

SOME DATA ON THE DISTRIBUTION, CONSERVATION STATUS AND PROTECTION OF FRESHWATER TURTLES IN THE PALAWAN ISLAND GROUP, PHILIPPINES

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Introduction

The Palawan Island Group is located between Mindoro Island and North Borneo, approximately 600km south-west of Manila, Philippines. Islands included in this group are Palawan (the largest island), Busuanga, Culion, Lampacan, Cuyo, Dumaran, Cagayancillo (also called Cagayanes) and Balabac. Palawan is the fifth largest island in the Philippine archipelago with an area of more than 11,000 square km.

The biological importance of Palawan is widely recognized both nationally and internationally. It has even been designated as a Biosphere Reserve by UNESCO since 1990. The region includes several existing Proclaimed Conservation Areas such as Coron Islands (7,580 hectares), El Nido Marine Reserve (89,140 hectares), Malampaya Sound (90,000 hectares) and Puerto Princesa Subterranean River National Park. Palawan has also been declared a mangrove reserve. Palawan has about 422 terrestrial and known marine vertebrate species. This number accounts for about 39% of all the vertebrate species found in the Philippines. Many of the species are endemic to Palawan and have restricted ranges confined to a small area (PCSDS, 2005).

The Philippine forest turtle (*Siebenrockiella* (= *Panayenemys*) *leytensis*) (Fig. 1) is one of the most endangered turtle species in the world and the most endangered turtle of the Philippines (Conservation International, 2003; IUCN, 2009). It is classified as critically endangered by the IUCN (2009) and included in Appendix II of the CITES convention (CITES, 2002). First described in 1920 (Taylor), the species was thought extinct (Gaulke & Fritz, 1998; Conservation International, 2003) until live specimens were observed for the first time *in situ* in 2001 and 2003 in northern Palawan (Diesmos *et al.*, 2004a; Fidenci, 2004).



Fig. 1. The critically endangered Philippine forest turtle *Siebenrockiella leytensis*.

Materials and methods

Between 2007 and 2009, we conducted field interviews and surveys for *S. leytensis* and other freshwater turtle species in southern Palawan to identify their distribution and status. In parallel, we evaluated their threats and appropriate conservation measures. We also conducted conservation educational and awareness activities, and illegal trade surveys of *S. leytensis*. Comprehensive surveys were undertaken in the following municipalities (divisions of the province): Narra, S. Española, Quezon, Brooke's Point, Rizal, Bataraza and Balabac, where data on *S. leytensis* were deficient.

Daytime surveys were conducted between 0730 and 1750 hrs, and night time surveys between 1800 and 2345 hrs. Local people living near rivers, creeks, lakes and ponds were interviewed during the day, and we produced and distributed more than 1,000 cards representing the Philippine forest turtle, including our team's contact information in case turtles were observed later (Figs 2 and 3). Previous studies (Berlin *et al.*, 1966; Ives *et al.*, 2008) and our experience have shown that local folk taxonomies must be interpreted with caution, so representative photographs of freshwater turtles were used to help local inhabitants to identify those found in their area.

The techniques for turtle surveys included visual surveys, snorkelling and trapping. Surveying occurred along suitable aquatic and upland



Fig. 2. Identification cards distributed to local communities to strengthen the search for the Philippine forest turtle in the wild.



Fig. 3. Team members during night surveys.

habitats, up to 100 metres from the aquatic habitat. Snorkelling was used to detect turtles in deeper waters, the undercut of banks or under rocks. Trapping was used in conjunction with other techniques. We used mostly box traps, baited wires (Fidenci, 2005a) and net traps. Box traps varied in size, with the smallest measuring 0.7m in length and 0.5m in width and height, and the largest 2m in length and 1m in width and height. Various baits (e.g. fish, crabs and fruits) were employed to attract turtles. Baited wires were placed in shallow water, usually less than 0.5m from the shoreline, to attract turtles.

During surveys the following data were recorded: date and duration of surveys, air and water temperatures, wind velocity, weather conditions, size of area surveyed, average and maximum depth, water velocity, percentage emergent and floating vegetation, canopy cover, substrate type, turtle species observed, activity of turtles observed, number and size of turtles captured, upland habitat description, land use type and human impact(s), if any. Locations of turtles were recorded using GPS.

Results and discussion

Our survey results allowed us to fill in gaps on the distribution of the freshwater turtles in southern Palawan where most data were very deficient. Four species of native freshwater turtles (*Dogania subplana*, *Cuora amboinensis*, *Cyclemys dentata* and *Siebenrockiella leytensis*) are known to occur in the Palawan Island Group (Diesmos *et al.*, 2008; Fidenci, 2005b); see Figure 4(a-d).

The Malayan box turtle (*Cuora amboinensis*) occupies all municipalities of Palawan including smaller satellite islands (Fig. 4a). We observed this species on numerous occasions during our surveys and field interviews (local people often keep live specimens as pets) and it is common. It is found in Palawan, Busuanga, Culion, Batas Island (Fidenci, Herpetological Review *in press*), Dumarán and Balabac, and occurs in a variety of aquatic habitats including urban areas such as Puerto Princesa City, where we observed it at various locations despite its cryptic behaviour. *C. amboinensis* also occurs outside the Palawan Island Group and it has the largest distribution of all the freshwater turtle species in the Philippines (Diesmos *et al.*, 2008).

The Asian leaf turtle (*Cyclemys dentata*) is also a common species in the Palawan Island Group (Fig. 4b). It is widespread and occurs in Palawan, Calauit, Culion, Busuanga, Dumarán and Balabac (Diesmos *et al.*, 2008 and this report). We observed this species in streams and on a few occasions on land. *C. dentata* also occurs outside the Palawan Island Group and it is also found in the Sulus and Tawi-Tawi in the Philippines (Diesmos *et al.*, 2008).



Fig. 5. The Malayan softshell turtle *Dogania subplana* observed in southern Palawan.

We observed the Malayan softshell turtle (*D. subplana*) (Fig. 5) in southern Palawan in the municipalities of Rizal, Quezon, S. Española, Bataraza and Brookes' Point (Fig. 4c). The species is only found in southern Palawan in the Palawan Island Group (Diesmos *et al.*, 2008 and this report). We did not encounter the Malayan softshell turtle in Balabac Island despite the presence of suitable aquatic habitats. This species is also found on other islands in the Philippines including Luzon, Mindoro and Mindanao (Diesmos *et al.*, 2008). We observed *D. subplana* in forested creeks usually at higher altitudes than the other freshwater species.

The Philippine forest turtle is endemic to the Philippines. In Palawan, this species has been found only in the northern part of Palawan – Taytay, San Vicente, Roxas and Puerto Princesa (Fig. 4d). This species was believed to possibly have a wider distribution range within Palawan including additional satellite islands like Busuanga or Balabac. However, our surveys could not detect this turtle in Balabac and southern Palawan. Therefore, *S. leytensis* occurs presently in the northern part of Palawan on an area of roughly 39,000 km² and in Dumaran Island (Diesmos *et al.*, 2008). The current range of this species is smaller than expected. In Dumaran Island, *S. leytensis* can be abundant within creeks. In Northern Palawan, populations found in the Taytay municipality are believed to have sharply declined (Diesmos *et al.*, 2008).

The Asian giant softshell turtle (*Pelochelys cantorii*) is currently known in two islands in the Philippines including Luzon and Mindanao (Diesmos et al., 2008). We believe that this species is absent from Palawan, including Balabac where it was cited a long time ago (de Elera, 1895; Siebenrock, 1903). Our interviews and surveys all failed to locate *P. cantorii* in Balabac and southern Palawan. *Cuora amboinensis* and *Cyclemys dentata* were the only two freshwater turtles found in Balabac. Moreover, the lack of suitable habitats (large water bodies and nesting sites) throughout the island reinforce the fact that *P. cantorii* may have never occurred there as previously believed. The status of the species known to occur in the Palawan Island Group is summarized in Table 1.

Table 1. Status of freshwater turtles in the Palawan Island Group.

Species	Range	Status	Threats
<i>Dogania subplana</i>	Restricted range (southern Palawan).	Common; however, some populations may have been declining due to overharvesting.	Illegal trade, habitat degradation and destruction.
<i>Cuora amboinensis</i>	Wide range (Palawan island group).	Common.	Domestic trade.
<i>Cyclemys dentata</i>	Wide range (Palawan island group).	Common.	Domestic trade.
<i>Siebenrockiella leytenis</i>	Restricted range (northern Palawan and Dumarán).	Critically endangered (IUCN 2009). Rapidly declining at some sites, and appears stable at a few others.	Domestic and international illegal trade, habitat degradation and destruction.

Evaluation of anthropogenic threats

We evaluated the anthropogenic threats for the entire known range of *S. leytensis*. We conducted 19 site visits and 746 surveys in the Palawan Island Group. We evaluated known data on trade (Fidenci & Maran, 2009; Philippine Government, unpublished data) and identified current threats. We rated each factor from 0 (not a factor) to 3 (high factor) that might contribute to its decline.

Table 2. Anthropogenic factors affecting *S. leytensis* within its known range in Palawan and Dumarán Islands. Overall rating* includes both Palawan and Dumarán, the only two islands where *S. leytensis* is known to occur. 0: not a factor; 1: low factor; 2: medium factor; 3: high factor.

Factor	Overall rating*	Palawan	Dumarán
Collecting/harvesting	2-3	3	1
Land use			
Habitat destruction	1	1	1
Habitat fragmentation	2	1-2	2
Habitat degradation	2	1-2	2
Exotic Species	0	0	0
Water contamination	1	1	1

Trading

Overall, illegal collecting of *S. leytensis* is the highest factor contributing to its decline (Table 2). Past reports have shown the negative impacts of illegal trading on this turtle in the areas of Taytay and San Vicente in northern Palawan (Diesmos & Palomar, 2004b). In Taytay, a major trading area, turtles are now more difficult to observe in the wild and some populations are thought to have been reduced dramatically or exterminated. *S. leytensis* has been sold illegally for domestic and international trade for the last eight years; therefore, the impact on wild populations is obviously very significant. Domestic and international trade is still rampant and the species is being illegally sold in the Philippines, North America, Europe and Japan (Diesmos *et al.*, 2008; Fidenci & Maran, 2009).

During our field surveys, we obtained a few reports of turtle trading in southern Palawan; however, our data revealed that the source of *S. leytensis* trading originated from northern Palawan, especially Taytay. For example, in S. Española, two carapaces of this turtle displayed in a house came from Taytay. Freshwater turtles traded in southern Palawan included all the three species occurring in the region. We could not obtain any volumes on the trade; however, its impact on the abundant species appears to be small.

One respondent from Balabac Island revealed to us the presence of a trade of freshwater turtles to Malaysia. However, the size of the trade, including whether it is occasional or regular, is unknown. On one occasion in Balabac, we also had a similar report of trade in turtles and other wildlife to Borneo (Malaysia) but very little information could be obtained. This would be the first mention of the existence of the turtle trade from Balabac to Borneo.

In Manila, *S. leytensis* has not been seen in pet shops since 2005; however, trade still occurs. We constantly observed *S. leytensis* in all major pet markets in Manila (e.g. Cartimar) including the main Chinese market, demonstrating that the domestic illegal pet trade is still rampant. We observed between two and ten *S. leytensis* for sale at each market, observing 171 animals over the 4-year period (Fidenci & Maran, 2009). During our last 2009 visits, *S. leytensis* was sold for between Php2,500 and 3,500 (53 and 75 USD) per turtle, but could be negotiated down to Php1,200 (28 USD) for smaller individuals. This was a 4 to 6-fold price increase since 2005.

Our undercover monitoring methods revealed that turtles could be ordered within one or two weeks, but the larger ones (greater than 30cm in carapace length) were difficult to obtain and most of those sold for the pet trade were sub-adults and young adults. It was uncommon to find large individuals for sale.

Land use

Land use can be detrimental to the aquatic and upland habitats of *S. leytensis*. Construction of roads, alteration of creek banks, deforestation and water pollution are potential threats to this turtle. However, habitat destruction and degradation is a lesser factor than illegal trading (Table 1). Some creeks and upland habitat occupied by turtles are within protected areas (e.g. Puerto Princesa Subterranean River Natural Park) and therefore should provide strong habitat protection. However, a large portion of the known occupied sites is threatened by deforestation, alteration of creeks and other human activities.

Conservation

The causative factors in the decline of *S. leytensis* are known (Table 2) and effective conservation is urgently needed. We have listed the measures that we believe should be implemented over the years to come, to ensure that

viable populations remain in Palawan and Dumarán islands (Table 3), and have ranked these for effectiveness based upon distribution, current projects, and current and foreseeable threats (see section on evaluation of anthropogenic threats).

Table 3. Effectiveness of conservation measures. Scores were determined using a 5 point scale (1 being ineffective, 5 being fully effective).

	Score
Education of local people and authorities	5
Enforcement of existing laws regarding the Philippine forest turtle	5
Anti-collecting patrols in selected sites	5
Sustainable alternative incomes for local communities	5
Monitoring and research on the Philippine forest turtle	4
New/upgraded protected area	4
Monitoring of trade	3
Habitat restoration and enhancement	3
Captive breeding facility	2
Reintroduction of Philippine forest turtles	1

During our interviews in Palawan, we clearly noticed the lack of awareness about conservation, as well as illegal trading of endangered species including *S. leytensis*. The lack of awareness was also evident in Dumarán Island where we observed in 2008 the destruction of a section of Omoi Creek caused by local residents despite the presence of the Katala Foundation, a local conservation group. Omoi Creek is one of the areas occupied by *S. leytensis*.

Matillano (2008) recommends release of *S. leytensis* at suitable sites. We strongly believe that this should be the last resort (Table 3) and current data do not support such conservation activity. Releasing turtles in the wild can be a complex task and requires comprehensive data on the turtle's natural history and habitat. Conservation efforts should focus on areas where *S. leytensis* is present

by providing long term protection of current wild populations and their habitats. A policy statement on captive breeding available from IUCN recommends captive-breeding actions when field surveys demonstrate that populations have fallen below 1,000 individuals in the wild. At the present time, comprehensive surveys are needed to assess the number of individuals remaining.

Recommendations

Based on all past and current projects conducted on *S. leytensis* in Palawan, we strongly recommend the following:

- ❑ Long-term ecological studies should be supported: while they may drain resources, they provide critical insights into the variation, flexibility and resilience of turtle populations, so that we can monitor and evaluate the direct impact of our conservation actions. There is a real lack of data on habitat use, populations, reproduction and survival of *S. leytensis* in the wild.
- ❑ Critical habitat which is essential to the survival of *S. leytensis* must be designated and conservation efforts must be implemented on those areas, including developing sustainable alternative income for local communities protecting this turtle from illegal activities.
- ❑ Conservation organizations, large and small, must stop competing and join forces to save this critically endangered turtle, working together to close down the trade as recommended by Fidenci and Maran (2009).
- ❑ Monitoring of the illegal trade and status of *S. leytensis* within the range of the species should be continued and intensified, with improvements in law enforcement and the targeting of known local illegal traders in Palawan. The roots of the problem must be addressed aggressively as a priority, to preserve wild populations.

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