CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Twenty-seventh meeting of the Animals Committee
Veracruz (Mexico), 28 April – 3 May 2014

Interpretation and implementation of the Convention

Compliance and enforcement

Review of Significant Trade in specimens of Appendix-II species
[Resolution Conf. 12.8 (Rev. CoP13)]

SPECIES SELECTED FOLLOWING COP15

1. This document has been prepared by the Secretariat.

2. At its 25th meeting (AC25, Geneva, 2011) and following the 15th meeting of the Conference of the Parties (CoP15, Doha, 2010), the Animals Committee selected 24 taxa for the Review of Significant Trade in compliance with paragraph a) and b) of Resolution Conf. 12.8 (Rev. CoP13) on *Review of Significant Trade in specimens of Appendix-II species.* (see documents AC25 Doc. 9.3 and AC25 Doc. 9.6).

3. At its 26th meeting (AC26, Geneva, 2012), the Committee reviewed the available information on these taxa in accordance with paragraph f) of Resolution Conf. 12.8 (Rev. CoP13). In instances where the Committee was satisfied that Article IV, paragraph 2 (a), 3 or 6 (a), was correctly implemented, it eliminated the species from the review with respect to the range State concerned, and these range States were notified accordingly by the Secretariat (see document AC26 Doc.12.3 and the summary record of AC26).

4. At AC26, the Committee also agreed that prior to the compilation of information called for in paragraph g), range States that had been kept in the process due to a lack of response but where no commercial trade had been recorded over the most recent 10 years, would be removed from the process in consultation with the Animals Committee. The taxa and range States that were thus retained in the review are shown in the table below.

Taxa selected following CoP15 and retained in the review after AC26

Taxon selected	Range State
Macaca fascicularis	Cambodia; India, Indonesia, Lao People's Democratic Republic, Mauritius, Palau, Philippines, Viet Nam
Psittacus erithacus	Benin, Central African Republic, Ghana, Nigeria, Togo, Uganda
Chamaeleo gracilis	Benin, Cameroon, Ghana, Guinea, Togo, Uganda
Chamaeleo senegalensis	Benin, Ghana, Guinea, Mali, Senegal, Sierra Leone
Trioceros melleri	Mozambique
Trioceros quadricornis	Cameroon, Nigeria
Kinyongia fischeri	United Republic of Tanzania
Kinyongia tavetana	United Republic of Tanzania
Ptyas mucosus	Cambodia, Lao People's Democratic Republic

Taxon selected	Range State
Naja sputatrix	Indonesia
Python reticulatus	Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Philippines, Singapore, Viet Nam
Podocnemis unifilis	Brazil, Ecuador, Peru, Suriname, Venezuela (Bolivarian Republic of)
Kinixys homeana	Benin, Cote d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Togo
Hippocampus algiricus	Guinea, Senegal
Hippocampus barbouri	Philippines
Hippocampus histrix	Egypt, Philippines, Viet Nam
Hippocampus trimaculatus	Singapore, Thailand, Viet Nam
Antipatharia spp.	Bahamas, Cuba, Democratic People's Republic of Korea, Dominican Republic, Fiji, Panama, Papua New Guinea, Philippines, Taiwan (Province of China), Vanuatu
Catalaphyllia jardinei	Fiji
Euphyllia cristata	Fiji, Solomon Islands, Vanuatu, Viet Nam
Plerogyra simplex	Fiji, Solomon Islands
Plerogyra sinuosa	Fiji, Marshall Islands, Palau, Singapore, Solomon Islands, Vanuatu
Trachyphyllia geoffroyi	Singapore, Solomon Islands

5. In accordance with paragraph g) of the Resolution, the Secretariat proceeded with the compilation of information regarding the species mentioned in the table above. The UNEP World Conservation Monitoring Centre (UNEP-WCMC) was engaged to compile information about the biology and management of and trade in these species, and to provide a preliminary categorization of the species in compliance with paragraphs h) and i). The Secretariat transmitted the resulting reports from UNEP-WCMC to relevant range States on 13 and 19 December 2013, which had 60 days to submit comments in accordance with paragraph j).

6. The species reports of UNEP-WCMC present conclusions about the effects of international trade on the selected species, the basis on which such conclusions are made, and problems with the implementation of Article IV of the Convention. They provide preliminary categorizations of each species into one of the three categories outlined in paragraph i) of Resolution Conf. 12.8 (Rev. CoP13), namely:

    i) 'species of urgent concern' shall include species for which the available information indicates that the provisions of Article IV, paragraph 2 (a), 3 or 6 (a) of the Convention are not being implemented;

    ii) 'species of possible concern' shall include species for which it is not clear whether or not these provisions are being implemented; and

    iii) 'species of least concern' shall include species for which the available information appears to indicate that these provisions are being met.

7. The UNEP-WCMC reports are attached in Annex 1 to this document. The comments from range States that had been received by the Secretariat at the time of writing this document (February 2014) are presented in annexes 2 to 10. They were provided by Brazil, Cambodia, the Democratic Republic of the Congo, Indonesia, Malaysia, Senegal, Thailand, Uganda, and Viet Nam.

Recommendations

8. In accordance with paragraphs k) and l) of Resolution Conf. 12.8 (Rev. CoP13), the Animals Committee is invited to:

    a) review the reports in the Annex to the present document and the responses received from range States and, if appropriate, revise the preliminary categorizations proposed by UNEP-WCMC; and

b) refer problems that are not related to the implementation of Article IV, paragraph 2 (a), 3 or 6 (a), to the Secretariat.

9. In accordance with paragraphs m) to o), the Animals Committee must formulate recommendations for species of urgent concern and of possible concern with deadlines for their implementation. Such recommendations should differentiate between short-term and long-term actions, and be directed to the range States concerned. Species of least concern shall be eliminated from the review.

Review of Significant Trade: Species selected by the CITES Animals Committee following CoP15 and retained in the review following AC26

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ABOUT UNEP-WORLD CONSERVATION MONITORING CENTRE

The UNEP World Conservation Monitoring Centre (UNEP-WCMC), based in Cambridge, UK, is the specialist biodiversity information and assessment centre of the United Nations Environment Programme (UNEP), run cooperatively with WCMC, a UK charity. The Centre's mission is to evaluate and highlight the many values of biodiversity and put authoritative biodiversity knowledge at the centre of decision-making. Through the analysis and synthesis of global biodiversity knowledge the Centre provides authoritative, strategic and timely information for Conventions, countries and organisations to use in the development and implementation of their policies and decisions.

The **UNEP-WCMC** provides objective and scientifically rigorous procedures and services. These include ecosystem assessments, support for the implementation of environmental agreements, global and regional biodiversity information, research on threats and impacts, and the development of future scenarios.

CITATION

UNEP-WCMC (2013). *Review of Significant Trade: Species selected by the CITES Animals Committee following CoP15 and retained in the review following AC26*.

PREPARED FOR

CITES Secretariat, Geneva, Switzerland.

DISCLAIMER

Contents

Introduction

The provisional categorisation for each species sheet follows the criteria outlined in Resolution 12.8 (Rev. CoP13) as follows:

> i) 'species of urgent concern' shall include species for which the available information indicates that the provisions of Article IV, paragraph 2 (a), 3 or 6 (a), are not being implemented;
> ii) 'species of possible concern' shall include species for which it is not clear whether or not these provisions are being implemented; and
> iii) 'species of least concern' shall include species for which the available information appears to indicate that these provisions are being met;

The categorisations take into consideration that, in accordance with Article VII (paragraph 5), specimens of animals bred in captivity are exempt from the provisions of Article IV. Specimens of sources F, R and W, however, require the making of non-detriment findings under Article IV and therefore are subject to the Review of Significant Trade.

Trade data was downloaded from the CITES Trade Database on 13th May 2013. Trade data in CITES annual reports received from range States after this date at the time of writing have also been incorporated (downloaded 4th September 2013). Trade data was downloaded for all years 2002-2012; however, since the deadline for submission for 2012 annual reports is 31st October 2013, annual reports for 2012 have not yet been received from many Parties. The trade sections within each species review include details of the annual reports submitted by each range State over the period 2002-2012.

The CITES Management and Scientific Authorities (or non-Party equivalents) for each range State were contacted by post and, where possible, by email in January/February 2013. Authorities were asked to provide information on conservation status, trade and management of each taxon, including the basis for making non-detriment findings. Where possible, national experts were also contacted to provide additional country-specific information.

Macaca fascicularis (Raffles, 1821): Cambodia, India, Indonesia, Lao People's Democratic Republic, Mauritius, Palau, Philippines, Viet Nam

Cercopithecidae, Long-tailed Macaque, Crab-eating Macaque

Selection for Review of Significant Trade

Macaca fascicularis was selected as a priority species for review as (all range States) at the 25th meeting of the Animals Committee (AC25 Summary Record), based on concerns regarding the i) large and rapidly increasing international trade, ii) lack of population data as a scientific basis for making non-detriment findings, iii) unrealistic trapping quotas and the failure to enforce them, iv) failure to include the impact of additional threats when making non-detriment findings, v) inconsistency and uncertainty about source codes, and vi) lack of self-sustaining colonies in captive breeding establishments (SSN, 2011). In both 2008 and 2009, *M. fascicularis* was identified as a species that met a high volume trade threshold (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from the People's Republic of China (hereafter referred to as China), Indonesia, Malaysia and Myanmar (AC26 Doc. 12.3). Bangladesh, Brunei Darussalam, Cambodia, India, Indonesia, Lao People's Democratic Republic (hereafter referred to as Lao PDR), Mauritius, Palau, Philippines, Singapore and Viet Nam were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Bangladesh, Brunei Darussalam and Singapore were removed from the process on the basis of no commercial trade over the most recent 10 years with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Macaca fascicularis* recommendations.

		General summary
		Widespread with several introduced populations. Categorised as Least Concern in the IUCN Red List (with some subspecies categorised as Data Deficient, Near Threatened or Vulnerable). Population decline reported in many areas, and international trade for biomedical research considered to be a key threat.
Range State	**Provisional category**	**Summary**
Cambodia	Possible Concern	Very high levels of international trade in 2002-2012 mainly in live specimens of sources C and F. Appears widespread in the country, however with unknown population size and ongoing decline. Capture for export considered as a main threat. Basis for making a non-detriment finding is unclear, therefore categorised as Possible Concern; questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
India	Least Concern	No international trade reported 2002-2011. Endemic subspecies *M. f. umbrosa* is restricted to the Nicobar Islands and is categorised as Vulnerable in the IUCN Red List due to the impacts of the 2004 tsunami, however surveys indicate recent population recovery. On the basis of no international trade, categorised as Least Concern.
Indonesia	Least Concern	High levels of international trade 2002-2011 mainly in source F live animals; trade declined since 2009. The export of wild-sourced individuals is prohibited, and no trade was reported in live, wild individuals since 2003 although exports of wild-sourced scientific specimens were reported. Widespread and considered locally abundant, therefore categorised as Least Concern although questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.

Lao People's Democratic Republic	Urgent Concern	Relatively high levels of international trade 2004-2011, including captive-bred (source C), wild and ranched specimens. Capture for trade considered a significant threat. Concern was raised over possible illegal trade. Occurs in southern Lao PDR. With an estimated population size of 3000-5000 individuals, considered potentially threatened. On the basis of high levels of trade and small population size, categorised as Urgent Concern; questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
Mauritius	Least Concern	Moderate levels of international exports 2002-2011, mainly source F, but introduced and considered invasive. Eradication efforts ongoing. Therefore, categorised as Least Concern.
Palau	Least Concern	Only one specimen reported in trade 2002-2011. Introduced and considered invasive, and therefore categorised as Least Concern.
Philippines	Least Concern	Moderate levels of international trade reported 2002-2011, virtually all in captive-bred live animals and specimens. Capture for export considered a threat. Hunting and collection is prohibited, excluding authorised capture for breeding or scientific purposes. Widespread and locally common but with a decreasing population trend. On the basis of virtually no trade in wild-sourced individuals, categorised as Least Concern although questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
Viet Nam	Least Concern	Very high level of exports 2002-2011 mainly in captive-bred individuals. Concern was raised over possible illegal trade. Export of wild-sourced individuals is prohibited. Locally common and considered Lower Risk nationally. Therefore, categorised as Least Concern although questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.

B. Species overview

Taxonomic note: Fooden (1995) reported that that up to 50 specific and subspecific names had been associated with *M. fascicularis,* which was considered a morphologically and genetically variable species. Wilson and Reeder (2005) (CITES Standard Reference) regarded *M. fascicularis* as a species group consisting of *M. fascicularis*, *M. irus* and *M. cynomolgos*. Fooden (2006) considered the group to include *M. fascicularis*, *M. mulatta* and *M. fuscata*, and Mittermeier *et al.* (2013) also included *M. cyclopis*. The species is known to hybridize with other *Macaca* spp. (Mittermeier *et al.*, 2013). Two genetically distinct forms (insular and mainland Southeast Asia) were identified by Gumert (2011).

Wilson and Reeder (2005) recognised the following subspecies: *M. f. aureus*, *M. f. atriceps*, *M. f. condorensis*, *M. f. fuscus, M. f. karimondjawae*, *M. f. lasiae, M. f. philippinensis*, *M. f. tua* and *M. f. umbrosus*.

Biology: *M. fascicularis* is a primarily arboreal primate (Bonadio, 2000) that occurs in various habitat types, including forests, coastal regions, forest edge habitats, grasslands and riparian sites, and is often found in human-modified habitats such as plantations, agricultural land, human settlements and recreation parks (Bonadio, 2000; Kemp, 2007; Fuentes *et al.*, 2011; Gumert, 2011; Mittermeier *et al.*, 2013).

M. fascicularis forms troops of approximately 10-85 individuals (Sussman *et al.*, 2011). Females reach sexual maturity at approximately four years (Thomson, 2008), and males at six (Bonadio, 2000). It typically gives birth to a single offspring at any time of the year (Kemp, 2007; Southwick and Siddiqi, 2011), although there is a birth peak during the rainy season (Bonadio, 2000). The gestation period is 160-168 days (Mittermeier *et al.*, 2013) and individual females may give birth every one or two years (Kemp and Burnett, 2003). The

average life span was estimated to be 25 years in the wild and up to 37 years in captivity (Kemp, 2007).

General distribution and status: *M. fascicularis* was described as widespread (Ong and Richardson, 2008; Gumert, 2011)**,** with its range reaching from Bangladesh and Myanmar in the north to Malaysia and the Indonesian archipelago in the south, and from the Nicobar Islands in the west to the Philippines and Timor in the east (Wolfheim, 1983; Fooden, 1995; Bonadio, 2000) (Figure 1)**.** Based on the limits of natural range area by Ong and Richardson (2008), DPIPWE (2011) estimated the natural range to cover approximately 2.4 million km^2. In addition, introduced populations were reported in Mauritius, Hong Kong SAR, Palau, Tinjil island and Papua in Indonesia (Kemp, 2007; Gumert, 2011), and possibly Sulawesi (Gumert, 2011); Shek (2011) regarded the Hong Kong SAR populations as reintroduced after extirpation. The total introduced range was estimated to be approximately 466 000 km^2 (DPIPWE, 2011).

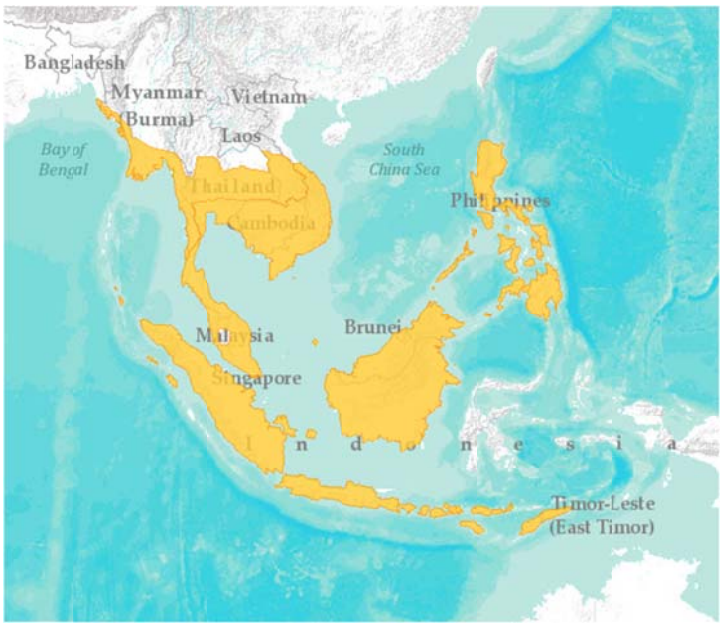

Figure 1. Distribution of *Macaca fascicularis* (Source: Ong and Richardson, 2008).

The current population size of *M. fascicularis* was considered to be poorly known (Cawthon Lang, 2006; Gumert, 2011). The species was described variously as "often abundant" (Ong and Richardson, 2008), "widespread but rapidly declining" (Eudey, 2008), and a common but locally depleted species (Foley and Shepherd, 2011).

M. fascicularis was categorised as Least Concern in the IUCN Red List, based on its "wide distribution, presumed large population, tolerance of a broad range of habitats, occurrence in a number of protected areas, and because it is unlikely to be declining at nearly the rate required to qualify for listing in a threatened category" (Ong and Richardson, 2008). *M. f. condorensis* was categorised as Vulnerable with the justification "population is estimated at less than a 1000 individuals in total (including mature individuals). Although the range of this subspecies is very limited, the island on which it lives is a national park, and there are no obvious threats that would lead it to decline very quickly" (Ong and Richardson, 2008). *M. f. umbrosus* was also categorised as Vulnerable, based on the likely negative impacts of the December 2004 tsunami and the potential impacts of habitat loss and hunting (Ong and Richardson, 2008). *M. f. philippensis* was categorised as Near Threatened based on "some declines due to hunting and habitat loss" (Ong and Richardson, 2008). The rest of the subspecies (*M. f. atriceps, M. f. aureus, M. f. fuscus, M. f. karimondjawae, M. f. lasiae* and *M. f. tua*) were categorised as Data Deficient based on a lack of information on population status and threats (Ong and Richardson, 2008); however, *M. f. aureus* (as *M. f. aurea*) was categorised as Critically Endangered in an assessment of South Asian

primate species by Molur *et al.* (2003), and Gumert *et al.* (2011) noted that "it is not unlikely that most of the data deficient forms are also in need of some level of conservation support". All subspecies were considered to have a decreasing population trend (Ong and Richardson, 2008).

Gumert (2011) reported a population decline of 40 per cent in approximately 25 years, based on population estimates by Fooden (1995; 2006). Most declines were reported to occur within natural environments, whereas populations inhabiting human-modified environments were increasing in many areas (Gumert, 2011). Eudey (2008, 2009b) called for a reassessment of the current Red List status due to the rapid decline of the species.

Threats: *M. fascicularis* was reported to be "heavily traded" (Foley and Shepherd, 2011), as one of the main primate species used in biomedical research (Eudey, 2008; Gumert, 2011; Sussman *et al.*, 2011). Foley and Shepherd (2011) considered global export data during 2004-2008 to indicate "extremely unsustainable" trade levels. Illegal trade was considered common (TRAFFIC and IUCN/SSC Wildlife Trade Programme, 2004; Foley and Shepherd, 2011; SSN, 2011;).

Domestic trade was considered to pose a significant threat in some range countries (SSN, 2011). *M. fascicularis* was reported to be "occasionally" hunted for food within its native range (Kemp, 2007), and frequently taken as a pet but abandoned after becoming sexually mature (Gumert, 2011). Ong and Richardson (2008) regarded hunting as the main threat, but did not consider it as a significant threat to the species overall.

Habitat loss was considered to form an additional threat (Wolfheim, 1983; Bonadio, 2000; Eudey, 2008), although *M. fascicularis* was considered to be relatively tolerant to habitat change (Ong and Richardson, 2008).

Overview of trade and management: *M. fascicularis* was listed in CITES Appendix II on 04/02/1977. The species was included in the CITES Review of Significant Trade in 1993, when it was concluded that the level of trade was unlikely to have an adverse affect on the populations overall (WCMC *et al.*, 1993). It was also identified as a possible candidate for review in 2004, but excluded as a species "for which the primary issues of concern appear to be other than Article IV implementation" (TRAFFIC and IUCN/SSC Wildlife Trade Programme, 2004).

M. fascicularis is bred in captivity in several countries, mainly for laboratory testing (Jiang *et al.*, 2007; Thomson, 2008). Kemp and Burnett (2003) noted that the availability of "captive-bred" specimens has reduced the demand on wild specimens.

As an introduced species, *M. fascicularis* was classified as one of the "100 of the world's worst invasive alien species" (Lowe *et al.*, 2004). It was considered to be a threat to local wildlife, a crop-raider and nuisance animal (Kemp, 2007; DPIPWE, 2011; Gumert, 2011;), causing population extirpations in some areas (Mi San and Hamada, 2011). It was reported to be controlled through trapping, relocation, culling and sterilization within and outside its native range (Jones-Engel *et al.*, 2011).

C. Country reviews

CAMBODIA

Distribution in range State: Occurrence in Cambodia was confirmed (Brandon-Jones *et al.*, 2004; Kemp, 2007; Ong and Richardson, 2008). Walston *et al.* (2001), Rawson (2010) and Gumert (2011) considered *M. fascicularis* to occur throughout Cambodia, but Wolfheim (1983) considered it absent in northern Cambodia. Campbell *et al.* (2006) recorded the species in the swamp forests of the Tonlé Sap Great Lake (central Cambodia). The CITES

Management Authority of Cambodia (*in litt.* to UNEP-WCMC, 2013) reported occurrence in the western zone of Cambodia (provinces of Koh Kong, Kam Pot, Kampong Speu and Po Sat), Tonlé Sap, and northern and eastern Cambodia.

Population trends and status: Based on surveys conducted on the Mekong river in northeast Cambodia during 2006-2007, Timmins (2008) considered *M. fascicularis* to be "probably in rapid decline" and under the risk of extirpation. The CITES MA of Cambodia (*in litt.* to UNEP-WCMC, 2013) reported densities of 67 individuals/km^2 in the western zone, 29 individuals per km^2 in the Tonlé Sap area, and 22 individuals/km^2 in northern and eastern Cambodia, based on surveys conducted in 2007 by the Department of Wildlife and Biodiversity of Forestry Administration. The surveys revealed that the species had been locally extirpated in some areas (CITES MA of Cambodia, *in litt.* to UNEP-WCMC, 2013). Lee (2011) conducted a one-month survey in northeastern Cambodia in 2008, recording no individuals in suitable habitats or in the markets, and concluded that the species was not common. Eudey (2009b) reported population declines, and Gumert (2011) considered the Cambodian populations to be "disappearing".

Threats: Trade for biomedical research purposes was considered to be the main threat to Cambodian populations (Eudey, 2008; SSN, 2011). Large-scale trapping for exports to China and Viet Nam reportedly started in 2006 (Pollard *et al.*, 2007), particularly affecting the populations close to human settlements (Lee, 2011). Ong and Richardson (2008) reported that females were captured for breeding facilities, whereas wild-caught males were directly exported as laboratory animals. Campbell *et al.* (2006) and BUAV (2008) reported large numbers being trapped in the wild within Tonlé Sap and Kratie Provinces, for breeding facilities in Cambodia and Viet Nam. Timmins (2008) regarded hunting for trade as the main cause of population decline in the Mekong river area in northeast Cambodia.

Additional threats were considered to include exploitation for traditional medicine, habitat loss (SSN, 2011) and capture for the domestic pet trade (Rawson, 2010)**.**

Trade: CITES annual reports have been received from Cambodia for all years 2002-2012. Cambodia has not published any export quotas for *M. fascicularis*. Direct exports of *M. fascicularis* from Cambodia 2002-2012 primarily consisted of source C and F live animals traded for commercial purposes; the remaining trade comprised W, F and R specimens traded for scientific, medical and commercial purposes (Table 1). Notable quantities of seized/confiscated specimens were also reported in 2008 and 2011. All of the specimens and a notable proportion of the live animals were imported by the United States; China was the principal country of import for live *M. fascicularis*.

No indirect exports of *M. fascicularis* originating in Cambodia were reported prior to 2006; indirect trade reported 2006-2012 principally comprised C and F specimens traded for scientific, medical and commercial purposes.

Table 1. Direct exports of *Macaca fascicularis* from Cambodia (excluding term/unit combinations traded in quantities totaling <10 units), 2004-2012. Trade was primarily reported with purpose code M, S or T. (No trade was reported in 2002-2003.)

Term	Units	Source	Reported by	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
live	-	C	Importer	1500	5040	9412	5780	2480	2720	3000	4400		34332
			Exporter	1590	7430	15990	5480				6000	3930	40420
		F	Importer					8060	11105	7310	2752		29227
			Exporter				1800	14820	15860	3095	3050		38625
specimens (including hair)	-	W	Importer							159	124		283
			Exporter										
		R	Importer						80				80
			Exporter										
		F	Importer					2519			550		3069
			Exporter								250		250
		I	Importer					750			336		1086
			Exporter										

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Based on a field visit conducted in 2008, Eudey (2009a) found anecdotal evidence of illegal trade from Cambodia. She also reported concerns raised by NGO observers of unrecorded trade from breeding facilities (Eudey, 2009b). According to Hamada *et al.* (2010), wild-caught specimens may be illegally exported from Cambodia to Lao PDR, where the species has a restricted population.

Management: *M. fascicularis* is categorised as a 'common' species (fairly common and widespread species, with high reproductive capacity and not under significant threat) under Article 48 of the Law on Forestry (Cambodia, 2002a). Article 49 of the Law on Forestry prohibits hunting within protected areas, and Article 50 prevents the keeping of common species as pets, and transporting and trading them in amounts exceeding "customary use" (Cambodia, 2002b). The CITES MA of Cambodia (*in litt.* to UNEP-WCMC, 2013) confirmed that trading, stocking, hunting and transporting the species on a "large commercial scale" without a permit from the Forestry Administration is illegal, and fines of two to four times the market value of the specimens must be paid if the regulation is violated.

The CITES MA of Cambodia (*in litt.* to UNEP-WCMC, 2013) reported that the species can be farmed under license from the Ministry of Agriculture, Forestry and Fisheries. Thomson (2008) reported that the "captive breeding" of *M. fascicularis* had increased significantly during 2001-2008. BUAV (2008) reported eight large-scale breeding farms producing specimens for export. The breeding facilities were considered to be reliant on wild-sourced breeding stock (BUAV, 2008; Thomson, 2008; SSN Primate Working Group, 2012), and often lack the capacity to produce second generation offspring (SSN, 2011). Inspections are reported to be conducted by the Forestry Administration (FA) of the Ministry of Agriculture, Fisheries and Forestry (MAFF) on the number of animals captured from the wild (Thomson, 2008)). The establishment of breeding farms close to protected areas had reportedly resulted in increased wild collection (CITES MA of Cambodia, 2007, pers. comm. to A. Eudey, in Eudey, 2008)**.**

The SSN (2011) expressed concerns about the making of non-detriment findings for *M. fascicularis* in Cambodia.

The species was reported to be present in many protected areas (Rawson, 2010)**,** and it was considered relatively abundant in the Seima Biodiversity Conservation Area (Pollard *et al.*, 2007). More recently, the species was recorded in the proposed Western Siem Pang Protected Forest (BirdLife International, 2012). However, R. A. Mittermeier (2008, pers. comm. to A. Eudey in Eudey, 2008) reported that the species had disappeared from many protected areas

due to illegal trade, and BUAV (2008) recorded field evidence of illegal, unlicensed trapping in the Beong Tonlé Chhma Reserve.

INDIA

Distribution in range State: The subspecies *M. f. umbrosa* is endemic to the Nicobar Islands (eastern Indian Ocean) (Wilson and Reeder, 2005; Ong and Richardson, 2008; Gumert, 2011), where it occurs mainly in the coastal regions of Katchall island and the Little Nicobar and Great Nicobar Islands (Fooden, 1995).

Population trends and status: In an assessment of the status of South Asian primates, *M. f. umbrosus* was classified as Near Threatened, based on its restricted range but improving habitat (Molur *et al.*, 2003). However, in the IUCN Red List assessment, Ong and Richardson (2008) categorised the subspecies as Vulnerable, based on its unknown status following the 2004 tsunami. Although a population decline was observed in coastal areas following the tsunami (Sivakumar, 2010; CITES Scientific Authority of India, *in litt.* to UNEP-WCMC, 2013), more recent surveys conducted in the Great Nicobar Island during 2011-2012 by Narasimmarajan and Raghunathan (2012) indicated population recovery.

Threats: Habitat loss and hunting, for subsistence, and because the species is a crop pest were considered to be the main threats (Molur *et al.*, 2003; Ong and Richardson, 2008; CITES SA of India, *in litt.* to UNEP-WCMC, 2013).

Trade: CITES annual reports have been received from India for every year 2002-2010. India has not published any export quotas for *M. fascicularis*. According to data in the CITES Trade Database, no direct or indirect trade in *M. fascicularis* originating in India was reported 2002-2012. The European Union suspended trade in wild-sourced *M. fascicularis* from India from 1997 until 26/11/2010.

Management: *M. f. umbrosa* is listed under Schedule I, Part I, Indian Wildlife (Protection) Act, 1972 (amended in 2002 and 2006) prohibiting hunting and trade without appropriate licenses (India, 1972). Regular population surveys are conducted as part of the Zoological Survey India project 'Faunal diversity of Great Nicobar Biosphere Reserve' (CITES SA of India, *in litt.* to UNEP-WCMC, 2013). The species also occurs in two protected areas, the Campbell Bay and Galathea National Parks within the Great Nicobar Island (CITES SA of India, *in litt.* to UNEP-WCMC, 2013).

INDONESIA

Distribution in range State: *M. fascicularis* is considered to be widespread in Indonesia (Fooden, 1995; Brandon-Jones *et al.*, 2004; Kemp, 2007; Eudey, 2008)**.** *M. f. fascicularis* occurs on Sumatra, Borneo and Java (Fooden, 1995; Mittermeier *et al.*, 2013), and adjacent islands, including Lingga, Bangka-Belitung and Batu (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). *M. f. karimondjiwae* is found on the Karimunjawa and Kemujan islands off the north-central coast of Java (Fooden, 1995; Afendi *et al.*, 2011; Gumert, 2011)**;** *M. f. fuscus* occurs on the Simeulue island (near the west coast of northern Sumatra) (Fooden, 1995; Gumert, 2011); and *M. f. lasiae* occurs on the Lasia (Pulau Lasia) island (near the west coast of northern Sumatra) (Gumert, 2011).

Introduced populations of *M. fascicularis* were reported to occur in West Papua and the Tinjil island (south of Java), where the species was intentionally introduced in 1988-1991 (Kemp, 2007; Gumert, 2011); a possibly introduced population was also reported to occur in Sulawesi (Gumert, 2011)**.**

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) recognised several local subspecies: *M. f. baweana* on the Bawean island (off the coast of Java), *M. f. limitis* on Timor

(East Nusa Tenggara Province), *M. f. mordax* on Java and Bali, *M. f. phaeura* on Nias island (off the west coast of Sumatra), *M. f. pumila* on Natuna island (off the northwest coast of Borneo) and *M. f. sublimitis* on Lombok, Sumbawa, Flores and Kambing islands of the Lesser Sunda island chain.

Population trends and status: The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) considered *M. fascicularis* to be common, with population increases in some areas due to the conversion of natural forests and the species' propensity for altered habitats, and Wolfheim (1983) considered the species to be locally abundant. Population surveys conducted in 2009 in Bali indicated an increasing population trend (Brotcorne *et al.*, 2011; Fuentes *et al.*, 2011). Southwick and Siddiqi (2011) also reported an increasing population trend in the Ubud forest in Bali. However, Kyes *et al.* (2011) noted that despite presumed high abundance, few recent population estimates were available. Based on a one-week survey and interviews conducted in 2009 in Java, Kyes *et al.* (2011) found that the species was unevenly distributed.

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) summarised population estimates based on local surveys, including 5800 individuals recorded in West Java (density of five individuals/ha), 4000 in Central Java (three individuals/ha), 3970 in Yogyakarta (three individuals/ha), 2130 in three villages of West Sumatra, 2624 in five villages of South Sumatra, 1200 in three villages of the Bengkulu Province (southwestern Sumatra) (Wirdateti *et al.*, 2007; Suyanto *et al.*, 2007 in CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013) and 2000 in the introduced populations of Tinjil island (Perwitasari-Farajallah *et al.*, 2010). In addition, populations of < 1000 individuals were recorded at Bali, Alas Kedaton, Lombok island and the Kerinci Seblat National Park (Sumatra) with recorded densities of 1-31 individuals/ha (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013, and references therein).

Afendi *et al.* (2011) conducted interviews and surveys on Karimunjawa island in 2008, estimating that the population size of *M. f. karimondjiwae* was "well under 1000 individuals, and quite likely smaller than 500" and suggested that the Red List status of Data Deficient should be upgraded (Afendi *et al.*, 2011). BUAV (2009) raised concerns over the reliability of surveys.

Threats: Domestic trade as pets was considered to form the main threat to Indonesian primates (Malone *et al.*, 2003; Shepherd, 2010). Based on market surveys, *M. fascicularis* was reported to be commonly available for a low price (Malone *et al.*, 2003; Shepherd *et al.*, 2004; Shepherd, 2010). The impact on wild populations was regarded as significant, because most infants or juveniles in trade were reportedly captured by killing the mother and had very high mortality in captivity (Malone *et al.*, 2003; Geissmann *et al.*, 2006).

Habitat loss was regarded as a significant threat (Eudey, 2008; Marchal and Hill, 2009; Yanuar *et al.* , 2009). Afendi *et al.* (2011) reported significant human-macaque conflict around the marine national park on the island of Karimunjawa, and Kyes *et al.* (2011) reported widespread conflict with humans in Java. The species was also reportedly killed as a crop pest in Bali (Fuentes *et al.*, 2011), and hunted for food in Bali and Borneo (Bonadio, 2000; Fuentes *et al.*, 2011).

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) considered harvest from the wild for export trade as "very limited" with no significant population impacts. However, Mittermeier *et al.* (2013) reported that trapping quotas for domestic research purposes as well as for export had been increased as a result of human-macaque conflict. Yanuar *et al.* (2009) considered capture for export as a significant threat in Sumatra.

Trade: CITES annual reports have been received from Indonesia for all years 2002-2011. Indonesia published export quotas for live, non-productive *M. fascicularis* every year 1998-2001; the quota applied to captive-bred (source C) animals only in 1998-2000 and wild-sourced animals only in 2001. In 2002, a quota was recorded as being 'in preparation', and in 2009 a zero export quota was published for wild-sourced *M. fascicularis*. According to data in the CITES Trade Database, no direct trade in wild-sourced *M. fascicularis* from Indonesia was reported in 2009 by either Indonesia or other countries of import.

Direct exports of *M. fascicularis* from Indonesia 2002-2012 primarily consisted of source F live animals and specimens traded for commercial, scientific and medical purposes (Table 2). The Indonesian MA (*in litt.* to UNEP-WCMC, 2013) confirmed that live specimens reported as captive-bred by Indonesia in 2010 may have comprised source F specimens. The principal country of import was the United States. Trade in live animals has declined every year since 2009, while trade in specimens increased considerably in 2010 but subsequently declined. The CITES MA and SA of Indonesia (2013, *in litt.* to UNEP-WCMC) confirmed the decreasing trend in live animal trade, and reported that actual exports in 2012 comprised 20 individuals.

Indirect trade in *M. fascicularis* originating in Indonesia 2002-2012 principally comprised C, F and W specimens traded for scientific, medical and commercial purposes.

Table 2. Direct exports of *Macaca fascicularis* from Indonesia (excluding term/unit combinations traded in quantities totaling <5 units), 2002-2011. Trade was primarily reported with purpose code M, S or T. (Indonesia's annual report for 2012 has not yet been received; no trade was reported in 2012; quantities rounded to one decimal place, where applicable.)

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	-	W	Importer	240										240
			Exporter	4	4									8
		C	Importer	1284	1017	520	600	738	1789	234				6182
			Exporter									1587		1587
		F	Importer	357	1441	1184	2309	2431	1511	3234	2540	1372	576	16955
			Exporter	3134	1370	2460	3127	2981	5211	4157	2156		1391	25987
		U	Importer	350										350
			Exporter											
specimens (including derivatives)	kg	F	Importer	36.3										36.3
			Exporter								0.2			0.2
		F	Importer	0.2				0.3						0.5
			Exporter								0.6		26.7	27.3
	-	W	Importer	2		300	381	250	940			1100		2973
			Exporter	200		137	90		140	350				917
		C	Importer	110			5	464						579
			Exporter			1700						8121		9821
		F	Importer	6		572	4	469		120	1504	4787	2935	10397
			Exporter	410	1736	1732	3662	1970	2410	1720	2418		1100	17158
		I	Importer				350							350
			Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: Unlicensed hunting and domestic trade of *M. fascicularis* for pets is illegal (Shepherd, 2010); however, the enforcement of primate regulations was considered to be insufficient (Geissmann *et al.*, 2006; Shepherd, 2010). The export of wild-sourced specimens has been prohibited since 1994 under Decree No. 03/Kpts/DJ-VI/1994 (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2013), following recommendations of the Animals

Committee in accordance with Resolution Conf. 8.9 (Doc. 11.41.1 Annex 2). The CITES MA and SA of Indonesia (2013, *in litt.* to UNEP-WCMC) reported that wild harvest was only allowed to replenish captive breeding populations, and the exports of *M. fascicularis* were limited to specimens sourced from "captive breeding" operations.

A harvest quota for wild-sourced individuals trapped for captive breeding is issued by the Management Authority (Directorate General of Forest Protection and Nature Conservation, PHKA), in accordance with recommendations made by the CITES SA (Indonesian Institute of Sciences, LIPI) (Santosa *et al.*, 2012). The CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2013) reported that experts from research organisations, universities and NGOs were involved in setting Provincial quotas, and that available information on biology and distribution, general land use and area-specific threats were used in determining allowable harvest levels. The CITES MA and SA of Indonesia (2013, *in litt.* to UNEP-WCMC) reported that actual numbers harvested from the wild are significantly lower than the quotas and that no individuals have been harvested from the wild 2010-2012 (Table 3). However, concerns were raised about management of the quotas (BUAV, 2009; Santosa *et al.*, 2012).

Table 3. Wild harvest quotas and total number of individuals of *Macaca fascicularis* taken from the wild in Indonesia for captive breeding purposes (source: Santosa *et al.*, 2012; CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013; CITES MA of Indonesia, *in litt*. to UNEP-WCMC, 2013).

Year	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Quota	2000	2000	4100	5100	15100	5000	50001	0*	0*
No of animals taken	0	200	344	0	886	0	0	0	0

* Quota not available

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) reported that a system of estimating Maximum Estimated Production (MEP) is used to monitor the licensed captive breeding operations. The MEP is estimated based on the number of adult breeding stock and estimated reproductive capacity, and the estimates are subsequently checked by the CITES MA (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2013). The combined total production plan of the eight licensed companies for 2013 was reported to be 8341 individuals (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2013).

Many breeding facilities were considered to lack the capacity to produce second-generation offspring (SSN, 2011), and concern was raised about the laundering of wild-caught individuals (Foley and Shepherd, 2011). However, more recently the Indonesian MA and SA (2013, *in litt.* to UNEP-WCMC) confirmed that tattooed marking is used for identifying captive-bred individuals.

Specimens produced in the Indonesian islands, in particular Tinjil, are exported under source codes C and F, although it was noted that they do not originate in a "controlled environment" as defined under CITES Res. 10.16 (Rev.) (SSN Primate Working Group, 2012). The Indonesian MA (*in litt.* to UNEP-WCMC, 2013) confirmed that individuals were mainly exported under source F from the Tinjil Island. The population was reportedly originally introduced for supplying the demand for laboratory trade, and increased in significance following the 1994 export ban on wild-caught individuals (Gumert, 2011). The Tinjil island populations were considered to be sustainably managed (Gumert, 2011), and to "maximize the health and well-being of animals" (Crockett *et al.*, 1996). Regular censuses are conducted to monitor these populations, and additional individuals were reportedly introduced recently to improve genetic stock (CITES MA and SA of Indonesia *in litt.* to UNEP-WCMC, 2013).

The species was reported to occur in "low densities" in the Kerinci-Seblat National Park in Sumatra (Yanuar *et al.*, 2009). In Bali, some populations in culturally important temple sites were considered to be protected (Gumert, 2011).

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Distribution in range State: *M. fascicularis* occurs in southern Lao PDR (Fooden, 1995; Duckworth *et al.*, 1999; Brandon-Jones *et al.*, 2004; Kemp, 2007; Hamada *et al.*, 2010; Gumert, 2011; Mittermeier *et al.*, 2013), where its habitats are restricted to riverine and secondary forests (Y. Hamada, pers. comm. to UNEP-WCMC, 2013). It was considered widespread in the Xe Kong and lower Mekong drainages (Duckworth *et al.*, 1999). Based on surveys conducted in 2005, 2007 and 2008, the species was recorded in the provinces of Attapeu (southeastern Lao PDR) and Champasak (southwestern Lao PDR) and on the Mekong river tributaries (Hamada *et al.*, 2011). However, it was not recorded in primate surveys conducted in northern Lao PDR in 2006 (Hamada *et al.*, 2007). Timmins (2008) described the distribution in Lao PDR as "naturally small".

Population trends and status: *M. fascicularis* was categorised as 'Potentially at Risk' (including species that are suspected to be at risk but with insufficient information, and species on or close to being at risk) in Lao PDR (Duckworth *et al.*, 1999). Hamada *et al.* (2011) used estimates of available habitat and densities recorded in the adjacent populations in Thailand to suggest that the total population size in the country was between 420 and 4200 individuals, placing the species "potentially under the threat of extinction"; a more recent estimate by Y. Hamada (pers. comm. to UNEP-WCMC, 2013) set the population size at 3000-5000 individuals, with a decreasing trend.

Threats: Habitat loss, hunting and capture for trade were considered as the main threats (Hamada *et al.*, 2011; SSN Primate Working Group, 2012). Hamada *et al.* (2010) reported that the species was caught from the wild in southern Lao PDR and transported to local breeding farms for export. Hamada *et al.* (2011) noted that *M. fascicularis* was being farmed in areas further north than its natural distribution.

The species was not recorded for sale in local bushmeat markets in southern Lao PDR during visits conducted in 2005 and 2007-2008, indicating that hunting for food was not a significant threat (Hamada *et al.*, 2011). It was reported to be persecuted as a crop pest in some areas (Hamada *et al.*, 2010).

Trade: Lao PDR became a Party to CITES in 2004; CITES annual reports have been received for the years 2006-2009. Lao PDR has not published any CITES export quotas for *M. fascicularis*. Direct exports of *M. fascicularis* from Lao PDR 2002-2012 consisted exclusively of live animals, the majority of which were captive-bred or ranched and traded for commercial purposes (Table 4). The principal countries of import were China and Viet Nam. Trade in live animals has shown an overall increase since 2006; no data are currently available for 2011 or 2012.

Indirect trade in *M. fascicularis* originating in Lao PDR 2002-2012 consisted of live animals traded for commercial purposes, the majority of which were wild-sourced.

The European Union suspended trade in wild-sourced *M. fascicularis* from Lao PDR from 1997 until 1999.

Table 4. Direct exports of *Macaca fascicularis* from Lao People's Democratic Republic, 2004-2010. All trade was in live animals and was primarily for commercial purposes. (Lao People's Democratic Republic became a Party to CITES in 2004 and annual reports have been received for the years 2006-2009; no trade was reported in 2002-2003 or 2011-2012.)

Source	Reported by	2004	2005	2006	2007	2008	2009	2010	Total
W	Importer	5985	2000						7985
	Exporter								
R	Importer			1000	1000	720	6500		9220
	Exporter					6580	6900		13480
C	Importer				7500	2050	2000	4600	16150
	Exporter			2000	4850				6850
F	Importer						900		900
	Exporter								
-	Importer								
	Exporter						120		120

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Y. Hamada (pers. comm. to UNEP-WCMC, 2013) reported anecdotal evidence of considerable numbers of *M. fascicularis* being illegally imported into the country and further numbers being exported to Viet Nam. Hamada *et al.* (2010) also provided anecdotal evidence of individuals caught illegally from temples and city parks in Thailand being imported to the breeding farms in Lao PDR. Based on field interviews with breeding facility owners or managers during 2011-2012, BUAV (2012) reported evidence of unrecorded imports from Cambodia, Thailand and Malaysia to supply breeding colonies. The interviews reportedly revealed that animals exported from Lao PDR to China were re-exported as being of Chinese origin. Eudey (2008) suggested that illegal trafficking of wild-caught *M. fascicularis* may occur between Lao PDR, Cambodia and Viet Nam, and BUAV (2012) presented anecdotal evidence of illegal trade from Lao PDR to Viet Nam.

Management: *Macaca* spp. are listed as 'managed' species under Category II (species that are considered economically important and the use of which is controlled) under the National Biodiversity Conservation Areas, Aquatic and Wildlife Management Regulations (No. 0360/AF.2003) (Lao People's Democratic Republic, 2003). The Wildlife and Aquatic Law of 2007 specifies that for the species listed under Category II, hunting is restricted or prohibited, and capture for commercial purposes requires permission from the Ministry of Agriculture and Forestry (Lao People's Democratic Republic, 2007). Y. Hamada (pers. comm. to UNEP-WCMC, 2013) considered the management of the species to be insufficiently enforced in Lao PDR.

According to Hamada *et al.* (2010), the breeding facilities of *M. fascicularis* in Lao PDR may temporarily hold wild-caught individuals for re-export via Viet Nam and/or China. During visits conducted to wildlife breeders in Bolikhamxay and Champasak provinces in 2005 and 2007-2008, Hamada *et al.* (2011) found no infants on the farms, suggesting that captive breeding was not taking place; due to the limited populations in Lao PDR, the origin of the wild-caught specimens was thought to be Thailand and/or Cambodia. Quantities exported from Lao PDR were considered to "far exceed" the capacity of the national population and the breeding facilities (Hamada *et al.*, 2011). However, based on more recent visits to breeding farms in February 2013, A. Eudey (*in litt.* to UNEP-WCMC, 2013) reported that two previously active farms had been deserted due to reduced demand from China.

The SSN (2011) expressed concerns about the making of non-detriment findings for *M. fascicularis* in Lao PDR. The use of source code 'R' for *M. fascicularis* from Lao PDR was considered inappropriate for primates (SSN Primate Working Group, 2012).

M. fascicularis was considered "relatively common locally in Xe Pian NBCA (National Biodiversity Conservation Area]" (Duckworth *et al.*, 1999). Timmins and Vongkhamheng (1996) recorded it in the Xe Sap National Biodiversity Conservation Area in the Salavan Province (southern Lao PDR).

MAURITIUS

Distribution in range State: The species was introduced to Mauritius (Kemp, 2007), presumably over 300 years ago (Gumert, 2011; Sussman *et al.*, 2011)**.** The core populations were considered to be in the Black River area (southwestern Mauritius), with population complexes also found in Port Louis (northwestern Mauritius) and Bambous (western Mauritius) (Sussman *et al.*, 2011)**.**

Population trends and status: Sussman *et al.* (2011) estimated that the total population size during the 1980s and 1990s was up to 40 000 individuals, and Kemp and Burnett (2003) estimated the population size in 2002 to be approximately 60 000, noting that the population density exceeded 32 individuals per square km and was considered "very high". However, following intensive trapping for export, a strong population decline was recorded (Padayatchy, 2011; Sussman *et al.*, 2011). Based on preliminary surveys conducted in 2009, L. Guidi (2013, pers. comm. to UNEP-WCMC) suggested that the population size may be under 10 000 individuals, although more recently, the population size may have increased. Satkoski Trask *et al.* (2013) reported a significantly higher estimated population size of 30 000-40 000 in the wild and 40 000 individuals at two local breeding centres, based on censuses conducted in 2006 and 2010.

Threats: *M. fascicularis* is considered a crop pest and a threat to local wildlife (Kemp, 2007; DPIPWE, 2011; Gumert, 2011; Padayatchy, 2011; Sussman *et al.*, 2011), and it is hunted as a nuisance animal and for food (Padayatchy, 2011; Sussman *et al.*, 2011). According to Lee and Priston (2005), due to the damage caused by the species, "extensive trapping for biomedical trade is considered the only effective way to control population size and reduce damage". Padayatchy (2011) estimated that trapping a maximum of 4000 specimens for biomedical research annually during 1985-2005 had little impact on the populations, however the numbers exported had significantly increased during 2005-2008. Trapping for the biomedical industries was reported to have decreased again in 2009, mainly as a result of the global economic crisis (Padayatchy, 2011)**.**

Trade: CITES annual reports have been received from Mauritius for all years 2002-2011. Mauritius published export quotas for wild-sourced *M. fascicularis* every year 1997-1999; no quotas have been published since. Direct exports of *M. fascicularis* from Mauritius 2002-2012 primarily consisted of live animals and specimens traded for scientific, medical and commercial purposes, the majority of which were source F with a notable proportion wild-sourced (Table 5). The principal countries of import were the United States, the United Kingdom, France and Spain.

Indirect trade in *M. fascicularis* originating in Mauritius 2002-2012 principally comprised C, F and W specimens traded for scientific, medical and commercial purposes.

Table 5. Direct exports of *Macaca fascicularis* from Mauritius (excluding term/unit combinations traded in quantities totaling <20 units), 2002-2011. Trade was primarily reported with purpose code M, S or T. (Mauritius' annual report for 2012 has not yet been received; no trade was reported in 2012; quantities rounded to one decimal place, where applicable.)

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	kg	F	Importer					200						200
			Exporter											
	-	W	Importer	2125	2339	1292	1433	1191	732	538	840	518	209	11217
			Exporter	2576	2200	2450	2169	1220	752	636	739	422	176	13340
		C	Importer	567	212	237	215	56	30	150	112	31	218	1828
			Exporter	127	24	577	176	154	78	280	86	26	156	1684
		F	Importer	4607	6113	6881	7667	6205	5926	8069	6093	7047	6324	64932
			Exporter	4427	5756	11615	7782	6541	6854	7728	5615	6615	6024	68957
		-	Importer		50		130	160	92		87			519
			Exporter											
specimens	kg	W	Importer	2	2.6	33	0.1				14	20		71.7
			Exporter											
	l	W	Importer	0.1	0.7	0.3	15.6	0.4	2.5	0.3			0.5	20.3
			Exporter					0.1	2.5		2.8	0.9	393.7	400.0
		F	Importer	7.3	20.5	6.7	2.7	8.0	1.3	1.1	8.1	7.6	0.5	63.8
			Exporter					5.1	3.3	2.5	16.6	5.7	3.0	36.2
	-	W	Importer	6	250	264	566	105	1	50	330	1154	1371	4097
			Exporter	638	741	714	635	505	978	805	337	1660	25	7038
		C	Importer				100				40	27	293	460
			Exporter	315		2	28	67	6	2018		98	5	2539
		F	Importer	14	559	716	880	2818	1408	52	5032	1894	100	13473
			Exporter	9620	6130	5950	6323	5825	249	370	1325	140	293	36225
		I	Importer	145						386	4			535
			Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *M. fascicularis* was reported to be trapped in conserved and cultivated areas as an attempt at population control (Kemp, 2007), and Sussman *et al.* (2011) noted that in spite of the observed population decline, there was "little enthusiasm" to protect the species.

The Mauritian National Parks Conservation Fund was reported to be funded through money from the "macaque industry"; a levy of USD 100 is collected for each exported specimen of *M. fascicularis*, and annual trapping fees are paid by the companies (Padayatchy, 2011). BUAV (2011) raised concern over insufficient breeding facilities in Mauritius.

PALAU

Distribution in range State: The introduced populations of *M. fascicularis* in Palau were likely established in the 1900s (Gumert, 2011; Wheatley, 2011). The main established populations are found on Angaur (Ngeaur) island (Kemp, 2007), but the species was also recorded on other islands, including the Rock islands, Peleliu, Koror and Airai on Badeldaob (Wheatley, 2011).

Population trends and status: The size of the Angaur population was estimated to be slightly fewer than 1000 individuals (Wheatley, 2011). Gumert (2011) reported population fluctuations between 400 and 800 individuals as a result of eradication attempts, and Kemp and Burnett (2003) noted that the species appeared to have recovered well from eradication efforts.

Threats: The species is reported to be persecuted as an invasive species, and hunted and captured as pets in Angaur (Kemp, 2007; Wheatley, 2011).

Trade: Palau became a Party to CITES in 2004; Palau reported no trade in CITES-listed species in 2005 and submitted CITES annual reports for the years 2007-2011. Palau has not published any export quotas for *M. fascicularis*. According to data in the CITES Trade Database, the only trade in *M. fascicularis* originating in Palau reported 2002-2012 consisted of one body exported directly to the United States in 2008, with no source or purpose specified, reported by Palau only.

Management: According to Kemp (2007), *M. fascicularis* is considered a pest by the Angaur island government, and eradication programmes have been established (Wheatley, 2011).

PHILIPPINES

Distribution in range State: Occurrence in the Philippines was confirmed (Kemp, 2007; Gumert, 2011), with *M. f. philippinensis* mainly occupying the western, northern and eastern islands (Fooden, 1995), and *M. f. fascicularis* found on the south-central islands (Brandon-Jones *et al.*, 2004). The two subspecies overlap in eastern Mindanao and southern Negros islands, where mixed phenotypes were also reported to occur (Fooden, 1995; Gumert, 2011).

Population trends and status: The species was reported to be common in some areas (Ong and Richardson, 2008; The Field Museum, 2010), although Gumert (2011) noted that no recent population estimates were available and a local population decline was observed.

M. f. philippensis was categorised as 'Near Threatened' based on "some declines due to hunting and habitat loss", and it was considered to have a decreasing population trend (Ong and Richardson, 2008).

Threats: Hunting and capture for medical research and as pets were considered as the main threats (Ong and Richardson, 2008; The Field Museum, 2010; Gumert, 2011). The CITES Review of Significant Trade in 1993 concluded that trapping in the Philippines was "having a detrimental effect on some populations" (WCMC *et al.*, 1993). The species was also reported to be caught for medicinal purposes in the Philippines (Mittermeier, 1987).

Trade: CITES annual reports have been received from the Philippines for the years 2002-2007 and 2009. The Philippines has not published any export quotas for *M. fascicularis*. Direct exports of *M. fascicularis* from the Philippines 2002-2012 primarily consisted of captive-bred live animals and specimens traded for scientific and medical purposes; trade in live animals decreased over the ten-year period overall (Table 6). The principal countries of import were the United States and Japan.

Indirect trade in *M. fascicularis* originating in the Philippines 2002-2012 principally comprised captive-bred specimens traded for scientific, medical and commercial purposes.

Table 6. Direct exports of *Macaca fascicularis* from the Philippines (excluding term/unit combinations traded in quantities totaling <50 units), 2002-2011. Trade was primarily reported with purpose code M, S or T. (Annual reports have not yet been received from the Philippines for the years 2008, or 2010-2012; no trade was reported in 2012; quantities rounded to one decimal place, where applicable.)

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	-	W	Importer	100										100
			Exporter											
		C	Importer	1534	1692	1570	1766	1713	1992	1362	1108	1349	954	15040
			Exporter	2676	1917	1485	1445	1628	2127		1244			12522
		U	Importer	80										80
			Exporter											
bones	-	C	Importer					1						1
			Exporter		1						99			100
specimens (including derivatives)	kg	C	Importer	<0.1	1.8	181.6		130.8	1.3	0.1		24.6	7.4	347.4
			Exporter		1.7						17.7			19.3
	l	C	Importer	9.5	4.5	52.9	15.0	6.2	4.8	3.3	4.5	3.0	9.1	112.9
			Exporter		166.6						7.8			174.4
	-	W	Importer		1	100	48		343	151	297	148	472	1560
			Exporter						3		1			4
		C	Importer	970	993	2229	7192	3766	6481	2784	768	1059	3018	29260
			Exporter	12670	193	19295			15715		8			47881
		I	Importer							150	42	74		266
			Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: Under the Administrative Order No 2004-15, *M. fascicularis* is included in the list of threatened wildlife under section D, "Other threatened species" (Philippines, 2004). Section 24 of the Republic Act No. 9147 (Wildlife Conservation and Protection Act) prohibits the collection of threatened wildlife species, excluding the collection for scientific or breeding purposes, which requires authorisation, and section 26 prohibits the possession of threatened species unless authorised by a certificate and with proven financial and technical capacity (Philippines, 2001). Hunting and trading for commercial purposes is prohibited under Section 27 (Philippines, 2001). The export of wild-caught specimens was prohibited following recommendations of the Animals Committee in accordance with Resolution Conf. 8.9 (Doc. 11.41.1 Annex 2).

The SSN (2011) expressed concerns about the basis of non-detriment findings for *M. fascicularis* in the Philippines.

VIET NAM

Distribution in range State: The subspecies *M. f. condorensis* is endemic to the Con Son and Hon Ba islands (southeastern coast of Viet Nam) (Son *et al.*, 2009; Mittermeier *et al.*, 2013). *M. f. fascicularis* occurs in southern Viet Nam (Brandon-Jones *et al.*, 2004; Gumert, 2011; Mittermeier *et al.*, 2013), up to 16°30′ N (Minh *et al.*, 2012). Based on surveys conducted during 2004-2008, Son *et al.* (2009) considered the species range to reach from Son Tra Mountain (district of Da Nang in south-central coast) to the province of Ca Mau (southern tip). Based on surveys conducted in central Viet Nam during 2006-2010, Minh *et al.* (2012) reported that the range of *M. fascicularis* reaches the province of Quang Tri (north-central coast) in the north.

Population trends and status: The total population size of *M. fascicularis* in Viet Nam was considered to be unknown (T. Nadler, 2013, *in litt.* to UNEP-WCMC); however, the CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) estimated that there were 30 subpopulations in the wild. Based on surveys conducted in central Viet Nam during 2006-2010, Minh *et al.* (2012) considered the species to occur in "high frequency" in several localities. Based on interviews with local inhabitants, Duc *et al.* (2010) reported it to be "quite abundant" in the Ta Kou National Reserve and Ta Dang Mountains, and Quyet and Khoi (2010) considered it as common in the Phu Quoc National Park and throughout the Phu Quoc islands.

The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) reported that it was categorised as 'Lower Risk' in the Viet Nam Red Data book of 2007. Wolfheim (1983) considered it to have a declining population trend, and the CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) reported a rapid population decline since 1975, but noted that the populations were increasing in some national parks.

The population size of *M. f. condorensis* was estimated to be approximately 1000 individuals, and the subspecies was categorised as 'Vulnerable' in the IUCN Red List, with the justification "the population is estimated at less than a 1000 individuals in total (including mature individuals). Although the range of this subspecies is very limited the island on which it lives is a national park, and there are no obvious threats that would lead it to decline very quickly" (Ong and Richardson, 2008). The subspecies was considered to have a decreasing population trend (Ong and Richardson, 2008).

Threats: Hunting and illegal trade were considered as the main threats (Nadler *et al.*, 2007; Son *et al.*, 2009), and it was also reported to be persecuted as a crop pest (Duc *et al.*, 2010). Ong and Richardson (2008) reported that females were captured for breeding facilities and wild-caught males were exported directly for use in biomedical testing. SSN Primate Working Group (2012) stated that "Evidence points to an illegal (and therefore unrecorded) trade in wild-caught *M. fascicularis* that is likely to have a big impact on populations".

The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) considered habitat loss as the main threat to the species.

Trade: CITES annual reports have been received from Viet Nam for all years 2002-2011. Viet Nam has not published any export quotas for *M. fascicularis*. Direct exports of *M. fascicularis* from Viet Nam 2002-2012 primarily consisted of specimens and live animals traded for commercial, scientific and medical purposes (Table 7). According to country of import data, the majority of the specimens were wild-sourced, however, Viet Nam did not report the export of any wild-sourced specimens. Trade in live animals decreased overall from 2007 onwards, while trade in specimens remained relatively constant. The principal country of import was the United States.

Indirect trade in *M. fascicularis* originating in Viet Nam 2002-2012 principally comprised captive-bred specimens traded for scientific, medical and commercial purposes.

Eudey (2008) suggested that illegal trafficking of wild-caught *M. fascicularis* may occur between Lao PDR, Cambodia and Viet Nam, and BUAV (2012) presented anecdotal evidence of illegal trade from Lao PDR to Viet Nam. T. Nadler (2013, *in litt.* to UNEP-WCMC) considered the species to be "one of the most common primates in the illegal trade" in Viet Nam. According to the TRAFFIC (2010) information on seizures and prosecutions during 1997-2010, several shipments of illegally transported *M. fascicularis*, varying from 61 to 147 individuals were confiscated in transport during 2006-2007; some of these shipments were reportedly on their way to China. Several perished specimens were in the shipments

(TRAFFIC, 2010). TRAFFIC East Asia reported illegal export of 770 specimens to China during April-May 2002 (TRAFFIC and IUCN/SSC Wildlife Trade Programme, 2004). The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) confirmed that the species had been commonly traded illegally between 2003-2008, but noted that more recently, the species was rarely encountered in illegal trade mainly due to reduced foreign demand.

Table 7. Direct exports of *Macaca fascicularis* from Viet Nam (excluding term/unit combinations traded in quantities totaling <20 units), 2002-2011. Trade was primarily reported with purpose code M, S or T. (Viet Nam's annual report for 2012 has not yet been received; no trade was reported in 2012.)

Term	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	W	Importer		3000	1400								4400
		Exporter				500							500
	R	Importer											
		Exporter				180							180
	C	Importer	4980	3503	4229	5642	8473	6922	5662	5647	4246	2185	51489
		Exporter	4584	5766	6361	5731	10134	7154	8082	6620	5843	1922	62197
	F	Importer				760		790	2420	1200			5170
		Exporter				1190	1690	790					3670
specimens (including derivatives)	W	Importer	8000	7528	8247	5143	3972	5160	4852	6175	3993	2848	55918
		Exporter											
	C	Importer	2740					1386	3256	2922	5610	3648	19562
		Exporter	21300	19800	47900		19800	15400	20385	19200	18710	28200	210695

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *M. fascicularis* is included in the category II B ("restricted from exploitation and use for commercial purposes", including "animals of scientific or environmental value or high economic value, with small populations in nature or in danger of extinction") under the Decree 32/2006/ND-CP on the Management of Endangered, Precious and Rare Species of Forest Plants and Animals (Viet Nam, 2006). Article 6 of the Act prohibits hunting and capture, with the exemption of capture for breeding purposes or scientific research, and Article 9 prohibits trade in wild specimens, but allows trade of captive-bred and confiscated specimens that cannot be released into the wild (Viet Nam, 2006). The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) confirmed that the export of wild-sourced *M. fascicularis* is prohibited in Viet Nam. However, Hang (2010) reported that crimes related to capturing and illegal possession of *Macaca* spp. were commonly reported.

Captive breeding facilities require registration under Decree No.82/2006/ND-CP (Ha *et al.*, 2007). Thomson (2008) reported that the CITES Scientific Authority conducts annual inspections on captive breeding facilities registered under the Vietnamese Forest Protection Department. However, it was suggested that many of the breeding facilities may be reliant on wild-caught individuals and lack the capacity to produce second generation offspring (SSN, 2011). Ha *et al.* (2007) reported that breeding stock had been imported from Lao PDR and Cambodia, indicating that local breeding facilities do not have the capacity to meet local demand. T. Nadler (2013, *in litt.* to UNEP-WCMC) reported that specimens are smuggled from Cambodia to Vietnamese breeding facilities, from where they are exported as captive-bred.

The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) reported that most subpopulations of *M. fascicularis* are found inside protected areas. Duc *et al.* (2010) recorded the species in the Ta Kou Nature Reserve in south-central coastal Viet Nam, and it was also recorded in surveys conducted in 2003 on the Phu Quoc Island National Park (southern coast) (Abramov *et al.*, 2007). Son *et al.* (2008) recorded *M. f. condorensis* in at least ten

locations at the Con Dao national park. Nadler (2010) noted that confiscated specimens were typically released in protected areas, and introduced populations were reported to occur outside the natural range of the species in the Cat Ba and Pu Mat National Parks and Pu Luong Nature Reserve (Nadler *et al.*, 2007; Son *et al.*, 2009; Nadler, 2010).

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

Illegal trade was reported to be a concern in Cambodia, Lao PDR and Viet Nam. Concerns were also raised over the reliance of captive-breeding facilities on wild stock, and the export of wild specimens as captive-bred from Cambodia (BUAV, 2008; Eudey, 2008; Eudey, 2009b; Lee, 2011; SSN Primate Working Group, 2012), Indonesia (Foley and Shepherd, 2011; SSN Primate Working Group, 2012), Lao PDR (SSN, 2011; BUAV, 2012), Philippines, and Viet Nam (Foley and Shepherd, 2011).

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Psittacus erithacus (Linnaeus, 1758): Benin, Central African Republic, Ghana, Nigeria, Togo, Uganda

Psittacidae, Grey Parrot, African Grey Parrot

Selection for Review of Significant Trade

Psittacus erithacus was selected as a priority species for review (all range States except those recently subject to previous recommendations which were still in effect, including Cameroon, the Congo, Côte d'Ivoire, the Democratic Republic of the Congo (hereafter referred to as DR Congo), Equatorial Guinea, Guinea, Liberia and Sierra Leone) at the 25th meeting of the Animals Committee (AC25 Summary Record) on the basis of information presented in AC25 Doc. 9.6. *P. erithacus* was identified as a species that met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009 (AC25 Doc. 9.6).

At the 26th meeting of the AC, responses had been received from Gabon, Guinea-Bissau and the United Republic of Tanzania (AC26 Doc. 12.3). Angola, Benin, Central African Republic, Ghana, Kenya, Nigeria, Rwanda, Sao Tome and Principe, Togo and Uganda were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Angola, Kenya, Rwanda and Sao Tome and Principe were removed from the process on the basis of virtually no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Psittacus erithacus* recommendations.

		General summary
		Global population estimated at 0.68-13 million individuals. Categorised as Vulnerable in the IUCN Red List, with a decreasing population trend. Capture for international pet trade regarded as the main threat.
Range State	**Provisional category**	**Summary**
Benin	Least Concern	No commercial trade in wild-sourced specimens since 2002. There appears to be no natural population in the country, therefore categorised as Least Concern.
Central African Republic	Least Concern	Relatively high levels of trade in captive-bred birds reported by countries of import only. Very low levels of trade in wild-sourced specimens with the exception of 2005, when 800 birds were traded. Population status is unclear, but on the basis of low trade in wild-sourced specimens, categorised as Least Concern, although questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
Ghana	Least Concern	Virtually no international trade reported and the export of parrots is prohibited. Locally still widespread, although populations severely reduced in most areas. Therefore, categorised as Least Concern.
Nigeria	Least Concern	Low levels of international trade in captive-bred individuals and virtually no trade in wild-sourced individuals due to trade suspensions by Nigeria and as recommended by the Standing Committee 2005-2011. New legislation was enacted and suspension removed. Populations severely reduced in most areas. On the basis of trade levels to date categorised as Least Concern, however any future trade should be considered as of Possible Concern in the absence of a clear basis for non-detriment findings.
Togo	Least Concern	Very low levels of international trade mainly in personal effects have continued with Togo as the country of origin. Introduced population, which is not considered to be viable. Therefore, categorised as Least Concern, although questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.

Uganda	Possible Concern	Very low levels of international trade 2002-2011. Populations apparently reduced in numbers but little recent information. Considering the unknown population status, the basis of non-detriment finding is unclear. Therefore categorised as Possible Concern.

B. Species overview

Taxonomic note: The CITES Standard Reference for birds (Dickinson, 2003) recognises two subspecies, *P. e. timneh* and *P. e. erithacus*, which are treated as separate species by BirdLife International (2013).

Biology: *P. erithacus* is the largest parrot in Africa (Juniper and Parr, 1998). It is relatively more abundant in open forest compared with primary forest (Perrin, 2012), and in some areas inhabits mangroves and gallery woodland (Benson *et al.*, 1988). It sometimes congregates in large flocks to roost (Benson *et al.*, 1988). Its diet primarily comprises seeds, nuts and berries (Serle *et al.*, 1977; Dändliker, 1992). Nesting usually occurs in a tree cavity (Perrin, 2012), and clutch size ranges from one to six eggs, with an average of three to four (Dändliker, 1992). The eggs hatch 30-37 days after laying and the nestlings fledge about 80 days after hatching; the young then become independent two to four weeks later (Dändliker, 1992). It reaches sexual maturity at three to four years of age (Luft, 2007).

General distribution and status: The distribution of the West African subspecies *P. e. timneh* was reported to reach from Guinea-Bissau to southern Mali, Sierra Leone and southwestern Côte d'Ivoire, whereas the wider range of *P. e. erithacus* was reported to reach from southeastern Côte d'Ivoire eastward to Kenya and southward to northern Angola, also covering the islands of Sao Tome and Principe (Dickinson, 2003) and Bioko (Equatorial Guinea) (BirdLife International, 2013) (Figure 2).

Figure 2: Global distribution of *Psittacus erithacus erithacus* [*P. erithacus*] and *P. e. timneh* [*P. timneh*]. (Source: BirdLife International and NatureServe 2012).

Borrow and Demey (2001) considered it locally common to scarce. Gatter (1997) estimated two breeding pairs/km² of *P. e. timneh* in logged forest north of Zwedru (southeastern Liberia), and McGowan (2001) provided estimates of 0.5-2.1 nests/km² and 4.9-6.0 birds/km² in Nigeria. The global *P. e. timneh* population was estimated at 120 100-259 000 birds, based on these density estimates (McGowan, 2001). BirdLife International (2013) produced a "coarse assessment" of 0.56-12.7 million individuals of *P. e. erithacus*, using estimated densities of 0.15-0.45 birds/km² (semi-deciduous forest, including deciduous forest) to 0.3-6.0 birds/km² (evergreen forest, including swamp forest and mangrove).

P. e. erithacus [as *P. erithacus*] and *P. e. timneh* [as *P. timneh*] were both categorised as Vulnerable in the IUCN Red List, due to the high pressure from harvest for international trade, in combination with habitat loss contributing to "rapid declines" over three generations (47 years) (BirdLife International, 2012a, 2012b). BirdLife International (2013) considered a decline of 30-49 per cent of *P.* (*e.*) *timneh* in 47 years as a "conservative estimate", and it was noted that the [sub]species may be uplisted in the future, should better data become available (BirdLife International, 2012b). Both [sub]species were considered to have a decreasing population trend (BirdLife International, 2012a, 2012b), and population declines were recorded in several range States (BirdLife International, 2013).

Threats: *P. erithacus* was considered to be one of the most popular pet birds in Europe, the United States and the Middle East, with increasing demand in China (BirdLife International, 2012a), and the live bird trade was considered to be the main cause of population decline (BirdLife International, 2013). According to an estimate by BirdLife International (2013), c. 21 per cent of the wild population is harvested annually for trade, while sustainable export levels were estimated to be approximately 10 per cent of current exports (BirdLife International, 2006). The species was considered particularly vulnerable to trapping pressure, because of its habit of congregating in flocks for roosting, drinking and frequenting mineral lick sites (BirdLife International, 2012a). In their review of the status of *P. erithacus* prepared for the 22nd meeting of the AC, BirdLife International (2006) emphasised that official trade figures represented minimum levels of harvesting, due to mortality in capture and confinement before export; mortality of up to 90 per cent prior to international transport was recorded in Cameroon (F. Dowsett-Lemaire *in litt.* to BirdLife International, 2012).

Habitat loss was also considered to have significant impacts on wild populations (BirdLife International, 2013).

Overview of trade and management: *P. erithacus* was listed in CITES Appendix II on 06/06/81, and it has been subject to three previous Reviews of Significant Trade. The first, which took place prior to the establishment of a formalised review process, determined that trade in the species was a "possible problem" (Inskipp *et al.*, 1988). The second was completed in 1992 under Phase I of the process established via Resolution Conf. 8.9, and concluded that "the impact of current levels of trade and/or the conservation status of the species was insufficiently known" (WCMC and IUCN/SSC Trade Specialist Group, 1992). Based on the information provided, the AC formulated recommendations for five Parties at their 7th meeting, and these were subsequently communicated to the Parties concerned (Cameroon, Côte d'Ivoire, Guinea, Liberia and Togo) in June 1992 (AC.8.10, AC.8.10.5). The recommendations and subsequent responses by the Parties, Animals and Standing Committees, and the CITES Secretariat for Togo are detailed under the country account. The third review for 20 countries in 2006 resulted in a document (AC22 Doc. 10.2 Annex 1), where five of the countries currently under review (Benin, Central African Republic, Nigeria, Togo and Uganda) were categorised as Least Concern (AC22 WG1 Doc. 1 Rev. 1), and no further action was taken.

C. Country reviews

BENIN

Distribution in range State: *P. erithacus* was listed as an introduced breeding species in the country (BirdLife International, 2012a). Bouet (1961) reported sightings from the forested region north of Sakété (southeastern Benin). However, the species was not listed for Benin by Dowsett and Dowsett-Lemaire (1993) or Dowsett and Forbes-Watson (1993). Cheke (2001)

included it as a component of the Guinea-Congo Forests biome in Benin, but it was not found in any of the four 'Important Bird Areas' surveyed. Dowsett and Dowsett (2011) treated it as a species erroneously included on the Benin list, and noted that feral groups of up to seven were commonly seen in Cotonou.

Population trends and status: Brunel (1958) considered it very rare, if at all present; none were reported during 20 months of observations. Bouet (1961) considered the species to be very rare in the forested region north of Sakété. No further population trend and status information was located.

Threats: Not applicable, as there appears to be no natural population.

Trade: CITES annual reports have been received from Benin for all years 2002-2012 with the exception of 2003 and 2006. Benin has not published any export quotas for *P. erithacus*. Direct exports of *P. erithacus* from Benin 2002-2012 consisted of live birds, the majority of which were wild-sourced and traded as personal possessions (Table 1). The majority of the birds were imported by France. Indirect exports of *P. erithacus* originating in Benin 2002-2012 comprised small numbers of wild-sourced and pre-Convention, live birds primarily traded as personal possessions.

Table 1. Direct exports of *Psittacus erithacus* from Benin, 2002-2011. All trade was in live birds. (Annual reports have not yet been received from Benin for the years 2003 or 2006; no trade was reported in 2003, 2007-2010 or 2012.)

Source	Purpose	Reported by	2002	2004	2005	2006	2011	Total
W	P	Importer			1	2		3
		Exporter		3	1		1	5
	T	Importer						
		Exporter	4					4
C	T	Importer						
		Exporter					2	2

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The European Union suspended trade in wild-sourced *P. erithacus* from Benin in 1997; this suspension under Commission Regulation (EC) No. 578/2013 of 17 June 2013 remains in place.

Management: Parrots are listed as 'partially protected' species under the Annex II of Law No 87-014 (1987), specifying that hunting, capture or collection of eggs requires a permit, with the exception of traditional hunting (Benin, 1987). Females and young of all 'partially protected' species are however considered fully protected under Law No 2002-16 of 2004 (Benin, 2004). Decree No 90-366 (1990) specifies that permits are needed for keeping parrots in captivity (Benin, 1990).

CENTRAL AFRICAN REPUBLIC

Distribution in range State: Breeding populations were reported (BirdLife International, 2012a). Carroll (1982) recorded it in Lobaye and Haute Sangha (Mambéré-Kadéï) prefectures in the southwestern part of the country in 1978 and 1980. Green and Carroll (1991) reported that it was present only in the extreme south of the country. The probable northern limit was reported to be the southern basin of the Ouaka river (Bouet, 1961), while the western limit was reported at Bouar (western Central African Republic) (Malbrant, 1952). Dowsett (2001) listed it as occurring in three 'Important Bird Areas' (IBAs) of the southwestern part of the country: Bangui, Ngotto, and the Dzanga-Ndoki National Park.

Population trends and status: Jehl (1976) noted that in Kembé (southern Central African Republic) two or three parrots were regularly seen flying over in the evening, while a flock of 45 was considered exceptional. Green and Carroll (1991) reported it to be at least locally abundant in the extreme south. R. Cassidy (pers. comm to UNEP-WCMC, 2013) reported

flocks of 50-200 birds in the dry season in the Dzangha-Sangha special reserve (southwestern Central African Republic) in 2012, and thought that roost sites would have larger numbers.

Threats: R. Cassidy (pers. comm to UNEP-WCMC, 2013) had not encountered any hunting of *P. erithacus* in the Dzanga Sangha reserve during over four years residence. No further information on threats was located.

Trade: CITES annual reports have not yet been received from the Central African Republic for the years 2004, 2008, 2011 or 2012. The Central African Republic has not published any export quotas for *P. erithacus*. Direct exports of *P. erithacus* from the Central African Republic 2002-2012 primarily consisted of live birds, the majority of which were captive-bred and traded for commercial purposes (Table 2). Figures reported by countries of import greatly exceeded those reported by the Central African Republic in most years; the main country of import, according to data reported by countries of import, was Singapore. Trade in live birds reported by countries of import decreased considerably from 2009 onwards.

Indirect exports of *P. erithacus* originating in the Central African Republic 2002-2012 comprised live birds which were primarily captive-bred and traded for commercial purposes.

Table 2. Direct exports of *Psittacus erithacus* from the Central African Republic, 2002-2011. (No trade was reported in 2012; annual reports have not yet been received from the Central African Republic for the years 2004, 2008, 2011 or 2012.)

Term	Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
bodies	W	P	Importer			1								1
			Exporter											
live	W	B	Importer											
			Exporter										1	1
		L	Importer							1				1
			Exporter											
		P	Importer	4	5	3	3			6		2	2	25
			Exporter	8	7									15
		T	Importer				800							800
			Exporter											
	R	P	Importer						2					2
			Exporter											
	C	T	Importer				2090	850	2730	2790	650			9110
			Exporter											
	U	P	Importer	2	1									3
			Exporter	2										2
	-	B	Importer											
			Exporter								2	8		10
		P	Importer											
			Exporter				10		2					12

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: Parrots are listed under Annex B, 'partially protected' animals under Law 84-045 (Central African Republic, 1984). The law specifies that capture is subject to licenses (Central African Republic, 1984). However, capacity for the enforcement of regulations concerning wildlife was considered very low, except where assisted by non-governmental organizations (F. Maisels *in litt*. to CITES Secretariat, 2006).

The species was reported to occur in three National Parks (Bangui, Ngotto, and Dzanga-Ndoki) in the southwestern part of the country (Dowsett, 2001).

No information on captive breeding of this species in the country could be located.

GHANA

Distribution in range State: Breeding populations were reported (BirdLife International, 2012a). Grimes (1987) described *P. erithacus* as a local resident throughout the forest zone, mainly confined to reserves but occasionally occurring in forest clearings. Dändliker (1992b) reported that the species was widespread over the entire western region, the entire central region, the western part of the eastern region (west of 0°15'W), the southern part of Brong-Ahafo region (south of 8°N) and the entire Ashanti region, except the north-eastern corner (north of the Volta lake and east of Ejura, 1°20'W). Weckstein *et al.* (2009) reported it from Foso and Goaso in the Upper Guinea forests (southwestern Ghana) in 2000 and 2003.

Population trends and status: In the 1940s, flocks of 500-1000 birds were encountered near Bekwai (south-central Ghana) (Grimes, 1987); however, Grimes (1987) described it as uncommon. Dändliker (1992b) reported having observed a roost of 800-1200 birds in the Benso area (southwestern Ghana) and estimated the total population size to be 30 000-80 000 in 1991-1992, based on roost surveys. Helsens (1996) considered the species to be a "common resident in forest areas" and reported flocks of 10-50 birds in the area around Abrafo in central Ghana. Weckstein *et al.* (2009) surveyed two sites in the Upper Guinea forests (southwestern Ghana) in 2000 and 2003 and categorised the species as rare at Foso, but recorded 5-10 specimens every afternoon 16th -19th March 2003 at Goaso. Dowsett-Lemaire and Dowsett (in prep.) reported that it had become extinct in Bia National Park (southwestern Ghana), and had disappeared from the Ofinsi district forest reserves, from Ejura and Mampong areas (central Ghana), as well as the Mpraeso scarp and Takoradi areas (southern Ghana). Dowsett-Lemaire and Dowsett (in prep.) carried out surveys December 2008 – January 2009 and 2009-2010, describing the species as still widespread in the forests of the south-west, but with decreasing populations; BirdLife International (2006) considered the Ghanaian populations to be "much reduced".

Threats: Illegal export was considered as the main threat to *P. erithacus* (Grimes, 1987), both within and outside protected areas (Dowsett-Lemaire and Dowsett, in prep.), and the species was also reported to be used in traditional medicine (Dändliker, 1992). It was however reported to be able to persist at a number of sites despite high hunting pressure (Dowsett-Lemaire and Dowsett, in prep.).

Trade: CITES annual reports have been received from Ghana for all years 2002-2012 with the exception of 2006. Ghana has not published any export quotas for *P. erithacus.* According to data in the CITES Trade Database, direct exports of *P. erithacus* from Ghana 2002-2012 consisted exclusively of wild-sourced, live birds; Ghana reported the export of one bird for personal purposes in 2002, two birds for commercial purposes in 2005, three birds for personal purposes in 2011 and one bird for personal purposes in 2012, while countries of import reported the import of birds for personal purposes in 2003 (five birds), 2005 (two birds) and 2011 (two birds). The main countries of import were the United Arab Emirates and South Africa. Indirect exports of *P. erithacus* originating in Ghana 2002-2012 comprised live birds which were primarily wild-sourced and traded for personal and commercial purposes.

Management: Ghana issued a ban on parrot trade in October 1967 to allow for an ecological study, but it was lifted in 1971 with the promulgation of the Wildlife Conservation Regulations (Legislative Instrument No. 685, dated 4 March 1971) (Dändliker, 1992). In 1976, trade was again banned until November 1977, and a further ban in 1980 (L.I. No. 1240, dated 15 May 1980) led to a succession of short-term bans until June 1986, when a longer term ban (in force until at least October 1992 and lifted only once in May 1989 for export of a shipment of confiscated parrots) was instituted (Dändliker, 1992). The export of parrots is currently

prohibited (Ghana Revenue Authority, 2013). All parrots are listed under Schedule II of the Ghanaian Wildlife Conservation Regulations (1971, amended 1989), prohibiting hunting and capturing between 1st August and 1st December, and at other times requiring a valid license (Ghana, 1971). In addition, hunting, capturing and destroying young individuals or adults with young is prohibited at all times (Ghana, 1971).

Ntiamoa-Baidu *et al.* (2001) listed occurrence in 22 IBAs around Ghana. The species was believed to be somewhat protected at Kakum National Park and Ankasa Conservation Area, but it was noted that illegal hunting takes place in both (Dowsett-Lemaire and Dowsett, in prep.). However, L. Holbech (pers. comm to UNEP-WCMC, 2013) saw none in Kakum N.P. during 10 days of surveys. Ntiamoa-Baidu *et al.* (2001) also recorded it in the contiguous Assin Attandanso Resource Reserve. Based on surveys of forest reserves conducted in October-November 2003, Rainey and Asamoah (2005) considered it rare in the Draw River Forest Reserve and uncommon in the Krokosua Reserve; it was not present in the Boi-Tano Reserve, but had been recorded there during previous surveys. Demey (2008) recorded the species in Ajenjua Bepo Forest Reserve, but not in the Mamang River Forest Reserve. Dowsett-Lemaire and Dowsett (in prep.) also reported occurrence in the Forest Reserves of Ayum/Subin, Tano Ofin, Amama Shelterbelt/Bosumkese and Bobiri.

NIGERIA

Distribution in range State: *P. erithacus* was listed as breeding in Nigeria (BirdLife International, 2012a). Benson *et al.* (1988) and Elgood *et al.* (1994) reported the species to be confined to the forest region in the south, from Lagos (southwest) to Calabar (southeast) and north to Ife (southeastern Nigeria) and Ogoja (southwestern Nigeria), where large enough areas of mature high forest remained. Records up to the 1960s reported sightings of the species from a number of locations in the south of the country: Bannerman (1951) stated that it lived only in areas of creeks and swamps and recorded it from Epe, Okitipupa, Abraka, Warri, Owerri, Afikpo and Okigwi; Neumann (1908) recorded the species from Degma and Oguta, while Bouet (1961) recorded it from Bonny, Lagos, and Lekki Lagoon. Zealor (2001) listed the species from nine Important Bird Areas: Afi River Forest Reserve (southeast), Okomu National Park (south), Cross River National Park – Oban Division, Cross River National Park—Okwangwo Division (both southeast), Omo Forest Reserve (southwest), Upper Orashi forests, Biseni forests, Akassa forests, and Sunvit Farm (all in the south). McGowan (2001) listed 20 sites in Nigeria from which the species had recently been reported. These included all the above-mentioned IBA sites and the following: Ikodi parrot roost, near upper Orashi Forest Reserve, Ke (between Sombreiro and New Calabar rivers) (all in the south), Ogidibene, Kaiama and surrounding villages (west), Bonny island (southeast), Ifon Forest Reserve (southern Nigeria), and four sites that required confirmation. The CITES Management Authority of Nigeria (*in litt.* to UNEP-WCMC, 2013) reported that the species is currently found in Cross River National Park, Okumo National Park and the Gashaka sector of Gashaka Gumti National Park (east).

Population trends and status: Information about trends and status of *P. erithacus* in Nigeria was considered insufficient (R. Akagu *in litt*. to UNEP-WCMC, 2013).

Marchant (1953) considered *P. erithacus* to be widespread in the south-east, although nowhere common. Serle (1957) described it as fairly common in the outlying forests in Onitsha and Ogoja Provinces and abundant in Calabar, Rivers, and southern Owerri Province. Farmer (1979) reported only one record in 11 years: three birds in the Ife-Ife area, but Mackenzie (1979) described it as common throughout the year in the Calabar area. Elgood *et al.* (1994) described it as previously locally common where large enough areas of mature high forest remained, but noted that it had become less numerous through human persecution and habitat loss. McGowan (2001) carried out a survey in southern Nigeria from January to March 2001, during which he surveyed two areas in Bayelsa State: Akassa (18.2 km²), where he found 38 nests at a density of 2.1/km², and Kaiama (50.4 km²), where 25 nests were found, at a density of 0.5/km². He also visited Ikodi at the mouth of the Bonny river in Bayelsa State, which held the largest roost of this species in Nigeria, reported to be 700-1200 birds during the winter months, as well as Ekonganaku, Cross River State, where about 50 birds were seen flying over at dusk (McGowan,

2001). In the mid 2000s, BirdLife International (2006) considered the Nigerian populations to be decreasing.

P. Hall (*in litt*. to CITES Secretariat, 2006) reported the species as having suffered alarming reductions in numbers throughout the country, ascribed mainly to trapping. The national population at that time was estimated to comprise of less than 5000 birds in total, with around 100 birds in the south-west (particularly Okomu National Park), under 1000 in the Niger Delta (the decline here reportedly owing to heavy recent trapping) and under 1000 in the south-east (P. Hall *in litt*. to CITES Secretariat, 2006). Eniang *et al.* (2008) carried out a survey of the Ekonganaku area, of Ikpan Forest Block in south-east Nigeria, using trappers to locate nests over 14 days. Eight active nests were located and 50 parrots were seen flying over (Eniang *et al.*, 2008). Olmos and Turshak (2009) noted a dramatic decline in numbers of the species in Omo Forest Reserve, south-west Nigeria, recording only one pair and a single bird in 2007, an area where Green *et al.* (2007) had observed flocks of hundreds in the 1990s. Most recently, P. Hall (*in litt*. to Rowan Martin, 2013) reported that the species was found only in isolated populations in the south-west in Omo Forest Reserve and Okomu National Park and in the south-east in the Cross River National Park. He estimated that the national population was around a thousand individuals (P. Hall *in litt*. to Rowan Martin, 2013).

Threats: Rapid loss of forest was considered a particular threat in Nigeria (BirdLife International, 2013). McGowan (2001) noted that many birds nested in mangroves but fly to feed in patches of rainforest, which are increasingly degraded and fragmented, forcing the parrots to fly further, placing them under considerable food-stress.

Eniang *et al.* (2008) reported trade in this species in south-east Nigeria, with birds coming in from various localities and being sold in Calabar, Port Harcourt, Lagos, Abuja and Kano. The CITES MA of Nigeria (*in litt.* to UNEP-WCMC, 2013) confirmed that *P. erithacus* was threatened due to illegal domestic and international trade for pets, as well as loss of habitat. Ineffective legislation and corruption were considered contributing factors to the escalating illegal trade in parrots in Nigeria (Eniang *et al.*, 2008).

Trade: CITES annual reports have not yet been received from Nigeria for the years 2005 or 2010-2012. Nigeria has not published any export quotas for *P. erithacus*. Direct exports of *P. erithacus* from Nigeria 2002-2012 primarily comprised live birds, the majority reported only by the countries of import; these were mainly traded in small numbers, with the exception of the import of 400 live, captive-bred birds for commercial purposes by the United Arab Emirates in 2005 (Table 3). No trade was reported in 2010-2012.

Indirect exports of *P. erithacus* originating in Nigeria 2002-2012 comprised small numbers of W, F and pre-Convention live birds, the majority of which were traded for personal purposes.

Table 3. Direct exports of *Psittacus erithacus* from Nigeria, 2002-2009. (Annual reports have not yet been received from Nigeria for the years 2005 or 2010-2012; no trade was reported in 2004, 2006, 2007 or 2010-2012.)

Term	Source	Purpose	Reported by	2002	2003	2005	2008	2009	Total
feathers	I	T	Importer				3		3
			Exporter						
live	W	P	Importer	3	1				4
			Exporter	1					1
	C	P	Importer	1					1
			Exporter						
		T	Importer			400			400
			Exporter						
	O	P	Importer					1	1
			Exporter						
	I	P	Importer	1					1
			Exporter						

Term	Source	Purpose	Reported by	2002	2003	2005	2008	2009	Total
		T	Importer	6					6
			Exporter						

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The CITES MA of Nigeria (*in litt.* to UNEP-WCMC, 2013) reported no records of trade in this species.

Dändliker (1992) noted that there was national demand for heads, legs and tail feathers of this species for use as medicine and magical fetishes, while McGowan (2001) reported that most trapped birds were exported. Nikolaus (2001) surveyed most markets in Nigeria in August-September 1999 and found 73 specimens of *P. erithacus* offered for sale.

The European Union suspended trade in wild-sourced *P. erithacus* from Nigeria in 2002; this suspension under Commission Regulation (EC) No. 578/2013 of 17 June 2013 remains in place.

Management: The hunting, capture or trade of *P. erithacus* (all parrots) was prohibited in Nigeria under Act No. 11 from 1985 (Nigeria, 1985). Nigeria's MA placed a moratorium on the issuance of CITES permits for this species in October 2000, due to increasing awareness that its status in the country was not known, but this moratorium was lifted in March/April 2001, despite recommendations to the contrary by McGowan (2001). Based on consideration of a report on CITES implementation of illicit trade from Nigeria, the CITES Standing Committee recommended suspension of all trade in CITES-listed species from the country in June 2005 (CITES Notification No. 2005/038); the suspension of trade was withdrawn in August 2011, based on a report on the enactment of new legislation and *in situ* work by the Secretariat (CITES Notification No. 2011/030). In May 2011, the new 'National Environmental (Protection of Endangered Species in International Trade) Regulations' were published (Okorodudu-Fubara, 2012).

The species was reported to occur in a number of protected areas (Zealor, 2001; CITES MA of Nigeria, *in litt.* to UNEP-WCMC, 2013).

TOGO

Distribution in range State: The species was listed as an introduced breeding species in the country (BirdLife International, 2012a), occurring in southern Togo (BirdLife International, 2013). It was recorded by Millet-Horsin (1923) from southern Togo and one bird was recorded at Mo (central Togo) by Cheke and Walsh (1980).

Population trends and status: Millet-Horsin (1923) described the species in southern Togo beyond the lagoon as very rare, becoming less rare further north. Only one subsequent record from the country has been reported by Cheke and Walsh (1980, 1996). In 1992 the MA of Togo assessed the population in the country as nonviable, based on a survey conducted the same year (PH1 sigtrad1.ref, CITES SC.29.11). R. Martin (pers. comm to UNEP-WCMC, 2013) reported no sightings of *P. erithacus* from the western part of the country nor the eastern part during surveys conducted in 2010 and 2011.

Threats: No information was located.

Trade: CITES annual reports have been received from Togo for all years 2002-2011 with the exception of 2006. Togo has not published any export quotas for *P. erithacus.* Direct exports of *P. erithacus* from Togo 2002-2012 comprised live birds which were primarily wild-sourced and traded as personal possessions; trade reported by Togo exceeded that reported by countries of import in most years (Table 4).

Indirect exports of *P. erithacus* originating in Togo 2002-2012 comprised small numbers of live birds, the majority of which were wild-sourced and traded for personal purposes.

Table 4. Direct exports of *Psittacus erithacus* from Togo, 2002-2011. All trade was in live birds. (No annual reports have yet been received from Togo for 2006 or 2012; no trade was reported in 2006 or 2012.)

Source	Purpose	Reported by	2002	2003	2004	2005	2007	2008	2009	2010	2011	Total
W	P	Importer		1	4				1		1	7

Source	Purpose	Reported by	2002	2003	2004	2005	2007	2008	2009	2010	2011	Total
		Exporter	6	7	9	4	6	2	13	7	1	55
	T	Importer										
		Exporter			2						1	3
R	P	Importer								1		1
		Exporter								3		3
C	P	Importer	1									1
		Exporter										

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The European Union suspended trade in wild-sourced *P. erithacus* from Togo from 1997 until 26/11/2010.

Management: Capture, hunting and export of animals are subject to license, as per Act No. 4 from 1968 (Togo, 1968) and its amendments (Ministère de la Justice, 2008), such as Decree No. 80-171 from 1980 (Togo, 1980) and Decree No. 90-178 from 1990 (Togo, 1990); however, the species does not appear to be protected in Togo.

In the early 1990s, *P. erithacus* was included in Phase I of the Significant Trade Review and the Animals Committee subsequently formulated the following recommendations, which were communicated to Togo's CITES MA in June 1992:

"The Management Authority of Togo should institute a moratorium on exports until it can provide evidence that the species occurs in sustainable numbers in the country (primary rec.); and should undertake population surveys of the species (secondary rec.)" (AC Doc. 8.10).

In October 1992, the MA of Togo responded that, based on a survey conducted that year, there was not a viable population in the country, and therefore no further export permits would be issued (PH1 sigtrad1.ref, CITES SC.29.11).

Many of the specimens were being traded nationally e.g. as red tail feathers for medicine (Cheke and Walsh, 1996). The CITES MA in Togo (pers. comm to UNEP-WCMC, 2004) noted that over the previous 10 years the species had only been used nationally, as a pet.

UGANDA

Distribution in range State: The species was listed as breeding in the country (BirdLife International, 2012a). Britton (1980) reported it to be resident (but breeding unproved) in the west (Budongo, Bugoma, and Bwamba forests, and in Rwenzori National Park) and south-east (Mengo and Busoga, including the Ssese islands in south central Uganda). Sekercioglu (2002) recorded it in Kibale National Park (southwest) in 1996. Byaruhanga *et al.* (2001) listed the species as occurring in seven Important Bird Areas: Bwindi Impenetrable National Park, Kibale National Park, Queen Elizabeth National Park (all southwest), Semliki National Park (west), Mabira Forest Reserve, Sango Bay area (both south central), and Budongo Forest Reserve. It was recorded in 14 out of 31 forest reserves surveyed in the mid 1990s (Davenport and Howard, 1996a, 1996b; Davenport *et al.*, 1996a, 1996b, 1996c, 1996d, 1996e, 1996f, 1996g, 1996h, 1996i, 1996j, 1996k, 1996l). Plumptre *et al.* (2010) surveyed several forest areas around Bugoma for six months in 2010 and found *P. erithacus* only in Bugoma Forest Reserve. Dranzoa *et al.* (2011) surveyed four small areas of forest on the north shore of Lake Victoria from the 1970s onwards; *P. erithacus* was found only in Ziika, a forest patch of 12 ha, where it was seen on one of nine Timed Species Counts (TSC) in 1989, and on less than half of the 24 TSC's in 2002-2009.

Population trends and status: Mackworth-Praed and Grant (1952) reported that *P. erithacus* might be extending its range in East Africa, but no further evidence for this has been found. Britton (1980) described it as a locally common resident. The Game Department of Uganda (in *litt. to* UNEP-WCMC, 1987) reported that the highest populations at the time were in Buganda and on the Ssese islands.

Carswell *et al.* (2005) considered the species as having been formerly common, especially on the islands and shoreline of Lake Victoria, but reported that it had become quite rare especially on the Ssese islands; they considered the species to be possibly threatened, although it was still fairly common in Mabira Forest. Amuno *et al.* (2007) counted the numbers of *P. erithacus* at flyways in Mabira and Budongo Forest Reserves between October 2002 and May 2003, and estimated the total populations at 342 and 714 birds, respectively. The Mabira population was considered at risk of becoming more fragmented, as the local forests were threatened with further degradation (Amuno *et al.*, 2007). Point counts in 42 locations within farmland around Lake Victoria recorded the following proportion of sightings for the species: 0.36 overall (n=42), of which 0.74 were in forest sites (n=19) and 0.04 in farmland sites (n=23) (Chamberlain *et al.*, 2009).

Sekercioglu (2002) surveyed 10 forest plots in Kibale National Park with different management programmes, between June and August 1996, but only saw a total of three *P. erithacus*. In Kibale Forest Reserve the species' abundance was correlated with the presence of fruiting trees, with the largest numbers appearing when particular tree species produce a seed crop, while at other times sightings were rare, suggesting that birds ranged over a very large area (Perrin, 2012). Movements into and out of main forests seemed to follow regular flyways and inter-forest movements were believed to increase with forest fragmentation (Perrin, 2012).

In Kampala, the species' numbers were believed to be increasing, which was thought to be due to an increase in wild birds and not in escaped or released birds (D. Pomeroy, pers. comm. to UNEP-WCMC, 2013).

Threats: Carswell *et al.* (2005) noted that there was an active internal trade of live birds for pets and exhibitions, and it was believed that many captive parrots in Uganda came from DR Congo (A. Plumptre *in litt.* to UNEP-WCMC, 2005). The Uganda Wildlife Authority (UWA, 2012) reported that the species was subject to illegal trade. Amuno *et al.* (2007) considered habitat degradation to be a major threat to the species.

Trade: CITES annual reports have not yet been received from Uganda for the years 2010-2012. Uganda has not published any export quotas for *P. erithacus*. Direct exports of *P. erithacus* from Uganda 2002-2012 comprised live birds which were primarily wild-sourced and traded as personal possessions (Table 5). Trade decreased over the ten-year period overall, with no trade reported in 2010-2012.

Indirect exports of *P. erithacus* originating in Uganda 2002-2012 comprised small numbers of live birds, the majority of which were wild-sourced and traded for personal purposes.

Table 5. Direct exports of *Psittacus erithacus* from Uganda, 2002-2009. All trade was in live birds. (Annual reports have not yet been received from Uganda for the years 2010-2012; no trade was reported in 2008 or 2010-2012.)

Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2009	Total
W	P	Importer	3	1		3	2		1	10
		Exporter	15	5	6	10				36
	T	Importer	2							2
		Exporter	1			1		1	1	4
C	S	Importer	20							20
		Exporter								

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: The hunting, capture or other utilization of parrots is prohibited without a special permit, as per the Uganda Wildlife Act (Uganda, 1996).

The Uganda Wildlife Authority reported the confiscation of 270 *P. erithacus* in 2011, which were destined for export to Europe; 204 of these birds were later released (UWA, 2012). In 2013, "several hundred" birds originating from DR Congo were reported to have been confiscated in Uganda and were later released in forest areas in the west of the country (D. Pomeroy, pers. comm. to UNEP-WCMC, 2013).

The species was confirmed to occur in a number of protected areas in Uganda (Britton, 1980; Byaruhanga *et al.*, 2001; Sekercioglu, 2002).

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

CITES annual reports have not been received from Benin for 2003 or 2006, the Central African Republic for 2004, 2008 or 2011, Ghana for 2006, Nigeria for 2005, 2010 or 2011, Togo for 2006 or Uganda for 2010 or 2011.

There were notable discrepancies in trade reported by countries of import and the Central African Republic and Togo.

Illegal trade in this species was reported to occur in Uganda.

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Chamaeleo gracilis Hallowell, 1842: Benin, Cameroon, Ghana, Guinea, Togo, Uganda

Chamaeleonidae, Graceful Chameleon

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee included *Chamaeleo gracilis* (all range States) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 specified that *C. gracilis* met a high volume trade threshold in 2008 and 2009 and the criterion of high variability in trade between 1999 and 2008. At the 26th meeting of the AC, responses had been received from the Democratic Republic of the Congo (hereafter referred to as DR Congo), Ethiopia, Guinea-Bissau and the United Republic of Tanzania (AC26 Doc. 12.3). Angola, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Equatorial Guinea, Eritrea, Gabon, Gambia, Ghana, Guinea, Kenya, Liberia, Nigeria, Senegal, Sierra Leone, Somalia, Sudan, Togo and Uganda were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Angola, Burkina Faso, Central African Republic, Chad, Congo, Cote d'Ivoire, Equatorial Guinea, Eritrea, Gabon, Gambia, Kenya, Liberia, Nigeria, Senegal, Sierra Leone, Somalia and Sudan were removed from the process on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Chamaeleo gracilis* recommendations.

		General summary
		Widespread and not considered to be threatened; however, population status is unknown.
Range State	**Provisional category**	**Summary**
Benin	Possible Concern	Moderate levels of trade 2002-2012 mainly in live, ranched individuals. Two instances of possible quota excesses were reported in 2010 (wild) and 2012 (ranched). The basis of quota setting is unclear. Population status is unclear. Therefore, categorised as Possible Concern; questions not related to the implementation of Article IV, paragraps 2 (a), 3 or 6 (a) remain.
Cameroon	Least Concern	Low levels of trade 2002-2011 and none reported since 2006. Population decrease reported in some areas, but widespread and at least locally common. Therefore, categorised as Least Concern.
Ghana	Possible Concern	Moderate levels of trade 2002-2011 mainly in wild-sourced individuals, and trade within quota. Appears widespread. Population status and basis for non-detriment finding is unclear. Therefore, categorised as Possible Concern.
Guinea	Least Concern	Virtually no reported international trade 2002-2011. Population status is unclear. Based on low levels of trade, categorised as Least Concern.
Togo	Urgent Concern	Relatively high levels of trade primarily in live, ranched individuals. Four instances of possible quota excesses were reported in 2002-2003 and 2007 (wild) and 2002 (ranched). Concern was raised over the basis of quotas in 2002; quotas have remained the same since then. Available information indicates restricted distribution, and the species appears to be rare. Therefore, categorised as Urgent Concern.

Uganda	Least Concern	Low levels of trade in wild-sourced individuals 2002-2011. Appears widespread. Therefore, categorised as Least Concern.

B. Species overview

Taxonomic note: Two distinct subspecies, *C. g. gracilis* and *C. g. etiennei*, were recognised (Klaver and Böhme, 1997; Tilbury, 2010); some authors elevate *C. g. etiennei* to a full species level (Razzetti and Msuya, 2002; Uetz, 2013).

C. gracilis was considered to closely resemble *C. senegalensis*, *C. dilepis* (Bartlett and Bartlett, 2001) and *C. anchietae* (Spawls *et al.*, 2002).

Biology: *Chamaeleo gracilis* is a large, arboreal chameleon (Spawls *et al.*, 2002), that mainly inhabits savannah environments with acacia trees (Spawls *et al.*, 2002; Malonza *et al.*, 2006; Tilbury, 2010) but is also found in forests (Akani *et al.*, 2001; Razzetti and Msuya, 2002; Böhme *et al.*, 2011), bushy farmland (Akani *et al.*, 2001), and human settlements (Wagner *et al.*, 2008).

It reaches sexual maturity at approximately 5-6 months (Bartlett and Bartlett, 2005), and produces one to two clutches per year (Rearick *et al.*, 2013). Typical clutch size is 10-25 eggs (Spawls *et al.*, 2002), but clutches of up to 45 eggs were recorded (Engeman *et al.*, 2005; Tilbury, 2010). Incubation lasts 6-7 months (Bartlett and Bartlett, 2005).

General distribution and status: *C. gracilis* is widespread in the sub-Saharan savannah belt, and its range reaches across Africa from Somalia in the east to Senegal in the west (Spawls and Rotich, 1997; Spawls *et al.*, 2002; Djeukam, 2007), and Sudan in the north (Townsend and Larson, 2002; Aurioles-Gamboa *et al.*, 2010). *C. g. gracilis* is the more widespread of the two subspecies, (Klaver and Böhme, 1997; Tilbury, 2010) (Figure 3), whereas *C. g. etiennei* is limited to the west coast of central Africa, including Angola, Gabon, Republic of Congo and DR Congo (Klaver and Böhme, 1997; Tilbury, 2010).

Engeman *et al.* (2005) reported that introduced *C. gracilis* may be reproducing in Florida.

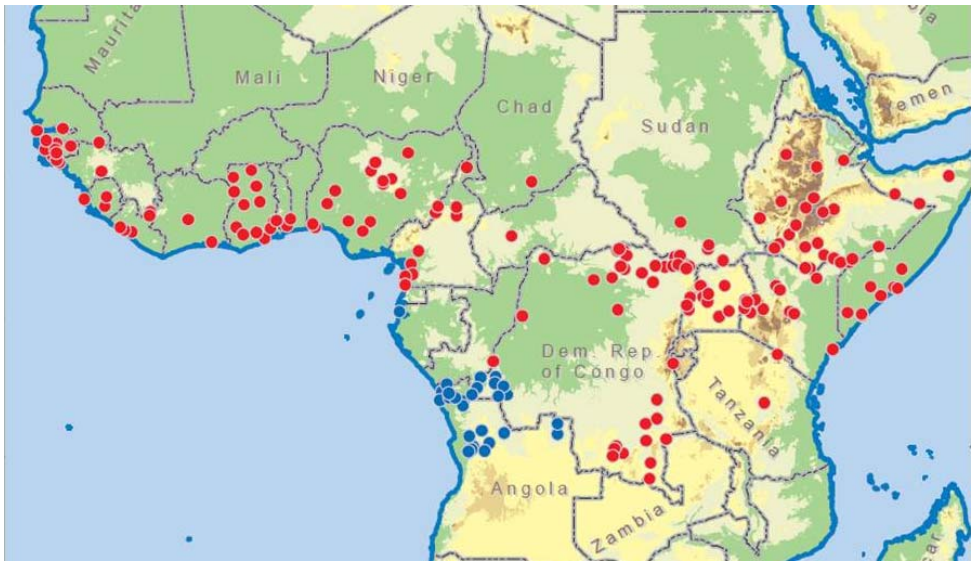

Figure 3. Map showing locality records of *Chamaeleo gracilis gracilis* (red data points) and *C. g. etiennei* (blue data points). (Source: Tilbury, 2010).

The population status of the species was considered poorly known (IUCN *et al.*, 1996), but it was regarded as not threatened (IUCN *et al.*, 1996; Tilbury, 2010). As a widespread species, *C. gracilis* was not considered to be of priority conservation concern (Carpenter *et al.*, 2004).

Threats: Hunting for traditional medicine and habitat loss were regarded as the main threats to the species (IUCN *et al.*, 1996). The annual setting of fires to large areas of the countryside was reported to kill many chameleons, and combined with intensive harvesting of adults, potentially suppress populations (C. Tilbury, *in litt.* to UNEP-WCMC, 2013).

C. Anderson (*in litt.* to UNEP-WCMC, 2013) considered the species to be exported in "extreme excess", and C. Tilbury (*in litt.* to UNEP-WCMC, 2013) noted that the species "could become locally scarce if harvested intensively".

Overview of trade and management: *C. gracilis* was listed in CITES Appendix II on 04/02/1977. It was reported to be one of the most important chameleon species in the global market (Carpenter *et al.*, 2004). The species was reported to be commonly available in the pet trade in the United States and Europe as wild-caught specimens (Bartlett and Bartlett, 2001; C. Anderson, *in litt.* to UNEP-WCMC, 2013; Rearick *et al.*, 2013;). C. Anderson (*in litt.* to UNEP-WCMC, 2013) reported that a typical price in the United States was less than USD 20; they were reported to have high mortality in captivity due to dehydration and high parasite load (Bartlett and Bartlett, 2001; Rearick *et al.*, 2013). In an assessment of morbidity and mortality in captivity by Altherr and Freyer (2001), *C. gracilis* was considered unsuitable for private husbandry due to being 'difficult to keep' or with 'high mortality in captivity', 'difficult to breed' and requiring conditions that are difficult to simulate.

N.L. Gonwouo (*in litt*. to UNEP-WCMC, 2013) noted that "Given the large distribution range from West to East Africa and the porous nature of national boundaries, it is difficult to effectively asses the country [of] origin of the species in the pet market if not officially documented."

C. gracilis was included in the CITES Review of Significant Trade in 1988 and in 1996. In the 1996 Review, it was considered that trade may affect populations at the local level; however, IUCN *et al.* (1996) noted that "no data exist to corroborate this". It was concluded that the increase in reported trade warranted "some concern, although absolute volumes are not high" (IUCN *et al.*, 1996).

C. Country reviews

BENIN

Distribution in range State: Harwood (2003) considered the species likely to occur in Benin, noting that dry woodland and savannah habitats suitable for the species were "relatively prevalent" in the country. The range map in Tilbury (2010) shows locality records near the border in neighbouring Togo and Nigeria.

Ullenbruch *et al.* (2010) reported occurrence of the species in Abomey-Didja (south-central Benin) and in Pendjari National Park (north-west Benin). The species was also recorded in the Beninese part of the W Transfrontier Biosphere Reserve (northern Benin) in surveys conducted in 2006-2007 (Chirio, 2009). During interviews conducted throughout Benin by Sinsin *et al.* (2008), *C. gracilis* was identified as a widespread species, recorded by 72.7 per cent of the interviewees as a species occurring in their local environment.

The CITES Management Authority of Benin (*in litt.* to UNEP-WCMC, 2013) confirmed occurrence in the departments of Zou (south-central Benin), Plateau (southeastern Benin), Mono (southwestern Benin) and Atlantique (southern Benin).

Population trends and status: Interviews with local communities conducted by Sinsin *et al.* (2008) suggested that chameleon populations in Benin are generally in decline, and this was confirmed by the CITES MA of Benin (*in litt.* to UNEP-WCMC, 2013).

Threats: *C. gracilis* was reported to be collected for local markets and sold for traditional medicinal purposes, however this trade is illegal and no estimates of trade volumes are available (CITES MA of Benin *in litt.* to UNEP-WCMC, 2013). Sinsin *et al.* (2008) considered all the Beninese chameleons (*C. gracilis*, *C. necasi* and *C. senegalensis*) to be "under heightened threat" and it was cautioned that "export market demand, should it persist at current levels, will result in the extinction of these species, given that they enjoy little or no effective protection". Captive breeding was recommended as means of reducing pressure towards wild populations (Sinsin *et al.*, 2008).

Trade: CITES annual reports have been received from Benin for all years 2002-2012 with the exception of 2003 and 2006. Benin published export quotas for ranched specimens of *C. gracilis* every year from 1997 onwards and for wild-sourced specimens from 2010 onwards (Table 1). The quota for ranched specimens appears to have been exceeded in 2012 according to data reported by Benin; Data for 2012 reported by countries of import are not yet available. The quota for wild-sourced specimens appears to have been exceeded in 2010 according to data reported by countries of import; Benin did not report any wild-sourced trade. A permit analysis revealed that the export permit reported by the country of import of the wild-sourced trade, Ghana, has not been reported by Benin for the species *C. gracilis*.

Table 1. CITES export quotas for ranched and wild-sourced *Chamaeleo gracilis* from Benin and global direct exports, as reported by the countries of import and export, 2002-2013. No quota for wild-sourced specimens was published prior to 2010. (No annual report has been received from Benin for the years 2003 or 2006; trade data for 2013 are not yet available.) (All trade was in live specimens with the exception of two bodies reported by the country of import in 2002; for each year, trade to which the quota does not apply in that year is greyed out.)

	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (ranched)		8550	4550	4550	3000	4000	3000	3000	3000	2500	2500	2500	2500
Quota (wild-sourced)										200	200	200	200
ranched	Importer	1123	2178	931	582	280	196	559	1500	1210	1312		
	Exporter			1390	600		760	870	1875	1300	2470	2865	
wild-sourced	Importer	510		195				500		400			
	Exporter												

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct exports of *C. gracilis* from Benin 2002-2012 primarily consisted of live specimens traded for commercial purposes, the majority of which were ranched (Table 2). Benin only reported trade in ranched specimens; however, countries of import reported trade in captive-bred and wild-sourced specimens in addition to ranched specimens. The principal countries of import were the United States and Ghana.

Indirect exports of *C. gracilis* originating in Benin 2002-2012 consisted of live individuals traded for commercial purposes, the majority of which were ranched with a small proportion wild-sourced.

The European Union suspended trade in wild-sourced *C. gracilis* from Benin in 2002; this suspension under Commission Regulation (EC) No. 578/2013 of 17 June 2013 remains in place.

Table 2. Direct exports of *Chamaeleo gracilis* from Benin, 2002-2012. All trade in live specimens was for commercial purposes; the bodies were traded for scientific purposes. (No annual report has been received from Benin for the years 2003 or 2006.)

Term	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
bodies	W	Importer	2											2
		Exporter												
live	C	Importer									200	173		373
		Exporter												
	R	Importer	1123	2178	931	582	280	196	559	1500	1210	1312		9871
		Exporter			1390	600		760	870	1875	1300	2470	2865	12130
	W	Importer	508		195				500		400			1603
		Exporter												

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The CITES MA of Benin (*in litt.* to UNEP-WCMC, 2013) reported that the species is traded illegally from Benin to Cameroon for medicinal purposes.

Management: Chameleons are included as "non-game" species under the Annex IV of Law No 87-014 (1987), specifying that permits are required for the hunting and capture of all species, with the exception of traditional hunting (Benin, 1987). Decree No 90-366 (1990) specifies that permits are needed for keeping chameleons in captivity, and details the documentation needed from farming operations (Benin, 1990).

Carpenter (2004) reported that Benin started exporting chameleons in 1992. During visits conducted to reptile farms in Benin in 2002, Harwood (2003) recorded three reptile farms that were producing chameleons, and at least one of these had the capacity of producing captive-bred *C. gracilis*. According to Ineich (2006), there were at least four farming operations holding *C. gracilis*; one farm was reported to hold 1500 specimens, and another one 900 specimens, 75 per cent of which were females.

Harwood (2003) reported that paid licenses and authorisation from the CITES MA were required for the capture of wild specimens to improve the breeding stock on chameleon farms. Information on the breeding capacity of farms was reportedly used as the basis of quota setting (Harwood, 2003), taking into consideration that 20 per cent of juveniles were released into the wild from ranching by the end of every season and that the egg and juvenile mortality was estimated to be 10 per cent (Ineich, 2006). However, Harwood (2003) noted that the basis of stock numbers provided by farmers was unclear and pointed out that the quota system did not sufficiently take into account the age structure of the population and differences in reproductive output between age classes.

Based on visits to breeding facilities conducted during 2004, Ineich (2006) expressed concern over erroneous use of source codes, reporting that reptile exports under source code R were likely to be a mixture of sources F, C, R and W, and questioned the basis of ranching in Benin, considering that many authors did not regard Benin as a range country. He cautioned that the export of wild-sourced reptiles as farmed was likely considering the high costs of maintaining breeding stock (Ineich, 2006).

CAMEROON

Distribution in range State: Occurrence in Cameroon was confirmed (IUCN *et al.*, 1996; Klaver and Böhme, 1997; LeBreton, 1999; Foguekem *et al.*, 2009; Barej *et al.*, 2010; Tilbury, 2010; Uetz, 2013). The range map of Tilbury (2010) indicates occurrence throughout the country apart from the southeastern parts, and the map of Chirio and LeBreton (2007) indicates absence in the southern part of Cameroon and the northern tip of the country. N. L. Gonwouo (*in litt*. to UNEP-WCMC, 2013) described the distribution as follows: "it has been recorded from the coast around Kribi [southwestern Cameroon] in the south extending northward in the savannah and Sahel zones where it is commonly observed on

shrubs and trees." M. LeBreton (pers. comm. to UNEP-WCMC, 2013) noted that the species was absent in the forested areas of southern Cameroon.

Herrmann *et al.* (2007) recorded *C. gracilis* during visual surveys and pitfall trapping in the Tchabal Mbabo mountain range in central Cameroon during 1998 and 2000.

Population trends and status: Chirio and LeBreton (2007) considered *C. gracilis* to be locally common. N.L. Gonwouo (*in litt*. to UNEP-WCMC, 2013) described the populations in the southern parts of the country around latitude 4°N as "scanty", whereas in the savannah of the Adamawa region (north-central Cameroon), the species was considered abundant.

The populations were considered to be decreasing in some areas with high human impact (N.L. Gonwouo, *in litt.* to UNEP-WCMC, 2013).

Threats: Habitat loss was reported to be a particularly important threat in the Adamawa savannah area where the main populations are found (N.L. Gonwouo, *in litt*. to UNEP-WCMC, 2013). Chirio and LeBreton (2007) considered savannah fires as a threat to the species.

M. LeBreton (pers. comm. to UNEP-WCMC, 2013) noted that the species was not targeted by intensive collection for pet trade, as the Cameroonian populations were relatively more difficult to access and transport to the market compared to many other populations in West Africa. Gonwouo (2002) interviewed local reptile collectors in the Mount Cameroon area, revealing that the mortality of wild-caught *Chamaeleo* spp. was typically at least 25 per cent, and that the majority of wild-caught specimens died within a month of capture.

Trade: CITES annual reports have not yet been received from Cameroon for the years 2008 or 2010-2012. Cameroon has not published any export quotas for *C. gracilis*. Direct exports from Cameroon 2002-2012 were all wild-sourced and consisted of bodies and specimens traded for scientific purposes and live individuals traded for commercial purposes (Table 3). No trade was reported after 2006.

No indirect exports of *C. gracilis* originating in Cameroon were reported 2002-2012.

Table 3. Direct exports of *Chamaeleo gracilis* from Cameroon, 2002-2006. All trade was wild-sourced. (No annual report has been received from Cameroon for the years 2008 or 2010-2012; no trade was reported in 2005 or 2007-2012.)

Term	Purpose	Reported by	2002	2003	2004	2006	Total
bodies	S	Importer		115			115
		Exporter					
live	T	Importer				50	50
		Exporter	30				30
specimens	S	Importer					
		Exporter			2		2

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *C. gracilis* is categorised as a "Class B" protected animal (species at risk of becoming threatened and requiring specific management measures) under the Decree No 0648/MINFOF of 2006 (Cameroon, 2006). Section 78 of Law No. 94/01 specifies that the hunting and capture of Class B species requires a permit (Republique du Cameroun, 1994). N.L. Gonwouo (*in litt*. to UNEP-WCMC, 2013) noted that apart from the capture permits, there were no specific regulations regarding the collection for pet trade.

C. gracilis was reported to occur in the Mbembe Forest Reserve (Nsanyi, 2012), and the Bouba Ndjidah National Park (Diffo, 2001).

GHANA

Distribution in range State: Occurrence of *C. [g.] gracilis* in Ghana was confirmed (IUCN *et al.*, 1996; Klaver and Böhme, 1997; Tilbury, 2010; Uetz, 2013). The range map of Tilbury (2010) indicates occurrence throughout the country. However, the species was not recorded in visual surveys conducted

in the Kyabobo National Park of Togo Hills during 2001 (eight-day visit), 2004 (nine-day visit) or 2005 (20-day visit) (Leaché *et al.*, 2006). It was reported to occur in the Draw River, Boi-Tano and Krokosua Hills forest reserves in southwestern Ghana (Ernst *et al.*, 2005).

Population trends and status: No information was located.

Threats: The species was reportedly used for medicinal and ceremonial purposes in some areas (Ernst *et al.*, 2005).

Trade: CITES annual reports have been received from Ghana for all years 2002-2012 with the exception of 2006. Ghana published annual export quotas for 1500 wild-sourced *C. gracilis* every year from 1997 onwards, apart from 2005-2007, when no quotas were published; from 1999 onwards, the quota applied to live specimens only (Table 4). No quota has yet been published for 2013. Trade remained within the quota in every year according to data reported by both the countries of import and of export.

Table 4. CITES export quotas for live, wild-sourced *Chamaeleo gracilis* from Ghana and global direct exports, as reported by the countries of import and of export, 2002-2012. (No annual report has been received from Ghana for the years 2006, 2011 or 2012; no quotas were published for 2005-2007 or 2013.)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Quota	1500	1500	1500	-	-	-	1500	1500	1500	1500	1500
Reported by importers	659	527	343	576	234	826	597	565	779	754	
Reported by exporters	680	719	520	750		890		1070	1320	1160	673

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct exports of *C. gracilis* from Ghana 2002-2012 primarily consisted of live, wild-sourced specimens traded for commercial purposes (Table 5). Countries of import reported trade in ranched specimens in 2002-2004 and 2009-2010, while Ghana reported the export of ranched specimens in 2004 only. The United States was the principal country of import.

Table 5. Direct exports of *Chamaeleo gracilis* from Ghana, 2002-2012. All trade was in live specimens. (No annual report has been received from Ghana for the years 2006 or 2011.)

Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
W	B	Importer	4											4
		Exporter												
	T	Importer	655	527	343	576	234	826	597	565	779	754		5856
		Exporter	680	719	520	750		890		1070	1320	1160	673	7782
R	T	Importer	25	100	100					106	45			376
		Exporter			25									25

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Indirect exports of *C. gracilis* originating in Ghana 2002-2012 principally comprised wild-sourced, live specimens traded for commercial purposes.

Carpenter (2004) reported that *C. gracilis* was the main chameleon species traded from Ghana between 1978 and 2001, contributing 59 per cent of chameleon exports.

The European Union suspended trade in wild-sourced *C. gracilis* from Ghana in 2009; this suspension under Commission Regulation (EC) No. 578/2013 of 17 June 2013 remains in place.

Management: The species is not listed under the Schedules of protected animals under the Ghanaian Wildlife Conservation Regulations of 1971 (Ghana, 1971).

Ghanaian reptile facilities were reported to produce mainly ranched specimens and to have a good level of control under the CITES Authorities (Ineich, 2006).

GUINEA

Distribution in range State: Occurrence in Guinea was confirmed (IUCN *et al.*, 1996; Klaver and Böhme, 1997; Tilbury, 2010; Böhme *et al.*, 2011; Uetz, 2013). The range map by Tilbury (2010) indicates occurrence in central-southern and southeastern Guinea. The CITES MA of Guinea (pers. comm. to UNEP-WCMC, 2013) reported that *C. gracilis* is found particularly in the upper Guinea (Haute-Guinée, northeastern Guinea) region.

Population trends and status: The CITES MA of Guinea (pers. comm. to UNEP-WCMC, 2013) reported that the abundance of the species was linked with the distribution of different ecosystems and annual rainfall patterns.

Threats: No information could be located.

Trade: CITES annual reports have not yet been received from Guinea for the years 2007, 2009, 2011 or 2012. Guinea has not published any export quotas for *C. gracilis*. According to data in the CITES Trade Database, direct trade in *C. gracilis* from Guinea 2002-2012 consisted of five wild-sourced bodies and two wild-sourced tails imported by Germany in 2011 for commercial purposes, reported by Germany only. No indirect exports of *C. gracilis* originating in Guinea were reported 2002-2012.

Management: No chameleon species are listed under the Annexes of protected species of the Guinean Wildlife Law L/99/038/AN of 1999 (Guinea, 1999). Article 61 specifies that the species that are not listed as protected may be hunted in accordance with the hunting regulations, however Article 62 prohibits unlicensed commercial trading and unlicensed possession of over five individuals in the same place (Guinea, 1999).

TOGO

Distribution in range State: Tilbury (2010) and IUCN *et al.* (1996) confirmed occurrence in the country. The range map of Tilbury (2010) indicates occurrence in southern Togo. The species was considered to be potentially present in all savannah habitats with tree or shrub cover in Togo (Harris, 2002), and Harwood (2003) noted that suitable habitats were “relatively prevalent” in the country. However, based on transect surveys conducted during 1999-2000 to map the populations of *C. gracilis* in Togo, Harris (2002) reported that the distribution of the species was “relatively restricted” and patchy; very few occurrences were recorded outside specific localities identified by chameleon hunters.

Population trends and status: Harris (2002) recorded 18 specimens of *C. gracilis* in 26 night-time transect surveys conducted in hunted and non-hunted sites during 1999-2000. The species was reported to be less abundant and to have a narrower range than *C. senegalensis* (Harris, 2002). Villagers interviewed in the surveyed areas confirmed few sightings of *C. gracilis*, indicating it was rare, and generally thought that the frequency of sighting the species, along with other reptiles, had decreased during the previous five years (Harris, 2002).

Threats: Chameleons were reported to be “extensively” used and sold for traditional religious and medicinal practices in Togo, and dried specimens were commonly found in local markets (Harris, 2002). It was noted that due to being generally difficult to observe, *C. gracilis* was mainly hunted at night using torches (Harris, 2002).

Trade: No annual reports have yet been received from Togo for the years 2006 or 2012. Togo published export quotas for wild-sourced *C. gracilis* every year from 1997 onwards and for ranched specimens from 1998 onwards (Table 6). The quota for wild-sourced specimens appears to have been exceeded in 2002 and 2003 according to data reported by both countries of import and Togo, and in 2007 according to data reported by Togo only; the quota for ranched specimens appears to have been exceeded in 2002 according to data reported by countries of import only. Togo did not specify whether its 2002-2003 or 2007 annual reports were compiled on the basis of permits issued or actual trade. Analysis of permit numbers reported by countries of import revealed that the apparent quota excesses in 2002 and 2003 could not be explained by export permits having been issued in the previous year.

Table 6. CITES export quotas for wild-sourced and ranched *Chamaeleo gracilis* from Togo and global direct exports, as reported by the countries of import and of export, 2002-2013. (No annual reports have been received from Togo for 2006 or 2012; trade data for 2012-2013 are not yet available.)(All trade was in live specimens with the exception of one body reported by the country of import in 2007.)

	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (wild-sourced)		500	500	500	500	500	500	500	500	500	500	500	500
Quota (ranched)		2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
wild-sourced	Importer	551	656	276	261	20	114	168		10			
	Exporter	665	610	90	155		770	50			450		
ranched	Importer	2878	2179	1898	1611	1567	1342	1438	837	1550	2044		
	Exporter	1185	450	1200	690		1025	1950	1091	2470	1620		

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct exports of *C. gracilis* from Togo 2002-2012 primarily consisted of live specimens traded for commercial purposes, the majority of which were ranched (Table 7). Trade in wild-sourced *C. gracilis* decreased between 2002 and 2010; trade reported by countries of export increased in 2011, but no wild-sourced trade was reported by countries of import. Trade in ranched *C. gracilis* reported by countries of import decreased between 2002 and 2009, but subsequently increased. The principal country of import of both ranched and wild-sourced specimens was the United States.

Indirect exports of *C. gracilis* originating in Togo 2002-2012 consisted of live specimens traded for commercial purposes, the majority of which were ranched with a small proportion of wild-sourced.

Table 7. Direct exports of *Chamaeleo gracilis* from Togo, 2002-2011. All trade was for commercial purposes. (No annual report has been received from Togo for 2006.)

Term	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	W	Importer	551	656	276	261	20	114	168		10		2056
		Exporter	665	610	90	155		770	50			450	2790
	R	Importer	2878	2179	1898	1611	1567	1341	1438	837	1550	2044	17343
		Exporter	1185	450	1200	690		1025	1950	1091	2470	1620	11681
	C	Importer				30							30
		Exporter											
	U	Importer				98							98
		Exporter											
bodies	R	Importer						1					1
		Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

In 1999, Togolese reptile exporters were reported to buy *C. gracilis* from local hunters for FF 1.2-2 (USD 0.2-0.4) and sell them to foreign traders for FF 40-50 (USD 8-10); the mean value of specimens sold online was USD 37 (Harris, 2002).

The European Union suspended trade in ranched *C. gracilis* from Togo in 1999 and in wild-sourced specimens from Togo in 2005; from 2007 onwards, the suspension for ranched *C. gracilis* applied only to specimens with a snout-vent length greater than 8 cm. Both suspensions remain in place under Commission Regulation (EC) No. 578/2013 of 17 June 2013.

Management: Chameleons are not protected under Togolese legislation (Togo, 1990; Togo, 2009). Carpenter *et al.* (2004) noted that Togo had the longest history of international chameleon trade in Africa and that it was a major producer of chameleons, accounting for 24 per cent of the global volume during 1977-2001 (Carpenter *et al.*, 2004). It was noted that in spite of the growing numbers in trade, no changes in policy or legislation had been made to accommodate the increasing pressures on wild populations (Carpenter *et al.*, 2004).

Based on visits conducted in 2002, Harwood (2003) reported chameleons being bred on several farms in Togo. The farming facilities were mainly described as ranching systems, and on one facility, adult

females and juveniles were reportedly released to the wild, unless exported, and then later collected from the location of release if needed for export (Harwood, 2003).

An export quota system was introduced following the recommendations of the Animals Committee, based on the Review of Significant Trade of *C. gracilis* in 1996 (Harris, 2002). Estimated production capacity was reported to be used as the basis of export quotas, however the numbers could be revised later in the year (Harwood, 2003). Estimating production capacity was considered difficult in the Togolese ranching systems, and it was noted that the quotas insufficiently take into account the age structure of the population, and the regularity of breeding (Harwood, 2003). It was reported that the stock tables produced by the reptile farms "appear to lack accuracy", and it was noted that in most cases stock estimates seemed to be unrealistically high (Harris, 2002).

According to Harwood (2003), paid licenses for wild capture were given annually based on requests from breeding farms, and the quotas could be increased throughout the year. Harris (2002) reported post-capture mortality of up to 25 per cent, mostly caused by heat stress.

In the 1996 Review of Significant Trade, it was noted that there was a lack of information on the population status in Togo, and that "the scientific basis for setting the quota requires elucidation" (IUCN *et al.*, 1996).

UGANDA

Distribution in range State: Occurrence in Uganda was confirmed (Klaver and Böhme, 1997; Spawls *et al.*, 2002; Tilbury, 2010; Uetz, 2013). The range map of Tilbury (2010) indicates occurrence throughout the country, but that of Spawls *et al.* (2002) suggests that the species is absent from the southern half of the country.

Population trends and status: No information on population status was located.

Threats: Fires during the dry season were regarded as the main threat (Uganda Game Department, *in litt.* to CITES Secretariat, 1987, in IUCN *et al.*, 1996).

Trade: CITES annual reports have not yet been received from Uganda for the years 2010-2012. Uganda has not published any CITES export quotas for *C. gracilis*. Direct exports of *C. gracilis* from Uganda 2002-2012 consisted of wild-sourced live individuals traded for commercial purposes (Table 8). The confiscation/seizure of 60 animals was also reported by the United Kingdom in 2002. The principal countries of import were Japan and the United States. No indirect exports of *C. gracilis* originating in Uganda were reported 2002-2012.

Table 8. Direct exports of *Chamaeleo gracilis* from Uganda, 2002-2011. All trade was in live individuals. (No annual report has been received from Uganda for the years 2010-2012; no trade was reported in 2005 or 2012.)

Source	Purpose	Reported by	2002	2003	2004	2006	2007	2008	2009	2010	2011	Total
W	T	Importer	152	125	10	15			25	158	64	549
		Exporter	45	461	44		35	26				611
I	-	Importer	60									60
		Exporter										

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Quotas for catching wildlife on private land outside protected areas were reported to be set by the Uganda Wildlife Authority (UWA) that uses information on population status as the basis of the quotas (Gagnon and Nuwe, 2008). According to Gagnon and Nuwe (2008), export quotas for *C. gracilis* for 2000-2006 varied between 0 and 230 individuals (Table 9).

Table 9. Quotas for the export of *Chamaeleo gracilis* in Uganda during 2000-2006.

Year	2000	2001	2002	2003	2004	2005	2006 (September)
Number of animals	140	230	100	0	0	0	150

Source: Gagnon and Nuwe, 2008.

Management: *C. gracilis* is not listed in the Schedules of protected species under the Uganda Game (Preservation and Control) Act of 1959 (consolidated in 2000) (Uganda, 2000). However, the Uganda Wildlife Act specifies that licenses are needed for all different types of wildlife use, including classes A (hunting), B (farming), C (ranching), D (trading), E (educational or scientific) and F (general extraction) (Uganda, 1996). The capture of animals within protected areas is prohibited in Uganda (National Environment Management Authority, 2008).

Gagnon and Nuwe (2008) reported that a wildlife use rights programme was established in Uganda in 2001, to promote conservation outside protected areas and improve community livelihoods through wildlife trade. Licenses were reportedly required for the capture, breeding and export of wildlife, and they specify the species, number of specimens, and purpose of capture or hunting (Gagnon and Nuwe, 2008). Local officers are responsible for the verification of capture permits, licensees, number of collected specimens, supervision of capture and reception of the relevant documents; however, it was noted that the resources available are very limited (National Environment Management Authority, 2008), and studies in the Wakiso District revealed that enforcement was insufficient (Gagnon and Nuwe, 2008).

Gagnon and Nuwe (2008) reported that two companies were actively trading in chameleons in Uganda. Companies involved in trapping live chameleons are required to keep the specimens in designated holding grounds approved by the District Environment Officers (National Environment Management Authority, 2008). Gagnon and Nuwe (2008) conducted a study on the chameleon trade chains, reporting that 30 per cent of trapped animals were supposed to be used for breeding; however, few animals were spotted on the holding facilities making it impossible to verify the level of compliance.

Vonesh (1998, 2001) reported that the species occurs in the Virungas and Garamba National Parks; however, the author did not record it in the Kibale National Park in surveys conducted during 18 months in 1995 and 1996-1997.

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

The species was reported to be traded illegally from Benin to Cameroon.

Concern was expressed over the erroneous use of source codes in Beninese reptile farms.

CITES annual reports have not yet been received from Benin for the years 2003 or 2006, Ghana for 2006, Togo for 2006, Uganda for 2010 or 2011, Cameroon for 2008, 2010 or 2011 or Guinea for 2007, 2009 or 2011.

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Chamaeleo senegalensis Daudin, 1802: Benin, Ghana, Guinea, Mali, Senegal, Sierra Leone

Chamaeleonidae, Senegal Chameleon

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee included *Chamaeleo senegalensis* (all range States) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 specified that *C. senegalensis* met the criterion of high volume trade in 2008 and 2009. At the 26th meeting of the AC, a response had been received from Guinea Bissau (AC26 Doc 12.3). Benin, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Gambia, Ghana, Guinea, Liberia, Mali, Mauritania, Nigeria, Senegal, Sierra Leone and Togo were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Gambia, Liberia, Mauritania, and Nigeria were removed from the process on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC. Togo was also removed from the process in agreement with the AC, although trade was reported from the country.

A. Summary

Overview of *Chamaeleo senegalensis* recommendations.

		General summary
		Widespread with a total range of > 2 million km^2. Categorised as Least Concern in the IUCN Red List, but with unknown population status. At least locally common.
Range State	**Provisional category**	**Summary**
Benin	Possible Concern	High levels of trade 2002-2011 mainly in ranched specimens. A possible quota excess was reported in 2012 (ranched). At least locally common. However, the basis of quota setting is unclear. Therefore, categorised as Possible Concern; questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
Ghana	Possible Concern	Relatively high levels of trade 2002-2012 mainly in wild-sourced individuals. Four instances of possible quota excesses were reported in 2002, 2008, 2009 and 2011 (wild). Population status and basis for non-detriment finding is unclear. Therefore, categorised as Possible Concern.
Guinea	Least Concern	Trade of 50 live wild-sourced specimens reported in 2004 and 2008. Widespread in the country and common in some areas. Therefore, categorised as Least Concern.
Mali	Least Concern	Trade of 850 and of 100 live, wild-sourced individuals was reported in 2008 and 2009 respectively, although this was not reported by countries of import. Occurs in southern Mali but population status is unknown. On the basis of low trade levels, categorised as Least Concern.
Senegal	Least Concern	Trade of 60 live, wild-sourced specimens was reported in 2008, although this was not reported by the country of import. Occurs in western Senegal but population status is unknown. On the basis of low trade levels, categorised as Least Concern.
Sierra	Least	Trade limited to four live, wild-sourced specimens in 2004, although this

Leone	Concern	was not reported by the country of import. Population status is unknown. On the basis of low trade levels, categorised as Least Concern.

A. Species overview

Taxonomic note: Tilbury (2010), the CITES Standard Reference for Chameleons, considered *C. senegalensis* and *C. laevigatus* to be morphologically similar and difficult to distinguish. Bartlett and Bartlett (2001) also reported close resemblance with *C. gracilis* and *C. dilepis*.

Biology: *C. senegalensis* is a widespread West African chameleon (Wilms *et al.*, 2013) that typically occurs in moist savannah habitats (Leaché *et al.*, 2006; Wilms *et al.*, 2013).

The species reaches sexual maturity in captivity at approximately six months and may breed several times a year (Francis, 2008), producing up to 70 eggs, with incubation lasting approximately seven months (Tilbury, 2010).

General distribution and status: The total range of the species was considered to cover > 2 million km² (Wilms *et al.*, 2013), reaching from Senegal and Gambia in the west to Cameroon in the east (Klaver and Böhme, 1997; Leaché *et al.*, 2006; Francis, 2008; Wilms *et al.*, 2013) (see Figure 4). Tilbury (2010) included Central African Republic as the easternmost range State.

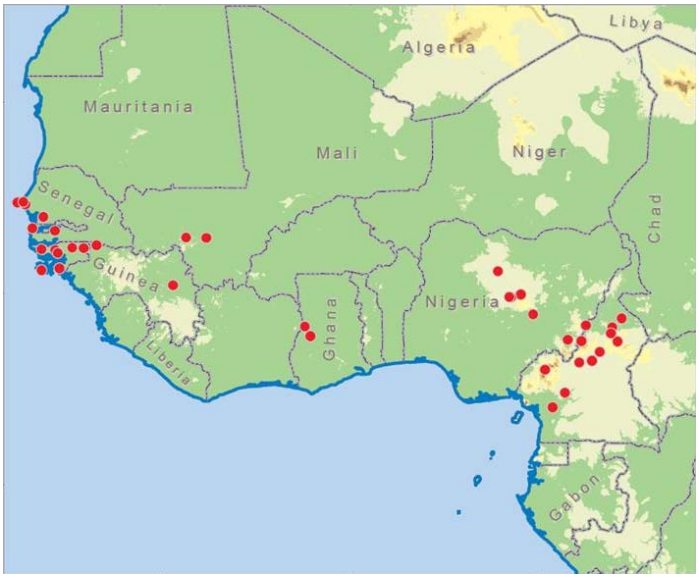

Figure 4. Map showing locality records of *Chamaeleo senegalensis*. (Source: Tilbury, 2010.)

C. senegalensis was described as widespread (Tilbury, 2010), locally common (Rödel and Agyei, 2002; Francis, 2008; Tilbury, 2010) and generally not threatened (Tilbury, 2010). However, C. Tilbury (*in litt.* to UNEP-WCMC, 2013) noted that the species "could become locally scarce if harvested intensively".

C. senegalensis was categorised as Least Concern in the IUCN Red List based on its "wide distribution and abundance", with the following justification: "while its population may be deleteriously impacted by exploitation, there is currently no indication that population declines are severe enough to qualify for listing in a threatened category" (Wilms *et al.*, 2013). However, its population size and trend were reported to be unknown, and it was noted that monitoring and research are needed to ensure the prevention of significant population declines (Wilms *et al.*, 2013).

Threats: *C. senegalensis* was reported to be harvested for the pet trade and traditional medicine; however, the impacts of harvesting were considered to be poorly known (Wilms *et al.*, 2013). Tilbury (2010) did not consider "intensive" harvesting for the pet trade as a significant threat; however, Carpenter *et al.* (2004) noted that due to the high annual volumes traded, *C. senegalensis* "should be of concern to conservationists as there is a lack of

information concerning the biology of the species and harvesting impacts". C. Anderson (*in litt.* to UNEP-WCMC, 2013) reported that the species was "exported in extreme excess".

The annual setting of fires to large areas of the countryside was reported to kill many chameleons, and combined with intensive harvesting of adults, to potentially suppress populations (C. Tilbury, *in litt.* to UNEP-WCMC, 2013).

Overview of trade and management: *C. senegalensis* was listed in CITES Appendix II on 04/02/1977. It was reported to be in high demand in the pet trade: according to an analysis of trade data from 1977-2001 by Carpenter *et al.* (2004), *C. senegalensis* accounted for a quarter of the global chameleon exports. The species was reported to be commonly available as wild-caught specimens (Bartlett and Bartlett, 2001; C. Anderson, *in litt.* to UNEP-WCMC, 2013). C. Anderson (*in litt.* to UNEP-WCMC, 2013) reported that a typical price per animal in the United States was < USD 20, which was considered low and would "not encourage any stage of the export, import or wholesale processes to care for the specimens well". *C. senegalensis* was reported to suffer from high mortality during transport and captivity (Bartlett and Bartlett, 2001; Francis, 2008). In an assessment of morbidity and mortality in captivity by Altherr and Freyer (2001), the species was considered unsuitable for private husbandry, due to being 'difficult to keep' or with 'high mortality in captivity', 'difficult to breed' and requiring conditions that are difficult to simulate.

C. senegalensis was reported to be protected in many parks and reserves in West Africa (Tilbury, 2010).

C. Country reviews

BENIN

Distribution in range State: Occurrence in Benin was confirmed (Chirio and LeBreton, 2007; Francis, 2008; Tilbury, 2010; Wilms *et al.*, 2013), and the CITES Management Authority of Benin (*in litt.* to UNEP-WCMC, 2013) considered it widespread and reported occurrence in the departments of Atlantique, Ouémé (southern Benin), Mono (southwestern Benin), Zou and Collines (south-central Benin). The species was recorded in the Beninese part of the W Transfrontier Biosphere Reserve (covering the region bordering Benin, Niger and Burkina Faso) in surveys conducted between May 2006 and November 2007 (Chirio, 2009). Ullenbruch *et al.* (2010) recorded four specimens reportedly originating in Didja (southern Benin) being sold on a local market in 2002.

Population trends and status: The CITES MA of Benin (*in litt.* to UNEP-WCMC, 2013) considered the species to be common, but declining. In interviews conducted around Benin, *C. senegalensis* was identified as a local species by 6.6 per cent of the interviewees (Sinsin *et al.*, 2008). Based on market visits, Ullenbruch *et al.* (2010) considered the species to be "much more common than *C. gracilis*".

Threats: *C. senegalensis* was reported to be collected for local markets and marketed for traditional medicinal purposes; however, this trade is illegal and no estimates of trade volumes are available (CITES MA of Benin *in litt.* to UNEP-WCMC, 2013). In visits conducted by Ullenbruch *et al.* (2010), *C. senegalensis* was "found on all markets in southern Benin".

Sinsin *et al.* (2008) considered the chameleons of Benin (*C. gracilis*, *C. necasi* and *C. senegalensis*) to be "under heightened threat" and cautioned that "export market demand, should it persist at current levels, will result in the extinction of these species, given that they

enjoy little or no effective protection". Captive breeding was recommended as a means of reducing pressure on wild populations (Sinsin *et al.*, 2008).

Trade: CITES annual reports have not yet been received from Benin for the years 2003 or 2006. Benin published export quotas for ranched *C. senegalensis* every year from 1997 onwards and for wild-sourced specimens from 2010 onwards (Table 1). Trade in wild-sourced and ranched specimens remained within the quota every year according to data reported by both countries of import and of export, with the exception of 2012, when the quota for ranched specimens was exceeded according to data reported by Benin; no trade has yet been reported by countries of import in 2012.

Table 1. CITES export quotas for ranched and wild-sourced *Chamaeleo senegalensis* from Benin and global direct exports, as reported by the countries of import and of export, 2002-2013. No quota for wild-sourced specimens was published prior to 2010. (No annual report has been received from Benin for the years 2003 or 2006; trade data for 2013 are not yet available.)(All trade was in live specimens with the exception of four bodies reported by the country of import in 2002; for each year, trade to which the quota does not apply in that year is greyed out.)

Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (wild-sourced)										1000	1000	1000	1000
Quota (ranched)		10500	10500	10500	8000	10000	7000	7000	7000	4000	4000	4000	4000
W	Importer	2797		200		200			100	500			
	Exporter												
R	Importer	4493	5165	2101	2353	2070	1251	3848	1924	3605	3565		
	Exporter	9278		4340	2230		2326	2620	5675	2550	2770	4610	

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct exports of *C. senegalensis* from Benin 2002-2012 primarily consisted of live individuals traded for commercial purposes, the majority of which were ranched (Table 2). Benin only reported trade in ranched specimens; however, countries of import reported trade in captive-bred and wild-sourced specimens in addition to ranched specimens. The confiscation/seizure of 209 live animals was also reported by the United Kingdom in 2004. The principal countries of import were the United States and Ghana.

Indirect exports of *C. senegalensis* originating in Benin 2002-2012 consisted of live individuals traded for commercial purposes, the majority of which were ranched with a small proportion wild-sourced and captive-bred.

Table 2. Direct exports of *Chamaeleo senegalensis* from Benin, 2002-2012. (No annual report has been received from Benin for the years 2003 or 2006.)

Term	Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
bodies	W	S	Importer	4											4
			Exporter												
live	W	T	Importer	2793		200		200			100	500			3793
			Exporter												
	R	T	Importer	4493	5165	2101	2353	2070	1251	3848	1924	3605	3565		30375
			Exporter	9278		4340	2230		2326	2620	5675	2550	2770	4610	36399
	C	T	Importer								100		200		300
			Exporter												
	I	-	Importer			209									209
			Exporter												

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Carpenter (2004) reported that Benin started exporting chameleons in 1992. Based on an analysis of trade data from 1977-2001, *C. senegalensis* was reported to be the most important chameleon species exported from Benin (Carpenter *et al.*, 2004).

In 2003, 98 specimens of *C. senegalensis* were reportedly confiscated in transit from Benin to the United States with CITES permits for 50 specimens of *C. gracilis* (TRAFFIC, 2012). The CITES MA of Benin (*in litt.*to UNEP-WCMC, 2013) reported that the species is traded illegally to Cameroon for medicinal purposes.

The European Union suspended trade in ranched *C. senegalensis* from Benin in 2009 and wild-sourced specimens from Benin in 2010; from 2012 onwards, the suspension for ranched *C. senegalensis* applied only to specimens with a snout-vent length of greater than 6 cm. Both suspensions remain in place under Commission Regulation (EC) No. 578/2013 of 17 June 2013.

Management: Chameleons are included in "non-game" species under Annex IV of the Law No 87-014 (1987) regulating nature protection and hunting in Benin (Benin, 1987). The law specifies that permits are required for the hunting and capture of all species, for the exception of traditional hunting practices (Benin, 1987). Decree No 90-366 (1990) specifies that permits are needed for keeping the species in captivity, and gives details of the documentation needed from farming operations (Benin, 1990).

According to Ineich (2006), there were at least five farming operations holding *C. senegalensis*; one farm was reported to hold 1500 specimens, and another one 1350 specimens, 75 per cent of which were females. It was reported that paid licenses and authorisation from the CITES MA were required for the capture of wild specimens to improve the breeding stock on chameleon farms (Harwood, 2003). Information on the breeding capacity of farms was reported to be used as the basis of quota setting (Harwood, 2003), taking into consideration that 20 per cent of juveniles were released into the wild from ranching by the end of every season and that the egg and juvenile mortality was estimated to be 10 per cent (Ineich, 2006).

Based on visits to breeding facilities conducted during 2004, Ineich (2006) expressed concern over erroneous use of source codes, reporting that reptile exports under source code R were likely to be a mixture of sources F, C, R and W. He cautioned that the export of wild-sourced reptiles as farmed was likely, considering the high costs of maintaining breeding stock (Ineich, 2006).

GHANA

Distribution in range State: Occurrence in Ghana was confirmed (Chirio and LeBreton, 2007; Francis, 2008; Tilbury, 2010; Uetz, 2013; Wilms *et al.*, 2013;). Leaché *et al.* (2006) recorded it in surveys conducted in the Kyabobo National Park (eastern-central Ghana) during 2001, 2004 and 2005, and Rödel and Agyei (2002) recorded it in surveys conducted in 2001 in the Volta region (eastern Ghana). However, Ernst *et al.* (2005) did not record the species in surveys conducted in the Draw River, Boi-Tano and Krokosua Hills forest reserves in southwestern Ghana.

Population trends and status: No information was located.

Threats: *C. senegalensis* was considered to be "possibly threatened by bush fires and collecting for local medicinal use" (Rödel and Agyei, 2002; Leaché *et al.*, 2006).

Trade: CITES annual reports have been received from Ghana for all years 2002-2012 with the exception of 2006. Ghana published annual export quotas for 1500 wild-sourced *C. senegalensis* every

year from 1997 onwards, apart from 2005-2007, when no quotas were published; from 1999 onwards, the quota applied to live specimens only (Table 3). No quota has yet been published for 2013. The quota appears to have been exceeded in 2002 according to data reported by countries of import only, and in 2011 according to data reported by Ghana only. Analysis of export permits reported by countries of import in their 2002 annual reports revealed that 18 of the permits were not reported by Ghana in either its 2001 or 2002 annual report.

Table 3. CITES export quotas for live, wild-sourced *Chamaeleo senegalensis* from Ghana and global direct exports, as reported by the countries of import and of export, 2002-2012. (No quotas were published for 2005-2007 or 2013. No annual report has been received from Ghana for 2006.) (For each year, trade to which the quota does not apply in that year is greyed out.)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Quota	1500	1500	1500	-	-	-	1500	1500	1500	1500	1500
Reported by importers	3346	1360	1199	744	1170	1791	1592	1203	1177	980	
Reported by exporters	1222	833	1113	2285		1180		1520	1397	1639	865

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct exports of *C. senegalensis* from Ghana 2002-2012 principally consisted of live, wild-sourced specimens traded for commercial purposes (Table 4). Countries of import reported trade in ranched specimens in 2002-2005 and 2008-2010, while Ghana reported trade in ranched specimens in 2012 only. Several confiscations/seizures were reported by the United States and the United Kingdom in 2004, 2008 and 2011. The United States was the principal country of import of both wild-sourced and ranched specimens.

Indirect exports of *C. senegalensis* originating in Ghana 2002-2012 principally comprised wild-sourced, live specimens traded for commercial purposes.

The European Union suspended trade in wild-sourced *C. senegalensis* from Ghana in 2009; this suspension under Commission Regulation (EC) No. 578/2013 of 17 June 2013 remains in place.

Table 4. Direct exports of *Chamaeleo senegalensis* from Ghana, 2002-2012. (No annual report has been received from Ghana for 2006 or 2011.)

Term	Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
live	W	T	Importer	3346	1360	1199	744	1170	1791	1592	1203	1177	980		14562
			Exporter	1222	833	1113	2285		1180		1520	1397	1639	865	12054
	R	T	Importer	50	680	145	283			162	100	146			1566
			Exporter											100	100
	I	T	Importer										95		95
			Exporter												
		-	Importer			17				1					18
			Exporter												
bodies	W	T	Importer	5											5
			Exporter												
		S	Importer												
			Exporter										6		6
	I	S	Importer										6		6
			Exporter												
specimens	W	S	Importer				3								3
			Exporter												
	I	S	Importer										7		7
			Exporter												

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: The species is not listed in the Schedules of protected animals under the Ghanaian Wildlife Conservation Regulations of 1971 (Ghana, 1971).

Ineich (2006) considered that the relatively low export quotas set by Ghana for reptile species with unknown population status may promote illegal exports to Benin and Togo.

Ghanaian reptile facilities were reported to produce mainly ranched specimens and have a good level of control under the CITES Authorities (Ineich, 2006).

GUINEA

Distribution in range State: Occurrence in Guinea was confirmed (Chirio and LeBreton, 2007; Francis, 2008; Tilbury, 2010; Böhme *et al.*, 2011; Uetz, 2013; Wilms *et al.*, 2013). Occurrences were recorded throughout the country in Kindia (western Guinea), Fouta Djallon and Labé/Saala (central Guinea) (Böhme *et al.*, 2011), Beyla (southeastern Guinea) (Chabanaud, 1921 in Böhme *et al.*, 2011) and Koundara (northwestern Guinea) (Grandison, 1956 in Böhme *et al.*, 2011). The species was also recorded in the Pic de Fon forest of the Simandou Mountain Range (south-eastern Guinea) in surveys conducted in 2002 (McCullough, 2004).

Population trends and status: *C. senegalensis* was considered to be "common in the southern Guinea savannah and wet woodlands" (Tilbury, 2010). The CITES MA of Guinea (pers. comm. to UNEP-WCMC, 2013) reported that the species was common in the Lower Guinea (Basse Guinée, coastal region), Middle Guinea (Moyenne Guinée, central Guinea), Upper Guinea (Haute Guinée, eastern Guinea) and forested Guinea (Guinée forestière, southeastern Guinea) regions.

Threats: No information about threats to the species in Guinea was located.

Trade: CITES annual reports have not yet been received from Guinea for the years 2007, 2009, 2011 or 2012. Guinea has not published any export quotas for *C. senegalensis*. According to data in the CITES Trade Database, direct exports from Guinea 2002-2012 consisted of live, wild-sourced specimens for commercial purposes reported by countries of import in 2004 (50 individuals) and reported by Guinea in 2008 (50 individuals). No indirect exports of *C. senegalensis* originating in Guinea were reported 2002-2012.

Management: No chameleon species appear to be listed under the Annexes of protected species of the Guinean Wildlife Law L/99/038/AN of 1999 (Guinea, 1999). Article 61 specifies that the species that are not listed as protected may be hunted in accordance to the hunting regulations; however, Article 62 prohibits unlicensed commercial trading and unlicensed possession of over five individuals in the same place (Guinea, 1999).

MALI

Distribution in range State: Occurrence in Mali was confirmed by several authors (Chirio and LeBreton, 2007; Francis, 2008; Uetz, 2013; Wilms *et al.*, 2013). The range map of Tilbury (2010) indicates occurrence in southern Mali.

Population trends and status: No information was located.

Threats: No information was located.

Trade: CITES annual reports have been received from Mali for all years 2002-2011. Mali has not published any export quotas for *C. senegalensis*. According to data in the CITES Trade Database, direct exports from Mali 2002-2012 consisted of live, wild-sourced specimens exported to the United States in 2008 (850 individuals) and China in 2009 (100 individuals) for commercial purposes. The trade was reported by Mali only. No indirect exports of *C. senegalensis* originating in Mali were reported 2002-2012.

Management: *C. senegalensis* is not protected under the Law No 95-31 on wildlife and habitat management (La Republique du Mali, 1995).

SENEGAL

Distribution in range State: Occurrence in Senegal was confirmed (Chirio and LeBreton, 2007; Francis, 2008; Tilbury, 2010; Uetz, 2013; Wilms *et al.*, 2013;). The range map of Tilbury (2010) indicates occurrence in western Senegal.

Population trends and status: No information on population trends and status in Senegal could be located.

Threats: No information on threats in Senegal could be located.

Trade: No annual reports have yet been received from Senegal for 2011 or 2012. Senegal has not published any export quotas for *C. senegalensis*. According to data in the CITES Trade Database, direct exports from Senegal 2002-2012 consisted of 60 live, wild-sourced specimens exported to Spain for commercial purposes in 2008, reported by Senegal only. No indirect exports of *C. senegalensis* originating in Senegal were reported 2002-2012.

Management: No chameleon species are listed as protected species under the Decree No 86-844 on hunting and animal protection (Senegal, 1986).

SIERRA LEONE

Distribution in range State: Occurrence in Sierra Leone was confirmed by several authors (Chirio and LeBreton, 2007; Francis, 2008; Uetz, 2013; Wilms *et al.*, 2013).

Population trends and status: No information was located.

Threats: No information was located.

Trade: CITES annual reports have been received from Sierra Leone for all years 2002-2011. Sierra Leone has not published any export quotas for *C. senegalensis*. According to data in the CITES Trade Database, direct exports from Sierra Leone 2002-2012 consisted of four live, wild-sourced specimens exported to the United States for commercial purposes in 2004, reported by Sierra Leone only. No indirect exports of *C. senegalensis* originating in Sierra Leone were reported 2002-2012.

Management: No information was located.

D. Problems identified that are not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a)15/05/2013

The species was reported to be traded illegally from Benin to Cameroon.

Concern was expressed over the erroneous use of source codes in Beninese reptile farms.

CITES annual reports have not yet been received from Benin for the years 2003 or 2006, Ghana for 2006, Guinea for 2007, 2009 or 2011 or Senegal for 2011.

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Kinyongia fischeri (Reichenow, 1887): United Republic of Tanzania

Chamaeleonidae, Fischer's Chameleon

Selection for Review of Significant Trade

At its 25th meeting in 2011, the Animals Committee included *Kinyongia fischeri* (all range States i.e. the United Republic of Tanzania [hereafter referred to as Tanzania] only) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 specified that *K. fischeri* (*sensu lato* i.e. based on the previously accepted taxonomy) met a high volume trade threshold between in 2008 and 2009. At the 26th meeting of the AC in 2012, a response had been received from Tanzania (AC26 Doc. 12.3), but it was retained in the review (AC26 Summary Record).

A. Summary

Overview of *Kinyongia fischeri* recommendations.

Range State	Provisional category	Summary
United Republic of Tanzania	Urgent Concern	Very high levels of trade mainly in wild-sourced individuals 2002-2011. Possible quota excesses were reported 2002-2010. Species subject to taxonomic split at CoP15, but trade levels, quota limits and management do not appear to reflect the change. *K. fischeri* (*sensu stricto*) is a rare species endemic to a highly restricted area in Tanzania. Therefore, categorised as Urgent Concern.

B. Species overview

Taxonomic note: The species was originally listed in CITES as *Chamaeleo fischeri* (Mertens, 1966), but was transferred to *Bradypodion* by Klaver and Böhme (1986) – these latter authors also considered *B. uthmoelleri* a separate species. CITES adopted the transfer of *C. fischeri* to *Bradypodion* in 1985 (CoP5, Com. 5.33 and Plen. 5.9 (Rev.)), although the basis for this was not stated. Broadley and Howell (1991) elevated *Bradypodion tavetanum* to full species status and CITES adopted *B. tavetanum* and *B. uthmoelleri* as separate species to *B. fischeri* in 1992 (CoP8). Klaver and Böhme (1997) (the CITES Standard Reference for Chamaeleonidae adopted in 2000 following CoP11) considered *B. f. fischeri*, *B. f. excubitor*, *B. f. multituberculatum* and *B. f. uluguruense* as subspecies, and regarded *matschiei* and *vosseleri* as synonyms of *B. f. fischeri*. The recognition of *C. (K.) excubitor* as a separate species was discussed at CoP13 (CoP13 Doc. 59.2) and subsequently at AC22 (AC22 Doc. 23). In 2010, following CoP15, three new relevant Standard References were adopted: Tilbury *et al.* (2006) assigned the species to the genus *Kinyongia* based on molecular analyses; Tilbury *et al.* (2007) corrected the spelling of the names of the relevant taxa; and Mariaux *et al.* (2008) split *excubitor*, *matschiei*, *multituberculata*, *uluguruensis* and *vosseleri* from *K. fischeri* on morphological or molecular features (CoP15 Doc. 35 (Rev. 3)).

Biology: *Kinyongia fischeri* is a large chameleon endemic to Tanzania (Mariaux *et al.*, 2008). It is typically found in cleared bushland, close to forest edge, and occurs in altitudes of up to 1500 m above sea level and possibly higher (Emmrich, 1994; Mariaux *et al.*, 2008). *K. fischeri sensu lato* produces clutches of 18-27 eggs (Spawls *et al.*, 2002).

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Distribution in range State: The distribution of *K. fischeri sensu stricto* was reported to be restricted to the Nguru and Nguu mountains in eastern Tanzania (Mariaux *et al.*, 2008; Menegon *et al.*, 2008; Tilbury, 2010) (Figure 5). The total forest area in the Nguru and Nguu mountains was estimated to be approximately 600 km²; however, it was noted that the species was "only known from relatively few specimens" and that "the true extent of their distribution within these forests is uncertain" (Tilbury, 2010).

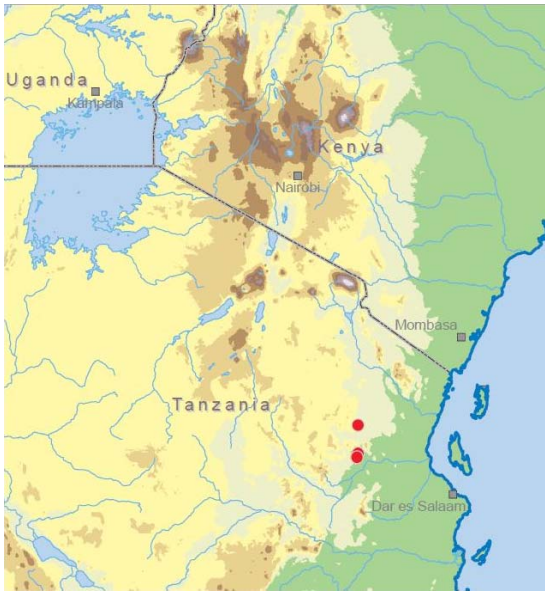

Figure 5. Map showing locality records of *Kinyongia fischeri*. (Source: Tilbury, 2010.)

Population trends and status: Mariaux *et al.* (2008) examined nine museum specimens (seven from the Nguru Mountains and two from the Nguu Mountains) and noted that *K. fischeri sensu stricto* was "Possibly not rare locally, but distribution presently only known from a few localities. Relatively large areas of protected and remote forest still exist in the Ngurus and a wider distribution than presently known is likely." Lutzmann (2008) claimed that it was known from only eight specimens. C. Tilbury (*in litt.* to UNEP-WCMC, 2013) described it as rare.

Threats: Spawls *et al.* (2002) regarded habitat loss as the main threat to *K. fischeri sensu lato*, and Menegon *et al.* (Menegon *et al.*, 2008) noted that habitat loss and degradation were key threats to the herpetofauna of South Nguru mountains. Carpenter (2004) considered harvesting as a potentially significant threat to endemic Tanzanian chameleons, including *K. fischeri sensu lato*.

Trade: *K. fischeri sensu lato* was listed in CITES Appendix II on 04/02/1977 under *Chamaeleo* spp., including *excubitor*, *matschiei* (with *vosseleri* as a synonym), *multituberculata*, *tavetana*, *uluguruensis* and *uthmoelleri* as subspecies. CITES annual reports have been received from Tanzania for all years 2002-2011 except 2007. Tanzania published export quotas for wild-sourced *K. fischeri* every year from 1997 onwards, and specimens of sources C and F every year from 1999 onwards; the quotas for wild-sourced specimens in 2012 and 2013 and for captive-bred specimens in 2010 applied to live animals only (Table 1). A quota for ranched specimens was also published in 1998 only. The quota for wild-sourced specimens appears to have been exceeded in 2002-2009 according to data reported by countries of import; according to data reported by Tanzania, the quota appears to have been exceeded in 2002 and 2010. Trade in C and F specimens remained within the quota in every year according to data reported both by countries of import and of export. Tanzania specified that all its annual reports submitted 2002-2011 were based on actual trade.

Table 1. CITES export quotas for *Kinyongia fischeri* from the United Republic of Tanzania and global direct exports, as reported by the countries of import and of export, 2002-2013. All trade was in live individuals, apart from 13 wild-sourced specimens reported by the countries of import in 2009. (No annual reports have been received from Tanzania for 2007 or 2012; trade data for 2012-2013 are not yet available.)(Trade in terms to which the quota does not apply in that year is greyed out; no captive-bred trade was reported in 2010.)

	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (W)		3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000 ♦	3000 ♦
Quota (F)		374	210	311	242	189	135	136	160	160■	160	180	10
W	Importers	3818	5195	4102	3427	4473	7354	5920	3638	2667	2366		
	Tanzania	4543	2574	1896	2968	2819		2373	2715	3160	1681		
F	Importers	33	42	217	200	87	30	131	90	40			
	Tanzania		46	10	120	52		86	30				

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK
Key: ♦ = applies to live specimens only; ■ = applies to live, captive-bred specimens only.

Direct exports of *K. fischeri* from Tanzania 2002-2012 primarily consisted of live specimens traded for commercial purposes, the majority of which were wild-sourced (Table 2). Countries of import reported greater numbers of wild-sourced specimens than Tanzania in most years. According to data reported by countries of import, trade in wild-sourced, live specimens peaked in 2007 and subsequently decreased; trade in source F live specimens also decreased from 2009 onwards, with no F trade reported in 2011. In addition, the United States and the United Kingdom reported low numbers of seizures/confiscations. The principal country of import of wild-sourced specimens was the United States, while the main country of import of F specimens was Germany.

Indirect exports of *K. fischeri* originating in Tanzania 2002-2012 primarily consisted of wild-sourced, live specimens traded for commercial purposes.

Table 2. Direct exports of *Kinyongia fischeri* from the United Republic of Tanzania, 2002-2011. (No annual report has been received from Tanzania for 2007 or 2012; trade data for 2012 are not yet available.)

Term	Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	W	T	Importer	3788	5195	4102	3402	4467	7349	5826	3625	2667	2356	42777
			Exporter	4543	2574	1896	2968	2819		2373	2715	3160	1681	24729
		B	Importer				15							15
			Exporter											
		P	Importer						5				10	15
			Exporter											
		Q	Importer	30			10	6		10				56
			Exporter											
		Z	Importer							84				84
			Exporter											
	R	T	Importer											
			Exporter					30						30
	C	T	Importer	75										75
			Exporter											
		B	Importer			14								14
			Exporter											
	F	T	Importer	33	42	217	200	87	30	131	90	40		870
			Exporter		46	10	120	52		86	30			344
	I	T	Importer	8							5	20	30	63
			Exporter											
		-	Importer	4	8	1								13
			Exporter											
bodies	I	T	Importer	2										2
			Exporter											
specimens	W	S	Importer								13			13
			Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The interpretation of trade in *K. fischeri sensu stricto* is complicated due to the changes in the taxonomic status of the species (see Taxonomic note). According to the CITES Trade Database, no trade in *K. excubitor*, *K. matschiei*, *K. multituberculata*, *K. uluguruensis* or *K. vosseleri* was reported in 2011 (the first complete year after these taxa were accepted as separate species by CITES). C. Tilbury (*in litt.* to UNEP-WCMC, 2013) noted that it is likely that most of the trade reported in *K. fischeri* consists of *K. matschiei*, *K. vosseleri* and *K. multituberculata*, which are distributed in the Usambara Mountains in more accessible areas. Based on frequent visits to the facilities of importers, distributors and breeders in the United States, a review of species lists used by dealers, and direct contact with exporters in Tanzania, C. Anderson (*in litt.* to UNEP-WCMC, 2013) considered the exports of *K. fischeri sensu stricto* from Tanzania during 1998-2013 to be restricted to three individuals (two males in 2009 and a single female in 2010). He estimated that more than 95 per cent of trade reported as *K. fischeri* consists of *K. multituberculata* from the East Usambara mountains, with a small number (probably less than four per cent) of *K. matschiei*, and very small numbers (probably less than one per cent) of *K. vosseleri* (C. Anderson, *in litt.* to UNEP-WCMC, 2013).

Management: *K. fischeri* is not protected in Tanzania; however, it is covered by the provisions of the Wildlife Conservation Act (no. 5 of 2009), whereby the capture of any animal requires a permit (United Republic of Tanzania, 2009). Tilbury (2010) reported that much of the range of the species falls under forest reserves offering "nominal protection".

Kinyongia fischeri sensu lato was included in the Review of Significant Trade in 1999 (WCMC *et al.*, 1999). At the 16th meeting of the AC, a primary recommendation was made to Tanzania to provide the Secretariat with detailed information on: i) the distribution and abundance of the species, ii) the justification or scientific basis for the non-detriment finding, and iii) mechanisms in place to ensure that annual quota would not be exceeded (Doc. AC.16.7.1). Tanzania's response, recorded at the 45th meeting of the Standing Committee, stated that i) much of the range of the species was in protected areas where capture is not allowed, ii) quotas take account of observations on population status, information obtained from trapping records and exports, and abundance in plantations (SC45 Doc.12). The Secretariat was satisfied that adequate measures were in place to implement Article IV for exports and undertook to help the Management Authority to refine the current system of monitoring trapping effort (SC45 Doc.12). The Secretariat was also satisfied with an explanation of the quota control system, and stated that no further action was required provided that the annual export quota was maintained at the 2001 level [3000 wild-taken, 332 F1] and that regular surveys were conducted to monitor the status of the species (SC45 Doc.12).

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

Amendments to the nomenclature of *K. fischeri* were adopted at CITES CoP15. Virtually all reported trade appears to consist of other taxa that were previously considered subspecies or synonyms (mainly *K. multituberculata* with also *K. matschiei* and *K. vosseleri* reported).

Tanzania's CITES annual report for 2007 has not yet been received.

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Kinyongia tavetana (Steindachner, 1891): United Republic of Tanzania

Chamaeleonidae, Mount Kilimanjaro Two-horned Chameleon

Selection for Review of Significant Trade

At its 25th meeting in 2011, the Animals Committee included *Kinyongia tavetana* (all range States) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 specified that *K. tavetana* met a high volume trade threshold between 2004 and 2008. At the 26th meeting of the AC in 2012, a response had been received from the United Republic of Tanzania (hereafter referred to as Tanzania) (AC26 Doc. 12.3). Tanzania and Kenya were both retained in the review (AC26 Summary Record). Following the 26th meeting of the AC Kenya was removed from the process on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

***Kinyongia tavetana* recommendation.**

Range State	Provisional category	Summary
United Republic of Tanzania	Possible Concern	High levels of trade 2002-2011 mainly in wild-sourced individuals. A possible quota excess was reported in 2002 (wild). Restricted range in northeastern Tanzania, where at least locally common. The basis of quota setting is unclear. Therefore, categorised as Possible Concern.

B. Species overview

Taxonomic note: The species was originally considered as a subspecies of *Chamaeleo fischeri* (Mertens, 1966), and transferred to *Bradypodion* by Klaver and Böhme (1986). The transfer of *C. fischeri* to *Bradypodion* was adopted by CITES in 1985 (CoP5, Com. 5.33 and Plen. 5.9 (rev.)), although the basis for this was not stated. Broadley and Howell (1991) elevated *Bradypodion tavetanum* to full species status and CITES adopted this in CoP8 1992, confirmed by the CITES Standard Reference for Chamaeleonidae adopted following CoP11 (Klaver and Böhme, 1997). Lutzmann and Necas (2002) split *B. tavetanum* into two subspecies: *B. t. boehmei*, restricted to the Taita Hills in Kenya, and *B. t. tavetanum* on Kilimanjaro and Meru mountains in Tanzania. In 2010, following CoP15, two new Standard References were adopted: Tilbury *et al.* (2006) assigned the species to the genus *Kinyongia* based on molecular analyses, and Mariaux *et al.* (2008) treated *K. boehmei* as a separate species.

Biology: *K. tavetana* is a medium-sized chameleon endemic to Kenya and Tanzania (Spawls *et al.*, 2002). It prefers montane forest habitats, but commonly inhabits disturbed vegetation and plantations (Lantermann, 2000; Mariaux *et al.*, 2008; Tilbury, 2010) at altitudes of 800-2200 m above sea level (Tilbury, 2010). Average clutch size is 11 eggs (Lutzmann and Necas, 2002), and Lutzmann (pers. comm. to UNEP-WCMC, 2013) reported that the species may be able to lay clutches up to every 4-6 weeks.

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Distribution in range State: The species was considered to have a restricted range in Tanzania and Kenya (Spawls *et al.*, 2002; Tilbury, 2010) (Figure 6). C. Tilbury (*in litt.* to UNEP-WCMC, 2013) noted that a population had been recorded in the Tsavo National Park in Kenya, but had not yet been genetically confirmed as *K. tavetana*.

Within Tanzania, the species was reported to occur in the Kilimanjaro, Meru and North and South Pare mountains in the northeastern part of the country (Razzetti and Msuya, 2002; Mariaux *et al.*, 2008; Tilbury, 2010).

Figure 6. Map showing locality records of *Kinyongia tavetana*. (Source: Tilbury, 2010.)

Population trends and status: Mariaux *et al.* (2008) considered it to be locally common and probably not threatened, and N. Lutzmann (pers. comm. To UNEP-WCMC, 2013) considered it not to be threatened. C. Tilbury (*in litt.* to UNEP-WCMC, 2013) noted that it may be "quite common where it occurs".

Threats: Habitat loss was considered a threat to *K. tavetana* (Spawls *et al.*, 2002). C. Tilbury (*in litt.* to UNEP-WCMC, 2013) stated that the species may be overharvested.

Trade: *K. tavetana* was listed in CITES Appendix II on 04/02/77 (as *Bradypodion tavetanum*).

CITES annual reports have been received from Tanzania for all years 2002-2011 except 2007. Tanzania published export quotas for wild-sourced *K. tavetana* every year from 1997 onwards, and for source C and F specimens every year from 1999 onwards; the quotas for wild-sourced specimens in 2012 and 2013 and for source F specimens in 2010 applied to live animals only (Table 1). A quota for ranched specimens was also published in 1998 only. The quota for wild-sourced specimens appears to have been exceeded in 2002 according to data reported both by countries of import and of export, and in 2003 according to data reported by the countries of import only. Tanzania specified that all its annual reports submitted 2002-2011 were based on actual trade. Analysis of permits revealed that the apparent quota excess in 2003 could be entirely explained by export permits having been issued in the previous year. Trade in source C and F specimens remained within the quota in every year according to data reported both by countries of import and of export.

Table 1. CITES export quotas for *Kinyongia tavetana* from the United Republic of Tanzania and global direct exports, as reported by the countries of import and of export, 2002-2013. All trade was in live animals, apart from 6 wild-sourced bodies reported by Tanzania in 2002 and 2 wild-sourced specimens reported by the countries of import in 2009. (No annual reports have been received from Tanzania for 2007 or 2012; trade data for 2012-2013 are not yet available.)(No captive-bred trade was reported in 2010.)

Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (W)		3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000 ♦	3000 ♦
Quota (F)		109	170	100	108	83	87	110	106	95	106	95	90
Quota (C)										106♦			
W	Importer	3436	3123	2762	2122	2247	2809	2612	2108	1761	1221		
	Exporter	3541	1847	1485	2106	2482		1452	1682	1930	775		
F	Importer	20	42	90	90	66	10	56		40			
	Exporter		60		97	51		70	20				

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK
Key: ♦ = applies to live specimens only

Direct exports of *K. tavetana* from Tanzania 2002-2012 primarily consisted of live individuals traded for commercial purposes, the majority of which were wild-sourced (Table 2). Countries of import reported greater numbers of wild-sourced specimens than Tanzania in most years. According to data reported by countries of import, trade in wild-sourced, live specimens decreased over the ten-year period overall. The principal countries of import for live specimens were the United States and Germany. Low numbers of confiscations/seizures were reported by the United States and the United Kingdom.

Indirect exports of *K. tavetana* originating in Tanzania 2002-2012 principally consisted of wild-sourced, live individuals traded for commercial purposes.

Table 2. Direct exports of *Kinyongia tavetana* from the United Republic of Tanzania, 2002-2011. (No annual reports have been received from the United Republic of Tanzania for 2007 or 2012; trade data for 2012 are not yet available.)

Term	Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	W	T	Importer	3410	3123	2762	2112	2241	2809	2502	2106	1761	1201	24027
			Exporter	3535	1847	1485	2106	2482		1452	1632	1840	775	17154
		P	Importer										20	20
			Exporter											
		Q	Importer	26			10	6		10				52
			Exporter											
		Z	Importer							100				100
			Exporter									90		90
		-	Importer											
			Exporter								50			50
	C	T	Importer						25					25
			Exporter											
		B	Importer			14								14
			Exporter											
	F	T	Importer	20	42	90	90	66	10	56		40		414
			Exporter		60		97	51		70	20			298
	I	T	Importer									10	20	30
			Exporter											
		-	Importer	2	30									32
			Exporter											
	U	T	Importer		338									338
			Exporter											
	-	T	Importer					4						4
			Exporter											
specimens	W	S	Importer								2			2
			Exporter											
bodies	W	S	Importer											
			Exporter	6										6

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *K. tavetana* is not protected in Tanzania; however, it is covered by the provisions of the Wildlife Conservation Act (No. 5 of 2009), whereby the capture of any animal requires a permit (United Republic of Tanzania, 2009). The species was reported to be protected in the Kilimanjaro, Meru and Tsavo National Parks, the North and South Pare mountains forest reserves (Tilbury, 2010) and the Arusha National Park (Razzetti and Msuya, 2002).

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

Tanzania's CITES annual report for 2007 has not yet been received.

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Trioceros melleri (Gray, 1865): Mozambique

Chamaeleonidae, Meller's Chameleon

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee included *Trioceros melleri* (all range States) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 specified that *T. melleri* met a high volume trade threshold in 2008 and 2009. At the 26th meeting of the AC, responses had been received from Malawi and the United Republic of Tanzania (AC26 Doc. 12.3). Mozambique was retained in the review (AC26 Summary Record).

A. Summary

Overview of *Trioceros melleri* recommendation.

Range State	Provisional category	Summary
Mozambique	Possible Concern	Moderate levels of trade 2002-2011 in wild-sourced individuals. A possible quota excess was reported in 2007. Occurs in northern Mozambique where at least locally common. Collection for pet trade is considered a threat and the basis of quota setting is unclear. Therefore, categorised as Possible Concern; questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.

B. Species overview

Taxonomic note: The species was treated as *Chamaeleo (Trioceros) melleri* by the CITES Standard Nomenclature until CoP 16 (Klaver and Böhme, 1997). A new Standard Reference was adopted at CoP 16 (CoP16 Com. I. 8), elevating the subgenus *Trioceros* to genus level based on morphological and genetic evidence (Tilbury and Tolley, 2009).

Biology: *Trioceros melleri* is a large chameleon species (Kalisch, 2002; Spawls *et al.*, 2002; Tolley and Burger, 2007; Tilbury, 2010;), with an average adult size of 46-61 cm (Kalisch, 2002). It is an arboreal species (Spawls *et al.*, 2002) that prefers savannah woodlands (miombo), and is often found high up in the canopy (Kalisch, 2002; Tilbury, 2010), but also inhabits urban areas with abundant mango trees (Tilbury, 2010). It was reported to occur at altitudes up to 1200-1500 m (Spawls *et al.*, 2002).

T. melleri reaches sexual maturity at approximately two years of age (Le Berre, 2009). In Malawi, reproduction occurs in December with hatching in March (Tilbury, 2010). One clutch is produced per year in the wild (Le Berre, 2009) and clutch size was reported to be 38-91 eggs (Spawls *et al.*, 2002), with an average of over 40 eggs (Kalisch, 2002). Löll (2010) reported a maximum clutch size of 70 eggs, considering the reproductive rate of *C. melleri* to be "very high". Eggs hatch at 140-180 days (Kalisch, 2002). *C. melleri* was regarded as one of the longest lived chameleon species, with a maximum life span of 12 years observed in captivity (Löll, 2010).

C. Country reviews

MOZAMBIQUE

Distribution in range State: Globally, *T. melleri* was considered to be "relatively widespread" (Tilbury, 2010), occurring in Malawi, Tanzania and Mozambique (Klaver and Böhme, 1997; Broadley and Howell, 2000; Spawls *et al.*, 2002; Tilbury, 2010) (see Figure 7).

Figure 7. Map showing locality records of *Trioceros melleri*. (Source: Tilbury, 2010.)

The species was reported to occur in northern Mozambique (Klaver and Böhme, 1997; Broadley and Howell, 2000; Spawls *et al.*, 2002; Uetz, 2013), north of the Zambezi river and east of the Shire river (Tilbury, 2010; C. Tilbury, *in litt.* to UNEP-WCMC, 2013). C. Tilbury (*in litt.* to UNEP-WCMC, 2013) considered its range in Mozambique as "likely to be large"; however noting that limited information was available on recorded localities within the country. Welch (1982) did not consider Mozambique as a range State, and the species was not recorded in visual herpetological surveys conducted during July-November 2003 in the Niassa Game Reserve in northern Mozambique (Branch *et al.*, 2005).

Population trends and status: *T. melleri* was considered to be common in the coastal forests of north-eastern Mozambique (Pascal, 2011). Spawls *et al.* (2002) considered the species as not threatened. The CITES Management Authority of Mozambique (pers. comm. to UNEP-WCMC, 2013) stated that no studies on the population status have been carried out due to lack of resources.

Threats: Due to its unusually large size, *T. melleri* was reported to be in high demand in the pet trade (Spawls *et al.*, 2002; Tilbury, 2010) and be easily harvested in the wild (Tilbury, 2010). Intensive harvesting for the pet trade was reported to have negative impacts on local populations (Tilbury, 2010). The species was considered to require conservation attention due to its restricted range, and it was stated that "even a low level of trade may increase the risk of extinction if this represents a high rate of extraction" (Carpenter *et al.*, 2004).

In an assessment of morbidity and mortality in captivity by Altherr and Freyer (2001), *T. melleri* was considered unsuitable for private husbandry, due to its large size, being characterised as 'difficult to keep' or with 'high mortality in captivity', and requiring conditions that are difficult to simulate. Kalisch (2002) noted that the species requires very large and well-planted enclosures, and due to high sensitivity to stress, is challenging to keep in captivity. Löll (2010) considered wild-caught specimens to typically carry a heavy load of parasites.

Trade: *T. melleri* was listed in CITES Appendix II on 04/02/1977 (as *Chamaeleo melleri*). CITES annual reports for 2011 and 2012 have not yet been received from Mozambique. Mozambique published export quotas for 1000 wild-sourced *T. melleri* every year 1997-2010; from 1999 onwards, the quota applied to live specimens only (Table 1). The quota appears to have been exceeded in 2007 according to data reported by Mozambique, but in five out of 10 years reported exports were less than half the quota level and reported imports even lower.

Mozambique does not specify whether its annual reports are compiled on the basis of actual trade or permits issued.

Table 1. CITES export quotas for live, wild-sourced *Trioceros melleri* from Mozambique and global direct exports, as reported by the countries of import and of export, 2002-2010. (No quotas have been published by Mozambique after 2010.)

	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010
Quota		1000	1000	1000	1000	1000	1000	1000	1000	1000
	Importer	617	265	39	66	72	339	98	138	239
	Exporter	786	950	238	250	200	1320	250	821	450

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct exports of *T. melleri* from Mozambique 2002-2012 primarily consisted of live, wild-sourced specimens traded for commercial purposes (Table 2). The confiscation/seizure of 55 animals was also reported by the United States in 2009. Mozambique reported consistently higher numbers of exported specimens compared to the countries of import. The United States was the principal country of import.

Indirect exports of *T. melleri* originating in Mozambique 2002-2012 consisted of low numbers of principally wild-sourced, live individuals traded for commercial purposes in 2002 and 2011.

Table 2. Direct exports of *Trioceros melleri* from Mozambique, 2002-2011. All trade was for commercial purposes. (Annual reports have not yet been received from Mozambique for 2011 or 2012; trade data for 2012 are not yet available.)

Term	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
bodies	W	Importer	3										3
		Exporter											
live	W	Importer	617	265	39	66	72	339	98	138	239	342	2215
		Exporter	786	950	238	250	200	1320	250	821	450		5265
	I	Importer								55			55
		Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: The species was not included in the list of protected species under the forestry and wildlife regulations Decree No 12/2002 (Moçambique, 2002).

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

Mozambique's CITES annual report for 2011 has not yet been received.

There was a notable discrepancy in trade reported by countries of import and Mozambique.

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Trioceros quadricornis Tornier, 1899: Cameroon, Nigeria

Chamaeleonidae, Four-horned Chameleon

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee included *Trioceros quadricornis* (all range States) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). At the 26th meeting of the AC, no responses had been received (AC26 Doc. 12.3) and Cameroon and Nigeria were retained in the review (AC26 Summary Record).

A. Summary

Overview of *Trioceros quadricornis* recommendations.

		General summary
		Restricted range in the montane rainforests of Cameroon and Nigeria, where common in some areas.
Range State	**Provisional category**	**Summary**
Cameroon	Possible Concern	Moderate levels of trade mainly in wild-sourced individuals 2002-2011. Protected in Cameroon, however the basis of the non-detriment findings is unclear. Total area of occupancy in southwestern Cameroon approximately 250 km^2; unfavourable conservation status. Capture for export considered a threat. Therefore, categorised as Possible Concern.
Nigeria	Least Concern	Distribution restricted to the Obudu plateau in southeastern Nigeria, but no international trade was reported 2002-2011. Therefore, categorised as Least Concern.

B. Species overview

Taxonomic note: The species was treated as *Chamaeleo (Trioceros) quadricornis* by the CITES Standard Nomenclature until CoP 16 (Klaver and Böhme, 1997). The new Standard Reference adopted at CoP 16 (CoP16 Com. I. 8) elevated the subgenus *Trioceros* to genus level based on morphological and genetic evidence (Tilbury and Tolley, 2009).

Two subspecies were identified, *T. [C.] q. quadricornis* and *T. [C.] q. gracilior* (Böhme and Klaver, 1981; Klaver and Böhme, 1997). N.L. Gonwouo (*in litt*. to UNEP-WCMC, 2013) noted that the two subspecies were difficult to distinguish, and that *T. q. gracilior* may be traded as *T. q. quadricornis*, which is more common in the pet trade. More recently, Barej *et al.* (2010) considered *T. q. eisentrauti* (previously *T. eisentrauti*) as an additional subspecies, based on molecular and morphological similarities.

Klaver and Böhme (1992) considered *C. quadricornis* to belong to the *C. cristatus* species group with *C. camerunensis*, *C. cristatus*, *C. eisentrauti*, *C. feae*, *C. montium*, *C. pfefferi* and *C. wiedersheimi*.

Biology: *T. quadricornis* is a West African chameleon that mainly inhabits primary montane forests (Gonwouo *et al.*, 2006) but is considered able to adapt to peri-urban habitats fairly well (Tilbury, 2010). Mature individuals reach a length of 25-35 cm (Dix, 1999). It reaches sexual maturity at approximately eight months (Le Berre, 2009) to one year of age (Schmidt

et al., 2009), and produces two to three clutches of 8-15 eggs per year following a two month gestation period (Tilbury, 2010). Hatching takes approximately five months (Tilbury, 2010).

General distribution and status: *T. quadricornis* occupies a restricted range in the highlands of Cameroon and Nigeria (Klaver and Böhme, 1997; C. Tilbury, *in litt.* to UNEP-WCMC, 2013) (Figure 8). Klaver and Böhme (1992) reported that the species was "only found in relict patches of montane rainforest confined to mountains or mountain ranges in the Cameroon-Nigerian hinterland".

Figure 8. Map showing locality records of *Trioceros quadricornis quadricornis* (red data points) and *T. q. gracilior* (blue data points). (Source: Tilbury, 2010.)

It was considered threatened, but fairly tolerant of human encroachment and relatively common in some villages (Tilbury, 2010).

Threats: Habitat loss was considered as the main threat (C. Tilbury, *in litt.* to UNEP-WCMC, 2013), and the species was also reported to be locally persecuted (Tilbury, 2010). Gonwouo *et al.* (2006), Chirio and LeBreton (2007) and Weiβ (2009) considered capture for export to be a significant threat in some areas. Carpenter (2004) considered *T. quadricornis* to be particularly vulnerable to harvesting due to its restricted distribution.

Overview of trade and management: The species was reportedly bred in captivity in the United States and Europe, however no information was available on the extent of captive breeding (WCMC *et al.*, 1999). In an assessment of morbidity and mortality in captivity by Altherr and Freyer (2001), *T. quadricornis* was considered unsuitable for private husbandry, due to suffering from high transport mortality and poor condition after transport, being characterised as 'difficult to keep' or with 'high mortality in captivity', and requiring conditions that are difficult to simulate.

C. Anderson (*in litt.* to UNEP-WCMC, 2013) cautioned that large quantities of the species were exported from Equatorial Guinea, which is not a range State for the species. The lack of reported imports from the range States was considered to indicate potential illegal trade (C. Anderson, *in litt.* to UNEP-WCMC, 2013).

M. LeBreton (pers.comm. to UNEP-WCMC, 2013) highlighted the importance of evaluating the impacts of trade separately for each subspecies.

T. quadricornis from Cameroon was included in the CITES Review of Significant Trade in 1999, when it was noted that the impact of export trade could not be evaluated with certainty due to the lack of population data (WCMC *et al.*, 1999).

The species was considered to be protected over a relatively small proportion of its range (Weiβ, 2009; Tilbury 2010), although *T. q. quadricornis* was considered to "enjoy relative

protection" within the Mount Kupe forest reserve (Tilbury, 2010). C. Tilbury (*in litt.* to UNEP-WCMC, 2013) noted that most of the protected areas within the range were small and inadequately managed.

C. Country reviews

CAMEROON

Distribution in range State: Occurrence was recorded in southwestern Cameroon in the Manengouba, Kupe (Perret, 1957; Klaver and Böhme, 1992; Hofer *et al.*, 2003; Barej *et al.*, 2010; Tilbury, 2010) and Bakossi mountains (Hofer *et al.*, 2003; Tilbury, 2010), in forests between 1800-2700 m above sea level (Chirio and LeBreton, 2007).

Gartshore (1986) considered the distribution of *T. q. quadricornis* to be limited to Mount Manengouba, but N.L. Gonwouo (*in litt.* to UNEP-WCMC, 2013) reported that it occurred as a "discontinuous population" on the Kupe and Manengouba mountains, Bakossi Hills and the southern part of Banyang-Mbo wildlife sanctuary. It was reported to be restricted to montane gallery forests on the border of forest and grassland at altitudes of 1800-2400 m above sea level (Gonwouo *et al.*, 2006). The total extent of occurrence of *T. q. quadricornis* was reported to be approximately 1400 km^2, and the area of occupancy was estimated to be 270 km^2 (LeBreton and Wild, 2003).

T. q. gracilior was reported to be found in the Lefo, Oku and Bamboutos mountains, Bamenda highlands and Mbulu hills (N.L. Gonwouo, *in litt.* to UNEP-WCMC, 2013) in undisturbed forests 1800-2250 m above sea level (Gonwouo *et al.*, 2006). LeBreton and Wild (2003) reported that the subspecies occurs in severely fragmented forest patches throughout its range, and estimated the extent of occurrence at approximately 9000 km^2 and the total area of occupancy at approximately 250 km^2.

The species was not observed on Mount Cameroon, Mount Mbam or Tchabal Mbabo (Gonwouo *et al.*, 2006). Herrmann *et al.* (2007) did not record the species in surveys conducted on the Tchabal Mbabo Mountains, Adamaoua Plateau (north-central Cameroon) in 1998 or 2000.

Population trends and status: The species was reported to be fairly common in the village of Oku (Chirio and LeBreton, 2007), however Hofer *et al.* (2003) considered it to be "potentially endangered". N.L. Gonwouo (*in litt.* to UNEP-WCMC, 2013) reported *T. q. gracilior* to be "common at some sites".

In unpublished Red List assessments for Cameroonian chameleons, LeBreton and Wild (2003) categorised both subspecies as Endangered due to limited distribution and ongoing habitat loss.

Both subspecies were considered to have a decreasing population status (N.L. Gonwouo, *in litt.* to UNEP-WCMC, 2013). LeBreton and Wild (2003) considered the *C. q. quadricornis* population on Mt Kupe as the "only stable one" due to improved control over deforestation, but noted that anecdotal evidence indicated population declines in areas where the species was collected for pet trade.

Gonwouo *et al.* (2006) cautioned that the "lack of information on the ecology and distribution of chameleons in the Cameroon mountain range is a major impediment to effective chameleon conservation in Cameroon". They recorded four individuals of *T. q. quadricornis* at Mount Manengouba, and five individuals of *T. q. gracilior* around lake Oku in 28 line transect surveys (56 person-hours) conducted in the Cameroonian mountain

range during May 2003-December 2005, concluding that the species was rare in the Cameroonian mountains (Gonwouo *et al.*, 2006).

Threats: Habitat loss was considered as the main threat to *T. quadricornis* (WCMC *et al.*, 1999; LeBreton and Wild, 2003; Tilbury, 2010; N.L. Gonwouo, *in litt.* to UNEP-WCMC, 2013; M. LeBreton, pers. comm. to UNEP-WCMC, 2013), although Gonwouo *et al.* (2006) noted that *T. q. gracilior* appears to be able to persist in remaining isolated habitat patches. N.L. Gonwouo (*in litt.* to UNEP-WCMC, 2013) noted that the main populations of *T. q. gracilior* on the Oku mountain had received little protection and were declining rapidly due to habitat loss.

Capture for export was regarded as a significant threat in some areas (LeBreton and Wild, 2003; Chirio and LeBreton, 2007), and Gonwouo *et al.* (2006) regarded the intensive collection for the pet trade as unsustainable. The populations of *T. q. quadricornis* in the Mount Manengouba area were reported to have declined as a result of capture for the pet trade (LeBreton and Wild, 2003; Gonwouo *et al.*, 2006), and the collection was described as "uncontrolled" and "illegal", whereas the collection of *T. q. gracilior* was regarded as less intensive and "periodical" due to longer distances to major population centres (G.N. LeGrand, *in litt.* to UNEP-WCMC, 2013).

Trade: CITES annual reports have not yet been received from Cameroon for the years 2008 or 2010-2012. Cameroon published an export quota of 400 live, wild-sourced *T. quadricornis* in 2001; a quota was reported to be "in preparation" in 2000 but was not published. No quotas were published from 2002 onwards. Direct exports of *T. quadricornis* from Cameroon 2002-2012 primarily consisted of live, wild-sourced individuals traded for commercial purposes (Table 1). While Cameroon did not report any trade in captive-bred specimens, the import of 30 captive-bred, live specimens was reported by countries of import in 2007. The principal countries of import were Germany, the Netherlands and the United Kingdom.

Indirect trade in *T. quadricornis* originating in Cameroon 2002-2012 consisted of wild-sourced and ranched live individuals traded for commercial purposes in 2003 and 2004.

Table 1. Direct exports of *Trioceros quadricornis* from Cameroon, 2002-2011. (No annual reports have been received from Cameroon for the years 2008 or 2010-2012; no trade was reported in 2004 or 2012.)

Term	Source	Purpose	Reported by	2002	2003	2005	2006	2007	2008	2009	2010	2011	Total
bodies	W	S	Importer		17								17
			Exporter										
live	W	P	Importer					20					20
			Exporter										
		S	Importer										
			Exporter							50			50
		T	Importer	86		141	712	390	863	660	475	402	3729
			Exporter			435	760	765		425			2385
		-	Importer										
			Exporter							140			140
	C	T	Importer					30					30
			Exporter										

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Gonwouo (2002) reported that *T. quadricornis* was the most highly exported chameleon species from Cameroon 1993-1999. In the 1999 CITES Review of Significant Trade, the exports from Cameroon were reported to have increased rapidly, but were considered "unlikely to be a problem" (WCMC *et al.*, 1999).

Management: *T. quadricornis* is categorised as a "Class A" fully protected animal (rare or endangered species) under Decree No 0648/MINFOF of 2006 (Cameroon, 2006). Section 78 of Law No. 94/01 specifies that the hunting of Class A species is strictly forbidden; however, these species may be captured and kept in captivity under authorisation by the wildlife authority (Republique du Cameroun, 1994). L.N. Gonwouo (*in litt.* to UNEP-WCMC, 2013) reported that there were no specific regulations regarding the collection for the pet trade, and recommended that the protection of *T. q. quadricornis* should be improved (Gonwouo *et al.* 2006).

T. quadricornis was considered to be relatively well protected in the Mount Kupe forest reserve (Tilbury, 2010). However, M. LeBreton (pers. comm. to UNEP-WCMC, 2013) noted that sufficient management plans and budgets were not in place to protect the populations that occurred within protected areas.

NIGERIA

Distribution in range State: According to the CITES Management Authority of Nigeria (*in litt.* to UNEP-WCMC, 2013) and E. Eniang (*in litt.* to UNEP-WCMC, 2013), *T. quadricornis* is widely distributed in the country. However, several authors consider the Nigerian subspecies *T. q. gracilior* to be restricted to the Obudu Plateau in southeastern Nigeria (Klaver and Böhme, 1992; Klaver and Böhme, 1997; LeBreton and Wild, 2003; Tilbury, 2010). E. Eniang (*in litt.* to UNEP-WCMC, 2013) conducted surveys in the Akwa Ibom State in southern Nigeria between September 2012 and March 2013, recording the species in the area. However, it was not observed in surveys conducted in the forests of southern Nigeria during 1994-2001 by Akani *et al.* (2001).

Population trends and status: The population status was reported to be unknown due to lack of surveys (CITES MA of Nigeria, *in litt.* to UNEP-WCMC, 2013; E. Eniang, *in litt.* to UNEP-WCMC, 2013). LeBreton and Wild (2003) reported that *T. q. gracilior* is limited to severely fragmented forest patches throughout its range.

Threats: Habitat loss was regarded as the main threat to the species (LeBreton and Wild, 2003; CITES MA of Nigeria, and E. Eniang, *in litt.* to UNEP-WCMC, 2013). E. Eniang (*in litt.* to UNEP-WCMC, 2013) noted that the species was persecuted in many areas due to the belief that it was dangerous and the CITES MA of Nigeria (*in litt.* to UNEP-WCMC, 2013) regarded unsustainable hunting for traditional medicine as an additional threat.

Trade: CITES annual reports have not yet been received from Nigeria for the years 2005 or 2010-2012. Nigeria has not published any export quotas for *T. quadricornis*. According to data in the CITES Trade Database, no direct or indirect trade in *T. quadricornis* originating in Nigeria was reported 2002-2012.

E. Eniang (*in litt.* to UNEP-WCMC, 2013) noted that the species was traded in local markets in many areas, primarily for traditional medicine. He also reported some anecdotal evidence of Togolese tradesmen attempting to buy live chameleons from Nigeria in July 2012, but the species was not identified.

Management: The species is reported to occur in the Gashaka-Gumti, Chad Basin, Kamuku, Kainji Lake, Old Oyo (CITES MA of Nigeria, *in litt.* to UNEP-WCMC, 2013), Cross River and Okomu National Parks (E. Eniang, *in litt.* to UNEP-WCMC, 2013). The CITES MA of Nigeria (*in litt.* to UNEP-WCMC, 2013) considered the National Parks legislation in Nigeria to provide sufficient protection to *T. quadricornis*; however, it was noted that non-detriment findings for the species in the National Parks were "yet to be conducted". E. Eniang (*in litt.* to UNEP-WCMC, 2013) reported that there were no regulations in Nigeria concerning the wild harvesting or trade of the species.

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

C. Tilbury (*in litt.* to UNEP-WCMC, 2013) noted that *T. eisentrauti* (recently considered as *T. q. eisentrauti*) may be traded as *T. quadricornis*.

According to data in the CITES Trade Database, the species was reported in trade in notable quantities from Equatorial Guinea, which is not a range State but borders Cameroon.

CITES annual reports have not yet been received from Cameroon for 2008, 2010 or 2011 or from Nigeria for 2005, 2010 or 2011.

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Ptyas mucosus (Linnaeus, 1758): Cambodia, Lao People's Democratic Republic

Colubridae, Oriental Rat Snake

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee included *Ptyas mucosus* (all range States) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 specified that *P. mucosus* met the criterion of high volume trade in 2008 and 2009. At the 26th meeting of the AC, responses had been received from the People's Republic of China (hereafter referred to as China), Indonesia, Malaysia, Myanmar and Pakistan (AC26 Doc. 12.3). Afghanistan, Bhutan, Cambodia, India, Iran, Lao People's Democratic Republic (hereafter referred to as Lao PDR), Nepal, Singapore, Sri Lanka, Tajikistan and Viet Nam were retained in the process (AC26 Summary Record). Following the 26th meeting of the AC, Afghanistan, Bhutan, India, Iran, Nepal, Singapore, Sri Lanka, Tajikistan and Viet Nam were removed from the process, on the basis of virtually no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Ptyas mucosus* recommendations.

		General summary
		Widespread but with unknown population status. Local population decline reported as a result of the harvesting of skins for international trade, but in general the species is considered fairly tolerant to harvesting.
Range State	**Provisional category**	**Summary**
Cambodia	Least Concern	Trade of 4000 live, wild-sourced individuals was reported in 2003, although this was not reported by the country of import. Appears relatively widespread, but population status unknown. On the basis of no trade since 2003, categorised as Least Concern; questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
Lao People's Democratic Republic	Possible Concern	Moderate levels of trade 2005-2011 mainly in ranched and captive-bred, live individuals. Occurs in central and southern parts of the country, but population status is unknown. The basis of non-detriment finding is unclear. Therefore, categorised as Possible Concern.

B. Species overview

Taxonomic note: No CITES standard references have been adopted for Colubridae. Auliya (2010) noted that, in accordance with the International Code of Zoological Nomenclature, the correct name is *P. mucosa*, but according to the recommendation of the 2011 CITES Asian Snake Trade Workshop, "*Ptyas mucosus* should probably be retained in preference to *Ptyas mucosa* unless there are compelling technical reasons" (AC25 Doc.22 (Rev.1) Annex 1).

Biology: *P. mucosus* is a diurnal, non-venomous snake (Breen, 1974; TRAFFIC, 2008) with an average length of 2-2.5 m, although specimens up to 4 m have been reported (Auliya, 2010). It occurs in a variety of habitats (Cox *et al.*, 1998) including open areas adjacent to forests,

agricultural land (Auliya, 2010), human inhabited areas (Whitaker, 1978) and parks and gardens (Das, 2010).

P. mucosus was reported to reach sexual maturity at approximately three years (Daniel, 1983), although data collected from Indonesian snake traders suggests that females may reach maturity at nine months (Auliya, 2010). Typical clutch size is 6-18 eggs (Cox *et al.*, 1998), and incubation lasts 60-95 days (Das, 2010). The timing of the breeding season varies across the distribution range (Daniel, 1983) and females may lay two clutches per year (Auliya, 2010).

General distribution and status: *P. mucosus* is widely distributed in South Asia from Iran and Afghanistan in the west to southern China in the east and Indonesia in the southeast (Daniel, 1983; Welch, 1988; Ananjeva *et al.*, 2006; TRAFFIC, 2008; Das, 2010).

Population trends were considered to be unknown (TRAFFIC, 2008), although declines were suggested from China (Zhou and Jiang, 2004) and from the island of Java (Auliya, 2010).

Threats: WCMC and IUCN/SSC Trade Specialist Group (1992) considered the collection of skins for international trade as the main threat to the species. More recently, Auliya (2010) considered overcollection to be the main cause of population decline in some areas, but noted that *P. mucosus* was fairly tolerant to harvesting.

Overview of trade and management: *P. mucosus* was listed in CITES Appendix III by India on 13/02/1984 and uplisted to Appendix II on 18/01/1990. It was considered to be one of the most heavily traded snakes in southeast Asia (Jenkins and Broad, 1994; Webb *et al.*, 2012). The species was subject to the CITES Review of Significant Trade in 1992, where it was concluded that the impacts of trade were largely unknown, although there was evidence of local population declines (WCMC and IUCN/SSC Trade Specialist Group, 1992). Neither Cambodia nor Lao PDR were Party to CITES at the time, and not included in the review (WCMC and IUCN/SSC Trade Specialist Group, 1992).

C. Country reviews

CAMBODIA

Distribution in range State: The occurrence of *P. mucosus* in Cambodia was confirmed by Saint-Girons and Pfeffer (1972), Bain and Hurley (2011) and Grismer *et al.* (2011). Grismer *et al.* (2008a, 2008b) reported sightings of *P. mucosus* from the northwestern part of the Cardamom region (southwestern Cambodia). However, the species was not recorded in surveys conducted in the uplands of eastern Mondolkiri (eastern Cambodia), northeastern Ratanakiri (northeast Cambodia) and northeastern Stung Treng (northwestern Cambodia) provinces during 2000 and 2003 (Stuart *et al.*, 2006).

Population trends and status: The CITES Management Authority of Cambodia (*in litt.* to UNEP-WCMC, 2013) noted that the status of the species in Cambodia is poorly known.

Threats: Martin and Phipps (1996) reported that snakes and snake products were commonly sold at local markets, and described the export of reptiles as unrestricted. However, no specific information regarding *P. mucosus* was located.

Trade: CITES annual reports have been received from Cambodia for all years 2002-2012. Cambodia has not published any CITES export quotas for *P. mucosus*. According to data in the CITES Trade Database, trade in *P. mucosus* originating in Cambodia reported over the period 2002-2012 comprised 4000 live, wild-sourced animals exported directly to Viet Nam for commercial purposes in 2003, reported by Cambodia only; no indirect trade in the species originating in Viet Nam was reported 2002-2012.

Stuart (2004) considered the export of snakes from Cambodia to Viet Nam to be substantial.

Management: *P. mucosus* is categorised as a 'common' species (fairly common and widespread species, with high reproductive capacity and not under significant threat) under Article 48 of Cambodia's Law on Forestry (2002) (Ministry of Agriculture Forestry and Fisheries, 2007). Article 49 of the Law on Forestry prohibits hunting within protected areas, and Article 50 prevents the keeping of common species as pets, and transporting and trading them in amounts exceeding "customary use" unless under a permit issued by the Forestry Administration (Cambodia, 2002). Shepherd *et al.* (2007) and Martin and Phipps (1996) expressed concern about insufficient law enforcement and management of wildlife trade in Cambodia.

Lao People's Democratic Republic

Distribution in range State: Bain and Hurley (2011) and Duckworth *et al.* (1999) reported occurrence of *P. mucosus* in central and southern Lao PDR. Teynié and David (2007) recorded it from the Champasak Province in southern Lao PDR.

Population trends and status: *P. mucosus* was considered to be "potentially at risk" in Lao PDR, although its status was regarded as insufficiently known (Duckworth *et al.*, 1999). Auliya (2011) reported population declines of *Ptyas* spp. in Lao PDR.

Threats: Auliya (2011) reported that the harvesting of *Ptyas* spp. occurred regularly and had led to population declines in Lao PDR.

Trade: Lao PDR became a Party to CITES in 2004; CITES annual reports from the country have been received for the years 2006-2009 only. Lao PDR has not published any CITES export quotas for *P. mucosus*. According to data in the CITES Trade Database, no direct trade in *P. mucosus* from Lao PDR was reported prior to 2005; direct trade over the period 2005-2012 comprised live animals traded for commercial purposes (Table 1). According to data reported by Lao PDR, the majority of the trade was ranched, while the majority of the trade reported by countries of import was captive-bred. The principal country of import was Viet Nam.

Indirect trade in *P. mucosus* originating in Lao PDR 2002-2012 comprised ranched, wild-sourced and captive-bred live animals traded for commercial purposes from 2004 onwards; trade peaked in 2011 at 43 500 animals, however no source was recorded for these specimens and the trade was reported by the country of re-export only.

Table 1. Direct exports of *Ptyas mucosus* from Lao People's Democratic Republic, 2005-2011. All trade was in live animals for commercial purposes. (Lao People's Democratic Republic became a Party to CITES in 2004; annual reports have been received for the years 2006-2009 only; no trade was reported in 2002-2004, 2006 or 2012.)

Source	Reported by	2005	2007	2008	2009	2010	2011	Total
W	Importer	1200						1200
	Exporter							
R	Importer							
	Exporter		4000	10000				14000
C	Importer				3500	3500		7000
	Exporter				10000			10000
-	Importer						7600	7600
	Exporter							

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Stuart (2004) considered the export of snakes from Lao PDR to Viet Nam to be substantial. Illegal harvest of reptiles for the international trade was considered widespread in Lao PDR (The World Bank, 2005).

Management: *P. mucosus* is not protected under the National Biodiversity Conservation Areas, Aquatic and Wildlife Management Regulations (No. 0360/AF.2003) (Lao People's Democratic Republic, 2003). Singh (2008) noted poor knowledge of wildlife regulations concerning CITES-listed species among harvesters and traders, and Berkmüller and Southammakoth (2001) reported low levels of capacity among management officials. The management and regulation of cross-border trade in wildlife was considered inadequate (Shepherd *et al.*, 2007) and, according to Nash (1997), there were no border checkpoints on the borders to China or Myanmar.

A complete ban on exporting wildlife outside Lao PDR was issued in 1990 as a precautionary measure while the state of wild populations of animals was being assessed (Nash, 1997). The export ban was reportedly omitted in the 2003 revision of wildlife trade regulations (Singh, 2008).

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

Illegal trade was reported to occur in both Cambodia and Lao PDR, and enforcement of regulations concerning wildlife trade was considered to be insufficient in both countries.

Auliya (2010) noted that *P. mucosus* may be traded as *Ptyas korros*, which is not listed on CITES, due to their similarity in appearance.

There was a notable discrepancy in trade reported by countries of import and Cambodia.

CITES annual reports have not yet been received from Lao, PDR for the years 2005 or 2010-2011.

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Naja sputatrix (F. Boie, 1827): Indonesia

Elapidae, South Indonesian Spitting Cobra, Equatorial Spitting Cobra, Javan Spitting Cobra, Indonesian Cobra

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee included *Naja sputatrix* from Indonesia in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). In both 2008 and 2009, *N. sputatrix* was identified as a species that met a high volume trade threshold and showed a sharp increase in trade, compared with the previous five year average (Annex 2, AC25 Doc. 9.6). At the 26th meeting of the AC, response had been received from Indonesia (AC26 Doc. 12.3), but the country was retained in the review (AC26 Summary Record).

A. Summary

Overview of *Naja sputatrix* recommendations.

Range State	Provisional category	Summary
Indonesia	Least Concern	High levels of trade 2002-2011, mainly in wild-sourced skins. A possible quota excess was reported in 2002 (live, wild). Harvested only in east and central Java, and export quotas take into account the recommendations of the SA based on available biological information. Endemic species categorised as Least Concern in the IUCN Red List and considered locally common including in disturbed habitats. Therefore, categorised as Least Concern.

B. Species overview

Taxonomic note: Asiatic species of the genus *Naja* have been reclassified and renamed several times (Wüster and Thorpe, 1989; Wüster *et al.*, 1997), having been considered varieties of *Naja naja* until the 1980s (Wüster *et al.*, 1995; Wüster, 1996a). Wüster and Thorpe (1989) used multivariate analysis of morphological characters to demonstrate that the populations from Java east to Alor island were distinct from those in the rest of South-East Asia. The current CITES Standard Reference (Wüster, 1996a) considers *N. sputatrix* as part of the *N. naja* species complex, together with *N. atra*, *N. kaouthia*, *N. naja*, *N. oxiana*, *N. philippinensis*, *N. sagittifera*, *N. samarensis*, *N. siamensis* and *N. sumatrana*.

Wüster (1996a) noted that before the 1990s, the name *N. sputatrix* was widely used for *N. sumatrana* originating in Malaysia and *N. siamensis* originating in Thailand (Wüster, 1996a).

Biology: *N. sputatrix* is a terrestrial, venomous snake with a dilatable neck (Hoser, 2009). Its preferred habitats include grasslands, savannas, swamps, agro-ecosystems, plantations and rice fields, but it can also be found in secondary forests (Iskandar *et al.*, 2012) and frequently occurs in human inhabited areas with abundant rat populations (NAVMED, 1968).

Males reach maturity at approximately 102 cm, females at approximately 97 cm (M. Auliya, *in litt.* to UNEP-WCMC, 2013). Available evidence suggests that one clutch is laid per year (M. Auliya, *in litt.* to UNEP-WCMC, 2013) although the CITES Management Authority and Scientific Authority of Indonesia (*in litt.* to UNEP-WCMC, 2013) reported that it may produce three clutches in two years. Average clutch size is 12-22 eggs, but up to 45 eggs

have been recorded (Daniel, 1983). The incubation period is 88 days (M. Auliya, *in litt.* to UNEP-WCMC, 2013).

C. Country reviews

INDONESIA

Distribution in range State: *N. sputatrix* is considered to be endemic to Indonesia with confirmed records from the islands of Java, Bali, Lombok, Sumbawa, Padar, Rinca, Komodo, Flores, Adonara, Lomblen (Lembata) and Alor (Mertens, 1930; Klemmer, 1963; Auffenberg, 1980; Wüster, 1996b; How and Kitchener, 1997; De Lang, 2011; Iskandar *et al.*, 2012) (Figure 9). Erdelen (1998) also included Bangka island, Belitung and the Riau Archipelago in the species' distribution, but Wüster (1996b) considered *N. sumatrana* to occur in these areas. The occurrence of *N. sputatrix* in Sulawesi was considered uncertain by Wüster (1996b) and unlikely by De Lang and Vogel (2006) and Koch (2011), but the Indonesian Directorate of Biodiversity Conservation (2011) included Sulawesi in the species' distribution. Wüster and Thorpe (1989) also reported an unconfirmed occurrence on Timor.

Welch (1988) considered the species to occur in Peninsular Malaysia, but according to Wüster (1996a), any specimens previously identified from the Malayan Peninsula belong to *N. sumatrana*.

Figure 9. Distribution of *Naja sputatrix*. (Source: Iskandar *et al.*, 2012.)

Population trends and status: *N. sputatrix* was categorised as Least Concern in the IUCN Red List, and considered "very common, especially in human made habitats" (Iskandar *et al.*, 2012). The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) confirmed that the species was widespread and common, with a stable population throughout the country. It was considered to be abundant in Java (Yuwono, 1998), and according to M. Auliya (pers. comm. to UNEP-WCMC, 2013), reports from local hunters in Java suggested that it has adapted well to the increased human populations, although is rare in some areas. Similarly, Boeadi *et al.* (1998) noted that the species did well in disturbed habitats in Java.

Several authors noted that information about trade levels and the biology and ecology of the species was lacking (Erdelen, 1998; Nijman and Shepherd, 2009; Iskandar *et al.*, 2012; Nijman *et al.*, 2012b).

Threats: Habitat degradation and persecution by humans were considered as possible threats to *N. sputatrix* (CITES Management Authority of Indonesia, 2011), although the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) reported that the species appears to benefit from human disturbance. M. Auliya (pers. comm. to UNEP-WCMC, 2013) noted that potential impacts of land use changes and the use of rat poison on the populations of *N. sputatrix* were poorly known.

Boeadi *et al.* (1998) thought that the species could support a significant commercial offtake in Java but noted that further studies were required to confidently assess the impact of harvesting on populations. Sugardjito *et al.* (1998) considered the amount of 109 650 specimens harvested in 1996 from central Java and the Yogyakarta as moderate harvest levels. However, more recently, Auliya (2011) considered the harvest levels of *N. sputatrix* for the skin trade from Indonesia as "largely unsustainable". The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) noted that apart from being harvested for trade, the species was also harvested as a nuisance animal, and the skins were collected as a by-product (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). Schlaepfer *et al.* (2005) and Nijman *et al.* (2012) noted the difficulty of making non-detriment findings for Indonesian reptiles because of the lack of information on population status and biology.

Trade: *N. sputatrix* was listed in CITES Appendix II on 18/01/1990. CITES annual reports have been received from Indonesia for all years 2002-2011. Indonesia published export quotas for wild-sourced *N. sputatrix* skins and live specimens every year from 1997 onwards; from 2003 onwards, the quota also applied to skin products (Table 1). The quota for live specimens appears to have been exceeded according to data reported by Indonesia in 2002, but not according to data reported by countries of import; Indonesia's 2002 annual report appears to be based on actual trade. Trade in skins and skin products remained within the quota in every year according to data reported both by countries of import and of export.

Direct exports of *N. sputatrix* from Indonesia 2002-2012 primarily consisted of wild-sourced skins traded for commercial purposes; notable quantities of skin products and meat were also reported in trade, the majority wild-sourced (Table 2). Exports of skins and skin products showed an overall decline from 2007 onwards; trade in meat increased considerably over this period, although figures reported by countries of import were significantly lower than those reported by Indonesia. The CITES MA and SA of Indonesia (2013) confirmed the decreasing trend in skin trade and noted that it was likely due to reduced market demand. The principal countries of import for skins were Mexico and Singapore, while the United States was the main country of import of skin products; the primary country of import of meat was the People's Republic of China (including Hong Kong, SAR).

Indirect exports of *N. sputatrix* originating in Indonesia 2002-2012 principally comprised skins and leather products, the majority of which were wild-sourced and traded for commercial purposes.

Table 1. CITES export quotas for wild-sourced *Naja sputatrix* from Indonesia and global direct exports, as reported by the countries of import and of export, 2002-2012. (Trade data for 2012-2013 are not yet available) (For each year, trade in those terms/combinations of terms to which the quota does not apply in that year is greyed out.)

		Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (live)			1350	500	450	450	450	450	450	450	450	450		450
Quota (skins and skin products)			135000♦	134500	134550	134550	134550	134550	134550	134550	134550	134550	135000■	134550
live		importers	11	49	24	20		29	43	17	9	17		
		Indonesia	4344	162	259	232	113	162	315	137	123	226		
skins		importers	48000	37000	100175	100197	121022	109897	43902	54587	73525	52696		
		Indonesia	124680	103574	86638	98909	118984	109991	50526	86402	79454	63750		
skin products	skin pieces	importers		754	200			15	417					
		Indonesia												
	garments	importers					4							
		Indonesia												
	large leather products	importers		107	21	87	29	15	46			2		
		Indonesia												
	small leather products	importers		1228	1470	294	5085	5081	2669	767	792	1302		
		Indonesia	138	2944	1208	8805	4951	4445	3485	494	4539	2511		
	Subtotal (skin products)	importers		2089	1691	381	5118	5111	3132	767	792	1304		
		Indonesia	138	2944	1208	8805	4951	4445	3485	494	4539	2511		
Subtotals (skins and skin products)		importers	48000	39089	101866	100578	126140	115008	47034	55354	74317	54000		
		Indonesia	124818	106518	87846	107714	123935	114436	54011	86896	83993	66261		
Total (live, skins and skin products)		importers	48011	39138	101890	100598	126140	115037	47077	55371	74326	54017		
		Indonesia	129162	106680	88105	107946	124048	114598	54326	87033	84116	66487		

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK
Key: ♦ = excludes skin products; ■ = includes live specimens

Table 2. Direct exports of *Naja sputatrix* from Indonesia (excluding terms traded in quantities totalling < 5 units), 2002-2011. The majority of trade was for commercial purposes. (Indonesia's annual report for 2012 has not yet been received; no trade was reported in 2012.)

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
skins	-	W	Importer	48000	37000	100175	100197	121022	109897	43902	54587	73525	52696	741001
			Exporter	124680	103574	86638	98909	118984	109991	50526	86402	79454	63750	922908
		O	Importer										3000	3000
			Exporter											
small leather products	-	W	Importer		1228	1470	294	5085	5081	2669	767	792	1302	18688
			Exporter	138	2944	1208	8805	4951	4445	3485	494	4539	2511	33520
		C	Importer						32					32
			Exporter											
		F	Importer						32					32
			Exporter											
		I	Importer							19			4	23
			Exporter											
		-	Importer								34			34
			Exporter											
meat	kg	W	Importer								900	5250		6150
			Exporter						3500	20200	64692	63291	99061	269259
		F	Importer											
			Exporter										18515	18515
live	-	W	Importer	11	49	24	20		29	43	17	9	17	219
			Exporter	4344	162	259	232	113	162	315	137	123	226	6073
		C	Importer										1200	1200
			Exporter									2400	1500	3900
		F	Importer	1500	600					300				2400
			Exporter	11160	8350	2900	4650	3500	5800	3957	2492			42809
skin pieces	-	W	Importer		754	200			15	417				1386
			Exporter											
large leather products	-	W	Importer		107	21	87	29	15	46			2	307
			Exporter											
		C	Importer						62	3				65
			Exporter											
		F	Importer						6					6
			Exporter											
		I	Importer					97						97
			Exporter											
bodies	-	W	Importer		200					40		66		306
			Exporter		200		100	500	553	20				1373
		I	Importer										2	2
			Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *N. sputatrix* is not protected in Indonesia (Government Regulation No. 7-1999 on the Preservation of Flora and Fauna), but harvest within protected areas is prohibited (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). Wildlife poaching and other forms of encroachment were reported to have become major issues in protected areas in Indonesia (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013).

Annual harvest quotas were reported to be set separately for each province, taking into account the recommendations of the SA and using available information on the biology and status of the species and its potential threats, as well as information collected from various stakeholders (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). However, Amaliah and Pudyatmoko (2012) cautioned that only taking into account the population status of the species when setting the quota was insufficient.

Snake collectors and exporters need to be licensed under the Directorate General of Forest Protection and Nature Conservation in order to apply for CITES export permits, and a separate permit is needed for domestic transport (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) reported that due to the establishment of standardised domestic transport permits, monitoring of the chain of custody was "theoretically possible to a certain degree of accuracy" in Indonesia.

Conservation and management of reptiles in Indonesia was considered to be a relatively recent phenomenon, with existing management activities regarded as inadequate (Iskandar and Erdelen, 2006). Nijman *et al.* (2012a) and Natusch and Lyons (2012) considered illegal trade in reptiles to be widespread in Indonesia and called for better enforcement of national laws. However, the Directorate of Biodiversity Conservation (2011) noted that illegal trade in snakes had declined considerably since 2006 due to increased monitoring. The Indonesian Department of Forestry and the Wildlife Conservation Society established the Wildlife Crimes Unit on the island of Sulawesi in 2001 with the objective of curbing illegal trade throughout Indonesia, but the effectiveness of the programme could not be confirmed (Lee *et al.*, 2005). The CITES MA of Indonesia (*in litt.* to UNEP-WCMC, 2013) reported that the Government of Indonesia had started to provide training on enforcement of CITES and wildlife laws to officers, officials and investigators from the State Police, Customs, Quarantine and the provincial offices of the Management Authority.

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) reported that two captive breeding operations exist in Indonesia, breeding *N. sputatrix* for commercial purposes. An evaluation conducted in 2012 reported high reproductive capacity of captive bred *N. sputatrix*, with a hatching rate of 90 per cent and survival rate of 70-80 per cent (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). The Maximum Estimated Production (MEP) of the two breeding operations, based on an estimate of breeding success for the year 2013 and drafted by the CITES MA, was set at 22 500 individuals (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). Nijman and Shepherd (2009) were concerned about the laundering of wild-caught specimens as captive bred and regarded this as being common practice in Indonesia. The majority of captive breeding facilities surveyed during 2006 was found to be either unsuitable for breeding reptiles or not in use (Nijman and Shepherd, 2009). Auliya (2011) expressed concern over the lack of breeding operations and called for improved management strategies. M. Auliya (pers. comm. to UNEP-WCMC, 2013) reported on a visit made in 2006 to a company in East Java which was registered as a supplier of *N. sputatrix* to the meat trade and most likely to the medicinal trade, and noted that according to the owner the current number of live specimens was 5249, and no wild

individuals were caught for breeding stock. However, based on irregularities in the data provided by the company, combined with observations made during the visit, it was concluded that the company only maintained wild-caught *N. sputatrix* and no breeding was taking place (M. Auliya, pers. comm. to UNEP-WCMC, 2013).

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

Due to the changes in the taxonomy of *Naja* spp., it is likely that specimens of *N. sputatrix* have been recorded in trade under different names.

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Python reticulatus (Schneider, 1801): Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Philippines, Singapore, Viet Nam

Pythonidae, Reticulated Python

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee included *Python reticulatus* (all range States) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 specified that *P. reticulatus* met a high volume trade threshold in 2008 and 2009 and the criteria of high variability in trade between 1999 and 2008 and a sharp increase in trade in 2009, compared with the average trade levels for 2004-2008. At the 26th meeting of the AC, responses had been received from Indonesia, Malaysia and Myanmar (AC26 Doc. 12.3). Bangladesh, Brunei Darussalam, Cambodia, India, Indonesia, Lao People's Democratic Republic (hereafter referred to as Lao PDR), Malaysia, Philippines, Singapore and Viet Nam were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Bangladesh, Brunei Darussalam and India were removed from the process, on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Python reticulatus* recommendations.

		General summary
		Widespread but with poorly known population status. Local depletions reported. Collection for skin trade regarded as a main threat, although the species is considered to be relatively tolerant to harvesting.
Range State	**Provisional category**	**Summary**
Cambodia	Least Concern	Virtually no international trade reported 2002-2011. Unclear conservation status. On the basis of no international trade, categorised as Least Concern.
Indonesia	Least Concern	Very high levels of trade reported 2002-2011, mainly in wild-sourced skins. Export quotas take into account the recommendations of the SA based on available biological information. Widespread and at least locally common, but some declines reported as a result of harvesting. However, harvested largely in oil palm plantations and populations appear able to sustain current harvest levels. Therefore, categorised as Least Concern.
Lao People's Democratic Republic	Least Concern	Relatively high and increasing levels of trade in captive-bred skins reported 2009-2011 by the countries of import only. Widespread in the country, but unknown conservation status, with some declines reported. On the basis of no trade reported in wild-sourced specimens, categorised as Least Concern, although questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
Malaysia	Possible Concern	Very high levels of trade reported 2002-2011, mainly in wild-sourced skins. Widespread in the country, but unclear conservation status. Non-detriment finding studies underway but not yet made available. The basis of quota setting is unclear. Therefore, categorised as Possible Concern pending the results of the non-detriment finding studies.
Philippines	Least Concern	Very low levels of trade reported 2002-2011. Widespread in the country, but unclear conservation status. On the basis of very low levels of international trade, categorised as Least Concern.
Singapore	Least Concern	No trade reported by Singapore. Relatively low levels of trade reported by countries of import 2002-2011, mainly in captive-bred skins. Common and protected, with commercial harvested prohibited. On the basis of low levels of direct trade, categorised as Least Concern.

Viet Nam	Least Concern	High levels of trade reported 2002-2011, mainly in captive-bred skins. Only captive-bred skins are allowed for commercial export. Critically Endangered nationally. On the basis of very low levels of trade in wild-sourced skins, categorised as Least Concern, although questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.

B. Species overview

Taxonomic note: In addition to the nominal subspecies, *P. reticulatus reticulatus*, two morphologically and genetically distinct subspecies have been described from Selayar and Tanahjampea islands (Flores Sea, Indonesia): *P. r. jampeanus* and *P. r. saputrai*, respectively (Auliya *et al.*, 2002).

Biology: *Python reticulatus* is a Southeast Asian snake species, typically associated with humid forests, but also found in cultivated areas and near human habitation (Hvass, 1975; Groombridge and Luxmoore, 1991; Cox *et al.*, 1998), often near water (O'Shea, 2011). Lengths of over 7 m have been reported (O'Shea, 2011), with females reported to mature at greater sizes and to grow larger than males (Shine *et al.*, 1998, 1999). Shine *et al.* (1999) noted that smaller snakes (including adult males and recently-matured females) feed primarily on rats and are therefore abundant in disturbed habitats, whereas older females that feed on larger mammals may be more common in undisturbed habitats. Clutch sizes of 10-100 eggs were reported by Stidworthy (1969), increasing with the size and age of the female (Groombridge and Luxmoore, 1991), although the mean clutch size produced by wild pythons was reported to be 24 eggs, with females reproducing only once every two to four years (Shine *et al.*, 1999).

General distribution and status: The species' range was reported to range from Assam (northeast India) to eastern parts of Indonesia and the Philippines (O'Shea, 2007), covering Nicobar Islands, Myanmar, Thailand, Lao PDR, Cambodia, Viet Nam, Malaysia, Indonesia and the Indo-Australian Archipelago (McDiarmid *et al.*, 1999). Groombridge and Luxmoore (1991) regarded the occurrence in India as possible.

Groombridge and Luxmoore (1991) considered the species' population status to be poorly known, but noted that many populations may be locally depleted. D. Natusch, (pers. comm. to UNEP-WCMC, 2013) also recognised the lack of objective information on the population size and status of *P. reticulatus* throughout its range.

Threats: Collection for the skin trade was regarded as the main threat to *P. reticulatus* (Groombridge and Luxmoore, 1991; Auliya, 2013; Natusch, D. pers. comm. to UNEP-WCMC, 2013), although the species was considered to be relatively tolerant of high rates of exploitation due to its rapid growth, early maturation, high reproductive rates, generalist habitat requirements and cryptic nature (Shine *et al.*, 1999). Other authors have also considered that *P. reticulatus* has the ability to withstand relatively intensive harvesting (Webb *et al.*, 2000; D. Natusch, pers. comm. to UNEP-WCMC, 2013).

Groombridge and Luxmoore (1991) also considered habitat alteration to represent a threat to the species and Auliya (2006) suggested that the species may be highly dependent on thickly vegetated fringe habitats associated with cultivated areas and that the conversion of land to monocultures may threaten populations.

Overview of trade and management: D. Natusch (pers. comm. to UNEP-WCMC, 2013) raised concerns about large exports of *P. reticulatus* skins originating in countries where the capacity for those levels of production is unconfirmed. Kasterine *et al.* (2012) suggested that

the volume of illegal trade in pythons from Southeast Asia may equal the volume of legal trade.

Kasterine *et al.* (2012) noted that skins of *Python* spp. were smuggled with other shipments, mixed with legally sourced skins through stockpiling, or exported with misreported quantity, origin or source.

D. Natusch (pers. comm. to UNEP-WCMC, 2013) considered that harvesting laws in the major source countries are rarely adhered to and that quotas for wild harvests are arbitrary and regularly exceeded.

C. Country reviews

CAMBODIA

Distribution in range state: In early records, *P. reticulatus* was considered to occur throughout Cambodia, particularly in marshy areas (Bourret, 1939 in: Groombridge and Luxmoore, 1991). More recently, the species' distribution in Cambodia has been described as uneven (M. Auliya, pers. comm to UNEP-WCMC, 2013) and records exist for the northwestern part of the Cardamom region (southwest Cambodia) (Grismer *et al.*, 2008a, 2008b), for Trapeang Chan (western Cambodia) (Saint Girons, 1972 in: Auliya, 2006), and for the Tonle Sap Great Lake area (Campbell *et al.*, 2006).

Population trends and status: M. Auliya (pers. comm. to UNEP-WCMC, 2013) indicated that no studies have been undertaken in Cambodia to provide substantial information on the status of the species. However, *P. reticulatus* was classified as a "common species" by the Ministry of Agriculture, Forestry and Fisheries of Cambodia (Cambodia, 2007) and D. Natusch (pers. comm. to UNEP-WCMC, 2013) noted that wild populations in Cambodia are likely to be stable.

Threats: Martin and Phipps (1996) listed *P. reticulatus* as a "notable species in trade in Cambodia", used for medicinal purposes, leather items and as pets. The authors estimated that approximately 200-300 kg of *Python* spp. from every province in Cambodia were sold in Phnom Penh every day.

Trade: CITES annual reports have been received from Cambodia for all years 2002-2012. Cambodia has not published any CITES export quotas for *P. reticulatus*. According to data in the CITES Trade Database, Cambodia has not reported any direct trade in *P. reticulatus* 2002-2012. Direct trade in *P. reticulatus* as reported by countries of import originating in Cambodia reported over the period 2002-2012 comprised one skin piece of unknown source imported by the United States directly from Cambodia for personal purposes in 2007. Indirect trade in the species originating in Cambodia reported 2002-2012 comprised one wild-sourced skin re-exported via Japan to the United States for commercial purposes in 2002, reported by the country of import only.

Martin and Phipps (1996) expressed concerns about illegal exports of wildlife from Cambodia, with most *Python* spp. reportedly exported live to Viet Nam, often for onward transit to China and Taiwan, Province of China, for the skin trade. D. Natusch (pers. comm. to UNEP-WCMC, 2013) considered that despite concerns over Cambodian snakes being collected and brought to Viet Nam to be sold to breeding farms, there was little evidence to support this claim.

Management: The Law on Forestry of 2002 states that the export/import of any "common" wildlife species requires a permit issued by the Forestry Administration, upon the approval of the Ministry of Agriculture, Forestry and Fisheries (Cambodia, 2002). However, Auliya

(2011) considered the existing law governing the hunting and trade of snakes in Cambodia to be unclear.

INDONESIA

Distribution in range state: Groombridge and Luxmoore (1991) considered *P. reticulatus* to be widespread in Indonesia, with the exception of New Guinea. Auliya (2006) reported occurrence in Sumatra and associated islands, Sulawesi and offshore islands, Lesser Sundas, West and East Kalimantan and offshore islands, Java (including Jakarta) and associated islands, Molucca islands, and Papua (unconfirmed records).

Population trends and status: Auliya (2006) noted the lack of population size data available for *P. reticulatus*, but reported a minimum of 19 individuals from a study area of 4.4 km^2 in West Kalimantan.

Iskandar and Erdelen (2006) noted the difficulty of collecting relevant field data to estimate the sustainability of *P. reticulatus* harvest in Indonesia.

Groombridge and Luxmoore (1991) noted that the species had been reported as common to uncommon in the country by different authors. The species was considered to be rare in West Java by de Haas (1941), in Sulawesi by de Lang and Vogel (2006) and in oil palm estates in North Sumatra by Abel (1998). However, the species' cryptic nature and the difficulty to catch it were recognised by Abel (1998) and Auliya (2006).

Reptile dealers reported declines in *P. reticulatus* in West Kalimantan (Auliya, 2006) and in North Sumatra (Shine *et al.*, 1999; Keogh *et al.*, 2001), which the authors suggested may be linked to an expansion of agricultural areas. Riquier (1998) reported relatively high catch rates in West Kalimantan, which were thought to be due to hunting pressure being lower than in other Indonesian islands.

Threats: The species is reportedly caught in rural areas, forests and near water for the skin trade (Groombridge and Luxmoore, 1991; Shine *et al.*, 1999; Auliya, 2006).

Groombridge and Luxmoore (1991) reported local population depletions caused by harvest and noted that "in Indonesia, traders generally report little decrease in the availability of *P. reticulatus* skins, but to some extent this is because the area in which snakes are captured is continually expanding, and more people are involved in collecting". Auliya (2006) similarly reported that declines in *P. reticulatus* were resulting in the increase of hunting areas and that the realisation of established quotas was only possible because the species was originating from more distant regions than in the 1990s.

Luiselli *et al.* (2012) cautioned that the rapid increase in the quantity of *P. reticulatus* legally exported from Indonesia combined with the decrease in forest cover may indicate that current rates of harvest are not sustainable and need to be investigated. Harvesting was thought to potentially have significant impacts on populations in Indonesia, due to the large numbers killed before reaching sexual maturity (Kasterine *et al.*, 2012).

However, Iskandar and Erdelen (2006) remarked "surprisingly, these high harvest rates have obviously not led to large-scale extinctions of certain populations." Shine *et al.* (1999) concluded "the commercial skin trade is unlikely to result in the extirpation of reticulated pythons from their Indonesian range. Undoubtedly, the large numbers of animals taken for the skin trade depress local abundances of pythons, and might eliminate these animals from small sections of highly fragmented habitats. The central issue in terms of sustainability of the trade, however, does not involve the possibility of extinction". D. Natusch (pers. comm. to UNEP-WCMC, 2013) similarly considered that, although harvesting reduces absolute numbers of snakes in the wild, there is no evidence of a continuous, long-term decline of *P. reticulatus* in the wild in Indonesia resulting from the skin trade.

The CITES Management Authority and Scientific Authority of Indonesia (*in litt.* to UNEP-WCMC, 2013) noted that the species' biology enables it to withstand high levels of harvest and that, although local

declines in the species had occurred, an overall crash in the wild population had not taken place, despite ongoing trade over six decades, which was considered to indicate that sustainability has been achieved (CITES MA and SA of Indonesia, 2013).

Auliya (2006) noted that local reptile hunters and dealers in northern Sumatra reported a scarcity of *P. reticulatus* in extensive monocultures such as oil palm plantations without aquatic environments and the author suggested that oil palm crowns did not represent favourable resting sites for *P. reticulatus*. However, Shine *et al.* (1999) considered oil palm plantations to be advantageous to relatively small pythons due to the abundance of rodent prey, and the CITES MA and SA of Indonesia (*in litt*. to UNEP-WCMC, 2013) highlighted the role of oil palm plantations in maintaining the sustainability of *P. reticulatus* harvests.

In addition to harvesting for trade, *P. reticulatus* are also taken because they are considered dangerous to livestock and children and represent a source of food in some areas (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). Shine *et al.* (1999) reported that even when not being caught for the skin trade, most *P. reticulatus* encountered by local people in Sumatra were killed for their meat or because they were considered nuisance animals. Shepherd *et al.* (2004) found that, in Sumatra, small individuals were caught for the pet trade, but noted that the profit made from catching large individuals for the skin trade was much higher.

Trade: CITES annual reports have been received from Indonesia for all years 2002-2011. Indonesia published export quotas for wild-sourced *P. reticulatus* skins and live specimens every year 1997-2013; from 2005 onwards, the quota also applied to skin products (Table 1). According to data in the CITES Trade Database, the quota for live specimens appears to have been exceeded according to data reported by Indonesia in 2004 and 2008, but not according to data reported by countries of import; Indonesia did not specify whether its 2004 or 2008 annual reports were based on permits issued or actual trade. The quota for skins and skin products appears to have been exceeded in 2002 and every year 2005-2011 according to data reported by Indonesia, and in 2005 and 2008-2011 according to data reported by countries of import. Indonesia's 2002 annual report appeared to be based on actual trade, while its 2011 annual report was compiled on the basis of permits issued; the basis of the remaining annual reports was not specified.

However, in its annual reports, Indonesia reports leather products (and occasionally skin pieces) with two quantities: one quantity representing the number of leather products/skin pieces traded, which is the quantity that is entered into the CITES Trade Database; and one quantity representing the number of skins that the products/pieces were derived from. If the latter quantity is added together with the number of raw skins reported by Indonesia, the totals do not exceed the 2005-2009 or 2011 quotas. The 2010 quota would still be exceeded by 400 units; however, in that year Indonesia recorded 400 skin pieces with a comment "waste from snake skin processing, no quota allocated". If these 400 skin pieces are excluded, the 2010 trade would also be within the quota.

Direct exports of *P. reticulatus* from Indonesia 2002-2012 primarily consisted of wild-sourced skins traded for commercial purposes; notable quantities of leather products and live specimens were also reported in trade, the majority wild-sourced and traded for commercial purposes (Table 2). The quantity of skins exported remained relatively constant, while exports of leather products showed a notable increase; trade in live specimens decreased over the ten-year period overall, with figures reported by countries of import considerably lower than those reported by countries of export. The principal country of import of skins was Singapore, while France and Japan were the main countries of import of skin products; the primary country of import of live specimens was the United States. A number of seized/confiscated specimens were also reported by countries of import over the period 2004-2011, in particular 4091 skins and 1785 small leather products.

Indirect exports of *P. reticulatus* from Indonesia 2002-2012 principally comprised skins and leather products, the majority of which were wild-sourced and traded for commercial purposes.

Table 1. CITES export quotas for wild-sourced *Python reticulatus* from Indonesia and global direct exports, as reported by the countries of import and of export (excluding trade reported by length or weight), 2002-2013 (trade data for 2012-2013 are not yet available). (For each year, trade in those terms to which the quota does not apply in that year is greyed out.)

		Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (live)			4500	5000	4500	4500	4500	4500	4500	4500	4500	4500		4500
Quota (skins and skin products)			157500♦	157000♦	157500♦	157500	157500	157500	157500	157500	157500	157500	162000■	157500
Live		Importer	2092	1778	1732	1988	2074	2111	1647	1246	540	521		
		Exporter	4425	3901	4887	4272	3869	4353	4599	3816	2912	3114		
Skins		Importer	71374	54271	77327	165924	147212	140523	156340	153753	141579	152852		
		Exporter	161408	153062	151479	152180	151425	154703	154655	154955	152997	151720		
skin products	skin pieces	Importer		115	69				142	25	331	206		
		Exporter	4600				1	2			80817			
	garments	Importer				1		9	1		70	4		
		Exporter												
	large leather products	Importer			4	139	432	627	100	84	200	291		
		Exporter												
	small leather products	Importer	1324	647	9448	3131	7409	14365	2508.5	21678	50319	31957		
		Exporter	7159	3641	9256	7588	10430	18531	14426	36649	52601	56627		
	Subtotals	Importer	1324	762	9521	3271	7841	15001	2751.5	21787	50920	32458		
		Exporter	11759	3641	9256	7588	10431	18533	14426	36649	133418	56627		
Subtotals (skins and skin products)		Importer	72698	55033	86848	169195	155053	155524	159091.5	175540	192499	185310		
		Exporter	173167	156703	160735	159768	161856	173236	169081	191604	286415	208347		
Total (live, skins and skin products)		Importer	74790	56811	88580	171183	157127	157635	160738.5	176786	193039	185831		
		Exporter	177592	160604	165622	164040	165725	177589	173680	195420	289327	211461		

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK
Key: ♦ = excludes skin products; ■ = includes live specimens

Table 2. Direct exports of *Python reticulatus* from Indonesia (excluding seizures/confiscations and trade in term/unit combinations totaling <500 units), 2002-2011. The majority of trade was for commercial purposes. (Indonesia's annual report for 2012 has not yet been received; no trade was reported in 2012.)

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Live	-	W	Importer	2092	1778	1732	1988	2074	2111	1647	1246	540	521	15729
			Exporter	4425	3901	4887	4272	3869	4353	4599	3816	2912	3114	40148
		C	Importer		23	50	2			8	144	56	50	333
			Exporter					33			416	256	57	762
		F	Importer	13		121	487	149	87	95	127	20		1099
			Exporter	77	129	946	888	340	203	636	139	159	226	3743
Skins	m	W	Importer			1100								1100
			Exporter											
	-	W	Importer	71374	54271	77327	165924	147212	140523	156340	153753	141579	152852	1261155
			Exporter	161408	153062	151479	152180	151425	154703	154655	154955	152997	151720	1538584
		C	Importer											
			Exporter	300										300
		F	Importer											
			Exporter	30										30
		O	Importer										400	400
			Exporter											
skin pieces	-	W	Importer		115	69				142	25	331	206	888
			Exporter	4600				1	2			80817		85420
		C	Importer			8								8
			Exporter											
Meat	kg	W	Importer	6000	13230	20240	28470	15327.2	16730					99997.2
			Exporter		19500	26250	31000	15750	12150		4000	2000	50	110700
	-	W	Importer					500						500
			Exporter	5000										7000
leather products (small and large)	-	W	Importer	1324	647	9452	3270	7841	14992	2608.5	21762	50519	32248	144663.5
			Exporter	7159	3641	9256	7588	10430	18531	14426	36649	52601	56627	216908
		R	Importer						4					4
			Exporter											
		C	Importer					134	36	12				182
			Exporter											
		F	Importer						12	11				23
			Exporter											
		-	Importer									1278		1278
			Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) noted that the harvesting and trade of *P. reticulatus* in Indonesia was widespread and involved perhaps 28 of Indonesia's 32 provinces.

Kasterine *et al.* (2012) described the illegal trade in *P. reticulatus* in Indonesia as follows: "hunters, out of necessity for income, ignore quotas and continue to illegally harvest snakes throughout the year and sell them to slaughterhouses. In order to maintain good business relationships with slaughterhouses, traders continue to purchase skins even after the quota is met". Shepherd *et al.* (2004) conducted monthly surveys of the wildlife markets in Medan (province of North Sumatra) between 1997 and 2001, noting that the *P. reticulatus* traded in those markets were not included in the Indonesian quota system.

There are reports of illegal trade in *P. reticulatus* skins from Indonesia via Singapore (TRAFFIC, 2011; Kasterine *et al.*, 2012). However, the CITES MA of Indonesia (2011) reported success in the monitoring of illegal snake trade between 2006 and 2010 and the CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) noted that while illegal harvests were not recorded, the number was considered to be insignificant, as such specimens cannot be sold to middlemen, collectors or exporters.

Management: Harvesting within protected areas is prohibited (CITES MA of Indonesia, 2011), although wildlife poaching and other forms of encroachment were reported to have become major issues in protected areas in Indonesia (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013).

Based on studies in North Sumatra and Central Kalimantan undertaken in 2012, the CITES MA and SA of Indonesia (*in litt*. to UNEP-WCMC, 2013) reported that more than 70 per cent of harvests were conducted within oil palm plantations and that around 7 million hectares of suitable oil palm plantations would be harvested in Indonesia in 2012, largely in Sumatra and Kalimantan. The CITES MA and SA of Indonesia, (*in litt*. to UNEP-WCMC, 2013) considered that, outside of protected areas, the more traditional habitats such as forests, which are less accessible to hunters, effectively act as "no-take-zones" and also reported that some oil palm plantations do not allow harvesting of *P. reticulatus*.

The snake industry in Indonesia is represented by a single organisation (IRATA), which takes a leading role in assisting the government with monitoring and research (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013). The CITES MA and SA of Indonesia, (*in litt*. to UNEP-WCMC, 2013) noted that considerable efforts have been made by IRATA and Indonesian authorities to improve the regulation and monitoring of reptile harvests in recent years and that traders are now well aware of the need to ensure sustainable harvests and have willingly supported research work, and that a number of field studies have been undertaken.

Annual quotas for the export of skins are set separately for each province and, while being largely based on the extent of historical catches, reportedly take into account the recommendations of the SA and information on population size and trends, age and size class, where available, and on environmental conditions (CITES Management Authority of Indonesia, 2011; CITES MA and SA of Indonesia, 2013). Quotas were reported to closely match the numbers of *P. reticulatus* harvested for trade, with around 99 per cent of all harvested *P. reticulatus* skins being exported (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013).

Snake collectors and exporters need to be registered and licensed under the Directorate General of Forest Protection and Nature Conservation in order to apply for CITES export permits (CITES MA and SA of Indonesia, *in litt.* to UNEP-WCMC, 2013).

It was reported that *P. reticulatus* was not bred in captivity for the skin trade, due to high production costs (CITES MA of Indonesia, 2011).

Kasterine *et al.* (2012) recommended that Indonesia should monitor the stockpiling of skins, and possibly establish a tagging system to control the potential laundering of illegally sourced skins through stockpiling. The CITES MA and SA of Indonesia (*in litt.* to UNEP-WCMC, 2013) reported that a tagging system was introduced in 1994 which allowed the year of harvest to be assigned, and that few stockpiles now exist, with most *P. reticulatus* skins being exported soon after being obtained.

At the CITES Asian Snake Trade Workshop in 2011, the CITES MA of Indonesia (2011) considered further research into the population status, control of habitat destruction and trade, and educational programmes to be important conservation needs of *P. reticulatus* in the country.

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Distribution in range state: Early references in Groombridge and Luxmoore (1991) noted that *P. reticulatus* was found throughout Lao People's Democratic Republic (hereafter referred to as Lao PDR), especially in marshy areas, and was more common in the central and southern provinces (Bourret, 1939 and Deuve, 1970 in: Groombridge and Luxmoore, 1991). Duckworth *et al.* (1999) considered *P. reticulatus* to be widespread in Lao PDR, and Stuart (1998) recorded *P. reticulatus* in surveys of Phou Luey National Biodiversity Conservation Area, Houaphanh Province (northeastern Lao PDR).

Population trends and status: The overall status of wild populations of *P. reticulatus* in Lao PDR is unknown (D. Natusch, pers. comm. to UNEP-WCMC, 2013).

According to Deuve (1970), in: Groombridge and Luxmoore (1991), *P. reticulatus* was not uncommon in Lao PDR, although populations were described as having declined markedly due to local utilisation and the export trade (Groombridge and Luxmoore, 1991). Duckworth *et al.* (1999) listed *P. reticulatus* as "potentially at risk in Lao PDR". In a survey of the Phou Luey National Biodiversity Conservation Area (NBCA) (northeastern Lao PDR) in 1998, the abundance of *P. reticulatus* was reported to be "much rarer" than ten years ago (Stuart, 1998). In household surveys of 24 villages in Nam Ha National Protected Area (northwestern Lao PDR) in 2002-2003, 13 per cent of households reported *P. reticulatus* as "decreasing in abundance" (Johnson *et al.*, 2003).

Threats: Duckworth *et al.*, (1999) considered the degree of threat to *P. reticulatus* from harvesting and trade to be high in Lao PDR. Stuart (1998) noted that in Phou Luey NBCA *P. reticulatus* were killed for food and for their skin and also because they were thought to eat domestic dogs (Stuart, 1998 in: Duckworth *et al.*, 1999).

D. Natusch (pers. comm. to UNEP-WCMC, 2013) considered that *P. reticulatus* in Lao PDR was well placed to withstand high harvest levels.

Trade: Lao PDR became a Party to CITES in 2004; CITES annual reports have been received for the years 2006-2009. Lao People's Democratic Republic has not published any CITES export quotas for *P. reticulatus*. According to data in the CITES Trade Database, Lao People's Democratic Republic has not reported any direct trade in the species. Direct trade in *P. reticulatus* from Lao People's Democratic Republic reported by countries of import (Malaysia and Singapore) over the period 2002-2012 comprised captive-bred skins traded for commercial purposes in 2009 (5000 skins), 2010 (20 000 skins) and 2011 (96 000 skins), and one large leather product reported as a seizure/confiscation in 2007.

No indirect trade in *P. reticulatus* originating in Lao People's Democratic Republic was reported prior to 2009. Indirect trade 2009-2011 primarily comprised captive-bred skins, totaling 91 010 skins as reported by Lao PDR and 90 304 skins as reported by countries of import; a further 1000 wild-sourced skins were also re-exported in 2010 (reported by the country of re-export only).

Nash (1997) reported that *P. reticulatus* skins were regularly traded in southern Lao PDR and specimens are traded as food and for ingredients for traditional medicines. Small quantities of *P. reticulatus* were also sold to traders in Pakse (southwestern Lao PDR), before being smuggled across to Thailand (Nash, 1997). According to Groombridge and Luxmoore (1991), traders in Thailand reported receiving *Python* spp. skins from Lao PDR on a regular basis for

re-export. Chazee (1990) in: Srikosamatara *et al.* (1992) recorded *P. reticulatus* being sold in the markets of Attapeu Province, southern Lao PDR.

Management: The main legislation protecting threatened flora and fauna in Lao PDR is Regulation 360, implemented through the Ministry of Agriculture and Forestry (Auliya, 2011). *P. reticulatus* is listed in Article 18 of Regulation 360, "List 1" species: "List of Restricted Wild and Aquatic Species"; species in this list are reportedly strictly managed and any activity relating to them requires approval from the Ministry of Agriculture and Forestry (Auliya, 2011). Any hunting of "restricted" species, whether for trade or other purposes, was reported to be illegal (Singh, 2008).

However, Johnson *et al.* (2003) noted that more enforcement was required in both urban centres and villages around Nam Ha National Protected Area (northwestern Lao PDR) to stop the hunting and use of animals which were protected by law, while Nash (1997) considered that the laws regarding wildlife trade had "probably not had any deep or widespread impact on such trade among the rural communities where such trade occurs or is initiated, as many rural hunters and traders are unable to speak or read official Lao language".

Kasterine *et al.* (2012) noted that all *P. reticulatus* skins exported from Lao PDR in 2009 and 2010 were reportedly bred at a single farm in Lao PDR and that doubts had been raised by TRAFFIC about the legitimacy of captive-bred *P. reticulatus* skin exports from Lao PDR. These doubts were due to concerns over the capacity of a single farm to produce such large numbers of animals (over 70 000 captive bred *Python* spp. can be produced annually), with the cost of breeding, feeding and maintaining the snakes to reach slaughter size appearing to be much higher than the market price (Kasterine *et al.*, 2012). Kasterine *et al.* (2012) made arrangements to visit the farm in 2012 with a view to meeting Lao PDR CITES officials there and reported the following:

"The Lao PDR CITES officials provided some information on the farm in the form of photographs, however, these did not prove that pythons were in fact being captive bred. Efforts were made to organise an outing to the farm, however; despite being informed of our study well in advance and having a permission letter signed by the appropriate government department, the farm owner would not allow us to visit the facility. Two reasons were given. Firstly that the snakes had all been removed from the facility for its cleaning and secondly that the owner was in Viet Nam for medical treatment and could not supervise the visit, despite having been previously notified of the research teams visit. Additionally, the son of the owner in question, also working in the business, is an employee of the Lao PDR Ministry of Commerce (CITES MA of Lao PDR, pers. comm.). Based on the experience from this field visit, the evasive behaviour of the farm owner in question and the lack of any evidence to the contrary, this research suggests that it is unlikely captive breeding in Lao PDR is taking place on any scale close to official export figures. It is possible, but not proven, that this farm could be acting as a front for illegally laundered skins, using dubious permits. All things considered, the trade in Reticulated Python skins from Lao PDR is highly suspicious."

According to D. Natusch (pers. comm. to UNEP-WCMC, 2013), this farm is not breeding snakes and is not laundering pythons from the wild but is selling permits to neighbouring countries to facilitate the export of Indonesian and Malaysian skins.

MALAYSIA

Distribution in range state: Occurrence reported in Peninsular Malaysia, and Sabah and Sarawak, Borneo (Groombridge and Luxmoore, 1991; McDiarmid *et al.*, 1999). In Peninsular

Malaysia it apparently occurs in suitable habitat throughout the peninsula (Groombridge and Luxmoore, 1991; Cox *et al.*, 1998) and in Sabah it is reportedly present in forested areas throughout (Groombridge and Luxmoore, 1991). The species has been recorded in Gunung Bubu (northwest Peninsular Malaysia) (Grismer *et al.*, 2010), Pulau Tioman (Lim and Lim, 1999; Grismer *et al.*, 2004) and Pulau Langkawi (Grismer *et al.*, 2006).

Population trends and status: Groombridge and Luxmoore (1991) stated: "Cantor (1847) reported that the species was "very numerous in the Malayan hills and valleys" in the mid-nineteenth century. At the end of the nineteenth century said to be one of the commonest snakes, pythons of up to 6 m (20 ft) then being 'by no means uncommon' (Ridley, 1899). Reported very common in the late 1950s at Asahan, Malacca. […] Similarly, said to be still quite common despite exploitation, and still readily to be seen (B. H. Kiew *in litt.*, 25 February 1986). Still abundant in Perlis, within the security area of northern Peninsular Malaysia (S. Ambu *in litt.*, 17 February 1986), but disturbance, habitat loss, persecution and exploitation for food reportedly causes appreciable mortality in other parts of the peninsula, where, by implication, the species may often be less than abundant. […]

Reported common in Sarawak at one time (Shelford, 1916), and said to be still widespread and common (H. Watson *in litt.*, 17 March 1986). However, during intensive herpetological fieldwork at three primary rainforest sites in Sarawak (Nanga Tekalit, 366 days; Labang, 128 days; Sengai Pesu, 160 days), the *P. reticulatus* seen numbered only 8, 10 and 4, respectively (R.F. Inger *in litt.*, 5 March 1986). Population levels are unknown in Sabah, although *P. reticulatus* is reportedly more common than *P. curtus* (CITES MA of Malaysia, 1985)."

D. Natusch (pers. comm. to UNEP-WCMC, 2013) considered that there was no evidence of a sustained, long-term decline in wild populations of *P. reticulatus* in Malaysia caused by the skin trade.

Threats: *P. reticulatus* was reported by the Department of Wildlife and National Parks (DWNP) to be the most harvested species in Peninsular Malaysia in both 2006 and 2007, with 148 207 and 125 650 specimens recorded as harvested, respectively (DWNP, 2006, 2007).

Trade: CITES annual reports have been received from Malaysia for all years 2002-2011. The CITES Scientific Review Group of the European Union (SRG) suspended trade in wild-sourced *P. reticulatus* from Malaysia in 2002; this suspension under Commission Regulation (EC) No. 757/2012 of 10/09/2012 remains in place. Malaysia published export quotas for wild-sourced *P. reticulatus* in 2002 and 2011-2013; separate quotas were published for Peninsular Malaysia and Sabah (Table 3). Malaysia distinguishes between trade from Peninsular Malaysia and Sabah in its annual reports; however countries of import do not make this distinction, which complicates quota analysis. According to data in the CITES Trade Database, trade in live specimens and skins remained within the 2002 quota according to data reported by Malaysia for Peninsular Malaysia and by importing countries. Trade reported by Malaysia for Sabah was within the 2011 quota; trade reported by countries of import appears to exceed the quota, however this figure includes trade from all parts of Malaysia. Trade data for 2012-2013 are not yet available.

Table 3. CITES export quotas for wild-sourced *Python reticulatus* from Malaysia and global direct exports, as reported by the countries of import and of export, 2002-2013. (No quotas were published in 2003-2010; trade data for 2012 and 2013 are not yet available.) (For each year, trade in those terms to which the quota does not apply in that year is greyed out; 'other' includes small leather products, meat and gall bladders and excludes trade reported by weight.)

	Reported by	2002	2011	2012	2013
Quota (live)		1000■	-	-	500■
Quota (skins)		280000■	-	-	162000■
Quota (all)		-	12000♦	12000♦	12000♦
live	Importer	75			
	Exporter	110■	♦		
skins	Importer	170529	99904		
	Exporter	168627■	12000♦		
other	Importer	46	9		
	Exporter	1■	♦		
Subtotals	Importer	170650	99913		
	Exporter	168738■	12000♦		

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK
Key: ■ = applies to Peninsular Malaysia only/ data for Peninsular Malaysia only; ♦ = applies to Sabah only/ data for Sabah only

Direct exports of *P. reticulatus* from Malaysia 2002-2012 principally comprised wild-sourced skins traded for commercial purposes; notable quantities of meat were also traded, all of which was wild-sourced (Table 4). Trade in skins reported by countries of export increased between 2010 and 2011, while trade reported by countries of import decreased slightly; trade in meat reported both by countries of import and of export increased between 2010 and 2011. The principal country of import of skins was Singapore, while Hong Kong, SAR imported the vast majority of the meat.

Indirect exports of *P. reticulatus* originating in Malaysia 2002-2012 primarily comprised leather products and skins, the majority wild-sourced and traded for commercial purposes.

Table 4. Direct exports of *Python reticulatus* from Malaysia (excluding trade in terms totaling <100 units), 2002-2011. The majority of trade was for commercial purposes. (Malaysia's annual report for 2012 has not yet been received; no trade was reported in 2012.)

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
skins	-	W	Importer	170529	87637	133123	174625	182411	179871	174250	90093	119961	99904	1412404
			Exporter	168627	71342	121270	147472	166508	113721	168787	120401	105874	128639	1312641
		C	Importer	2						600		400	1740	2742
			Exporter	1500	1500									3000
		O	Importer											
			Exporter								360			360
skin pieces	-	W	Importer		1				50		350			401
			Exporter											
large leather products	-	W	Importer		6				1303					1309
			Exporter											
		I	Importer				1							1
			Exporter											
small leather products	-	W	Importer	46	126	6			7	28	38	1316	9	1576
			Exporter	1	1	3	660	4				1		670
		C	Importer							2	36			38
			Exporter											
		I	Importer	3	4									7
			Exporter											
meat	-	W	Importer											
			Exporter				10078	19501			12000	12500	6254	60333
	kg	W	Importer	4617	1378	3254	10538	20227	35001.5	12520	22750	10890	22434	143609.5
			Exporter	6147	840	4154	1327		13549	1230	11950	5560	17200	61957
live	-	W	Importer	75	23	12	20	64	4	6	1			205
			Exporter	111	22	30	101	107	19	9	41	3	9	452
		R	Importer											
			Exporter				40							40
		C	Importer	3				50	24	140	32			249
			Exporter					50	24		11			85
gall bladders	-	W	Importer											
			Exporter					83.5					73	156.5
	kg	W	Importer				57	74	60	496.8		260.8	72.8	1021.4
			Exporter											
gall	-	W	Importer											
			Exporter				57		60					117
	kg	W	Importer							12	421.1			433.1
			Exporter				29.4			698.8		200		928.2
derivatives	kg	W	Importer											
			Exporter								375.1			375.1

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The CITES Management Authority of Malaysia (*in litt.* to UNEP-WCMC, 2013) reported the export of 149 193 skins in 2012. Skin export figures provided by the CITES MA of Malaysia (*in litt.* to UNEP-WCMC, 2013) for the period 2005-2011 were on average 22 per cent lower than those recorded in the CITES Trade Database as reported in the corresponding CITES Annual Reports from Malaysia.

The European Union has banned trade in wild-sourced *P. reticulatus* from Peninsular Malaysia since 2002.

Management: *P. reticulatus* is protected in Peninsular Malaysia – 'Protected Wildlife' on Schedule I of the Wildlife Conservation Act 2010 (CITES MA of Malaysia *in litt.* to UNEP-WCMC, 2013); Sabah - Schedule 2 Part I ('Protected animals – limited hunting and collection under licence') of the Wildlife Conservation Enactment 1997 (SWD, 1997); and Sarawak - Schedule 1 Part II of the Wildlife Protection Ordinance 1998 (SFC, 2006). Consequently, the collection, possession and trade of the species are regulated by a system of licences issued by the Department of Wildlife and National Parks (DWNP) of Peninsular Malaysia, the Sabah Wildlife Department and the Sarawak Forestry Commission respectively.

The CITES MA of Malaysia (*in litt.* to UNEP-WCMC, 2013) reported that the Department of Wildlife and National Parks (DWNP) had set up voluntary export quotas for *P. reticulatus* of 180 000 skins during 2005-2010 and 162 000 skins during 2011-2012, while for live animals the export quota was 500 during 2005-2012, except in 2007 when it was 450 (CITES MA of Malaysia, *in litt.* to UNEP-WCMC, 2013). The CITES MA of Malaysia (pers. comm. to UNEP-WCMC, 2013) noted further that a zero export quota had been imposed on the state of Sarawak and that a quota of 12 000 skins was in place for the state of Sabah. The Sabah quota was expected to be revised on the basis of the results of an ongoing non-detriment finding study (CITES MA of Malaysia, pers. comm. to UNEP-WCMC, 2013).

The CITES MA of Malaysia (*in litt.* to UNEP-WCMC, 2013) indicated that, in Peninsular Malaysia, although the species is harvested throughout the peninsula, harvests occur mainly in Perak, Pahang and Johor. According to data provided by DWNP (2007), in 2007 these three states accounted for nearly 60 per cent of harvested specimens in Peninsular Malaysia, with most of the remaining originating in the states of Selangor, N. Sembilan and Kedah.

The DWNP was reported to be undertaking a three-phase non-detriment finding study on *P. reticulatus* in Peninsular Malaysia, with phase 1 conducted in Selangor, Perak and Terengganu during May-November 2011, phase 2 conducted in Pahang and Kedah during May-November 2012 and phase 3 ongoing in 2013 (CITES MA of Malaysia, *in litt*. to UNEP-WCMC, 2013). However, the results had not been made available as of September 2013.

PHILIPPINES

Distribution in range state: *P. reticulatus* is widespread within the Philippines and has been recorded on Basilan, Bohol, Cebu, Jolo, Leyte, Luzon, Masbate, Mindoro, Mindanao, Negros, Palawan, Panay, Polillo, Samar and Tawi-Tawi (Leviton, 1963 in: Groombridge and Luxmoore, 1991). While it was previously considered to occur only as far north as Luzon, O'Shea (2011) noted that it has also been found on the island of Itbayat in the northern Batanes islands.

Population trends and status: Alcala (1986), in: Groombridge and Luxmoore (1991), reported that *P. reticulatus* was common throughout the Philippines, although it was also noted that no snakes more than 2 m long had been recorded in eastern Negros during the previous decade, suggesting that the population structure was shifting (Groombridge and Luxmoore, 1991).

In 2004, the Department of Environment and Natural Resources listed *P. reticulatus* under "other threatened species", which refers to species which are not critically endangered, endangered nor vulnerable but are under threat from adverse factors, such as over-collection, throughout their range and are likely to move to the vulnerable category in the

near future (Philippines, 2004). *P. reticulatus* is included in the National Red List of Philippine Wild Fauna (Auliya, 2011).

Threats: Changes in the population structure of *P. reticulatus* on Negros were attributed to forest destruction and the inhabitants' habit of killing all snakes encountered (Alcala *in litt*., 1986 in: Groombridge and Luxmoore, 1991). While people in the interior reportedly eat python occasionally, hunting for the skin trade was suspected to be negligible (Alcala *in litt*., 1986 in: Groombridge and Luxmoore, 1991). However, other accounts noted that *P. reticulatus* was hunted for food by tribal communities and for skins, which command high prices, and that hunting pressure may have been excessive (Alcala, 1986 in: Groombridge and Luxmoore, 1991).

Scheffers *et al*. (2012) included *P. reticulatus* in a list of animals poached in part of a forest National Park in southern Luzon, and noted that hunting (for all species listed) was driven by both direct consumption and sale and that law enforcement in the study area was limited.

Trade: CITES annual reports have not yet been received from the Philippines for the years 2008 or 2010-2012. The Philippines has not published any CITES export quotas for *P. reticulatus*. According to data in the CITES Trade Database, direct trade in *P. reticulatus* from the Philippines reported over the period 2002-2012 primarily comprised leather products and skins traded for commercial purposes; the leather products were mainly wild-sourced, while the majority of the skins were captive-bred (Table 5). Most of the trade in these terms was reported by the Philippines only. The only country of import to report imports directly from the Philippines was the United States; the Philippines reportedly exported *P. reticulatus* to nine trading partners in total, the majority of the trade going to Italy (skins) and the United Kingdom (leather products).

The only indirect trade in *P. reticulatus* originating in the Philippines 2002-2012 comprised one wild-sourced skin piece re-exported via the United States to the Kingdom of Bahrain for personal purposes in 2008.

Table 5. Direct exports of *Python reticulatus* from the Philippines (excluding trade in terms totaling <10 units), 2004-2011. (No trade was reported in 2002-2003, 2005 or 2011-2012; annual reports have not yet been received from the Philippines for 2008 or 2010-2012.)

Term	Source	Purpose	Reported by	2004	2006	2007	2008	2009	2010	Total
skins	W	T	Importer							
			Exporter					108		108
	C	T	Importer							
			Exporter					294		294
	I	P	Importer	1					1	2
			Exporter							
leather products (small and large)	W	T	Importer		52	243			2	297
			Exporter					331		331
	C	T	Importer							
			Exporter					95		95
	I	P	Importer	1			1		1	3
			Exporter							

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

In March 2006, two crates of snakes and reptiles were seized at Ninoy Aquino International Airport, which included three *P. reticulatus*, believed to be wild-caught (TRAFFIC, 2010). The shipment was not accompanied by export documents and was bound for a trader in Penang, Malaysia (TRAFFIC, 2010).

Management: According to TRAFFIC (2010), all wildlife in the Philippines is protected and only captive-bred reptiles are allowed to be exported, provided permits are obtained.

SINGAPORE

Distribution in range state: Occurrence reported by Cox *et al.* (1998) and Das (2010). The CITES SA of Singapore (*in litt.* to UNEP-WCMC, 2013) indicated that the species was found all over the country, including many offshore islands such as Tekong, Ubon and Sentosa.

Population trends and status: Reportedly "still far from rare" in 1922, when several specimens were captured within the municipal limits (Sworder, 1922 in: Luxmoore *et al.*, 1988). According to Luxmoore *et al.* (1988), the species was still relatively common in the mid-1980s. The CITES SA of Singapore (*in litt.* to UNEP-WCMC, 2013) reported that the species was common in the country.

Threats: According to the CITES SA of Singapore (*in litt.* to UNEP-WCMC, 2013), the main threat to *P. reticulatus* in the country is conflict with humans as a result of the species preying on pets and livestock. Loss of forest was not considered to be a threat due to the species' versatility in habitat use (CITES SA of Singapore, *in litt.* to UNEP-WCMC 2013).

Trade: CITES annual reports have been received from Singapore for all years 2002-2011. Singapore has not published any CITES export quotas for *P. reticulatus*. The CITES Scientific Review Group of the European Union (SRG) suspended trade in wild-sourced *P. reticulatus* from Singapore between 1997 and 2011. According to data in the CITES Trade Database, direct trade in *P. reticulatus* from Singapore reported over the period 2002-2012 primarily comprised captive-bred skins and small leather products traded for commercial purposes, the vast majority reported by countries of import only (Table 6). According to data reported by countries of import, the principal country of import was the United States.

Indirect trade in *P. reticulatus* originating in Singapore 2002-2012 principally consisted of wild-sourced, captive-bred and pre-Convention leather products traded for commercial purposes.

Table 6. Direct exports of *Python reticulatus* from Singapore (excluding specimens traded for scientific purposes), 2008-2011. (No trade was reported in 2002-2007 or 2012; Singapore's annual report for 2012 has not yet been received.)

Term	Source	Purpose	Reported by	2008	2009	2010	2011	Total
skins	W	T	Importer					
			Exporter					
	C	T	Importer	300				300
			Exporter					
small leather products (including garments)	W	T	Importer			6		6
			Exporter					
	C	T	Importer		4	5	18	27
			Exporter					
	O	P	Importer		1			1
			Exporter					
	-	-	Importer			9		9
			Exporter					

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

No evidence of illegal trade was reported (CITES SA of Singapore, *in litt.* to UNEP-WCMC, 2013). Kasterine *et al.* (2012), however, expressed concerns about the provenance and legality of skins re-exported from Singapore.

Management: The CITES SA of Singapore (*in litt.* to UNEP-WCMC, 2013) reported that *P. reticulatus* is protected in Singapore under the Wild Animals and Birds Act, that its commercial harvest is prohibited and that there is no active species management or population monitoring.

VIET NAM

Distribution in range state: Sang *et al.* (2009) recorded the species along the north central coast (provinces of Ha Tinh, Quang Binh and Thua Thien-Hue), south central coast

(municipality of Da Nang city and provinces of Quang Nam, Binh Dinh and Kanh Hoa), central highlands (provinces of Kon Tum, Gia Lai and Dak Lak), southeastern Viet Nam (provinces of Binh Phuoc, Ba Ria-Vung Tau and Dong Nai), south-western (province of Tay Ninh) and southern Viet Nam (Ho Chi Minh City and the provinces of Long An, Kien Giang and Ca Mau). Szyndlar and Nguyen (1996) recorded the species from the Gia Lai and Kon Tum provinces in central Viet Nam. According to the CITES MA of Viet Nam (*in litt*. to UNEP-WCMC, 2013) the species is known from the central to the southern parts of Viet Nam (from Da Nang city to Ca Mau province).

Population trends and status: The species was categorised as 'Vulnerable' in the Red Data Book of Viet Nam in 1994 (Ministry of Science Technology and Environment, 1992), and it was reportedly uplisted to 'Critically Endangered' in 2004 (WWF and TRAFFIC, 2012; CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) noted that a lack of comprehensive surveys meant that population size and trends of *P. reticulatus* in Viet Nam were unknown, but it was nevertheless considered to be very rare in the wild due to habitat loss and environmental degradation.

Threats: Threats to *P. reticulatus* in Viet Nam were reported to include habitat loss and fragmentation, overharvesting and illegal trade (Nguyen, 2006; CITES MA of Viet Nam, *in litt*. to UNEP-WCMC, 2013). The species was reported to be used as food and for medicinal purposes, as well as for its skin (Ministry of Science Technology and Environment, 1992; Venkataraman, 2007; Van and Tap, 2008).

Trade: CITES annual reports have been received from Viet Nam for all years 2002-2011. Viet Nam has not published any CITES export quotas for *P. reticulatus*. According to data in the CITES Trade Database, direct trade in *P. reticulatus* from Viet Nam reported over the period 2002-2012 primarily comprised captive-bred skins, with notable quantities of captive-bred leather products also traded; the majority of the trade was for commercial purposes (Table 7). Trade in skins has shown a notable increase over the period 2002-2011, while trade in leather products peaked in 2008 and subsequently declined. The principal country of import of skins was Singapore, while Japan imported the vast majority of the leather products.

Indirect trade in *P. reticulatus* originating in Viet Nam 2002-2012 principally consisted of leather products, skins and skin pieces traded for commercial purposes, of which the majority were captive-bred and a notable quantity wild-sourced; the proportion of wild-sourced skins showed an overall decrease over this period.

Illegally caught wild individuals were thought to potentially be exported from Indonesia and Malaysia, and re-exported via Singapore as captive-bred from Viet Nam (Kasterine *et al*., 2012).

Table 7. Direct exports of *Python reticulatus* from Viet Nam, 2002-2011. The majority of trade was for commercial purposes. (Viet Nam's annual report for 2012 has not yet been received; no trade was reported in 2012.)

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
skins		C	Importer	38242	47458	34626	46952	59215	129586	120648	73097	114581	126916	791321
			Exporter		36940	33061	43082	75182	97954	93248	98854	111958	121763	712042
	m	C	Importer	2000	275	1000	5500		500					9275
			Exporter	102000	34275	8000	19500							163775
skin pieces	-	W	Importer									30		30
			Exporter											
		C	Importer									193	25	218
			Exporter											
large leather products	-	C	Importer				265							265
			Exporter				265							265
small leather products	-	W	Importer						788	1	2	3		794
			Exporter							6254				6254
		C	Importer	40	6	5578	600		14430	18729	3397	1049	149	43978
			Exporter		9	6865	214		11096	14077	4677	272		37210
		I	Importer							1				1
			Exporter											
live	-	W	Importer	120	6									126
			Exporter		6									6
		C	Importer	363	231									594
			Exporter	2540	1112	150		60		200	5	50		4117
		-	Importer											
			Exporter										40	40

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) reported that there is no specific monitoring programme for wild populations of *P. reticulatus* in Viet Nam, although the species is managed and monitored as part of biodiversity management plans for individual protected areas.

P. reticulatus is listed as a Group II species (valuable species which have small populations in the wild or which are at risk of extinction) under Government Decree 32/2006/ND-CP (Viet Nam, 2006a). The Decree specifies that the species may only be exploited for scientific purposes or under licence in designated special use forests for projects approved by the Ministry of Agriculture and Rural Development or the Provincial People's Committee (Viet Nam, 2006a).

The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) confirmed that only specimens taken from captive breeding farms managed and monitored by the Forest Protection Department are allowed to be exported for commercial purposes.

All facilities breeding CITES-listed species must be registered and approved by the CITES SA under Government Decree 82/2006/ND-CP, which implements CITES in the country (Viet Nam, 2006b).

Thomson (2008) reported that the species was being bred for commercial purposes since at least the 1980s, with founder stock primarily obtained from local food markets and from neighbouring countries, and being "managed intensively within mostly contained production systems". The majority of python farming was reported to be conducted in the Mekong Delta (Thomson, 2008).

Captive breeding was reported to be mainly aimed at the skin trade market, primarily to Europe, although breeding stock, meat and derivatives were also marketed locally (Thomson, 2008) and the species was also reportedly bred for medicinal purposes (Van and Tap, 2008). The price of mature individuals was reported to have increased significantly from USD6.30/kg in 2000 to USD12.60/kg in 2005 due to the high demand for skins in the world market (Thomson, 2008).

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

Laundering of wild-sourced *P. reticulatus* as captive-bred was considered a potential problem (Kasterine *et al.*, 2012), as the production of large snakes in captivity on a commercial scale was considered to be uneconomic (Webb *et al.*, 2012) and the cost of rearing *P. reticulatus* to a suitable size for the skin market appeared to surpass prices achieved on the market (Kasterine *et al.*, 2012).

Concerns were raised over the high number of reportedly captive-bred individuals exported from a single farm in Lao PDR, and also from Viet Nam (Kasterine *et al.*, 2012), with operations breeding snakes in Viet Nam considered to require "thorough investigation" (Auliya, 2011). However, D. Natusch (pers. comm. to UNEP-WCMC, 2013) reported that Viet Nam had many farms genuinely breeding large numbers of *P. reticulatus* and that concerns that some of these farms are laundering animals from the wild have not been substantiated.

Illegal trade was reported to be a concern in Indonesia, Lao PDR and Viet Nam, and potential laundering of illegally sourced skins through stockpiling was considered to be a concern in Indonesia.

CITES annual reports have not yet been received from Lao PDR for the years 2005, 2010 or 2011 or from the Philippines for the years 2008, 2010 or 2011.

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Podocnemis unifilis Troschel, 1848: Brazil, Ecuador, Peru, Suriname, Venezuela (Bolivarian Republic of)

Podocnemididae, Yellow-spotted River Turtle

Selection for Review of Significant Trade

Podocnemis unifilis was selected for inclusion in the Review of Significant Trade as a priority species for review at the 25th meeting of the Animals Committee (AC25 Summary Record) on the basis of information presented in AC25 Doc. 9.6. In both 2008 and 2009, *P. unifilis* was identified as a species that met the criteria of high volume of trade for a globally threatened or near-threatened species and showed a sharp increase in trade compared to the previous five year average (AC25 Doc. 9.6). At the 26th meeting of the AC, responses had been received from Colombia, Guyana and Peru (AC26 Doc. 12.3). The Plurinational State of Bolivia (hereafter referred to as Bolivia), Brazil, Ecuador, Peru, Suriname and the Bolivarian Republic of Venezuela (hereafter referred to as Venezuela) were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Bolivia was removed from the process on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Podocnemis unifilis* recommendations.

		General summary
		Widespread species, with a total range of up to 7 million km². Categorised as Vulnerable in the IUCN Red List. At least locally common but population declines reported in many areas.
Range State	**Provisional category**	**Summary**
Brazil	Least Concern	Low levels of trade 2002-2011 in wild-sourced specimens; no commercial trade reported. Export of wild-sourced specimens for commercial purposes is prohibited. Widespread but with declining populations. Based on low trade levels, categorised as Least Concern.
Ecuador	Least Concern	Trade of one wild-sourced specimen for scientific purposes was reported in 2008, and the CITES MA confirmed that the species is not harvested for commercial purposes. Occurs in eastern Ecuador, and categorised as Vulnerable in the national Red List. On the basis of very low trade, categorised as Least Concern.
Peru	Least Concern	Very high levels of trade 2002-2011 mainly in live, ranched individuals with an increasing trend. A possible quota excess was reported in 2009 (ranched). Wild-sourced exports are prohibited, however the export of 1500 live, wild individuals was reported in 2007 by countries of import. Appears widespread, but classified Threatened in the national Red List. Population declines reported in some areas. Comprehensive information on the management of ranching and monitoring of harvested populations available. Therefore, categorised as Least Concern.

Suriname	Least Concern	Trade of eight and ten wild-sourced live specimens was reported in 2002 and 2005, respectively. Appears rare, and the harvesting of juveniles for the pet trade was regarded as an important threat. However, on the basis of very low trade, categorised as Least Concern.
Venezuela (Bolivarian Republic of)	Least concern	Moderate levels of trade 2002-2012 mainly in live, ranched and captive-bred individuals. Monitoring of ranching operations reported; no licenses for ranching granted 2010-2012. Widespread and at least locally abundant. Categorised Vulnerable in the national Red List with a declining population trend, although CITES MA reported population recovery in some areas. On the basis of no wild-sourced, commercial trade, categorised as Least Concern.

B. Species overview

Taxonomic note: Fritz and Havaš (2007) (CITES Standard Reference for Testudines) and Bickham *et al.* (2007) noted that *Emys cayennensis* had been used as a synonym of *Podocnemis unifilis* as well as *P. erythrocephala*, and considered *P. unifilis* as the valid name. Bonin *et al.* (2006) treat the species as *P. cayennensis*.

Biology: *P. unifilis* is a South American aquatic turtle that inhabits mainly large rivers and lakes (Bonin *et al.*, 2006), but also flooded forests, swamps and lagoons (Ojasti, 1996). The species has a carapace length of up to 50 cm (Barrio-Amorós, 2004).

Estimates of female maturation age vary between 4-15 years (Ojasti, 1996). The timing of the reproductive season usually overlaps with the dry season (Almeida *et al.*, 2005). Females typically lay eggs on exposed riverbanks at night time (Hernández *et al.*, 2010b), often in small groups (Bonin *et al.*, 2006). Pritchard (1979) and Soini (1996) reported that the species was capable of reproducing several times per year, and Bonin *et al.* (2006) considered two clutches per season as common; however, Ojasti (1996) noted that there was no clear evidence to confirm this, and Moll and Moll (2004) stated that available evidence suggests single annual nesting. The average clutch size is 15-25 eggs (Pritchard, 1979; Almeida *et al.*, 2005), however clutches of up to 40 eggs have been reported (Almeida *et al.*, 2005; Hernández *et al.*, 2010b). The number of eggs was reported to increase with the size of the female (Escalona 2010), and the sex of the offspring is determined by incubation temperature (Hernández *et al.*, 2010b). Vanzolini (2003) reported hatching success of over 90 per cent of eggs in undisturbed nests.

General distribution and status: *P. unifilis* was considered widespread (Hernández *et al.*, 2010b), its range covering the Caribbean drainages and Upper Amazon Tributaries (Moll and Moll, 2004; Ernst *et al.*, 2013) (Figure 10). Uetz (2013) reported possible occurrence in Trinidad and Tobago and introduced

populations in Florida. Based on a study using microsatellites, Escalona *et al.* (2009) suggested that the populations of the Amazon and Orinoco drainages represent genetically divergent lineages.

Using projected range maps, Buhlmann *et al.* (2009) estimated its total range to be 7 184 705 km². Based on surveys conducted across the Amazon basin, Norris *et al.* (2011) estimated maximum abundances of 2-20 *P. unifilis*/km of river.

P. unifilis was classified as Vulnerable in the IUCN Red List, however this assessment was considered to need updating (Tortoise and Freshwater Turtle Specialist Group, 1996). Groombridge (1982) considered the species as "still relatively common in a few areas but locally depleted", whereas Johns (1987) noted that in many areas, the populations of *P. unifilis* were so low that "extinction is in sight". Ojasti (1996) considered the species to be "fairly common in the more remote rivers". However, recent studies confirm a population decline. Escalona *et al.* (2009) found genetic evidence of a "substantial recent population decline" in ten localities, and Escalona (2010) estimated that the populations had declined by at least 80 per cent during 2000-2010. Mittermeier *et al.* (2010) noted that the species had disappeared from some beaches where it had previously nested.

Threats: Overexploitation was regarded as the main threat (Groombridge, 1982; Johns, 1987; Conway-Gómez, 2007; Escalona, 2010; Mittermeier *et al.*, 2010; Pineda-Catalan *et al.*, 2012). Historical evidence indicates heavy overexploitation of the South American *Podocnemis* spp. (Moll and Moll, 2004), leading to rapid population decline of the larger species *P. expansa* and increased hunting pressure on *P. unifilis* (Escalona and Fa, 1998; Bock *et al.*, 2001; Caputo *et al.*, 2005). *P. unifilis* is hunted for its meat and eggs (Bonin *et al.*, 2006; Franklin, 2007). It forms a major part of the local diet along the Amazon and Orinoco rivers (Ojasti, 1996), and is a major source of income (Kemenes and Pezzuti, 2007). During the breeding season, nesting females are caught by hand on the beach, and at other times, they are captured using fish hooks and fruit baits, and other fishing devices (Ojasti, 1996; Moll and Moll, 2004).

Bonin *et al.* (2006) noted that *P. unifilis* was previously collected in large numbers for the pet trade, and Weaver (1973, in Moll and Moll, 2004) reported that tens of thousands of hatchlings were transported to the pet market during the 1960s-1970s, noting that mortality rates during transport were sometimes very high. However, the pet trade was considered to have decreased during the early 2000s as a result of stricter regulations (Bonin *et al.*, 2006). Altherr and Freyer (2001) considered *P. unifilis* "not suitable for private husbandry" due to its specific habitat requirements and high mortality in captivity.

Escalona (2010) considered habitat destruction as a significant threat, and Vanzolini (2003) noted that the species was sensitive to the damming of rivers for hydroelectric projects.

Overview of trade and management: *P. unifilis* was listed in CITES Appendix II on 01/07/1975.

Commercial farms and ranches were reportedly established in various countries to produce hatchlings for the pet trade and mature individuals for consumption as food (Moll and Moll, 2004). Moll and Moll (2004) cautioned that although farming efforts could reduce the pressure on wild populations, escaped individuals could have negative impacts on wild populations. Páez and Bock (2004) suggested that due to the slow growth rates of *P. unifilis*, captive rearing may not be economically viable, and Fachín-Terán *et al.* (2004) pointed out that the prevailing socioeconomic and ecological conditions limit the success of farming in many areas.

Collection and artificial incubation of eggs was suggested to be an efficient means to conserve nesting populations (Ortega *et al.*, 1998; Fachín Terán and von Mülhen, 2003), and

P. unifilis conservation is typically focussed on the protection of key nesting beaches and/or relocating eggs to protect them from flooding and predation (Bock *et al.*, 2001). Bock *et al.* (2001) cautioned that hatchling relocation projects may interfere with the migratory behaviour of the species.

C. Country reviews

BRAZIL

Distribution in range State: The species' occurrence in Brazil was confirmed by the Tortoise and Freshwater Turtle Specialist Group (1996), Fritz and Havaš (2007) and Bérnils and Costa (2012). Bonin *et al.* (2006) reported that the distribution of *P. unifilis* covers the Brazilian Amazon Basin, reaching close to the sea, and Moll and Moll (2004) reported that it is found in the Guaporé (western Brazil), Trombetas (northern Brazil) and Tapajós (eastern Brazil) rivers.

Population trends and status: Scabin *et al.* (2010) considered the status of Brazilian river turtles to be of "high concern", pointing out that the population status of *P. unifilis* was poorly known. In 1985, the species was reported to be common in some areas, but populations were declining and overexploited (Johns, 1987). Fachín Terán *et al.* (2004) reported that *P. unifilis* was historically abundant in the Mamirauá Sustainable Development Reserve, but that interviews with local inhabitants conducted 1996-1997 revealed that the populations had "diminished drastically" due to hunting. Bonin *et al.* (2006) reported local extirpations as a result of hunting.

Scabin *et al.* (2010) conducted surveys of eleven lakes from October 2009 to October 2010 using four trammel nets to collect, mark and recapture river turtles. During the surveys, 53 individuals of *P. unifilis* were captured, but none were re-captured (Scabin *et al.*, 2010).

Threats: *P. unifilis* was reported to be commonly hunted for food and also widely sold in markets (Torres, 1992; Fachín Terán *et al.*, 2004). Johns (1987) reported high quantities of meat and eggs being sold in Tefé (northwestern Brazil) and noted that female *P. unifilis* fetched particularly high prices. More recently, Fachín Terán *et al.* (2004) reported that the species continued to be caught at the adjacent Tefé, Japurá and Juruá rivers for the markets in Tefé.

Studies conducted at the Río Unini Extractive Reserve (northeastern Brazil) by Scabin *et al.* (2010) during 2009-2010 and at the Mamirauá Sustainable Development Reserve (northwestern Brazil) during 1996-1998 by Fachín-Terán *et al.* (2004) and in the same locality in 2005 by Lopes *et al.* (2012) suggest that exploitation by local communities may be unsustainable. Scabin *et al.* (2010) noted that the intensive and unregulated harvest could lead to local extirpation, and Fachín-Terán *et al.* (2004) reported that the species was being illegally captured in large quantities. Lopes *et al.* (2012) regarded it as one of the most frequently hunted species.

In Brazil, the genus as a whole was considered susceptible to nest destruction due to river dredging (Rodrigues, 2005), with the lack of nesting sites sometimes leading to eggs being laid in agricultural clearings with high vulnerability to predation (Almeida *et al.*, 2005).

Trade: CITES annual reports have been received from Brazil for all years 2002-2011. Brazil has not published any export quotas for *P. unifilis*. According to data in the CITES Trade Database, direct exports from Brazil 2002-2012 primarily consisted of wild-sourced bodies and specimens traded for scientific purposes, the majority of which was not confirmed by the country of import (Table 1). The principal country of import was the United States.

Indirect exports of *P. unifilis* originating in Brazil 2002-2012 comprised small numbers of carapaces and carvings traded for educational purposes in 2004-2005.

Table 1. Direct exports of *Podocnemis unifilis* from Brazil, 2002-2011. All trade was wild-sourced. (Brazil's annual report for 2012 has not yet been received; no trade was reported in 2006 or 2012.)

Term	Purpose	Reported by	2002	2003	2004	2005	2007	2008	2009	2010	2011	Total
specimens	S	Importer					150			3		153
		Exporter	41			150					16	207
bodies	S	Importer										
		Exporter					150	150	40	3	92	435
carapace	E	Importer										
		Exporter		1		2						3
	S	Importer										
		Exporter									18	18
carvings	E	Importer			2							2
		Exporter										
skulls	E	Importer										
		Exporter		1								1
unspecified	E	Importer										
		Exporter			1							1

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The CITES Management Authority of Brazil (*in litt.* to UNEP-WCMC, 2013) confirmed that no permits had been issued to export the species for commercial purposes between 1975 and 2012. R. Vogt (pers. comm. to UNEP-WCMC, 2013) stated that there was no evidence of illegal trade and the CITES MA of Brazil (*in litt.* to UNEP-WCMC, 2013) confirmed that no illegal exports were recorded.

Management: *P. unifilis* is not included in the list of species threatened with extinction (Order No. 1.522 of 1989, amended by Order No. 45-N of 1992 and Order No. 062 of 1997) (IBAMA, 1989), but all hunting and trade in animals and their eggs without appropriate licenses is prohibited under the Environmental Crimes Law from 1999 (Brazil, 1999). The CITES MA of Brazil (*in litt.* to UNEP-WCMC, 2013) stated that the harvesting of the species from the wild for commercial purposes is prohibited, but noted that the use of ranched specimens for commercial purposes is not regulated.

It was also reported that export for commercial purposes is allowed for sources C or F (CITES MA of Brazil, *in litt.* to UNEP-WCMC, 2013). Mittermeier *et al.* (2010) reported that the Brazilian government has encouraged the farming of *Podocnemis* spp., and enforced regulations prohibiting the hunting of wild individuals. Programmes had been established to provide farmers with *P. unifilis* to raise, however it was recommended that the long-term sustainability of these programmes should be evaluated (Mittermeier *et al.*, 2010). Order No 142/92 of 1992 regulates the breeding of *P. unifilis* for commercial purposes, and lists the requirements that a breeding centre needs to fulfil to obtain a license for the breeding of the species (IBAMA, 1992).

However, Scabin *et al.* (2010) stated that the prohibitions on wild harvest were "not followed", and noted that the inspection of boats transporting turtles was particularly challenging in the Brazilian Amazonia, which covers a very large area. Illegal harvest of chelonians was reported to be particularly common along the Purus River (Kemenes and Pezzuti, 2007). Fachín Terán *et al.* (2004) called for increased involvement from the Brazilian Agency for the Environment and Renewable Natural Resources (IBAMA) in inspecting and monitoring turtle trade.

ECUADOR

Distribution in range State: Occurrence in Ecuador was confirmed (Tortoise and Freshwater Turtle Specialist Group, 1996; Bonin *et al.*, 2006)**,** and Fritz and Havaš (2007) reported the species from eastern Ecuador. *P. unifilis* was observed in surveys conducted along the Tiputini river in the Orellana Province (eastern Ecuador) between 1997-2001 (Cisneros-Heredia, 2006), and also along the Aguarico river basin (eastern Ecuador) (Townsend *et al.*, 2005). It was not observed during a total of 1117 effort-hours of sampling during 1986-2007 at the Jatun Sacha reserve in eastern Ecuador (Vigle, 2008).

Population trends and status: *P. unifilis* was categorised as 'Vulnerable' in the Ecuadorian Red List of reptiles in 2005 (Rodríguez-Guerra, 2012). The CITES MA of Ecuador (*in litt.* to UNEP-WCMC, 2013) reported that the total population size was not known, although population studies have been conducted in some areas. Cisneros-Heredia (2006) considered it as "the most observed turtle" along the Tiputini River, noting that "groups up to 12 adult or juvenile individuals were frequently observed". However, population declines were reported within the Aguarico river basin by Townsend *et al.* (2005) and Caputo *et al.* (Caputo *et al.*, 2005).

Threats: Overexploitation of eggs and animals for meat was considered as the main threats (CITES MA of Ecuador, *in litt.* to UNEP-WCMC, 2013). A study conducted on the Aguarico River by Caputo *et al.* (2005) found flooding to destroy over 60 per cent of nests.

Trade: CITES annual reports have not yet been received from Ecuador for the years 2006, 2011 or 2012. Ecuador has not published any export quotas for *P. unifilis*. According to data in the CITES Trade Database, Ecuador has not reported any direct exports of the species 2002-2012. Direct trade reported by countries of import comprised one wild-sourced specimen traded for scientific purposes in 2008. No indirect exports of *P. unifilis* originating in Ecuador were reported 2002-2012. The CITES MA of Ecuador (*in litt.* to UNEP-WCMC, 2013) confirmed that there were no authorised exports for commercial purposes from Ecuador.

Management: The CITES MA of Ecuador (*in litt.* to UNEP-WCMC, 2013) confirmed that *P. unifilis* was not harvested for commercial export purposes. It was reported to occur in the Yasuní National Park (eastern Ecuador) (Bass *et al.*, 2010). Community-based monitoring programmes were reported to show an increase in *P. unifilis* as a result of banning the hunting of adults, regulating egg collection and rearing hatchlings (Townsend *et al.*, 2005).

PERU

Distribution in range State: Iverson (1992) and Fritz and Havaš (2007) confirmed the species' occurrence in northeastern Peru. Based on earlier records, Ferronato and Morales (2012) reported its occurrence in the regions of Loreto (northern Peru), Ucayali, Madre de Dios (eastern Peru), Huánuco and Pasco (central Peru), and the CITES MA of Peru (*in litt.* to UNEP-WCMC, 2013) reported that it also occurred in Amazonas and San Martín (northern Peru). Ferronato *et al.* (2011) reported its occurrence in Pasco (central Peru), and the Tropical Rainforest Coalition (2004) reported that the species was found in the Manu river (eastern Peru).

Population trends and status: *P. unifilis* was classified as 'Threatened' in the Peruvian Red List (Pulido, 1991) and the Tropical Rainforest Coalition (2004) reported that the species was facing a "huge depletion" in Peru. Yallico and Suarez de Freitas (1995) indicated that the Manu National Park (southeastern Peru) hosted the "last good populations" of *P. unifilis* which was "in danger of extinction", and Pineda-Catalan *et al.* (2012) noted that fishermen near Iquitos (northeastern Peru) were reporting that *P. unifilis* was becoming harder to catch,

indicating a population decline. Soini (1996) considered the species to be scarce in areas where it had been collected intensively, but abundant along the Pacaya river (Pacaya-Samiria National Reserve, PSNR, northeastern Peru), where a minimum of 14 adult females per km of river and an average of 29 nests per km of river were reported.

Based on more recent surveys, conservation efforts had resulted in population increases within the PSNR (Murrieta and Ruiz, 2006; Sánches *et al.*, 2006), and the CITES MA of Peru (*in litt.* to UNEP-WCMC, 2013) confirmed that the total population within the Reserve had increased significantly in recent years (CITES MA of Peru, *in litt.* to UNEP-WCMC, 2013). The estimated number of egg-laying females in the Yanayacu-Pucate basin was reported to have increased from under 500 individuals in 1994 to over 5000 individuals in 2009; the increase was considered to be linked to the implementation of management plans for the species after 2004, with the average number of nests found per km per person increasing from 0.045 during 1997-2004 to 0.124 during 2005-2009 (CITES MA of Peru, *in litt.* to UNEP-WCMC, 2013).

Threats: Overexploitation was considered to be the main cause of population decline (Yallico and Suarez de Freitas, 1995; CITES MA of Peru, *in litt.* to UNEP-WCMC, 2013). *P. unifilis* is hunted for food (Tropical Rainforest Coalition, 2004; Chirif, 2005; Ferronato and Morales, 2012), for subsistence and commercial purposes (Soini, 1996). Soini (1996) estimated that along the Pacaya River, more than 90 per cent of the eggs and 200-300 egg-laying females were collected annually, and Kvist *et al.* (2001) reported that thousands of eggs were collected during the period of two months in 1997. Genetic analyses conducted by Pineda-Catalan *et al.* (2012) during 2007-2008 confirmed that illegally hunted *P. unifilis* individuals from the Pacaya Samiria National Reserve were being sold at the Iquitos markets.

The loss of nesting habitat was considered as an additional threat (CITES MA of Peru, *in litt.* to UNEP-WCMC, 2013). The CITES MA of Peru (*in litt.* to UNEP-WCMC, 2013) considered international trade to pose no significant threat to the species in Peru.

Trade: CITES annual reports have not yet been received from Peru for the years 2006 or 2012. Peru published an annual export quota for 13 810 ranched specimens in both 2008 and 2009. According to data in the CITES Trade Database, the quota appears to have been exceeded in 2009 according to both data reported by country of export (22 608 live, ranched specimens) and by countries of import (18 734 live, ranched specimens). Trade in 2008 remained within the quota according to data reported both by countries of export and of import (10 272 and 7104 live, ranched specimens, respectively).

Direct exports of *P. unifilis* from Peru 2002-2012 primarily consisted of live specimens traded for commercial purposes, the majority of which were ranched (Table 2). Trade in ranched specimens was reported only from 2007 onwards, and peaked in 2011. All trade in captive-bred specimens took place prior to 2004, while all trade in source F specimens was reported from 2005 onwards. Small numbers of seized/confiscated eggs and bodies were also reported. The principal country of import was Hong Kong, SAR.

The CITES MA of Peru (*in litt.* to UNEP-WCMC, 2013) reported authorizing exports from breeding farms, with figures increased from 3160 in 2008 to 15 266 in 2011 (18 585 in 2012) and the exports from the Pacaya-Samiria National Reserve increased from 8672 in 2008 to 61 540 in 2011 (109 983 in 2012). This is reflected in the sharp increase in trade in ranched specimens from 2007 to 2011 (Table 2).

Indirect exports of *P. unifilis* originating in Peru 2002-2012 primarily consisted of captive-bred individuals traded for commercial purposes; no indirect trade took place in 2002-2003,

2005, 2008 or 2011. In 2009, the United States reported the import of 1000 seized/confiscated live specimens originating in Peru and re-exported via Hong Kong, SAR.

Table 2. Direct exports of *Podocnemis unifilis* from Peru, 2002-2011. (Annual reports have not yet been received from Peru for the years 2006 or 2012; no trade was reported in 2012.)

Term	Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	W	T	Importer						1500					1500
			Exporter											
	R	T	Importer						3518	7104	18734	2394	55717	87467
			Exporter						6418	10272	22608	26712	61540	127550
	C	T	Importer	118	430	193								741
			Exporter	145	1588	100								1833
	F	T	Importer				198	330	1657	3700	2939	2640	3475	14939
			Exporter				249		1276	3160	8440	3640	15266	32031
	I	T	Importer		50									50
			Exporter											
specimens	W	S	Importer							261				261
			Exporter							261				261
bodies	I	P	Importer									1		1
			Exporter											
carapace	W	Q	Importer											
			Exporter							6				6
eggs	I	P	Importer								13			13
			Exporter											
feet	W	S	Importer											
			Exporter	372										372

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *P. unifilis* is categorised as 'Vulnerable' under Decree 034-2004-AG (Peru, 2004). The Decree prohibits unlicensed hunting, capture, transport and exportation for commercial purposes (Peru, 2004). The CITES MA of Peru (*in litt.* to UNEP-WCMC, 2013) reported that all *P. unifilis* exported from Peru are either produced in authorised breeding farms or in the Pacaya-Samiria Reserve, where community-based management plans are in place and a non-detriment finding has been based on surveys indicating a continuous population increase. The prohibition of exports in wild-sourced specimens was highlighted in the response of Peru to the CITES Secretariat in regard to the Significant Trade Review process (CITES MA of Peru, *in litt.* to the CITES Secretariat, 2011).

Management plans for the sustainable use of *P. unifilis* in Peru include the transfer of eggs from natural nesting sites to artificial beaches, where a proportion of hatchlings are returned to the wild (CITES MA of Peru, *in litt.* to UNEP-WCMC, 2013). Approximately 1.4 million hatchings were reported to have been released to the wild in the PSNR between 1994 and 2012 in various parts of the reserve: 628 139 in the Pacaya basin 1995-2012, 546 744 in the Yanayacu-Pucate basin 1994-2012, 184 548 in the Samiria basin 2007-2012 and 26 848 in the Yanayacu Grande basin 2010-2012 (Vásquez Ruesta *et al*., 2013). In 2012, a total of 13 947 nests were reported to be transferred to artificial beaches, resulting in 123 754 hatchlings traded and 252 292 hatchlings returned into the wild (Vásquez Ruesta *et al*., 2013).

The current managment regime in Peru was considered to have played a key role in the recovery of the species and to be an example of successful sustainable use (CITES MA of Peru, *in litt.* to the CITES Secretariat, 2011; Vásquez Ruesta *et al*., 2013).

The species was reported to occur in several protected areas: Manu Biosphere Reserve (Yallico and Suarez de Freitas, 1995), Pacaya-Samiria National Reserve (Soini, 1996; Murrieta and Ruiz, 2006), the Tambopata river watershed in the Tambopata National Reserve and Bahuaja-Sonene National Park (ParksWatch, 2002), and the Amarakaeri Communal Reserve (ParksWatch, 2003). The Sideneck Turtle Management and Conservation Program in the Manu National Park was established to improve the sustainability of use by local communities through i) relocation of eggs from flood-prone nesting beaches, ii) prevention of flooding, iii) releasing of turtles produced in hatcheries, and monitoring their survival, and iv) establishing a turtle adoption program (Tropical Rainforest Coalition, 2004).

SURINAME

Distribution in range State: Groombridge (1982) considered the population in Suriname to consist of "stragglers from Amazon tributaries". However, Fritz and Havaš (2007) considered the distribution range to include "Caribbean drainages of the Guianas", and occurrence in the country was confirmed by TFTSG (1996), De Ávila Pires (2005), Bonin *et al.* (2006) and Ernst *et al.* (2013). The distribution map of Iverson (1992) includes three localities; two in the southeastern part of the country, and one (unconfirmed) recording on the northern coast. However, the CITES MA of Suriname (*in litt.* to UNEP-WCMC, 2013) reported observations of one or two specimens in Sipaliwini river (southern Suriname) and Nickerie river (northwestern Suriname).

Population trends and status: *P. unifilis* was considered to be "very rare" in Suriname (Tropenbos, 2004; CITES MA of Suriname, *in litt.* to UNEP-WCMC, 2013). The CITES MA of Suriname (*in litt.* to UNEP-WCMC, 2013) reported that during over 30 years of field work in the country only three specimens and no nesting sites were located.

Threats: According to the CITES MA of Suriname (*in litt.* to UNEP-WCMC, 2013), the harvesting of adults and eggs for food, and juveniles for the pet trade, are the main threats to the species. Habitat destruction was considered a further, but less important threat (CITES MA of Suriname, *in litt.* to UNEP-WCMC, 2013).

Trade: CITES annual reports have been received from Suriname for all years 2002-2011. Suriname published export quotas for wild-sourced *P. unifilis* every year from 1997 onwards; from 1999 onwards the quota applied to live specimens only (750 individuals in 2002 and 630 individuals every year 2003-2013). According to data in the CITES Trade Database, the only direct exports of *P. unifilis* from Suriname reported 2002-2012 consisted of live, wild-sourced specimens traded for commercial purposes in 2002 (eight) and 2005 (ten), each reported by both trading partners; trade therefore remained within the quota in every year (trade data for 2012-2013 are not yet available). In addition, the United States reported the import of eight seized/confiscated specimens from Suriname in 2002. No indirect exports of *P. unifilis* originating in Suriname were reported 2002-2011.

The CITES MA of Suriname (*in litt.* to UNEP-WCMC, 2013) reported that no exports had taken place since 2002, and no evidence of illegal trade of *P. unifilis* was recorded.

The European Union suspended trade in wild-sourced *P. unifilis* from Suriname in 1999; this suspension under Commission Regulation (EC) No. 578/2013 of 17 June 2013 remains in place.

Management: *P. unifilis* is managed as a 'cage species' under the Game Law of Suriname (CITES MA of Suriname, *in litt.* to UNEP-WCMC, 2013). A bag limit of two individuals applies in the northern zone of Suriname (Suriname, 2012), however local harvesting of adults and eggs for food is not regulated (CITES MA of Suriname, *in litt.* to UNEP-WCMC, 2013).

VENEZUELA (BOLIVARIAN REPUBLIC OF)

Distribution in range State: *P. unifilis* was reported to be widespread throughout the Orinoco river basin, as well as the Caura, Caroni (southern Venezuela) and Unare (northern Venezuela) rivers (CITES MA of Venezuela, *in litt.* to UNEP-WCMC, 2013). Fritz and Havaš (2007) reported occurrence in southern Venezuela, and Barrio-Amorós and Narbaiza (2008) considered it widespread in the Amazonas State (southern Venezuela). In a study conducted in the southeastern part of the state of Cojedes in central Venezuela, Polisar *et al.* (2008) found *P. unifilis* to have a more restricted distribution compared to *P. voglii*. Staton and Dixon (1977) suggested that it likely occurs on the Llanos (grassland plains penetrated by Orinoco river in central and southwestern Venezuela), although it was not recorded during their 11 month survey in 1973-1974.

Population trends and status: The species was categorised as 'Vulnerable' in the Venezuelan Red List (Ojasti *et al.*, 2008), and the population trend was considered to be declining (Thorbjarnarson *et al.*, 1993; Ojasti *et al.*, 2008).

According to the CITES MA of Venezuela (*in litt.* to UNEP-WCMC, 2013), field observations indicate that mature specimens are relatively abundant and that there is no indication of a significant population decline. Thorbjarnarson *et al.* (1993) considered *P. unifilis* to be "still abundant in many lowland riverine habitats in Venezuela", and Escalona (2010) and Escalona and Loiselle (2003) considered it abundant in the riparian habitats of Caura river and its tributaries. Barrio-Amorós and Narbaiza (2008) conducted interviews and direct observations on four expeditions in the Amazon state in 1998, concluding that although the species was hunted for food in the region, it "maintains some demographic abundance". However, Rodriguez (2001, pers. comm. to Fidenci, in Fidenci, 2002) reported that "Based on fishing capture and personal observations, populations of *P. unifilis* in the River Caura are [...] becoming vulnerable". Fidenci (2002) described the Orinoco populations as "unknown, but probably highly reduced".

Threats: Exploitation was regarded as the main threat (Thorbjarnarson *et al.*, 1993; Ojasti *et al.*, 2008; Escalona, 2010; CITES MA of Venezuela, *in litt.* to UNEP-WCMC, 2013), with both eggs and meat being consumed in Amazonas (Barrio-Amorós and Narbaiza, 2008), and it was considered culturally and economically important in the Caura river area (Escalona, 2010a). The CITES MA of Venezuela (*in litt.* to UNEP-WCMC, 2013) considered the species to be in low demand in urban centres. However, Escalona and Loiselle (2003) conducted a study on turtle hunting on the Mato river (tributary of the Caura river) in 2000, and found that the demand for *P. unifilis* was high in urban areas. Their results confirmed that while all age and size classes were caught for local consumption, capture for commercial trade focussed heavily on mature females fetching highest prices on the markets (Escalona and Loiselle, 2003). Ojasti *et al.* (2008) reported that in 2000, local hunters were paid BS 5000 (ca. USD 8 at the time of writing) adult *P. unifilis*, and the same individual could be sold at the state capital for BS 30 000 (ca. USD 35-45).

In a study conducted on the Nichare and Tawadu rivers, Escalona and Fa (1998) found that egg collection was the main cause of nesting failure and that on exploited beaches, only 17 per cent of nests produced hatchlings. Hernández *et al.* (2010a) found that in 2009, egg predation by humans and animals was the main threat along the Manapire river, causing the loss of 80 per cent of nests; while along the Cojedes river, 28 per cent of nests were destroyed by predation and flooding.

Predation of eggs by dogs and feral pigs was considered a significant threat by the CITES MA of Venezuela (*in litt.* to UNEP-WCMC, 2013). Hernández *et al.* (2010b) found on surveys conducted on the Cojedes and Manapire rivers in 2009 that 28 per cent and 85 per cent of

eggs, respectively, were lost to predation and flooding. Escalona (2010) noted that habitat destruction was an important threat along the Caura river and its tributaries.

Trade: CITES annual reports have been received from Venezuela for all years 2002-2012. Venezuela has not published any export quotas for *P. unifilis*. According to data in the CITES Trade Database, direct exports of *P. unifilis* from Venezuela 2002-2012 primarily consisted of ranched and captive-bred live individuals traded for commercial purposes; no trade was reported in 2002 or 2010-2011 (Table 3). The only trade in wild-sourced specimens was for scientific purposes, all imported by the United States. The principal countries of import of ranched and captive-bred animals were Mexico and Taiwan, Province of China. No indirect exports of *P. unifilis* originating in Venezuela were reported 2002-2012.

Table 3. Direct exports of *Podocnemis unifilis* from Venezuela (Bolivarian Republic of), 2003-2012 (no trade was reported in 2002 or 2010-2011). (Quantities rounded to one decimal place, where applicable.)

Term	Units	Source	Purpose	Reported by	2003	2004	2005	2006	2007	2008	2009	2012	Total
live	-	R	T	Importer			250			1550			1800
				Exporter	100	300	775	880		900	500		3455
		C	T	Importer		150	200	120	1750				2220
				Exporter		150	450	900	2400			700	4600
specimens	l	W	S	Importer									
				Exporter					<0.1				<0.1
	m3	W	S	Importer					<0.1				<0.1
				Exporter									
	-	W	S	Importer				40					40
				Exporter	40			80					120

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The CITES MA of Venezuela (*in litt.* to UNEP-WCMC, 2013) reported that no licenses to collect eggs for ranching were granted during 2010-2012, due to economic reasons. There was reported to be no evidence of illegal trade (CITES MA of Venezuela, *in litt.* to UNEP-WCMC, 2013). However, Hernández and Espín (2003) estimated the rates of illegal exploitation of *Podocnemis* spp. in the middle Orinoco region of Venezuela through collecting shells and obtaining data from the National Guard and Ministry of Environmental Affairs seizures, and concluded that *P. unifilis* was the second most commonly captured species after *P. expansa*.

Management: *P. unifilis* is included in the list of hunted animals (Resolution MARNR No 102 of 1996, amended in 2002) (CITES MA of Venezuela, *in litt.* to UNEP-WCMC, 2013). Capture is allowed from March to April with a bag limit of two individuals, and requires a licence granted by the Ministry of Environment and Natural Resources (Ministerio del Ambiente y de los Recursos Naturales, MARN) (Hernández and Espín, 2003).

The CITES MA of Venezuela (*in litt.* to UNEP-WCMC, 2013) reported that to obtain a license to collect eggs from the wild, ranching operations need to provide a technical report with details on local population structure and nest abundance. Ten per cent of the hatched specimens should be released into the wild at the age of 12 months, which was considered higher than natural survival rates, with a potential to increase the total recruitment rates of exploited populations (CITES MA of Venezuela, *in litt.* to UNEP-WCMC, 2013). It was also stated that Ministry authorities are involved in monitoring to ensure that the ranching operations fulfil the requirements (CITES MA of Venezuela, *in litt.* to UNEP-WCMC, 2013). In the response by the CITES MA of Venezuela to the Animals Committee questionnaire about source code R, ranching of *P. unifilis* was considered to reduce hunting pressure, maintain genetic resources, reinforce wild populations and generate economic resources (AC24 Doc. 8.1, Annex 4).

The CITES MA of Venezuela (*in litt.* to UNEP-WCMC, 2013) reported that various governmental and non-governmental conservation projects to conserve the species through the collection and artificial incubation of eggs were in place. Actions to conserve the species in the Arrau turtle wildlife reserve on the Orinoco river basin were considered successful, and the number of *P. unifilis* nests had increased from 103 in 2006 to 980 in 2012 (CITES MA of Venezuela, *in litt.* to UNEP-WCMC, 2013). *P. unifilis* was reported to occur in several protected areas (Ojasti *et al.*, 2008), including the Capanaparo-Cinaruco National Park, although being "heavily exploited for food" (Thorbjarnarson *et al.*, 1993).

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

Evidence of illegal trade was reported from Brazil, Peru and Venezuela.

CITES annual reports have not yet been received from Ecuador for 2006 or 2011 or Peru for 2006.

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Kinixys homeana Bell, 1827: Benin, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Togo

Testudinidae, Home's Hinge-back Tortoise

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee included *Kinixys homeana* for inclusion in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 specified that *K. homeana* met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009. At the 26th meeting of the AC, a response had been received from the Democratic Republic of the Congo (hereafter referred to as DR Congo) (AC26 Doc. 12.3). Benin, Cameroon, Congo, Côte d'Ivoire, DR Congo, Equatorial Guinea, Gabon, Ghana, Liberia, Nigeria, Sierra Leone and Togo were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Cameroon, Congo, Liberia, Nigeria and Sierra Leone were removed from the process on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC. Ghana was removed from the process in agreement with the AC, although trade was reported from the country.

A. Summary

Overview of *Kinixys homeana* recommendations

		General summary
		Current range considered to cover up to 9235 km^2, with a population size of up to 4.2 million individuals. Categorised as Vulnerable in the IUCN Red List with a declining population trend.
Range State	**Provisional category**	**Summary**
Benin	Possible Concern	Moderate levels of trade 2002-2012 mainly in live, ranched individuals. A possible quota excess was reported in 2010 (wild). Concerns were raised on the management of ranching. Limited range and ongoing population decline. Therefore, categorised as Possible Concern.
Côte d'Ivoire	Least Concern	Trade of 250 wild-sourced and 200 captive-bred live individuals was reported in 2003, although this was not reported by Côte d'Ivoire. Occurs in southern Côte d'Ivoire but population status is unknown. On the basis of low trade levels, categorised as Least Concern.
Democratic Republic of the Congo	Least Concern	Occurs in northern Democratic Republic of the Congo, with possible isolated subpopulations in the eastern part of the country. However, no international trade reported 2002-2011, and therefore, categorised as Least Concern.
Equatorial Guinea	Least Concern	Trade of 25 live, wild-sourced individuals was reported in 2003, although this was not reported by the country of import. At least locally relatively abundant, although population decline reported. On the basis of low trade levels, categorised as Least Concern.
Gabon	Least Concern	Distribution in the country is contested, although the CITES MA confirms occurrence. On the basis of very low levels of international trade 2002-2011, categorised as Least Concern.
Togo	Possible Concern	High levels of trade 2002-2011 mainly in live, ranched specimens. Three instances of possible quota excesses were reported 2002-2005 (wild). Concerns were raised regarding the management of the species, including ranching. Appears to be rare and decreasing. Therefore, categorised as Possible Concern.

B. Species overview

Taxonomic note: Kirkpatrick (1998) noted that *Kinixys* spp. are subject to misidentification, and according to Tabaka (2003), *K. homeana* and *K. erosa* are often confused, although reliably distinguishable based on the angle of the fifth vertebral scute.

Biology: *Kinixys homeana* is a West African tortoise that inhabits lowland evergreen forests (Broadley, 1989; Ernst *et al.*, 2013), where it prefers humid sites (Bonin *et al.*, 2006) and is often found along streams and swampy habitats (Branch, 2008). Luiselli (2003) and Luiselli *et al.* (2006) reported that the species may occur on densely vegetated habitat patches in areas where it is hunted, and inhabit a wider variety of different habitats in areas where it is protected from hunting.

The ecology of *K. homeana* was considered poorly known, partially due to it being relatively inactive and difficult to observe (Harwood, 2003). It produces clutches of two to four eggs (Kirkpatrick, 1998) up to two times per year, generally during the dry season in December and January (Maran and Serpol, 2006).

General distribution and status: The distribution of *K. homeana* was reported to reach from Liberia in the west to Cameroon and DR Congo in the east (Broadley, 1989; Iverson, 1992; Bonin *et al.*, 2006; Fritz and Havaš, 2007; Branch, 2008; Vetter, 2011) (Figure 11); occurrence in the Republic of the Congo was reported by Branch (2008) and Jackson and Blackburn (2010), whereas Vetter (2011) reported probable occurrence in the country.

Based on projected range maps, Buhlmann *et al.* (2009) estimated the range of *K. homeana* to cover 1 825 142 km^2. Luiselli *et al.* (2006) noted that the existing distribution maps represent the historical range of the species, but that more recently the area of suitable habitat had declined. They estimated that in 1992, the range of the species covered approximately 788 843 km^2, while by 2006, the range had reduced to 5 per cent of this (9235 km^2), although it was thought to probably be even narrower than this (Luiselli *et al.*, 2006). Protected areas were estimated to cover three per cent of the species' total range (Luiselli *et al.*, 2006).

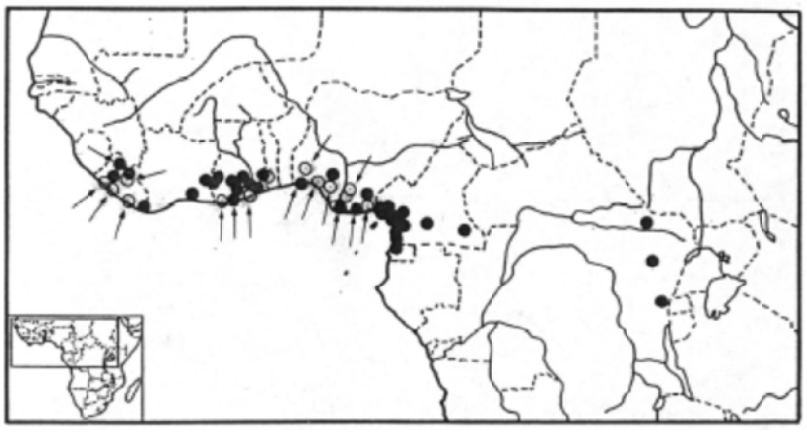

Figure 11: Distribution of *Kinixys homeana* in West Africa, based on occurrence records (after Iverson, 1992) and recently discovered sites (open circles). Arrows indicate sites where the populations are suspected to have declined or disappeared. (Source: Luiselli *et al.*, 2006).

The total population size of *K. homeana* was estimated to be "at best" 4 205 000 individuals (Luiselli *et al.*, 2006). The population density was considered relatively low (Bonin *et al.*,

2006); estimates of approximately 1.4 individuals/ha were made in Nigeria and considered to be representative of the total range (Luiselli *et al.*, 2006).

K. homeana was classified as Vulnerable in the IUCN Red List, based on a population decline of 90 per cent over three generations (40 years), and a predicted continuous trend of population decline (Luiselli *et al.*, 2006). A declining population trend was also reported by Bonin *et al.* (2006) and Branch (2008), and coastal populations were considered to be particularly affected (Luiselli *et al.*, 2006).

Threats: Main threats to *K. homeana* were considered to include habitat loss (Broadley, 1989; Bonin *et al.*, 2006; Maran and Serpol, 2006; Branch, 2008), hunting for subsistence and traditional medicine, and capture for the international pet trade (Luiselli *et al.*, 2006; Maran and Serpol, 2006; Branch, 2008). Harwood (2003) considered the species to be relatively tolerant to opportunistic hunting, due to being relatively inactive and difficult to find, and Bonin *et al.* (2006) considered it to be "perhaps somewhat less heavily hunted for food than the other *Kinixys* species". However, Luiselli *et al.* (2006) considered harvest levels to be unsustainable and raised concern over hunting within protected areas.

In the late 1990s, Kirkpatrick (1998) stated that the high levels of exports "cannot continue indefinitely without depleting the wild populations" and more recently, Branch (2008) considered *K. homeana* to be common in the international pet trade. Schlaepfer (2005) listed *K. homeana* as a species "particularly vulnerable to commercial take on the basis of [...] life history characteristics, geographic distribution, and levels of US trade, 1998-2002", suggesting that its status was "so dire that the trade of wild-caught animals should be halted or severally reduced", and that it "may not be adequately protected against overcollecting". Low prices were reportedly paid for pet *K. homeana* in the United States, and consequently, specimens collected from the wild "often arrive in a stressed condition, with no information available as to their place of origin" (Kirkpatrick, 1998). High mortality in captivity was linked to parasitic infections or inadequate environmental conditions (Kirkpatrick, 1998; Farkas and Sátorhelyi, 2006; Webb, 2012), and the species was considered difficult to keep in captivity (Corton, 2013; Altherr and Freyer, 2001).

Overview of trade and management: *K. homeana* was listed in CITES Appendix II on 01/07/75. The species was included in the CITES Review of Significant Trade in 1993, when international trade was not considered to have a negative impact on the species overall, but thought to possibly affect local populations (WCMC *et al.*, 1993).

Luiselli *et al.* (2006) noted that the species was protected under customary laws in some range areas, but considering its status, recommended that it should be included under protective legislation in all countries.

The European Union suspended trade in live, wild-sourced *K. homeana* from all countries between 1999 and 2004.

C. Country reviews

BENIN

Distribution in range State: Several authors did not consider Benin to be a range country (Pritchard, 1979b; Broadley, 1989; Iverson, 1992; Ullenbruch *et al.*, 2010; Luiselli *et al.*, 2012), but Luiselli *et al.* (2006) although Uetz (2013) reported its occurrence in the country, and the distribution map by Vetter (2011) indicates that the species is found in southern Benin. Luiselli *et al.* (2008) recorded occurrence in Cotonou and Porto Novo (southern coast), Maran

(2009) reported observations in the Department of Zou in central-southern Benin in 2002, and Diagne (2010) recorded the species in the Lokoli swamp forest in southern Benin. The CITES Management Authority of Benin (*in litt.* to UNEP-WCMC, 2013) confirmed occurrence in the department of Plateau (southeastern Benin).

Luiselli *et al.* (2006) estimated that in 1992, the potential range of the species covered 2600 km^2 in Benin, but noted that the actual range was likely to be narrower.

Population trends and status: In surveys conducted during October-November 2003, Luiselli *et al.* (2006) recorded one individual in 29 field survey hours in Cotonou, and none in 31 hours of field survey in Porto Novo. Luiselli *et al.* (2008) also conducted six independent line-transect surveys (5000 m long and 20 m wide) along the coastal wet forests during different seasons in 2003-2005, capturing 16 *K. homeana* in total. They concluded that the population density of the species was low. During interviews conducted throughout Benin by Sinsin *et al.* (2008), 76 per cent of local people considered the turtle populations (*K. belliana* and *K. homeana*) to be in decline, and the CITES MA of Benin (*in litt.* to UNEP-WCMC, 2013) confirmed the declining population trend.

Threats: *K. homeana* was reported to be commonly hunted in Benin for local consumption (Luiselli *et al.*, 2006; Sinsin *et al.*, 2008), and Maran (2009) cautioned that the species may disappear from the country unless protection is improved. The species was reported to be available in the local markets (CITES MA of Benin, *in litt.* to UNEP-WCMC, 2013).

Trade: CITES annual reports have been received from Benin for all years 2002-2012 with the exception of 2003 and 2006. Benin published export quotas for ranched specimens of *K. homeana* every year from 1997 onwards and for wild-sourced and captive-bred specimens from 2010 onwards (Table 1). Trade in ranched specimens remained within the quota every year according to data reported both by countries of import and by countries of export. The quotas for wild-sourced and captive-bred individuals appear to have been exceeded in 2010 according to data reported by countries of import; Benin did not report any wild-sourced trade apart from 100 animals in 2008, and the only trade in captive-bred individuals reported by Benin was the export of 30 animals reported in 2011 and 20 animals in 2012. A permit analysis revealed that the export permits reported by the country of import of the wild-sourced and captive-bred trade in 2010, Ghana, have not been reported by Benin for the species *K. homeana*.

Table 1. CITES export quotas for ranched, wild-sourced and captive-bred *Kinixys homeana* from Benin and global direct exports, as reported by the countries of import and of export, 2002-2013. No quota for wild-sourced or captive-bred specimens was published prior to 2010. All trade was in live specimens. (No annual reports have been received from Benin for the years 2003 or 2006; trade data for 2013 are not yet available; for each year, trade to which the quota does not apply in that year is greyed out.)

Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (ranched)		4600	3600	3600	2000	3000	1000	1000	1000	800	800	800	800
Quota (wild)										50	50	50	50
Quota (captive-bred)										30	30	30	30
ranched	Importer	2042	1970	250	110	158	60	425	775	114	10		
	Exporter	2556		425	210		362	380	915	270	730	580	
wild-sourced	Importer	279						400		1000			
	Exporter							100					
captive-bred	Importer								25	200			
	Exporter										30	20	

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct exports of *K. homeana* from Benin 2002-2012 consisted of live specimens traded for commercial purposes, the majority of which were ranched (Table 2). Trade in ranched animals decreased over this period overall. Benin reported the export of wild-sourced individuals only in 2008, while imports of wild-sourced individuals were reported in 2002, 2008 and 2010 by the countries of import. The import of 225 captive-bred specimens was reported in 2009-2010, while Benin reported the export of only 50 captive-bred specimens in 2011-2012. The United Kingdom also reported the import of 56 seized/confiscated animals in 2002. The principal country of import of ranched specimens, Ghana, was also the main country of import of wild-sourced individuals and the only country of import of captive-bred *K. homeana* from Benin.

Indirect exports of *K. homeana* originating in Benin 2002-2012 consisted of live individuals traded for commercial purposes, the majority of which were ranched with a notable proportion wild-sourced.

Table 2. Direct exports of *Kinixys homeana* from Benin, 2002-2012. All trade was in live specimens for commercial purposes. (No annual reports have been received from Benin for the years 2003 or 2006.)

Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
W	Importer	279						400		1000			1679
	Exporter							100					100
R	Importer	2042	1970	250	110	158	60	425	775	114	10		5914
	Exporter	2556		425	210		362	380	915	270	730	580	6428
C	Importer								25	200			225
	Exporter										30	20	50
I	Importer	56											56
	Exporter												

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

In 2003, Luiselli *et al.* (2006) recorded 97 *K. homeana* during three market visits in the main markets in Cotonou and 109 individuals during three market visits in the main markets of Porto Novo. Maran (2009) also observed live *K. homeana* for sale in the markets of Porto Novo in 2002, where the species was sold for food or traditional medicine. The price of *K. homeana*, CFA 4000 (ca. USD 8 at the time of writing), was higher than that of *K. belliana*, CFA 3000 (ca. USD 6) per animal (Maran, 2009). According to the vendors, individuals for sale originated in the forest reserves of Dogo and Kétou (central Benin) (Maran, 2009).

The European Union suspended trade in wild-sourced and ranched *K. homeana* from Benin in 2005 and 2006, respectively; these suspensions under Commission Regulation (EC) No. 578/2013 of 17 June 2013 remain in place.

Management: Along with other tortoises, *K. homeana* is classified as an unprotected small game species under Annex III of law No 87-014 (1987) (Benin, 1987). Hunting appears to be allowed apart from where it occurs in protected areas (Benin, 1987).

Harwood (2003) reported that in 2002, there were five farms authorised to export live reptiles, all of which were located in southern Benin. There was a quota system in place, whereby the export quota for captive-bred or ranched individuals was calculated based on information on stock levels from farms (Harwood, 2003). Harwood (2003) reported that some neonates were maintained to support the adult breeding population, and additional individuals were collected from the wild every year to avoid inbreeding. A quota system was reportedly in place to limit the number of individuals captured from the wild, however it was noted that farmers could apply for permission to increase these quotas (Harwood,

2003). Releases of ranched specimens into the wild were reportedly carried out under the supervision of relevant authorities, however they were not being recorded (Harwood, 2003).

Ineich (2006) conducted visits to breeding facilities in Benin during 2004, reporting that *K. homeana* was produced in at least two of the five reptile breeding facilities in operation at the time. He noted that due to the high costs of maintaining breeding stock compared to harvesting from the wild, specimens traded from Benin as 'ranched' were most likely a mixture of W, R and C (Ineich, 2006). He also expressed concern over the unsuitable conditions in ranching facilities (Ineich, 2006).

Sinsin *et al.* (2008) reported that the species occurs in the Pendjari National Park.

CÔTE D'IVOIRE

Distribution in range State: The distribution maps of Broadley (1989), Iverson (1992) and Vetter (2011) indicate occurrence in southern Côte d'Ivoire, and Luiselli *et al.* (2006), Luiselli *et al.* (2012) and Uetz (2013) also confirmed the species' occurrence in the country. Maran (2009) recorded its occurrence in several localities in southern Côte d'Ivoire in 1997 and 2000. In reptile surveys conducted in March 2002 in the lowland forests of Haute Dodo and Cavally in western Côte d'Ivoire, Alonso *et al.* (2005) did not record any observations.

Luiselli *et al.* (2006) estimated that in 1992, the potential range of the species covered 37 123 km², but noted that the actual range was likely to be narrower.

Population trends and status: Luiselli *et al.* (2006) noted that no recent population surveys of *K. homeana* had been conducted in the country. No further information on the species' population trend and status in Côte d'Ivoire was located.

Threats: Maran (2009) considered *K. homeana* to be more tolerant to deforestation and hunting than *K. erosa*. No further information on threats was located.

Trade: CITES annual reports have not yet been received from Côte d'Ivoire for the years 2006, 2010 or 2012. The country has not published any export quotas for *K. homeana*. According to data in the CITES Trade Database, no direct exports of the species were reported by Côte d'Ivoire 2002-2012. Direct exports reported by countries of import comprised 250 wild-sourced and 200 captive-bred, live specimens imported for commercial purposes by the United Arab Emirates in 2003. No indirect exports of *K. homeana* originating in Côte d'Ivoire were reported 2002-2012.

The European Union suspended trade in live, wild-sourced *K. homeana* from Côte d'Ivoire from 18/02/2005 until 10/05/2006.

Management: Along with all tortoises, *K. homeana* is listed as a game species under Annex III of Law No. 94-442 (1994), which was an amendment to Law No. 65-255 on wildlife protection and hunting (Côte d'Ivoire, 1994). The law specifies that its hunting and capture are allowed for customary purposes, while hunting for other purposes requires a license (Côte d'Ivoire, 1994).

K. homeana was reported to occur in some protected areas in the country (Bonin *et al.*, 2006).

DEMOCRATIC REPUBLIC OF THE CONGO

Distribution in range State: Uetz (2013) reported possible occurrence in northern DR Congo, and the range map by Vetter (2011) suggests continuous occurrence north of the river Congo. The distribution map by Iverson (1992), however, indicates that the species' population has a restricted range in the northeastern part of the country, which is isolated from the main population. In a rapid assessment survey conducted in the Lokutu region (northern DR Congo, near the Congo river) in 2004, the species was not observed; however,

it was noted that access to potentially pristine forest patches was limited, and that the studied forests were under strong human impact (Penner and Rödel, 2007). Fritz and Havaš (2007) considered eastern DR Congo as the eastern border of the species' range. Luiselli *et al.* (2006) suggested that the isolated subpopulations in the easternmost forests of DR Congo may represent a new subspecies and should be studied.

Luiselli *et al.* (2006) estimated that in 1992, the potential range of the species covered 150 000 km², but noted that the actual range was likely to be narrower.

Population trends and status: No information was located.

Threats: No information was located concerning specific threats to the species in DR Congo. However, Debroux *et al.* (2007) considered excessive hunting to be a threat to wildlife in general in the country, and noted that many protected areas in the country are "paper parks" where poaching is common. It was also reported that protection efforts in the country were mostly focussed on large, charismatic species (Debroux *et al.*, 2007).

Trade: CITES annual reports have not yet been received from DR Congo for the years 2010-2012. The country has not published any export quotas for *K. homeana*. According to data in the CITES Trade Database, no direct or indirect trade in *K. homeana* from DR Congo was reported 2002-2012.

The European Union suspended trade in live, wild-sourced *K. homeana* from DR Congo from 18/02/2005 until 10/05/2006.

Management: *K. homeana* is not included in the lists of protected and partially protected species in the country under the Decree No 003/CAB/MIN/ECN/EF/2006 (Democratic Republic of the Congo, 2006).

EQUATORIAL GUINEA

Distribution in range State: Chirio and LeBreton (2007), Luiselli *et al.* (2012) and Uetz (2013) confirmed occurrence in Equatorial Guinea, and the distribution map by Vetter (2011) indicates limited occurrence along the northwestern coast. Pritchard (1979a) confirmed occurrence in Río Muni (continental Equatorial Guinea), and according to Luiselli *et al.* (2006), the distribution map by Iverson (1992) confirmed occurrence on Bioko island and in Río Muni. Gonwouo and Nsang (2005) recorded the species in a rapid biodiversity assessment in the Monte Alén National Park (central mainland) in 2005, although only one individual was observed.

Luiselli *et al.* (2006) estimated that in 1992, the potential range of the species covered 28 051 km², but noted that the actual range was likely to be narrower.

Population trends and status: The CITES MA of Equatorial Guinea (pers. comm. to UNEP-WCMC, 2013) described *K. homeana* as relatively abundant. However, Gonwouo and Nsang (2005) considered it to be "becoming increasingly rare" in the Monte Alén National Park, an area where *K. erosa* was still abundant.

Threats: In the Monte Alén National Park, Gonwouo and Nsang (2005) found that *K. homeana* was "collected whenever encountered and eaten locally", which had a negative impact on the populations.

Fa and Yuste (2001) studied the offtake patterns of 42 hunters over 16 months in the moist forests of Mount Mitra Region in Río Muni (part of the Monte Alén National Park) in 1998-1999, recording that *K. erosa* but no *K. homeana* had been hunted.

Trade: CITES annual reports have been received from Equatorial Guinea for the years 2002-2004; the country reported 'no trade' in the years 2005-2012. Equatorial Guinea has not

published any export quotas for *K. homeana*. According to data in the CITES Trade Database, the only direct export of *K. homeana* from Equatorial Guinea reported 2002-2011 comprised 25 live, wild-sourced individuals exported to Spain for commercial purposes in 2003, reported by Equatorial Guinea only. No indirect exports of *K. homeana* originating in Equatorial Guinea were reported over this period. The CITES MA of Equatorial Guinea (pers. comm. to UNEP-WCMC, 2013) confirmed that there was virtually no commercial trade in the species.

The European Union suspended trade in live, wild-sourced *K. homeana* from Equatorial Guinea from 18/02/2005 until 10/05/2006.

Management: Law No 7/2003 establishes different categories of threatened species in the country, including i) species in danger of extinction, ii) species that are particularly threatened by habitat loss, iii) species that are vulnerable to become either of the above, and iv) species of special interest due to high scientific, ecological or cultural value or rarity (Equatorial Guinea, 2003). The categorisation of *K. homeana*, however, could not be located.

Gonwouo and Nsang (2005) expressed concern over the unsustainable use of the species in the Monte Alén National Park, recommending that "special attention" should be paid towards conservation measures.

GABON

Distribution in range State: Chirio and LeBreton (2007) and Bonin *et al.* (2006) considered Gabon as a range country, while the distribution map by Vetter (2011) indicated possible occurrence of the species within the country. Luiselli *et al.* (2006), considered the species likely to be present in the country, however this was based solely on reported exports. The CITES MA of Gabon (*in litt.* to UNEP-WCMC, 2013) reported that based on field observations, the species is distributed throughout the country. Field observations were reported in the periphery of Birougou National Park in central Gabon, and Monts de Cristal National Park in northwestern Gabon (CITES MA of Gabon *in litt.* to UNEP-WCMC, 2013). However, many authors did not consider Gabon to be a range country of *K. homeana* (Iverson, 1992; Pauwels and Maran, 2007; Branch, 2008; Luiselli *et al.*, 2012; Uetz, 2013). Based on a literature review and field work conducted during 2001-2005, Pauwels *et al.* (2006) was unable to confirm the species' occurrence in any of the Gabonese National Parks, and noted that the status of *K. homeana* was "still to be evaluated", and might be recorded "through additional field work". More recently, O. S. G. Pauwels (2013, pers. comm. to UNEP-WCMC) pointed out that the species has been "cited by mistake" as occurring in the country, stating that there was "no evidence at all" to prove that it occurs in Gabon, and if it did, it would be restricted to a "very limited geographical zone". He further noted that he regularly conducts checks of the roadside markets for turtles on offer, and confirmed that *K. homeana* had never been encountered in local trade, whereas *K. erosa* was frequently sold (O.S.G. Pauwels, 2013, pers. comm. to UNEP-WCMC).

Population trends and status: The CITES MA of Gabon (*in litt.* to UNEP-WCMC, 2013) reported that the status of the species was unknown due to lack of population surveys; however occasional sightings in the field were considered to suggest that it is not threatened. No further information on the species' status in the country was located.

Threats: The CITES MA of Gabon (*in litt.* to UNEP-WCMC, 2013) considered habitat loss as the main threat to the species, noting that it was occasionally hunted for subsistence purposes or for the local markets in rural areas. O. S. G. Pauwels (pers. comm. to UNEP-WCMC, 2013) stated that all species of turtles are hunted for food and medicinal purposes in all parts of the country, with turtles being opportunistically collected for local markets, but not for international trade.

Trade: CITES annual reports have been received from Gabon for all years 2002-2012 with the exception of 2006 and 2011. Gabon published an export quota for live, wild-sourced *K. homeana* in 2001 (ten animals), 2002 (ten animals), 2007 (five animals) and 2008 (five animals); a quota for wild-sourced carapaces in 2002 (ten), 2007 (five) and 2008 (five); and a quota for five wild-sourced, formalinized specimens in 2007 only. According to the CITES Trade Database, the only direct exports of *K. homeana* reported 2002-2012 were in 2002; Gabon reported the export of three wild-sourced carapaces to France for personal purposes, while France reported the import of two pre-Convention bodies and one pre-Convention carapace for personal purposes in the same year. None of the quotas therefore appears to have been exceeded according to either data reported by the countries of import or of export. No indirect exports of *K. homeana* originating in Gabon were reported 2002-2012.

The CITES MA of Gabon (*in litt.* to UNEP-WCMC, 2013) reported that there were no records concerning the import and export of the species, and that one export request had been declined in 2012.

The European Union suspended trade in live, wild-sourced *K. homeana* from Gabon from 18/02/2005 until 10/05/2006.

Management: *K. homeana* is not included in the list of fully or partially protected species under Decree No 189 of 1987 (Gabon, 1987) and the CITES MA of Gabon (*in litt.* to UNEP-WCMC, 2013) confirmed that the species is not protected under Gabonese legislation. However, the exploitation of native species in Gabon is subject to authorisation from the relevant authorities (*in litt.* to UNEP-WCMC, 2013).

Bonin *et al.* (2006) noted that the species was found in some of the National Parks of Gabon, and according to the CITES MA of Gabon (*in litt.* to UNEP-WCMC, 2013), it occurs in the Birougou and Monts de Cristal National Parks.

TOGO

Distribution in range State: Pritchard (1967; 1979a) and Luiselli *et al.* (2012) did not consider Togo as a range country, however the distribution map by Vetter (2011) indicates occurrence in the southern, coastal part of the country, and the distribution map by Iverson (1992) appears to indicate occurrence along the Ghanaian border. Maran (2009) observed the species in Kpele Ele (southwestern Togo) in 2002, and Gonwouo and Nsang (2005) recorded one individual in the Monte Mitra region of the Monte Alén National Park (central mainland) in 2005. Harris (2002) reported that suitable habitat was restricted to gallery forests and mountain areas around Badou and Kpalime, but did not record the species in field surveys conducted in 1999-2000.

Luiselli *et al.* (2006) estimated that in 1992, the potential range of the species covered 5600 km², but noted that the actual range was likely to be narrower.

Population trends and status: Based on interviews with local inhabitants conducted during 1999-2000, Harris (2002) reported that fewer of them recognised *K. homeana* than *K. belliana*, with even fewer recognizing *K. erosa*, which "probably reflects their relative abundance". Interviewees reported few sightings of *K. homeana*, indicating that it was rare, and they generally thought that the frequency of sighting of this species and other reptiles had decreased during the previous five years (Harris, 2002).

Threats: Habitat loss due to deforestation was regarded as the main threat in Togo (Harris, 2002), and suitable forest habitat was considered to be rare and decreasing (Harwood, 2003).

The species was also reported to be hunted for food and traditional medicine, traded locally and "routinely collected if encountered" (Harris, 2002). Capture for international trade was

regarded as an additional threat (Harris, 2002). In the 1993 CITES Review for Significant Trade, trade from Togo was thought to potentially have adverse effects on populations (WCMC *et al.*, 1993).

Trade: CITES annual reports have not yet been received from Togo for the years 2006 or 2012. Togo published export quotas for 500 wild-sourced and 2000 ranched *K. homeana* every year from 1997 onwards (Table 3). The quota for wild-sourced specimens appears to have been exceeded in 2002-2005 according to data reported by countries of import; trade in ranched specimens remained within the quota every year according to data reported both by countries of import and by countries of export.

Table 3. CITES export quotas for wild-sourced and ranched *Kinixys homeana* from Togo and global direct exports, as reported by countries of import and of export, 2002-2013. (Annual reports have not yet been received from Togo for 2006 or 2012; trade data for 2012-2013 are not yet available.) (All trade was in live specimens with the exception of 50 wild-sourced carapaces reported by the country of export in 2002.)

	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (wild-sourced)		500	500	500	500	500	500	500	500	500	500	500	500
Quota (ranched)		2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
wild-sourced	Importer	1876	878	706	717	308	111	52	160	266	40		
	Exporter	75	83							250			
ranched	Importer	1532	1344	902	1245	1040	1524	1014	665	549	632		
	Exporter	1447	1888	1971	1789		1577	1127	1225	1115	705		

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct exports of *K. homeana* from Togo 2002-2012 consisted of live specimens and carapaces traded for commercial purposes, the majority of which were ranched with a significant proportion wild-sourced (Table 4). Countries of import reported considerably higher numbers of wild-sourced individuals than Togo; Togo reported trade in wild-sourced specimens only in 2002-2003 and 2010. Imports of both ranched and wild-sourced animals decreased over the period 2002-2011 overall. The principal country of import of both ranched and wild-sourced specimens was the United States, with Italy, France and Ghana also importing notable quantities of ranched specimens.

Indirect exports of *K. homeana* originating in Togo 2002-2012 consisted of live individuals, the majority of which were ranched or wild-sourced and traded for commercial purposes.

Table 4. Direct exports of *Kinixys homeana* from Togo, 2002-2011. All trade was for commercial purposes. (No annual report has been received from Togo for 2006.)

Term	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	W	Importer	1876	878	706	717	308	111	52	160	266	40	5114
		Exporter	25	83							250		358
	R	Importer	1532	1344	902	1245	1040	1524	1014	665	549	632	10447
		Exporter	1447	1888	1971	1789		1577	1127	1225	1115	705	12844
carapace	W	Importer											
		Exporter	50										50

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Most hunting was reported to take place during the dry season, when the species is more easily detected; this overlaps with the time when females are gravid, which may potentially have significant impacts on local populations (Harris, 2002). Surveys of local markets revealed one to two specimens for sale on each of 13 out of 26 surveyed market stalls (Harris, 2002). In 1999, reptile exporters were reported to buy *K. homeana* from local hunters for FF 1.5-2.5 (USD 0.3-0.5) and sell them to foreign traders for USD 4-6; the mean value of specimens sold online was USD 28 (Harris, 2002).

Harris (2002) noted that illegal exports of *Kinixys* spp. were often seized in Togo.

The European Union suspended trade in wild-sourced and ranched *K. homeana* from Togo in 2005; from 2006 onwards, the suspension for ranched *K. homeana* applied only to specimens with a snout-vent length of greater than 8 cm, and from 2012 onwards to specimens with a straight carapace length greater than 8 cm. Both suspensions remain in place under Commission Regulation (EC) No. 578/2013 of 17 June 2013.

Management: *K. homeana* does not appear to be protected under Togolese legislation (Togo, 1990; 2009).

Based on visits during 1999-2000, Harris (2002) reported that approximately 2537 females of *Kinixys* spp. were being kept in one of the breeding facilities and that approximately 90 per cent of juvenile tortoises produced were being released, although it was not known whether they were being released into suitable habitat. Harwood (2003) visited the country in 2002, reporting that four out of six authorised farms were exporting live reptiles from Togo. These farms, situated close to the capital Lomé, were reported to operate mainly as ranching systems (Harwood, 2003). Ineich (2006) conducted visits to Togolese farms in 2004, and noted that by his second visit in 2006, many of the recommendations regarding improving breeding conditions, had been implemented.

Luiselli *et al.* (2006) raised concern over the high levels of exports of *K. homeana* from Togo, and recommended strict regulation of trade in wild-sourced specimens. He noted that it was "often unclear how these specimens are obtained because tortoise farms are very underdeveloped" (Luiselli *et al.*, 2006). The species was reported to be captured by local hunters and sold to reptile farms, however it was considered difficult to find and was therefore sometimes bought from farms and villages where it was being held in captivity for medicinal or religious purposes (Harris, 2002).

In the quota system for ranched species from Togo, the total quota was reported to be calculated based on information on stock levels from farms (Harwood, 2003). These figures represented production estimates which were collected from each farm at the beginning of each year, subject to revision following requests from individual farms (Harwood, 2003). Some capture from the wild for breeding purposes was reported to be allowed when authorised by licenses, with releases of ranched specimens to the wild being carried out under supervision from relevant authorities (however, no exact figures of the releases were being recorded) (Harwood, 2003).

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

Seizures of illegal exports of *Kinixys* spp. were reported in Togo.

CITES annual reports have not yet been received from Benin for 2003 or 2006, Togo for 2006, Côte d'Ivoire for 2006 or 2010, DR Congo for 2010 or 2011 or Gabon for 2006 or 2011.

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Hippocampus algiricus (Kaup, 1856): Guinea, Senegal

Syngnathidae, West African Seahorse

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Hippocampus algiricus* (all range States) in the Review of Significant Trade as a priority species, following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *H. algiricus* was identified as a species that showed a sharp increase in trade in 2009 (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, no responses had been received (AC26 Doc. 12.3). Algeria, Angola, Benin, Côte d'Ivoire, Gambia, Ghana, Guinea, Liberia, Nigeria, Sao Tome and Principe, Senegal and Sierra Leone were retained in the process (AC26 Summary Record). Following the 26th meeting of the AC Algeria, Angola, Benin, Côte d'Ivoire, Gambia, Ghana, Liberia, Nigeria, Sao Tome and Principe and Sierra Leone were removed from the process, on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Hippocampus algiricus* recommendations.

		General summary
		Unknown population status. Categorised as Vulnerable in the IUCN Red List due to suspected population decline. Concerns were raised over the appropriateness of the size limit recommended by the Animals Committee.
Range State	**Provisional category**	**Summary**
Guinea	Urgent Concern	High levels of trade 2004-2012 in wild bodies. Unknown status in Guinea. Specimens in trade primarily sourced from bycatch and the scientific basis for a non-detriment finding is unclear. Therefore categorised as Urgent Concern.
Senegal	Urgent Concern	Relatively high levels of trade 2004-2012 mainly in wild bodies. Unknown population status, but population declines and a reduction in size of specimens caught observed. Specimens in trade primarily sourced from bycatch and the scientific basis for non-detriment findings is unclear. Therefore, categorised as Urgent Concern.

B. Species overview

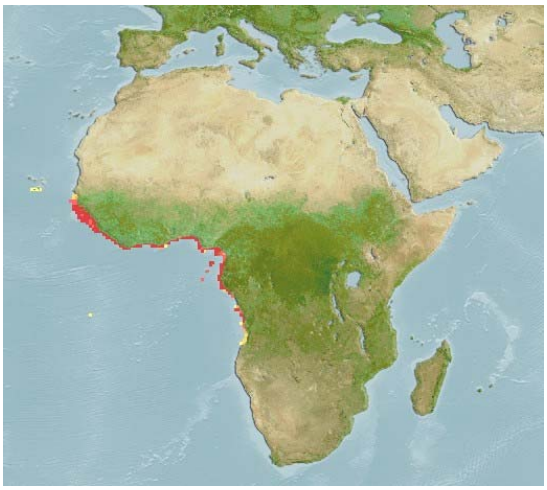
Taxonomic note: Several taxonomic revisions of the genus *Hippocampus* have taken place (Lourie *et al.*, 1999). Scales (2010) pointed out the difficulty of identifying and classifying species of *Hippocampus* as well as the lack of research in *Hippocampus* taxonomy. All non-spiny *Hippocampus* were formerly traded as *H. kuda,* and genetic research indicates that *H. algiricus* is closely related to both *H. kuda* and *H. reidi* (Lourie *et al.*, 2004).

Biology: *H. algiricus* occurs in shallow waters of less than 25 m depth (Wirtz *et al.*, 2007), often associated with sea grass beds and soft bottom habitats (West, 2012). *H. algiricus* is a relatively large species with a maximum recorded adult height of 19 cm; the biology and life history of the species is poorly known (Lourie *et al.*, 2004).

Hippocampus spp. populations have an equal sex ratio (Lourie *et al.*, 1999) and animals are monogamous within a breeding cycle (Foster and Vincent, 2004). The reproductive rate of *Hippocampus* spp. is considered to be limited due to the combination of small brood sizes and lengthy parental care (Lourie *et al.*, 1999).

Hippocampus spp. have small home ranges, low mobility and low natural adult mortality (Vincent, 1996). They were generally thought to live between 1-5 years (Vincent and Koldewey, 2006), but data on survival rates and other life history parameters was considered limited (Foster and Vincent, 2004).

General distribution and status: *H. algiricus* inhabits the coastal waters off West Africa, from Senegal to Angola (Afonso *et al.*, 1999; Lourie *et al.*, 2004; Mamonekene *et al.*, 2006) (Figure 12), but data on the distribution of the species was considered insufficient (Lourie *et al.*, 2004).



Information about the species was considered inadequate, as it was primarily known from museum specimens (Wirtz *et al.*, 2007). *H. algiricus* was classified as Data Deficient in the IUCN Red List in 2002, but the classification was changed to Vulnerable in 2012 due to a suspected decline in the population (Czembor *et al.*, 2012).

Threats: Direct exploitation, by-catch and habitat destruction were considered to be major threats to *Hippocampus* species in general (Vincent, 1996). The majority of *Hippocampus* spp. were reported to be caught as by-catch during shrimp trawls (Aish *et al.*, 2003; McPherson and Vincent, 2004; Giles *et al.*, 2006; Perry *et al.*, 2010). Pressure on particular populations or species targeted for the live aquarium trade was considered substantial (Hunt and Vincent, 2006; Vincent *et al.*, 2011a).

The biological characteristics of *Hippocampus* spp. were considered likely to render them vulnerable to over-fishing and unsuitable for intense harvesting (Vincent, 1996; Foster and Vincent, 2004). These characteristics were also thought to explain the substantial declines in *Hippocampus* populations observed by fishermen and traders worldwide (Vincent, 1996; Vincent *et al.*, 2011a). However, Curtis *et al.* (2007) found that demersal fishing may not reduce numbers of all *Hippocampus* species and Martin-Smith and Vincent (2005) also observed fisheries-independent declines. However, Vincent (1996) pointed out that the artisanal collection and by-catch of *Hippocampus* was unsustainable, as collectors will continue harvesting *Hippocampus* spp. even when populations decrease to critically low levels.

Overview of trade and management: *H. algiricus* was listed in CITES Appendix II on 15/05/2004.

In 2004, a voluntary minimum height limit of 10 cm for international trade in wild *Hippocampus* specimens was recommended by the Animals Committee at its 20th meeting (CITES Notification 2004/033; CITES Notification 2005/014). Concerns were raised that this size limit would not sufficiently protect *H. algiricus* from overexploitation due to the height at maturity exceeding 10 cm (Foster and Vincent, 2005) and the shrinkage in size of dried specimens of *Hippocampus* spp. (Nadeau *et al.*, 2009). Curtis and Vincent (2008)

recommended a precautionary minimum size limit of 14 cm, pending socioeconomic and management evaluation. No export or re-export permits are required for up to four dead specimens of *Hippocampus* spp. per person for personal or household effects, as per CITES Resolution Conf. 13.7 (Rev. CoP 16).

Evanson *et al.* (2011) noted that trade in the species had increased "approximately two to three-fold" since 2004 and estimated the number of individuals traded between 2004 and 2008 to be around 4.1 million. The largest source of *H. algiricus* in international trade was reported to be by-catch from shrimp-harvesting by trawlers (Evanson *et al.*, 2011), with the majority of *H. algiricus* entering trade destined for the Asian market, primarily as dried specimens used in traditional medicine, but also as tonic foods and curios (Vincent *et al.*, 2011b). Traditional (Chinese) medicine was estimated to consume 95 per cent of *Hippocampus* spp. in trade (Vincent *et al.*, 2011a), with some specimens also traded as curios (dried) and live for aquarium and hobbyist use (Lourie *et al.*, 2004). Vincent (1996) considered the growing trade in *Hippocampus* spp. to be potentially unsustainable, and Evanson *et al.* (2011) were particularly concerned about the pressure that the emerging trade would have on *H. algiricus* populations.

Koldewey and Martin-Smith (2010) reported that demand for *Hippocampus* spp. could not yet be met through aquaculture and that the majority of aquaculture facilities surveyed were reported to supply the live aquarium trade only.

The identification of individual species of *Hippocampus* in international trade was considered problematic, since fishers and traders seldom identify *Hippocampus* to the species level (Vincent *et al.*, 2011b). Furthermore, information on trade in *Hippocampus* from African countries was found to be insufficient (Vincent *et al.*, 2011b).

A clear understanding of the life history and ecology was considered essential for the management of *Hippocampus* spp. (Curtis *et al.*, 2007), with robust monitoring required to assess conservation actions (Martin-Smith and Vincent, 2005). Thornhill (2012) noted the difficulty of making non-detriment findings for *Hippocampus* spp. due to the lack of data on population biology.

C. Country reviews

GUINEA

Distribution in range State: The occurrence of *H. algiricus* in Guinea was reported by Lourie *et al.* (1999; 2004), but the range within the country is unknown to date (Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Little was considered to be known about the species in the wild in Guinea, but it was thought to be a habitat generalist, occurring on both soft and hard substrates as well as seaweed and sea grass (Project Seahorse, unpublished data, in: Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Population trends and status: West (2012) found *H. algiricus* to be the most abundant species of *Hippocampus* off the coast of Guinea, but highlighted a lack of research and information. No further local status information was available (Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Threats: Bycatch by the artisanal fishing fleet was considered to be the main threat to the species in Guinea (Project Seahorse, unpublished data, in: Project Seahorse, *in litt.* to UNEP-WCMC, 2013). The increasing fishing pressure off the coast of Guinea, combined with the degradation of the marine coastal environment, were considered to be potential threats to *H. algiricus* (Vincent *et al.*, 2011b).

Trade: Evanson *et al.* (2011) considered the country to be the main country of export of seahorses in Africa. Preliminary trade surveys carried out in 2012 in Guinea showed that all seahorses were sourced from bycatch and were destined for the Asian market; further analysis of data was however noted to be required and the number of interviews carried out for this study was considered to be small (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). *H. algiricus* was the seahorse species most often encountered in trade in the country, with small numbers of *H. hippocampus* also recorded (Project Seahorse, unpublished data, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013) and Guinea was thought to be one of the major African exporters of *H. algiricus* (Vincent *et al.*, 2011b).

CITES annual reports have not yet been received from Guinea for the years 2007, 2009, 2011 or 2012. Guinea has not published any export quotas for *H. algiricus*. According to data in the CITES Trade Database, direct exports of *H. algiricus* from Guinea 2004-2012 comprised wild-sourced bodies and live individuals traded for commercial purposes (Table 1). No trade was reported 2010-2012. The only importers were Hong Kong SAR and the People's Republic of China (hereafter referred to as China).

Indirect exports of *H. algiricus* originating in Guinea consisted of wild-sourced bodies imported by Canada for commercial purposes in 2005 (25 kg reported by Guinea, 55 kg reported by the importer).

Small quantities of trade in *Hippocampus* spp. from Guinea were reported at the genus level 2004-2011, consisting of wild-sourced bodies exported directly from Guinea for commercial purposes in 2007 (160 kg, reported by the country of import only) and 2008 (23 kg, reported by Guinea only).

Table 1. Direct exports of *Hippocampus algiricus* from Guinea, 2004-2009 (no trade was reported in 2010-2012; annual reports have not been received from Guinea for 2007, 2009, 2011 or 2012). All trade was wild-sourced and for commercial purposes. The species was listed in Appendix II on 15/05/2004. (Quantities rounded to one decimal place, where applicable.)

Term	Units	Reported by	2004	2005	2006	2007	2008	2009	Total
bodies	kg	Importer	1009.4	1107.3	1030	683.8	1073	844	5747.5
		Exporter	822	1508.8					2330.8
live	kg	Importer							
		Exporter	425						425

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

CITES trade from Guinea was predominantly in *H. algiricus*, with some trade at genus level; trade records reported in kilograms between 2004 and 2008 were converted to number of individuals, using a mean global dry weight of 2.69g per seahorse, which resulted in an annual trade of 300 000–860 000 individuals (Evanson *et al*., 2011). However, this was thought to under-estimate the weight of West African seahorses (West, 2012; Project Seahorse, unpublished data, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Non-CITES Census and Statistics data records from Hong Kong SAR from 1998 to 2010 were reported to list mean annual imports of approximately 157 000 (±160 000) seahorses [~448.6 kg, based on 350 seahorses/kg] from Guinea at genus level (Hong Kong CSD, undated, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). Although these data were noted to closely reflect the imports by Hong Kong SAR recorded within the CITES Trade Database for overlapping years, trade of 62 000 individuals [~177 kg] in 2010 was not found to be reflected in the CITES data (Hong Kong CSD, undated, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). These trade data were reported to record trade in weight, with conversions applied on the basis of one kilogram of dry trade representing approximately 350 seahorses (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Management: *H. algiricus* does not appear to be specifically protected by Guinean law (Guinea, 1999) and no local regulations were known (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). West (2012) found no evidence that trade in *Hippocampus* was being regulated

in Guinea, but since the major threat to the species seemed to be by-catch, the author pointed out that trade regulations alone would not suffice to ensure the protection of the species.

A lack of marine protected areas in Guinea was noted, resulting in insufficient protection of *Hippocampus* and other fishes (Brugiere and Kormos, 2008). The Guinean Fisheries Code from 1995 prohibits the use of explosives and toxins for fishing (Guinea, 1995). The Regulations on Artisanal Fishing further prohibits the use of purse- and beach seines (Guinea, 2006).

SENEGAL

Distribution in range State: The occurrence of *H. algiricus* in Senegal was reported by Lourie *et al.* (2004). The species was reported to occur along the entire coast of the country (West, 2012).

Little was reported to be known about this species in the wild, but it was thought to be a habitat generalist, inhabiting areas with sea grasses and macro algae (West, 2012). It was found on both soft and hard substrates (West, 2012), and it appeared to prefer habitats sheltered from strong wave action (Project Seahorse, unpublished data, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Population trends and status: *H. algiricus* was found to be the most abundant species of *Hippocampus* off the coast of Senegal, although a lack of research and information available was noted (West, 2012). The species may be more abundant south of Dakar than north, based on catch data (West, 2012).

However, fishers interviewed in 2012 reported a decrease in the size and abundance of *Hippocampus* species caught (West, 2012). Based on such observations, combined with the "significant catch and trade of seahorses and general over-fishing in the country", Project Seahorse suspected a decline in populations locally (Project Seahorse, unpublished data, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). No further local status information was available (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Threats: West (2012) considered illegal, unreported and unregulated (IUU) fishing in Senegal to be the main threat to *H. algiricus,* with actual catches thought to be 40 per cent higher than estimated. Fishers regularly reported declines in the number of *Hippocampus* spp. caught, as well as a reduction in size, which, together with a bias towards males in by-catch, was considered a potential sign of over-fishing (West, 2012).

Trade: Senegal was considered to be one of the major countries of export of *H. algiricus* in Africa (Vincent *et al.*, 2011b), and Evanson *et al.* (2011) listed Senegal as the second largest country of export after Guinea. Local trade and consumption of seahorses was considered minimal, with the majority of the catch being sold from fishers to intermediate buyers and then on to local exporters who ship the seahorses to mainland China, Hong Kong SAR and Taiwan, Province of China (West, 2012).

Most of the specimens of *H. algiricus* exported from Senegal were found to originate from artisanal fisheries (West, 2012). Approximately 1.1 million seahorses were estimated to be landed annually in Senegal, based on trade surveys conducted in 2012; however, as by-catch by large commercial vessels was thought to be significantly underestimated, real landings were believed to be much higher (Project Seahorse, unpublished data, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). Furthermore, considerable discrepancies between observed and reported trade volumes of *H. algiricus* in Senegal were identified (West, 2012), and seahorse landings were noted to be significantly higher than the volumes reported in CITES trade (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

CITES annual reports have not yet been received from Senegal for 2011 or 2012. Senegal has not published any export quotas for *H. algiricus*. According to data in the CITES Trade Database, direct exports of *H. algiricus* from Senegal 2004-2012 principally consisted of wild-

sourced bodies and skeletons traded for commercial purposes (Table 2). Senegal also reported exports of live individuals (20) and specimens (45) not reported by the importers. Hong Kong SAR and China were the principal importers.

Indirect exports of *H. algiricus* originating in Senegal 2004-2012 comprised 55 kg of wild-sourced bodies exported to Canada for commercial purposes in 2005, reported by the country of re-export only.

In addition, the import of 30 live *Hippocampus* directly from Senegal was reported at the genus level by countries of import in 2003 (source and purpose not specified).

Table 2. Direct exports of *Hippocampus algiricus* from Senegal, 2004-2011 (annual reports have not yet been received from Senegal for 2011 or 2012; no trade was reported in 2012). All trade was wild-sourced. The species was listed in Appendix II on 15/05/2004. (Quantities rounded to one decimal place, where applicable.)

Term	Units	Purpose	Reported by	2004	2005	2006	2007	2008	2009	2010	2011	Total
bodies	kg	T	Importer	480.5	552.8	314.8	673	328	20	36	200	2605.1
			Exporter	520.5		358.8	464	506				1849.3
live	-	Q	Importer									
			Exporter				20					20
skeletons	-	T	Importer									
			Exporter						60	1354		1414
specimens	-	S	Importer									
			Exporter	45								45

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

While all exports of seahorse species from Senegal were recorded within the CITES Trade Database as either *Hippocampus* spp. or *Hippocampus algiricus*, under closer scrutiny of specimens recorded as *H. algiricus* to verify species identity, two species were found to be traded: *H. algiricus* and *H. hippocampus* (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). In fact, the latter species was estimated to represent up to 30 per cent of individuals in trade in Senegal locally (Project Seahorse, unpublished data, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). This highlights the difficulties in accurate data collection due to challenges in identification.

An assessment of CITES trade data reported in kilograms was estimated to represent an annual mean of approximately 235 000 individuals (±149 000 individuals) from 2004 to 2011 (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). Evanson *et al.* (2011) estimated an annual trade of 200 000–310 000 individuals between 2004 and 2008, based on a conversion factor of 2.69 g/seahorse.

Non-CITES Census and Statistics data records from Hong Kong SAR from 1998 to 2010 was reported to list mean annual imports of approximately 120 000 seahorses (±103 000) from Senegal at genus level (Hong Kong CSD, undated, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). Trade recorded in 2007 and 2008 was noted to be significantly lower than trade volumes reported to CITES (100 000 and 13 000, as opposed to 250 000 and 122 000) (Hong Kong CSD, undated, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). These trade data were reported to record trade in weight, with conversions applied on the basis of one kilogram of dry trade representing approximately 350 seahorses (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Management: *H. algiricus* does not appear to be specifically protected by Senegalese law (Senegal, 1986) and no local regulations were known (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). West (2012) found no evidence of regulation or management of trade in *Hippocampus* spp. in Senegal, and the size limit of 10 cm recommended by the Animals Committee seemed to be unknown or ignored in the country. The author also concluded that since the major threat to the species seemed to be by-catch, trade regulations alone would not be sufficient to ensure the protection of the species (West, 2012). However, an increase in the adoption of appropriate mesh sizes in order to reduce by-catch was observed

(West, 2012). The Fishing Code of Senegal prohibits the use of explosives or toxins for fishing (Senegal, 1998).

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

CITES annual reports have not yet been received from Guinea for 2007, 2009 and 2011 or from Senegal for 2011.

By-catch was reported as a main threat and IUU fishing was reported to be occurring in Senegal.

The difficulty of identifying *Hippocampus* at species level was considered problematic for the monitoring of trade in specific species.

Trade in *Hippocampus* spp. has been reported at the genus level, making the monitoring of trade in individual species difficult. Furthermore, the mixed reporting of units (number of specimens and weight) makes it difficult to estimate the total number of specimens in international trade.

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Hippocampus barbouri (Jordan & Richardson, 1908): Philippines

Syngnathidae, Barbour's Seahorse

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Hippocampus barbouri* (all range States) in the Review of Significant Trade as a priority species, following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *H. barbouri* was identified as a species that met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009 (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from Indonesia and Malaysia (AC26 Doc. 12.3). The Philippines were retained in the review (AC26 Summary Record).

A. Summary

Overview of *Hippocampus barbouri* recommendation.

Range State	Provisional category	Summary
Philippines	Least Concern	Virtually no international trade reported 2004-2012. Restricted distribution and status poorly known. Catch and trade of seahorses banned since 2004. Therefore, categorised as Least Concern.

B. Species overview

Taxonomic note: Several taxonomic revisions of the genus *Hippocampus* have taken place, including revisions to *H. barbouri* (Lourie *et al.*, 1999, 2004). All non-spiny *Hippocampus* specimens used to be traded under the name *H. kuda*, prior to the isolation of *H. barbouri*, *H. borboniensis, H. comes, H. fisheri, H. fuscus* and *H. kelloggi* as distinct species (Lourie *et al.*, 2004). Lourie *et al.* (2004) noted that *H. barbouri* probably included several distinct forms and that it was often mistaken for *H. histrix*. Wiswedel (2012) considered *H. aimei* to be a synonym of *H. barbouri*. Scales (2010) pointed out the difficulty of identifying and classifying species of *Hippocampus* as well as the lack of research into *Hippocampus* taxonomy.

Biology: *H. barbouri* occurs in areas with shallow seagrass beds (Lourie *et al.*, 2004) in depths of up to 10 m (Kuiter, 2000) and is often seen clinging to hard corals (Lourie *et al.*, 2004).

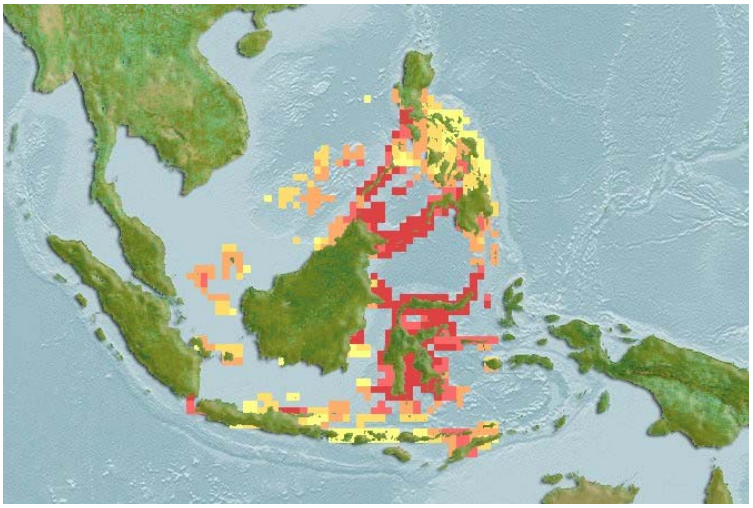
The maximum recorded adult height of *H. barbouri* is 15 cm, while the height at first maturity has been recorded as 8 cm (Lourie *et al.*, 2004).

Additional information on the biology of *Hippocampus* spp. is available in the Biology section of *Hippocampus algiricus*.

C. Country review

PHILIPPINES

Distribution in range State: Data on the population status of *H. barbouri* were considered to be extremely limited (Wiswedel, 2012), with the species being found only in the waters of Indonesia, Malaysia and the Philippines (see Figure 13) (Lourie *et al.*, 2004) and dispersal among populations reportedly being highly restricted (Scales, 2010).



The occurrence of *H. barbouri* in the Philippines was confirmed by Lourie *et al.* (2004) and the species was reported from the Palawan and Sulu Archipelagos (Lourie *et al.*, 2005).

Population trends and status: *H. barbouri* was categorised as Vulnerable in the IUCN Red List and populations were believed to be declining throughout its range due to extensive trade, mortality through by-catch and habitat degradation (Wiswedel, 2012).

Substantial declines in *Hippocampus* spp. were reported by fishers in the Philippines between 1970 and 2003 (O'Donnell *et al.*, 2010), and Martin-Smith *et al.* (2004) and Vincent *et al.* (2007) concluded that *Hippocampus* spp. were affected by overfishing in the Philippines. No further local status information was available (Project Seahorse, *in litt.* to UNEP-WCMC, 2013) and no species-specific information on trends for *H. barbouri* in the Philippines was located.

Threats: Direct exploitation, by-catch and habitat destruction were considered to be major threats to *Hippocampus* spp. (Vincent, 1996). By-catch of seahorses was found to be widespread, primarily in shrimp trawling (Aish *et al.*, 2003). Pressures on particular seahorse populations used for the live aquarium trade were considered substantial (Hunt and Vincent, 2006; Vincent *et al.*, 2011a).

The biological characteristics of *Hippocampus* spp. were considered likely to render them vulnerable to over-fishing and unsuitable for intense harvesting (Vincent, 1996; Foster and Vincent, 2004; Scales, 2010). These characteristics, combined with fishing pressure, were thought to explain the substantial declines in *Hippocampus* populations observed by fishermen and traders worldwide (Vincent, 1996), although Curtis *et al.* (2007) found that demersal fishing may not reduce numbers in all *Hippocampus* species and Martin-Smith and Vincent (2005) also observed fisheries-independent declines. According to Vincent (1996), the level of *Hippocampus* collection in artisanal fisheries and as by-catch is unsustainable, due to the fact that collectors continue harvesting *Hippocampus* spp. even when populations decrease to critically low levels.

Scales (2010) considered the highly restricted dispersal among populations of *H. barbouri* to be a potential threat to the survival of the species.

Severe historic declines in seahorse catches led to conservation concerns over *Hippocampus* species in the Philippines (e.g. see Martin-Smith *et al.*, 2004; Vincent *et al.*, 2007; O'Donnell *et al.*, 2010). *Hippocampus* spp. were considered to be vulnerable due to trade for traditional medicine, curios and aquaria (Vincent, 1996), with annual *Hippocampus* spp. by-catch in the Philippines estimated at between two and six million specimens (Vincent *et al.*, 2011). Specimens were also reported to be targeted directly by divers (Martin-Smith *et al.*, 2004; Vincent *et al.*, 2007) and habitat destruction was considered a threat (Vincent, 1996; Marcus *et al.*, 2007; Short *et al.*, 2011). The species' key habitat, seagrass beds, was estimated to have declined by 30-50 per cent in the Philippines (UNEP, 2004) and

Castro *et al.* (2006) reported that the increase in human activity in coastal areas was threatening marine fauna and flora.

Trade: Traditional medicine was estimated to consume 95 per cent of *Hippocampus* spp. in trade (Vincent *et al.*, 2011a), with some specimens also traded as curios (dried) and live for aquarium and hobbyist use (Lourie *et al.*, 2004). The identification of individual species of *Hippocampus* in international trade was considered problematic, since fishers and traders seldom identify *Hippocampus* to the species level (Vincent *et al.*, 2011b).

Most *H. barbouri* in trade were reported to be caught in artisanal fisheries (Roe, 2008; O'Donnell *et al.*, 2010). Three areas (Palawan (including Busuanga), the central Visayas (including Bohol, Cebu and Negros) and Mindanao (including Sulu and Tawi Tawi in the southern Philippines)), were reported to have been the main sources of specimens (Vincent, 1996).

CITES annual reports have not yet been received from the Philippines for the years 2008 or 2010-2012. The Philippines has not published any export quotas for *H. barbouri*. According to data in the CITES Trade Database, no direct or indirect trade in *H. barbouri* from the Philippines was reported 2004-2012, with the exception of 30 seized/confiscated bodies imported by the United Kingdom directly from the Philippines in 2003. However, notable quantities of trade in *Hippocampus* from the Philippines were reported at the genus level by countries of import, primarily comprising bodies reported without a source specified and wild-sourced, live specimens traded 2002-2005 (Table 1). The vast majority of the bodies were imported by Italy; the principal countries of import of live specimens were the Netherlands and Germany.

Table 1. Direct imports of *Hippocampus* reported at the genus level as *Hippocampus* spp. from the Philippines, 2002-2011 (no trade was reported in 2006-2009 or 2012). All trade was reported by the countries of import; no exports were recorded by the Philippines (annual reports have not yet been received from the Philippines for the years 2008 or 2010-2012). The species was listed in Appendix II on 15/05/2004. No direct or indirect trade in *H. barbouri* from the Philippines was reported at the species level 2004-2012.

Term	Units	Source	Purpose	2002	2003	2004	2005	2010	2011	Total
bodies	kg	U	T		16					16
	-	I	T				761			761
		-	-	3340	14000					17340
derivatives	-	I	P					4		4
live	kg	U	T			11				11
	-	W	T	348	386	141				875
		-	-	32	25	52				109
specimens	-	W	S						37	37

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Prior to the listing of *Hippocampus* spp. in CITES Appendix II, the Philippines was considered a major country of export of seahorses (Wabnitz *et al.*, 2003; Evanson *et al.*, 2011; Project Seahorse *in litt.* to UNEP-WCMC, 2011) and exports of notable quantities of *Hippocampus* spp. were reported. Vincent (1996) estimated annual exports between 1993 and 1995 of dried *Hippocampus* spp. from the Philippines at 3.5-11 tonnes (~1.5-4.7 million specimens) and those of live specimens at more than 0.5 million individuals. Evanson *et al.* (2011), using a conversion factor of 3.33 g/seahorse, estimated volumes of dried specimens exported annually from the Philippines between 1998 and 2001 to represent 245 000-365 000 individuals (based on trade survey data), dropping to approximately 38 000 individuals in 2004-2005 together (based on CITES data).

Management: *H. barbouri* was listed in CITES Appendix II on 15/05/2004.

In 2004, a voluntary minimum height limit of 10 cm for international trade in wild *Hippocampus* specimens was recommended by the Animals Committee at its 20th meeting (CITES Notification 2004/033; CITES Notification 2005/014). Concerns were raised that this would not sufficiently protect all *Hippocampus* spp. from overexploitation due to the height at maturity for several species being more than 10 cm (Foster and Vincent, 2005) and the shrinkage in size of dried specimens (Nadeau *et al.*, 2009). Curtis and Vincent (2008) recommended a precautionary minimum size limit of 14 cm, pending socioeconomic and management evaluation. No export or re-export permits are required for up to four dead specimens of *Hippocampus* spp. per person for personal or household effects, as per CITES Resolution Conf. 13.7 (Rev. CoP 16).

Fishing, taking and trade of any species included in the CITES Appendices is prohibited in the Philippines, as per Section 97 of the Fisheries Code (Philippines, 1998), and the catch and trade of seahorses was prohibited in 2004 (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). However, illegal collection of aquarium specimens (Marine Aquarium Council, 2006) and fishing were reported to continue due to lack of enforcement and alternative sources of income (O'Donnell *et al.*, 2010) and the trade restriction was found to be ignored by a substantial number of fishermen that were trading *Hippocampus* spp. nevertheless (Gonzales and Savaris, 2005).

Section 88 of the Fisheries Code prohibits the use of explosives, electricity and poisons for fishing (Philippines, 1998). However, both dynamite (Marcus *et al.*, 2007) and cyanide were found to be used illegally (CCIF, 2001).

In 2011, the CITES Management Authority of the Philippines confirmed that no species-specific monitoring was being conducted (E. Alesna, pers. comm. to UNEP-WCMC, 2011). The prohibition of harvest and trade in seahorses in 2004 was reported to have made it more difficult for local scientists to obtain data on seahorses, apart from *H. comes*, for which there is a long term monitoring project in the central Philippines (Angelie Nellas, Project Seahorse Foundation *in. litt.* to Project Seahorse, *in litt.* to UNEP-WCMC, 2013). Furthermore, the Marine Aquarium Council has initiated a certification scheme in the Philippines, the Marine Aquarium Management Transformation Initiative (MAMTI), to control and monitor the trade in aquarium specimens (Roe, 2008). A clear understanding of the life history and ecology was considered essential for the management of *Hippocampus* species (Curtis *et al.*, 2007), with robust monitoring required to assess conservation actions (Martin-Smith and Vincent, 2005). Thornhill (2012) noted the difficulty of making non-detriment findings for *Hippocampus* spp. due to the lack of data on population biology.

A facility established in Handumon, central Philippines, was reported to be breeding *Hippocampus* spp. in captivity (Vincent, 1996), but Koldewey and Martin-Smith (2010) reported that demand for *Hippocampus* spp. could not yet be met through aquaculture, although they considered *H. barbouri* suitable for aquaculture. The majority of aquaculture facilities surveyed globally were reported to supply specimens only to the live aquarium trade (Koldewey and Martin-Smith, 2010).

Several Marine Protected Areas in the Philippines were considered to contribute to the protection of *Hippocampus* spp. (Haggan *et al.*, 2002; Martin-Smith *et al.*, 2004; Samoilys *et al.*, 2007; Roe, 2008).

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

No CITES annual reports received from the Philippines for 2008, 2010 and 2011.

By-catch was reported as a main threat and illegal trade was reported to be occurring.

The difficulty of identifying *Hippocampus* at species level was considered problematic for the monitoring of trade in specific species.

Trade in *Hippocampus* spp. has been reported at the genus level, making the monitoring of trade in individual species difficult. Furthermore, the mixed reporting of units (number of specimens and weight (kg)) makes it difficult to estimate the total number of specimens in international trade.

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Hippocampus histrix (Kaup, 1856): Egypt, Philippines, Viet Nam

Syngnathidae, Thorny Seahorse, Spiny Seahorse

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Hippocampus histrix* (all range States) in the Review of Significant Trade as a priority species, following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *H. histrix* was identified as a species that met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009 and showed a sharp increase in trade in 2009, compared with average trade levels for 2004-2008 (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from China, Egypt, Indonesia, Japan, Malaysia, Seychelles, Tonga, the United Republic of Tanzania and the United States of America (AC26 Doc. 12.3). Egypt, India, Mauritius, the Federated States of Micronesia (hereafter referred to as Micronesia), Mozambique, Papua New Guinea, the Philippines, Samoa, South Africa and Viet Nam were retained in the process (AC26 Summary Record). Following the 26th meeting of the AC, India, Mauritius, Micronesia, Mozambique, Papua New Guinea, Samoa and South Africa were removed from the process on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Hippocampus histrix* recommendations.

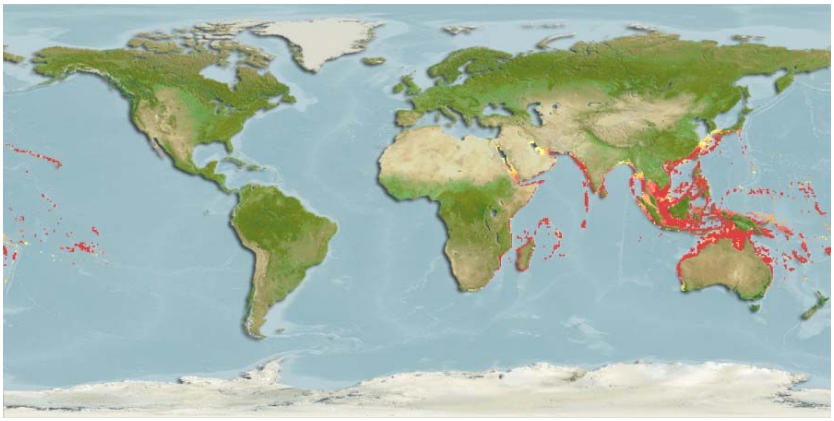
		General summary
		Widespread, but categorised as Vulnerable in the IUCN Red List on the basis of suspected population decline.
Range State	**Provisional category**	**Summary**
Egypt	Least Concern	No international trade reported 2004-2012. Contested occurrence in the country. On the basis of no trade, categorised as Least Concern.
Philippines	Least Concern	Very low levels of international trade reported since 2004. Restricted distribution and status poorly known. Catch and trade of seahorses banned since 2004. Therefore, categorised as Least Concern.
Viet Nam	Least Concern	No international trade reported 2004-2012, although relatively low levels of trade at genus level. Export of wild seahorses is prohibited until a non-detriment finding is conducted. Status of species unclear but low abundance inferred. On the basis of no trade, categorised as Least Concern.

B. Species overview

Taxonomic note: Several taxonomic revisions of the genus *Hippocampus* have taken place, including revisions to *H. histrix* (Lourie *et al.*, 1999b, 2004). The name *H. histrix* has been used for virtually any species of spiny *Hippocampus* occurring in the Indo-Pacific, and the species is sometimes confused with *H. angustus*, *H. barbouri*, *H. jayakari* and *H. spinosissimus* (Lourie *et al.*, 2004). Scales (2010) noted that *H. histrix* posed one of the greatest challenges in seahorse taxonomy.

Biology: *H. histrix* is found on different substrates, such as sponges, rocky reefs and soft corals, but mainly in seagrass habitats (Kuiter, 2000; Lourie *et al.*, 2004). The species mostly occupies depths between 6 and 20 m (Lourie *et al.*, 2004), but has also been found at greater depths (Kuiter, 2000). The maximum recorded adult height of the species is 17 cm (Lourie *et al.*, 2004).

Additional information on the biology of *Hippocampus* spp. is available in the Biology section of *Hippocampus algiricus.*



General distribution and status: The species' range (Figure 14) was believed to be one of the largest of any *Hippocampus* spp., occurring throughout the Indo-Pacific (Lourie *et al.*, 2004). *H. histrix* was categorised as Vulnerable in the IUCN Red List, on the basis of suspected population declines of over 30 per cent (Wiswedel, 2012).

Threats: Direct exploitation, by-catch and habitat destruction, especially of inshore seagrass beds (Short *et al.*, 2011), were considered to be major threats to *H. histrix* (Vincent, 1996; Wiswedel, 2012). Seahorse by-catch was found to be common, primarily in shrimp trawling (Aish *et al.*, 2003). Pressures on particular seahorse populations used for the live aquarium trade were considered substantial (Hunt and Vincent, 2006; Vincent *et al.*, 2011).

The biological characteristics of *Hippocampus* spp. were considered likely to render them vulnerable to over-fishing and unsuitable for intense harvesting (Vincent, 1996; Foster and Vincent, 2004; Scales, 2010). These characteristics, combined with fishing pressure, were also thought to explain the substantial declines in *Hippocampus* populations observed by fishermen and traders worldwide (Vincent, 1996). However, Curtis *et al.* (2007) found that demersal fishing may not reduce numbers in all *Hippocampus* species and Martin-Smith and Vincent (2005) also observed fisheries-independent declines. According to Vincent (1996), the level of *Hippocampus* collection in artisanal fisheries and as by-catch is unsustainable, due to the fact that collectors will continue harvesting *Hippocampus* spp. even when populations decrease to critically low levels.

Overview of trade and management: *H. histrix* was listed in CITES Appendix II on 15/05/2004.

In 2004, a voluntary minimum height limit of 10 cm for international trade in wild *Hippocampus* specimens was recommended by the Animals Committee at its 20th meeting (CITES Notification 2004/033; CITES Notification 2005/014). Concerns were raised that this would not sufficiently protect all *Hippocampus* spp. from overexploitation due to the height at maturity for several species being more than 10 cm (Foster and Vincent, 2005) and the shrinkage in size of dried specimens (Nadeau *et al.*, 2009). Curtis and Vincent (2008) recommended a precautionary minimum size limit of 14 cm, pending socioeconomic and management evaluation. No export or re-export permits are required for up to four dead specimens of *Hippocampus* spp. per person for personal or household effects, as per CITES Resolution Conf. 13.7 (Rev. CoP 16).

Traditional Chinese Medicine (TCM) was estimated to consume 95 per cent of *Hippocampus* spp. in trade (Vincent *et al.*, 2011), and Lee (2000) found *H. histrix* on offer in TCM-shops in the Republic of Korea. *Hippocampus* spp. are also traded as curios (dried) and live for

aquarium and hobbyist use, although *H. histrix* was not considered common in the aquarium trade (Lourie *et al.*, 2004).

A clear understanding of life history and ecology was considered essential for the management of *Hippocampus* spp. (Curtis *et al.*, 2007), with robust monitoring required to assess conservation actions (Martin-Smith and Vincent, 2005). Thornhill (2012) noted the difficulty of making non-detriment findings for *Hippocampus* spp. due to the lack of data on population biology.

Koldewey and Martin-Smith (2010) believed that demand for *Hippocampus* spp. could not yet be met through aquaculture.

C. Country reviews

EGYPT

Distribution in range State: No records of the species' occurrence in Egypt were located. However, the CITES Management Authority of Egypt (*in litt.* to UNEP-WCMC, 2013) confirmed the occurrence of *H. histrix* in the Red Sea, where it was reported to inhabit sea grass areas and to a lesser extent coral reefs.

Lourie *et al.* (2004) noted the resemblance of *H. histrix* to *H. jayakari*, another spiny seahorse, which can be found in Egyptian waters. Wiswedel (pers. comm. to UNEP-WCMC, 2013) considered the occurrence of *H. histrix* in the Red Sea unlikely and believed specimens reported as *H. histrix* most likely represented misidentified *H. jayakari*, although it was pointed out that this could not be confirmed without seeing the specimens concerned.

Population trends and status: The CITES MA of Egypt considered *H. histrix* to be the most common seahorse in the Red Sea; the species was reportedly abundant and not threatened with extinction, although information available on population status and trends was considered insufficient (CITES MA of Egypt, *in litt.* to UNEP-WCMC, 2013).

Threats: Illegal trade, manifest in confiscations of considerable amounts of seahorses in the last three years, was considered a possible threat to *Hippocampus* spp. (CITES MA of Egypt, *in litt.* to UNEP-WCMC, 2013).

Trade: CITES annual reports have not yet been received from Egypt for the years 2005, 2008, 2011 or 2012. Egypt has not published any export quotas for *H. histrix*. According to data in the CITES Trade Database, no direct or indirect trade in *H. histrix* originating in Egypt was reported 2002-2012. However, countries of import reported small quantities of trade in *Hippocampus* recorded at the genus level directly from Egypt in 2002 (40 live, wild-sourced specimens imported by the United Kingdom for commercial purposes) and 2004 (three seized/confiscated bodies imported by New Zealand).

The CITES MA of Egypt reported the confiscation of 189.5 kg of seahorses (species composition unknown) at Cairo Airport in 2013 (*in litt.* to UNEP-WCMC, 2013); a significant increase from 2011 and 2012 when 5.5 kg and 75.6 kg respectively, were confiscated (representing approximately 2000 and 28 000 individuals; calculated using 2.69 g/seahorse as a conversion factor, after Evanson *et al.* (2011)).

McPherson and Vincent (2011) considered the lack of information on trade in *Hippocampus* spp. from African countries problematic. *Hippocampus* spp. originating in Egypt were mostly destined for the aquarium trade (McPherson and Vincent, 2011).

Management: Act No. 124 of 1983 on Fishing, Aquatic Life and Aquaculture prohibits the capture of aquarium fish in maritime waters, as well as the use of poison, explosives or

dynamite (Egypt, 1983). The Act also requires every fisher to obtain a fishing license (Egypt, 1983). According to the CITES MA of Egypt, no permits for exports of *H. histrix* have been issued in the past ten years (*in litt.* to UNEP-WCMC, 2013).

No specific management of *H. histrix* was reported to be taking place in Egypt but the species was reportedly not being harvested in Egypt, as its habitats were generally found within protected areas, where harvesting of any wildlife is prohibited (CITES MA of Egypt, *in litt.* to UNEP-WCMC, 2013). Several marine protected areas with suitable habitats for *H. histrix* are located along the Red Sea coast, supported by more than 300 rangers (CITES MA of Egypt, *in litt.* to UNEP-WCMC, 2013).

PHILIPPINES

Distribution in range State: The occurrence of *H. histrix* in the Philippines was confirmed by Lourie *et al.* (2004), but the distribution within the country was considered unclear (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Population trends and status: Substantial declines in *Hippocampus* spp. were reported by fishers in the Philippines between 1970 and 2003 (O'Donnell *et al.*, 2010), and Martin-Smith *et al.* (2004) and Vincent *et al.* (2007) concluded that *Hippocampus* spp. were affected by overfishing in the Philippines. No further local status information was available (Project Seahorse, *in litt*. to UNEP-WCMC, 2013) and no species-specific information on trends for *H. histrix* in the Philippines was located.

Threats: Direct exploitation, by-catch and habitat destruction were considered to be major threats to *Hippocampus* spp. (Vincent, 1996). By-catch of seahorses was found to be widespread primarily in shrimp trawling (Aish *et al.*, 2003). Pressures on particular seahorse populations used for the live aquarium trade were considered substantial (Hunt and Vincent, 2006; Vincent *et al.*, 2011).

The biological characteristics of *Hippocampus* spp. were considered likely to render them vulnerable to over-fishing and unsuitable for intense harvesting (Vincent, 1996; Foster and Vincent, 2004; Scales, 2010). These characteristics, combined with fishing pressure, were thought to explain the substantial declines in *Hippocampus* populations observed by fishermen and traders worldwide (Vincent, 1996), although Curtis *et al.* (2007) found that demersal fishing may not reduce numbers in all *Hippocampus* species and Martin-Smith and Vincent (2005) also observed fisheries-independent declines. According to Vincent (1996), the level of *Hippocampus* collection in artisanal fisheries and as by-catch is unsustainable, due to the fact that collectors continue harvesting *Hippocampus* spp. even when populations decrease to critically low levels.

Severe historic declines in seahorse catches led to conservation concerns over *Hippocampus* species in the Philippines (e.g. see Martin-Smith *et al.*, 2004; Vincent *et al.*, 2007; O'Donnell *et al.*, 2010). *Hippocampus* spp. were considered to be vulnerable due to trade for traditional medicine, curios and aquaria (Vincent, 1996), with annual *Hippocampus* spp. by-catch in the Philippines estimated at two to six million specimens (Pajaro, unpubl. data, in: Vincent *et al.*, 2011). Specimens were also reported to be targeted directly by divers (Martin-Smith *et al.*, 2004; Vincent *et al.*, 2007) and habitat destruction was considered a threat (Vincent, 1996; Marcus *et al.*, 2007; Short *et al.*, 2011). The species' key habitat, seagrass beds (Project Seahorse, *in litt*. to UNEP-WCMC, 2013), was estimated to have declined by 30-50 per cent in the Philippines (UNEP, 2004) and Castro *et al.* (2006) reported that the increase in human activity in coastal areas was threatening marine fauna and flora.

Trade: The majority of *Hippocampus* spp. were thought to be caught by artisanal fishers (Vincent, 1997; Roe, 2008). Three areas (Palawan (including Busuanga), the central Visayas (including Bohol, Cebu and Negros) and Mindanao (including Sulu and Tawi Tawi in the

southern Philippines)), were reported to have been the main sources of specimens (Vincent, 1996).

CITES annual reports have not yet been received from the Philippines for the years 2008 or 2010-2012. The Philippines has not published any export quotas for *H. histrix*. The Philippines did not report any exports of *H. histrix* over the period 2002-2012. Direct imports from the Philippines 2002-2012 (as recorded by countries of import) consisted of bodies, live individuals and specimens; with the exception of a large shipment of bodies in 2003 of unknown source, all trade was wild-sourced (Table 1). The United States also reported the import of 36 seized/confiscated bodies in 2004-2005. Spain imported the bodies of unknown source and the United States and Germany imported the remaining specimens. No indirect exports of *H. histrix* originating in the Philippines were reported 2002-2012.

Table 1. Direct imports of *Hippocampus histrix* from the Philippines, 2002-2011 (no trade was reported in 2006-2010 or 2012). All trade was reported by the countries of import; no exports were recorded by the Philippines (annual reports have not yet been received from the Philippines for the years 2008 or 2010-2012). The species was listed in Appendix II on 15/05/2004.

Term	Units	Source	Purpose	2002	2003	2004	2005	2011	Total
bodies	kg	W	T			10			10
		I	T			35	1		36
	-	U	T		4200				4200
live	-	W	T	2	1	26			29
specimens	-	W	S					5	5

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Countries of import reported notable quantities of trade in *Hippocampus* recorded at the genus level from the Philippines; this is summarised in the section on *H. barbouri*.

Prior to the listing of *Hippocampus* spp. in CITES Appendix II, the Philippines was considered a major country of export of seahorses (Wabnitz *et al.*, 2003; Evanson *et al.*, 2011; Project Seahorse *in litt.* to UNEP-WCMC, 2011) and exports of notable quantities of *Hippocampus* spp. were reported. Vincent (1996) estimated annual exports between 1993 and 1995 of dried *Hippocampus* spp. from the Philippines at 3.5-11 tonnes (~1.5-4.7 million specimens) and those of live specimens at more than 0.5 million individuals. Evanson *et al.* (2011), using a conversion factor of 3.33 g/seahorse, estimated volumes of dried specimens exported annually from the Philippines between 1998 and 2001 to represent 245 000-365 000 individuals (based on trade survey data), dropping to approximately 38 000 individuals in 2004-2005 together (based on CITES data).

Management: Information on the management of *Hippocampus* spp. in the Philippines is available in the Management section for *Hippocampus barbouri*.

VIET NAM

Distribution in range State: The occurrence of *H. histrix* in Viet Nam was confirmed by Lourie *et al.*, (1999a, 2004). The species was reported to occur in the Gulf of Tonkin, Da Nang (central Viet Nam), Ba Ria Vung Tau (south Viet Nam), Kien Giang Sea (southwest Viet Nam) (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013) and in Khanh Ho[a] province (southeast Viet Nam) (Lourie *et al.* 1999a).

Population trends and status: Giles *et al.* (2006) reported that landings of *Hippocampus* spp. showed geographic variations in volume, with fewer caught in the north of Viet Nam than in the south; it was unclear whether this was due to variations in abundance or the fishing methods used. Experts at a workshop on seahorses in the country did however believe that this pattern reflected seahorse distribution (S. Foster, Project Seahorse, pers. comm. to Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Landings of *H. histrix* as by-catch of a coastal trawl fishery fleet between 1996 and 2000 were rare, despite the fleet operating in the preferred habitat of the species, which might infer low abundance of *H. histrix* in Viet Nam (Meeuwig *et al.*, 2006). Trade surveys conducted in 2011 on Phu Quoc island did not record trade in this species (Ut and Tam, 2012 in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) estimated the whole Vietnamese population of *H. histrix* to be less than 10 000 mature individuals. This population estimate, which was also published in the Red Data Book of Viet Nam (Most, 2007 in Project Seahorse, *in litt*. to UNEP-WCMC, 2013), was called into question by local experts during a Project Seahorse workshop in May 2013 focusing on implementing CITES for seahorses in the country (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

The species is categorised as Vulnerable in the 2007 National Red Data Book of Viet Nam (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013), and the population was believed to be declining at a rate of 20 per cent annually (Most, 2007 in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). Population declines and reductions in the size of *Hippocampus* specimens were inferred from data (Vincent, 1996), and fishers confirmed declines in the availability of specimens from 1995 to 1999 (Giles *et al.* 2006). Trade surveys conducted in 2011 on Phu Quoc island revealed that fishermen had observed declines in the availability of seahorses over the last five to ten years [prior to 2011] (Ut and Tam, 2012 in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

The status of *Hippocampus* populations in Viet Nam was considered to be poorly known (Giles *et al.*, 2006), and Project Seahorse (*in litt*. to UNEP-WCMC, 2013) confirmed that independent assessments of the population status of seahorses in Viet Nam have not been conducted to date.

Threats: The CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) considered overharvesting, by-catch and habitat destruction to be major threats to the species. Non-selective trawling was thought to pose the greatest threat to *Hippocampus* spp. in Viet Nam (Giles *et al.*, 2006), a view that was confirmed by in-country experts during a 2013 workshop on seahorses in the country (S. Foster, Project Seahorse, pers. comm. to Project Seahorse, *in litt*. to UNEP-WCMC, 2013). Ninety per cent of Vietnamese marine fisheries were classified as artisanal and were operating in near-shore waters (Tuan, 2003), which were thought to be heavily exploited (Pomeroy *et al.*, 2009).

The species' key habitat, seagrass beds (Lourie *et al.*, 2004), was found to have decreased by more than 50 per cent over the last 10-15 years, both in distribution, area and density (Frouin *et al.*, 2012 in: Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Trade: The majority of *Hippocampus* spp. were thought to be sourced from trawl by-catch, which was estimated at about 6.5 tonnes (~2.3 million specimens) annually, over five coastal provinces (Bac Lieu, Kien Giang, Binh Thuan, Ca Mau and Khanh Hoa) from 1995 to 1999 (Giles *et al.*, 2006). A small scale target fishery was thought to supply the live trade (Giles *et al.*, 2006). Interviews with fishers and traders from 1995 to 1999 indicated that *H. histrix* made up less than one per cent of the species composition (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Viet Nam was reported to be one of the top five producers of dried *Hippocampus* spp. (Project Seahorse, unpubl. data in: Giles *et al.*, 2006). While internal trade in "seahorse tonic" was reported (CoP12 Prop. 37), the majority of specimens were reported to be exported to China, "generally through unofficial and unregulated channels" (Giles *et al.*, 2006). However, information on the nature and size of this trade was considered insufficient (Giles *et al.*, 2006). According to a survey conducted in 1991 in the Da Nang and Binh Thuan provinces, about 13.3 kg of *H. histrix* was traded locally at the time (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

CITES annual reports have been received from Viet Nam for all years 2002-2011. Viet Nam has not published any export quotas for *H. histrix*. According to data in the CITES Trade Database, no direct or indirect trade in *H. histrix* originating in Viet Nam was reported 2004-2012; Germany reported the import of nine live, wild-sourced specimens directly from Viet Nam for commercial purposes in 2003, prior to the listing of the species. However, countries

of import reported notable quantities of trade in *Hippocampus* recorded at the genus level from Viet Nam, a considerable proportion of which were seizures/confiscations (Table 2); Viet Nam did not report any trade at the genus level.

Table 2. Direct imports of *Hippocampus* reported at the genus level as *Hippocampus* spp. from Viet Nam, 2002-2011. (No trade was reported in 2012; Viet Nam's annual report for 2012 has not yet been received.) All trade was reported by the countries of import; no exports were reported by Viet Nam. The species was listed in Appendix II on 15/05/2004. (Figures rounded to one decimal place, where applicable.) No trade in *H. histrix* from Viet Nam was recorded 2004-2011.

Term	Units	Source	Purpose	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
bodies	kg	I	P								0.3		1.0	1.3
			T							15		4.7		19.7
			-								1.0			1.0
	-	W	P				2	261	200		20			483
			T				686	104	55					845
		I	P				13	25	205	409	268	848	462	2230
			T			86	1	20	2	212	206	74	46	647
			-		3	164	26	1	34		22			250
derivatives	kg	I	P									1.6		1.6
			-	2.8		0.0								2.8
	-	W	P				2	23						25
			T				180	96						276
		I	P				720	12		358	153	6035	2387	9665
			T				21					38		59
			-	12		11					12			35
extract	-	I	P									1		1
live	-	W	T	10			405	500		75				990
		C	T					1720	300					2020
		F	T						800	300	100			1200
		-	-		6									6

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Evanson *et al.* (2011), using a conversion factor of 2.69 g/seahorse, estimated volumes of dried seahorses (overall) exported annually from Viet Nam between 1998 and 2001 to represent 540 000-610 000 individuals (based on trade survey data), dropping to ~147 000 individuals annually in 2004-2008 (based on CITES data).

Between 1993 and 2003, domestic trade records from Taiwan, POC indicated imports of an annual average of 36 000 (± 43 000) seahorses from Viet Nam (converted from kilograms using a conversion factor of 350 seahorses per kilogram), but since 2004 the country was not found to be reported as a source for *Hippocampus* spp. other than as reported in the CITES database (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

While domestic consumption in Viet Nam had previously been believed to be insignificant (Giles *et al.*, 2006), observations of more than ten shops selling seahorses in Nha Trang in 2013 (S. Foster, pers. comm. to Project Seahorse, *in litt*. to UNEP-WCMC, 2013) indicated that domestic trade may be "more significant than previously thought" (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Management: In 2011, the CITES MA of Viet Nam confirmed that the export of wild-sourced seahorses was not permitted and would not be permitted until non-detriment findings were conducted (*in litt.* to UNEP-WCMC, 2011). A need for such assessments within the next five years was identified (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2011), but as of 2013, no such assessments had been conducted for *H. histrix,* and no export permits for international trade had been issued (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013). A workshop convened by Project Seahorse in Viet Nam in 2013 (including representatives from CITES authorities, fisheries authorities, academia, government research representatives and the aquaculture industry) focused on implementing CITES for seahorses, and participants agreed that further data collection on this species was needed within the country (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Harvest of *Hippocampus* spp. within the core zones of the five Marine Protected Areas (MPAs) was reported to be prohibited, with plans to increase the number of existing MPAs

(CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2011). The species was reported to be covered within the following legislation (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013):

- Government Decree No 82/2006/ND-CP of August 10, 2006: *Management of export, import, re-export and introduction from the sea, transit, breeding*; and
- Circular No 59/2010/TT-BNN of October 29, 2010: *Ministry of Agriculture and Rural Development (MARD) on Promulgating Lists of wild animals and plants under CITES management*

In addition, Directive no. 1/1998/CT-TTG and the Fisheries Law Article 6:6 from 2003 prohibit the use of explosives, electricity and poison for fishing (Viet Nam, 2003). However, Pomeroy *et al.* (2009) reported that in some areas all three methods were commonly used.

Few management measures were considered appropriate to mitigate the different pressures seahorse populations are facing; those identified included MPAs and seasonal closures of fisheries in coastal areas of less than 0.5 m depth (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). However, the effectiveness and enforcement and of such measures was unclear (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Pomeroy *et al.* (2009) considered illegal, unreported and unregulated (IUU) fishing to be a significant problem in Viet Nam, and Giles *et al.* (2006) believed that regulation of international trade would have little impact on reducing seahorse by-catch or domestic trade in Viet Nam.

No species specific monitoring program was in place (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

Truong (1998) noted that *H. histrix* had not been successfully bred in captivity in the country at that time.

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

CITES annual reports are outstanding from Egypt for 2005, 2008 and 2011 and from the Philippines for 2008, 2010 and 2011.

By-catch was reported as a main threat and IUU fishing was considered a problem in Viet Nam.

Illegal trade was reported to be occurring in all three countries.

The difficulty of identifying *Hippocampus* at species level was considered problematic for the monitoring of trade in specific species.

Trade in *Hippocampus* spp. has been reported at the genus level, making the monitoring of trade in individual species difficult. Furthermore, the mixed reporting of units (number of specimens and weight) makes it difficult to estimate the total number of specimens in international trade.

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Hippocampus trimaculatus (Leach, 1814): Singapore, Thailand, Viet Nam

Syngnathidae, Longnose Seahorse, Flat-faced Seahorse, Low-crowned Seahorse, Three-spotted Seahorse

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Hippocampus trimaculatus* (all range States) in the Review of Significant Trade as a priority species, following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *H. trimaculatus* was identified as a species that met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009 and showed a sharp increase in trade in 2009, compared with average trade levels for 2004-2008 (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from Australia, China, Indonesia, Japan, Malaysia and Myanmar (AC26 Doc. 12.3). Cambodia, India, the Philippines, Singapore, South Africa, Thailand and Vietnam were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Cambodia, India, the Philippines and South Africa were removed from the process, on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Hippocampus trimaculatus* recommendations.

		General summary
		Categorised as Vulnerable in the IUCN Red List on the basis of observed population declines.
Range State	**Provisional category**	**Summary**
Singapore	Least Concern	No international trade reported 2004-2012. Population status unclear. On the basis of no trade, categorised as Least Concern.
Thailand	Urgent Concern	High levels of trade in wild-sourced bodies 2002-2011. Categorised as Vulnerable nationally, with populations thought to be declining. Basis of non-detriment findings unclear. Therefore, categorised as Urgent Concern.
Viet Nam	Least Concern	Virtually no international trade reported 2002-2012, although relatively high levels of trade at genus level. Export of wild seahorses is prohibited until a non-detriment finding is conducted. Categorised as Endangered nationally. On the basis of virtually no trade, categorised as Least Concern.

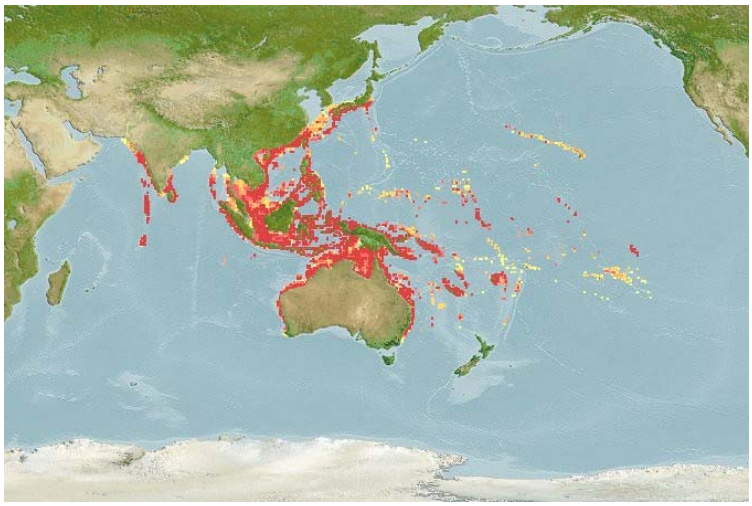
B. Species overview

Taxonomic note: Several taxonomic revisions of the genus *Hippocampus* have taken place, including revisions to *H. trimaculatus* (Lourie *et al.*, 1999b, 2004). The species is sometimes confused with *H. fisheri* and *H. zebra* (Lourie *et al.*, 2004).

Biology: *H. trimaculatus* occurs in sandy-, gravel- or muddy bottom habitats, in relatively deep water between 10 and 100 m (Lourie *et al.*, 1999b; Scales, 2010). The maximum recorded adult height of the species is 17 cm (Lourie *et al.*, 2004).

Additional information on the biology of *Hippocampus* spp. is available in the Biology section of *Hippocampus algiricus*.

General distribution and status: *H. trimaculatus* occurs in the waters of southwest Asia and Australia (Project Seahorse, 2003) (Figure 15), although reports from Australian waters were thought to possibly represent a separate species (Lourie *et al.* 1999; Lourie and Vincent, 2004). The dispersal potential of *H. trimaculatus* was believed to be relatively high (Lourie *et al.*, 2005).



H. trimaculatus was categorised as Vulnerable in the IUCN Red List on the basis of observed population declines of more than 30 per cent (Project Seahorse, 2003). An update of the Red List assessment for this species is being led by Project Seahorse (Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Populations are believed to still be declining (Project Seahorse, unpublished data, in: Project Seahorse, *in litt.* to UNEP-WCMC, 2013) based on evidence from analysis of CITES trade data for seahorses (Evanson *et al.*, 2011) and trade surveys in Southeast Asia (Giles *et al.* 2006; Perry *et al.* 2010; Project Seahorse and Thai Department of Fisheries, unpublished data in: Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Threats: Direct exploitation, by-catch and habitat destruction were considered to be major threats to *H. trimaculatus* (Vincent, 1996; Project Seahorse, 2003). Seahorse by-catch was found to be common, primarily in shrimp trawling (Aish *et al.*, 2003). Pressures on particular seahorse populations used for the live aquarium trade were considered substantial (Hunt and Vincent, 2006; Vincent *et al.*, 2011). Murugan *et al.* (2009) considered *H. trimaculatus* to be one of the most important species in Traditional Chinese medicine (TCM), while its dull colouration made it undesirable in the aquarium trade.

The biological characteristics of *Hippocampus* spp. were considered likely to render them vulnerable to over-fishing and unsuitable for intense harvesting (Vincent, 1996; Foster and Vincent, 2004; Scales, 2010). These characteristics, combined with fishing pressure, were also thought to explain the substantial declines in *Hippocampus* populations observed by fishermen and traders worldwide (Vincent, 1996), although Curtis *et al.* (2007) found that demersal fishing may not reduce numbers in all *Hippocampus* species and Martin-Smith and Vincent (2005) also observed fisheries-independent declines. According to Vincent (1996), the level of *Hippocampus* collection in artisanal fisheries and as by-catch is unsustainable, due to the fact that collectors continue harvesting *Hippocampus* spp. even when populations decrease to critically low levels.

Overview of trade and management: *H. trimaculatus* was listed in CITES Appendix II on 15/05/2004.

In 2004, a voluntary minimum height limit of 10 cm for international trade in wild *Hippocampus* specimens was recommended by the Animals Committee at its 20th meeting

(CITES Notification 2004/033; CITES Notification 2005/014). Concerns were raised that this would not sufficiently protect all *Hippocampus* spp. from overexploitation due to the height at maturity for several species being more than 10 cm (Foster and Vincent, 2005) and the shrinkage in size of dried specimens (Nadeau *et al.*, 2009). Curtis and Vincent (2008) recommended a precautionary minimum size limit of 14 cm, pending socioeconomic and management evaluation. No export or re-export permits are required for up to four dead specimens of *Hippocampus* spp. per person for personal or household effects, as per CITES Resolution Conf. 13.7 (Rev. CoP 16).

TCM was estimated to consume 95 per cent of *Hippocampus* spp. in trade (Vincent *et al.*, 2011). *Hippocampus* spp. are also traded as curios (dried) and live for aquarium and hobbyist use (Lourie *et al.*, 2004). *H. trimaculatus* was found to be the most heavily traded species worldwide with an estimated annual volume of 1.2-2.5 million individuals between 2004 and 2008 (Evanson *et al.*, 2011).

A clear understanding of life history and ecology was considered essential for the management of *Hippocampus* spp. (Curtis *et al.*, 2007), with robust monitoring required to assess conservation actions (Martin-Smith and Vincent, 2005). Thornhill (2012) noted the difficulty of making non-detriment findings for *Hippocampus* spp. due to the lack of data on population biology.

H. trimaculatus was considered suitable for aquaculture (Murugan *et al.*, 2009; Koldewey and Martin-Smith, 2010), although Koldewey and Martin-Smith (2010) believed that demand for *Hippocampus* spp. could not yet be met through aquaculture.

C. Country reviews

SINGAPORE

Distribution in range State: The occurrence of *H. trimaculatus* in Singapore was confirmed by Lourie *et al.* (2004), but the distribution within the country is unknown (Project Seahorse, *in litt.* to UNEP-WCMC, 2013). Scientists at the National Parks Board conducting surveys of *H. kuda* had not yet recorded *H. trimaculatus* (C. Tong, pers. comm. to Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Population trends and status: The CITES Scientific Authority of Singapore (*in litt.* to UNEP-WCMC, 2013) reported that the last record of *H. trimaculatus* from Singapore was from 1934, but that it was uncertain if this was due to the rarity of the species or its preference for deeper waters out of the reach of scuba divers.

Local trends are unknown and no further local status information was available (Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Threats: Habitat loss due to coastal development was considered to be the main threat to *Hippocampus* spp. in Singapore (National Parks Board Singapore, 2010; CITES SA of Singapore, *in litt.* to UNEP-WCMC, 2011). The impact of trade for TCM and aquaria were also considered substantial (CITES SA of Singapore, *in litt.* to UNEP-WCMC, 2013).

Trade: In 1998-2001, some traders were reported to source their stock locally (Project Seahorse, *in litt.* to UNEP-WCMC, 2011), but trade surveys carried out from 1999-2000 found that live and dried seahorses appeared to be mainly supplied by foreign sources (Evanson *et al.* 2011). Prior to the CITES listing of *Hippocampus* spp., Singapore was acting as a major country of import and of re-export for the trade (Wabnitz *et al.*, 2003) with annual imports amounting to approximately 1.7 million seahorses, mainly originating in India, and (re-)exports of 75 000– 743 000 seahorses, mainly destined for Hong Kong SAR (Evanson *et al.*

2011). It was considered unclear whether exports decreased after the CITES listing of *Hippocampus* spp., or whether the suggested decrease was a result of inaccurate trade records between the two periods (Evanson *et al*. 2011).

CITES annual reports have been received from Singapore for all years 2002-2011. Singapore has not published any export quotas for *H. trimaculatus*. According to data in the CITES Trade Database, no direct or indirect trade in *H. trimaculatus* originating in Singapore was reported 2002-2012. Countries of import reported small quantities of trade in *Hippocampus* recorded at the genus level directly from Singapore in 2002 (145 live, wild-sourced specimens for commercial purposes), 2004 (ten live specimens reported without a source or purposes specified) and 2010 (16 seized/confiscated bodies); Singapore did not report any trade at the genus level.

Non-CITES Census and Statistics data records from Hong Kong SAR from 1998 to 2010 were reported to list mean annual imports of approximately 157 000 (±161 000) seahorses at genus level from Singapore (Hong Kong CSD, undated, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). This trade was thought to represent re-exports from Singapore (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

H. trimaculatus was reportedly not observed in local trade (CITES SA of Singapore, *in litt.* to UNEP-WCMC, 2013), although the CITES SA of Singapore (*in litt.* to UNEP-WCMC, 2011) confirmed that a total of 277 illegally traded *Hippocampus* spp., originating in Indonesia and China, had been seized in 2008-2010.

Management: Section 5 of the Wild Animals and Birds Act 1965, rev. 2000 (Chapter 351) prohibits the killing, taking or keeping of any wild animal or bird without a license (Singapore, 1965); however, no such licenses were reported to have been issued "for many years" (Lye, 2008). The Endangered Species (Import and Export) Act 2006 prohibits the trade in endangered animals without a permit (Singapore, 2006; CITES SA of Singapore, *in litt.* to UNEP-WCMC, 2011). The Fisheries Act 1969 prohibits the use of explosives, poison or trawl nets to trap fish (Singapore, 1969).

The CITES SA of Singapore (*in litt.* to UNEP-WCMC, 2011) confirmed that no CITES permits for locally sourced *Hippocampus* spp. had been issued, that harvest of *Hippocampus* spp. was not taking place for commercial trade and that, therefore, non-detriment findings were not being made. No species specific monitoring or management was believed to take place (CITES SA of Singapore, *in litt.* to UNEP-WCMC, 2013). Scientists at the National Parks Board were reported to be conducting surveys of seahorses, although focusing on *H. kuda* and not on *H. trimaculatus* (C. Tong, pers. comm. to Project Seahorse, *in litt*. to UNEP-WCMC, 2013); no further management actions focusing on seahorse were known (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

The CITES SA of Singapore (*in litt.* to UNEP-WCMC, 2011) noted that *Hippocampus* spp. were being successfully bred in captivity in Singapore.

THAILAND

Distribution in range State: The occurrence of *H. trimaculatus* in Thailand was confirmed by Lourie *et al.* (2004) and Perry *et al.* (2010). The species was reported from the Gulf of Thailand and the Andaman Sea (CITES MA of Thailand , *in litt.* to UNEP-WCMC, 2013).

The species was found to occur at depths of 12-42 m during experimental trawl surveys carried out by the Thai Department of Fisheries, with a mean depth of 15 m (Phoonsawat *et al.*, 2012 in Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

Population trends and status: By-catch of *Hippocampus* spp. was reported most frequent in the south of Thailand, followed by the central and eastern coasts (Perry *et al.*, 2010).

H. trimaculatus was among the most common species caught as by-catch in both the Gulf of Thailand and the Andaman Sea (CITES MA of Thailand, *in litt.* to UNEP-WCMC, 2013). The Thai Department of Fisheries estimated the total biomass of *Hippocampus* spp. in Thai waters at 9.6 tonnes, based on experimental trawl surveys (Phoonsawat *et al*., 2012 in Project Seahorse, *in litt.* to UNEP-WCMC, 2013).

In 2005, the species was classified as Vulnerable in the Thai Red Data Book (Vidthayanon, 2005). Declines in *Hippocampus* populations were reported by fishers in the late 1990s (Perry *et al.*, 2010) and, more recently, 98 fishers out of 132 interviewed during trade surveys in 2013 reported declines (Project Seahorse and Thai DoF, unpublished data in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Threats: In Thailand, *Hippocampus* spp. were reported to be threatened by habitat change, by-catch, invasive species and trade for traditional medicine (CITES MA of Thailand, *in litt.* to UNEP-WCMC, 2011). Overfishing was considered to be the main cause of population declines (Vincent, 1996), with annual *Hippocampus* spp. by-catch estimated at 2.1 million specimens (Anon. 2001 in: Perry *et al*., 2010). Fishing for *Hippocampus* spp. was generally reported to occur during the non-monsoon season from October to February, which was thought to be the breeding season for many species (Vincent, 1996).

Trade: Thailand was considered to be one of the most important countries of export, if not the main country of export, of seahorses globally (Perry *et al*., 2010; Evanson *et al*., 2011; Vincent *et al*., 2011). In the mid-1990s, it was estimated to export 15 tonnes (~4.5 million specimens) of dried *Hippocampus* specimens annually (Vincent, 1996). Significant discrepancies were found between the export volumes reported by Thailand and the import volumes reported by other countries during the 1990s (Perry *et al*., 2010). The domestic trade in *Hippocampus* spp. was also considered substantial (Perry *et al*., 2010). Landed catch volumes in the late 1990s were estimated to represent 2.1 million seahorses annually, including *H. trimaculatus* (Perry *et al*., 2010). Similar catch rates were found in trade surveys conducted in 2012-2013, and although total volumes were unclear (Project Seahorse and Thai DoF, unpublished data in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013), *H. trimaculatus* was found to be the most commonly encountered species in Thai trade (Project Seahorse and Thai DoF, unpublished data; Laksanawimol, Kasetsart University, unpublished data in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). A small domestic trade in live seahorses, including trade in *H. trimaculatus*, was also reported (Laksanawimol, Kasetsart University, unpublished data in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

H. trimaculatus specimens in trade were reported to mainly originate from by-catch from shrimp trawl fisheries and some other fisheries, although a small scale fishery was also thought to target the species for the live trade (Perry *et al*. 2010; Project Seahorse and Thai DoF, unpublished data; Laksanawimol, Kasetsart University, unpublished data in: Project Seahorse, *in litt.* to UNEP-WCMC, 2013). Seahorses were reportedly bought by a few local buyers initially before being sold on to wholesalers and exporters, mainly in Bangkok, Ranong, and Surat Thani (Project Seahorse and Thai DoF, unpublished data in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). The majority were then reportedly exported to Hong Kong SAR, Taiwan Province of China and mainland China (Perry *et al*. 2010; Project Seahorse and Thai DoF, unpublished data; Laksanawimol, Kasetsart University, unpublished data in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

CITES annual reports have been received from Thailand for all years 2002-2011. Thailand has not published any export quotas for *H. trimaculatus*. According to data in the CITES Trade Database, direct exports of *H. trimaculatus* from Thailand 2004-2012 principally consisted of wild-sourced bodies traded for commercial purposes (Table 1). Hong Kong SAR was the principal importer.

No indirect exports of *H. trimaculatus* originating in Thailand were reported prior to 2007; indirect trade reported 2007-2012 principally comprised wild-sourced bodies traded for commercial purposes.

Table 1. Direct exports of *Hippocampus trimaculatus* from Thailand, 2004-2011. (No trade was reported in 2012; Thailand's annual report for 2012 has not yet been received.) All trade was wild-sourced and for commercial purposes. The species was listed in Appendix II on 15/05/2004. (Quantities rounded to one decimal place, where applicable.)

Term	Units	Reported by	2004	2005	2006	2007	2008	2009	2010	2011	Total
bodies	kg	Importer	1893	4236	3101.8	3343.9	2972.5	2896.0	3377.1	2805.6	24625.8
		Exporter	4008.0	7683.8	6179.5	6197.7	4269.4	3383.6			31721.9
	-	Importer			100						100
		Exporter							4191.3	3004.3	7195.6
derivatives	kg	Importer								38	38
		Exporter									

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Table 2 summarises direct trade in *Hippocampus* reported at the genus level from Thailand 2002-2011; the bodies reported in 2002 were all imported by Italy, while the principal importers from 2003 onwards were Singapore, Hong Kong SAR and Taiwan, POC.

Table 2. Direct exports of *Hippocampus* reported at the genus level from Thailand, 2002-2011. (No trade was reported in 2012; Thailand's annual report for 2012 has not yet been received.) (Quantities rounded to one decimal place, where applicable.)

Term	Units	Source	Purpose	Reported by	2002	2003	2004	2005	2007	2008	2010	2011	Total
bodies	kg	W	P	Importer				2.2					2.2
				Exporter									
			T	Importer			101.4	300.6		60			462
				Exporter			774.2						774.2
		I	P	Importer								<0.1	<0.1
				Exporter									
	-	W	P	Importer		1							1
				Exporter									
			T	Importer			80						80
				Exporter							24.5	0.3	24.8
		I	P	Importer					1				1
				Exporter									
			-	Importer			1						1
				Exporter									
		-	-	Importer	5040								5040
				Exporter									
derivatives	-	I	P	Importer							12		12
				Exporter									

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

CITES trade data for all seahorses reported in trade from Thailand in kilograms was converted using a mean dry weight of 3.22 g per seahorse, resulting in a total of ~4.9 million seahorses being exported per year in 2004-2008; the majority of trade was reportedly being imported by Hong Kong SAR or Taiwan, POC (Evanson *et al.* 2011). *H. trimaculatus* was believed to be the most commonly exported species from Viet Nam, representing ~ 36 per cent of trade each year (Evanson *et al.* 2011).

Non-CITES Census and Statistics data records from Hong Kong SAR from 1998 to 2011 were reported to amount to 3.7 million seahorses (±3.2 million) imported from Thailand annually at genus level, although after peak years in 2001 and 2002, the annual average from 2005-2010 was approximately 2.5 million seahorses, with no trade yet reported in 2011 (Hong Kong CSD, undated, in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Between 1993 and 2011, trade records from Taiwan POC, indicate imports of an annual average of approximately 1.4 million dried seahorses (±841 000 individuals), although average numbers traded between 2008 and 2011 dropped to below 400 000 (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

While no exports of live seahorses from Thailand were reported, low volumes of live specimens were reported to be traded domestically (Laksanawimol, Kasetsart University, unpublished data in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). In addition, some domestic trade was reported in dried seahorses for traditional medicine and curios (Perry *et al*. 2010; Project Seahorse and Thai DoF, unpublished data; Laksanawimol, Kasetsart University, unpublished data in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Management: The export of live *Hippocampus* spp. caught in Thai waters was reported to be prohibited since 1988 (Export and Import of Goods Act, B.E. 2522, 1979; CITES MA of Thailand, *in litt.* to UNEP-WCMC, 2011), but illegal exports were thought to have continued (Perry *et al.*, 2010). The following list of Notifications under the Thai Fishery Law was provided by the CITES Management Authority of Thailand (*in litt.* to UNEP-WCMC, 2011) and was considered to be contributing to the management of *Hippocampus* spp.:

- Notification B.E. 2515 *Re: Determination of Areas in which Fishing Appliances, i.e., Trawls and Push Nets used with Motor Vessels, are Prohibited*
- Notification B.E. 2522 *Re: Prohibition of Trawls and Push Nets in Fishing in Phang Nga Bay*
- Notification B.E. 2523 RE: *Using of Trawls and Push Nets with Motor Vessels in Fishing in Pang Nga Bay*
- Notification B.E. 2541 *Re: Prohibition of Push Nets used with Motor Vessel in Fishing in the Locality of Pattani Province*
- Notification B.E. 2542 *Re: Prohibition of Certain Kinds of Fishing Appliances in Spawning and Breeding Seasons in the Localities of Prachuab Kirikhan, Chumphon and Surat Thani Provinces during February 15 to May 15*
- Notification B.E. 2542 [sic]*Re: Determining the Area in which Beam Trawls are prohibited in Some Localities of Chonburi Province*

Consequently, the use of trawl- and push-nets within 3 km of the Thai coast is prohibited, as is the use of stationary gear within 400 m of the coastline (B.E.2515) (CHARM, 2005; Morgan and Staples, 2006). The effectiveness of such spatial and temporal measures for the mitigation of pressures on seahorses was unknown, and other pressures remain unaddressed (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). It was therefore considered important to assess seahorse distribution within spatial and temporal exclusion zones to understand the coverage of such measures for each *Hippocampus* species (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). The CITES MA of Thailand confirmed that the Fisheries Act B.E. 2490 (1985) prohibits the use of explosives, electricity and chemicals, fishing during the hatching season and fishing in seagrass and coral reef areas (CITES MA of Thailand, *in litt.* to UNEP-WCMC, 2011). However, illegal fishing was found to occur (CITES MA of Thailand, *in litt*. to UNEP-WCMC, 2011) and Panjarat (2008) reported the frequent use of illegal fishing techniques in the Andaman Sea, as well as the disregard for closed fishing seasons. Furthermore, following complaints from fishers, Notification B.E. 2542 was reviewed and temporarily suspended in February 2013 (B.E. 2543) (CITES MA of Thailand, *in litt.* to UNEP-WCMC, 2013).

Further measures include the establishment of conservation areas (e.g. 26 000 km^2 in the Gulf of Thailand and 1800 km^2 in Phang Nga and Krabi) and protected areas (73 479 km^2 in 2011) (CITES MA of Thailand, *in litt.* to UNEP-WCMC, 2011). However, illegal fishing within protected areas was reported (Panjarat, 2008).

Further management measures in Thailand included research into aquaculture aimed at a possible reduction of trade in wild specimens and research into *Hippocampus* spp. genetics (CITES MA of Thailand, *in litt.* to UNEP-WCMC, 2011). In 1998, one seahorse aquaculture

facility was operating, although it did not appear to be breeding this species (Koldewey and Martin-Smith, 2010).

Research on the status of *Hippocampus* spp. in Thailand was reportedly initiated in 2012 (CITES MA of Thailand, *in litt.* to UNEP-WCMC, 2013).

A workshop convened by Project Seahorse in June 2013 in Thailand focused on addressing concerns raised through the Review of Significant Trade process for *H. kelloggi*, *H. kuda* and *H. spinosissimus*. Workshop participants (including CITES Authorities, fisheries authorities, academia, government research representatives and the aquaculture industry) determined that Thailand was unable to make a defensible non-detriment finding for its exports of any of these species or indeed *H. trimaculatus* (Project Seahorse, *in litt.* to UNEP-WCMC, 2013). It was recognised that more information should be collected on *H. trimaculatus* (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

VIET NAM

Distribution in range State: The occurrence of *H. trimaculatus* in Viet Nam was confirmed by Lourie *et al.* (1999a, 2004). The species was reported to occur in Gulf of Tonkin, Binh Thuan and Khanh Hoa Sea (both southeast) (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

Population trends and status: Giles *et al.* (2006) reported that landings of *Hippocampus* spp. showed geographic variations in volume, with fewer caught in the north of Viet Nam than in the south; it was unclear whether this was due to variations in abundance or the fishing method used. Experts at a workshop on seahorses in the country did however believe that this pattern reflected seahorse distribution (S. Foster, Project Seahorse, pers. comm. to Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

H. trimaculatus was reported to be among the most commonly caught species in southern and central Viet Nam in the mid to late 1990s (Giles *et al.*, 2006; Meeuwig *et al.*, 2006). Lourie *et al.* (1999a) considered the species to be "particularly common and widely-distributed" throughout Viet Nam. Fisher interviews carried out in 2011 on Phu Quoc island, southern Viet Nam, also reported that *H. trimaculatus* was one of the main species caught (Ut and Tam, 2012 in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013). However, the CITES MA of Viet Nam (*in litt.* to UNEP-WCMC, 2013) estimated the whole Vietnamese population to be only 2500 mature individuals. This population estimate, which was also published in the Red Data Book of Viet Nam (Most, 2007 in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013), was called into question by local experts during a Project Seahorse workshop in May 2013, which focused on implementing CITES measures for seahorses in the country (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

The species was categorised as Endangered in the 2007 National Red Data Book of Viet Nam (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013), with population declines estimated at 20 per cent per year and the species was noted to be of high value for TCM (Most, 2007 in Project Seahorse, *in litt*. to UNEP-WCMC, 2013). Population declines and reductions in the size of *Hippocampus* specimens were inferred from data (Vincent, 1996) and fishers confirmed declines in availability from 1995 to 1999, with *H. trimaculatus* being among the three seahorse species most often mentioned in these interviews (Giles *et al.* 2006). Trade surveys conducted in 2011 on Phu Quoc island revealed that fishermen had observed declines in the availability of seahorses over the last five to ten years [prior to 2011] (Ut and Tam, 2012 in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

The status of *Hippocampus* populations in Viet Nam was considered to be poorly known (Giles *et al.*, 2006), and Project Seahorse (*in litt*. to UNEP-WCMC, 2013) confirmed that independent assessments of the population status of seahorses have not been conducted to date.

Threats: Information on threats to *Hippocampus* spp. in Viet Nam is available in the Threats section of *Hippocampus histrix.*

Trade: The majority of *Hippocampus* spp. were thought to be sourced from trawl by-catch, which was estimated at about 6.5 tonnes (~2.3 million specimens) annually over five coastal provinces (Bac Lieu, Kien Giang, Binh Thuan, Ca Mau and Khanh Hoa) from 1995 to 1999 (Giles *et al.*, 2006). A small scale

target fishery was thought to supply the live trade (Giles *et al.*, 2006). Interviews with fishers and traders from 1995 to 1999 indicated that *H. trimaculatus* was one of the main species caught (Project Seahorse, *in litt*. to UNEP-WCMC, 2013); trade surveys carried out in 2011 on Phu Quoc island also found the species to be one of the main seahorses in trade (Ut and Tam, 2012 in: Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Viet Nam was reported to be one of the top five producers of dried *Hippocampus* spp. (Project Seahorse, unpubl. data in: Giles *et al.*, 2006). While internal trade in "seahorse tonic" was reported (CoP12 Prop. 37), the majority of specimens were reported to be exported to China, "generally through unofficial and unregulated channels" (Giles *et al.*, 2006). However, information on the nature and size of this trade was considered insufficient (Giles *et al.*, 2006). According to a survey conducted in 1991 in the Da Nang and Binh Thuan provinces, about 328 kg of *H. trimaculatus* was being traded locally at the time (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

CITES annual reports have been received from Viet Nam for all years 2002-2011. Viet Nam has not published any export quotas for *H. trimaculatus*. According to data in the CITES Trade Database, direct exports of *H. trimaculatus* from Viet Nam 2002-2012 consisted of low numbers of wild-sourced live individuals and bodies traded for personal and commercial purposes in 2005 and 2007; in addition, the United States reported the import of 23 seized/confiscated bodies in 2008 (Table 3). The United States was the only importer. No trade was reported after 2008, and no indirect exports of *H. trimaculatus* originating in Viet Nam were reported 2004-2012. However, notable quantities of trade in *Hippocampus* recorded at the genus level were reported by countries of import (none reported by Viet Nam); this trade is summarised in the section on *H. histrix*.

Table 3. Direct exports of *Hippocampus trimaculatus* from Viet Nam, 2005-2008 (no trade was reported in 2004, 2006 or 2009-2012; Viet Nam's annual report for 2012 has not yet been received). The species was listed in Appendix II on 15/05/2004.

Term	Source	Purpose	Reported by	2005	2007	2008	Total
bodies	W	P	Importer		14		14
			Exporter				
	I	P	Importer			23	23
			Exporter				
live	W	T	Importer	20			20
			Exporter	40			40

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Evanson *et al.* (2011), using a conversion factor of 2.69 g/seahorse, estimated volumes of dried seahorses (overall) exported annually from Viet Nam between 1998 and 2001 to represent 540 000-610 000 individuals (based on trade survey data), dropping to ~147 000 individuals annually in 2004-2008 (based on CITES data).

Between 1993 and 2003, domestic trade records from Taiwan, POC indicated imports of an annual average of 36 000 (± 43 000) seahorses from Viet Nam (converted from kilograms using a conversion factor of 350 seahorses per kilogram), but since 2004 the country was not reported as a source for *Hippocampus* spp. other than as reported in the CITES database (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

While domestic consumption in Viet Nam was previously believed to be insignificant (Giles *et al.*, 2006), observations of more than ten shops selling seahorses in Nha Trang in 2013 (S. Foster, pers. comm. to Project Seahorse, *in litt*. to UNEP-WCMC, 2013) indicated that domestic trade may be "more significant than previously thought" (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Management: In 2011, the CITES MA of Viet Nam confirmed that the export of wild-sourced seahorses was not permitted and would not be permitted until non-detriment findings were conducted (*in litt.* to UNEP-WCMC, 2011). A need for such assessments within the next five years was identified (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2011), but as of 2013, no such assessments had been conducted for *H. trimaculatus,* and no export permits for international trade had been issued (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013). A workshop convened by Project Seahorse in Viet Nam in 2013 (including representatives from CITES authorities, fisheries authorities, academia, government research representatives and the aquaculture industry) focused on implementing CITES measures for seahorses, and participants agreed that the country was unable to make a defensible non-detriment finding for trade in *H. trimaculatus* and that further information would need to be collected on this species (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Details on legislation relevant to *Hippocampus* species in Viet Nam are available in the Management section of *Hippocampus histrix*.

Few management measures were considered appropriate to mitigate the different pressures seahorse populations are facing; those identified included MPAs and seasonal closures of fisheries in coastal areas of less than 0.5 m depth (Project Seahorse, *in litt*. to UNEP-WCMC, 2013). However, the effectiveness and enforcement of such measures was unclear, and they were considered unlikely to effectively support *H. trimaculatus*, a deeper water species which is primarily captured in shrimp trawl fisheries (Project Seahorse, *in litt*. to UNEP-WCMC, 2013).

Pomeroy *et al.* (2009) considered illegal, unreported and unregulated (IUU) fishing to be a significant problem in Viet Nam, and Giles *et al.* (2006) believed that regulation of international trade would have little impact on reducing seahorse by-catch or domestic trade in Viet Nam.

No species specific monitoring program was in place (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

Truong (1998) observed that *H. trimaculatus* had been successfully bred in captivity in the country.

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

By-catch was reported as a main threat and IUU fishing was considered a problem in Viet Nam.

Illegal trade was reported to be occurring in all three countries.

The difficulty of identifying *Hippocampus* at species level was considered problematic for the monitoring of trade in specific species.

Trade in *Hippocampus* spp. has been reported at the genus level, making the monitoring of trade in individual species difficult. Furthermore, the mixed reporting of units (number of specimens and weight) makes it difficult to estimate the total number of specimens in international trade.

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Antipatharia: Bahamas, Cuba, Democratic People's Republic of Korea, Dominican Republic, Fiji, Panama, Papua New Guinea, Philippines, Taiwan, Province of China, Vanuatu

Antipatharia, Black Coral

Selection for Review of Significant Trade

Summary

Antipatharia (all species in all range States) were selected as priority species for reviewat the 25th meeting of the Animals Committee following consideration of document AC25 Doc. 9.6 (AC25 Summary Record). The analysis in Annex 2 of AC25 Doc. 9.6 identified three species (*Antipathes densa*, *Cirrhipathes anguina* and *Myriopathes japonica*) that met the criteria of high volume trade during 2004-2008. At the 26th meeting of the AC, responses had been received from Argentina, Australia, Chile, People's Republic of China (hereafter referred to as China), Colombia, Costa Rica, Guyana, Indonesia, Japan, Liberia, Madagascar, Myanmar, New Zealand, Pakistan, Seychelles, Tonga, the United Kingdom and the United States of America (AC26 Doc. 12.3). Bahamas, Barbados, Belize, Brazil, Cape Verde, China (Province of Taiwan), Cuba, Democratic People's Republic of Korea (hereafter referred to as DPR Korea), Djibouti, Denmark, Dominica, Dominican Republic, Ecuador, El Salvador, Fiji, Grenada, Honduras, India, the Islamic Republic of Iran (hereafter referred to as Iran), Ireland, Italy, Jamaica, Malaysia, Maldives, Mauritius, Morocco, Mozambique, Nicaragua, Netherlands, Palau, Panama, Papua New Guinea, Philippines, Portugal, Republic of Korea, Russian Federation, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Saudi Arabia, Somalia, South Africa, Spain, Sri Lanka, Suriname, Trinidad and Tobago, Tuvalu, Uruguay, Vanuatu and the Bolivarian Republic of Venezuela (hereafter referred to as Venezuela) were retained in the process (AC26 Summary Record). Following the 26th meeting of the AC, all of these range states (apart from Bahamas, Cuba, DPR Korea , Dominican Republic, Fiji, Panama, Papua New Guinea, Philippines, Taiwan, Province of China (hereafter referred to as Taiwan POC) and Vanuatu) were removed from the process on the basis of virtually no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

Overview of Antipatharia recommendations.

		General summary
		Occur in all oceans, but generally poorly known and some population depletions reported.
Range State	**Provisional category**	**Summary**
Bahamas	Least Concern	Virtually no international trade reported 2002-2012. Some species are common, while others are uncommon or patchily distributed. On the basis of no trade, categorised as Least Concern.
Cuba	Least Concern	Moderate levels of international trade reported 2002-2005 mainly in wild-sourced carvings; no international trade reported since 2008. Locally abundant, but depleted in some areas. No licences for extraction issued since 1999. Therefore, categorised as Least Concern.
Democratic People's Republic of Korea	Least Concern	No international trade reported 2002-2012. Population status unknown. On the basis of no trade, categorised as Least Concern.

Dominican Republic	Least Concern	Virtually no international trade reported since 2003, when one country of import reported trade of 1464 raw corals. Population status unknown. Harvest and trade prohibited. Therefore, categorised as Least Concern.
Fiji	Least Concern	No commercial trade reported 2002-2012, with a few specimens traded for personal purposes. At least locally common. Therefore, categorised as Least Concern.
Panama	Least Concern	No international trade reported 2002-2012. Population status unknown. On the basis of no trade, categorised as Least Concern.
Papua New Guinea	Least Concern	No commercial international trade reported 2002-2012; very low levels of trade for personal/scientific purposes. Population status unknown. On the basis of no trade, categorised as Least Concern.
Philippines	Least Concern	Virtually no commercial trade 2002-2012, with the exception of 2007, when 418 carvings were reported by countries of import. No trade reported by the Philippines 2002-2012. Harvest and trade of corals prohibited. Locally common. Therefore, categorised as Least Concern. However, questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
Taiwan, Province of China	Possible Concern	High levels of trade 2002-2012 in wild-sourced corals reported by countries of import. Very little trade reported since 2008. Management measures put in place 2009. Basis of non-detriment finding is unclear and therefore, categorised as Possible Concern. Questions not related to the implementation of Article IV, paragraphs 2 (a), 3 or 6 (a) remain.
Vanuatu	Least Concern	Virtually no international trade reported since 2003. Population status unknown. Export of live, wild-sourced corals prohibited. Therefore, categorised as Least Concern.

A. Overview

Taxonomic note: The order Antipatharia (Black corals) comprises seven families, 43 genera and 248 species, according to the CITES Standard Reference adopted at CoP16 (UNEP-WCMC, 2012). The taxonomy of Antipatharia was considered complicated due to the description of numerous species from incomplete specimens and the lack of a clearly defined taxonomic hierarchy at the genus and family level (Opresko and Sanchez, 2005; Opresko, 2006).

Biology: Antipatharia are long-lived corals (Grigg, 1965; Opresko and Sanchez, 2005; Wagner, 2011) typically found on hard substrates in areas with strong currents and depths below 50 m (Wagner *et al.*, 2012), however, some species inhabit relatively shallow reefs (Opresko and Sanchez, 2005). In some species, a single colony can reach several metres in height (Opresko and Sanchez, 2005), with longevity estimates in different species ranging from 12 to approximately 4250 years (Wagner, 2011 and references therein; Brugler, Opresko, & France, 2013). Most Antipatharia species are considered to lack symbiotic algae (Grigg, 1993), although evidence suggesting symbiosis was found in some species (Wagner *et al.*, 2010; Bo *et al.*, 2011).

Comprehensive accounts of the reproductive biology of Antipatharia were reported to be lacking (Parker *et al.*, 1997). A study of *Antipathes fiordensis* revealed a life history characterised by predominantly sexual reproduction, first reproduction at over 30 years of age, annual spawning, potentially high colony fecundity, and short-lived free-swimming larvae (Parker *et al.*, 1997). *A. dichotoma* was found to reach maturity earlier, at 12-13 years (Grigg, 1993). In Cuba, males were reported to mature at 9 years (size of 110-119 cm) and females at 10-12.5 years (size of 120-129 cm) (Guitart 1994 in: CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013). Reported growth rates ranged from 1.2 cm per year for *A. griggi* in

Hawaii (Opresko, 2009; Brugler *et al.*, 2013), to 159 cm per year for both *Stichopathes* cf. *maldivensis* from Indonesia (Bo *et al.*, 2009) and *Cirrhipathes* cf. *anguina* (Brugler *et al.*, 2013).

Antipatharia have been reported to occur from a depth of 4 m (*Antipathella aperta* in New Zealand; Grange, 1985), to a maximum depth of 8600 m (*Schizopathes affinis* from the Pacific Kurile-Kamchatka and Aleutian trenches; Pasternak, 1977), but the majority of species and greatest abundance were reported to occur at depths of 30-80 m (Grigg, 1993; Sánchez *et al.*, 1998; Bruckner *et al.*, 2008), with approximately 75 per cent of species occuring at depths of greater than 50 m (Cairns, 2007). Light intensity is significantly reduced at these depths; the shallowest natural colonies of *Antipathes grandis* in Hawaii, for example, live at approximately 35 m depth, where light levels are below 25 per cent of surface light in clear water (Grigg, 1965). Therefore, assessments of coral reef risk will not necessarily reflect the totality of Black corals in the assessment area, though some may be affected.

General distribution and status: Antipatharia occur in all oceans (Grigg, 1965), with the greatest number of species being found in the subtropics and tropics (Bruckner *et al.*, 2008; Wagner *et al.*, 2012). Studies on the biogeographical distribution of individual species were reported to be very scarce; a large proportion were known only from their type locality, partly due to the remoteness of their habitats and partly due to taxonomic difficulties (Wagner, 2011).

The global population trend was reported to be unknown, with very few recent surveys having been conducted (Bruckner *et al.*, 2008). Most Antipatharia colonies from tropical coral reefs were reported to have been largely depleted at depths accessible by recreational divers, with the only known populations of commercial size being in Hawaii (Bruckner *et al.*, 2008).

Threats: Antipatharia are harvested for the jewellery trade and handicraft (Grigg, 2001; Padilla and Lara, 2003; Bruckner *et al.*, 2008). Limited gene flow, low growth rates (Opresko and Sanchez, 2005) and the infrequent recruitment in Antipatharia were considered to make these corals susceptible to rapid declines if subject to overharvesting (Goenaga and Boulon, 1992). Wells *et al.* (1983), however, noted that extinction due to overexploitation was unlikely, because many populations were undiscovered or located in areas difficult to access. However, a decline in larger specimens since 1998 was considered to indicate the negative impacts of a doubling of harvesting pressure in Hawaii, following a period of sustainable yields from 1975 to 1998 (Bruckner *et al.*, 2008). The disappearance of the "great black coral forests" of Grand Cayman (Cayman Islands) and Cozumel (Mexico) was also considered to be caused by overharvesting (Humann and DeLoach, 2002). Padilla and Lara (2003) reported that collection in Cozumel began in the late 1960s, initially by snorkelling to 20 m depth, then at increased depths using SCUBA; by 1995 authorities suspended permission to collect Black coral in Cozumel over safety concerns, as commercially sized colonies were depleted to a depth of over 80 m.

There have been no confirmed cases of coral bleaching in Antipatharia, and bleaching is not considered to be a threat to the order as a whole (M. Bo, pers. comm. to UNEP-WCMC, 2013). However, extensive mortality of Black corals was observed in Indonesia (Sumatra), possibly due to high temperatures (M. Bo, pers. comm. to UNEP-WCMC, 2013). Large-scale mortality of Black corals in Hawaii, particularly from 80 to 105 m depth (a zone free of harvest pressure at the time) was attributed to overgrowth by an invasive coral species (*Carijoa riisei*) since 2001 (Kahng and Grigg, 2005).

Overview of trade and management: The order Antipatharia was listed in CITES Appendix II on 06/06/1981. Global direct trade in Antipatharia reported between 2002 and 2011 primarily comprised carvings (totalling 936 125 carvings and 1439 kg of carvings, as reported by countries of import) and raw corals (totalling 207 111 corals and 3447 kg of

corals, as reported by countries of import). The vast majority of trade was wild-sourced. Trade reported by the countries of import greatly exceeded that reported by the countries of export; the principal exporter, according to data reported by countries of import, was Taiwan, POC; according to data reported by countries of export, the principal country of export was Cuba. The principal countries of import were Japan and the United States. The majority of the trade reported by countries of export was recorded at the order level (Antipatharia spp.), while a large proportion of the trade reported by countries of import was at the species level, the top two species in trade being *Antipathes densa* and *Cirrhipathes anguina*.

In 2011, various Parties including Taiwan POC reportedly concluded negotiations on the Convention on the Conservation and Management of High Seas Fisheries Resources in the North Pacific Ocean which, once it comes into force, will prohibit all Parties bound by its regulations from commercially harvesting specimens of Antipatharia in waters outside of their respective exclusive economic zones (Cooper *et al.,* 2011).

C. Country reviews

BAHAMAS

Distribution in range State: Opresko and Sanchez (2005) recorded six species of shallow water Black corals in the Bahamas, and Humann and DeLoach (2002) recorded ten species.

Population trends and status: Humann and DeLoach (2002) categorised *Antipathes lenta*, *A. umbratica* and *Stichopathes leutkeni* as common species**,** *A. caribbeana* and *Plumapathes pennacea* as common to uncommon, *Tanacetipathes hirta*, *T. barbadensis* and *T. tanacetum* as occasional to uncommon, and *A. gracilis* and *A. atlantica* as occasional.

In 2008, coral reefs in the Bahamas overall were assessed as "in a near crisis situation" (Creary *et al.*, 2008) but no information on the status of deeper water coral communities could be located.

Threats: No threats specific to Antipatharia were located.

Trade: CITES annual reports have been received from the Bahamas for all years 2002-2011 with the exception of 2010. The Bahamas has not published any CITES export quotas for Antipatharia. According to data in the CITES Trade Database, trade in Antipatharia originating in the Bahamas reported over the period 2002-2012 comprised one wild-sourced *Antipathes speciosa* carving exported directly to the United States for commercial purposes in 2006 (reported by the Bahamas only), and raw corals of the genus *Antipathes* (recorded at the genus level) reported as seized/confiscated in 2008 (one coral) and 2009 (six corals) by the United States, also imported directly from the Bahamas. No indirect trade in Antipatharia originating in the Bahamas was reported 2002-2012.

The CITES Scientific Authority of the Bahamas advised that there was no record of Antipatharia being harvested in the Bahamas, nor was there evidence of illegal harvest or illegal trade (CITES SA of the Bahamas, *in litt.* to UNEP-WCMC, 2013).

Management: The CITES SA of the Bahamas (CITES SA of the Bahamas, *in litt.* to UNEP-WCMC, 2013) confirmed that unlicensed collection and trading of corals is prohibited under the Fisheries Resources (Jurisdiction and Conservation) Regulations of 1986 (Bahamas, 1986). The use of firearms or noxious substances for fishing within the exclusive fishery zone and spearfishing apparatus in certain areas is prohibited (Bahamas, 1986).

McManus and Lacambra (2004) reported that there are five Marine Protected Areas (MPAs) in the Bahamas, all with a no take status. Two per cent of the country's reef area was reported to be inside MPAs (Burke and Maidens, 2004). However, the level of protection afforded to Black coral through MPAs is unclear.

CUBA

Distribution in range State: Three species of Antipatharia were reported from Cuba (Ortiz and Lalana, 2008). Occurrence of Black coral was confirmed from the Isla de la Juventud (south-western Cuba) (UNEP/IUCN, 1988a), Playa Ancon, Cazones Gulf (southern Cuba), Colorados Archipelago (northwestern Cuba) and from Varadero to Camarioca and Punta Maya (in Matanzas Bay, northern Cuba) (CITES MA of Cuba, *in litt.* to UNEP-WCMC 2013). Black coral was also found along the north of Pinar del Río Province (western Cuba) and Puerto de Sagua (Havana) (Spalding *et al.*, 2001).

Population trends and status: Stocks of Antipatharia were described as unusually abundant in the shallow waters of Isla de la Juventud (UNEP/IUCN, 1988a) and high concentrations of Black corals were identified from Varadero to Camarioca and Punta Maya and Playa Ancon, Cazones Gulf and the Colorados Archipelago (CITES MA of Cuba, *in litt.* to UNEP-WCMC 2013), whilst found to be depleted in some locations along the north of Pinar del Río Province, in Matanzas Bay, Puerto de Sagua and Cazones Gulf (Spalding *et al.*, 2001).

In the Cazones Gulf area, where a large proportion of the harvests were reported to take place, black corals were distributed in an area of 150 km^2, with 37 km^2 covered by black coral patches, and an estimated average density of 5.9 colonies per 100 m^2 (Guitart 1994 in: CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013).

In 2008, coral reefs in Cuba were reported to have suffered declines of live coral cover between 2001 and 2006 (Creary *et al.*, 2008), but no information on the status of deeper water coral communities could be located.

Threats: The main threats to Antipatharia were considered to be habitat destruction and illegal collection (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013). Illegal harvest reportedly led to the depletion of adult Black coral stocks in some locations at shallower depths (Alcolado *et al.*, 2003).

Trade: CITES annual reports have been received from Cuba for all years 2002-2010. Cuba has not published any CITES export quotas for Antipatharia. According to data in the CITES Trade Database, direct exports of Antipatharia from Cuba 2002-2011 consisted primarily of wild-sourced carvings traded for commercial purposes reported at the order level and at the genus level (genus *Antipathes*) (Table 1). No direct trade was reported from 2009 onwards. Trade reported by Cuba generally exceeded that reported by countries of import; the only countries of import to report imports of carvings were Panama and Spain.

Indirect trade in Antipatharia originating in Cuba 2002-2012 consisted of wild-sourced carvings re-exported via Panama to Cuba for commercial purposes in 2002 (1011 carvings as reported by Panama and 109 as reported by the country of import) and 2003 (216 carvings as reported by Panama; no trade reported by the importer).

Table 1. Direct exports of the order Antipatharia from Cuba, 2002-2008. (Annual reports have not yet been received from Cuba for 2011 or 2012; no trade was reported in 2006 or 2009-2012; quantities rounded to one decimal place, where applicable.)

Taxon	Term	Units	Source	Purpose	Reported by	2002	2003	2004	2005	2007	2008	Total
Antipatharia spp.	carvings	-	W	T	Importer	1388	970	73				2431
					Exporter	2075	1126	2066	4954	100		1032 1
	raw corals	kg	I	P	Importer						2	2
					Exporter							
		-	W	P	Importer	2		1				3
					Exporter							
				T	Importer	291						291
					Exporter							
			U	P	Importer				2			2
					Exporter							
Antipathes spp.	carvings	kg	W	T	Importer							
					Exporter			0.1				0.1
		-	W	T	Importer		198	862				1060
					Exporter				2667			2667
	raw corals	-	U	P	Importer		2		2			4
					Exporter							

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Commercial stocks of Black corals were discovered in 1960 (Alcolado *et al.*, 2003), and commercial exploitation reportedly began in 1981 (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013). An official estimate of Black corals extracted by four enterprises in 1998 amounted to 1468.6 kg at depths of 20-55 m (Alcolado *et al.*, 2003). Illegal harvest of Black corals reportedly took place since the 1970s (Alcolado *et al.*, 2003).

Management: All species of Antipatharia were included in Cuba's list of species of 'special significance for the biological diversity in the country' (Miyar Barrueco, 2011). Resolution 33/1996 established zones and annual limits for the collection of Black coral species according to the advice of the Institute of Oceanology (IDO, the Cuban Scientific Authority for marine species) (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013).

Antipatharia harvesting reportedly took place between 1981 and 1999, with most harvests taking place in the Pinar del Río province and in the Cazones Gulf, and a total of 1843 kg harvested during 1987-1999 (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013).

Harvest quotas were based on population surveys conducted by IDO, Cuba's national aquarium and UNEP between 1987 and 1993 and set at 300 kg per year (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013). Based on population decreases in some areas subject to harvest, the quota was reduced to 200 kg in 1994 and harvesting in these areas was discontinued; the quota was again set at 300 kg in 1996, when a management plan was put in place and over-harvested areas were closed (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013). The minimum harvestable size for Black corals was set at 120 cm height and 2.5 cm base diameter (Alcolado *et al.* 2003; CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013).

On the basis of black coral density and area of cover in the Cazones Gulf and surrounding areas, the potential annual harvest was estimated at around 450 kg per year, i.e. above the annual harvest quotas for the country, which was considered to indicate that harvest levels were sustainable and precautionary (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013).

According to Resolution 160/2011, licenses for harvesting, transport and trade are issued on the basis of availability of adequate scientific information, existence of non-detriment findings, benefits for the conservation of the species derived from its use, and legal origin of

the specimens (Miyar Barrueco, 2011). The CITES MA of Cuba (*in litt.* to UNEP-WCMC, 2013) reported that no new licences had been granted for Black coral harvest since 1999, as no new information on the status of the populations had been presented since 1994 to inform a non-detriment finding.

Licences for the export of Antipatharia carvings were reportedly issued 1996-2003, with the 2003 licence being valid until October 2013 and exports reported after 1999 relating to Black corals harvested prior to that year and to re-exports originating in Asia (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013).

Alcolado *et al.* (2003) reported a significant improvement in the control of harvest following improved harvest inspections. Resolution 160/2011 also included measures to protect gorgonians (order Gorgonacea), which are difficult to distinguish from black corals by Customs, thus improving the effectiveness of law enforcement (CITES MA of Cuba, *in litt.* to UNEP-WCMC, 2013).

Democratic People's Republic of Korea

DPR Korea is not a Party to CITES and therefore has not submitted any annual reports or published any CITES export quotas. According to data in the CITES Trade Database, no direct or indirect trade in Antipatharia originating in DPR Korea was reported by countries of import 2002-2012.

No information was located on the distribution, trends, threats, trade or management of Antipatharia within the country.

Dominican Republic

Distribution in range State: Three species of Antipatharia were recorded in a checklist of marine species from the south coast of the Dominican Republic from La Caleta, Catalina island, and Saona island (Williams *et al.*, 1983); Black coral species were also reported from Del Este National Park (south-east) (Katz, 1981 in: UNEP/IUCN, 1988a).

Population trends and status: The CITES MA of the Dominican Republic (*in litt.* to UNEP-WCMC, 2013) reported that no assessments of population trends and status have been conducted.

In 2008, some coral reefs in the Dominican Republic were considered to be in less favourable conditions, and while increases in coral cover were reported for some locations, the damage by hurricanes that year had not been established (Creary *et al.*, 2008); no information on the status of deeper water coral communities could be located.

Threats: The CITES MA of the Dominican Republic (*in litt.* to UNEP-WCMC, 2013) considered climate change to be a threat to Antipatharia.

Trade: CITES annual reports have been received from the Dominican Republic for all years 2002 onwards, with the exception of 2003, 2005 and 2012. The Dominican Republic has not published any CITES export quotas for Antipatharia. According to data in the CITES Trade Database, no direct trade in Antipatharia was reported by the Dominican Republic over the period 2002-2012. Direct trade reported by the only importer, the United States, comprised 1464 raw corals, reported at the order level and of unknown source, imported directly from the Dominican Republic for commercial purposes in 2003, and seized/confiscated *Abyssopathes lyriformis* carvings also imported directly from the Dominican Republic in 2007 (57 carvings) and 2008 (two carvings). No indirect trade in Antipatharia originating in the Dominican Republic was reported 2002-2012.

The CITES MA of the Dominican Republic confirmed that there was no legal trade in Antipatharia and no evidence of illegal trade (*in litt.* to UNEP-WCMC, 2013).

Management: The CITES MA of the Dominican Republic confirmed that the harvest of Black coral is prohibited on the basis of Decree No. 318 of 1986 (*in litt.* to UNEP-WCMC, 2013). Law No. 307 of 2004 extended the prohibition to all species of corals, living or dead; permits are required for any harvest (Dominican Republic, 2004).

Of the Dominican Republic's reef area, 43 per cent was reported to be inside Marine Protected Areas (MPAs) (Burke and Maidens, 2004). However, the level of protection afforded to Black coral through MPAs is unclear.

FIJI

Distribution in range State: Lewis (1985 in: Richards *et al.*, 1994) reported two Black coral species from the country. Antipatharia corals were recorded at all six sites in a study of coral reefs in the Mananuca islands off the west coast of Fiji during 2002 to 2003 (Comley *et al.*, 2003), normally on outer reef slopes and high current environments (J. Comley, pers. comm. to UNEP-WCMC, 2013).

Population trends and status: In the 1980s, Antipatharia resources in Fiji were described as considerable but lightly exploited (Anon., 1984 in: UNEP/IUCN, 1988), and "widely, but patchily distributed", but limited and vulnerable to overexploitation (Lewis, 1985 in: Richards *et al.*, 1994). More recently, they were described as "frequent" in the Castaway Reef Complex, but less abundant at Malalo island in the same reef zone (Comley *et al.*, 2003). J. Comley (pers. comm. to UNEP-WCMC, 2013) considered Antipatharia as fairly uncommon overall, though locally common.

Chin *et al*. (2011) considered the status of coral reefs in Fiji to be stable overall. No information on the status of deeper water coral communities could be located.

Threats: Teh *et al.* (2007) stated that international trade in Fiji's coral reef resources was likely exacerbating overexploitation of already stressed reef ecosystems. Localised threats to Fijian coral reefs included fishing, sedimentation, pollution from land-based sources, coastal development and population growth (Nair, 2003; Chin *et al.*, 2011). The relative impact and cumulative effects of these threats on Antipatharia is unclear.

Trade: CITES annual reports have been received from Fiji for all years 2002 onwards with the exception of 2003, 2011 and 2012. Fiji has not published any CITES export quotas for Antipatharia. According to data in the CITES Trade Database, direct trade in Antipatharia originating in Fiji 2002-2012 was all reported at the order level, consisting of two wild-sourced raw corals and one wild-sourced carving exported for personal purposes in 2002 and 2005, respectively, as well as the seizure/confiscation of three raw corals and 28 g of raw corals in 2005 and 2009, respectively. The wild-sourced trade was reported by Fiji only, while the seizures/confiscations were reported by the importer, New Zealand. No indirect trade in Antipatharia originating in Fiji was reported 2002-2012.

J. Comley (pers. comm. to UNEP-WCMC, 2013) reported that Antipatharia was not traded as live specimens, but a few hundred curios and handicrafts were sold in local markets each year. Earlier assessments considered the Black coral market in Fiji as modest (Harper, 1988; UNEP/IUCN, 1988c). Black corals were reported to have been collected for jewellery from the mid-1980s to 1990 (Lovell, 2001) and processed on a small scale (Veitayaki *et al.*, 1995), but harvest was reported to have subsequently ceased (Lovell, 2001).

Management: The Endangered and Protected Species Regulations of 2003 limit the export of Black corals to no more than two legally acquired beach-washed items per person (Fiji,

2003). Cabinet Guidelines for the exploitation of Antipatharia in Fiji were reported to prohibit the export of unprocessed products, mechanical harvest or the use of destructive drag-nets for commercial harvest (Richards *et al.*, 1994). Captive breeding and artificial propagation of corals must be notified to the CITES MA (Fiji, 2003).

Reef management in Fiji is largely driven by traditional communities establishing their own marine protected areas, or by Fiji Locally Managed Marine Areas (FLLMAs), of which there are 205 sites; full government gazetting was reported to be slow (Sykes and Morris, 2009). FLLMA protection ranges from non-take to collection for a limited duration or specific species only (Sykes and Morris, 2009). Whilst 32 per cent of Fiji's reef area was reported to be included within marine protected areas (MPAs), management was reportedly effective for 0.3 per cent of reefs; partially effective for 21 per cent, not effective for 0.2 per cent and of unknown effectiveness for 11 per cent (Chin *et al.*, 2011). However, the level of protection afforded to Black coral through LMMA's is unclear.

PANAMA

Distribution in range State: Opresko (1976) reported *Antipathes panamensis* and *Arachnopathes ericoides* from the Pearl islands, Gulf of Panama. Lutz and Ginsberg (2007, and references therein) confirmed the presence of *Antipathes lenta* and *A. gracilis* in the country.

Population trends and status: No information on the population trend and status in Panama could be located.

Coral cover in 2008 was found to be stable overall, although it had deteriorated at some reefs, while increased at others (Rodrigues-Ramirez *et al.*, 2008). No information on the status of deeper water coral communities could be located.

Threats: Panama's coral reefs were reported to be under very high pressure from natural impacts, such as crown-of-thorns starfish (*Acanthaster planci*), and increasing human activities, such as sedimentation and pollution (NOAA, 2012). Garzón-Ferreira *et al.* (2002) reported that uncontrolled tourism in Bocas del Toro, on the Caribbean coast of Panama, had led to increased coral collection in general, over-fishing, direct damage to corals by divers, anchors and boats, sewage pollution and sedimentation. The relative impact and cumulative effects of these threats on Antipatharia is unclear.

Trade: CITES annual reports have been received from Panama for all years 2002 onwards with the exception of 2009 and 2012. Panama has not published any CITES export quotas for Antipatharia. According to data in the CITES Trade Database, no direct or indirect trade in Antipatharia originating in Panama was reported 2002-2012.

Management: The use of marine resources in MPAs is regulated according to the management plan of each area (Panama, 2006). The second largest coral reef in the eastern Pacific (Bahia Damas) was reported to be fully protected within the Coiba National Park, which is managed by the National Authority of the Environment and accessible only by permit (NOAA, 2012). Garzón-Ferreira *et al.* (2002) reported the presence of ten MPAs, and 11 per cent of Panama's reef area was reported to be inside MPAs, with inadequate or unknown management effectiveness for three of the four MPAs assessed (Burke and Maidens, 2004). However, the level of protection afforded to Black coral through MPAs is unclear.

PAPUA NEW GUINEA

Distribution in range State: UNEP/IUCN (1988c) reported populations from the eastern areas and islands of Papua New Guinea, namely Central Province, Manus, New Ireland, East New Britain, the North Solomons, Milne Bay and Salamaua Peninsula.

Population trends and status: In 1988, Antipatharia was described as "comparatively abundant" in Papua New Guinea in areas where there had been little exploitation (UNEP/IUCN, 1988c). No more recent information could be located.

Chin *et al*. (2011) considered the status of corals reefs to be stable, although locally affected by land-based pollution and overfishing. No information on the status of deeper water coral communities could be located.

Threats: Around 55 per cent of reefs in Papua New Guinea were rated as threatened by local human activities, the most pervasive threat being overfishing (Burke *et al*., 2012). Damage to reefs from sediment, pollution and overfishing was also reported, along with an increase in harvest pressure (Chin *et al*., 2011). The relative impact and cumulative effects of these threats on Antipatharia is unclear.

Trade: CITES annual reports have been received from Papua New Guinea for all years 2002-2011. Papua New Guinea has not published any CITES export quotas for Antipatharia. According to data in the CITES Trade Database, trade in Antipatharia originating in Papua New Guinea 2002-2012 was all wild-sourced and exported directly from Papua New Guinea for personal or scientific purposes (Table 2). The majority of the trade was reported by Papua New Guinea only; no trade has been reported since 2009.

Table 2. Direct exports of the order Antipatharia from Papua New Guinea, 2002-2009. All trade was wild-sourced. (Papua New Guinea's annual report for 2012 has not yet been received; no trade was reported in 2005-2008 or 2010-2012.)

Taxon	Term	Purpose	Reported by	2002	2003	2004	2009	Total
Antipatharia spp.	carvings	P	Importer					
			Exporter			2		2
	raw corals	P	Importer				1	1
			Exporter		4			4
	specimens	P	Importer					
			Exporter	1		17	3	21
Antipathes spp.	raw corals	S	Importer					
			Exporter		13			13
Cirrhipathes spp.	raw corals	S	Importer					
			Exporter		10			10

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

In the 1980s and 1990s, Black coral was reportedly processed on a small scale in the country (Veitayaki *et al*., 1995) and a small jewellery industry was reported to use Antipatharia which was mainly sourced from the Central Province (Wells, 1982 in: UNEP/IUCN, 1988).

Reports of illegal trade date back to the 1980s, when poaching of Antipatharia by fishing boats from Japan and Taiwan POC was reportedly occurring in many areas (S. Wells, 1982 in: UNEP/IUCN, 1988).

Management: The Fisheries Management Act (1998) regulates fishing (including the harvest of corals) through licensing and gear restrictions, and bans the use of explosives or poison. Although the legislation in Papua New Guinea was considered to be strong, management was considered limited by low capacity and political will, along with poor access to remote reefs; furthermore there was reportedly no legislation specific to coral reef management (Chin *et al*., 2011).

A number of Locally Managed Marine Areas (Chin *et al*., 2011), and several marine parks were reported to have been designated in the country (SPREP, 1999). However, the level of protection afforded to Black coral through these measures is unclear.

PHILIPPINES

Distribution in range State: Black corals were recorded from the central Philippines from the Balicasag Municipal Reserve (UNEP/IUCN, 1988b) and the seas of Jagna town in Bohol (Chiu, 2012).

Population trends and status: The populations of Black corals in Jagna, Bohol, were reported to be in very good condition (Chiu, 2012). However, an ongoing study on population density and depth distribution found that species richness was low in Jagna (H. Suarez, *in litt.* to UNEP-WCMC, 2013).

The condition of coral reefs overall appears to have declined "over the last few decades" (since ~1980s) (Burke *et al.*, 2012). No information on the status of deeper water coral communities could be located.

Threats: The Philippines reefs were believed to be the second most highly threatened reefs in Southeast Asia (NOAA, 2012). The greatest contributor to reef degradation was reported to be destructive fishing; other threats identified were coastal development, agriculture, aquaculture and land cover change (Burke *et al.*, 2006). The relative impact and cumulative effects of these threats on Antipatharia is unclear.

Trade: CITES annual reports have been received from the Philippines for the years 2002-2007 and 2009. The Philippines has not published any CITES export quotas for Antipatharia. According to data in the CITES Trade Database, the Philippines has not reported any direct trade in Antipatharia from 2002 onwards. Direct trade in Antipatharia from the Philippines reported by the countries of import 2002-2012 primarily consisted of wild-sourced raw corals and carvings traded for commercial and personal purposes (Table 3). Notable quantities of raw corals were also reported as seizures/confiscations. All trade was reported by the United States.

Indirect trade in Antipatharia originating in the Philippines 2002-2012 consisted of 3175 wild-sourced *Cirrhipathes anguina* carvings reported by the country of import only in 2005, as well as small quantities of wild-sourced scientific specimens and seized/confiscated carvings and raw corals; no trade has been reported since 2009.

Table 3. Direct exports of the order Antipatharia from the Philippines, 2002-2011. All trade was reported by the importer. (Annual reports have not yet been received from the Philippines for the years 2008 or 2010-2012; no trade was reported in 2006, 2008 or 2012.)

Taxon	Term (units)	Source	Purpose	2002	2003	2004	2005	2007	2009	2010	2011	Total
Antipatharia spp.	carvings	W	P				1					1
		I	T	2								2
	raw corals	I	P						4	1		5
			T			996						996
	raw corals (kg)	I	P							4		4
Antipathes ceylonensis	carvings	W	T					418				418
Antipathes spp.	raw corals	W	P	1	20							21
		I	P					2				2
	specimens	W	S							10	27	37
Bathypathes spp.	specimens	W	S								1	1
Cirrhipathes spp.	live	W	E								5	5
	specimens	W	S								1	1
Parantipathes spp.	specimens	W	S								4	4

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Most coral harvest has been banned in the Philippines since the late 1990s (see management section). Prior to that, Black corals were reportedly collected in large amounts from deep waters for use in jewellery and sculpture (Carleton & Philipson, 1989 in: Veitayaki *et al.*, 1995).

TRAFFIC (2012) reported that illegal harvest of Black coral was taking place in the Philippines, with corals being sold in raw form for further processing in the country; Moro Gulf and the Sulu Sea were identified as harvest sites, and Cebu City, Cotabato City and Zamboanga as processing and manufacturing sites.

Management: Section 91 of the Philippine Fisheries Code of 1998 bans coral exploitation and exportation: it is unlawful to gather, possess, sell, or export semi-precious corals, whether raw or processed, except for scientific or research purposes; Section 92 bans fishing methods and gear that are destructive to coral reefs; Section 97 states that it is prohibited to take species listed in CITES (Philippines, 1998).

The populations of Black corals in Jagna, Bohol, were reported to be controlled by the Jagna Coastal Resource Management Council (Chiu, 2012).

The Bureau of Fisheries and Aquatic Resources was reported to have intensified its campaign against illegal and destructive fishing recently, together with the Philippine Coast Guard, local government units and other stakeholders (Paunan, 2012). Furthermore, the Philippine presidential palace was reported to have called for consumers to boycott jewellery made from Black coral in a bid to stop illegal harvest in the country (Avendaño, 2011).

The Philippines was reported to have the highest number of MPAs of the Southeast Asian countries (NOAA, 2012), with 28 MPAs designated at the national level and a further ~1000 designated at local levels (Green *et al.*, 2012). However, management effectiveness was rated as partial or inadequate for most MPAs (Burke *et al.*, 2006; BFAR, n.d.). Some "outstanding success stories" from local management of reefs, encouraged by the Philippine government, have been reported (BFAR, n.d.), but government agencies were generally considered to be understaffed and insufficiently funded for effective management and monitoring of coral reefs (Burke *et al.*, 2006; BFAR, n.d.). The level of protection afforded to Black corals through MPAs is unclear.

TAIWAN, PROVINCE OF CHINA

Distribution in Taiwan POC: The presence of Antipatharia in Taiwan POC was confirmed by Jones *et al.* (2000) and Wagner (2011). Some species have been described from southern Taiwan POC: *Antipathes* spp. were identified in Nanwan (Shih and Mok, 1996), and *Cirripathes spiralis* was described from Kenting National Park, where *C. anguina* was described as occasional, and *Antipathes densa* was described as uncommon (Anon, 1975); however no further information on the distribution of Black corals in Taiwan POC was located.

Population trends and status: No information on Antipatharia population trends and status was located.

Coral reefs were reported from all the waters around Taiwan POC, except the sandy area on the west coast (Dai *et al.*, 2005). A survey of 32 sites in eight regions between 1997 and 2004 found that living coral cover at 18 sites was less than 30 per cent, though some sites in southern Taiwan POC, had covers of more than 60 per cent (Dai *et al.*, 2005). Dai *et al.* (2005) found both increasing and decreasing trends in living coral cover at different sites from 1997 to 2004, with no significant changes overall. No information on the status of deeper water coral communities could be located.

Threats: No information on threats specific to Antipatharia was located. Burke *et al* (2006a) and Dai *et al.* (2005) considered all of Taiwan POC's reefs to be threatened. Main threats to coral reefs were considered to include overfishing, destructive fishing, pollution, nutrient enrichment, marine recreational activities, and coastal development (Burke *et al.*, 2006; NOAA, 2012).

Trade: The CITES annual reports of China do not include data on the trade of Taiwan POC. According to data in the CITES Trade Database, direct trade in Antipatharia from Taiwan, POC 2002-2012 reported by countries of import consisted primarily of wild-sourced carvings and raw corals traded for commercial purposes (Table 4). A notable quantity of carvings was reported as seized/confiscated in 2003. The top species in trade were *Antipathes densa* and *Cirrhipathes anguina* (both carvings and raw corals) and *Myriopathes japonica* (carvings only); a large proportion was also reported at the order level. The principal countries of import were Japan and the United States. Wild-sourced trade peaked in 2004 and subsequently declined overall, with very little trade reported from 2008 onwards.

Indirect trade in Antipatharia originating in Taiwan POC 2002-2012 primarily consisted of wild-sourced carvings traded for commercial purposes; trade peaked in 2006 and subsequently declined, with no indirect trade reported in 2011 or 2012.

Table 4. Direct exports of the order Antipatharia from Taiwan, Province of China, 2002-2011. The majority of trade was for commercial purposes. All trade was reported by the countries of import; the annual reports of China do not include data on the trade of Taiwan, Province of China. (No trade was reported in 2009 or 2012; quantities rounded to one decimal place, where applicable.)

Term	Units	Source	2002	2003	2004	2005	2006	2007	2008	2010	2011	Total
carvings	-	W	85809	222289	228701	223252	164329	1588	290			926258
		I	3	399				36				438
	kg	W	477.7	42.0	38.9	510.5	116.6					1185.6
derivatives	-	W		3840		775						4615
live	-	W	5236	1000		550						6786
raw corals	-	W	16004	21200	58944	9350	51199	45490				202187
		I					20					20
	kg	W		150.0	1416.3	610.0	1044.0	150.0		50.0		3420.3
		I									0.2	0.2

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Taiwan POC was reported to be the world's largest supplier of worked Black coral (Bruckner *et al.*, 2008) and Taipei was identified as a trade hub for processing, manufacturing and transit as well as the consumer/retail market (TRAFFIC, 2012). TRAFFIC (2012) reported that e-commerce sites have listed for sale Black coral 'trees' collected from near shore sites in Taiwan POC.

Huang and Ou (2010) reported that the scale of Taiwan POC's licenced precious coral fisheries industry had declined since 1979, but this was accompanied by an increase in illegal, unreported and unregulated (IUU) coral fishing. In 2007 there were three authorised coral fishing vessels, but 96 active IUU vessels had also been identified as operating in waters of Taiwan, POC (Fisheries Agency & Council of Agriculture, 2009 in: Huang and Ou, 2010). Reports of illegal trade included the discovery by the US Department of Justice (2013) of illegal imports of black coral into the United States from Taiwanese (POC) suppliers from 2007 to 2009; corals were believed to have been supplied from mainland China. In 2005, Cuba expressed doubts over the legitimacy of the CITES documents for a shipment of Antipatharia originating in Taiwan POC which was, via Dominica, destined for Cuba, and requested Taiwan POC's assistance to investigate (Huang and Ou, 2010). The resulting pressure on coral export companies led to a request for the government to address the stability of the precious coral fisheries industry in Taiwan POC (Huang and Ou, 2010).

Management: Concerns over the exploitation of precious corals led to the development of the Management Regulation for Fishing-Coral Fisheries Vessels adopted in 2009, which specifies regulations for coral fisheries licences:

Licences are valid for one year;

Designated areas for coral harvest (five, covering 7811 km^2 in total; three of which only permit coral harvest between September and April);

Timeframes of operation (220 days/year);

Annual limits for catch (200 kg) and export (120 kg) per vessel;

Designated dock areas for coral harvest and log books to be verified;

Regulated vessel monitoring and log books;

Vessels are subject to monitoring measures; and

Corals must be traded through designated fishery association meetings (Huang and Ou, 2010).

Since these regulations have been implemented, the number of licensed vessels has increased from three to 55 and a dedicated patrol boat has enforced regulations at sea (Huang and Ou, 2010).

Huang and Ou (2010) recommended that in addition to the measures adopted in 2009, for each coral species, minimum basal diameter and colony size and total allowable catch should be specified and that selective fishing methods should be used. The authors were concerned that the area designated for coral harvest was insufficient to be sustainable, the number of operating vessels and timeframes of operation too high, profitability overall poor and operative vessels inefficient (Huang and Ou, 2010).

In Taiwan POC, 14 per cent of the reef area was reported to be inside MPAs (Burke *et al.*, 2006). However, the management effectiveness of MPAs in Taiwan POC was rated as poor, with inadequate legal protection and lax enforcement (Burke *et al.*, 2006). The Department of Marine and Coastal Resources and several universities were reported to coordinate coral reef monitoring and management (Dai *et al.*, 2005). The level of protection afforded to Black coral through these measures is unclear.

VANUATU

Distribution in range State: Black coral has been reported from Espiritu Santo (the largest island of Vanuatu) (Bruce, 2010), including from President Coolidge and Million Dollar Point Reserve (southern part of the island) (UNEP/IUCN, 1988c).

Population trends and status: No information on trends and status of Antipatharia in Vanuatu was located.

Monitoring of coral reefs and reef resources was described as having been conducted on an ad hoc basis before 2001 (Raubani, 2009) and as a consequence, Chin *et al.* (2011) were unable to determine long-term trends on coral cover, health and resilience of reefs due to a lack of longer term data. No information on the status of deeper water coral communities could be located.

Threats: Threats to Vanuatu's coral reefs were reported to include coastal construction, land reclamation and impacts from land-based pollution sources (NOAA, 2012).

President Coolidge and Million Dollar Point Reserve suffered extensive hurricane damage in 1985, although Antipatharia in deeper water was reportedly unaffected (UNEP/IUCN, 1988c). Divers from visiting yachts were however reported to take Black coral from the reserve, prevention of which was reportedly hampered by a shortage of staff (UNEP/IUCN, 1988c).

Trade: CITES annual reports have been received from Vanuatu for all years 2002-2011. Vanuatu has not published any CITES export quotas for Antipatharia. According to data in the CITES Trade Database, direct trade in Antipatharia from Vanuatu 2002-2012 consisted of live and raw corals traded for commercial purposes, carvings traded for various non-commercial purposes, and scientific specimens (Table 5). The majority of the trade was reported at the order level. The principal countries of import were the United States and France. No direct trade has been reported since 2008.

Indirect trade in Antipatharia originating in Vanuatu 2002-2012 comprised small quantities of wild-sourced carvings and pre-Convention raw corals traded for non-commercial purposes in 2005 and 2007, respectively, reported at the order level by the country of re-export only.

Table 5. Direct exports of the order Antipatharia from Vanuatu, 2003-2008. (No trade was reported in 2002 or 2009-2012.)

Taxon	Term	Units	Source	Purpose	Reported by	2003	2004	2005	2006	2007	2008	Total
Antipatharia spp.	carvings	-	W	E	Importer					7		7
					Exporter							
			O	P	Importer							
					Exporter				2	7		9
				Q	Importer							
					Exporter					7		7
	live	-	W	T	Importer							
					Exporter	150						150
	raw corals	-	O	P	Importer							
					Exporter	1	1	1				3
Antipathes dichotoma	raw corals	kg	W	T	Importer						2	2
					Exporter							
	specimens	kg	O	S	Importer							
					Exporter						2	2
Antipathes grandis	raw corals	kg	W	T	Importer						4	4
					Exporter							
	specimens	kg	O	S	Importer							
					Exporter						4	4

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

The creation of President Coolidge and Million Dollar Point Reserve reportedly ended the semi-commercial collection of Black coral and allowed populations to recover (Power *in litt.*, 1987 in: UNEP/IUCN, 1988).

Management: The Department of Fisheries is responsible for the management and control of fishery resources in Vanuatu (Government of Vanuatu, 2010). The Fisheries Act No 55 (of 2005) prohibits the harvest of corals within marine reserves and the use of explosives or poison for fishing (Vanuatu, 2005).

The Department of Fisheries' National Marine Aquarium Trade Management Plan of 2009 prohibits the collection of wild corals from any marine park, sanctuary or community-protected area, in addition to tourist diving spots, and further prohibits the export of wild live corals except for "farmed" specimens, which should clearly show growth around their base and originate from known sources (Vanuatu Department of Fisheries, 2009). Kinch *et al.* (2011) reported that the Vanuatu Fisheries Department had imposed a ban on harvest and export of wild corals since the early 1990s. Harvest of corals and rocks are subject to licences and are restricted to hand collection by snorkelling; underwater breathing apparatus is also subject to licences (Government of Vanuatu, 2010).

According to Amos (2007), the Department of Fisheries initiated a Coral Reef Monitoring Program in 1998. Routine monitoring of the marine aquarium trade fishery was to be undertaken in line with the Vanuatu National Marine Aquarium Trade Management Plan (Vanuatu Department of Fisheries, 2009). Monitoring of coral reefs was noted to be sporadic and subject to a number of challenges (Chin *et al.*, 2011), mainly lack of funding and capacity (Whippy-Morris, 2009).

In 2009, Locally Managed Marine Areas were reported to cover 58 km^2 and 89 km^2 of marine areas were set aside as no-take zones (Govan, 2009). At least 80 villages were estimated to be managing MPAs (Chin *et al.*, 2011); MPAs in the country were reported to vary in effectiveness (Raubani, 2008, 2009). However, the level of protection afforded to Black coral through these measures is unclear.

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

CITES annual reports have not yet been received from the Bahamas for 2010, Cuba for 2011, the Dominican Republic for 2003 or 2005, Fiji for 2003 or 2011, Panama for 2008 or the Philippines for 2008, 2010 or 2011.

Concerns over illegal harvest or trade were raised for Cuba and the Philippines; illegal trade and IUU fishing may be of particular concern in Taiwan, POC.

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Catalaphyllia jardinei (Kent, 1893): Fiji
Caryophylliidae, Elegant Coral

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Catalaphyllia jardinei* (all range States) in the Review of Significant Trade as a priority species for review following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *C. jardinei* was identified as a species that met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009, and met the criterion of a sharp increase in trade in 2008, compared with average trade levels for 2003-2007 (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from Australia, Indonesia, Japan, Malaysia and Seychelles (AC26 Doc. 12.3). Fiji, Maldives, Papua New Guinea, Philippines and Viet Nam were retained in the process (AC26 Summary Record). Following the 26th meeting of the AC, Maldives, Papua New Guinea, Philippines and Viet Nam were removed from the process, on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Catalaphyllia jardinei* recommendation.

Range State	Provisional category	Summary
Fiji	Least Concern	Very low levels of international trade reported, with no trade since 2003. Population status unknown, and the basis of a non-detriment finding is unclear. On the basis of very low trade, categorised as Least Concern.

B. Species overview

Biology: The genus *Catalaphyllia* contains only one species, *C. jardinei,* which is zooxanthellate [in symbiosis with microalgae] (Veron, 2000) and ahermatypic [not a main contributor to the reef matrix] (Atkinson *et al.*, 2008b). Colonies are either free living or attached (Borneman, 2002), and mature colonies can reach 100 cm in diameter (Wood, 1983; E. Turak pers. comm. in Turak *et al.*, 2008). *C. jardinei* was reported to occur in shallow, tropical reef environments (Turak *et al.*, 2008) and protected, preferably turbid, water (Veron, 2000). The depth range of the species was reported to be 0-40 m (Turak *et al.*, 2008). Some authors considered *C. jardinei* to be a habitat specialist (Atkinson *et al.*, 2008a; Roelofs and Silcock, 2008), preferring soft bottom habitats such as grassbeds, algal flats and sandy or muddy substrates (Suharsano and Bruckner, 2008). Turak *et al.* (2008) reported that the species occurred in a variety of reef biotypes, but was especially common on soft substrates, rather than in areas of dense coral growth.

C. jardinei is a gonochoric [sexes separated in different individuals] species (Wabnitz *et al.*, 2003) with the age at sexual maturity roughly 3-8 years (Turak *et al.*, 2008), based on those for most reef building corals (Wallace, 1999). The average generation length was assumed to be 10 years (Turak *et al.*, 2008). *C. jardinei* was observed to be slow growing, with linear growth rate estimates of only 0.8-15.2 cm/year (Green and Shirley, 1999).

General distribution and status: The range of *C. jardinei* (Figure 16) comprises the Indo-West Pacific and oceanic west Pacific [central Indo-Pacific] (Turak *et al.,* 2008).

Figure 16. Global distribution of *Catalaphyllia jardinei*. Key: 0: not recorded, 1: confirmed record, 2: probable or predicted record. (Source: Veron *et al.*, 2013).

C. jardinei was described as widespread (Turak *et al.*, 2008) and conspicuous, although seldom common (Veron, 2000). Turak *et al.* (2008) considered the species to be rare throughout its range, while Veron (2000) reported it rare in the western Indian Ocean. Although specific population trends are unknown, reductions were inferred from declines in habitat quality (Wilkinson, 2004). The IUCN classify the species as Vulnerable, on the basis of inferred population reductions based on estimated habitat degradation and population loss of 36 per cent over three generation lengths (30 years), and threat susceptibility increasing the likelihood of the species being lost within one generation in the future from reefs at a critical stage (Turak *et al.*, 2008). Re-assessment in 10 years was considered important due to predicted threats from climate change and ocean acidification (Turak *et al.*, 2008).

Further information on the conservation status of corals is expected to become available in the near future on http://www.coralsoftheworld.com/.

Threats: Harvesting for the aquarium trade was reported as a principal threat (Turak *et al.*, 2008). Green and Shirley (1999) noted that corals of the genus *Catalaphyllia* were colourful and large polyped, making them attractive in the live aquarium trade.

Non-extractive threats to coral species, in general, were reported to include climate change, particularly due to increased sea temperatures and coral bleaching (stress-induced expulsion of symbiotic algae), and coral disease, as well as increased severity of ENSO (El Niño Southern Oscillation) events, storms and ocean acidification (Turak *et al.*, 2008). Compared with other coral species, *C. jardinei* was reported to have low susceptibility to coral bleaching (Roelofs and Silcock, 2008).

Additional localised events posing threats to coral reef communities included pollution, invasive species changing native species dynamics, as well as human development activities; however, the severity of these combined threats to the global population of *C. jardinei* were unknown (Turak *et al.*, 2008).

Overview of trade and management: *C. jardinei* was listed in CITES Appendix II on 18/01/1990. Harvested for the aquarium trade, the species was reported to be mainly collected from deepwater sites with sandy/silty substrates, where the species grows as small free-living colonies (Borneman, 2002). *C. jardinei* was considered to "survive robustly" in aquaria (Green and Shirley, 1999). Captive-propagated specimens of this species were considered to be "extremely uncommon" (Borneman, 2008). The European Union suspended trade in wild-sourced *C. jardinei* from Indonesia in 1999 and from the Solomon Islands in 2003; these suspensions remain in place under Commission Regulation (EC) No.

578/2013 of 17 June 2013 at the time of writing (September 2013). The European Union also temporarily suspended imports of *C. jardinei* from Fiji in 2003-2004 and Tonga in 2005-2006.

C. Country review

Fiji

Distribution in range State: Occurrence of *C. jardinei* in Fiji was reported by Lovell and McLardy (2008), based on the University of the South Pacific (USP) coral collection, which was initiated in 1972. No further records of the species' occurrence in the country could be located. The species was not recorded during surveys of the Mamanuca islands in the west of Fiji, Volivoli (Mani) in the north of the main Fijian island Viti Levu (Fenner, 2006a, 2006b), the Great Astrolabe Reefs (100 km south of Viti Levu) (Koven and Paulay, 1997; Obura and Mangubhai, 2003) or the North Astrolabe Reef (Obura and Mangubhai, 2003).

Population trends and status: No information on the population trend and status in Fiji could be located. However, the population status of the species was not believed to be of concern and it was estimated to be collected from less than two per cent of the reef area (J. Comley, pers. comm. to UNEP-WCMC, 2013).

Threats: *C. jardinei* was reportedly collected for international trade in Fiji (Lovell, 2003; Prasad, 2010), but a study conducted on behalf of the government focussing on issuing non-detriment findings for coral exports from Fiji (Nand, 2008) does not consider the species. The collection of reef resources for the aquarium trade was thought to be of potential concern (Chin *et al.*, 2011) and pose a moderate risk (Center for Ocean Solutions, 2009). Teh *et al.* (2007) stated that international trade in Fiji's coral reef resources was likely exacerbating overexploitation of already stressed reef ecosystems; however, no species-specific concerns were noted.

Localised threats to Fijian coral reefs included fishing, sedimentation, pollution from land-based sources, coastal development and population growth; these threats were noted to be increasing around populated areas (Nair, 2003; Chin *et al.*, 2011). Two thirds of Fiji's reefs were assessed as being threatened by local activities, with 34 per cent of reefs at medium threat, 21 per cent at high threat and 10 per cent at very high threat; reefs sites around Viti Levu were considered most at risk (Chin *et al.*, 2011). At all reef sites of Viti Levu, overfishing and sediment damage were assessed as a high threat (Sykes and Morris, 2009); Raymakers (2003) reported that virtually all collection of live corals took place on the island of Viti Levu due to the proximity of the international airport. Areas around Lautoka were affected by high levels of pollution and destructive fishing was a medium threat; in the south, these threats varied depending on reef location (Sykes and Morris, 2009). Coral reefs off Suva were noted as particularly degraded (Vuki *et al.*, 2000). Although destructive fishing methods, such as the use of poisons and dynamite, were prohibited by law, these practices were considered widespread throughout Fiji and a possible threat to coral reefs (Nair, 2003). Bleaching was also noted as a threat (Obura and Mangubhai, 2003). The relative impact and cumulative effects of these threats on *C. jardinei* is unclear.

Trade: CITES annual reports have been received from Fiji for all years 2002 onwards except 2003, 2011 and 2012. Fiji published a zero export quota for wild-sourced live or dead pieces of *C. jardinei* in every year 2003-2005; no export quotas have been published since. According to data in the CITES Trade Database, Fiji did not report any direct exports of *C. jardinei* over the period 2002-2012. According to data reported by countries of import, the 2003 zero quota appears to have been exceeded with the import of 100 wild-sourced, live corals and 50 wild-sourced, raw corals reported by Singapore and Japan, respectively. Although Fiji did not submit an annual report for 2003, the format of the export permit numbers reported by the countries of import suggests that the permits were issued by Fiji in 2003, although it is still possible that the actual trade did not take place. The only other direct trade in *C. jardinei* reported 2002-2011 was the import of 250 wild-sourced, raw corals by Japan and 50 wild-sourced, live corals by France (40 corals) and Germany (10 corals) in 2002; all trade was for

commercial purposes. No indirect trade in *C. jardinei* originating in Fiji was reported 2002-2012.

The direct export of small quantities of live, wild-sourced corals reported at the genus level (*Catalaphyllia* spp.) was reported between 2002 and 2007, totalling 81 corals according to data reported by countries of import and 17 corals according to data reported by Fiji. Indirect trade recorded at the genus level was reported in 2002 and 2003, involving small quantities of live, wild-sourced corals. As there is only one species in the genus, it can be inferred that this trade was in *C. jardinei.*

Management: Trade was reported to be managed through the setting of policies and guidelines within the Fisheries Act, including the restriction of the number of companies permitted to harvest live corals to two (Lovell and Whippy-Morris, 2008). Four companies were reported to harvest live rock (Kinch *et al.*, 2011) and operators were required to develop 'Collection Area Management Plans' for certification by the Fiji Marine Aquarium Council (MAC) (Lovell, 2009). Earlier assessments indicated that the ability of the government to monitor the harvesting and trade of coral was considered limited due to low capacity and inadequate financial resources (Nair, 2003). A revision of the legislative basis to govern trade in corals and other marine products was highlighted as a need (Manoa, 2008).

The main coral collection sites in Fiji are located off the coasts of Viti Levu: offshore from Lautoka in the north (Walt Smith International, WSI), and offshore from Deuba in the Beqa lagoon in the south (Aquarium Fish Fiji, AFF) (Lovell and McLardy, 2008; Nand, 2008).

On the basis of a study that found greater coral abundance at randomly selected AFF and WSI collection sites (representing more than 60 and 80 per cent of collection area sites, respectively) compared with randomly selected non-collection sites, Nand (2008) reported that the aquarium industry had minimal impact on coral stocks in Fiji. However, the author recommended further long-term monitoring and improvement of the survey methods (Nand, 2008).

Quotas were reviewed in 2009 by the Fiji Department of Fisheries and the University of the South Pacific's Institute of Marine Resources by undertaking coral assessments at WSI and AFF sites using survey methods approved by the Fijian Scientific Authority (Kinch *et al.*, 2011). Densities based on corals counted along belt transects (by genus or species category) were extrapolated to the wider collection area for the reef flat habitat and compared to percentage of corals collected by AFF in 2007 (Kinch *et al.*, 2011). It was concluded that collection levels of live coral were sustainable (less than 0.0085 per cent of total estimated colonies were exported) (Kinch *et al.*, 2011). The sustainable proportion of harvest of coral species from collection areas was believed to range from 0-3 per cent, depending on the species characteristics, abundance and size of the site (Parry-Jones, 2004).

Reef management in Fiji is largely driven by traditional communities establishing their own marine protected areas, or by Fiji Locally Managed Marine Areas (FLLMAs), of which there are 205 sites; full government gazetting was reported to be slow (Sykes and Morris, 2009). FLLMA protection ranges from non-take to collection for a limited duration or specific species only (Sykes and Morris, 2009). Whilst 32 per cent of Fiji's reef area was reported to be included within marine protected areas (MPAs), management was reportedly effective for 0.3 per cent of reefs; partially effective for 21 per cent, not effective for 0.2 per cent and of unknown effectiveness for 11 per cent (Chin *et al.*, 2011).

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

Some trade was reported at genus level despite the genus only containing one species; *Catalaphyllia* is not one of the genera for which identification to genus level is acceptable (CITES Notification No. 2012/047).

No CITES annual reports have been received from Fiji for three years (2003, 2011 and 2012).

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Euphyllia cristata Chevalier, 1972: Fiji, Solomon Islands, Vanuatu, Viet Nam

Caryophylliidae, White Grape Coral

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Euphyllia cristata* (all range States) in the Review of Significant Trade as a priority species, following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *E. cristata* was identified as a species that met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009 (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from Australia, China, Indonesia, Japan and the United States of America (hereafter referred to as the United States) (AC26 Doc. 12.3). Fiji, Papua New Guinea, Philippines, Solomon Islands, Vanuatu and Viet Nam were retained in the process (AC26 Summary Record). Following the 26th meeting of the AC, although Papua New Guinea and the Philippines were removed from the process on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Euphyllia cristata* recommendations.

		General summary
		Widespread but rare. Categorised as Vulnerable in the IUCN Red List. Population declines reported in some areas.
Range State	**Provisional category**	**Summary**
Fiji	Least Concern	Low levels of trade, with the exception of 2002 and 2003 when considerable quantities were traded at genus level. Trade within quotas in most years. Appears to be fairly common overall, although locally rare and patchily distributed. Given the low levels of trade 2004-2011, categorised as Least Concern.
Solomon Islands	Least Concern	Virtually no international trade reported, with the exception of 2002 and 2003, when considerable quantities were traded at genus level. Population status is unclear. The collection of corals for the aquarium trade was thought to be of concern in the Solomon Islands. On the basis of virtually no trade, categorised as Least Concern.
Vanuatu	Least Concern	Very low levels of trade 2002-2011. Unclear population status but good overall coral cover. On the basis of very low levels of trade, categorised as Least Concern.
Viet Nam	Least Concern	Virtually no international trade 2002-2012. Widespread but with unclear population status. Harvest and trade in wild corals has been prohibited since 2003. On the basis of virtually no international trade, categorised as Least Concern.

B. Species overview

Biology: *E. cristata,* a zooxanthellate [in symbiosis with microalgae] (Veron, 2000) and ahermatypic [not a main contributor to the reef matrix] species (Atkinson *et al.*, 2008), inhabits all reef areas at depths of 1-35 m (Turak *et al.*, 2008). Veron (2000) noted that it occurred in shallow reef environments.

The species usually exists in small colonies consisting of attached single polyps (Turak *et al.*, 2008). *E. cristata* is a gonochoric [sexes separated in different individuals] species (Wabnitz *et al.*, 2003), and the age at sexual maturity is assumed to be 3-8 years (Turak *et al.*, 2008) based on that for most reef building corals (Wallace, 1999). The average generation length was assumed to be 10 years (Turak *et al.*, 2008). Green and Shirley (1999) observed that *Euphyllia* species were the fastest growing species of the main Scleractinian corals in international trade, with minimum area growth rates of 96.5 cm^2 per year.

General distribution and status: The range of *E. cristata* (Figure 17) comprises the Indo-West Pacific, including east Africa, the Andaman Sea, the central Indo-Pacific, Australia, South-east Asia, southern Japan and the East China Sea, as well as the oceanic West Pacific (Turak *et al.*, 2008). It was also reportedly known from American Samoa (Fenner pers. comm. in: Turak *et al.*, 2008).

Figure 17. Global distribution of *Euphyllia cristata.* Key: 0: not recorded, 1: confirmed record, 2: probable or predicted record. (Source: Veron *et al.*, 2013).

The species was described as widespread and rare throughout its range (Turak *et al.*, 2008) and as uncommon but conspicuous (Veron, 2000). Although specific population trends are unknown, reductions were inferred from declines in habitat quality (Wilkinson, 2004). The IUCN classified the species as Vulnerable based on estimated habitat degradation, an inferred population reduction of 36 per cent over three generations (30 years) and threat susceptibility increasing the likelihood of the species being lost within one generation in the future from reefs at a critical stage (Turak *et al.*, 2008). Re-assessment in 10 years was considered important due to predicted threats from climate change and ocean acidification (Turak *et al.*, 2008).

E. cristata was estimated to be "more likely than not" to fall below a critical risk threshold, meaning that extinction is likely by 2100, although some uncertainly in the assessment was noted (Brainard *et al.*, 2011).

Further information on the conservation status of corals is expected to become available in the near future on http://www.coralsoftheworld.com/.

Threats: *E. cristata* was considered heavily harvested for the aquarium trade (Turak *et al.*, 2008). Green and Shirley (1999) noted that corals of the genus *Euphyllia* were frequently colourful and large polyped, making them attractive in the live aquarium trade. According to Bruckner (2000), *Euphyllia* species are amongst the most abundant corals in trade, partly because they must be continually replaced as they survive poorly in captivity, are also easily damaged during collection, are susceptible to disease and acclimatise badly to artificial conditions.

Non-extractive threats to coral species were reported to include climate change, leading to increased sea temperatures and coral bleaching (stress-induced expulsion of symbiotic algae) and coral disease, as well as increased severity of ENSO (El Niño Southern Oscillation) events, storms and ocean acidification (Turak *et al.*, 2008). *E. cristata* was reported to be particularly susceptible to coral disease and bleaching (Wilkinson, 2004). However, Rachello-Dolmen and Cleary (2007) considered *Euphyllia* species to be "stress tolerators", able to occur in areas of high sedimentation or eutrophication, and Roelofs and Silcock (2008) considered the genus to have low susceptibility to coral bleaching.

Additional localised events that could threaten coral reef communities included pollution, invasive species changing native species dynamics, as well as human development activities; however, the severity of these combined threats to the global population of *E. cristata* was unknown (Turak *et al.*, 2008).

Overview of trade and management: *E. cristata* was listed in CITES Appendix II on 01/08/1985. CITES Notification No. 2013/035 provides a list of stony coral genera for which identification to genus level is acceptable for the purpose of implementing Resolutions Conf. 11.17 (Rev. CoP16) and Conf. 12.3 (Rev. CoP16). This includes the genus *Euphyllia* (applicable to dead corals only). The notification states that these taxa should nevertheless be identified to species level where feasible. The trade accounts below therefore include a summary of trade reported at the genus level.

The European Union suspended trade in wild-sourced *Euphyllia* spp. from Indonesia in 2000; this suspension remains in place at the time of writing (September 2013) under Commission Regulation (EC) No. 578/2013 of 17 June 2013.

C. Country reviews

Fiji

Distribution in range State: Occurrence of *E. cristata* in Fiji was confirmed by Veron (2000). The species was reported from the Mamanuca islands in the west of Fiji (Nuku, Sunflower, Honeymoon, Wadigi) and Volivoli (Mani) in the north of the main Fijian island Viti Levu (Fenner, 2006a, 2006b). It was also recorded from the Great Astrolabe Reefs (100 km south of Viti Levu) (Koven and Paulay, 1997), although it was not reported to be present on the Great and North Astrolabe Reefs by Obura and Mangubhai (2003).

Population trends and status: No population estimates were identified for the Fijian population of *E. cristata*. The species was considered to be fairly common in the country (J. Comley, pers. comm. to UNEP-WCMC, 2013) but was recorded as 'rare' at each site surveyed at Volivoli beach in the north of Viti Levu (Fenner, 2006a, 2006b). According to Nand (2008), *Euphyllia* species showed a patchy distribution pattern at Aquarium Fish Fiji (AFF) collection sites surveyed in the south (covering Beqa, Yanunca, Navua, Pacific Harbour and Serua), with total coral cover estimated at 112 405 m^2 based on an extrapolation of the areas surveyed. At the Walt Smith International (WSI) collection sites from Lautoka to the Yasawa group of islands in the western part of Fiji, total coral cover for *Euphyllia* spp. was estimated at 699 905 m^2 (Nand, 2008). Out of 29 CITES-listed coral taxa found during surveys (mostly only identified to genus level), *Euphyllia* species were amongst the least common at the two main collection areas (WSI and AFF) in Fiji (Nand, 2008). However, collection areas were noted to have a high coral diversity and abundance compared to other areas (Nand, 2008).

Chin *et al.* (2011) reported that Fiji's reefs had average coral cover of 45 per cent (range 8-60 per cent), which had remained unchanged from an earlier status report (Wilkinson, 2008). Monitoring data since 1999 suggested that Fijian reefs were in good condition, with strong resilience and recovery potential after coral bleaching events (such as in 2000 and 2002), as well as crown-of-thorns starfish [*Acanthaster planci*] outbreaks and cyclones (Lovell and Sykes, 2008; Sykes and Morris, 2009). Rapid coral re-growth in many areas following disturbance suggested a stable reef status with little evidence of widespread and prolonged stress, damage or loss of coral cover at surveyed reefs (Chin *et al.*, 2011).

Threats: The collection of reef resources for the aquarium trade was thought to be of potential concern (Chin *et al.*, 2011) and pose a moderate risk (Center for Ocean Solutions, 2009). Teh *et al.* (2007) stated that international trade for Fiji's coral reef resources, such as corals, was likely exacerbating exploitation of already stressed reef ecosystems. Raymakers (2003) reported that collection of live corals was mainly restricted to the island of Viti Levu due to the proximity of the international airport. No species-specific concerns were noted. The effects of trade on this species were, however, not considered to be of too much concern (J. Comley, pers. comm. to UNEP-WCMC, 2013).

Further information on threats to corals in Fiji is available in the Threats section on *Catalaphyllia jardinei*.

Trade: CITES annual reports have been received from Fiji for all years 2002 onwards except 2003, 2011 and 2012. Fiji published a CITES export quota for wild-sourced, live or dead pieces of *E. cristata* every year from 2003 onwards, with the exception of 2006 (Table 1). According to data in the CITES Trade Database, trade reported from 2002 onwards remained within the export quota in every year according to data reported both by countries of import and by countries of export, with the exception of 2009 when the quota was apparently exceeded by 46 pieces according to country of import reported data.

Table 1. CITES export quotas for wild-sourced, live or dead pieces of *Euphyllia cristata* from Fiji and global direct exports, as reported by the countries of import and of export, 2003-2013. (No quotas were published in 2002 or 2006; no annual reports have been received from Fiji for the years 2003 or 2011; trade data for 2012 and 2013 are not yet available.)

	Reported by	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (live and raw)		78	78	156	-	156	117	117	600	600	600	**600**
live corals	Importer	3		153	65	31		158		22		
	Exporter		21	49	36	2			6			
raw corals	Importer							5				
	Exporter											
Subtotals (live and raw corals)	Importer	3		153	65	31		163		22		
	Exporter		21	49	36	2			6			

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

No other direct trade in *E. cristata* from Fiji was reported 2002-2012. All trade in Table 1 was for commercial purposes; the principal country of import was the United States. Indirect trade in *E. cristata* originating in Fiji 2002-2012 consisted of small quantities of wild-sourced live and raw corals traded for commercial purposes in 2006, 2010 and 2011.

Direct trade from Fiji in *Euphyllia* reported at the genus level primarily comprised wild-sourced, live corals traded for commercial purposes, with notable quantities reported in 2002-2003 and relatively small quantities in subsequent years (Table 2). Indirect trade in *Euphyllia* reported at the genus level originating in Fiji also mainly comprised wild-sourced, live corals traded for commercial purposes; no indirect trade was reported from 2005 onwards.

Table 2. Direct exports from Fiji of *Euphyllia* reported at the genus level, 2002-2011. (No trade was reported in 2007-2008, 2010 or 2012; no annual reports have been received from Fiji for the years 2003, 2011 or 2012.)

Term	Source	Purpose	Reported by	2002	2003	2004	2005	2006	2009	2011	Total
live	W	T	Importer	2205	1590	4		11		4	3814
			Exporter	1663					20		1683
	I	T	Importer						5	25	30
			Exporter								
raw corals	W	E	Importer								
			Exporter	2							2
		T	Importer	8			15				23
			Exporter								

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: General information on management relating to corals in Fiji is available in the Management section on *Catalaphyllia jardinei*.

According to a Department of Fisheries study on non-detriment findings for corals in Fiji, an average of 1767.5 [presumably live corals] of *Euphyllia* spp. were collected for export annually, which was reported to represent 2.11 per cent of the wild stock, estimated to be approximately 83 900 live corals in the collection sites (Nand, 2008).

The sustainable proportion of harvest of coral species from collection areas was believed to range from 0-3 per cent, depending on the species characteristics, abundance and size of the site (Parry-Jones, 2004).

SOLOMON ISLANDS

Distribution in range State: Occurrence of *E. cristata* in the Solomon Islands was confirmed by Veron (2000) and Veron and Turak (2006). It was recorded at 59 out of 113 sites surveyed on the nine major islands of the main island chain of the Solomon Islands (Turak, 2006).

Population trends and status: No population estimates or trends were identified for *E. cristata* in the Solomon Islands. *E. cristata* was not considered abundant at any of the sites surveyed of the nine major islands in 2004 (Turak, 2006).

Limited monitoring data are available to assess coral reef status in the Solomon Islands, although high coral cover in the Western Province and general health indicated that the status may be stable and corals potentially highly resilient (Chin *et al.*, 2011). The Solomon Islands coral reef area was estimated at 5750 km^2, with an average coral cover of 30 per cent (Wilkinson, 2008) and coral reef communities were reported to be in good condition overall (Turak, 2006).

Threats: The extraction of live corals for the growing international aquarium trade was reported to be of concern, with collectors observing declines in abundance for some corals (Albert *et al.*, 2012) and villagers reporting local depletion of reefs due to coral extraction in Nggela (Sulu *et al.*, 2000). Coral collection appears to be limited to certain reef areas, and on a national scale, the impact on reefs was considered limited and localised (Albert *et al.*, 2012). Collection of live coral for lime production was predicted to negatively affect coral reef communities (Veron and Turak, 2006), although coral collection for lime predominantly comprised *Acropora* spp. (Spalding *et al.*, 2001; Albert *et al.*, 2012).

Burke *et al.* (2011) considered overfishing/destructive fishing and land-based pollution to be the main threats to coral reefs in the Solomon Islands, with other pressures predicted to increase rapidly due to rapid (human) population growth. Logging was reported as an additional threat (Veron and Turak, 2006; Kere, 2008), as were natural impacts such as climate change (Albert *et al.*, 2012) and damage by crown-of-thorns starfish [*Acanthaster planci*] (Green *et al.*, 2006). Seventy-one per cent of the country's reefs were assessed as being threatened by local activities, with 42 per cent of reefs at medium threat, 24 per cent at high threat and 6 per cent at very high threat; risks to reefs overall were thought likely to be increasing (Chin *et al.*, 2011).

Trade: The Solomon Islands became a Party to CITES in 2007; CITES annual reports have been received for the years 2008-2010. The Solomon Islands has not published any CITES export quotas for *E. cristata*. According to data in the CITES Trade Database, direct trade in *E. cristata* from the Solomon Islands 2002-2012 comprised live, wild-sourced corals imported for commercial purposes in 2006 (16 corals) and 2007 (20 corals) by the United States and Japan, respectively, all reported by the countries of import only. No indirect trade in *E. cristata* originating in the Solomon Islands was reported 2002-2012.

Direct trade from the Solomon Islands in *Euphyllia* reported at the genus level 2002-2012 primarily comprised wild-sourced, live corals traded for commercial purposes, with notable quantities reported in 2002-2003 and relatively small quantities in subsequent years (Table 3). Indirect trade in *Euphyllia* reported at the genus level originating in the Solomon Islands also mainly comprised wild-sourced, live corals traded for commercial purposes; no indirect trade was reported from 2005 onwards.

Table 3. Direct exports of *Euphyllia* reported at the genus level from the Solomon Islands, 2002-2011. All trade was for commercial purposes. (No trade was reported in 2007 or 2012; the Solomon Islands became a Party to CITES in 2007 and has submitted annual reports for the years 2008-2010.)

Term	Source	Reported by	2002	2003	2004	2005	2006	2008	2009	2010	2011	Total
live	W	Importer	4361	8526	2	75	351	10				13325
		Exporter							245	260		505
	C	Importer	16									16
		Exporter										
	I	Importer							2	22	5	29
		Exporter										
raw corals	W	Importer	350			20						370
		Exporter										

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *E. cristata* does not appear to be specifically protected by Solomon Islands law. The Wildlife Protection and Management Act 1998 implements the requirements of CITES, however it does not appear to restrict the trade and export of corals (Solomon Islands, 1998b), while the Fisheries Act 1998 prohibits the export of live corals without a licence (Solomon Islands, 1998a). Albert *et al.* (2012) reported that the export of corals in the Solomon Islands is regulated by using a quota approach, but considered that little information had been collected on the sustainability of coral harvesting for the aquarium and curio trade. One operator (Aquarium Arts Solomon Islands) was reported to hold a licence to export live corals and a further two operators had licences to export curios (Trinidad *et al.*, 2012).

Live corals destined for the aquarium trade were reported to be mainly extracted from Nggela in the Florida islands (Central Province), with smaller quantities from the Marau Sound and in and around the capital, Honiara (Sulu *et al.*, 2000; Kinch, 2004; Lal and Kinch, 2005), thus limiting the impact of harvest to localised areas (Albert *et al.*, 2012).

The Solomon Islands Coral Reef Monitoring Network monitors a number of reef locations in the country (Chin *et al.*, 2011), although these do not appear to include the Nggela area. Albert *et al.* (2012) identified a need for comprehensive baseline coral assessments at primary harvest sites focusing on coral species targeted for the trade as part of a proposed National Coral Management Plan, noting the lack of information on status of coral reefs in extraction areas.

The understanding of national fisheries regulations and resource management issues was reported to be poor locally, with extensive coastlines leading to difficulties with the enforcement of fisheries regulations (Pacific Horizon Consultancy Group, 2008; Wilkinson, 2008). Whilst the use of dynamite fishing is banned under the Fisheries Act (1998), the practice was still reported to occur locally (Albert *et al.*, 2012).

Traditional management through tenure and ownership (Spalding *et al.*, 2001; Green *et al.*, 2006) was considered very important for the management of coral reefs (Sulu *et al.*, 2000), allowing reef owners to declare short term protected areas or closed/open zones (Ramhoia, 2005). Community managed marine conservation areas have been established in Marau Sound, Ngella, Marovo Lagoon, Tetepare, Roviana Lagoon and Gizo, and the incorporation of these areas within larger, legalised marine protected

area network was suggested by Green *et al.* (2006). Govan (2009) reported that there were 115 no-take zones within 22 protected areas, 113 Locally Managed Marine Areas (LMMA) and 109 community conserved areas with a marine component in the Solomon Islands. Although community management efforts such as the LMMA's were considered to be promising, the overall efficacy of management was unknown and further studies of these systems were recommended (Chin *et al.*, 2011).

A National Plan of Action (NPOA) for the regional Coral Triangle Initiative has been developed, focusing on community-based management to achieve sustainable use of marine resources and biodiversity conservation (MECM/MFMR, 2010). Prioritised national actions included: development of protected areas legislation and establishment and effective management of Marine Protected Areas, developing best practice and guidance for community fishery management, implementing surveys for priority species and collating information on threatened species in a national list (MECM/MFMR, 2010). Burke *et al.* (2011) estimated that six per cent of the Solomon Islands reefs were protected.

Albert *et al.* (2012) reported that coral farming for the aquarium trade was established in the country.

VANUATU

Distribution in range State: Occurrence of *E. cristata* in Vanuatu was confirmed by Veron (2000). It was collected from Southern Aneityum in the south of Vanuatu (Veron, 1990).

Population trends and status: The species was noted to be rare in Vanuatu (Veron, 2000). No further information on population trends or status could be located.

Chin *et al.* (2011) reported that there is generally good coral cover on Vanuatu's reefs, but that no long-term monitoring data were available to determine resilience, long-term trends or the overall status of coral reefs, although recovery after destructive events had been observed locally. Signs of declines in Vanuatu's coral reef habitats were reported by Naviti and Aston (2000).

Threats: Over-exploitation was considered a major threat to Vanuatu's reefs (Raubani, 2009; Whippy-Morris, 2009). Coral harvesting in Vanuatu was thought to have had a very limited negative impact (Center for Ocean Solutions, 2009; Raubani, 2009), and the level of exploitation was not considered to be a threat (Amos, 2007). However, the absence of monitoring and strict management was thought to possibly pose a threat to corals, and it was recommended that the resource be safeguarded immediately (Amos, 2007). Coral mining was noted to be of concern, with collection of reef resources for the aquarium trade of potential concern (Chin *et al.*, 2011).

Another threat included coral reef damage through destructive fishing methods (Amos, 2007), although these practices were considered uncommon (Pakoa, 2007; Raubani, 2009). Sedimentation and eutrophication were reported as primary concerns in urban areas, in addition to climate change (Naviti and Aston, 2000). Ninety-two per cent of the country's reefs were assessed as being threatened by local activities, with 37 per cent of reefs at medium threat, 41 per cent at high threat and 14 per cent at very high threat; risks to reefs overall were thought likely to be increasing (Chin *et al.*, 2011).

Trade: CITES annual reports have been received from Vanuatu for all years 2002-2011. Vanuatu has not published any CITES export quotas for *E. cristata*. According to data in the CITES Trade Database, direct trade in *E. cristata* from Vanuatu was reported in the years 2007-2009 only, and consisted of captive-produced and wild-sourced corals traded for commercial purposes (Table 4). The principal country of import was the United States. No indirect trade in *E. cristata* originating in Vanuatu was reported 2002-2012.

Table 4. Direct exports of *Euphyllia cristata* from Vanuatu, 2007-2009. All trade was for commercial purposes. (Vanuatu's annual report for 2012 has not yet been received; no trade was reported in 2002-2006 or 2010-2012.)

Term	Source	Reported by	2007	2008	2009	Total
live	W	Importer	3	31	6	40
		Exporter	6			6
	C	Importer				

Term	Source	Reported by	2007	2008	2009	Total
		Exporter	21	77		98
	F	Importer			7	7
		Exporter				
raw corals	F	Importer				
		Exporter			12	12

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Direct trade from Vanuatu in *Euphyllia* reported at the genus level 2002-2012 primarily comprised wild-sourced, live corals traded for commercial purposes in 2003; small quantities of captive-produced, raw and live corals and wild-sourced scientific specimens were also reported (Table 5). No indirect trade in *Euphyllia* reported at the genus level originating in Vanuatu was reported 2002-2012.

Table 5. Direct exports of *Euphyllia* reported at the genus level from Vanuatu, 2003-2010. (Vanuatu's annual report for 2012 has not yet been received; no trade was reported in 2002, 2004-2005 or 2011-2012.)

Term	Source	Purpose	Reported by	2003	2006	2007	2008	2009	2010	Total
live	W	T	Importer	44						44
			Exporter	240						240
	F	T	Importer					2		2
			Exporter							
	I	T	Importer				1			1
			Exporter							
raw corals	F	T	Importer							
			Exporter						20	20
specimens	W	S	Importer			1				1
			Exporter		1					1

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Corals were reported to be collected to a limited extent for the local tourist trade in the country (Amos, 2007).

Management: The Department of Fisheries is responsible for the management and control of fishery resources in Vanuatu (Government of Vanuatu, 2010). The Fisheries Act No 55 (of 2005) prohibits the harvest of corals within marine reserves and the use of explosives or poison for fishing (Vanuatu, 2005).

The Department of Fisheries' National Marine Aquarium Trade Management Plan of 2009 prohibits the collection of wild corals from any marine park, sanctuary or community-protected area, in addition to tourist diving spots, and further prohibits the export of wild live corals except for "farmed" specimens, which should clearly show growth around their base and originate from known sources (Vanuatu Department of Fisheries, 2009). Kinch *et al.* (2011) reported that the Vanuatu Fisheries Department had imposed a ban on harvest and export of wild corals since the early 1990s. Harvest of corals and rocks are subject to licences and are restricted to hand collection by snorkelling; underwater breathing apparatus is also subject to licences (Government of Vanuatu, 2010).

According to Amos (2007), the Department of Fisheries initiated a Coral Reef Monitoring Program in 1998. Routine monitoring of the marine aquarium trade fishery was to be undertaken in line with the Vanuatu National Marine Aquarium Trade Management Plan (Vanuatu Department of Fisheries, 2009). Monitoring of coral reefs was noted to be sporadic and subject to a number of challenges (Chin *et al.*, 2011), mainly lack of funding and capacity (Whippy-Morris, 2009).

In 2009, Locally Managed Marine Areas were reported to cover 58 km^2, and 89 km^2 of marine areas were set aside as no-take zones (Govan, 2009). At least 80 villages were estimated to be managing marine protected areas (Chin *et al.*, 2011); MPAs in the country were reported to vary in effectiveness (Raubani, 2008, 2009).

VIET NAM

Distribution in range State: Occurrence of *E. cristata* in Viet Nam was confirmed by Veron (2000). Tuan *et al.* (2005) recorded the species at Hon Mot in the Nha Trang Bay Marine Protected Area (MPA), Khanh Hoa province (south-central Viet Nam) and Latypov (2011) recorded the species off the Kondao (Con Dao) islands, south-eastern Viet Nam. The CITES Management Authority of Viet Nam reported a wide distribution, ranging from northern to southern Viet Nam, including Bach Long Vi, Con Co, Hon Mun, Con Dao and Phu Quoc islands (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

Whilst several species of *Euphyllia* spp. were recorded off Hon Nai island in Cam Ranh Bay (southern Viet Nam), *E. cristata* was not present (Latypov and Selin, 2012). *Euphyllia* spp. were recorded in Jiang Bo Reef (Latypov and Selin, 2008), and on the upper reefs slopes during surveys of the Tho Chau, Con Dao and Thu islands in southeast Viet Nam (Latypov and Selin, 2011).

Population trends and status: *E. cristata* was found to be rare in Nha Trang Bay MPA (Tuan *et al.*, 2005), while the genus was considered rather common at the Jiang Bo Reef (Latypov and Selin, 2008). No further information on population trends or status could be located.

Seventy per cent of Vietnam's reefs were considered to be in a 'fair' condition, while 20 per cent were described as 'poor' and one per cent as 'healthy' (Wilkinson, 2008). Knowledge of the extent, condition and composition of the coral reefs in Viet Nam was, however, considered to be very limited (Tran *et al.*, 2012). Local surveys indicated that coral communities at the Tho Chu, Con Dao and Thu islands in the Gulf of Siam and southern Viet Nam were in a good condition; local coral covers of between 10 and 90 per cent were recorded in 2010 (Latypov and Selin, 2011). While coral cover was reported to be stable in some areas, such as Con Dao MPA, it was found to have declined by 40 per cent at Bach Long Vi island and was considered to be declining over the country as a whole (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

Threats: Over-harvesting, habitat loss, pollution and natural disasters were identified as the main threats to coral reefs (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013), as was the impact of destructive fishing practises (Tuan *et al.*, 2006).

Trade: CITES annual reports have been received from Viet Nam for all years 2002-2011. Viet Nam has not published any CITES export quotas for *E. cristata*. According to data in the CITES Trade Database, no direct trade in *E. cristata* from Viet Nam was reported 2002-2012. Indirect trade in *E. cristata* originating in Viet Nam 2002-2012 consisted of two live, wild-sourced corals re-exported via the United States to the United Kingdom of Great Britain and Northern Ireland (hereafter referred to as the United Kingdom) for commercial purposes in 2007, reported by the country of import only.

Trade in *Euphyllia* reported at the genus level originating in Viet Nam 2002-2012 consisted of seized/confiscated corals imported directly from Viet Nam by the United States in 2006 (five live corals), 2008 (43 live corals and 32 raw corals) and 2011 (two live corals), and one wild-sourced, raw coral re-exported via the United States for commercial purposes in 2003.

Management: Several coral ecosystem monitoring activities have been implemented locally in Viet Nam (Tun, 2006); however, a lack of national monitoring and management of this species was noted (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

The CITES MA of Viet Nam confirmed that the harvest and trade of wild stony corals had been prohibited since 2003, as laid down in the Fishery Law 2003; any trade would have to comply with CITES and Vietnamese regulations (CITES MA of Viet Nam, *in litt.* to UNEP-WCMC, 2013).

Protective measures were reported to have improved the status of reefs at Hon Mun, Bach Long Vi and Con Dao islands, as well as Noi reef (Latypov and Selin, 2012). In 2010, the development of 16 MPAs was approved by the Government (Decision No. 742/QD-TTg), eight of which had been formally designated by 2013; the number of MPA's was planned to increase to 20 by 2020 (Directorate of Fisheries, 2013).

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

Some trade was reported at genus level for live *Euphyllia* specimens, which is not in accordance with CITES Notification No. 2013/035 and previous according Notifications.

No CITES annual reports have been received from Fiji for three years (2003, 2011 and 2012).

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Plerogyra simplex Rehberg, 1892: Fiji, Solomon Islands

Caryophylliidae

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Plerogyra simplex* (all range States) in the Review of Significant Trade as a priority species, following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *P. simplex* was identified as a species that met the criterion of a sharp increase in trade in 2008, compared to the previous five year average and met a high volume trade threshold for a globally threatened or near-threatened species in 2009 (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from Indonesia, Japan, Malaysia and the United States of America (hereafter referred to as the United States) (AC26 Doc. 12.3). The Cook Islands, Fiji, Kiribati, Papua New Guinea, Philippines, Solomon Islands, Vanuatu and Viet Nam were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, The Cook Islands, Kiribati, Papua New Guinea, Philippines, Vanuatu and Viet Nam were removed from the process on the basis of no commercial trade over the previous 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Plerogyra simplex* recommendations.

		General summary
		Widespread, but categorised as Near Threatened in the IUCN Red List based on habitat loss and population decline.
Range State	**Provisional category**	**Summary**
Fiji	Possible Concern	Moderate levels of international trade 2002-2012 in wild corals. Three possible quota excesses were reported in 2008, 2009 and 2010. The basis of non-detriment finding is unclear. Rare and patchily distributed. Therefore, categorised as Possible Concern.
Solomon Islands	Least Concern	Virtually no international trade 2002-2012 and very low levels of trade at genus level. Population status is unknown, but coral reefs overall are in good condition. The collection of corals for the aquarium trade was thought to be of concern in the Solomon Islands. On the basis of virtually no trade, categorised as Least Concern.

B. Species overview

Biology: *P. simplex,* a zooxanthellate [in symbiosis with microalgae] (Veron, 2000), ahermatypic [not a main contributor to the reef matrix] species (Atkinson *et al.*, 2008b) occurs in shallow, protected reef environments, especially in turbid water (Veron, 2000). Turak *et al.* (2008) reported that it occurs at depths of 3-30 m and that it was found on reef slopes, particularly from the mid to lower regions. Atkinson *et al.* (2008a) considered *Plerogyra* species to be habitat specialists, however Borneman (2002) reported that, in Indonesia, *Plerogyra* species occurred in most habitats, although primarily on fringing and patch reef slopes.

The age at sexual maturity was assumed to be 3-8 years (Turak *et al.*, 2008), based on estimates for most reef building corals (Wallace, 1999). The average generation length was assumed to be 10 years (Turak *et al.*, 2008).

General distribution and status: The range of *P. simplex* (Figure 18) comprises the Indo-West Pacific, south-east Asia, Japan and the East China Sea and the oceanic West Pacific (Turak *et al.*, 2008).

Figure 18. Global distribution of *Plerogyra simplex*. Key: 0: not recorded, 1: confirmed record, 2: probable or predicted record. (Source: Veron *et al.*, 2013).

Veron (2000) considered *P. simplex* to be uncommon, while Turak *et al.* (2008) reported it to be widespread and moderately common throughout its range.

Although specific population trends are unknown, reductions were inferred from declines in habitat quality; this species was, however, reported to be resilient to some threats and may survive in reefs at a critical stage of degradation (Wilkinson, 2004). *P. simplex* was thought to be more resilient to habitat loss and reef degradation due to an assumed large effective population size (Turak *et al.*, 2008). The IUCN classified the species as Near Threatened, based on estimated habitat loss and inferred population reduction loss of 19 per cent over three generation lengths (30 years), and moderate susceptibility of the species to a number of threats (Turak *et al.*, 2008). Re-assessment in 10 years was considered important, due to predicted threats from climate change and ocean acidification (Turak *et al.*, 2008).

Further information on the conservation status of corals is expected to become available in the near future on http://www.coralsoftheworld.com/.

Threats: *P. simplex* was reported to be heavily harvested for the aquarium trade (Turak *et al.*, 2008). Green and Shirley (1999) noted that corals of the genus *Plerogyra* spp. were colourful and large polyped, making them attractive in the live aquarium trade.

Non-extractive threats to coral species, in general, were reported to include climate change, leading to increased sea temperatures and coral bleaching (stress-induced expulsion of symbiotic algae) and coral disease, as well as increased severity of ENSO (El Niño Southern Oscillation) events, storms and ocean acidification (Turak *et al.*, 2008). However, Roelofs and Silcock (2008) considered *Plerogyra* spp. to have low susceptibility to coral bleaching.

Additional localised events that could threaten coral reef communities included pollution, invasive species changing native species dynamics, as well as human development activities; however, the severity of these combined threats to the global population of *P. simplex* was unknown (Turak *et al.*, 2008).

Overview of trade and management: *P. simplex* was listed in CITES Appendix II on 18/01/1990. The European Union suspended trade in wild-sourced *P. simplex* from Indonesia in 1999; this suspension remains in place under Commission Regulation (EC) No. 578/2013 of 17 June 2013 at the time of writing (September 2013). The European Union also temporarily suspended imports from Fiji in 2003-2009.

CITES Notification No. 2013/035 provides a list of stony coral genera for which identification to genus level is acceptable for the purpose of implementing Resolutions Conf. 11.17 (Rev. CoP16) and Conf. 12.3 (Rev. CoP16). This includes the genus *Plerogyra* (applicable to dead corals only). The notification states that these taxa should nevertheless be identified to species level where feasible. The trade accounts below therefore include a summary of trade reported at the genus level.

C. Country reviews

FIJI

Distribution in range State: Occurrence of *P. simplex* in Fiji was confirmed by Veron (2000). It was recorded at Volivoli (Mani) in the north of the main Fijian island Viti Levu (Fenner, 2006b) and at the Great and North Astrolabe Reefs (100 km south of Viti Levu) (Obura and Mangubhai, 2003). *P. simplex* was not recorded from the Mamanuca islands in the west of Fiji or the Coral Coast in the south (Fenner, 2006a).

Population trends and status: The species was considered to be fairly common in the country (J. Comley, pers. comm. to UNEP-WCMC, 2013), but was recorded as 'rare' at Volivoli (north of Viti Levu) at each site surveyed (Fenner, 2006b). According to Nand (2008), *Plerogyra* species showed a patchy distribution pattern at Aquarium Fish Fiji (AFF) collection sites surveyed (covering Beqa, Yanunca, Navua, Pacific Harbour and Serua, all south Viti Levu) with total coral cover estimated at 27 820 m^2, based on an extrapolation of the areas surveyed. At the Walt Smith International (WSI) collection sites from Lautoka to the Yasawa group of islands in the western part of Fiji, total coral cover for *Plerogyra* spp. was estimated at 291 713 m^2 (Nand, 2008). Out of 29 CITES-listed coral taxa found during surveys (mostly only identified to genus level), *Plerogyra* species were amongst the least common at the two main collection areas (WSI and AFF) in Fiji (Nand, 2008). However, collection areas were noted to have a high coral diversity and abundance compared to other areas (Nand, 2008).

Chin *et al.* (2011) reported that Fiji's reefs had average coral cover of 45 per cent (range 8-60 per cent), which had remained unchanged from an earlier status report (Wilkinson, 2008). Monitoring data since 1999 suggested that Fijian reefs were in good condition, with strong resilience and recovery potential after coral bleaching events (such as in 2000 and 2002), as well as crown-of-thorns starfish [*Acanthaster planci*] outbreaks and cyclones (Lovell and Sykes, 2008; Sykes and Morris, 2009). Rapid coral re-growth in many areas following disturbance suggested a stable reef status, with little evidence of widespread and prolonged stress, damage or loss of coral cover at surveyed reefs (Chin *et al.*, 2011).

Threats: The collection of reef resources for the aquarium trade was thought to be of potential concern (Chin *et al.*, 2011) and pose a moderate risk (Center for Ocean Solutions, 2009). Teh *et al.* (2007) stated that international trade for Fiji's coral reef resources, such as corals, was likely exacerbating exploitation of already stressed reef ecosystems. The effects of trade on this species were, however, not considered to be of too much concern (J. Comley, pers. comm. to UNEP-WCMC, 2013).

Further information on threats to corals in Fiji is available in the Threats section on *Catalaphyllia jardinei*.

Trade: CITES annual reports have been received from Fiji for all years 2002 onwards except 2003, 2011 and 2012. Fiji published a CITES export quota for wild-sourced, live or dead pieces of *P. simplex* every year from 2003 onwards, with the exception of 2006 (Table 1). According to data in the CITES Trade Database, trade remained within the export quota in every year according to data reported by countries of import; however, according to data reported by Fiji, export quotas in 2008, 2009 and 2010 were apparently exceeded. Fiji did not specify whether its 2008-2010 annual reports were compiled on the basis of actual trade or permits issued.

Table 1. CITES export quotas for wild-sourced, live or dead pieces of *Plerogyra simplex* from Fiji and global direct exports (excluding trade reported by weight), as reported by the countries of import and of export, 2003-2013. (No quotas were published in 2002 or 2006; no annual reports have been received from Fiji for the years 2003 or 2011; trade data for 2012 and 2013 are not yet available.)

	Reported by	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (live and raw)		1200	1200	2400	-	2400	1800	1800	2000	2000	2000	2000
live corals	Importer					803	1176	1265	1545	1685		
	Exporter			40	128	614	3360	2920	3757			
raw corals	Importer								105	70		
	Exporter											
Subtotals (live and raw corals)	Importer					803	1176	1265	1650	1755		
	Exporter			40	128	614	3360	2920	3757			

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

In addition to the trade included in Table 1, countries of import reported the import of 50 kg of wild-sourced, raw corals in 2011 and the seizure/confiscation of live corals in 2009 (six corals) and 2010 (one coral). All direct trade was for commercial purposes; the principal country of import was the United States. Indirect trade in *P. simplex* originating in Fiji 2002-2012 consisted of small quantities of live, wild-sourced corals traded for commercial purposes between 2008 and 2011.

Direct trade from Fiji in *Plerogyra* reported at the genus level 2002-2012 primarily comprised wild-sourced, live corals traded for commercial purposes, with notable quantities reported in 2002-2004 and relatively small quantities in subsequent years (Table 2). The principal country of import was the United States. Indirect trade in *Plerogyra* reported at the genus level originating in Fiji also mainly consisted of wild-sourced, live corals traded for commercial purposes; no indirect trade was reported from 2008 onwards.

Table 2. Direct exports of *Plerogyra* reported at the genus level from Fiji, 2002-2010. (No trade was reported in 2008-2009 or 2011-2012; no annual reports have been received from Fiji for the years 2003, 2011 or 2012.)

Term	Units	Source	Purpose	Reported by	2002	2003	2004	2005	2006	2007	2010	Total
live	-	W	T	Importer	1741	716	78	34	85	50		2704
				Exporter	1168		4695	4				5867
		I	T	Importer							40	40
				Exporter								
	kg	W	T	Importer	18							18
				Exporter								
raw corals	-	W	E	Importer								
				Exporter	2							2
		I	P	Importer	1							1
				Exporter								

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: Information on management relating to corals in Fiji is available in the Management section on *Catalaphyllia jardinei*.

According to a Department of Fisheries study on non-detriment findings for corals in Fiji, an average of 258.9 [presumably live corals] of *Plerogyra* spp. were collected for export annually, which was reported to represent 1.21 per cent of the wild stock, estimated to be approximately 21 375 live corals in the collection sites (Nand, 2008).

The sustainable proportion of harvest of coral species from collection areas was believed to range from 0-3 per cent, depending on the species characteristics, abundance and size of the site (Parry-Jones, 2004).

Distribution in range State: Occurrence of *P. simplex* in the Solomon Islands was confirmed by Veron (2000) and (Veron and Turak, 2006). It was recorded at 59 out of 113 sites surveyed off the nine major islands of the main island chain of the Solomon Islands (Turak, 2006).

Population trends and status: No population estimates or trends were identified for *P. simplex* in the Solomon Islands. It was not considered abundant at any of the sites surveyed of the nine major islands in 2004 (Turak, 2006).

Limited monitoring data are available to assess coral reef status in the Solomon Islands, although high coral cover in the Western Province and general health indicated that the status may be stable and corals potentially highly resilient (Chin *et al*., 2011). The Solomon Island's coral reef area was estimated at 5 750 km^2, with an average coral cover of 30 per cent (Wilkinson, 2008) and coral reef communities were reported to be in good condition overall (Turak, 2006).

Threats: Information on threats to corals in the Solomon Islands is available in the Threats section on *Euphyllia cristata*.

Trade: The Solomon Islands became a Party to CITES in 2007; CITES annual reports have been received for the years 2008-2010. The Solomon Islands has not published any CITES export quotas for *P. simplex*. According to data in the CITES Trade Database, direct trade in *P. simplex* from the Solomon Islands 2002-2012 consisted of 30 live, wild-sourced corals imported for commercial purposes by Germany in 2002, reported by Germany only. The Solomon Islands have not reported any direct trade in this species. No indirect trade in *P. simplex* originating in the Solomon Islands was reported 2002-2012.

Direct trade from the Solomon Islands in *Plerogyra* reported at the genus level 2002-2012 primarily comprised wild-sourced, live corals traded for commercial purposes (Table 3); the principal country of import was the United States. Indirect trade in *Plerogyra* reported at the genus level originating in the Solomon Islands 2002-2012 consisted of a small number of wild-sourced, live and raw corals traded for commercial purposes in 2002.

Table 3. Direct exports of *Plerogyra* reported at the genus level from the Solomon Islands, 2002-2010. All trade was for commercial purposes. (No trade was reported in 2004, 2011 or 2012; the Solomon Islands became a Party to CITES in 2007 and has submitted annual reports for the years 2008-2010.)

Term	Source	Reported by	2002	2003	2005	2006	2007	2008	2009	2010	Total
live	W	Importer	213	207	9	72	23	170			694
		Exporter							40	47	87
	I	Importer								1	1
		Exporter									
raw corals	W	Importer	200								200
		Exporter									

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *P. simplex* does not appear to be specifically protected by Solomon Islands law.

Information on management relating to corals in the Solomon Islands is available in the Management section on *Euphyllia cristata*.

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

Some trade was reported at genus level for live *Plerogyra* specimens, which is not in accordance with CITES Notification No. 2013/035 and previous according Notifications.

No CITES annual reports have been received from Fiji for three years (2003, 2011 and 2012).

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Plerogyra sinuosa (Dana, 1846): Fiji, Marshall Islands, Palau, Singapore, Solomon Islands, Vanuatu

Caryophylliidae, Bladder Coral

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Plerogyra sinuosa* (all range States) in the Review of Significant Trade as a priority species, following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *P. sinuosa* was identified as a species that met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009 (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from Australia, the People's Republic of China (hereafter referred to as China), Indonesia, Japan, Malaysia, the United Kingdom of Great Britain and Northern Ireland (hereafter referred to as the United Kingdom), United Republic of Tanzania (hereafter referred to as Tanzania) and the United States of America (hereafter referred to as United States) (AC26 Doc. 12.3). Djibouti, Egypt, Fiji, India, Israel, Kenya, Kiribati, Maldives, Marshall Islands, Mauritius, Palau, Papua New Guinea, Philippines, Saudi Arabia, Singapore, Solomon Islands, Sudan, Vanuatu and Viet Nam were retained in the process (AC26 Summary Record). Following the 26th meeting of the AC, Djibouti, Egypt, India, Israel, Kenya, Kiribati, Maldives, Mauritius, Papua New Guinea, Philippines, Saudi Arabia, Sudan and Viet Nam were removed from the process, on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC.

A. Summary

Overview of *Plerogyra sinuosa* recommendations.

		General summary
		Widespread, but categorised as Near Threatened in the IUCN Red List based on habitat loss and population decline.
Range State	**Provisional category**	**Summary**
Fiji	Possible Concern	Moderate levels of international trade 2002-2012 in wild corals. Possible quota excesses were reported every year where quotas were published. The basis of the non-detriment findings is unclear. Uncommon and patchily distributed. Therefore, categorised as Possible Concern.
Marshall Islands	Least Concern	Virtually no trade reported 2002-2012. Widely distributed, but population status unknown. Coral reefs considered almost pristine. On the basis of virtually no trade, categorised as Least Concern.
Palau	Least Concern	Virtually no trade reported 2002-2012. Unknown population status, but long-term coral cover thought to be stable. Export of hard corals is prohibited. On the basis of virtually no trade, categorised as Least Concern.
Singapore	Least Concern	Virtually no international trade reported 2002-2012. Unknown population status; coral populations have declined considerably due to the extensive loss of reefs. On the basis of virtually no trade, categorised as Least Concern.
Solomon Islands	Possible Concern	Moderate levels of international trade in wild corals reported 2002-2012 and relatively low levels at genus level. The population status is unknown, but coral reefs overall are in good condition nationally. The collection of corals for the aquarium trade was thought to be of concern nationally and the basis of the non-detriment findings is unclear. Therefore, categorised as Possible Concern.
Vanuatu	Least Concern	Virtually no international trade at species level and low levels of trade reported at genus level, with no trade reported since 2003. Uncommon in Vanuatu, but coral cover overall considered good. On the basis of virtually no trade, categorised as Least Concern.

B. Species overview

Biology: *P. sinuosa,* a zooxanthellate [in symbiosis with microalgae] (Veron, 2000), ahermatypic [not a main contributor to the reef matrix] species (Atkinson *et al.*, 2008b), was reported to occur in protected reef environments, where it was mainly found in turbid water (Veron, 2000). Turak *et al.* (2008) reported that *P. sinuosa* occurred at depths of 3-35 m, with the exception of high energy environments. Atkinson *et al.* (2008a) considered *Plerogyra* species to be habitat specialists, but Borneman (2002) reported that in Indonesia *Plerogyra* species occurred in most habitats, although primarily on fringing and patchy reef slopes.

The age at sexual maturity is assumed to be 3-8 years (Turak *et al.*, 2008), based on estimates for most reef building corals (Wallace, 1999); the average generation length was assumed to be 10 years (Turak *et al.*, 2008).

General distribution and status: The range of *P. sinuosa* (Figure 19) comprises the Indo-West Pacific, where it was found in the Red Sea and the Gulf of Aden, the southwest and northern Indian Ocean, the central Indo-Pacific, Australia, South-east Asia, Japan, the East China Sea, the West Pacific and central Pacific (Turak *et al.*, 2008).

Figure 19. Global distribution of *Plerogyra sinuosa*. Key: 0: not recorded, 1: confirmed record, 2: probable or predicted record. (Source: Veron *et al.*, 2013).

P. sinuosa was considered to be usually uncommon by Veron (2000), while Turak *et al.* (2008) reported it to be common throughout its range.

Although specific population trends are unknown, reductions were inferred from declines in habitat quality; this species was, however, reported to be resilient to some threats and may survive in reefs at a critical stage of degradation (Wilkinson, 2004). The species was thought to be more resilient to habitat loss and reef degradation due to an assumed large effective population size (Turak *et al.*, 2008). The IUCN classified the species as Near Threatened based on estimated habitat degradation and inferred population reduction loss of 20 per cent over three generation lengths (30 years) and due to a moderate susceptibility to a number of threats (Turak *et al.*, 2008). Re-assessment in 10 years was considered important due to predicted threats from climate change and ocean acidification (Turak *et al.*, 2008).

Further information on the conservation status of corals is expected to become available in the near future on http://www.coralsoftheworld.com/.

Threats: Extensive reduction of coral reef habitat was considered the major threat to *P. sinuosa,* but it was also reported to be heavily harvested for the aquarium trade (Turak *et al.*, 2008). Green and Shirley (1999) noted that corals of the genus *Plerogyra* were colourful and large polyped, making them attractive in the live aquarium trade.

Non-extractive threats to coral species, in general, were reported to include climate change, leading to increased sea temperatures and coral bleaching (stress-induced expulsion of symbiotic algae) and coral disease, as well as increased severity of ENSO (El Niño Southern Oscillation) events, storms and ocean acidification (Turak *et al.*, 2008). However, Roelofs and Silcock (2008) considered *Plerogyra* spp. to have low susceptibility to coral bleaching.

Additional localised events that could threaten coral reef communities included pollution, invasive species changing native species dynamics, as well as human development activities; however, the severity of these combined threats to the global population of *P. sinuosa* was unknown (Turak *et al.*, 2008).

Overview of trade and management: *P. sinuosa* was listed in CITES Appendix II on 18/01/90.

CITES Notification No. 2013/035 provides a list of stony coral genera for which identification to genus level is acceptable for the purpose of implementing Resolutions Conf. 11.17 (Rev. CoP16) and Conf. 12.3 (Rev. CoP16). This includes the genus *Plerogyra* (applicable to dead corals only). The notification states that these taxa should nevertheless be identified to species level where feasible. The trade accounts below therefore include a summary of trade reported at the genus level.

The European Union suspended trade in wild-sourced *P. sinuosa* from Indonesia in 2000; this suspension remains in place at the time of writing (September 2013) under Commission Regulation (EC) No. 578/2013 of 17 June 2013. The European Union also temporarily suspended imports from Tonga in 2005-2009.

C. Country reviews

Fiji

Distribution in range State: Occurrence of *P. sinuosa* in Fiji was confirmed by Veron (2000). The species was reported to occur at a number of sites in the Mamanuca islands in the west of Fiji (Fenner, 2006). It was also recorded from the Great Astrolabe Reefs (100 km south of Viti Levu) (Koven and Paulay, 1997; Obura & Mangubhai, 2003).

Population trends and status: The species was considered to be fairly common in the country (J. Comley, pers. comm. to UNEP-WCMC, 2013), but was recorded as 'uncommon' at Cakaunilolo, Motuse, and Wadigi in the Mamanuca islands in the west of Fiji; 'rare' at Sally, Nayuul, and N. Castaway (Fenner, 2006) but was found to be locally common at the Great Sea Reef to the north of Vanua Levu (Jenkins, 2004).

Further information on the status of *Plerogyra* spp. and corals overall in Fiji is available in the Population trends and status section on *Plerogyra simplex*.

Threats: The collection of reef resources for the aquarium trade was thought to be of potential concern (Chin *et al.*, 2011) and pose a moderate risk (Center for Ocean Solutions, 2009). Teh *et al.* (2007) stated that international trade for Fiji's coral reef resources, such as corals, was likely exacerbating exploitation of already stressed reef ecosystems. The effects of trade on this species were however not considered to be of too much concern (J. Comley, pers. comm. to UNEP-WCMC, 2013).

Further information on threats to corals in Fiji is available in the Threats section of *Catalaphyllia jardinei*.

Trade: CITES annual reports have been received from Fiji for all years 2002 onwards except 2003, 2011 and 2012. Fiji published a CITES export quota for wild-sourced, live or dead pieces of *P. sinuosa* every year from 2003 onwards, with the exception of 2006 (Table 1). According to data in the CITES Trade Database, the quotas were apparently exceeded according to data reported by countries of import in 2003, 2004, 2005, 2007, 2009, 2010 and 2011 and according to data reported by Fiji in 2007, 2008, 2009 and 2010. Fiji did not specify

whether its 2007-2010 annual reports were compiled on the basis of actual trade or permits issued.

Table 1. CITES export quotas for wild-sourced, live or dead pieces of *Plerogyra sinuosa* from Fiji and global direct exports, as reported by the countries of import and of export, 2002-2013. (No quotas were published in 2002 or 2006; no annual reports have been received from Fiji for the years 2003 or 2011; trade data for 2012 and 2013 are not yet available.)

	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Quota (live and raw)		-	205	205	410	-	410	307	307	650	650	650	650
live corals	Importer	140	398	242	511	834	476	291	602	831	734		
	Exporter			183	238	740	421	810	1092	1928			
raw corals	Importer	250	60		30			5		5			
	Exporter												
Subtotals (live and raw corals)	Importer	390	458	242	541	834	476	296	602	836	734		
	Exporter			183	238	740	421	810	1092	1928			

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

No other direct trade in *P. sinuosa* from Fiji was reported 2002-2012. All direct trade was for commercial purposes; the principal countries of import were the United Kingdom and the United States. Indirect trade in *P. simplex* originating in Fiji 2002-2012 comprised relatively small quantities of live, wild-sourced corals traded for commercial purposes.

Trade in *Plerogyra* reported at the genus level originating in Fiji has been summarised in the section on *Plerogyra simplex*.

Management: Information on management relating to corals in Fiji is available in the Management section on *Catalaphyllia jardinei*.

Based on the figures reported by Nand (2008), it is assumed that the overall *Plerogyra* stock in the collection sites represents approximately 21 375 live corals. The 2008 and 2009 quotas published by Fiji (Table 1) would therefore have allowed the harvest of approximately 8.42 per cent of *Plerogyra* spp. stocks and the 2010-2012 quotas of 9.36 per cent. The sustainable proportion of harvest of coral species from collection areas was believed to range from 0-3 per cent, depending on the species characteristics, abundance and size of the site (Parry-Jones, 2004). According to a Department of Fisheries study on non-detriment findings for corals in Fiji, an average of 258.9 [presumably live corals] of *Plerogyra* spp. were collected for export annually, which was reported to represent 1.21 per cent of the wild stock (Nand, 2008).

MARSHALL ISLANDS

Distribution in range State: Occurrence of *P. sinuosa* in the Marshall Islands was confirmed by Veron (2000). It was not recorded in surveys during the 1950s of the Atolls of Bikini, Rongelap, Rongerik, Eniwetok, Jaluit, Nugol, Kwajalein, Arno, Wotje, Namotik, Ailuk, Pokak, Ebon or Likiep by Wells (1954), nor was it reported in surveys of six northern atolls in the 1990s (Bok-ak, Pikaar, Tōke, Wōtto, Rondik, Adkup) and Jemo reef island in 1988 (Maragos, 1994). Its presence was confirmed from Majuro and Milli atolls, and the species was thought to be present throughout the Marshall Islands (CITES Management Authority of the Marshall Islands, pers. comm. to UNEP-WCMC, 2013).

Population trends and status: No population estimates or trends were identified for *P. sinuosa* in the Marshall Islands. The CITES MA of the Marshall Islands did not have any information on the status or population trends of this species (CITES MA of the Marshall Islands, pers. comm. to UNEP-WCMC, 2013).

The majority of reefs in the Marshall Islands were considered to be almost pristine (Pinca *et al.*, 2005; Beger *et al.*, 2008; Wilkinson, 2008) and showing high coral cover, although local damage through human and natural impacts were noted (Pinca *et al.*, 2005; Chin *et al.*, 2011). The status of coral reefs

was considered to be stable overall (with a low confidence of assessment), although the resilience of reefs and trends could not be described adequately due to the lack of long-term data (Chin *et al.*, 2011). The composition and structure of coral communities in the Marshall Islands was considered to be unique and requiring protection through management (Beger *et al.*, 2008).

Threats: Harvest for the aquarium trade was assessed as a moderate threat (Center for Ocean Solutions, 2009) and was reported to have led to overexploitation (Beger *et al.*, 2008); coral dredging was also reported (Wilkinson, 2008).

Threats to coral reefs in the Marshall Islands were reported to include climate change (average sea temperatures are already near the upper limit for coral survival) and tropical storms (Pinca *et al.*, 2005; Beger *et al.*, 2008). Localised threats included coral disease, coastal development and run-off, pollution, tourism and fishing (Pinca *et al.*, 2005; Beger *et al.*, 2008). Wilkinson (2008) reported that threats such as over- and destructive fishing and coral bleaching had left the Marshall Islands relatively unaffected, with the exception of Majuro, where coral diversity and cover had declined due to degradation and fishing pressure, coral disease and crown-of-thorns starfish [*Acanthaster planci*]; this local decline was expected to continue. In contrast, the Center for Ocean Solutions (2009) considered pollution, climate change and fishing to have severe impacts on reefs. Roughly a quarter of the Marshall Islands' reefs were assessed as being threatened by local activities, with 20 per cent of reefs at medium threat, five per cent at high threat and one per cent at very high threat (Chin *et al.*, 2011).

Trade: The Marshall Islands are not a Party to CITES and therefore have not submitted any CITES annual reports or published any CITES export quotas. According to data in the CITES Trade Database, low levels of direct trade in *P. sinuosa* from the Marshall Islands were reported by countries of import 2002-2012 and consisted of live, wild-sourced corals traded for commercial purposes in 2002 (65 corals) and 2004 (five corals). The principal country of import was Germany. Indirect trade in *P. sinuosa* originating in the Marshall Islands 2002-2012 comprised 20 live, source 'F' corals traded for commercial purposes in 2008.

Direct trade from the Marshall Islands in *Plerogyra* reported at the genus level 2002-2012 consisted of 20 live, wild-sourced corals imported by Canada for commercial purposes in 2002 (reported by the country of import only) and 15 raw corals reported as seized/confiscated by the importer, the United Kingdom, also in 2002. No indirect trade in *Plerogyra* originating in the Marshall Islands was reported at the genus level 2002-2012.

Management: The Director of the Marshall Islands Marine Resources Authority (MIMRA) acts both as the competent Authority for the issuance of CITES permits and the scientific institution responsible for the making of non-detriment findings (CITES, 2009). The Fisheries Act bans destructive fishing methods, such as the use of poison or explosives (Marshall Islands, 2004). The Marshall Islands were considered to have a "substantial legislative basis for managing marine resources", but it was considered unclear whether it was adequate and effective (Chin *et al.*, 2011). Corals, which are not included in the list of protected species, were nevertheless deemed to be worthy of conservation measures (RMI-OEPPC, 2008).

Baseline data was reported to be available from a number of monitoring efforts since 2001 (Chin *et al.*, 2011), with long-term monitoring at Rongelap, Ailuk, Likiep, Majuro and Arno Atolls since 2006/2007 (Beger *et al.*, 2008). However, this species was not subject to any species-specific monitoring program (CITES MA of the Marshall Islands, pers. comm. to UNEP-WCMC, 2013).

One main operator and several smaller ones were reported to be involved in the marine aquarium fishery, with harvest concentrated in Majuro lagoon (Gillett, 2007). Pinca *et al.* (2005) noted that little quantitative information was available on the amount of coral removed from reefs. Small aquaculture farms were reported to culture coral fragments for the aquarium trade, but they were considered "boom and bust business[es]" (Beger *et al.*, 2008). The ventures operated by MIMRA on Majuro, Likiep, Arno and Mili were considered the most successful operations (Beger *et al.*, 2008). Ocean Reefs and Aquarium were reported to mariculture corals in tanks, unlike other operations in the region (Cartwright *et al.*, 2012).

The CITES MA of the Marshall Islands confirmed that only aquacultured corals were being exported from the country, although this species had not been exported to date, with the exception of small numbers of re-exports (pers. comm. to UNEP-WCMC, 2013).

Marine Protected Areas, the majority being small, were reported to have been established in Bikini, Ailinginae, Rongelap and Rongerik atolls, with fisheries and/or management plans for Mili, Likiep, Arno, Ailuk and Majuro atolls being developed (Beger *et al.*, 2008). The Bikini Atoll was included in the World Heritage Sites list in 2010 due to its historic significance (UNESCO, 2013), but the atoll was also reported to have a high coral cover (Chin *et al.*, 2011). An action plan on the protection of marine areas was completed in 2008 (Wilkinson, 2008) and the Marshall Islands was reported to have agreed 30 per cent of nearshore marine resources to be under "effective conservation" under the Micronesia Challenge (Beger *et al.*, 2008).

PALAU

Distribution in range State: Occurrence of *P. sinuosa* in Palau was confirmed by Randall (1995) and Veron (2000).

Population trends and status: No population estimates or trends were identified for *P. sinuosa* in Palau. A rapid ecological assessment in 1992 reported Palau's reefs to be in good condition (Maragos and Cook, 1995), but a bleaching event in 1997/1998 coincident with the El Niño Southern Oscillation (ENSO) was reported to have severely affected corals, resulting in an average healthy coral coverage of only 15.6 per cent (Bruno *et al.*, 2001). However, a monitoring programme established by the Palau International Coral Reef Centre indicated coral cover recovery with annual increases of ~2.9 per cent from 2001-2004, suggesting that long-term coral cover is relatively stable and probably resilient to disturbance (Chin *et al.*, 2011).

Threats: Direct use, such as fishing and tourism, as well as coastal development and land runoff, pollution, tropical storms and climate change were considered to be the main threats affecting Palau's reefs (Chin *et al.*, 2011). However, the prevalence of coral disease was thought to be low, as was pollution (Golbuu *et al.*, 2005; Marino *et al.*, 2008). Around 30 per cent of Palau's reefs were considered to be threatened, with 26 per cent of reefs at medium threat, three per cent at high threat and one per cent at very high threat; risks to some reefs were thought likely to be increasing (Chin *et al.*, 2011).

Localised threats to reefs included sedimentation associated with runoff from coastal development around Babeldaob, the largest island of the archipelago (Golbuu *et al.*, 2005; Marino *et al.*, 2008), and river discharges, which negatively affected coral cover and richness in Ngermeduu Bay (Golbuu *et al.*, 2011).

Trade: Palau became a Party to CITES in 2004; Palau reported no trade in CITES-listed species in 2005 and submitted CITES annual reports for the years 2007-2011. Palau has not published any export quotas for *P. sinuosa*. According to data in the CITES Trade Database, direct trade in *P. sinuosa* originating in Palau 2002-2012 consisted of 20 live corals imported by the United States from Palau in 2007 for commercial purposes, of which 16 were wild-sourced and four captive-bred, all reported by the country of import only. Palau has not reported any direct trade in the species, and no indirect trade in the species was reported by either Palau or countries of import 2002-2012. No direct or indirect trade in *Plerogyra* originating in Palau was reported at the genus level 2002-2012.

The only marine invertebrate trade business in Palau (Belau Aquaculture) reportedly closed in 2006 (Marino *et al.*, 2008).

Management: The Palau Marine Act of 1994 regulates ornamental fisheries and prohibits the export of hard corals and live rock (Palau, 1994), although Marino *et al.* (2008) reported that not all attempts to implement total harvest bans had been successful.

Thirty-one marine protected areas (MPAs) have been established, covering more than 40 per cent of Palau's near-shore marine area (Marino *et al.*, 2008). With the exception of the Ngerukuid Preserve and Ngerumekaol MPAs, which are managed under national government, all fall under local government authority (Marino *et al.*, 2008). Chin *et al.* (2011) reported that Palau faced a number of management challenges, including a lack of capacity to implement management and enforce plans at state and national levels.

SINGAPORE

Distribution in range State: An inventory of the species' occurrence in Singapore documented distribution records from Satumu, Semakau, Jong, Sisters, Hantu, St. John's and Kusu islands (Huang *et al.*, 2009).

Population trends and status: No population estimates or trends were identified for *P. sinuosa* in Singapore. At Hantu island, the species was recorded at two out of 12 transects (four different depths at three sites surveyed) (Chou, 1988), and at Satumu island it was recorded five times in four of the eight transects (four different depths at two sites surveyed) (Goh and Chou, 1993).

Since the early 1800s, it has been estimated that Singapore has lost 60 per cent of its reef area (Chou, 2006), with the remaining reef area estimated at 10 km^2 (Huang *et al.*, 2009), mainly fringing the offshore islands (Chou *et al.*, 2012). Reefs were reported to be limited to shallow areas due to reduced reef creation in depths below 3 m (Chou, 1988; Goh and Chou, 1993). Live coral cover on the remaining reefs was estimated at 10-60 per cent (National Parks Board Singapore, 2010), with some reefs reported to have lost virtually all coral cover (Chou, 2002). While corals had declined in abundance (Chou, 2006), species diversity was nevertheless considered to have remained high (Goh, 2008).

Threats: Direct destruction of reefs through coastal reclamation work and associated high sedimentation rates were considered the main threat to corals (Goh and Chou, 1993; Chou, 2002; Reef Ecology Study Team, 2008; Huang *et al.*, 2009), with local extinctions considered possible (Huang *et al.*, 2009). The shipping traffic and associated mechanical damage and pollution were also noted to be of concern (Chou *et al.*, 2012). Harvest for the aquarium trade, considered "rampant" until the 1990s, was found to have declined considerably in more recent years (Chou *et al.*, 2012). Further localised threats to corals included pressure from recreational use (Huang *et al.*, 2006; Reef Ecology Study Team, 2008) and bleaching (Chou, 2002; Reef Ecology Study Team, 2008).

Trade: CITES annual reports have been received from Singapore for all years 2002-2011. Singapore has not published any CITES export quotas for *P. sinuosa*. Singapore has not reported any direct trade in this species. According to data reported by countries of import in the CITES Trade Database, direct trade in *P. sinuosa* from Singapore 2002-2012 consisted of small quantities of wild-sourced corals traded for commercial purposes, with eight live corals imported by South Africa in 2006 and 40 raw corals imported by Turkey in 2009. No indirect trade in *P. sinuosa* originating in Singapore was reported 2002-2012. No direct or indirect trade in *Plerogyra* originating in Singapore was reported at the genus level 2002-2012.

Management: *P. sinuosa* does not appear to be specifically protected by Singaporean law (Heng, 2008). The collection of wild animals without a licence is prohibited under the Wild Animals and Birds Act 1965 (Singapore, 1965), although it was considered unclear whether

this protection covered marine invertebrates (Heng, 2008). The Endangered Species (Import and Export) Act 2006 lays down permit requirements for exports of corals (Singapore, 2006). The National Parks Board mandate was reported to include the marine environment since the 1990s (Chou *et al.*, 2012), and the management of coral reefs was reported to be divided between a large number of stakeholders, such as various government agencies and private corporations with coastal facilities, nature or recreation groups (Goh, 2008).

A decline of harvest of reef resources for the aquarium trade observed since the 1980s was thought to be a result of stricter enforcement measures (Chou, 2002).

None of the reefs in Singapore are legally protected, and Chou *et al.* (2012) noted that an integrated coastal management mechanism was absent. An Inter-Ministerial Technical Committee on Coastal and Marine Environment was established in 2007 and includes representatives from "all relevant agencies" (Chou *et al.*, 2012).

A coral nursery was reported to have been established in 2007 as a collaborative project between National Parks Singapore, the National University of Singapore, the National Environment Agency and the Keppel Corporation (National Parks Board Singapore, 2010). The aim of the nursery was the rehabilitation of naturally-fragmented corals until they can be transplanted to natural reefs (Goh, 2008).

The status of corals was reported to be monitored at nine sites through a project established in 2005 (National Parks Board Singapore, 2010).

SOLOMON ISLANDS

Distribution in range State: Occurrence of *P. sinuosa* in the Solomon Islands was confirmed by Veron (2000) and Veron and Turak (2006). It was recorded at 59 out of 113 sites surveyed off the nine major islands of the main island chain of the Solomon Islands (Turak, 2006).

Population trends and status: No population estimates or trends were identified for *P. sinuosa* in the Solomon Islands. It was not considered abundant at any of the sites surveyed of the nine major islands in 2004 (Turak, 2006).

Limited monitoring data were available to assess coral reef status in the Solomon Islands, although high coral cover in the Western Province and general health indicated that the status may be stable and corals potentially highly resilient (Chin *et al.*, 2011). The Solomon Island's coral reef area was estimated at 5750 km^2, with an average coral cover of 30 per cent (Wilkinson, 2008) and coral reef communities were reported to be in good condition overall (Turak, 2006).

Threats: Information on threats to corals in the Solomon Islands is available in the Threats section on *Euphyllia cristata*.

Trade: The Solomon Islands became a Party to CITES in 2007; CITES annual reports have been received for the years 2008-2010. The Solomon Islands has not published any CITES export quotas for *P. sinuosa*. According to data in the CITES Trade Database, direct trade in *P. sinuosa* from the Solomon Islands 2002-2012 primarily consisted of live, wild-sourced corals traded for commercial purposes (Table 2). The principal country of import was the United States.

Table 2. Direct exports of *Plerogyra sinuosa* from the Solomon Islands, 2002-2011. All trade was for commercial purposes. (No trade was reported in 2012; the Solomon Islands became a Party to CITES in 2007 and has submitted annual reports for the years 2008-2010.)

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	-	W	Importer	200	40	253	947	662	786	553	839	403	308	4991

Term	Units	Source	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
			Exporter								582	249		831
		I	Importer								11			11
			Exporter											
	kg	W	Importer						6					6
			Exporter											
raw corals	-	W	Importer							40				40
			Exporter								31			31

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Indirect trade in *P. sinuosa* originating in the Solomon Islands 2002-2012 consisted of small quantities of live, wild-sourced corals traded for commercial purposes.

Trade in *Plerogyra* reported at the genus level originating in the Solomon Islands has been summarised in the section on *Plerogyra simplex.*

Management: *P. sinuosa* does not appear to be specifically protected by Solomon Islands law.

Information on management relating to corals in the Solomon Islands is available in the Management section on *Euphyllia cristata*.

VANUATU

Distribution in range State: Occurrence of *P. sinuosa* in Vanuatu was confirmed by Veron (2000); it was collected from Aneityum in the south of Vanuatu (Veron, 1990).

Population trends and status: The species was noted to be uncommon in Vanuatu (Veron, 2000). No further information on population trends or status could be located.

Chin *et al.* (2011) reported that there was generally good coral cover on Vanuatu's reefs, but that no long-term monitoring data was available to determine resilience, long-term trends or the overall status of coral reefs, although recovery after destructive events had been observed locally. Signs of declines in Vanuatu's coral reef habitats were reported by Naviti and Aston (2000).

Threats: Information on threats to corals in Vanuatu is available in the Threats section on *Euphyllia cristata*.

Trade: CITES annual reports have been received from Vanuatu for all years 2002-2011. Vanuatu has not published any CITES export quotas for *P. sinuosa*. Vanuatu has not reported any direct trade in the species. According to data reported by countries of import in the CITES Trade Database, direct trade in *P. sinuosa* originating in Vanuatu 2002-2012 consisted of 50 live, wild-sourced corals imported by Germany directly from Vanuatu in 2003 for commercial purposes. No indirect trade in the species originating in Vanuatu was reported 2002-2012. Direct trade from Vanuatu in *Plerogyra* reported at the genus level 2002-2012 comprised wild-sourced corals traded for commercial purposes, with Vanuatu reporting the export of 390 live corals in 2003 and countries of import reporting the import of 328 live and 30 raw corals in 2003 and 50 live corals in 2004. The principal country of import was the United States. No indirect trade in *Plerogyra* originating in Vanuatu was reported at the genus level 2002-2012.

Management: Information on Management relating to corals in Vanuatu is available in the Management section on *Euphyllia cristata*.

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

Some trade was reported at genus level for live *Plerogyra* specimens, which is not in accordance with CITES Notification No. 2013/035 and previous according Notifications.

No CITES annual reports have been received from Fiji for three years (2003, 2011 and 2012).

Destruction of reefs through coastal reclamation was considered the main threat to corals in Singapore.

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Trachyphyllia geoffroyi (Audouin, 1826): Singapore, Solomon Islands

Trachyphylliidae, Crater Coral (Folded Coral, Puffed Coral)

Selection for Review of Significant Trade

At its 25th meeting, the Animals Committee (AC) included *Trachyphyllia geoffroyi* (all range States) in the Review of Significant Trade as a priority species, following consideration of document AC25 Doc 9.6 (AC25 Summary Record). *T. geoffroyi* was identified as a species that met a high volume trade threshold for a globally threatened or near-threatened species in 2008 and 2009 and showed a sharp increase in trade in 2008, compared to the previous five year average (Annex 2, AC25 Doc 9.6). At the 26th meeting of the AC, responses had been received from Australia, Indonesia, Japan, Malaysia, Myanmar, Seychelles, the United Kingdom of Great Britain and Northern Ireland (hereafter referred to as United Kingdom) and the United Republic of Tanzania (hereafter referred to as Tanzania) (AC26 Doc. 12.3). Egypt, Fiji, India, Israel, Jordan, Maldives, Mozambique, Papua New Guinea, Philippines, Saudi Arabia, Singapore, Solomon Islands, Sudan and Viet Nam were retained in the review (AC26 Summary Record). Following the 26th meeting of the AC, Egypt, India, Israel, Jordan, Maldives, Mozambique, Papua New Guinea, Philippines, Saudi Arabia, Sudan and Viet Nam were removed from the process, on the basis of no commercial trade over the most recent 10 years, with the agreement of, and in consultation with, the AC. Fiji was removed from the process in agreement with the AC, although trade was reported from the country.

A. Summary

Overview of *Trachyphyllia geoffroyi* recommendations.

		General summary
		At least locally common, but categorised as Near Threatened in the IUCN Red List, based on habitat loss and population decline.
Range State	**Provisional category**	**Summary**
Singapore	Least Concern	Virtually no international trade reported 2002-2012. The population status is unknown, but coral populations have declined considerably due to the extensive loss of reefs. Based on virtually no trade, categorised as Least Concern.
Solomon Islands	Least Concern	Relatively low levels of international trade reported 2002-2012. The population status is unknown, but coral reefs overall are in good condition. The collection of corals for the aquarium trade was thought to be of concern nationally and the basis of non-detriment finding is unclear. On the basis of relatively low trade, categorised as Least Concern.

B. Species overview

Taxonomic note: *T. geoffroyi* is sometimes recorded in trade under the synonym *Wellsophyllia radiata* by some Parties.

Biology: *T. geoffroyi* is the only species of the genus *Trachyphyllia* and is free-living and zooxanthellate [in symbiosis with microalgae] (Veron, 2000). This ahermatypic species [not a main contributor to the reef matrix] (Atkinson *et al.*, 2008b) was reported to occur on soft substrates (Suharsano and Bruckner, 2008) around continental islands and in inter-reef environments (Veron, 2000), generally to depths of 40 m (Sheppard *et al.*, 2008). Atkinson *et al.* (2008a) considered species of the genus *Trachyphyllia* to be habitat specialists. Whilst the species was found to typically grow as a solitary unattached colony, occasional formation of large colonies was reported (Sheppard *et al.*, 2008); such colonies were only found in protected and shallow island bays (Veron, 2000). *T. geoffroyi* was frequently found with other

free living corals of the genera *Heteropsammia*, *Heterocyathus*, *Cycloseris* and *Diaseris* (Veron, 2000).

The age at sexual maturity was assumed to be 3-8 years (Sheppard *et al.*, 2008), based on those for most reef building corals (Wallace, 1999). The average generation length was assumed to be 10 years (Sheppard *et al.*, 2008).

General distribution and status: *T. geoffroyi* was reported to occur in the Red Sea and the Gulf of Aden, the Indian Ocean, the central Indo-Pacific, Australia, South-East Asia, Japan, East China Sea and the oceanic southwest Pacific (Sheppard *et al.*, 2008).

Whilst *T. geoffroyi* was considered rare on reefs, it was common around continental islands and some inter-reef areas (Veron, 2000). Sheppard *et al.* (2008) reported the species to be widespread and uncommon. The population size was considered difficult to estimate for *Trachyphyllia* spp. [*T. geoffroyi* being the only species in the genus], as corals may be difficult to find in some locations, yet be abundant in others (Suharsano and Bruckner, 2008).

Although specific population trends were unknown, reductions were inferred from declines in habitat quality; this species was however reported to be resilient to some threats and may survive in reefs at a critical stage of degradation (Wilkinson, 2004). *T. geoffroyi* was found in deeper waters and off-reef areas, and was therefore thought to be more resilient to habitat loss and reef degradation, due to an assumed large effective population size (Sheppard *et al.*, 2008). The IUCN classify the species as Near Threatened, based on estimated habitat loss and inferred population reduction loss of 22 per cent over three generation lengths (30 years), and susceptibility of the species to a number of threats (Sheppard *et al.*, 2008). Re-assessment in 10 years was considered important due to predicted threats from climate change and ocean acidification, especially if the species was found to disappear from reefs at a critical stage of degradation (Sheppard *et al.*, 2008).

Further information on the conservation status of corals is expected to become available in the near future on http://www.coralsoftheworld.com/.

Threats: Extensive reduction of coral reef habitat (due to a combination of threats) was considered the major threat to *T. geoffroyi* (Sheppard *et al.*, 2008). The species was also considered to be highly susceptible to harvesting for the aquarium trade (Sheppard *et al.*, 2008). Green and Shirley (1999) noted that *Trachyphyllia* spp. were colourful and large polyped corals, making them attractive in the live aquarium trade. The more colourful colonies, which occur in deepwater sites, were reported to be less abundant than the colonies with more muted colouration inhabiting near shore areas, leading to increased harvesting pressure on the deepwater colonies in Indonesia (Borneman, 2002).

Non-extractive threats to coral species, in general, were reported to include climate change, leading to increased sea temperatures and coral bleaching (stress-induced expulsion of symbiotic algae) and coral disease, as well as increased severity of ENSO (El Niño Southern Oscillation) events, storms and ocean acidification (Sheppard *et al.*, 2008). However, Roelofs and Silcock (2008) considered *Trachyphyllia* spp. to have relatively low susceptibility to coral bleaching compared with other coral genera.

Additional localised events that could threaten coral reef communities included pollution, invasive species changing native species dynamics, as well as human development activities; however, the severity of these combined threats to the global population of *T. geoffroyi* was unknown (Sheppard *et al.*, 2008).

Overview of trade and management: This species was listed in CITES Appendix II on 18/01/1990. The European Union suspended trade in wild-sourced *T. geoffroyi* from Indonesia in 1999 and from Fiji in 2003; these suspensions under Commission Regulation

(EC) No. 578/2013 of 17 June 2013 remain in place at the time of writing (September 2013). The European Union also temporarily suspended imports from Tonga in 2005-2006.

C. Country reviews

SINGAPORE

Distribution in range State: An inventory of the species' occurrence in Singapore included documented distribution records from Satumu and Semakau islands (Huang *et al.*, 2009); its presence was also recorded on Hantu island (Chou, 1988; Huang *et al.*, 2009) and Sentosa island (Ming *et al.*, 2010).

Population trends and status: No population estimates or trends were identified for *T. geoffroyi* in Singapore. At Hantu island, the species was recorded at one out of 12 transects (four different depths at three sites surveyed) (Chou, 1988). On Sentosa island, the species was found to have colonised a marina seawall, although it was the least abundant species found (Ming *et al.*, 2010).

Further information on the status of corals reefs in Singapore is available in the Population trends and status section on *Plerogyra sinuosa*

Threats: Information on threats to corals in Singapore is available in the Threats section on *Plerogyra sinuosa*

Trade: CITES annual reports have been received from Singapore for all years 2002-2011. Singapore has not published any CITES export quotas for *T. geoffroyi*. Singapore did not report any trade in the species during the period 2002-2011. According to data reported by countries of import in the CITES Trade Database, direct trade in *T. geoffroyi* from Singapore 2002-2012 consisted of wild-sourced corals traded for commercial purposes, with 26 live corals imported by South Africa in 2006 and 58 raw corals imported by Turkey in 2009. No indirect trade in *T. geoffroyi* originating in Singapore was reported 2002-2012.

Management: *T. geoffroyi* does not appear to be specifically protected by Singaporean law (Heng, 2008).

Further information on the management of corals in Singapore is available in the Management section on *Plerogyra sinuosa*.

SOLOMON ISLANDS

Distribution in range State: Occurrence of *T. geoffroyi* in the Solomon Islands was confirmed by Veron and Turak (2006). It was recorded to occur within 59 out of 113 sites surveyed off the nine major islands of the main island chain of the Solomon Islands (Turak, 2006).

Population trends and status: No population estimates or trends were identified for *T. geoffroyi* in the Solomon Islands. The species was not considered abundant at any of the survey sites of the nine major islands in 2004 (Turak, 2006).

Limited monitoring data are available to assess coral reef status in the Solomon Islands, although high coral cover in the Western Province and general health indicated that the status may be stable and corals potentially highly resilient (Chin *et al.*, 2011). The Solomon Island's coral reef area was estimated at 5750 km^2, with an average coral cover of 30 per cent (Wilkinson, 2008) and coral reef communities were reported to be in good condition overall (Turak, 2006).

Threats: Information on threats to corals in the Solomon Islands is available in the Threats section on *Euphyllia cristata*.

Trade: The Solomon Islands became a Party to CITES in 2007; CITES annual reports have been received for the years 2008-2010. The Solomon Islands has not published any CITES export quotas for *T. geoffroyi*. According to data in the CITES Trade Database (based largely on data reported by countries of import), direct trade in *T. geoffroyi* from the Solomon Islands 2002-2012 primarily consisted of live, wild-sourced corals traded for commercial purposes (Table 1). The principal country of import was the United States.

Indirect trade in *T. geoffroyi* originating in the Solomon Islands 2002-2012 consisted of small quantities of live corals traded for commercial purposes in 2010-2011, the majority of which were wild-sourced.

Table 1. Direct exports of *Trachyphyllia geoffroyi* from the Solomon Islands, 2002-2011. All trade was wild-sourced and for commercial purposes. (No trade was reported in 2012; the Solomon Islands became a Party to CITES in 2007 and has submitted annual reports for the years 2008-2010.)

Term	Units	Reported by	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
live	-	Importer	400	70	373	504	467	202	171	228	257	88	2760
		Exporter								97	280		377
raw corals	-	Importer				20							20
		Exporter							27	1			28
	kg	Importer							4				4
		Exporter											

Source: CITES Trade Database, UNEP-World Conservation Monitoring Centre, Cambridge, UK

Management: *T. geoffroyi* does not appear to be specifically protected by Solomon Islands law.

Information on management relating to corals in the Solomon Islands is available in the Management section on *Euphyllia cristata*.

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

Destruction of reefs through coastal reclamation was considered the main threat to corals in Singapore.

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Annex: Key to Purpose and Source Codes

Source of specimens

Code	Description
W	Specimens taken from the wild
R	Ranched specimens: specimens of animals reared in a controlled environment, taken as eggs or juveniles from the wild, where they would otherwise have had a very low probability of surviving to adulthood
D	Appendix-I animals bred in captivity for commercial purposes in operations included in the Secretariat's Register, in accordance with Resolution Conf. 12.10 (Rev. CoP15), and Appendix-I plants artificially propagated for commercial purposes, as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 4, of the Convention
A	Plants that are artificially propagated in accordance with Resolution Conf. 11.11 (Rev. CoP15), as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 5 (specimens of species included in Appendix I that have been propagated artificially for non-commercial purposes and specimens of species included in Appendices II and III)
C	Animals bred in captivity in accordance with Resolution Conf. 10.16 (Rev.), as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 5
F	Animals born in captivity (F1 or subsequent generations) that do not fulfil the definition of 'bred in captivity' in Resolution Conf. 10.16 (Rev.), as well as parts and derivatives thereof
U	Source unknown (must be justified)
I	Confiscated or seized specimens (may be used with another code)
O	Pre-Convention specimens

Purpose of trade

Code	Description
T	Commercial
Z	Zoo
G	Botanical garden
Q	Circus or travelling exhibition
S	Scientific
H	Hunting trophy
P	Personal
M	Medical (including biomedical research)
E	Educational
N	Reintroduction or introduction into the wild
B	Breeding in captivity or artificial propagation
L	Law enforcement / judicial / forensic