

## Rediscovery of the Philippine Forest Turtle, *Heosemys leytensis* (Chelonia; Bataguridae), from Palawan Island, Philippines

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**Abstract.** - We report new observations from natural populations of the critically endangered Philippine forest turtle, *Heosemys leytensis*. Previously known from two cotypes (reportedly from Leyte Island) that were destroyed during World War II, a lone specimen in a U.S. collection, and a specimen purchased on Palawan Island in the late 1980s, its status in the wild has been uncertain since its discovery. Our recent surveys of Palawan and nearby Dumaran islands have documented natural populations that are under immediate threat due to over-harvesting and loss of habitat. Records of captive animals and interviews with residents from these islands suggest that this species is heavily exploited for food, pet trade, and ornamental fish pond curiosities. There is an urgent need to establish a conservation program to study and protect remaining natural populations.

**Key words.** - *Heosemys leytensis*, Asian freshwater turtles, turtle trade, Philippine forest turtle, Palawan Island, Philippines.

### Introduction

Taylor (1920) described the Philippine forest turtle, *Heosemys leytensis*, on the basis of two specimens that were collected by Gregorio Lopez. These specimens were reportedly collected from a swamp at the Municipality of Cabalian, southern Leyte Province, Leyte Island, Philippines (Fig. 1). The cotypes (a male and a female) were eventually deposited in the Philippine Bureau of Science (Taylor, 1944) but were destroyed during the World War II firebombing of Manila (Brown and Alcalá, 1978; Buskirk, 1989).

Between Taylor's (1920) description and the late 1980s, no additional specimens or information became available for this species, although its status as a valid species has never been challenged (e.g., Pritchard, 1979;

Ernst and Barbour, 1989; Iverson, 1992). In 1988, Timmerman and Auth reported on a specimen purchased from a local resident of the Municipality of Taytay, northern Palawan Island (Fig. 1). Buskirk (1989) described a neotype for the species (CAS 60930) based on a single specimen also reportedly from Cabalian, Leyte.

Since these reports, numerous herpetologists, including us, have searched for *H. leytensis* at Cabalian, Leyte (Fig. 1) without success. The apparent rarity of the species formed the basis of its listing under CITES Appendix II and by IUCN as a Critically Endangered species (Hilton-Taylor, 2000). Chelonian biologists questioned whether the species was really rare or just unstudied, extinct or extirpated, and whether the specimen reported by Timmerman and Auth (1988) was from

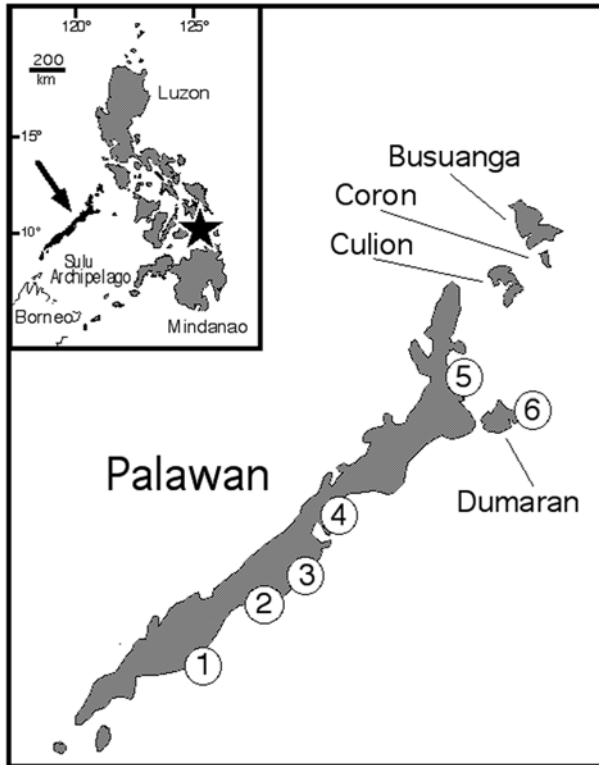


Figure 1. - Map of Palawan Island group in relation to the Philippines (inset) and Leyte Island. The type locality (Taylor, 1920) of *H. leytensis* is indicated with a star; recent trade or captive animal locations include (1) Brooke's Point, (2) Rizal, (3) Aborlan, and (4) Puerto Princesa and known natural populations include (5) Taytay, and (6) Dumarán Island.

a natural population on Palawan or the result of interisland trade (Ernst and Barbour, 1989; Iverson, 1992; Das, 1995; Gaulke, 1995). The question remained whether *H. leytensis* occurred on Leyte Island or whether the original type locality data were in error.

In late 2001, as part of a comprehensive status assessment of Palawan's endemic amphibians and reptiles, we began a survey of forested sites throughout the island. We soon became aware of three nonmarine turtle species present in some local wet markets and in the possession of local wildlife traders. Two species *Cuora amboinensis* and *Cyclemys dentata*, are common on Palawan (Taylor, 1920; Alcala, 1986; Gaulke and Fritz, 1998; Widmann, 1998; ACD and RMB, pers. obs.). A third species, frequent in the wildlife and food trade, was identified as Taylor's (1920) *Heosemys leytensis*.

**New observations.** - The live specimens we examined match published descriptions of *H. leytensis* (Taylor, 1920; Buskirk, 1989; Ernst and Barbour, 1989): carapace unkeeled except for posterior vertebrals; vertebrals broader than long; anterior marginals projecting beyond cervicals, rendering anterior rim from slightly to strongly serrated; plastron much smaller than carapace, nar-

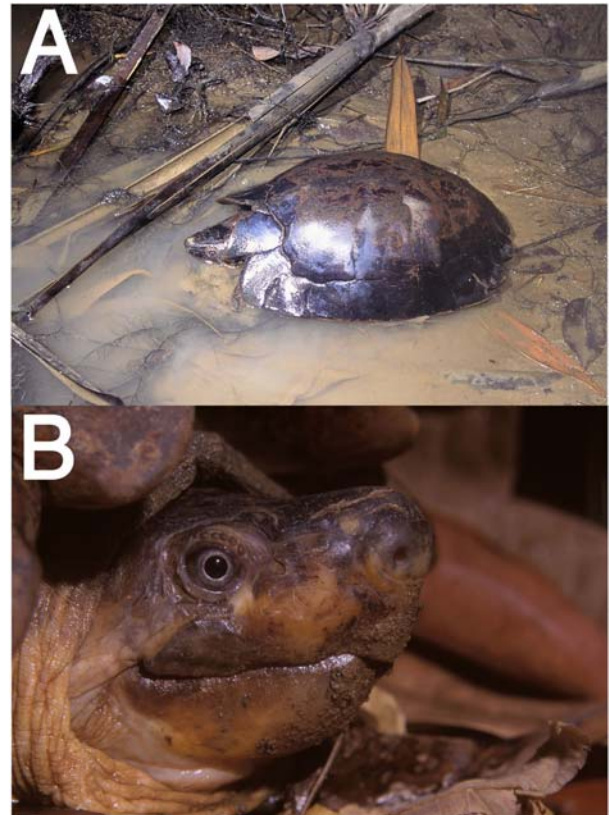


Figure 2. - Live *H. leytensis* from natural population on Dumarán Island, northern Palawan: (A) An individual of undetermined sex in a small stream on Dumarán Island; (B) close up of the head.

rowing anteriorly and posteriorly; angular notch between gulars deep and distinct; notch between gulars and humerals present, less distinct; anal notch deep and circular; three to four enlarged transverse scales present on anterior side of each foreleg; coloration rusty brown with darker margins on anterior scutes; narrow white line crosses head just behind auricular openings, medially divided in some specimens (Figs. 2-5). A full technical redescription of the morphology of *H. leytensis* will be published elsewhere (Diesmos et al., unpublished data).

We located captive animals for sale in markets at the Municipalities of Brookes Point, Aborlan, Rizal, Puerto Princesa City, and Taytay (Fig. 1). The animals were for sale as pets, ornamental fish pond curiosities, and for food. Additionally, *H. leytensis* individuals were found in public restaurants in the capital city of Puerto Princesa (Fig. 4b). In many areas, residents expressed the belief that the keeping of pet *H. leytensis* specimens brings the owner good luck.

We found natural populations in the vicinity of Lake Manguao, Municipality of Taytay, Palawan Island and on Dumarán Island (Fig. 2). Exact localities are not given to protect these populations. Several individuals of each natural population were observed in slow-mov-

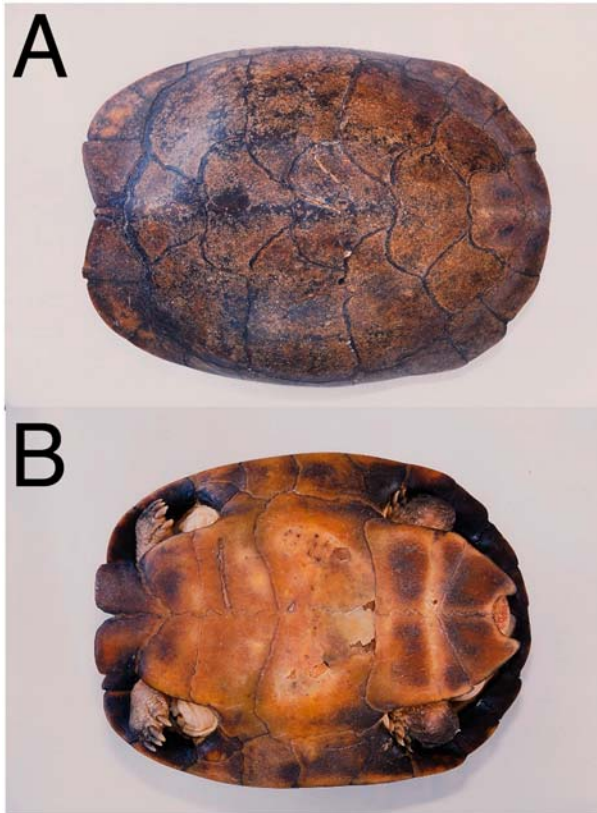


Figure 3. - (A) Dorsal view of carapace and (B) ventral view of plastron of a subadult *H. leytensis* of undetermined sex (captive pet, reportedly wild-caught locally) from Dumarán Island, N. Palawan.

ing streams, quiet side pools, and nearby disturbed gallery forests (Fig. 4a), at most a few meters from the water's edge. Residents in these localities reported to us that turtles are always located in the general vicinity of water, but that they can be found many meters away from water as well. Residents also report that *H. leytensis* burrows in stream banks and retreats under large nearby limestone boulders in the dry season when streambeds run dry.

Interviews with Tagbanwa tribe members in the Municipality of Taytay suggest that in some areas this species is fairly common. Reports of natural populations in the southern localities of Rizal and Brookes Point will need to be confirmed. In these areas interviewed persons claimed that *H. leytensis* was present in nearby forests but we were unable to locate wild animals ourselves.

## Discussion

Our recent field observations confirm that *H. leytensis* occurs naturally on Palawan and at least on one of its northern satellite islands. Despite numerous surveys of suitable habitat at Cabalian, Leyte conducted by E.

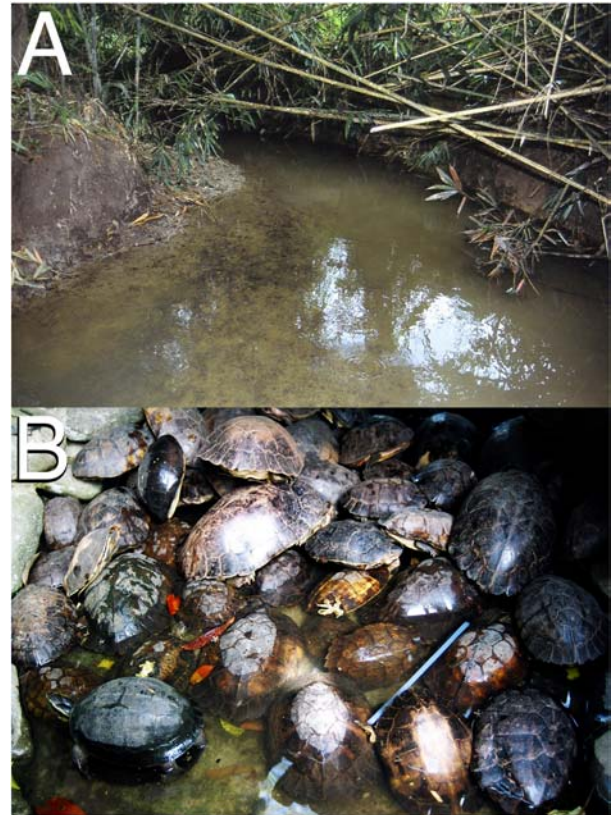


Figure 4. - (A) Preferred stream habitat of *H. leytensis* from Dumarán Island, northern Palawan; (B) *Heosemys leytensis*, *Cuora amboinensis*, and *Cycllemys dentata* specimens alive in captivity in restaurant of Puerto Princesa City, Palawan Island.

Taylor, A. Alcalá, and ourselves, no additional specimens of *H. leytensis* have been collected there. Interviews with residents in the vicinity of Cabalian, have failed to find verbal accounts of fresh-water turtles that fit the description of *H. leytensis*. We suspect that the species does not and never has naturally occurred on Leyte. We prefer the use of the common name “Philippine forest turtle” given that we have only observed animals in remnant old-growth forests and our sense is that this species is forest dependent.

It is possible that Taylor or Lopez mislabeled or otherwise confused locality information assigned to the original co-types on Leyte and the third specimen at CAS (Buskirk, 1989). Taylor (1920) also reported *Cycllemys dentata* from Cabalian, Leyte (see also Iverson, 1992). This species has not since been reported from Leyte and is otherwise restricted in the Philippines to Palawan and the Sulu archipelago (Fig. 1; Taylor, 1920; Gaulke, 1995; Gaulke and Fritz, 1998). The fact that another conspicuous Palawan turtle species was reported at the same time and from the same site on Leyte (Taylor, 1920) suggests that a group of specimens from Palawan were mixed into collections from Leyte or



Figure 5. - A live *Heosemys leytensis* from the Municipality of Taytay, northern Palawan Island, Philippines. Watercolors by Mr. Rene Aquino.

were mislabeled. Based on information from the CAS herpetological registry, it is clear that G. Lopez also collected on Coron and Busuanga (Fig. 1) which would appear to be a likely source of the presumably erroneous “Leyte” specimens of *C. dentata* and *H. leytensis*. Thus, we suspect that a locality error is the basis of the specific epithet and the long-held belief that *H. leytensis* naturally inhabits the island of Leyte. Whether *H. leytensis* has ever been introduced outside of Palawan or the country, remains to be documented.

Finally, given the geological history and the Pleistocene formation of isolated paleoislands in the Philippines (Heaney, 1985; Hall, 1996, 1998) it is not surprising that *H. leytensis* may be restricted to Palawan and satellite islands. Based on available information from other groups of Philippine endemics, it is somewhat rare for a species to be shared between both the Palawan (Palawan + Busuanga + Coron + Culion + Dumarán) and the Mindanao (Mindanao+Bohol+Leyte+Samar) Pleistocene Aggregate Island Complexes (PAICs). That is, based on previously-elucidated patterns of biogeography (Brown and Alcalá, 1970; Brown

and Diesmos, 2001; Brown and Guttman, 2002; Evans et al., 2003), we would expect to find Philippine endemics with restricted distributions on the Palawan PAIC or the Mindanao PAIC, but not necessarily both. There are some exceptions to these apparent trends, but they appear to be rare and limited to non-endemic widespread species that are also shared with the islands of the Sunda Shelf (Borneo, Java, Sumatra, etc.), or widespread Philippine endemics that are also found throughout the rest of the archipelago (Inger, 1954; Alcalá and Brown, 1998; Brown and Alcalá, 1970, 1978, 1980)

**Recommendations.** - We recommend that an immediate exhaustive survey of the Palawan PAIC (including Balabac, Coron, Busuanga, Culion, and Dumarán) be undertaken to determine the status of natural *H. leytensis* populations. Basic knowledge of the species’ distribution, habitat requirements, and natural population size will be a necessary requirement for designing effective conservation strategies. To combat illegal hobbyist, consumptive, and/or medicinal trade, wildlife managers will need to have reasonable estimates of numbers of animals

Table 1. - Standard measurements of *H. leytensis* specimens from captivity (Nos. 1-20) and a natural population (Nos. 21-24; Dumaran Isl.). Carapace Length and Width are straight-line distances; Carapace Width measured at widest point; Tail Length measured from posterior edge of cloaca to tip of tail. Sex undetermined; all measurements are in mm.

Number	Carapace Length	Carapace Width	Plastron Length	Tail Length
1.	177.0	134.3	153.8	15.9
2.	183.8	139.6	151.6	17.6
3.	189.6	144.5	157.2	19.8
4.	192.5	142.4	158.1	18.3
5.	192.7	148.4	150.8	19.1
6.	196.4	152.2	151.4	20.4
7.	200.1	148.1	165.9	22.2
8.	203.6	151.8	171.4	19.2
9.	210.2	157.3	118.1	35.6
10.	215.9	160.8	179.7	19.9
11.	222.3	171.2	186.6	35.1
12.	231.2	172.2	185.2	22.8
13.	248.5	191.5	206.8	18.6
14.	261.7	191.0	210.3	25.5
15.	266.3	195.5	201.5	26.2
16.	269.9	196.4	213.0	23.4
17.	271.7	198.3	206.7	21.7
18.	275.3	200.5	205.6	19.7
19.	278.0	200.4	208.9	27.1
20.	280.0	201.6	205.2	29.1
21.	290.6	207.8	216.3	27.7
22.	297.8	211.4	208.5	30.9
23.	299.6	212.4	212.1	28.2
24.	299.9	212.9	213.0	35.0

being illegally harvested. Legislative protection of the species will need to be adjusted to recognize its current known distribution on Palawan and not Leyte. We expect that a specific conservation strategy will be necessary to protect this species from unchecked exploitation. The fact that the entirety of Palawan is officially designated a national protected area provides some assurance, but we suspect additional measures will need to be undertaken to protect this species while promoting its study. The legal "Protected Area" status of Palawan Island clearly is not deterring local exploitation of this species. Local education programs and public awareness campaigns targeting both the general public and local environmental authorities may be the key to insuring that *H. leytensis* does not become another casualty of the "Asian turtle crisis" (van Dijk et al., 2000). Many basic questions regarding the distribution, demography, ecology, reproductive biology, and phylogenetic affinities of *H. leytensis* remain to be answered.

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