

**A REPORT
ON THE TURTLE POPULATIONS
OF THE ISLANDS OFF THE EAST COAST OF JOHOR
AND SUGGESTIONS FOR THEIR MANAGEMENT**

by

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EXECUTIVE SUMMARY

The Status of the Turtles of the Islands of Johor

- 1) During the 1989 season, hawksbill turtles laid an estimated 100-200 egg clutches, and green turtles an estimated 10-20 egg clutches. The highest density of nesting was reported at Pulau Mertang, Pulau Lima, Pulau Pemanggil and Pulau Simbang. Most turtle nesting occurs during the months of April through August.
- 2) Present levels of nesting activity are reportedly much lower than they were years ago. The decline in the nesting population is attributed to the following factors:
 - a) Over-harvest of eggs for human consumption.
 - b) Capture of turtles in commercial fishing gear -- especially in trawl nets.
 - c) Destruction of prime nesting beach by coastal development.

Management Recommendations

- 1) A legal ban should be imposed on the harvest and sale of turtle eggs for human consumption throughout the State of Johor.
- 2) The law that restricts trawling within 5 nautical miles of shore needs to be strictly enforced within the boundaries of the Marine Parks. To help discourage illegal trawling activity, concrete obstacles or tires filled with cement might be placed within the restricted zone. These would snag and damage the illegally operated trawl nets.
- 3) Hatcheries need to be established on each island. These could be maintained by licensed, resident egg collectors. Fisheries personnel should be dispatched at intervals to determine the number of eggs protected and their rates of hatching success. The egg collectors should be paid for each egg they protect. They might also receive a bonus for eggs that produce hatchlings. They should be required to incubate 100% of the eggs that they collect.

- 4) Some of the highest levels of turtle nesting were recorded at islands not yet gazetted as Marine Parks. Because of their turtle populations, the following islands need to be incorporated into the Marine National Park system of Malaysia:
 - a) Pulau Mertang Besar;
 - b) Pulau Mertang Tengah;
 - c) Pulau Mertang Timor;
 - d) Pulau Lima Besar;
 - e) Pulau Lima Kecil; and
 - f) Pulau Pemanggil.
- 5) In order to preserve the breeding habitat of the turtles, the most important turtle nesting beaches should be identified and established as "Turtle Nesting Sanctuaries." Those forms of coastal development known to be harmful to turtles should be restricted from their vicinity.
- 6) Surveys of the turtle populations of the following offshore islands of Johor need to be carried out:
 - a) the Pulau Aur group; and
 - b) the Pulau Sibul group.
- 7) The fact that turtles occasionally nest at the islands should be publicized to tourists.

1. INTRODUCTION

Most of the information in this report was gathered during a visit to Johor on 25-27 September 1989 in the company of Mr. Siow Kuan Tow, the Director of Fisheries for the State of Johor, and Encik Sukarno bin Wagiman (Fisheries Research Institute). On 26 September, we departed from Mersing in a Department of Fisheries vessel, and during the next two days visited the following islands: Pulau Besar, Pulau Tinggi, Pulau Simbang, Pulau Lima, Pulau Rawa, Pulau Pemanggil and Pulau Mertang (Figures 1 and 2). We interviewed egg collectors and other residents of the islands and visited the most important nesting beaches. Mr. Siow kindly gave me copies of the statistics on egg collection that he obtained from the men licensed to collect eggs.

2. THE ISLANDS

2.1 The Islands and Marine National Park System

At the time of our visit, Pulau Besar, Pulau Tinggi, Pulau Simbang, and Pulau Rawa were all part of the Malaysian system of Marine National Parks. Not included in the Park system were the islands in the Pulau Mertang and Pulau Lima groups and the most remote island that we visited, Pulau Pemanggil.

2.2 The Resident Human Populations

Of the islands we visited, Pulau Simbang, and those in the Pulau Lima and Pulau Mertang groups were uninhabited. The other islands had resident populations that included about 300 people on Pulau Tinggi and 45 people on Pulau Besar (Jabatan Perikanan, 1987). Statistics for Pulau Rawa and Pulau Pemanggil were not readily available.

3. SPECIES AND NESTING DENSITY OF THE TURTLES

Two species of turtles are reported to nest on the islands off the east coast of Johor--the hawksbill turtle (Eretmochelys imbricata) and the green turtle (Chelonia mydas). Hawksbills are reportedly the most abundant. According to our informants, the amount of turtle nesting that now occurs in Johor is but a fraction of previous levels.

3.1 Hawksbill Turtles

The data on hawksbill nesting that we gathered from our informants (shown in Table 1) suggest that at least 58 to 104 hawksbill egg clutches were deposited at the islands during the 1989 season. Other egg clutches were probably collected by people other than those we interviewed, such as passing fisherman. If we assume that our informants observed 50% of the egg clutches laid, then approximately 100 to 200 hawksbill egg clutches would have been laid in the islands off the east coast of Johor.

3.2 Green Turtles

Reports of green turtle nesting are shown in Table 2. If we assume that our informants missed at least 50% of the green turtle nesting that occurred, then an estimated 10 - 20 green turtle egg clutches were deposited on the islands off the east coast of Johor in 1989.

4. THE NESTING SEASON

Table 3 shows the statistics for the numbers of hawksbill eggs collected each month by the licensed egg collectors of the Johor islands. These data indicate that the hawksbill season runs from April through August.

We were not told during which months green turtles nest. Very possibly, however, the season in Johor is the same as elsewhere along the east coast of the peninsula, with a peak during the months of March through August.

5. THREATS FACING THE POPULATION

Three major threats endanger the survival of the marine turtles of the islands of Johor. These are:

- 1) **Over-harvest of eggs for human consumption.** At the time of the study, virtually every egg laid at the islands was collected and most were consumed by people.

- 2) **Capture of turtles in commercial fishing gear.** Residents of the islands complained that large numbers of turtles are being captured each year in fishermen's nets--especially in trawl nets.
- 3) **Destruction of prime nesting beaches by unrestrained coastal development.**

6. **RECOMMENDATIONS FOR THE MANAGEMENT OF THE TURTLE POPULATIONS**

6.1 **Legal Ban on Egg Sale**

A legal ban on the harvest and sale of turtle eggs for human consumption is needed. If possible, the ban should be State-wide, since most of the turtle nesting that takes place in Johor occurs within the boundaries of the Marine National Parks. At the very least, a ban should be placed at the islands. Continued consumption of turtle eggs is incompatible with the following objectives of a Marine National Park as stated in the Fisheries Act of 1985: "to--

- a) afford special protection to the aquatic flora and fauna of such area or part thereof and to protect, preserve and manage the natural breeding grounds and habitat of aquatic life with particular regard to species of rare and endangered flora and fauna;
- b) allow for the natural regeneration of aquatic life in such area or part thereof where such life has been depleted."

During our visit, when Mr. Siow suggested to a group of egg collectors at Pulau Tinggi that a legal ban on the harvest of eggs for human consumption might be imposed in 1991, they replied that it should be imposed earlier--in 1990!

6.2 **Prohibit Trawling Vessels within the Marine National Parks**

The laws prohibiting trawlers from fishing within 5 nautical miles of shore need to be strictly enforced especially within the boundaries of the Marine National Parks. Not

only do trawling vessels kill turtles, they severely damage fragile marine ecosystems.

One possible way to discourage the illegal activities of trawling vessels would be to submerge objects in the restricted zones in order to damage the trawl nets. A variety of objects might be used for this purpose including tires filled with cement or even large blocks of concrete.

6.3 Establish Hatcheries

Hatcheries need to be established at several of the islands, and these could be maintained by the licensed egg collectors. The licensed collectors should be required to incubate 100% of the eggs collected.

Considering the large area in question, and the relatively low density of turtle nesting that occurs, it would be impractical to station Fisheries personnel at the islands specifically to operate turtle hatcheries. Accordingly, Mr. Siow has proposed that licensed egg collectors residing at the island be responsible for setting up hatcheries, for planting eggs in them, and for the subsequent release of the hatchlings.

The egg collectors would be paid \$ 0.35 per egg. At the end of the season (or preferably, at intervals within the season) Fisheries personnel could visit the collectors and excavate the contents of the nests from which young have already hatched. In this way they could ascertain how many eggs had been protected.

The following problems are likely to occur with such a system:

- a) Too long a delay between the time the eggs are laid by the female and when they are planted in the hatchery. Ideally, no more than two to four hours should elapse.
- b) Too long a delay between the emergence of the hatchlings from the nest and their release into the sea. Ideally, the hatchlings should be released immediately after they emerge from the nest.

The following are suggestions to help overcome the above mentioned problems:

- a) A training course should be conducted for the egg collectors to show them correct procedures for operating a turtle hatchery.
- b) If it is logistically possible, egg collectors should be encouraged to leave the eggs buried in the natural nests. Perhaps if they were to erase the tracks of the nesting turtle, human intruders would be less likely to poach the eggs.
- c) Egg collectors might be awarded a bonus for eggs that successfully hatch, especially if they are left in the natural nests.

6.4 Gazette as Marine Parks Those Islands with the Largest Numbers of Nesting Turtles

The highest levels of turtle nesting activity were reported at Pulau Mertang, Pulau Lima and Pulau Pemanggil--none of which have been gazetted as Marine Parks.

Inclusion within the Marine National Park system should afford added protection for the turtles nesting there. For this reason, the following islands need to be gazetted as Marine Parks:

- a) Pulau Mertang Besar;
- b) Pulau Mertang Tengah;
- c) Pulau Mertang Timor;
- d) Pulau Lima Besar;
- e) Pulau Lima Kecil; and
- f) Pulau Pemanggil.

6.5 Establish Nesting Beach Sanctuaries

In order to protect the breeding habitat of the turtles, those beaches with the highest levels of nesting activity need to be

identified and designated as "Turtle Nesting Sanctuaries." All forms of coastal development known to be incompatible with nesting turtles should be restricted from the vicinity of those beaches.

6.6 Turtle Surveys Needed

Some islands off the coast of Johor have not yet been adequately surveyed for turtles. In particular, the following islands warrant further study (Figure 1):

- a) the Pulau Aur group: and
- b) the Pulau Sibul group.

6.7 Promote Turtles as Tourist Attractions

The presence of turtles at the islands should be promoted as a tourist attraction. Even if the tourists never see turtles, the mystique of the islands is enhanced by the knowledge that sea turtles occur there.

LITERATURE CITED

Jabatan Perikanan. 1987. Bancian Khas Penduduk Taman Laut 1987. 17 December 1987. 56 pages.

TABLE 1. Hawksbill Turtle Nesting in 1989. See Figures 1 and 2 for the location of each island.

Island	Verbal Reports Obtained in Interviews	Statistics from Licensed Egg Collectors
P. Besar	few turtles nest	--
P. Tinggi	perhaps 20 - 30 nests	--
P. Simbang	perhaps 10 - 20 nests	812 eggs (5 nests)
P. Lima	P. Lima Kecil (1 beach) P. Lima Besar (2 beach) "more turtles nest at P. Lima than at P. Tinggi"	1,416 eggs (11 nests?)
P. Rawa	"some nesting at beach behind island"	--
P. Pemanggil	at least five beaches on island have nesting	1,120 eggs (7-8 nests)
P. Mertang	P. Mertang Timor (2 beaches) P. Mertang Barat (1 beach)	5,299 eggs (35 nests?) 682 hatchlings

TABLE 2. Green Turtle Nesting in 1989. See Figures 1 and 2 for the location of each island.

Island	Verbal Reports Obtained in Interviews	Statistics from Licensed Egg Collectors
P. Besar	no reported nesting	--
P. Tinggi	no reported nesting	--
P. Simbang	no reported nesting	--
P. Lima	no reported nesting	--
P. Rawa	no reported nesting	--
P. Pemanggil	some green turtles nest, especially on N.E. side of island at Kadoh Beach	6 green turtle nests
P. Mertang	very few	--

TABLE 3. Numbers of Hawksbill Eggs Reported per Month by the Licensed Egg Collectors. See Figures 1 and 2 for the location of each island.

Month	Pulau Simbang	Pulau Lima	Pulau Pemanggil	Pulau Mertang	Total
February	--	--	--	--	--
March	--	--	--	--	--
April	--	235	--	800	1,035
May	450	412	300	1,730	2,892
June	--	416	320	1,850	2,586
July	362	353	200	919	1,834
August	--	--	300	--	300
September	--	--	--	--	--
Total	812	1,416	1,120	5,299	8,647

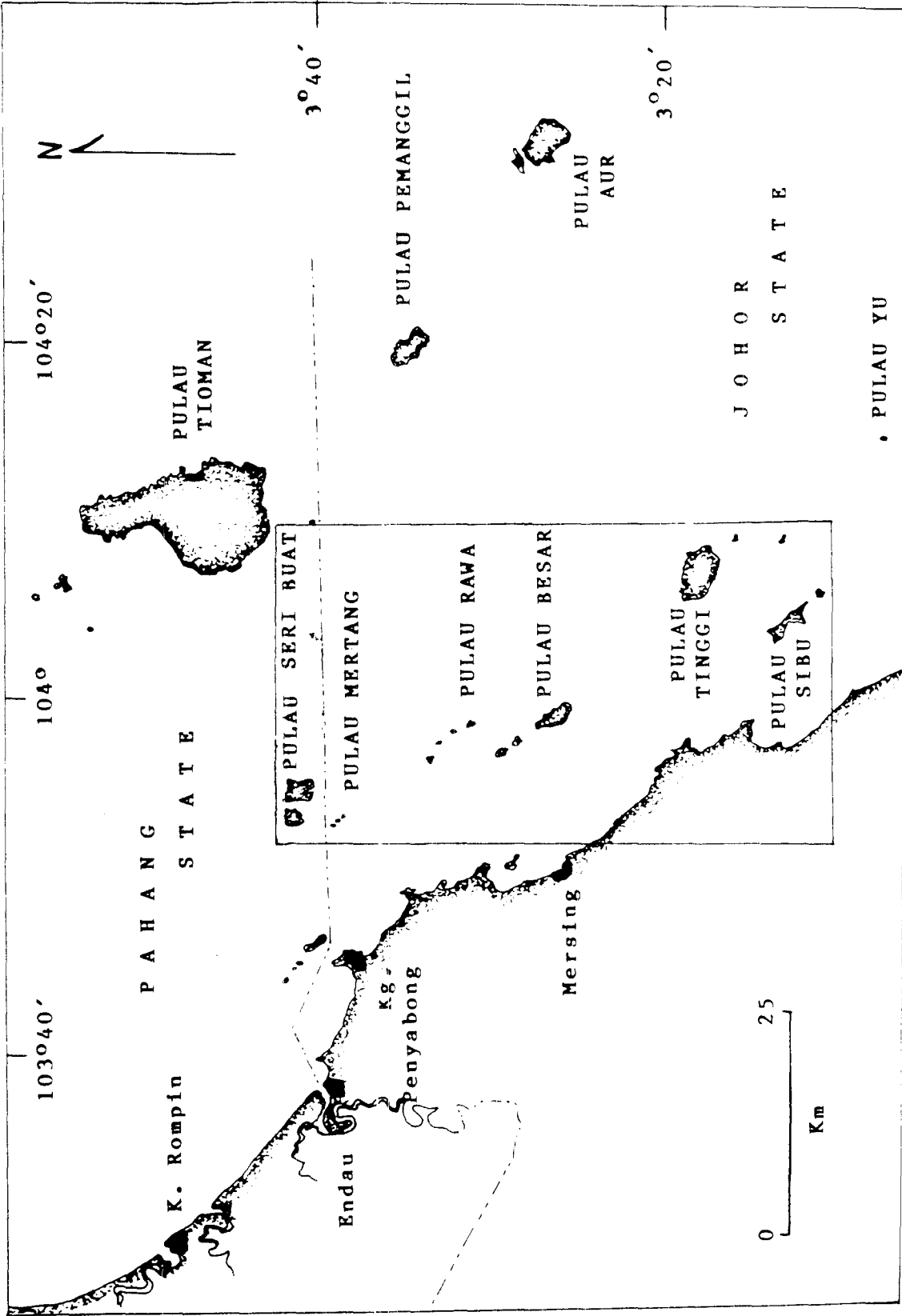


FIGURE 1. Map showing the islands off the east coasts of the States of Pahang and Johor. See Figure 2 for an enlargement of the area enclosed by rectangle.

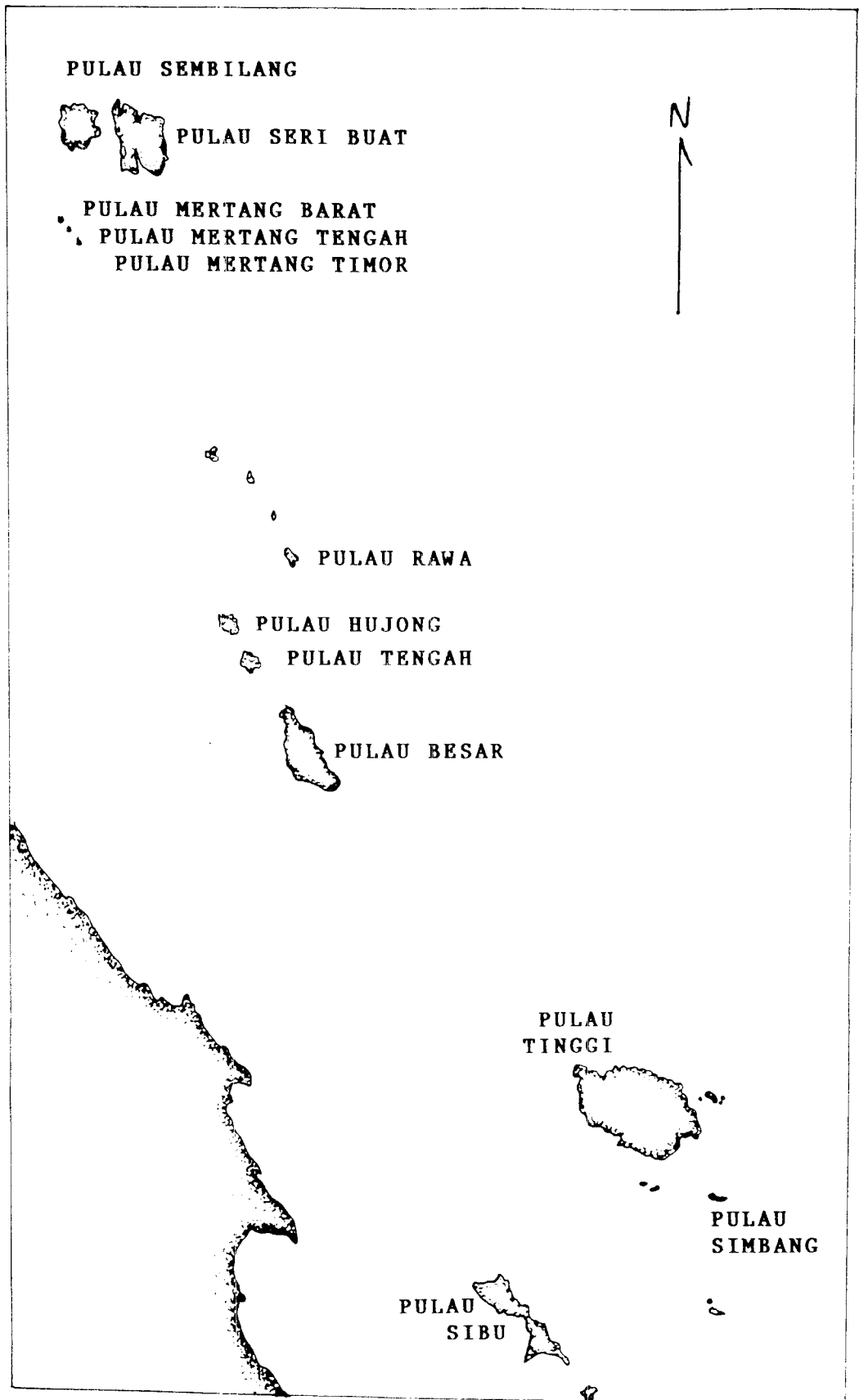


FIGURE 2. Map showing enlargement of the area indicated in Figure 1.