Callagur borneoensis Schlegel and Müller, 1844

FAMILY: Emydidae

COMMON NAMES: Painted Batagur, Painted Terrapin, Saw-jawed Turtle, Three-striped Batagur (English); Émyde Peinte de Bornéo (French); Galápago Pintado (Spanish)

GLOBAL CONSERVATION STATUS: Listed as Critically Endangered: CR - A1bcd in the *2004 IUCN Red List of Threatened Species* on the basis of a known or suspected 80% decline in population over three generations (IUCN, 2004).

SIGNIFICANT TRADE REVIEW FOR: Brunei Darussalam, Malaysia, Thailand

Range States selected for review

Range State	Exports* (1994-2003)	Urgent, possible or least concern	Comments
Brunei Darussalam	0	Least Concern	No export recorded
Malaysia	14,842	Least Concern	Population severely depleted and declining. Zero quotas set from 2005 to 2006 pending research allowing the establishment of non-detriment findings in compliance with Article IV. The situation would merit review if trade were allowed to resume.
Thailand	100	Least Concern	Populations scattered with very few individuals; 100 specimens reported as imported from Thailand in 2001. Nationally protected; illegal trade is of concern.

* Excluding re-exports

SUMMARY

Callagur borneoensis is a large fresh water chelonian with a wide distribution in the Sunda region of Southeast Asia from southern Thailand to Borneo (Indonesia). Populations are known to be declining rapidly, with Peninsular Malaysia believed to be the last stronghold for the species with an estimated remaining total population of a few thousand animals. The species is currently classified by IUCN as Critically Endangered. The severe population decline has been caused by international trade of live specimens for pet trade and food consumption, local consumption of eggs and meat and habitat loss.

The species was included in CITES Appendix II in 1997. Recorded international trade in the period 1994-2003 amounts to just under 16,000 animals, the majority of these (just under 15,000) reported as exports of live specimens from Malaysia to China in 2000 and 2001. This number is very high compared with the estimated total wild population of the species in Malaysia of less than a few thousand, indicating either severe over-harvesting of the species there, and/or the presence in the shipments of significant numbers of animals originating from another range State, most probably Indonesia. Malaysia set export quotas of 1,000 for 2002, 600 for 2003 and 300 for 2004 and exports dropped to just 442 in 2002, 343 in 2003 and 70 in 2004. Quotas have been set at zero for 2005 and 2006, pending the availability of information that will allow the making of non-detriment findings, and therefore trade from Malaysia is currently of Least Concern. Any resumption in trade from Malaysia should be carefully monitored and controlled, as it would appear from the information available that this terrapin is unlikely to be able to withstand any significant harvest of adult individuals. In addition, concerns regarding alleged illegal trade in the species should be addressed. Thailand's population is almost extinct and totally protected although China reported imports of 100 specimens originating from Thailand. No exports have been recorded from Brunei Darussalam. Trade from Thailand and Brunei Darussalam is therefore of Least Concern. There is no evidence of captive breeding of the species on a commercial scale.

SPECIES CHARACTERISTICS

Callagur borneoensis, or Painted Terrapin is a medium-sized to large freshwater chelonian. Males and females can reach 40 and 50 cm carapace length respectively (Moll, 1985). This riverine species has a wide distribution in the Sundaland region, occurring from the southernmost provinces of Thailand (Satun, Yala and Narathiwat provinces) in the north, southward through Peninsular Malaysia to the islands of Borneo and Sumatra in Indonesia (van Dijk in *litt*., 2006; UNEP-WCMC, 2002; WWF Malaysia, 2001). Once common, few large populations remain and most rivers have less than 50 nesting females, while only three rivers in Peninsular Malaysia are thought to have more than 100 (WWF Malaysia, 2001).

Outside the breeding season, *C. borneoensis* inhabits estuaries of medium to large rivers and, e.g. in Sarawak, mangrove swamps (UNEP-WCMC, 2002; UNEP-WCMC, 2006). Nesting takes place on sea beaches, although the species seemingly lacks a salt excreting gland and cannot reside in brackish water in excess of 50% sea water for extended periods (Dunson and Moll, 1980). Nesting is undertaken at night at low tide on sand beaches along with nesting sea turtles or on sandbanks within a few kilometres of the mouth of its home river (UNEP-WCMC, 2002). Reproduction is seasonal, from June to August on the east coast of Peninsular Malaysia and from October to January on the west coast. Moll (1985) reported that in Malaysia, two clutches of 10 – 12 eggs may be laid per season. In Sarawak, it was observed that 15-20 eggs were laid in February and again in March. Incubation reportedly takes around 70 days (Anon., 2005; UNEP-WCMC, 2002). Average life expectancy is unknown (UNEP-WCMC, 2002).

Adult diet comprises mainly fruits and greenery from riverside plants and mangroves (UNEP-WCMC, 2002). Interviews with local villagers indicated that river grass was its major food source on the Dungun River (Asian Turtle Conservation Network, 2004). *C. borneoensis* sometimes feeds on village refuse, especially fruit scraps, discarded into the water. The terrapin basks on logs or vegetation mats (UNEP-WCMC, 2002).

Prior to the late 1990s, when consumption in East Asia increased dramatically, the primary threat appears to have been overexploitation of eggs for local human consumption (van Dijk *in litt,.* 2006; WWF Malaysia, 2001). Nests are easily detected because of stereotypic and predictable feeding and nesting patterns of the terrapins and thus nearly all eggs can be collected (Turtle Conservation Fund, 2003). The heavy demand for eggs and exploitation of adults for export coupled with the species' low reproductive potential and predictable nesting patterns make it one of the most seriously threatened river turtles in Southeast Asia. Activities such as sand mining, beach-front development, the construction of dams, sea walls and jetties and the removal of sand and vegetation are also threatening the survival of the species as nesting sites are destroyed or become out of reach for the terrapins (Moll, 1997; UNEP-WCMC, 2002; WWF Malaysia, 2001). *C. borneoensis* is listed in the 2004 IUCN Red List as Critically Endangered (CR - A1bcd), on the basis of a known or suspected 80% decline in population over three generations (IUCN 2004).

INTERNATIONAL TRADE

International trade is in live specimens for human consumption of meat in East Asia (adults) and the global pet trade (juveniles) (van Dijk *in litt,.* 2006). No international trade in eggs is recorded. Eggs are consumed locally. The Painted Terrapin is collected along with other turtle species through an extensive network of trappers, hunters and middlemen and export operations have become established at particular locations. Often these trade points move to new, more distant areas when, after a rapid increase in exploitation effort, capture and export volumes peak and decline as accessible populations become depleted and only small specimens are left. For this species, such 'boom-and-bust' cycles at particular locations have been noted in Indonesia (Asian Turtle Trade Working Group, 2000b).

Table 1: Exports excluding re-exports of live wild *Callagur borneoensis*, 1994-2003. Species listed on CITES Appendix II in 1997 (trade until 1996 not reflected in CITES trade database).

Export country	*(1994)*	*(1995)*	*(1996)*	1997	1998	1999	2000	2001	2002	2003	Total
Indonesia	*0*	*0*	*15*	2	0	245	150	150	0*	0	580
Malaysia	*0*	*0*	*3*	0	47	274	7944**	5789	442	343	14842**
Thailand	*0*	*0*	*0*	0	0	0	0	100	0	0	100
Totals	*0*	*0*	*18*	2	47	519	8094**	6039	460	343	15522**

(Source: CITES trade statistics derived from the *CITES Trade Database*, UNEP World Conservation Monitoring Centre, Cambridge, UK)

* 18 specimens were reported by the USA as imports on permits issued by Indonesia in 2001
** these figures exclude 1100 captive-bred specimens reported as exported from Malaysia in 2000

Table 2. Export quotas for Indonesia and Peninsular Malaysia (wild-taken specimens) from 1999 - 2006

Export country	1999	2000	2001	2002	2003	2004	2005	2006
Indonesia	450	180	180	0	0	0	0	0
Malaysia				1000, then reduced to 600	600	300	0	0

(Sources: CITES Management Authority Indonesia 2004, CITES Management Authority Malaysia 2004)

COUNTRY ACCOUNTS

Brunei Darussalam

Status:

Uncertain, but listed as a range State in the UNEP-WCMC CITES Species Database (2006). However, the species has not been reported there in the past century (van Dijk *in litt*., 2006).

Management and trade:

No exports from Brunei Darussalam have been recorded. Trade is therefore of Least Concern.

Malaysia

Status:

In Peninsular Malaysia the species has a wide distribution from the northern state of Perlis to the southern corner of Johor. The species has been recorded from the tidal sections of the following rivers and their estuaries: Kedah, Muda (Kedah), Junjung (Penang), Perak (Perak), Linggi (Negeri Sembilan), Melaka (Malacca), Muar (Johore), Pahang (Pahang), Dungun, Paka, Kemaman, Setiu-Chalok, Terengganu and Besut River in Terengganu (CITES Management Authority Malaysia, 2004). *Callagur borneoensis* is also found in Sarawak (CITES Management Authority Malaysia, 2004) but has not been recorded from Sabah (van Dijk *in litt*., 2006).

In Peninsular Malaysia, populations have been severely depleted (Sharma and Tisen, 2000). Individual nesting populations are in general extremely small and the species is considered to be seriously threatened with extinction (Honegger, 1998). According to Van Dijk (*in litt.* 2006) Peninsular Malaysia's total population of mature individuals is probably currently on the order of no more than a few thousand animals; however, Chan (*in litt.* 2006) suggests that even this is a gross over-estimate.

On the east coast of Peninsular Malaysia the largest known breeding populations are on the Setiu-Chalo and Paka river systems in Terengganu. A sampling programme carried out in the Setiu River between 2003 and 2005 provided an estimate of about 200 individuals with a male to female sex ratio of 1:1.3. This compares with an earlier estimate of 600 - 700 individuals (UNEP-WCMC, 2002). The Setiu population has been heavily impacted by mortality from a pesticide spill (van Dijk *in litt.,* 2006). According to Chan and Soh (2005), the number of Painted Terrapin nests from the Setiu River has ranged from 160 to 200 annually in recent years. Between 1985 and 1990, the population at Paka-Kerteh (Terengganu) is believed to have declined from 160 to 108 individuals (Asian Turtle Trade Working Group, 2000a). Overall the population in Terengganu was estimated at 405 individuals in 1995, compared with earlier estimates of 585 in 1990 and 178 in 1985. Statistics released by the Fisheries Department of Terengganu indicate that there were 87, 267, 351, 432 and 328 nests in 2000, 2001, 2002, 2003 and 2004 respectively in Terengganu (Chan *in litt.,* 2006).

On the west coast of Peninsular Malaysia the largest population was reported in 2001 as occurring in the Linggi river bordering Negeri Sembilan and Melaka. At that time Sungai Paka, Sungai Setiu and Sungai Linggi were believed to be the only three rivers in Peninsular Malaysia with possibly still more than 100 breeding females (WWF Malaysia, 2001).

For Sarawak there is no evidence that any population monitoring has been carried out (van Dijk *in litt.,* 2006) and no population estimates are available.

Management and trade:

The main exporter of *C. borneoensis* has been Peninsular Malaysia, with recorded exports of over 13,700 wild-caught specimens in the period 1997-2003. In addition, 1,100 individuals reported as captive-bred were exported in 2000. However, the species is not known to be bred in captivity on a commercial scale, requiring large breeding ponds and displaying aggressive behaviour (van Dijk *in litt.,* 2006). It seems more likely that these were hatchlings raised in hatcheries from translocated wild-collected eggs.

Reported trade peaked in 2000 (nearly 8,000) and 2001 (over 6,500), with most of the specimens exported to China (7,200 in 2000; over 5,700 in 2001). In 2000 trade was mainly only reported as exports by Malaysia; importing countries only recorded imports of just over 100 specimens in that year. In contrast, exports recorded by Malaysia for 2001 are close to recorded imports (virtually all to China).

Regular monitoring of the offer for sale in wildlife markets in South China show trends that closely parallel reported international trade. During 1993/1994, no individuals were detected (Lau *et al.,* 1995). In 2000, some 50-100 individuals could be found during a single visit to markets in Guangzhou, whilst in 2001, this number dropped to less than 50 (Kadoorie Farm and Botanic Garden, 2004). Since 2001, individuals have been detected on the markets on a few occasions only (Lau *in litt.*, 2006). This supports the supposition that the high reported numbers in international trade in 2000 and 2001 were genuine and not an artefact resulting from permitting problems or mis-identification of other, similar, species, such as *Batagur baska* and *Orlitia borneensis*, both of which occur in the same areas as *Callagur* and are traded along with it. The declared figures are however very high in comparison with estimated wild populations in Peninsular Malaysia, which are believed to amount to a few thousand mature individuals at most. It is therefore possible that they include animals that originated elsewhere (Chan *in litt.*, 2006).

In 2001, a survey was conducted among all active exporters to assess turtle stock volumes. An administrative export quota of 1000 specimens of *C. borneoensis* was set by the Malaysian CITES Management Authority for 2002, based on 50% of the total stock held by exporters at the end of 2001. This quota was subsequently reduced to 600 for the year 2002 based on an analysis of volumes of exports in previous years (CITES Management Authority Malaysia *in litt*., 2004). The administrative quota for 2003 remained at 600 and for 2004 was 300, the latter based on the number of individuals found in holding facilities of exporters as of the end of 2003 (CITES Management Authority Malaysia *in litt.,* 2006). These quotas were not communicated to the CITES Secretariat. For 2005 and 2006 no exports of any wild-caught native turtles or tortoises (including *C. borneoensis*) are to be allowed, pending the collection of information allowing the establishment of robust non-detriment findings for each species (CITES Management Authority Malaysia *in litt.,* 2006).

In Peninsular Malaysia, six of the 11 States have legislation pertaining to protection and exploitation of turtles and three (Pahang, Penang and Perak) have had a draft document under review for several years (CITES Management Authority Malaysia *in litt.*, 2004; Southeast Asian Fisheries Development Centre, undated). Two States (Perlis and Selangor) do not have any legislation to protect chelonians (Sharma and Tisen, 2000). In many cases, existing legislation is somewhat unclear as to which species are covered, although generally it is taken that *C. borneoensis* is included in the relevant ordinances.

In Sarawak, *C. borneoensis* is listed as a 'Totally Protected Species' and all freshwater turtles and tortoises are listed as 'Protected Species' under the Wild Life Protection Ordinance (1957, amended 1973/1998). Enforcement of this protection is the responsibility of the Wildlife, National Parks and Wildlife Office of the Sarawak Forestry Department (Sharma and Tisen, 2000). The Customs (Prohibition of Exports/Import) Orders of 1988 specifically ban all export and import of turtle eggs, including those of *C. borneoensis* (Chan *in litt.,* 2006; Southeast Asian Fisheries Development Centre, undated). The species is also legally protected in Sabah, despite never having been recorded there.

There have been various conservation projects monitoring the behaviour and ecology of *C. borneoensis* (UNEP-WCMC, 2002). A number of sandbanks and beaches, which serve as nesting grounds, have been gazetted in Malaysia as reserves or sanctuaries. There is some disagreement as to the effectiveness of

protection in these areas; according to the CITES Management Authority of Malaysia, no harvesting has been recorded over the past few years (CITES Management Authority Malaysia *in litt.,* 2006). However, poaching of eggs has still reportedly been causing problems (van Dijk *in litt.,* 2006).
Egg harvesting is allowed from non-gazetted sandbanks, but only with a licence (CITES Management Authority Malaysia, 2004). In Peninsular Malaysia, the states of Kelantan, Pahang, Perak and Terengganu have legislation protecting turtles from being killed and giving the state authority to license egg collectors and to lease collecting areas. Despite the species having become rare, the concurrent sea turtle egg collection on nesting beaches continues to make terrapin egg collection profitable. Terrapin eggs are preferred over those of the sea turtles due to their larger size and prefered taste. Eggs were reported in 2001 as selling for RM 1.70 (USD 0.44) per egg, which is up to five times the price of a chicken egg (WWF Malaysia, 2001). Licensed collectors are required to sell 70% of their harvest to the Malaysian Fisheries Department to be incubated, in order to ensure sustainable management of *C. borneoensis*. However it was reported in the early 2000s that prices offered by the Fisheries Department were not competitive with those obtained on the commercial market and often only a small percentage (30%) of turtle eggs was surrendered and the rest sold (UNEP-WCMC, 2000; WWF Malaysia, 2001). In 1997, it was reported that 100% of eggs recorded were collected in Peninsular Malaysia, of which 35-90% were incubated to produce hatchlings to return to the rivers (Sharma *in litt.,* 1997).

In 1999, 48 three year-old *C. borneoensis* raised at the University College of Science and Technology (KUSTEM) in Terengganu were released into the Setiu River. In 2003, another 27 seven one year-old individuals (6 males and 21 females) were released. As of early 2006, no captive *Callagur* were maintained at KUSTEM (Chan *in litt.,* 2006). The Kuala Setiu Baharu Turtle Sanctuary in Terengganu has become a Marine Protected Area (MPA) primarily aimed at providing habitat for *Batagur baska* during the nesting season, but also protecting the largest known populations of nesting *Callagur borneoensis* (van Dijk *in litt.,* 2006; Sharma, 1994). An *in situ* hatchery programme was to have been established here (CITES, 2004; van Dijk *in litt,.* 2006), although it was reported in early 2006 that no artificial incubation had yet been carried out (Chan *in litt.* 2006) and it is believed that *in-situ* hatchery efforts have ended (van Dijk *in litt,.* 2006).

Trade is of Least Concern as zero quotas have been set for 2005 and 2006, pending the availability of information to make non-detriment findings. It would appear from the information available that this terrapin is unlikely to be able to withstand significant harvest, either for domestic use or for international trade, such that trade would be of possible concern if allowed to resume.

Thailand

Status:

Painted Terrapins are reported to be almost extinct in Thailand, with only one population of scattered animals left in Klong La-Ngu in Satun Province (van Dijk *in litt.,* 2006; Honegger, 1998; UNEP-WCMC, 2002).

Management and trade:

China recorded the import of 100 live specimens from Thailand in 2001. Legislation for the protection of turtles has been in existence in Thailand since 1947 and consists of three acts, the Fisheries Act, B.E. 2490 (1947), Export and Import Act, B.E. 2522 (1979) and Wild Animals Reservations and Protection Act, B.E. 2535 (1992). *Callagur borneoensis* is protected under the Wildlife Reservation and Protection Act (1992) and was listed as a protected species in 1994. Protection prohibits all forms of use and killing, both for domestic use and export. However, capture may be allowed under exceptional circumstances, e.g. scientific research, in which case a permit is granted by the relevant authorities. A captive breeding experiment was carried out in 2002/2003, at the Satun Inland Fisheries Station using 24 males and 27 females. The specimens were kept in a breeding pond and fed on fish and plant material. Females laid 5-15 eggs and hatching success averaged 87% (CITES Management Authority Thailand *in litt.*, 2006)

Current trade is thus considered as Least Concern. However, reports of ongoing illegal trade merit further investigation.

PROBLEMS IDENTIFIED THAT ARE NOT RELATED TO THE IMPLEMENTATION OF ARTICLE IV, PARAS 2(a), 3, or 6(a)

As noted above, the size of the exports reported by Malaysia in 2000 and 2001 compared with estimated population levels of the species within Malaysia indicate that a proportion, at least, of these animals may have originated elsewhere, most likely Sumatra, and been imported into Malaysia without documentation. These and other indications of illegal trade merit further investigation. Illegal export from Indonesia is believed to be occurring and is of concern (Jenkins *in litt,* 2006).

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