

INTRODUCTION

Hanging appendix-like below the belly of Asia, the Malay peninsula extends as a long, narrow backbone of a mountain range that originates in Burma and Thailand. The southern third of this peninsula, reaching to within 2° of the equator, is the mainland portion of Malaysia, West Malaysia. In this lush, tropical land exists one of the world's most diverse assemblages of turtles. Some five families, twenty genera, and twenty-three species (Table I) have been reported for this area which is slightly smaller than the state of Illinois. As in other developing countries, here is a heavy demand for these species and their products. But unlike so many other countries in this region, the value of turtles as a renewable resource is recognized in West Malaysia and efforts are being made to conserve them for future generations.

This report describes the usage of turtles in West Malaysia and reviews laws and conservation measures currently being undertaken to protect these valuable species.

THE FAUNA

The batagurine emydids, largest and most varied chelonian group in West Malaysia, comprise 48% (11/23) of the species. The members range in size from *Cuora amboinensis* and *Siebenrockiella crassicollis* which seldom attain carapace lengths of 200 mm to *Orlitia borneensis* which may approach 800 mm carapace length. In habits a few are chiefly aquatic (e.g. *Batagur baska* and *Callagur borneoensis*) but most tend to be amphibious (e.g. *Dermochelys platynota*, *Cyclernys dentata*, *Heosemys grandis*. *Heosemys spinosa* seems to be the most terrestrial of the group.

Of the three testudinids reported for Malaysia, only *Geochelone emys* is at all common. They are today most numerous in hill and mountainous areas, perhaps because of human predation and development in the lowlands.

Representatives of all five genera of sea turtles occur along the coasts of West Malaysia, but only *Dermochelys coriacea*, *Chelonia mydas*, and *Lepidochelys olivacea* nest in numbers; most nesting beaches occur on the east coast and associated islands. The *Dermochelys* nesting population, possibly exceeded only by one in Guiana, is one of the world's largest.

Four genera and species of trionychids have been reported from Malaysia. Three of the four (*Trionyx cartilagineus*, *Pelochelys bibroni* and *Chitra indica*) approach or exceed 700 mm disc length. The fourth (*Dogania subplana*) seldom reaches 250 mm. *Trionyx cartilagineus* is by far the most common and occurs in rivers, swamps, ponds and ditches throughout the country.

Uses of turtles in West Malaysia fall into three somewhat overlapping categories: food, religious and superstitious purposes, and novelties for the tourist trade.

Certainly the chief importance of turtles to Malaysians is as food, the usage varying considerably with race and religion. Malays, who comprise over fifty percent of the population in West Malaysia, are prohibited from eating turtle (reptile) meat by the Islam faith. They can, however, eat turtle eggs which are considered a great delicacy and are said to have aphrodisiacal properties. Eggs of five species (*Dermochelys coriacea*, *Chelonia mydas*, *Lepidochelys olivacea*, *Batagur baska* and *Callagur borneoensis*) are common in local markets during appropriate seasons (Fig. 1). Whereas chicken eggs sell for US 4-6 cents each, *Chelonia* and *Lepidochelys* eggs cost 8-10 cents each and *Dermochelys*, *Batagur* and *Callagur* eggs cost 12-16 cents each. Eggs are eaten raw, soaked in brine and then boiled, or mixed with pullet (glutinous) rice.

The second largest ethnic group (37%) and the largest consumer of turtle flesh in West Malaysia is the Chinese. They eat most of the local species (excluding sea turtles) prepared in a variety of dishes. Beyond their delectability, chelonians are reputed to possess certain medicinal value. It is believed that one's kidneys, strength and virility all benefit from a properly prepared turtle dish. A jelly prepared by boiling a carapace with vinegar is used to treat fevers, debility, and acute rheumatism (Burkill, 1966).

Softshells, chiefly *Trionyx cartilagineus*, are particularly esteemed for food. One delicious method of preparation is soup made from the flesh and cartilaginous portion of the shell with a variety of herbs, including ginseng. Hardshell turtles are steamed with Chinese herbs. Eggs are often eaten with wild honey.

Where religion allows, Indians also eat turtle, but comprising a small minority in the country, their impact on turtle populations is presumably light. An elderly lady told me that turtle meat steamed with Indian herbs could cure piles.

Finally the aborigines or Orang Asli (indigenous peoples of Malaya) eat turtle and are amazingly adept at finding them. Aquatic species are probed for in the mud and sand when waters are low or are speared from a prau (dugout) in clear swamps and rivers. Preparation is without frills; the plastron is opened and the intestines are removed, cleaned, salted and then replaced. The turtle is placed among the coals of an open fire until done. Turtles are considered an especially good find because they come equipped with their own cooking pot.

Although eggs are sold in markets on both coasts, turtles are common only in the west coast markets where most of the Chinese have settled. The east coast is predominately Malay. In the market in Telok Anson, a medium-sized western town, the most common species sold are *Trionyx cartilagineus* and *Cuora amboinensis* with

Siebenrockiella crassicollis and *Pelochelys bibroni* showing up occasionally. Softshells bring the best prices with young (more tender) *Trionyx cartilagineus* selling for US 80 cents per kati (1 1/3 lbs.). *Cuora* sell for 60 to 80 cents each. In addition to the market, turtles are sold in the so-called Chinese "pet shops". Here they are purchased for food, medicine, or occasionally as pets. In one large establishment I recorded the following species: *Callagur borneoensis*, *Cuora amboinensis*, *Cyclemys dentata*, *Geochelone emys*, *Heosemys grandis*, *H. spinosa*, *Notochelys platynota*, *Orlitia borneensis*, *Pelochelys bibroni*, *Siebenrockiella crassicollis*, and *Trionyx cartilagineus*.

Other than food, turtles have a certain religious significance to Chinese Buddhists and a number of turtle temples are scattered throughout Malaysia. According to popular belief, one finding a turtle and delivering it to one of these temples has saved a life and will be rewarded with good fortune and long life. In some temples, turtles are given no care but in others, where they have become a tourist attraction, vegetable greens are sold for visitors to feed the turtles.

Two of the most attractive and striking turtle temples are the Kek Lok Si Temple in Penang (Fig. 2 & 3) and Sam Poh Thong Temple in Ipoh. The former sits high on a hill overlooking the city of George Town. The latter is built into a cliff and sheer rock walls surround the turtle pool and garden on all sides. Within both temples one can see *Batagur baska*, *Callagur borneoensis*, *Cuora amboinensis*, *Heosemys grandis*, *Orlitia borneensis*, *Siebenrockiella crassicollis*, and even *Pseudemys scripta elegans* (a common US turtle sold in Malaysian pet shops). Several *Geochelone emys* were observed around the edge of the pool at Penang. *Heosemys grandis* was most common in both temples.

Easily the largest tourist activity related to chelonians is "turtle watching" which has created a sizeable industry on the east coast in recent years. During the sea turtle nesting season (May to September) thousands of tourists converge on the various nesting beaches, a practice being increasingly promoted in travel brochures. A number of motels cater to the "turtle watchers" and local entrepreneurs profit by selling food, drink, and protection for parked cars. Further it is not unusual to be walking down a seemingly deserted stretch of beach only to have someone dart out of the shadows to sell "turtle watching" tickets.

The most popular turtle watching area is a half mile stretch of beach at Rantau Abang, Trengganu, where the Department of Fisheries operates a hatchery and nesting sanctuary for the giant leatherback, *Dermochelys coriacea*. Here a series of small open coffee shops have been constructed where tourists can await the turtles which often do not emerge until 2:00 or 3:00 a.m. Unfortunately, these shops have greatly proliferated recently and their

lights are becoming a problem, discouraging the shy leatherbacks from using the government's beach. Crowds are also becoming a problem; it is not unusual for a leatherback to lay its eggs while encircled by several hundred observers. One night in 1975 an estimated 4000 observers swarmed the nesting beach. Emerging turtles could find no open sand and eventually returned to water.

Fortunately, turtles have not become a big tourist souvenir item. Only *Eretmochelys imbricata* has joined the gaudy, stuffed, shellacked false gharials, crocodiles, monitor lizards, and cobra-mongoose displays in tourist shops of Singapore and Kuala Lumpur. Some tortoise shell (*Eretmochelys*) is also sold in various forms of jewelry. For the most part these hawkbill products come from Indonesia rather than local sources. I have seen no evidence that the reptile leather business is using turtle hides. Crocodylians, monitor lizards, and pythons are most commonly sold for this purpose.

LEGISLATION AND CONSERVATION

Malaysia is a conservation leader in SE Asia. This circumstance is partly because of the country's relatively high standard of living, partly due to enlightened leadership in those government agencies responsible for the nation's resources, and partly to a small but active band of conservationists. Spearheading many conservation efforts is the Malayan Nature Society, presently approaching one thousand members. The Society publishes THE MALAY NATURE JOURNAL for scientific publication and THE MALAYAN NATURALIST, a quarterly newsletter which covers recent conservation events and serves as a forum for members' conservation ideas. Beyond this the Society operates a speakers' bureau for schools and organizations, holds essay and art contests on conservation subjects, and generally publicizes conservation throughout the country.

Among its recent activities are several turtle-related projects. The Society is working with the Tourist Development Corporation to insure that increased tourist visitation and facilities at leathery turtle nesting beaches cause minimal disturbance to the turtles. On the west coast the Society is working to establish sanctuaries for *Chelonia mydas* and *Lepidochelys olivacea* on the tourist islands of Pangkor and Penang and a sanctuary for *Eretmochelkys imbricata* in the state of Malacca.

Two government agencies divide responsibility for turtles. Fresh water and terrestrial species fall under Game Department jurisdiction whereas salt water species are under control of the Department of Fisheries. These agencies enforce existing laws and set up government sponsored conservation programs.

Unfortunately, protection of declining species is hampered by a scarcity of existing laws. Only two of eleven states presently have laws controlling exploitation of inland turtles. In the state of Perak, two laws passed in

915 offer protection to the genera *Orlitia*, *Batagur*, *Callagur*, and *Hardella*. Interestingly, the latter does not occur in Malaysia. Basic provisions of the laws prohibit certain types of traps in the nesting area at times when hatchlings are emerging, prohibit the killing of these genera on the lower Perak River, and give the state authority to license and lease egg-collecting areas. In 1972 the state of Kedah passed a similar law for licensing and leasing *Batagur* egg-collecting areas.

Four out of eleven states (Perak, Kelantan, Trengganu, and Pahang) have laws applying to sea turtles but the major emphasis is on licensing and leasing egg-collecting areas. Adults are given protection but egg-collecting is not restricted and thus almost all eggs laid are collected and sold.

To gain uniformity in turtle legislation throughout West Malaysia, a new law has been written that applies to *Batagur baska*, *Dermochelys coriacea*, *Chelonia mydas*, *Lepidochelys olivacea* and *Eretmochelys imbricata*. The new legislation transfers the authority and responsibility for turtle protection from the state to the Department of Fisheries (federal), providing more power and wider coverage over turtle management. Specific tenets of the bill provide for regulation of egg collection, killing and possession of turtles, tourist "turtle watching", cruelty to turtles, conservation programs and collection of statistics on nesting. The greatest obstacle in passing such sweeping legislation is that wildlife exploitation is the prerogative of each state and no federal law can be passed controlling this resource. Therefore each state assembly must pass the law separately for it to be accepted countrywide and whether all states will approve this new law remains to be seen.

Despite the inadequacy of existing laws, both Game and Fisheries Departments have begun active conservation efforts for endangered species. The Game Department in 1967, under the leadership of the present Chief Game Warden, Mohamed Khan, an avid conservationist and current president of the Malayan Nature Society, established a hatchery program for *Batagur baska* on the Perak River. Eggs are purchased from local licensed collectors and hatched in sand on an artificial beach. Hatchlings are then raised in captivity for one year and released on the natural nesting beaches. To date 6,000 to 7,000 *Batagur* have been returned to the Perak River as part of this program. The program is an important step in halting the decline of *Batagur* populations but a number of programs remain to be worked out. Low hatching success and the advisability of raising hatchlings in captivity are two problems under current study. Next year the *Batagur* program will be expanded with the establishment of a hatchery on the east coast's Trengganu River.

The Department of Fisheries currently operates a hatchery for *Dermochelys coriacea* in the state of Trengganu. The history of this project has recently been reviewed (Kiew, 1975). Briefly, the program was initiated

by the Department of Fisheries and the Malayan Nature Society under the advisement of Dr. J.R. Hendrickson in 1961. The state of Trengganu financed the original project which produced 3,699 hatchlings from 8,366 eggs. With additional financial aid from the World Wildlife Fund, Fauna Preservation Society, and the Malaysian Government, the number of hatchlings released has grown steadily to 42,616 from 91,147 eggs in 1974. From 1961-1974, 244,392 hatchlings have been released. The present goal is to obtain 15% (ca. 180,000) of all eggs laid each year for the hatchery.

The Director of the Fisheries Department in Trengganu, Siow Kuan Tow, presently oversees the *Dermochelys* program. An active, imaginative biologist and administrator, Mr. Siow has grandiose plans for the sea turtle hatchery on Malaysia's east coast. Examples of future improvements that Mr. Siow would like to add to the program include: 1) fencing off five of the twelve miles of the *Dermochelys* nesting beach as a turtle sanctuary; 2) beginning similar hatchery programs for *Chelonia mydas* and *Lepidochelys olivacea*; and 3) establishing a green turtle ranch in a fenced-off natural pasture.

CONCLUSION

The future for chelonians in Malaysia looks brighter than in other parts of SE Asia, but there are still many problems which need attention. Considering the large numbers of turtles sold in markets and exported to Singapore for consumption each year, certain populations must be rapidly dwindling. Population studies are sorely needed to provide the base-line data necessary to assess which species are being over-exploited. At present those species nesting in mass on specific areas (i.e., *Batagur*, *Callagur*, sea turtles) seem most threatened, although the great demand for softshell meat requires that these species be watched closely as well.

Hopefully Malaysia's excellent beginning in turtle conservation will be continued and expanded to set an example for other nations in the area.

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EDWARD O. MOLL
Eastern Illinois University
Charleston, Illinois

Table I. Chelonians of West Malaysia

CHELONIIDAE

- Caretta caretta**
- Chelonia mydas*
- Eretmochelys imbricata*
- Lepidochelys olivacea*

DERMOCHELYIDAE

- Dermochelys coriacea*

EMYDIDAE

- Batagur baska*
- Callagur borneoensis*
- Cuora amboinensis*
- Cuora trifasciata**
- Cyclemys dentata*
- Geoemyda spengleri**
- Heosemys spinosa*
- Heosemys grandis*
- Hieremys annandali***
- Malayemys subtrijuga***
- Notochelys platynota*
- Orlitia borneensis*
- Siebenrockiella crassicollis*

TESTUDINIDAE

- Geochelone elongata**
- Geochelone emys*
- Geochelone impressa*

TRIONYCHIDAE

- Chitra indica**
- Dogania subplana*
- Pelochelys bibroni*
- Trionyx cartilagineus*

* Based on reports in literature but I have not seen Malaysian specimens.

** Known from Malay Peninsula; occurrence in West Malaysia needs substantiation.



Fig. 1. Sea turtle eggs on sale in market at Kuala Trengganu, Malaysia.



Fig. 2. Kek Lok Si Temple, a "turtle temple" on Penang Island, Malaysia.

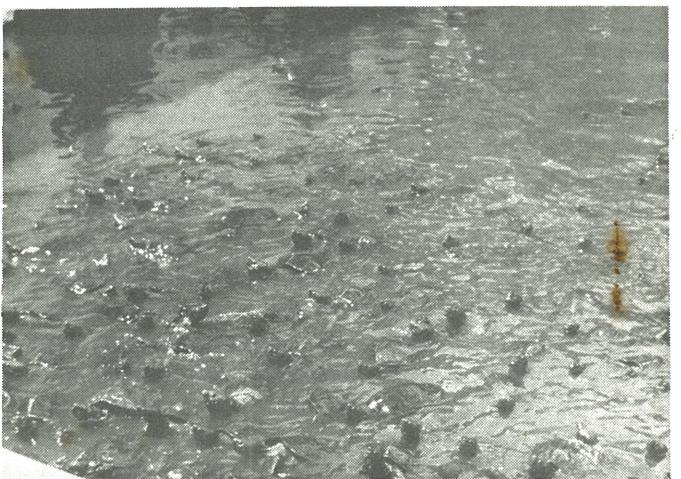


Fig. 3. Turtles "begging" for food in main pool at Kek Lok Si Temple.

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