

RESEARCH, CONSERVATION AND MANAGEMENT OF MARINE TURTLES IN VIETNAM

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INTRODUCTION

The seawaters of the ASEAN region are recognised as a critical habitat for marine turtles of the World. Research, conservation and management activities on marine turtles have been conducting in each country in the region, but there are still gaps in our knowledge of the biological characteristics as well as habitats of marine turtles.

The first information on marine turtles in Vietnam was reported by Le Qui Don (1877) and Trinh Hoai Duc (1863), then updated information was reviewed by the French Researchers Bocourt (1886), Chevey (1926), Bourret (1927,1941).

Some earlier research on marine turtles was initiated by Dao Van Tien (1976) and Nguyen Khac Huong (1978). Special emphasis on research, conservation and management of marine turtles in Vietnam was re-initiated only after ASEAN workshop on Asean Sea Turtles Conservation and Protection Programme held 4-5 December 1997 in Jakarta, Indonesia. Since early 1998, the Government of Vietnam, through the Ministry of Fisheries has appointed the Research Institute of Marine Products as National Institution taking responsibility for research activities on marine turtles in Vietnam.

POPULATION AND DISTRIBUTION OF MARINE TURTLES

Species occurrence

Five species of marine turtles have been identified in Vietnam, namely Green turtle (*Chelonia mydas*), Loggerhead (*Caretta caretta*), Hawksbill turtles (*Eretmochelis imbricata*), Olive Ridley turtle (*Lepidochelys olivacea*) and Leatherback turtle (*Dermochelys coriacea*).

The occurrence of these species throughout seawaters of Vietnam is given in Table 1 and illustrated in Figure 1.

Table 1: Marine turtles species and their occurrence in Vietnam

Area	Number of Species	Latin name of Species
Tonkin Gulf	4	<i>Chelonia mydas</i> <i>Caretta caretta</i> <i>Dermochelys coriacea</i> <i>Eretmochelys imbricata</i>
Central water	4	<i>Caretta caretta</i> <i>Chelonia mydas</i> <i>Eretmochelys imbricata</i> <i>Dermochelys coriacea</i>
Southeastern water	4	<i>Caretta caretta</i> <i>Chelonia mydas</i> <i>Eretmochelys imbricata</i> <i>Lepidochelys olivacea</i>

Area	Number of Species	Latin name of Species
Southwestern water (Gulf of Thailand)	3	<i>Caretta caretta</i> <i>Chelonia mydas</i> <i>Eretmochelys imbricata</i>
Hoang Sa Archipelago (Paracels)	2	<i>Caretta caretta</i> <i>Eretmochelys imbricata</i>
Truong Sa Archipelago (Spratly)	2	<i>Chelonia mydas</i> <i>Eretmochelys imbricata</i>

- Green turtle (*Chelonia mydas*) - Vietnamese name (VN): VYch
This species is widely distributed, but the highest concentration occurs in seawater of Con Dao island and Truong Sa (Spratly) Archipelago. Nesting season lasts from March to August. The average number of laid eggs in each clutch ranged from 80 - 150.
- Hawksbill turtle (*Eretmochelys imbricata*) - VN: ṣai m̄i
The highest concentration was found in seawaters of Catba Island (Tonkin Gulf), Hoang Sa (Paracels), Con Dao Island (Southeast water), Phu Quoc Island (Gulf of Thailand). Nesting season lasts from February to May.
- Loggerhead turtle (*Caretta caretta*) - VN: Qūn @̄ng
The highest concentration occurs in seawater of Hoang Sa (Paracels), Nha Trang (Central), Phu Quoc Island (Gulf of Thailand). Nesting season lasts from February to May, an average number of laid eggs is 170-200, eggs diameter ranged from 38-41 mm.
- Leatherback turtle (*Dermochelys coriacea*)- VN : r̄i da
This species is distributed mainly in the Tonkin Gulf and Central water of Vietnam. An average diameter of eggs is 33 mm. This species fed mainly on sea grass.
- Olive Ridley turtle (*Lepidochelys olivacea*) - VN: @ó, vYch
The highest concentration occurs in seawater of Con Dao (Southeast water). Nesting season lasts from February to June.

Affect of human activities on population of marine turtles

In Vietnam, turtle is considered as one among four cult animals. Turtle is symbol of Longevity and other animals are symbols of Power, Happiness and Wisdom. Therefore, fishermen always try to avoid to catch marine turtles. Incidentally caught turtles if still alive, fishermen should release them immediately to sea.

Some interview-based studies were carried out in 1998 by RIMP in Thanh Hoa (Tonkin Gulf), Quang Nam, Da Nang and Khanh Hoa provinces (Central of Vietnam). The results showed that almost marine turtles were incidentally caught by different types of fishing gears especially by bottom trawls, gillnets, longline and some time by purse seine. However, number of marine turtles incidentally caught by commercial fishing gears as by-catch in Vietnam was estimated to be less than 100 individuals per year. Currently, there are not any commercial fishery on marine turtles in Vietnam.

On the other hand, coastal habitats who are not involved in fisheries activities are still hunting on marine turtles by SCUBA diving and longlines for tourism purposes or collecting marine turtle eggs for domestic consumption as food.

The positions, where marine turtles are incidentally caught by different types of fishing gears in Vietnamese seawaters are shown in Figure 2.

NESTING SEASON AND EGG COLLECTION

Con Dao Island is the main nesting site of marine turtles in Vietnam. It is located about 100 miles southwestern Vung Tau City in between coordinate of 8°34' - 8°49' N Latitude and 106°31' - 106°45' E Longitude. (Fig. 3).

In fact, Con Dao is a group of 14 big and small islands providing 17 natural nesting habitats for marine turtles, of which five are most important namely: HON BAY CANH, HON TRE LON, HON CAU, HON TAI and HON TRUNG TAM (HON in Vietnamese means SMALL ISLAND). Annually, thousands of marine turtles come ashore for nesting on sand beaches of these major nesting sites.

Among 5 species of marine turtles in Vietnam, only three species come ashore Con Dao Island for nesting, namely: Green turtle, Loggerhead and Hawksbill turtles. According to observations in 1997, Green turtle occurred on all 16 natural nesting sites (100%), Hawksbill turtle on 6 (37.5%) and Loggerhead turtle on 1 (6.25%).

Nesting season for marine turtles in Con Dao Island differs among different species. In general, nesting season lasts from March to November with the peak from May to October. Nesting season of Green turtle is given in Table 2.

Table 2: Nesting season of Green turtle in Con Dao in 1997

Natural nesting sites	Nesting season	Nesting peak
HON TAI	March - November	August
HON BAY CANH	April - November	October
HON CAU	April - November	July - September
HON TRE LON	Year around	June - October

Source: Report on results of conservation of marine turtles in CON DAO National Park in 1997.

Observations on nesting behaviour of marine turtles showed that turtles usually nest mostly at night at about 15 minutes before or after spring-tide.

It is noted that, not all marine turtles coming ashore for nesting will be successful in nesting. Results of observations on nesting success in period from June to August, 1997 in natural nesting sites of Con Dao Island are given in Table 3.

Table 3: Results of observations on nesting of marine turtles in June-August 1997 in Con Dao Island

Date	Nesting sites	Number of nests with eggs laying	Number of nests without eggs laying	Number of unsuccessful nests	Total
29/06/97	Hon Bay Canh	10	11	12	33
15/07/97	Hon Bay Canh	14	01	01	16
26/08/97	Hon Bay Canh	12	14	05	31
29/07/97	Hon Tre Lon	07	01	01	09
07/07/97	Hon Cau	05	01	03	09
26/08/97	Hon Tai	03	01	00	04
Σ		51	29	22	102
%		50	28.4	21.6	100

Source: Reports on results of conservation of marine turtles in Con Dao National Park in 1997.

It is clearly that, 50.0% of nesting turtles were successful with nesting and laying eggs, 28.4 % successful with nesting without eggs laying and 21.6 % were not successful with both nesting and egg laying. According to the statistical data of Con Dao National Park, in 1997 among 1496 marine turtles coming ashore for nesting, 805 were successful with nesting and egg laying, comprising 53.8%; 374 were successful with nesting without egg laying (25.0 %) and 317 were unsuccessful in both nesting and egg laying. Number of eggs laid per each clutch ranged from 36 to 150 with an average of 90 eggs.

Hatch rate of marine turtles depends on the interaction of a number of factors, such as salinity, humidity, temperature, gas flow, rainfall, tidal inundation, erosion and predation. Hatch rate of marine turtles in Con Dao Island in 1997 is given in Table 4.

Table 4: Hatch rate of marine turtles in Con Dao Island in 1997

Nesting sites	Number of laid eggs	Hatch rate rate (%)	Rate of unfertilised eggs (%)	Rate of unhatched eggs (%)	Rate of died hatchlings on beaches (%)
HON TAI	4,000	76.88	9.10	14.02	0
HON BAY CANH	34,219	81.16	3.78	15.08	0.32
HON CAU	10,659	78.56	6.28	15.16	0.06
HON TRE LON	13,777	57.81	20.56	21.62	0
Average		75.29	8.24	16.47	0.20

Source: Report on results of conservation of marine turtles in the Con Dao National Park in 1997.

The hatch rate ranged from 57.81 to 81:16 with average rate of 75.29. It was found that hatch rate in 1997 higher than hatch rate in 1994,1995 and 1996.

CONSERVATION AND MANAGEMENT

Con Dao National Park was established in 1993. The fauna and flora here consist of about 1,321 species, of which 44 are rare and have been recorded in the Red Book of Vietnam.

Due to the geographical features of Con Dao Island, the Southwest monsoon strongly affected shoreline from June to November (nesting season) threatening marine turtles nestings. Therefore to save marine turtles nestings is very important in Con Dao.

In 1995, the Programme "Salvation of marine turtles in Vietnam" has been launched and supported by WWF. Observations on nesting behaviour of marine turtles have been conducted during reproduction period in Con Dao Island. Nestings on nesting sites in Con Dao are recorded and marked and those being threatened be washed away by wave should be removed to safer sites. Newly emerged hatchlings are rearing in artificial lakes for some time then be released to sea.

The number of saved hatchlings was increased gradually year by year. In 1994 only 6,000 hatchlings have been saved, then increased to 28,500 in 1995 and 70,000 in 1997.

The difficult problems being faced in research and conservation of marine turtles in Vietnam are shortage of financial support, lack of training opportunities, insufficient knowledge to technology and it's applications, etc.

RESEARCH ACTIVITIES

Few research has been conducted on marine turtles in Vietnam. The topic titled "Study on marine turtles resources, to determine measures to protect and develop their resources in seawaters of Vietnam" has been conducting since 1998 only and with very limited budget granted by Ministry of Fisheries of Vietnam. The main objectives of the study are as follows:

- To estimate the abundance and distribution of marine turtles.
- To study on tagging, nesting behaviour and biology.
- To study on affect of fishing gears on turtles.
- To establish sanctuaries.

On the other hand, activities on conservation of marine turtles in Con Dao have been carrying out since 1995 with assistance of WWF in both technical and financial terms.

Institutions currently involved in research and conservation on marine turtles in Vietnam are: Research Institute of Marine Products (RIMP) and Con Dao National Park. The following researchers are involved in marine turtles research in Vietnam: from RIMP - Dr. Pham Thuoc, Dr. Chu Tien Vinh, Mr. Dao Van Tu, Mr. Dinh Thanh Dat. From Con Dao National Park - Mr. Dao Xuan Ai.

LAW AND ENFORCEMENT

There are not any special enactments, regulations on pertaining to marine turtles in Vietnam. However, the following legal documents issued by the Government of Vietnam relating to the Fisheries resources protection and development (including marine turtles) can be listed:

- Ordinance dated 25 April 1989 on protection and development of fisheries resources, which stipulated that: "Prohibit any actions causing harmful affects on resources, habitats of aquatic living resources" (Chapter I, Article 5); "Exploitation and commerce of living aquatic resources of high economic value being rare, threatened or endangered should be banned" (Chapter II, Article 12).
- Enactment No 195 - HDBT (Council of Ministers) dated 2 June 1990 guiding on execution of the Ordinance dated 25 April 1989.

- Decision No 130-CP dated 20 April 1991 on Establishment of the Fisheries Protection Department under Ministry of Fisheries.
- National Law on Environment Protection issued in 1993.
- Provisions N 415/TTg dated 20 August 1994 of Prime-minister promulgating the statute on the organization and activities of State Inspectors in the field of protection of fisheries resources.

The Ministry of Fisheries of Vietnam has issued other relating documents, namely:

- Circular No 04-TS/TT dated 40 August 1990 guiding execution of Ordinance on protection and development of fisheries resources.
- Circular No 04-TS/TT dated 21 November 1994 guiding the execution of Enactment No 85-CP on administrative punishment in fisheries resources protection.
- Decision 682 TS/QD dated 11 September 1993 enacting the provisions on marine resources exploitation and management in key fishing grounds.

The Ordinance dated 25 April 1989 stipulates that “The Government of Vietnam welcomes and ready to cooperate closely with any foreign countries and international organizations in protecting, conserving fisheries resources, their habitats and other shared aquatic living resources”.

Figure 1: Distribution of marine turtle species in Vietnam

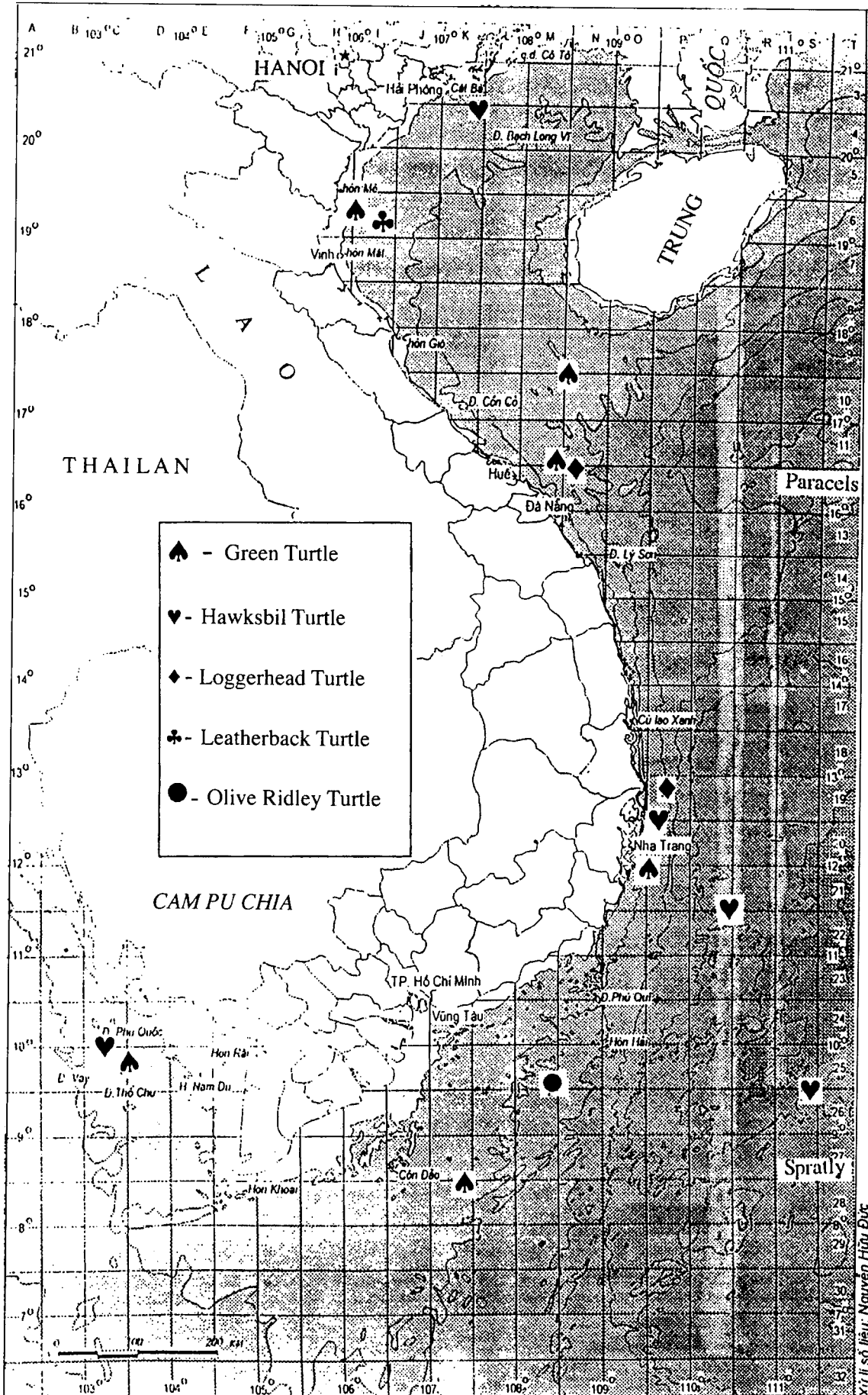


Figure 2: Positions where marine turtles are incidentally caught by fishing gear

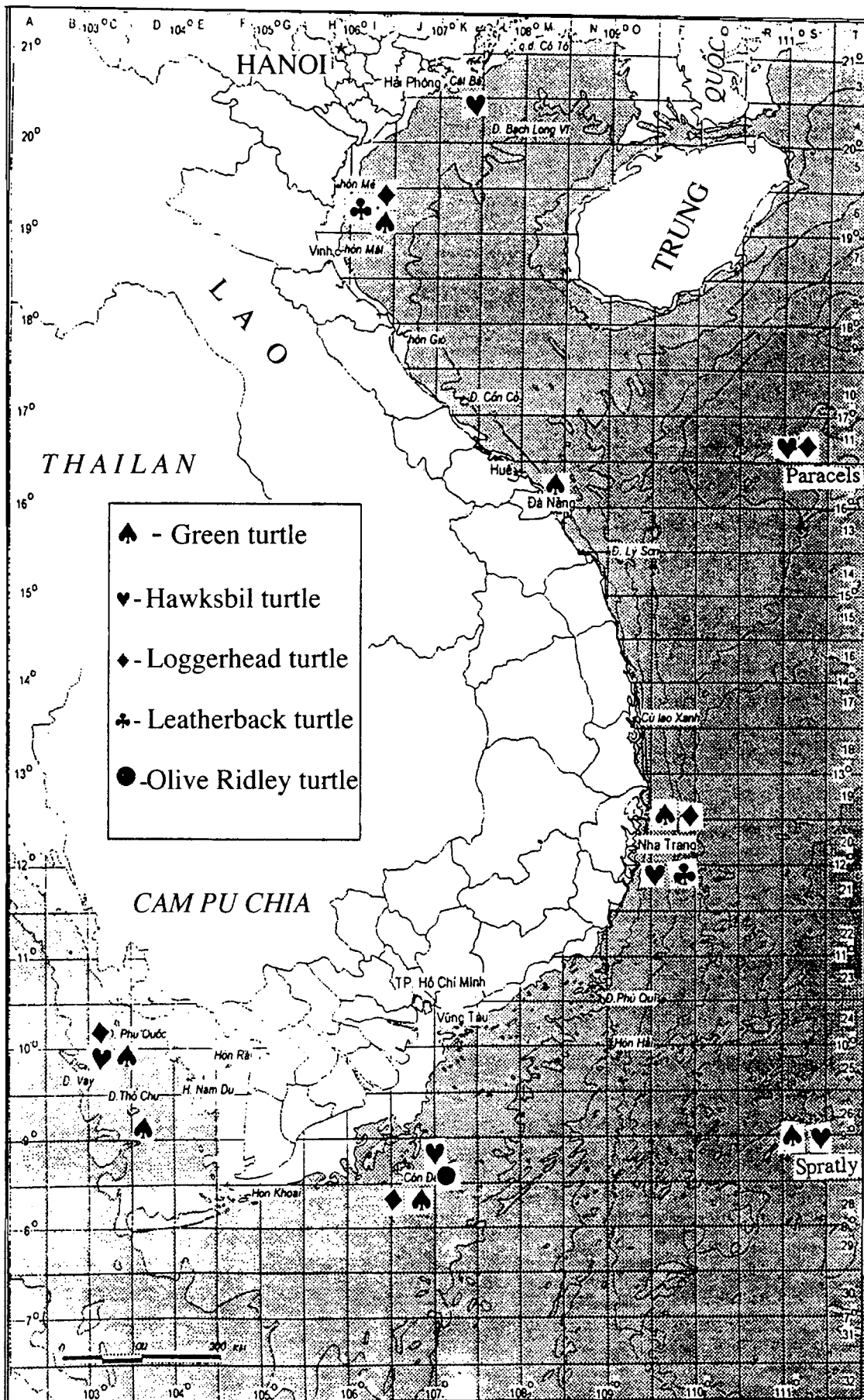
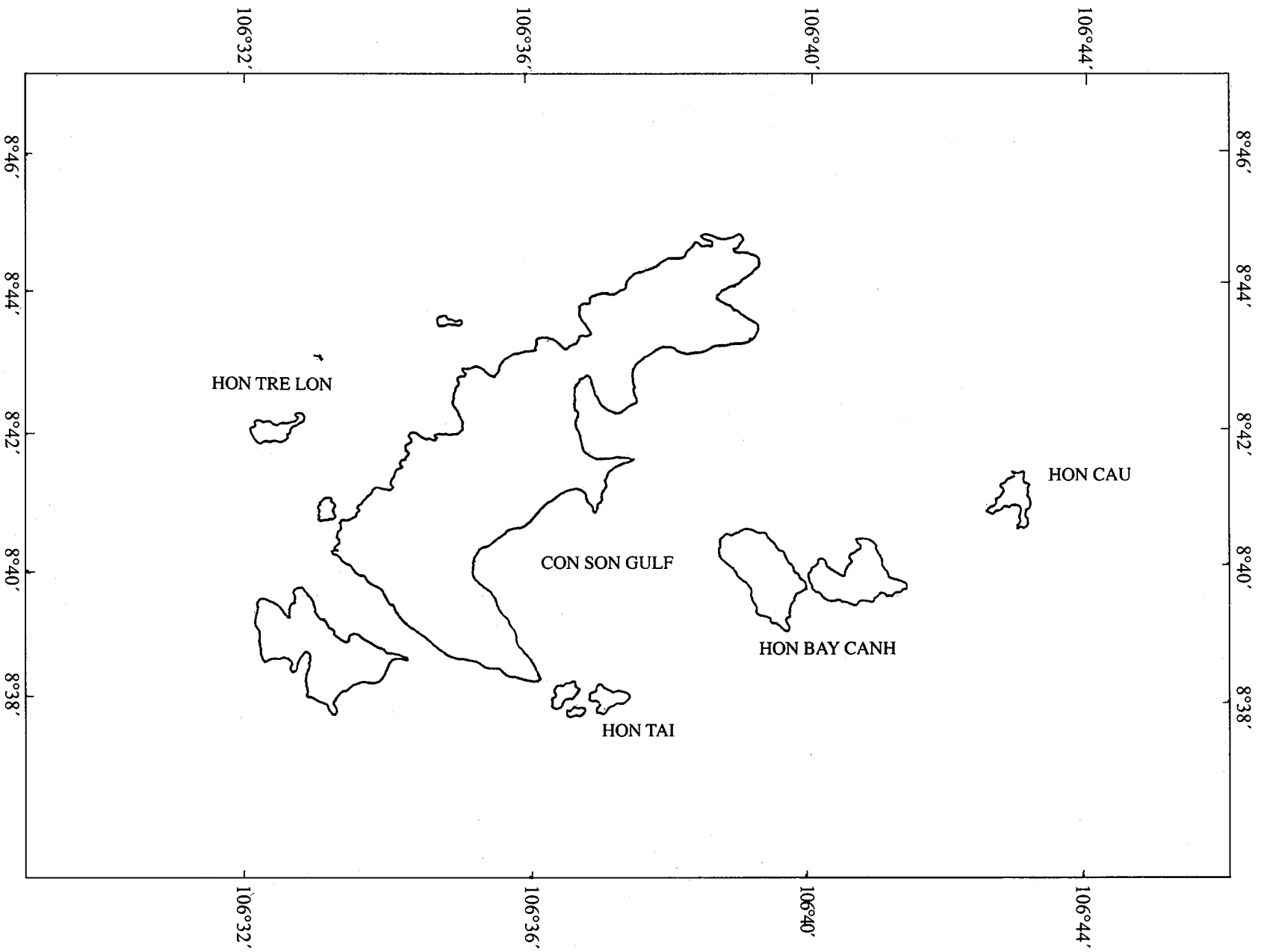


Figure 3: Map of Con Dao Island and major nesting sites



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