adults predominantly favoured for collection (Bilbeisi, 2015). It was reported that wild *T. graeca* [*T. g. terrestris*] are collected and sold at special pet markets in Amman city, largely for tourists (Bilbeisi, 2015). Disi *et al.* (2014) noted *T. graeca* could be seen on sale in Amman markets and was kept as pets, but on a small scale. Illegal trade in *T. graeca* has also been documented (Eid *et al.*, 2011).

Trade: All CITES annual reports have been submitted by Jordan for the period 2006-2015. No export quotas have been published for *T. graeca* by Jordan for the period 2006-2015.

According to data in the CITES Trade Database, all direct trade in *T. graeca* from Jordan 2006-2015 was in live animals, the majority of which were captive-bred for commercial purposes with 66 071 animals reported by Jordan and 72 637 animals reported by importing countries (Table 1). Jordan did not report any captive-bred trade for commercial purposes 2012-2015 but did report high levels of live trade without a purpose and source in these years; a permit analysis suggests that at least part of the trade reported by Jordan without a purpose or source was reported by importers as captive bred for commercial purposes. In addition, high quantities of wild-sourced live animals were exported for commercial purposes (Table 1), although no wild-sourced specimens were reported by Jordan or importers in 2014 or 2015. The CITES MA and SA of Jordan (*in litt.* to UNEP-WCMC, 2017) provided more recent records of trade, reporting the export of 5900 captive-bred animals in 2016.

Table 1: Direct exports of *Testudo graeca* from Jordan, 2006-2015. Jordan has submitted all annual reports 2006-2015. All trade was in live *T. graeca*.

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
P	C	Importer											
		Exporter			5			2					7
	I	Importer	1										1
		Exporter											
	W	Importer											
		Exporter					2						2
Q	C	Importer		30									30
		Exporter											
T	C	Importer	11458	8745	8200	8623	10518	8150	6280	3963	4250	2450	72637
		Exporter	11560	16835	13000	9485	4870	10321					
	I	Importer				200	7		250				457
		Exporter											
	W	Importer	1520	2395	3190	1100		100	1900	3978			14183
		Exporter		2170	600	2575	800	1900					

Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
T	-	Importer											
		Exporter		200									200
Z	C	Importer	300		300								600
		Exporter	400		800								1200
-	I	Importer				1							1
		Exporter											
-	-	Importer											
		Exporter							10632	5673	5950	3900	26155

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

All indirect trade in *T. graeca* originating from Jordan comprised live animals, with the majority being in captive-bred animals for commercial purposes (Table 2). Quantities of exports were much lower than for direct exports.

Table 2: Indirect exports of *Testudo graeca* originating in Jordan, 2006-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
live	P	C	Importer				1				2			3
			Exporter									3		
T	C	C	Importer				22	120		149				291
			Exporter	100			57		9	149				315
	D	D	Importer						9					9
			Exporter											
W	W	W	Importer				6							6
			Exporter											

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

In Jordan's biennial report 2003-2004, confiscations involving Greek Tortoises (*T. graeca*) were reported, but no further details provided (AC25 Doc. 19). During July to November in 2009, 42 individuals of *T. graeca* were confiscated from markets in Amman city (Eid *et al.*, 2011; CITES MA and SA of Jordan *in litt.* to UNEP-WCMC, 2017). In 2012, 536 *T. graeca*, which were intended to be smuggled to Saudi Arabia, were seized by Jordanian customs officials (Oda, 2012). Between 2014 and 2016, a total of 521 *T. graeca* in illegal trade were confiscated in Jordan (Table 3) (CITES MA and SA of Jordan *in litt.* to UNEP-WCMC, 2017).

Table 3: Confiscated *T. graeca* in Jordan, 2014-2016 (CITES MA and SA of Jordan *in litt.* to UNEP-WCMC, 2017).

Year	Number of confiscated animals
2014	334
2015	81
2016	106

Management: Jordan became a Party to CITES on 14th March 1979. This species is listed in appendix 2 of Bylaw no. 43 for the year 2008 of the Provisional Agriculture Law No (44) for the year 2002 (CITES MA and SA of Jordan *in litt.* to UNEP-WCMC, 2017). This bylaw was reported to categorise reptiles and other wildlife banned from hunting and trade, according to the level of protection (Disi *et al.*, 2014). However, the bylaw itself could not be located and it is unclear whether there is a complete prohibition on hunting and trade.

Regulation No. Z 34 of 2003, issued under Article 57, paragraph (a) of the Provisional Agriculture Law No. 44 of 2002, regulates wildlife protection, hunting and trade (Ministry of Agriculture, 2003; Disi *et al.*, 2014).

According to CITES MA and SA of Jordan (*in litt.* to UNEP-WCMC, 2017), no studies have been carried out to monitor current populations of *T. graeca* in Jordan and no management plan for the species exists. Although no trade in wild-sourced specimens was reported in 2014 and 2015, it was not clarified whether additional wild-sourced exports would be permitted. As noted above, the species was reported to be present in several nature reserves, including Dibbeen Nature Reserve (Damhoureyeh *et al.*, 2009; Attum *et al.*, 2011). In 2007, seven individuals, which had been confiscated from traders in Amman (believed to have originated in northern Jordan), were released in Dibbeen forest reserve (Attum *et al.*, 2011). Bilbeisi (2015) believed that's measures to protect the species in Jordan were needed immediately and that studies on the species ecology and population dynamics were also required. Disi *et al.* (2014) believed that *T. graeca* needed urgent protection in Jordan due to habitat loss.

This species is covered by the Jordanian Government strategy on the conservation and sustainably use of biological diversity (The Hashemite Kingdom of Jordan, 2001). Obstacles preventing the conservation of biodiversity were reported to include a lack of public awareness of the importance of environmental protection, updating legislations and sanctions, updating jurisdictional processes, law enforcement and lack of implementation of environmental strategies (The Hashemite Kingdom of Jordan, 2001).

Through its national legislation project, the CITES Secretariat categorised the national legislation in Jordan as legislation that is believed generally not to meet all of the requirements for the implementation of CITES.

Syrian Arab Republic

Distribution: *T. graeca* was reported to occur in northern and western Syria (Fritz *et al.*, 1996; van Dijk *et al.*, 2004; Široký *et al.*, 2007). Its occurrence has been reported from Suwayda, Qanawat and Rashiedeh (in the Jabal ad Durūz Mountains in south-west Syria), Jourine in Jabal an Nusayriyāh Mountains and Qal'at Samaan (western Syria) (Široký *et al.*, 2007), Al Kafr, Saleh, Saydnaya, Ayn Al Bayda, Jourine, Kafr Takharim and Qalat Samaan (Mikulíček *et al.*, 2013), from Nizran (25 km south of As Suwayda) (Lymberakis and Kalionzopoulou, 2003), from Dar Ta'izzah and Qalat Saman (north-west Aleppo) [*T. g. terrestris*] (Fritz *et al.*, 2007) and from Ma'lula and Saydnaya (Jabal esh Sharqi, Anti Lebanon Mts.), Ayn al Baydah, Jourine and Masyaf (Jabal al Nusayriyah), Al Kafr, As Suwayda' and between As Suwayda' and Saleh (Jabal Duruz) [*T. g. antakyensis*] (Fritz *et al.*, 2007).

A population was also reported from Palmyra city (central Syria), however, it was unknown whether this population was connected with the species occurrence on the west coast, or represented an isolated occurrence (the source of this population was also considered unknown) (Fritz *et al.*, 1996). South of Antilibanon, *T. graeca* was reported to occur in a range of habitats between Jebel ash Sheikh and the eastern slope of Jebel ed Drouz (Fritz *et al.*, 1996). *T. graeca* was also recorded in the coastal Aansariye mountain range in Mediterranean habitats and from Al Hasakah in the Syrian Upper Mesopotamia (museum specimen) (Fritz *et al.*, 1996).

Population status and trends: The species was reported to be common in north Syria from the Mediterranean coastal area to the western steppe region (Fritz *et al.*, 1996). No recent information on the status of *T. graeca* in Syria could be located.

Threats: There is political instability in the country, and Syria does not appear to have functioning CITES Authorities. Illegal trade has been documented; in 2006, more than 41 *T. graeca* [*T. g. terrestris*] from Syria were confiscated at Abu Dhabi (UAE) and 60 *T. graeca* from Syria were confiscated at Al Ghuaifat (UAE) (AC25 Doc. 19).

Trade: CITES annual reports have been submitted by Syria for the period 2006-2012. Syria did not publish export quotas for *T. graeca* 2006-2015. According to data in the CITES Trade Database, direct trade in *T. graeca* from Syria was nearly all in live animals for commercial purposes, with export of 27 575 live animals reported by Syria and 35 055 reported by importers (Table 4). Syria reported the main source of live exports as ranching; importers reported the majority of live trade as captive-bred. Trade in live animals was reported to have increased 10- and 40- fold between 2010 and 2011, as reported by importing countries and Syria respectively.

Table 4: Direct exports of *Testudo graeca* from Syria, 2006-2015. Syria has not yet submitted annual reports for 2013-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	
bodies	E	I	Importer					1						1	
			Exporter												
live	E	C	Importer												
			Exporter		10										10
	P	C	Importer								1			1	
			Exporter				1								1
		I		Importer					1					1	
				Exporter											
	R			Importer											
				Exporter					1						1
	W			Importer					3						3
				Exporter			8	3	2						
	T	C		Importer		550			1000	2800		7800	5900	1300	19350
				Exporter	500	450		500		1100	650				
		F			Importer										
					Exporter							600			
R				Importer					5150	3800				8950	
				Exporter					350	10950	5700				17000
W				Importer	2500	1200	500			2550					6750
				Exporter	3150	1450				2150					
trophies		E	I	Importer											
				Exporter						1					

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *T. graeca* originating in Syria mainly comprised live, captive-bred animals for commercial purposes (Table 5).

Table 5: Indirect exports of *Testudo graeca* originating in Syria, 2006-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	
derivatives	T	R	Importer												
			Exporter						100						100
live	B	I	Importer												
			Exporter		10										10
	L	I	Importer												
			Exporter				1								1
	P	D	Importer												
			Exporter							10					10
	R			Importer											
				Exporter										1	
	W			Importer											
				Exporter								1	1	1	
	T	C		Importer						1300		500	1050		2850
				Exporter			197				1300		600	2107	500

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
live (cont.)	T	R	Importer											
			Exporter					200						200
		W	Importer	12		12								24
			Exporter	18		12								30
	-	-	Importer											
			Exporter									1100	150	1250

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Management: Syria became a Party to CITES on 29th July 2003. Through its national legislation project, the CITES Secretariat categorised the national legislation in Syria as legislation that is believed generally not to meet the requirements for the implementation of CITES. No information on the management of this species in Syria could be located. The CITES Authorities of Syria were consulted by email and post; only one email address appeared to be functioning and the letter sent by post was returned undelivered.

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

In the CITES species identification manual (CITES Secretariat, 1980), *Testudo hermanni* is listed as a similar species. Schleich *et al.* (1996) considered *Testudo kleinmanni* as very similar. Illegal trade in the species was reported to be a problem, with recent seizures reported in Jordan and previous reports of seizures of specimens stated to originate in Syria.

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Ornithoptera croesus: Indonesia

A. Summary

<p>INDONESIA: Endangered (assessment requires updating), with population size and trend unknown. Endemic to Indonesia and restricted to a few Moluccan islands. Primarily threatened by habitat loss and possibly trade; illegal trade in birdwing butterflies has been reported. Annual reports were submitted by Indonesia for all years 2006-2015, although the 2013 report appears incomplete for <i>Ornithoptera</i>. High levels of trade 2006-2015, predominantly in ranched specimens (29 885 as reported by Indonesia), with a peak in trade in 2011, although trade declined thereafter. A shift in source was observed in 2014, with recent trade predominantly reported as source code F. Indonesia responded to the consultation relating to the RST. Wild-sourced exports for commercial purposes are not permitted, although collection from the wild to augment breeding facilities occurs with harvest levels set annually. There are four current breeders of birdwing butterflies in Indonesia (species unspecified). Whilst in general, ranching of birdwings is widely considered not to impact on wild populations, no monitoring of the impact of offtake for captive production appears to take place in Indonesia. The species is currently under review for protected status nationally. It is unclear if ranching in the country is taking place (or captive breeding only). The basis for non-detriment findings for acquisition of specimens from the wild for ranching or captive breeding is unclear and the impact of offtake on wild populations of is uncertain; therefore, categorised as Unknown status.</p>	<p>RECOMMENDATION:</p> <p>Unknown status</p> <p>(Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)</p>
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RST Background

Ornithoptera croesus (Wallace's Golden Birdwing) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *O. croesus* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, as well as in 2012, and also met the criteria for being a globally threatened species in trade (Endangered), on the basis of trade data presented in AC27 Doc. 12.5. A response to the Secretariat's consultation had not been received from Indonesia, its only range State at AC28 (August, 2015) (AC28 Doc. 9.4 (Rev.2)), hence Indonesia was retained in the RST process (AC28 Com. 8, AC28 Summary Record).

O. croesus was previously included in the RST following CoP7 (October, 1989). The species was considered at AC9 (September, 1993), and Indonesia was categorised as of 'Possible Concern', but no recommendations were issued.

B. Species characteristics

Taxonomic note: Ohya (2001) [the CITES standard nomenclature reference for birdwing butterflies] recognises 11 *Ornithoptera* species: *O. alexandrae*, *O. victoriae*, *O. priamus*, *O. croesus*,

O. aesacus, *O. chimaera*, *O. tithonus*, *O. rothschildi*, *O. goliath*, *O. paradisea* and *O. meridionalis*, whereas D'Abbrera (1975) [the previous CITES standard nomenclature reference for birdwing butterflies] also considered *O. allotiei*, *O. richmondia*, *O. caelestis* and *O. urvilliana* to be valid species. Häuser *et al.* (2005) follows Ohya (2001), but also considered *O. richmondia* as a valid species within the genus. Ohya (2001) recognises three subspecies of *O. croesus*: *O. c. croesus*, *O. c. lydius* and *O. c. toeante*.

Biology: *O. croesus* is a dark brown and golden-orange birdwing butterfly, overlaid with a green iridescence (males), with a wingspan of 13-15 cm for males and 16-19 cm for females (Environment Canada, 2000). *Ornithoptera* spp. show strong sexual dimorphism (Parsons, 1996a). Similar species include *O. aecacus* and *O. priamus* (Environment Canada, 2000).

The species was reported to occur in lowland forest areas, where it inhabits swamps and similar habitats (Igarashi 1979 in Collins and Morris, 1985). Vane-Wright (pers. comm. to UNEP-WCMC, 2012) considered that birdwing butterflies were able to survive in much altered habitats, if their host vines and some suitable food plants for the adults were still available.

The development of birdwing butterflies from egg to adult was reported to last several weeks (Collins and Morris, 1985). The eggs of birdwing butterflies are the largest of all butterflies, and may reach up to 4 mm in diameter; eggs were reported to be laid on the *Aristolochia* spp. plants that the caterpillars use as a food source (Collins and Morris, 1985). Some species were considered to be specialists, feeding only on one plant species (Collins and Morris, 1985). Based on Igarashi and Fukuda (2000) and Matsuka (2001), the CITES Management Authority and Scientific Authority of Indonesia (*in litt.* to UNEP-WCMC, 2017) noted that the food plant of *O. croesus* was a distinct species of *Aristolochia*. According to Collins and Morris (1985), *Ornithoptera* spp. generally laid less than 30 eggs per brood.

C. Country reviews

Indonesia

Distribution: *O. croesus* is endemic to Indonesia, where it is restricted to a few islands in the Moluccas in the east of the country (Collins and Morris, 1985). Ohya (2001) reported the following distribution: *O. c. croesus* from Bacan and outlying islands, *O. c. lydius* from Halmahera and outlying islands and *O. c. toeante* from Morotai Island (all situated in the northern Moluccas).

This species (in particular the subspecies' *lydius* and *croesus*) was considered highly localised (T. New in WCMC *et al.*, 1993), and Collins and Morris (1985) noted that both *O. c. croesus* and *O. c. lydius* occur in highly productive lowland forest.

Population status and trends: *O. croesus* is considered Endangered by the IUCN (no justification provided), and the assessment was noted to require updating (Gimenez Dixon, 1996). This assessment was considered "difficult to understand" by Pegg *et al.* (2005), as 80 per cent of the original rainforest biome encompassing the species' range was then reported to still be intact and to include seven protected areas totalling 4880 km².

Birdwing butterflies were generally considered to be vulnerable in Indonesia and affected by habitat destruction (CITES Scientific Authority (SA) of Indonesia, pers. comm. to UNEP-WCMC, 2012a). It was noted that no information was available on the population size of *O. croesus* (CITES Management Authority (MA) of Indonesia, *in litt.* to UNEP-WCMC, 2017).

T. New (in WCMC *et al.*, 1993) considered the species (particularly the subspecies *lydius* and *croesus*) to be rare and highly localised, occurring in small populations. No information was located on the current population size or status of this species.

Threats: Habitat loss was considered the main threat to birdwing butterflies, including in Papua New Guinea (T. Bayliss-Smith, pers. comm. to UNEP-WCMC, 2012), Malaysia, the Philippines and Indonesia (New and Collins, 1991). Vane-Wright (pers. comm. to UNEP-WCMC, 2012) considered birdwing butterflies not to be very threatened overall, although noted that total land clearance and the use of selective herbicides were threats.

Commercial collection was considered an additional threat to birdwing butterflies (Collins and Morris, 1985), particularly for species occurring in geographically restricted areas (Parsons, 1995a). *Ornithoptera* spp. were reported to be in particularly high demand by collectors (Parsons, 1996b), and amongst the most highly priced in the market (Laithwaite *et al.*, 1975; Parsons, 1995b, 1995a; New, 1997). New and Collins (1991) highlighted that the trade in dried butterfly specimens was very difficult to monitor as they could be sent through the post. The difficulties in controlling illegal harvest and trade were believed unlikely to be alleviated solely through protective legislation (New and Collins, 1991). TRAFFIC (2011) reported several seizures of birdwing butterflies (including various *Ornithoptera* spp. originating in Indonesia) and subsequent prosecutions between 1997 and 2011.

In Indonesia, birdwing butterflies were considered affected by habitat destruction (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2012b; CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017). Illegal trade was also considered a threat, with detection challenging due to their size (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Trade: *O. croesus* was listed in CITES Appendix II on 28th June 1979, as part of the genus listing for *Ornithoptera*. All CITES annual reports have been submitted by Indonesia for the period 2006–2015; however Indonesia’s 2013 report appears to be incomplete for *Ornithoptera*. Indonesia have not published any export quotas for *O. croesus*

According to data in the CITES Trade Database, direct trade in *O. croesus* from Indonesia 2006–2015 primarily consisted of ranched and source F bodies for commercial purposes, with 35 656 bodies reported by Indonesia and 15 403 reported by importing countries (Table 1). The observed shift in reported source from R to F may be as a result of EU discussions on the appropriate source code for *O. croesus* specimens originating in Indonesia (see ‘Management’). Trade in bodies of *O. croesus* increased between 2006 and 2011 as reported by Indonesia, however decreased thereafter.

Table 1. Direct exports of *Ornithoptera croesus* from Indonesia, 2006–2015. Indonesia has submitted annual reports for all years 2006–2015; the 2013 report appears to be incomplete for *Ornithoptera*.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
bodies	E	I	Importer							250				250
			Exporter											
	P	R	Importer	9	20	20	18	11				6		84
			Exporter											
	S	R	Importer			60								60
			Exporter											
	T	C	Importer			82	40	120			220	60		522
			Exporter							362				
		F	Importer	456	17		104						642	1219
			Exporter									2960	2811	
		I	Importer							14				14
			Exporter											
	R		Importer	2513	1884	776	1831	1930	1307	1923	1135	885		14184
			Exporter	4249	3013	3490	3585	6080	6113	3355				
	W		Importer				10							10
			Exporter											

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
live	T	R	Importer					30						30
			Exporter											
specimens	P	W	Importer			3								3
			Exporter											
	T	R	Importer						10					10
			Exporter											
trophies	T	F	Importer										148	148
			Exporter											
	R		Importer					260						260
			Exporter											

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *O. croesus* originating in Indonesia 2006-2015 was primarily in ranched bodies exported for commercial purposes. Re-exports were lower in quantity than direct exports, with 1497 bodies reported by exporters and 613 reported by importers (Table 2).

Table 2: Indirect exports of *Ornithoptera croesus* originating in Indonesia, 2006-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total			
bodies	P	C	Importer			1								1			
			Exporter		2										2		
			F	Importer			2							1		3	
				Exporter	20	36	21	4	6	2		6	4	6		105	
			R	Importer	4			4		2			2		1	13	
				Exporter	26	4	28	40	59	11	31	50	20	32		301	
			W	Importer													
				Exporter								2					2
			T	C	Importer						10						10
					Exporter		2										2
			F	F	Importer			2									2
					Exporter	2	20	6								6	34
			I	I	Importer			15									15
					Exporter												
			R	R	Importer	101		12	10	2	1					10	136
					Exporter	242	101	137	69	277	44	135	30	11	4		1050
			W	W	Importer		42	116	30	105	40	40	40	20			433
					Exporter						1						1
			specimens	E	R	Importer								100			100
						Exporter											
Z	R	Importer				1								1			
		Exporter															
trophies	T	F	Importer														
			Exporter										12		12		
	R	R	Importer														
			Exporter				42	42	33	264	15		207		603		
	W	W	Importer														
			Exporter							20						20	

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

New and Collins (1991) regarded birdwing butterflies as the “most important component of insect trade, because of the high prices they command”, with the highest prices paid for rare species (New and Collins, 1991; Slone *et al.*, 1997) and for females, because they were generally considered to be more difficult to collect (New and Collins, 1991). According to Parsons (1995a), butterflies were traded for three main purposes: 1) high value dead specimens for the specialist collector trade, 2) low value dead specimens for the decorative trade, and 3) live individuals, mainly aimed at live displays in greenhouses.

Management: Indonesia became a Party to CITES in 1978. Further details on legislation, quota setting, captive breeding and ranching, enforcement and reporting are provided below.

Legislation: Act No. 5 of 1990 ‘Concerning Conservation of Living Resources and their Ecosystems’ and Regulation No. 8 on the utilization of wildlife regulate the management of species within the country, prohibiting the harvest and trade of protected species’ (Ministry of Forestry, 1990; President of the Republic of Indonesia, 1999b). The latter also lays down sanctions relating to illegal trade (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017). Regulation No. 7 of 1999 lists species which are protected in Indonesia, including *O. chimaera*, *O. goliath*, *O. paradisea*, *O. priamus* and *O. rothschildi* (President of the Republic of Indonesia, 1999a). While not protected under Indonesian law, *O. croesus*, (together with *O. aesacus*, and *O. meridionalis*) was considered to be in urgent need of protection (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2012a).

Referring to Peggie (2011), the CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2017) noted that *O. croesus*, along with *O. aesacus*, *O. meridionalis*, *Troides cuneifera*, *T. oblongomaculatus* and *T. prattorum*, was proposed to be included as a protected species within the legislation. The CITES SA of Indonesia (pers. comm. to UNEP-WCMC, 2017) reported that the relevant legislation was under review and expected to be updated by the end of 2017.

Trade in specimens of butterfly species included in CITES Appendix II was reportedly only permitted if of captive-bred origin, with harvest of wild specimens restricted to research and educational (including scientific collections in museums) purposes (Peggie, 2011). The CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2017) confirmed that harvest, domestic transport and export of CITES species was strictly controlled, as per Decree of the Minister of Forestry Number 447/Kpts-II/2003. All exports were reported to be verified (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Through its national legislation project, the CITES Secretariat categorised the national legislation in Indonesia as category 1 legislation that is believed generally to meet the requirements for implementation of CITES.

Quota setting: Export quotas and quotas for breeding stocks were reportedly set annually by the Indonesian CITES MA, SA and other stakeholders (AC22 Doc. 13.1), although export quotas for this species do not appear to have been communicated to the CITES Secretariat⁸.

In 2008, quotas to collect specimens from the wild for breeding and/or research purposes were published in Decree SK.06/IV-KKH/2008 for a number of birdwing butterfly species, with zero quotas published for exports of wild specimens (PHKA, 2008). In 2012, the CITES SA of Indonesia (pers. comm. to UNEP-WCMC 2012a) confirmed that harvest numbers were set annually for all butterflies included in CITES Appendix II, with numbers generally between 200 and 300 individuals per species and restricted for breeding purposes only. The numbers were reported to be set to ensure that harvest was not detrimental to the species and were based on a “rough assessment” of the number of eggs, survival rates and threat to the species (levels of habitat loss and demand) (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2012b).

In 2017, it was reported that harvest quotas were based on annual applications by breeders for parental stocks for the next year; applications were to be submitted to the Provincial Offices of the MA, with all numbers from all 34 Indonesian provinces submitted to the Directorate General of the MA (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2017). The Directorate General of the MA was reported to then seek advice from the CITES SA, with the latter also considering some input from NGOs and other

⁸ The CITES export quotas. Available at: <https://cites.org/eng/resources/quotas/index.php> [Accessed: 27/03/17].

stakeholders, prior to providing their precautionary advice (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2017). In 2017, four butterfly breeders were reported to be registered in Indonesia; breeders are required to be registered and licenced (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017). Based on the information provided by the CITES MA and SA (*in litt.* to UNEP-WCMC, 2017), one facility appears to be UD Giradys; this facility seems to be located in East Java.

The CITES MA and SA (*in litt.* to UNEP-WCMC, 2017) noted that ‘ideally, we would have population data on this species to monitor the impact of trade to the wild population’.

Captive-breeding and ranching: Descriptions of the production facilities maintaining birdwing butterflies in Indonesia were provided by the CITES SA of Indonesia in 2012. Specimens were reported to be generally collected from the wild as pupae (for some species as caterpillars) and transferred to enclosures, with some of the emerging adults kept to breed a further four to five generations, until the introduction of new specimens was required to maintain the broodstock (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2012b). However, it was noted that some companies may not follow this pattern (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2012b). The CITES SA of Indonesia (pers. comm. to UNEP-WCMC, 2012b) pointed out that it may therefore be more appropriate to consider the specimens in trade to be ‘ranched’, although captive breeding was ultimately being aimed for.

In accordance with the definition in Conf. Res. 11.16 (Rev. CoP15), the term ‘ranching’ means the rearing in a controlled environment of animals taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood. Butterfly ranching has been defined as a method “whereby unenclosed habitat patches are enriched with larval food-plants and adult nectar sources and thereby rendered superattractive, and from where specimens may be harvested by rearing from collected early stages” (New, 1994). Pupa can then be collected and placed in a cage, hatching box, glass house, or shade house, then when it hatches, the butterfly is killed (by injection of boiling water or ethyl acetate), dried in the sun and sold (Hutton, 1985; Ruskin, 1985; Parsons, 1995a; Weintraub, 1995; Small, 2004). However, it is difficult for a farmer to know how many pupae are present on the vines and thus how many should be collected (Hutton, 1985; Ruskin, 1985; Parsons, 1995a; Small, 2004). Captive breeding is more appropriate to cases where all stages of development are enclosed in a controlled environment. Ranched or captive-bred butterflies are, unlike wild-caught ones, undamaged and therefore of higher quality (Parsons, 1995a). Butterflies were reportedly produced through both ranching and captive breeding systems in Indonesia (AC22 Doc. 13.1).

Ranching was considered to reduce the pressure on natural populations (Collins and Morris 1985; Parsons 1995a; Cranston 2010; CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017), producing undamaged specimens for trade, and preventing habitat destruction through creating alternative local incomes (Collins and Morris, 1985; Parsons, 1995a; Cranston, 2010). Nijman (2010) reported that the increased production of butterflies from breeding farms in Southeast Asia had significantly decreased wild harvesting in some countries and the CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2017) believed that sustainable harvest of the species through captive production was possible.

It was reported that the Indonesian CITES SA conducted monitoring visits to the butterfly farms and ranches, and presented suggestions to improve the facilities (AC22 Doc. 13.1).

Slone *et al.* (1997) noted that there was no information available on the benefits of ranching to the population size or extinction probability in the wild. Increased availability of planted *Aristolochia* spp. was also thought to possibly attract a high proportion of females, laying their eggs there rather than in their natural habitats, with the practice potentially resulting in overharvest of the population (Schütz, 2000). In West Papua, it was noted that local populations of butterflies had “apparently” not been

affected by ranching operations, and that in some cases, it had helped to reduce the conversion of forests to agriculture (Wells *et al.*, 1999).

Population monitoring: *O. croesus* was thought to be monitored by the Aketajawe-Lolobata National Park (167 300 hectares) in Halmahera, (the largest island of the Moluccas) and the success in breeding the species in captivity was believed to alleviate pressure on wild populations (CITES SA of Indonesia, 2017). No information on monitoring the impact of the offtake for captive production was provided, however, the CITES SA noted that more ‘attention’ was required for this species and other birdwing butterflies (pers. comm. to UNEP-WCMC, 2017).

Enforcement: In the 1990s, much of the Indonesian trade in butterfly specimens was considered to be “poorly controlled” (New, 1997). It was noted that partly due to the complicated regulations, butterflies may be illegally harvested from the wild (AC22 Doc. 13.1). The CITES SA of Indonesia (pers. comm. to UNEP-WCMC, 2012a) noted that illegal trade was a major problem, due to a lack of law enforcement, but the CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2017) later noted that annual training was being provided to “field officers and officials of Special Police and Civil Investigator of BKSDA, Customs, Quarantine and State Police” to tackle illegal trade. Furthermore, a Memorandum of Understanding to support coordination and cooperation between customs and the CITES MA was reported to being formalised (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Reporting: The issue of source code determination for *Ornithoptera* spp. has been discussed by the CITES Scientific Authorities of the EU Member States at meetings of the Scientific Review Group (SRG). The SRG recommends using source code F rather than source code R in cases where not all the criteria of the definition of “captive-breeding” are met as established under Resolution Conf. 10.16 (Rev.) on specimens of animal species bred in captivity. The SRG has concluded that ‘ranching’ (meaning the rearing in a controlled environment of animals taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood) did not seem to be appropriate for cases for *Ornithoptera* spp. in trade, where wild specimens were being used regularly to supplement captive breeding stock (European Commission, pers. comm. to UNEP-WCMC, 2017.)

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

Trade noted to be difficult to control, as dried butterflies can be sent by post (New and Collins, 1991).

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Ornithoptera rothschildi: Indonesia

A. Summary

INDONESIA: Vulnerable (assessment requires updating), population size and trend unknown. Endemic to Indonesia and restricted range in north western part of West Papua Province. Primarily threatened by habitat loss and possibly trade; illegal trade in birdwing butterflies has been reported. Annual reports were submitted by Indonesia for all years 2006-2015, although the 2013 report appears incomplete for *Ornithoptera*. High levels of trade 2006-2015, predominantly in ranched specimens (15 616 as reported by Indonesia) with a peak in trade in 2010, although trade declined thereafter. A shift in source was observed in 2015, with recent trade predominantly reported as source code F. Indonesia responded to the consultation relating to the RST. The species is nationally protected. Wild-sourced exports for commercial purposes are not permitted, although collection from the wild to augment breeding facilities occurs with harvest levels set annually. There are four current breeders of birdwing butterflies in Indonesia (species unspecified). Whilst in general, ranching of birdwings is widely considered not to impact on wild populations, no monitoring of the impact of offtake for captive production appears to take place in Indonesia. The basis for non-detriment findings for acquisition of specimens from the wild for ranching or captive breeding is unclear, and the impact of offtake on wild populations is uncertain; therefore, categorised as Unknown status.

RECOMMENDATION:

Unknown status

(Species-country combination may be relevant to AC discussions under Conf. Res. 17.7.)

RST Background

Ornithoptera rothschildi (Rothschild's Birdwing) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *O. rothschildi* was identified as a species that met a high volume trade threshold for globally threatened species in 2012, on the basis of trade data presented in AC27 Doc. 12.5. A response to the Secretariat's consultation had not been received from Indonesia, its only range State at AC28 (August, 2015) (AC28 Doc. 9.4 (Rev.2)), hence Indonesia was retained in the RST process (AC28 Com. 8, AC28 Summary Record).

O. rothschildi was previously included in the RST following CoP10 (June, 1997). The species was reviewed for AC15 (July, 1999) and Indonesia was categorised as 'Least Concern', with no recommendations issued, although it was noted that ranched specimens were being reported by importers as wild-caught (AC15 Proceedings).

B. Species characteristics

Taxonomic note: Ohya (2001) [the CITES standard nomenclature reference for birdwing butterflies] recognises 11 *Ornithoptera* species: *O. alexandrae*, *O. victoriae*, *O. priamus*, *O. croesus*, *O. aesacus*, *O. chimaera*, *O. tithonus*, *O. rothschildi*, *O. goliath*, *O. paradisea* and *O. meridionalis*, whereas D'Abbrera (1975) [the previous CITES standard nomenclature reference for birdwing butterflies] also considered *O. allotiei*, *O. richmondia*, *O. caelestis* and *O. urvilliana* to be valid species. Häuser *et al.* (2005) follows Ohya (2001), but also considered *O. richmondia* as a valid species within the genus. Ohya (2001) recognises three subspecies of *O. croesus*: *O. c. croesus*, *O. c. lydius* and *O. c. toeante*.

Biology: *O. rothschildi* is a dark brown, pale green and golden yellow birdwing butterfly, overlaid with a blue iridescence (males), with a wingspan of 10.5-13 cm for males and 13.5-15.5 cm for females (Environment Canada, 2000). *Ornithoptera* spp. show strong sexual dimorphism (Parsons, 1996a). Similar species include *O. chimaera* and *O. tithonus* (Environment Canada, 2000).

O. rothschildi was described as a montane species, generally found at altitudes between 1800 m and 2450 m above sea level (Collins and Morris, 1985). Vane-Wright (pers. comm. to UNEP-WCMC, 2012) considered that birdwing butterflies were able to survive in much altered habitats, if their host vines and some suitable food plants for the adults were still available.

The development of birdwing butterflies from egg to adult was reported to last several weeks (Collins and Morris, 1985). The eggs of birdwing butterflies are the largest of all butterflies, and may reach up to 4 mm in diameter; eggs were reported to be laid on the *Aristolochia* spp. plants that the caterpillars use as a food source (Collins and Morris, 1985). Some species were considered to be specialists, feeding only on one plant species (Collins and Morris, 1985). Based on Igarashi and Fukuda (2000) and Matsuka (2001), the CITES Management Authority and Scientific Authority of Indonesia (*in litt.* to UNEP-WCMC, 2017) did not consider that the food plant of *O. rothschildi* was a distinct species of *Aristolochia*. According to Collins and Morris (1985), *Ornithoptera* spp. generally laid less than 30 eggs per brood.

C. Country reviews

Indonesia

Distribution: *O. rothschildi* is endemic to Indonesia (Parsons, 1995b, 1996), where it occurs on the Arfak Mountains of the north western part of the West Papua Province (Collins and Morris, 1985; Kondo *et al.*, 2003). Nagypal (2008) considered it to have the narrowest distribution of any birdwing butterfly species.

Population status and trends: *O. rothschildi* is considered Vulnerable by the IUCN (no justification provided) and the assessment was noted to require updating (Gimenez Dixon, 1996). Despite its restricted distribution, in the late 1970 and mid-1980s, it was not considered rare and was reported to be abundant in some areas (Haugum and Low, 1978, in Collins and Morris 1985). Collins and Morris (1985) noted that its conservation status was poorly known.

Birdwing butterflies were generally considered to be vulnerable in Indonesia and affected by habitat destruction (CITES Scientific Authority of Indonesia, pers. comm. to UNEP-WCMC, 2012a). It was noted that there was a lack of population data for this species (CITES Management Authority of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Threats: Habitat loss was considered the main threat to birdwing butterflies, including in Papua New Guinea (T. Bayliss-Smith, pers. comm. to UNEP-WCMC, 2012), Malaysia, the Philippines and Indonesia (New and Collins, 1991). Vane-Wright (pers. comm. to UNEP-WCMC, 2012) considered birdwing butterflies not to be very threatened overall, although noted that total land clearance and the use of selective herbicides were threats.

Commercial collection was considered an additional threat to birdwing butterflies (Collins and Morris, 1985), particularly for species occurring in geographically restricted areas (Parsons, 1995a). Haugum (1984, *in litt.* to Collins and Morris 1985) reported that the species was under heavy pressure of commercial exploitation in Indonesia and Collins and Morris (1985) recommended an assessment of the conservation status of *O. rothschildi* and the impacts of commercial trade. *Ornithoptera* spp. were reported to be in particularly high demand by collectors (Parsons, 1996b), and amongst the most highly priced in the market (Laithwaite *et al.*, 1975; Parsons, 1995b, 1995a; New, 1997). New and Collins (1991) highlighted that the trade in dried butterfly specimens was very difficult to monitor as they could be sent through the post. The difficulties in controlling illegal harvest and trade were believed unlikely to be alleviated solely through protective legislation (New and Collins, 1991). TRAFFIC (2011) reported several seizures of birdwing butterflies (including various *Ornithoptera* spp. originating in Indonesia) and subsequent prosecutions between 1997 and 2011.

In Indonesia, birdwing butterflies were considered affected by habitat destruction (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2012b; CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017). Illegal trade was also considered a threat, with detection challenging due to their size (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Trade: *O. rothschildi* was listed in CITES Appendix II on 28th June 1979, as part of the genus listing for *Ornithoptera*. All CITES annual reports have been submitted by Indonesia for the period 2006–2015, however Indonesia’s annual report for 2013 appears to be incomplete for *Ornithoptera*. No quotas have been published for *O. rothschildi* by Indonesia.

According to data in the CITES Trade Database, direct trade in *O. rothschildi* from Indonesia 2006–2015 comprised primarily of ranches for commercial purposes, with 15 616 reported by Indonesia and 7011 reported by importing countries (Table 1). The observed shift in reported source from R to F between 2014 and 2015 may be as a result of EU discussions on the appropriate source code for *O. rothschildi* specimens originating in Indonesia (see ‘Management’). Trade in bodies of *O. rothschildi*, as reported by importing countries, remained relatively stable between 2006 and 2015. Exports as reported by Indonesia peaked in 2010 with the number of individuals reported being approximately 2.5 times that reported in 2009. Thereafter, Indonesia reported a decline in direct trade in *O. rothschildi*.

Table 1: Direct exports of *Ornithoptera rothschildi* from Indonesia, 2006-2015. Indonesia has submitted annual reports for all years 2006-2015; the 2013 report appears to be incomplete for *Ornithoptera*.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
bodies	P	R	Importer	10	10	26	26	23	14	8				117
			Exporter											
	S	R	Importer			50								50
			Exporter											
	T	C	Importer			40	40	100				20		200
			Exporter								111			
	F		Importer	28							60		106	194
			Exporter											1084
	I		Importer								20			20
			Exporter											
	R		Importer	796	1288	479	596	1006	713	841	678	191	423	7011
			Exporter	1462	1902	1491	1266	3265	2631	1890		1466	243	15616
trophies	T	R	Importer							135	30			165
			Exporter											

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

Indirect trade in *O. rothschildi* originating in Indonesia 2006-2015 primarily comprised ranched bodies, traded for personal and commercial purposes, as reported by re-exporters. Importing countries consistently reported lower levels of indirect trade than re-exporting countries (Table 2).

Table 2: Indirect exports of *Ornithoptera rothschildi* originating in Indonesia, 2006-2015.

Term	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
bodies	P	R	Importer					2	1		1			4
			Exporter	20	10	8	17	26	8	2	11		3	105
	U		Importer										1	1
			Exporter											
	W		Importer											
			Exporter								1			
	T	C	Importer					5						5
			Exporter											
	R		Importer			10	2	2	6	2				22
			Exporter	9	19	44	10	33	12	86	7		5	225
	W		Importer					20	15	5				40
			Exporter											
specimens	Z	R	Importer			2								2
			Exporter											
trophies	T	R	Importer											
			Exporter					4		27	8	18		5

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 21/03/2017

New and Collins (1991) regarded birdwing butterflies as the “most important component of insect trade, because of the high prices they command”, with the highest prices paid for rare species (New and Collins, 1991; Slone *et al.*, 1997) and for females, because they were generally considered to be more difficult to collect (New and Collins, 1991). According to Parsons (1995a), butterflies were traded for three main purposes: 1) high value dead specimens for the specialist collector trade, 2) low value dead specimens for the decorative trade, and 3) live individuals, mainly aimed at live displays in greenhouses.

Management: Indonesia became a Party to CITES in 1978. Further details on legislation, quota setting, captive breeding and ranching, enforcement and reporting are provided below.

Legislation: Regulation No. 7 of 1999 lists species which are protected in Indonesia, including *O. rothschildi* (President of the Republic of Indonesia, 1999a). Act No. 5 of 1990 ‘Concerning

Conservation of Living Resources and their Ecosystems' and Regulation No. 8 on the utilization of wildlife regulate the management of species within the country, prohibiting the harvest and trade of protected species' (Ministry of Forestry, 1990; President of the Republic of Indonesia, 1999b). The latter also lays down sanctions relating to illegal trade (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017). Through its national legislation project, the CITES Secretariat categorised the national legislation in Indonesia as category 1 legislation that is believed generally to meet the requirements for implementation of CITES.

Trade in specimens of butterfly species included in CITES Appendix II was reportedly only permitted if of captive-bred origin, with harvest of wild specimens restricted to research and educational (including scientific collections in museums) purposes (Peggie, 2011). The CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2017) confirmed that harvest, domestic transport and export of CITES species was strictly controlled, as per Decree of the Minister of Forestry Number 447/Kpts-II/2003. All exports were reported to be verified (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Quota setting: Export quotas and quotas for breeding stocks were reportedly set annually by the Indonesian CITES MA, SA and other stakeholders (AC22 Doc. 13.1), although export quotas for this species do not appear to have been communicated to the CITES Secretariat⁹.

In 2008, quotas to collect specimens from the wild for breeding and/or research purposes were published in Decree SK.06/IV-KKH/2008 for a number of birdwing butterfly species, with 150 individuals *O. rothschildi* from the wild for breeding and/or research purposes and zero quotas published for exports of wild specimens (PHKA, 2008). In 2012, the CITES SA of Indonesia (pers. comm. to UNEP-WCMC 2012a) confirmed that harvest numbers were set annually for all butterflies included in CITES Appendix II, with numbers generally between 200 and 300 individuals per species and restricted for breeding purposes only. The numbers were reported to be set to ensure that harvest was not detrimental to the species and were based on a "rough assessment" of the number of eggs, survival rates and threat to the species (levels of habitat loss and demand) (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2012b).

In 2017, it was reported that harvest quotas were based on annual applications by breeders for parental stocks for the next year; applications were to be submitted to the Provincial Offices of the MA, with all numbers from all 34 Indonesian provinces submitted to the Directorate General of the MA (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2017). The Directorate General of the MA was reported to then seek advice from the CITES SA, with the latter also considering some input from NGOs and other stakeholders, prior to providing their precautionary advice (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2017). In 2017, four butterfly breeders were reported to be registered in Indonesia; breeders are required to be registered and licenced (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017). Based on the information provided by the CITES MA and SA (*in litt.* to UNEP-WCMC, 2017), one facility appears to be PT. Rizky Perdana; this facility seems to be located in Arfak.

The CITES MA and SA (*in litt.* to UNEP-WCMC, 2017) noted that 'ideally, we would have population data on this species to monitor the impact of trade to the wild population'.

Captive-breeding and ranching: Descriptions of the production facilities maintaining birdwing butterflies in Indonesia were provided by the CITES SA of Indonesia in 2012. Specimens were reported to be generally collected from the wild as pupae (for some species as caterpillars) and transferred to enclosures, with some of the emerging adults kept to breed a further four to five generations, until the introduction of new specimens was required to maintain the broodstock (CITES SA of Indonesia, pers.

⁹ The CITES export quotas. Available at: <https://cites.org/eng/resources/quotas/index.php> [Accessed: 27/03/17].

comm. to UNEP-WCMC, 2012b). However, it was noted that some companies may not follow this pattern (CITES SA of Indonesia, pers. comm. to UNEP-WCMC, 2012b). The CITES SA of Indonesia (pers. comm. to UNEP-WCMC, 2012b) pointed out that it may therefore be more appropriate to consider the specimens in trade to be ‘ranched’, although captive breeding was ultimately being aimed for.

In accordance with the definition in Conf. Res. 11.16 (Rev. CoP15), the term ‘ranching’ means the rearing in a controlled environment of animals taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood. Butterfly ranching has been defined as a method “whereby unenclosed habitat patches are enriched with larval food-plants and adult nectar sources and thereby rendered super-attractive, and from where specimens may be harvested by rearing from collected early stages” (New, 1994). Pupa can then be collected and placed in a cage, hatching box, glass house, or shade house, then when it hatches, the butterfly is killed (by injection of boiling water or ethyl acetate), dried in the sun and sold (Hutton, 1985; Ruskin, 1985; Parsons, 1995a; Weintraub, 1995; Small, 2004). However, it is difficult for a farmer to know how many pupae are present on the vines and thus how many should be collected (Hutton, 1985; Ruskin, 1985; Parsons, 1995a; Small, 2004). Captive breeding is more appropriate to cases where all stages of development are enclosed in a controlled environment. Ranched or captive-bred butterflies are, unlike wild-caught ones, undamaged and therefore of higher quality (Parsons, 1995a). Butterflies were reportedly produced through both ranching and captive breeding systems in Indonesia (AC22 Doc. 13.1).

Ranching was considered to reduce the pressure on natural populations (Collins & Morris 1985; Parsons 1995a; Cranston 2010; CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017), producing undamaged specimens for trade, and preventing habitat destruction through creating alternative local incomes (Collins and Morris, 1985; Parsons, 1995a; Cranston, 2010). Nijman (2010) reported that the increased production of butterflies from breeding farms in Southeast Asia had significantly decreased wild harvesting in some countries and the CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2017) believed that sustainable harvest of the species through captive production was possible.

It was reported that the Indonesian CITES SA conducted monitoring visits to the butterfly farms and ranches, and presented suggestions to improve the facilities (AC22 Doc. 13.1).

Slone *et al.* (1997) noted that there was no information available on the benefits of ranching to the population size or extinction probability in the wild. Increased availability of planted *Aristolochia* spp. was also thought to possibly attract a high proportion of females, laying their eggs there rather than in their natural habitats, with the practice potentially resulting in overharvest of the population (Schütz, 2000). In West Papua, it was noted that local populations of butterflies had “apparently” not been affected by ranching operations, and that in some cases, it had helped to reduce the conversion of forests to agriculture (Wells *et al.*, 1999).

No information on monitoring of the offtake for captive production was provided, however, the CITES SA noted that more ‘attention’ was required for birdwing butterflies (pers. comm. to UNEP-WCMC, 2017).

Enforcement: In the 1990s, much of the Indonesian trade in butterfly specimens was considered to be “poorly controlled” (New, 1997). It was noted that partly due to the complicated regulations, butterflies may be illegally harvested from the wild (AC22 Doc. 13.1). The CITES SA of Indonesia (pers. comm. to UNEP-WCMC, 2012a) noted that illegal trade was a major problem, due to a lack of law enforcement, but the CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2017) later noted that annual training was being provided to “field officers and officials of Special Police and Civil Investigator of BKSDA, Customs, Quarantine and State Police” to tackle illegal trade. Furthermore, a Memorandum of Understanding to

support coordination and cooperation between customs and the CITES MA was reported to being formalised (CITES MA of Indonesia, *in litt.* to UNEP-WCMC, 2017).

Reporting: The issue of source code determination for *Ornithoptera* spp. has been discussed by the CITES Scientific Authorities of the EU Member States at meetings of the Scientific Review Group (SRG). The SRG recommends using source code F rather than source code R in cases where not all the criteria of the definition of "captive-breeding" are met as established under Resolution Conf. 10.16 (Rev.) on specimens of animal species bred in captivity. The SRG has concluded that 'ranching' (meaning the rearing in a controlled environment of animals taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood) did not seem to be appropriate for cases for *Ornithoptera* spp. in trade, where wild specimens were being used regularly to supplement captive breeding stock (European Commission, pers. comm. to UNEP-WCMC, 2017.)

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

Trade noted to be difficult to control, particularly as dried butterflies can be sent by post (New & Collins, 1991).

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Hirudo medicinalis & *H. verbana*: Turkey

A. Summary

TURKEY:

H. medicinalis: Categorised as Near Threatened globally. *H. medicinalis* is the northernmost medicinal leech occupying the deciduous arboreal zone from the United Kingdom and southern Norway to the southern Urals and probably as far as the Altai Mountains. Turkey occurs far south of the known geographic range of *H. medicinalis* and does not appear to be a range State following a taxonomic split adopted at CoP15 (March 2010). Turkey has not published export quotas nor reported exports of *H. medicinalis* since 2011, although some importing countries continue to erroneously report imports using this name. On the basis that Turkey is not a range State for the species, categorised as Less concern.

Molecular studies confirm that the medicinal leech occurring in commercial trade from Turkey is *H. verbana*; hence, this species was also assessed.

H. verbana: Occurs from Switzerland and Italy in the west, to Turkey and Uzbekistan, largely corresponding to the Mediterranean and sub-boreal steppe zone. Threatened by loss and deterioration of wetlands, reduction in availability of amphibian and mammalian hosts and localised over-collection. Widespread throughout the wetlands of Turkey, although populations thought to have declined. There are no national population estimates but surveyed wetlands in Eastern Anatolia were estimated to contain over 18.5 million medicinal leeches (equivalent to 24 845 kg). Turkey responded to the consultation relating to the RST. The majority of commercial exports are taken from two wetlands along the Black Sea coast and collection of leeches is prohibited for four months during the reproductive period. All leech collectors require a license and must submit origin certificates for all their products. Turkey published an annual export quota of 2000 kg for *H. verbana* 2014-2017. Exports are primarily in live, wild-sourced specimens, reported by weight and number. Combined exports of *H. medicinalis* and *H. verbana* have declined over the period 2006-2015 and have remained within quota. Annual reports were submitted by Turkey for all years 2006-2015. Available information indicates that a non-detriment finding in accordance with the provisions of Article IV is in place, therefore categorised as Less concern.

RECOMMENDATION:

H. medicinalis:
Less concern

H. verbana:
Less concern

RST Background

Hirudo medicinalis (Northern Medicinal Leech) was selected for the Review of Significant Trade (RST) as a priority species for review (all range States) at the 27th meeting of the Animals Committee, April 2014 (AC27 WG1 Doc. 1, AC27 Summary Record). *H. medicinalis* was identified as a species that met a high volume trade threshold for globally threatened species 2007-2011, as well as in 2012, on the basis of trade data presented in AC27 Doc. 12.5. Responses to the Secretariat's consultation were received from 17 range States at AC28 (AC28 Doc. 9.4 (Rev.2)). Austria, Belarus, Belgium (distribution uncertain), Croatia, Czech Republic, Denmark, Estonia (distribution uncertain), Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Luxemburg (distribution uncertain), Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine and United Kingdom of Great Britain and Northern Ireland were removed from the RST process at AC28 (August, 2015), whilst Turkey (distribution uncertain¹⁰) was retained (AC28 Com. 8, AC28 Summary Record).

At AC12, trade levels from Turkey were reported likely to be having a detrimental impact on the population (AC12 Summary Record).

B. Species characteristics

Taxonomic note: Whilst *H. medicinalis* was once considered to be the only species of medicinal leech in the Western Palearctic, scientific understanding of the taxonomy and distribution of medicinal leeches (*Hirudo* spp.) has changed considerably over recent years (Trontelj and Utevsky, 2005, 2012; Utevsky *et al.*, 2010). The independent status of *Hirudo verbana* was formally re-established by Neesemann and Neubert (1999), and it is now recognised that at least four genetically distinct species (*H. medicinalis*, *H. verbana*, *H. orientalis* and *H. troctina*) occur in Europe and adjacent regions (e.g. Trontelj *et al.*, 2004; Siddall *et al.*, 2007; Trontelj and Utevsky, 2005, 2012; Utevsky *et al.*, 2010).

H. medicinalis [*sensu lato*] was listed in CITES Appendix II on 22nd October 1987, with *H. verbana* being split from *H. medicinalis* and listed in its own right, following adoption of Neesemann and Neubert (1999) as the CITES standard nomenclatural reference at CoP15, March 2010 (CoP15 Doc. 35 (Rev. 3)).

Although often erroneously marketed as *H. medicinalis*, the medicinal leech species most frequently in commercial trade is now known to be *H. verbana* (Kutschera, 2006; Siddall *et al.*, 2007; Trontelj and Utevsky, 2012). *H. verbana* itself is subdivided into an Eastern (southern Ukraine, North Caucasus, Turkey and Uzbekistan) and Western phylogroup (Balkans and Italy), with commercially traded specimens originating from the Eastern phylogroup (Turkey and the Russian Federation) (Trontelj and Utevsky, 2012).

Molecular characterisation of leeches from northern and western Turkey have thus far proved to be *H. verbana* (Trontelj and Utevsky, 2012; Sağlam *et al.*, 2016), as have leeches from commercial facilities known to originate from Turkey (Kutschera, 2006; Trontelj and Utevsky, 2012). Most recently, Sağlam *et al.* (2016) collected 18 individual medicinal leeches from six populations throughout Turkey, leading to the discovery of a new species *Hirudo sulukii* n. sp. in southeastern Turkey that is genetically isolated from the remaining Turkish medicinal leech populations by the Southeastern Taurus mountains.

Biology: Medicinal leeches (*Hirudo* spp.) occur in warm-water ponds, waters that dry up periodically, floodplain pools and small lakes (Elliott and Kutschera, 2011; Utevsky *et al.*, 2010, 2014). They are exoparasites, feeding off the blood of animal hosts (e.g. frogs, cattle and horses) (Elliott and Kutschera,

¹⁰ After consideration of the recent literature, Turkey has been removed from Species+ (www.speciesplus.net) as a possible range State of *H. medicinalis*.

2011; Utevsky *et al.*, 2010, 2014), with tadpoles and juvenile newts reportedly particularly important for young medicinal leeches to feed on (Elliott and Kutschera, 2011). Little was reported to be known about the exact ecological requirements for survival of *H. medicinalis* and *H. verbana* in the wild (Elliott and Kutschera, 2011).

Medicinal leeches (*Hirudo* spp.) are hermaphrodites [they are bisexual, with each mature individual producing both male and female gametes], with mating occurring in summer; sperm can be stored for one to nine months between copulation and cocoon deposition, chiefly in July and August (Elliott and Kutschera, 2011). Under laboratory conditions, adult *H. medicinalis* were found to lay one to seven cocoons with three to 30 eggs per cocoon, producing two broods per year under optimum conditions (Zapkuviene, 1972a, 1972b, in: Elliott and Kutschera, 2011). Whilst there was reported to be little available information from the wild, *H. medicinalis* and *H. verbana* are thought to take at least two years to reach the breeding stage, although slow-growing leeches may not breed until they are three or four years old (Elliott and Kutschera, 2011).

Morphological differences, including distinctive colour patterns, have been described for *H. medicinalis* and *H. verbana* (Nesemann and Neubert, 1999), and Trontelj and Utevsky (2005) stated that the various *Hirudo* species could be “readily identified by their coloration pattern”, despite patterns of individual leeches varying within species. Nevertheless, there has been confusion with their morphological identification (Sağlam *et al.*, 2016), and *H. verbana* is widely recognised as being misidentified in trade as *H. medicinalis* (Kutschera, 2006; Siddall *et al.*, 2007; Trontelj and Utevsky, 2012).

C. Country reviews

Turkey

Distribution: The geographic ranges of the medicinal leeches of the Western Palearctic (*H. medicinalis*, *H. verbana*, *H. orientalis* and *H. troctina*) show little geographic overlap between species, with vast belt-shaped ranges extending from east to west (Utevsky *et al.*, 2010; Trontelj and Utevsky, 2012, Figure 1). *H. medicinalis* is the northernmost species, distributed from southern Norway and Sweden in the north, to Britain [United Kingdom] in the west, the southern Urals and probably as far as the Altai Mountains [Russian Federation] in the east and south to Slovenia and Croatia, occupying the deciduous arboreal zone (Utevsky *et al.*, 2010; Trontelj and Utevsky, 2012). *H. verbana* occurs to the south of *H. medicinalis*, from Switzerland and Italy in the west, to Turkey and Uzbekistan, which largely corresponds to the Mediterranean and sub-boreal steppe zone (Utevsky *et al.*, 2010; Trontelj and Utevsky, 2012).

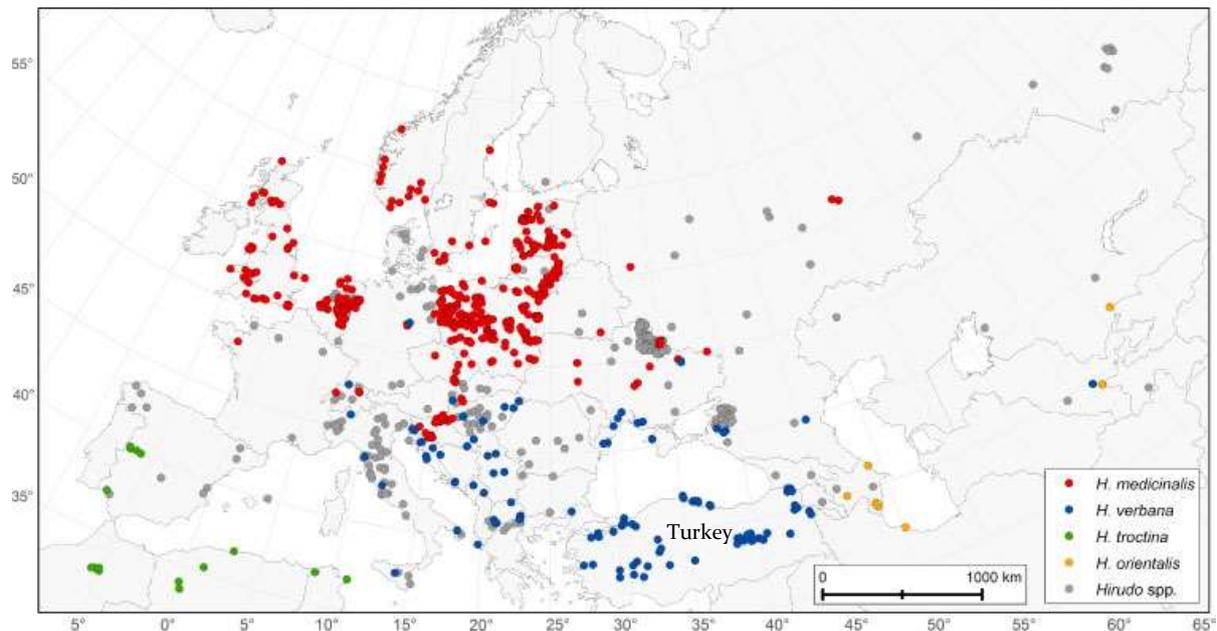


Figure 1. Distribution of *Hirudo* species records in the Western Palearctic. (Records with a low taxonomic reliability were not assigned to species level). (Source: Utevsky *et al.*, 2010).

Recent phylogenetic and phylogeographic studies of *Hirudo* spp. do not consider Turkey a range State for *H. medicinalis* (Utevsky *et al.*, 2010; Trontelj and Utevsky, 2012); Turkey is far south of the species' known geographic range. Furthermore, whilst additional sampling and molecular characterisation of medicinal leeches from Turkey may be desirable, to date, only *H. verbana* and newly-described *H. sulukii* have been identified as occurring in Turkey (Trontelj and Utevsky, 2012; Sağlam *et al.*, 2016). In particular, leeches from the Kizilirmak and Yeşilirmak Deltas on the Black Sea coast [northern Turkey], comprising the majority of leech specimens destined for export, have proven to be to *H. verbana* (Sağlam, 2011; Sağlam *et al.*, 2016), as have leeches from Izmir [western Turkey] and northern Turkey (Trontelj and Utevsky, 2012) and from commercial breeding facilities in the USA, UK and Germany that were known to originate from Turkey (Trontelj and Utevsky, 2012). Trontelj and Utevsky (2005) and Elliot and Kutchera (2011) also considered that recent information on the biology and distribution of '*H. medicinalis*' in Turkey (e.g. Demirsoy *et al.*, 2001; Kasperek *et al.*, 2000) probably pertained to *H. verbana*.

Kasperek *et al.* (2000) reported that *H. medicinalis* [*sensu lato*] was "widely distributed over the country"; they recorded the species in 42 of the 65 wetlands surveyed in the western half of Turkey and concluded that "leeches inhabit practically all suitable habitats in Turkey". The most important areas for leeches were found to be the eastern part of the Kizilirmak Delta [north coast], the Karamik Marshes [western inland], the Yeşilirmak Delta [north coast], the Sultan Marshes [central], Eber Gölü [western inland] and at two sites in Thrace [European Turkey, northwest] - Gala Gölü and Terkos Gölü. Other important areas were the Karagöl Marshes/Sinop [north coast], Işikli Gölü [western inland], Efteni Gölü [northwest], Beyşehir Gölü [southwest], the western part of the Kizilirmak Delta [north coast] and Uluabat (Apoliyont) Gölü [northwest]. *H. medicinalis* [*sensu lato*] was not found in the Çukurova area in southern Turkey (Ağyatan Gölü, Akyatan Gölü, Tarsus wetlands) and it was also not reported from the more western Göksu delta on the Mediterranean coast (Kasperek *et al.*, 1999, 2000).

Sağlam *et al.* (2008) found medicinal leeches in 22 out of 87 wet field sites studied in Eastern Anatolia [eastern Turkey]: 11 sites in the western provinces of Bingöl, Elazığ, Erzincan, Malatya and Tunceli, one isolated site in the province of Bitlis, and 10 sites in the north-eastern provinces of Ağrı, Ardahan, Iğdir and Kars. These were considered to be *H. medicinalis*, based on identification under a microscope

(Sağlam *et al.*, 2008). Leeches did not occur in wetlands of the provinces of Erzurum, Hakkari, Muş and Van (Sağlam *et al.*, 2008).

The CITES Management Authority of Turkey (Ministry of Food, Agriculture and Livestock, *in litt.* to UNEP-WCMC, 2017a) provided a comprehensive list of wetlands throughout Turkey where *H. medicinalis* [*sensu lato*] was reported to occur:

“Çubuk Dam lake and Eymir Lake (Geldiay, 1949), Gölcük Lake (İzmir) (Geldiay and Tareen, 1972). Sırakaraağaçlar River (Sinop) (Bat *et al.*, 2000), Lakes of Abant, Acarlar, Acıgöl, Ağyatan, Akşehir, Akyatan, Arapçiftliği, Bafa, Beyşehir, Bolluk, Borabay, Burdur, Çaltıçak, Çavuşçu, Çöl, Dalyan, Dipsiz, Eber, Efteni, Eğirdir, Gala, Gerede, Gölcük (Bolu), Işıkli, İznik, Karapınar, Kozanlı, Köyceğiz, Küçük Akgöl, Küçük Mangit, Kulu, Ladik, Manyas, Marmara, Mogan, Poyrazlar, Samsam, Sapanca, Sarıkum, Süleymaniye, Terkos, Tersakan, Tuz, Apolyont, Uyuz, Yeniçağa, Deltas of Yeşilirmak River, Büyük Menderes ve Kızılırmak, Hotamış, wetlands of Karagöl (Sinop), Eşmekaya, Sultan ve Ereğli bataklıkları, Karamık, Tarsus (Kasperek *et al.*, 2000), Efteni Lake, Poyrazlar Lake (Demirsoy *et al.*, 2001), Delta of Gediz (İzmir) (Ustaoglu *et al.*, 2003), Yayla Lake (Denizli) (Taşdemir *et al.*, 2004), Gökpinar stream (Denizli) (Duran *et al.*, 2007), Fırınz stream (Kahramanmaraş) (Yıldırım, 2006), Melen Lake (Özbek and Sarı, 2007), Doğubeyazıt reeds (Ağrı), Putka Lake, Eminbey reeds, Armutveren reedsı-1, Armutveren reeds-2, Armutveren reeds-3 (Ardahan), Soğuk Çeşme reeds (Bingöl), Gölbaşı marsh (Bitlis), Beyaz Çeşme marsh, Bahçecik marsh (Elazığ), Subatan marsh, Sülük Lake (Erzincan), Üçkaya Lake (Iğdır), Dellet Marshı, Sülük Lake-1, Sülük Lake-2 (Kars), Ahır Lake (Malatya), Kopuzlar wetland, Palanotu wetland, Büyük Sülük Lake, Küçük Sülük Lake, Sekirek Marshı (Tunceli) (Sağlam *et al.*, 2008).”

They noted that molecular studies had not identified the existence of *H. medicinalis* within Turkish waters and that the medicinal leech species occurring at these sites probably represented *H. verbana* (Ministry of Food, Agriculture and Livestock, *in litt.* to UNEP-WCMC, 2017a). However, they also noted that Turkey’s geographic location at the intersection of Europe, Asia, the Middle East and Africa enriched it’s biodiversity, and that whilst only *H. verbana* and *H. sulukii* had thus far been identified by molecular characterisation, molecular investigations and intense studies indicate that additional species can be found in Turkey (Ministry of Food, Agriculture and Livestock, *in litt.* to UNEP-WCMC, 2017b).

Population status and trends: *H. medicinalis* is categorised as Near Threatened by the IUCN (Utevsky *et al.*, 2014) as neither a reduction in population sizes nor a decline in the geographical range has been detected. Nevertheless, deterioration and loss of wetland habitats and a reduction in amphibian and mammalian hosts (due to the global amphibian decline and abandonment of traditional grazing practices) was noted to have likely affected populations and geographic ranges, but to have remained unnoticed due to lack of field research and/or taxonomic expertise (Utevsky *et al.*, 2014).

Utevsky *et al.* (2010) also proposed the global threat category of Near Threatened for *H. verbana*, although the species has not yet been officially assessed by the IUCN. *H. medicinalis* and *H. verbana* were both reported to occur “throughout their vast ranges where favourable habitats are available”, although it was acknowledged that they could be “endangered locally by collecting pressure” (Utevsky *et al.*, 2010).

H. medicinalis was reported to have been once abundant in Europe (Elliott and Kutschera, 2011), although over-collection for medicinal purposes throughout the 19th century, together with recent collection pressure and general loss and pollution of European wetlands, were reported to have caused dramatic population declines throughout its geographic range (Trontelj and Utevsky, 2005; Siddall *et al.*, 2007). *H. medicinalis* is now extinct from Ireland and considered threatened in at least 15 countries (Elliott and Kutschera, 2011).

Within Turkey, Kasperek *et al.* (2000) reported that *H. medicinalis* [*sensu lato*] was not rare. Kasperek *et al.* (1999; 2000) reported on a study carried out 1997–1999 evaluating the status of *H. medicinalis* [*sensu lato*] throughout the major wetlands of western Turkey. Population density (indicated by the number of leeches collected by a single collector per hour) was found to vary considerably between wetlands, with highest densities recorded at Karagöl Marshes (1830 leeches/hr/person), at Sarıköy in the Kizilirmak Delta (1240 leeches/hr/person) and in the Karamik Marshes (862 leeches/hr/person) (Kasperek *et al.*, 2000). It was estimated that potential leech habitat in the surveyed wetlands of western Turkey covered approximately 65–67 000 ha (Kasperek *et al.*, 2000). Kasperek *et al.* (1999) determined leech density to be 0.63/m² in 1997 and 0.69/m² in 1998, in a 1400 m² area of Efteni Gölü [northwestern Turkey], and at another location where the animals could move more freely in and out of the study area (thus perhaps recolonising after offtake), a density of 3.16/m² was found over a surface area of 1250 m².

In their study of medicinal leeches in Eastern Anatolia [eastern Turkey], Sağlam *et al.* (2008) found the density of leeches to vary from 0.2/m² in Doğubeyazit Marsh to 124/m² in Beyaz Çeşme Marsh (Elaziğ Province). Sağlam *et al.* (2008) suggested that the high leech density found at some sites might be due to the absence of previous commercial collection. They estimated that in the surveyed wetlands of Eastern Anatolia which were found to contain leeches, 18 517 728 medicinal leeches (equivalent to 24 845 kg) could be obtained per year, with the greatest numbers coming from the vast Doğubeyazit Marsh near the eastern border, which accounted for 8750 ha of the 8785 ha of available habitat (Sağlam *et al.*, 2008).

Threats: Elliot and Kutschera (2011) considered that the major factor in the decline of *H. medicinalis* and *H. verbana* was “the general loss of wetlands, especially eutrophic ponds and marshes throughout Europe, and the isolation of the remaining ponds by changes in land use”. *Hirudo* spp. were also reported to be threatened locally by collection pressure, as well as threatened by the global decline of amphibians (as hosts) and abandonment of traditional grazing practices, leading to a scarcity of mammalian blood (e.g. cattle and horses) in leech diets (Utevsky *et al.*, 2010, 2014; Elliott and Kutschera, 2011).

Medicinal leeches [*H. medicinalis* and related species] have been used for phlebotomy (blood-letting) for centuries, they are used for a wide variety of medical purposes including the production of pharmaceutical remedies, and they are also used as a model organism in neurobiology (Elliott and Kutschera, 2011; Utevsky *et al.*, 2014; Sağlam *et al.*, 2016). The saliva of *H. medicinalis* contains hirudin, a powerful natural anti-coagulant (Elliott and Kutschera, 2011).

Turkey is one of the major exporters of medicinal leeches worldwide, primarily *H. verbana* (Sağlam, 2011; Sağlam *et al.*, 2016). Ninety per cent of all leeches for export were reportedly collected from the Kizilirmak Delta and Yeşilirmak Delta in the Black Sea region (Kasperek *et al.*, 2000), which are known to be *H. verbana* (Sağlam, 2011; Trontelj and Utevsky, 2012; Sağlam *et al.*, 2016). In 2000, Kasperek *et al.* (2000) reported that leeches from the Karamik Marshes were only occasionally collected, with other significant leech populations not used for commercial collection, at least on a regular basis.

Demirsoy *et al.* (2001) considered medicinal leeches to be threatened by over-collection, noting the large numbers collected annually in Turkey. Kasperek *et al.* (2000) considered that commercial exploitation was taking place at only a few places and did not appear to be affecting the population seriously. However, Sağlam (2011) noted that only around 38 percent of Turkey’s annual export quota was used in 2008, with leech exports decreasing year on year, indicating a decline in wild populations. Sağlam *et al.* (2008) also cautioned that exporting frozen leeches could pose a greater threat, in that leeches could be collected and stored in forbidden periods of the year, during the breeding season.

The Ministry of Food, Agriculture and Livestock (*in litt.* to UNEP-WCMC, 2017a) reported that the main threats to *Hirudo* spp. within Turkey were: the drying of wetlands for agricultural conversion or to

combat mosquitoes and other parasites; pesticides from agricultural runoff; the negative effect of global climate change and the use of medicinal leeches for treatment in clinics and hospitals in Turkey. Traditional and complementary medical practice regulations issued by the Ministry of Health in 2014 were reported to have greatly increased the use of medicinal leech within country, leading to a decline in exports.

Trade: *H. medicinalis* [sensu lato] was listed in CITES Appendix II on 22nd October 1987, with *H. verbana* being split from *H. medicinalis* and listed in its own right, at CoP15, (March 2010).

All CITES annual reports have been submitted by Turkey for the period 2006-2015. Turkey published exports quotas for wild-sourced live or frozen *H. medicinalis* by weight 2006-2011 and *H. verbana* 2011-2017. Records of trade in *H. medicinalis* and *H. verbana* appear to have been used interchangeably for trade from Turkey 2006-2015. When considering both *H. medicinalis* and *H. verbana* combined, it does not appear that trade exceeded quota values set by Turkey for the period 2006-2015 (Table 1). Whilst quotas have been published by weight, trade in *Hirudo* species was also reported by number, by both Turkey and importers. Based on an estimated average leech weight of 1.9 g (Sağlam *et al.*, 2008), when trade reported by both weight and number is combined, it appears that trade levels were still well within published export quotas (with approximately an additional 2.5 kg of wild leeches reported by Turkey and 167 kg of wild leeches reported by importers during the 10 year period 2006-2015).

Table 1: CITES export quotas for live or frozen, wild *H. medicinalis* and *H. verbana* from Turkey, 2006-2017 and global direct exports of live leeches and bodies (kg) as reported by countries of import and Turkey, 2006-2015. Turkey has submitted all annual reports 2006-2015. Quantities rounded to whole numbers where applicable.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Quota: <i>H. medicinalis</i> (kg)	6000	6000	6000	6000	6000	2000	-	-	-	-	-	-
Reported by importer	3128	4839	1820	1677	1287	200	250					
Reported by Turkey	4842	4373	3054	9	1601	222						
Quota: <i>H. verbana</i> (kg)	-	-	-	-	-	3000	4000	3000	2000	2000	2000	2000
Reported by importer						236	608	468	103	366		
Reported by Turkey						263	964	511	161	362		

According to data in the CITES Trade Database, all exports of *Hirudo* species reported by Turkey comprised *H. medicinalis* for the period 2006-2010 and *H. verbana* for 2012-2015. Turkey reported exports of both *H. medicinalis* and *H. verbana* in 2011. Importing countries continued to report direct trade in *H. medicinalis* from Turkey up to 2015. A permit analyses identified a number of cases where the same export permit number was reported in trade for *H. verbana* by Turkey and *H. medicinalis* by the importer.

Direct trade in *Hirudo* species reported by Turkey predominantly comprised live, wild-sourced leeches and bodies reported by weight and number for commercial purposes (Table 2). Importers also reported high levels of trade in live leeches by number, the majority of which were wild-sourced for either commercial or medicinal purposes. When considering both *H. medicinalis* and *H. verbana* combined, direct exports of leeches from Turkey reported by weight declined over the period 2006-2015.

Indirect trade in *Hirudo* species originating in Turkey primarily comprised high levels of live, wild-sourced leeches reported by number, for commercial purposes (Table 3). Indirect trade 2006-2010 was reported solely as *H. medicinalis* while for the period 2012-2015 all indirect trade was reported as *H. verbana*. Both species of *Hirudo* were reported in indirect trade in 2011.

Table 2: Direct exports of *Hirudo* species from Turkey, 2006-2015. Turkey has submitted all annual reports 2006-2015. Quantities rounded to whole numbers where applicable.

Taxon	Term	Unit	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total		
<i>Hirudo medicinalis</i>	bodies	kg	T	W	Importer	1337	3618	659	388							6002		
					Exporter	2965	2882	780									6627	
		-	T	W	Importer		199		221								420	
					Exporter				100								100	
	live	kg	S	W	Importer		50	50									100	
					Exporter		50	50									100	
				T	W	Importer	1791	1170	1111	1289	1287	200	250				7098	
						Exporter	1877	1441	2224	9	1601	222						7374
			-			Importer		1										1
						Exporter												
		-	M	W	Importer						4000	4000	3000	4000	6000	21000		
					Exporter													
			T	C	Importer						1000						1000	
					Exporter													
				Importer				4507	18900	8575	5503	6309				43794		
				Exporter						1241								1241
<i>Hirudo verbana</i>	bodies	kg	M	W	Importer										24	24		
					Exporter													
	live	kg	T	W	Importer					236	608	468	103	342	1757			
					Exporter					263	964	511	161	362	2261			
		-	M	W	Importer							1500	4		1504			
					Exporter													
		T	W	Importer					1000	8030	5700	6505			21235			
				Exporter														
meat	kg	T	W	Importer														
				Exporter												24	24	

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 03/04/2017

Table 3: Indirect exports of *Hirudo* species originating in Turkey, 2006-2015. Quantities rounded to whole numbers, where applicable.

Taxon	Term	Unit	Purpose	Source	Reported by	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total					
<i>Hirudo medicinalis</i>	live	kg	T	R	Importer					20						20					
					Exporter																
					W	Importer	5	8												13	
						Exporter	11	6		2										19	
					-	T	C	Importer							1030						1030
								Exporter													
<i>Hirudo verbana</i>	live	-	M	W	Importer																
					Exporter																
					T	Importer									240		300		600	1140	
						Exporter															
					T	W	Importer									5150	5150	18870	23250	19691	72111
							Exporter									10310	6180	19170	23670	21320	80650

Source: CITES Trade Database, UNEP-WCMC, Cambridge, UK, downloaded on 03/04/2017

Management: Turkey became a Party to CITES in 1996. Medicinal leech populations were reported to be monitored and controlled by the relevant Provincial Directorates of the Ministry of Food, Agriculture and Livestock within the framework of legal regulations (Ministry of Food, Agriculture and Livestock, *in litt.* to UNEP-WCMC, 2017a). Restrictions and prohibitions on fisheries hunting include the requirement for 'frogs, leeches and black snails' to have a Special Product Origin Certificate and prohibition of the hunting of leeches between 1 March and 30 June (Ministry of Food, Agriculture and Livestock, 2016). This four month hunting ban during the reproductive period was reported to be aimed at the management and protection of leeches, in addition to production of an annual export quota (The Ministry of Food, Agriculture and Livestock, *in litt.* to UNEP-WCMC, 2017a). In addition, all leech collectors were reported to require a license for collection, and origin certificates must be submitted to the Ministry of Food, Agriculture and Livestock for entry into the Fisheries Information System, enabling the export quota of 2000 kg to be maintained (Ministry of Food, Agriculture and Livestock, *in litt.* to UNEP-WCMC, 2017b). Whilst there is no comprehensive monitoring programme for *H. verbana*, there were reported to be some observations at collection sites and some ongoing scientific studies (Ministry of Food, Agriculture and Livestock, *in litt.* to UNEP-WCMC, 2017b).

The Ministry of Food, Agriculture and Livestock (*in litt.* to UNEP-WCMC, 2017a) reported that whilst the 2014 regulation on traditional and complementary medical applications (Ministry of Health, 2014) stated that leeches used for medicinal use should be taken from leech farms, wild specimens were also being used.

Turkey's legislation is categorised as category 1 within the CITES National Legislation Project, meaning that it is believed generally to meet the requirements for implementation of CITES.

D. Problems identified that are not related to the implementation of Article IV, paras 2(a), 3 or 6(a).

Whilst recent phylogenetic studies indicate that *H. medicinalis* does not occur in Turkey, and that the medicinal leech species harvested for export is actually *H. verbana* (see above), some importing countries continue to erroneously report exports from Turkey as *H. medicinalis*. This may in part be due to national legislation in importing countries not taking into account new taxonomic findings and only addressing *H. medicinalis*.

Morphological differences between *H. medicinalis* and *H. verbana* are described in the CITES standard reference (Nesemann and Neubert, 1999) and elsewhere, nevertheless, there may be lookalike issues in the correct identification of species in trade.

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