

Status of leatherback turtles in Viet Nam

By Phan Hong Dung

1. The legal protection status for leatherback turtles

1.1 Overview

leatherback turtles are listed as a threatened species in the Red Data book of Viet Nam

The following legal documents have been issued by the Government of Viet Nam in relation to the fisheries resources protection and development (including leatherback turtles):

- Ordinance dated 25 April 1989 on the protection and development of fisheries resources, which stipulated that:
 - “Prohibit any actions causing harmful affects on resources or habitats of aquatic living resources “(Chapter I, Article 5).
 - “Exploitation and commerce of living aquatic resources of high economic value that are 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 and innovated in 2004.
- Provisions No 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 also issued other relevant documents, namely:

- Circular No 04-TS/TT dated 4 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 is ready to cooperate closely with any regional and international organizations in protecting, conserving fisheries resources, their habitats and other shared aquatic living resources”
- In April 2002, the Government of Vietnam amended Decree 48/CP to include marine turtles. Under this decree the deliberate catch, killing or use of turtles (including leatherback turtle) is illegal.
- Most importantly, Vietnam Law of Fisheries had been signed by H.E President of S.R. Viet Nam on December 10 2003 and it entered enforcement on the July 1 2004: “This law is the great legitimacy to exploit, capture, culture, preserve, protect and manage the marine resources, especially, fisheries resources and other marine wildlife”.

The Vietnam Law of Fisheries had been states that: Chapter II: Protection and development of fisheries resources Article 7: Habitat protection

1. Organizations and individuals shall be responsible for the protection of aquatic habitat.
2. Organizations and individuals conducting fisheries activities and other activities that directly affect the aquatic habitat, migration, spawning of fish species shall comply with provisions as set out by this Law and other legislation dealing with environmental protection, water resources and other relevant legislation.
3. Organizations and individuals while setting up, altering or destroying the constructions related to aquatic habitat, migration, spawning of fisheries resources shall conduct environment impact assessment as set out by legislation dealing with environmental protection.
4. Organizations and individuals while fishing by setting barriers, set nets in rivers, lakes, lagoons shall provide corridor areas for the movement of fisheries resources as regulated by local People’s Committees.

Article 8: Conservation, protection, rehabilitation and development of fisheries resources

1. The State: shall issue policies regarding the conservation and protection of fisheries resources, particularly of the endangered, rare and precious species and those that have economic value and scientific importance; shall encourage the scientific research for suitable measures to develop fisheries resources; shall invest in production of fish fry for releasing into their natural habitat and shall create artificial habitat in order to rehabilitate and develop fisheries resources.
2. Organizations and individuals shall be responsible for conservation, protection, rehabilitation and development of fisheries resources as set out by this Law and other relevant legislation.
3. Ministry of Fisheries shall periodically proclaim the followings:
 - a. The Red Book of Viet Nam lists of aquatic species and other species prohibited to be fished; the list of aquatic species for which fishing is prohibited and also defines season
 - b. Fishing methods, types of fishery and fishing gear which are prohibited or are restricted are scheduled

1.2 Management agency responsible for marine turtle conservation in Viet Nam

Operational level	Name and type of agency
National level	In 1998 the Ministry of Fisheries appointed the Research Institute for Marine Fisheries (RIMF) as the national institution responsible for research activities and proposing the general framework for management and conservation of marine turtles. The National Department of Fisheries Resource Exploitation and Protection (at MoFI) has prepared and developed the management tools that relate to controlling fisheries resource exploitation and protection in sustainable manners.
State level	WWF-Indochina, IUCN Viet Nam, Traffic Viet Nam-ASEAN and FFI all collaborate with Viet Nam Government partnerships involving marine turtles in Viet Nam. Coastal Provincial Fisheries Departments play an important coordinating role with the national organization as well as NGO to protect and conserve marine turtles at provincial sites.
Local level	Authority Board of Marine Protected Areas, Marine Park and Natural Preservation Area, such as Hon Mun MPA, Nui Chua and Con Dao NP implement several activities as volunteered and assigned by MoFI and RIMF.

2. Nesting populations

2.1 Overview

Bourret (1941) provided the first descriptions of marine turtles in Viet Nam and reported that Viet Nam's waters five species of marine turtles including leatherback turtles. Bourret (1941) also collected information from local fishers indicating that leatherback turtles nested along the beaches in central Viet Nam. More recently detailed surveys of the distribution and abundance of marine turtles in Viet Nam conducted by Pham Thuoc (2003) and Hamann et al, (2005) indicate that in the 1960s/1970s there was a nesting population in the order of 500 females per year. Nesting beaches were spread throughout the central provinces from Quang Binh south to Binh Thuan. In particular, elderly fishermen interviewed by Hamann et al. (2005) from Quang Ngai (Binh Son district) and Binh Thuan (Bai Xep commune) said that prior to the 1960s (and the war) 10 to 20 leatherback turtles nested per night between June to August. Occasional leatherback nesting was also recorded by Nguyen Khac Huong (1978) in Hai Van- Son Tra during the late 1970s

Vietnamese nesting green turtle surveys began at Con Dao in 1995 and at Nui Chua in 2000. Although leatherback turtles are occasionally seen in the waters around Con Dao National Park and the coast adjacent to Nui Chua, they have not been recorded nesting on any of Con Dao's or Nui Chua's beaches (Pham Thuoc 2000; Nguyen Thi Dao 1999; Le Xuan Ai 2001, 2003; Tran Minh Hien 2002; Hamann et al. 2002, 2005).

Recent sightings of nesting leatherback turtles

Thua Thien Hue Province (2000), and Quang Ngai Coastal Area (2001) (Dinh Hong Thanh Personal Communication)

2.2 Details of leatherback turtle nesting population

There are two turtle tagging programs operating in Viet Nam. The first, and longest running program, occurs on Con Dao Islands and the second program was started in 2000 at the mainland beach of Nui Chua (Ninh Thuan Province). Neither of these programs have recorded leatherback turtle nesting. Two recent surveys of marine turtles have been conducted. Between 1998 and 2002 RIMF investigated marine turtle resources in Viet Nam in 28 coastal provinces by conducting interviews at fishing ports and with staff at marine research institutions. This survey found no evidence of current leatherback turtle nesting (Pham Thuoc 2003). A second survey, involving some of the same research staff, was conducted in 2002. This second survey entailed conducting interviews with a broader section of the community (including artisanal fishers, commercial fishers and Government representatives) (Hamann et al. 2005). Results from Hamann et al. (2005) indicated that fewer than 10 nests are laid per year and these occur along the beaches in each of Quang Ngai and Binh Dinh provinces (Figure 1).

2.3 Seasonality of leatherback nesting

Tonkin Gulf (from Quang Ninh to Quang Tri Province): foraging leatherback turtles are normally seen in March and April and very rare captures (one or two per year, generally released alive) of adult sized leatherback turtles occur each year, coinciding with the jellyfish season. Given that the nesting season in the provinces of Quang Binh, Quang Tri, Hue and Da Nang begins in April (Pham Thuoc 2003; Phan Hung Dung 2003; Hamann et al. 2005), it is likely that leatherback turtles are migrating or courting in the offshore island at Tonkin Gulf. **Central Viet Nam** (from Thua Thien Hue to Ninh Thuan Provinces): the nesting season for leatherback turtles is similar as for the other species. It occurs from April until July. **Southern Viet Nam** The nesting season for marine turtles, although very few leatherback turtles currently nest in this region, lasts from June till September along the southern coast beaches of Vietnam, such as Con Dao, Phu Quy, Tho Chu and Phu Quoc Island Group.

2.3) Genetic studies

A plan to collect and analyse mtDNA samples for marine turtles in Viet Nam, including leatherback turtles, has been approved by RIMF and MoFI and will be conducted after 2006.

2.4) Biological parametres

There are no published biological data collected from nesting leatherback turtles in Viet Nam. However, from interviews with fishermen, Pham Thuoc (1999, 2003) indicate that; the average size of nesting females is between 120 and 180cm, they lay between 70 to 90 eggs per clutch; eggs are between 41 and 50mm in width and hatchlings are between 40 to 60mm in carapace length (Table 1).

Table 1. Summary of biological data collected from leatherback turtles in Viet Nam

Category of data	Average	References
Size of nesting females	120 - 180	Pham Thuoc (2001)
Number of eggs per clutch	70-90	Pham Thuoc (2001)
Clutches per season	Uncertain	
Re-nesting interval (days)	Uncertain	
Number of years between breeding seasons (years)	Uncertain	
Size of eggs (cm)	41-50mm	Pham Thuoc (2001)
Size of hatchlings (cm)	4-6	Pham Thuoc (2001)
Incubation success (%)	Uncertain	

2.5) Pivotal temperature studies

No studies on pivotal temperature or hatchling sex ratios have been conducted in Viet Nam



Figure 1. Location of former and current locations for leatherback turtle nesting in Viet Nam

2.6) Migration records

There have been no reports of leatherback turtles being caught in Viet Nam that were carrying tags applied in another country. Only one leatherback turtle has been tagged in Viet Nam. This tagged turtle stranded adjacent Nghia Hung Commune, Nam Dinh Province and was tagged and released.

2.7) Protection of nesting beaches (e.g. national parks)

Name of the beach(s)	Name of the planned National Park
Son Tra Island beaches	Hai Van –Son Tra (Quang Nam)
Nam Yet Island Beaches	Spratly archipelago (although only at sea sightings of leatherback turtles)
Bai Dai Beaches	Phu Quy Island (Ninh Thuan) (although only at sea sightings of leatherback turtles)
Bai cat min	Tho Chu Island (Kien Giang) (although only at sea sightings of leatherback turtles)
Hon Da Lon	Phu Quoc Island (Kien Giang) (although only at sea sightings of leatherback turtles)

2.8) Use of hatcheries used to protect marine turtle nests

Hatcheries are used by staff at Con Dao National Park to protect a small number of green turtle nests. No leatherback clutches have been placed into hatcheries for incubation.

2.9) Threats to nesting marine turtles

The main threats to nesting populations of leatherback turtles in Viet Nam are (1) harvest of eggs and adult turtles from nesting beaches and (2) the incidental capture in fishing gear (Table 2; Pham Thuoc 1999, 2003; Hamann et al. 2002; 2005; Cox 2003).

Table 2. Summary of the threats to leatherback turtles nesting in Viet Nam

Threats at this site/area	Current occurrence			Historical occurrence			
	Low	Med	High	Unknown	Low	Med	High
Exploitation of nesting females	X						X
Egg collection	X						X
Agricultural development			X		X		
Tourist development			X		X		
Urban development		X			X		
Industrial development		X			X		
Artificial lighting	X			X			
Coastal erosion			X		X		
Vehicles on the beach		X			X		
Sand mining		X		X			
Unregulated hatchery practices		Not applicable				Not Applicable	
Natural threats/predation			X		X		
Other (please describe):							

2.10) Impacts of coastal development and/or sand mining on leatherback turtle nesting.

Not applicable

2.11) Major existing threats to nesting turtles.

- Priority 1** Gill net
- Priority 2** Trawling
- Priority 3** Longline and purse seine vessels
- Priority 4** Tourism Development
- Priority 5** Egg collection

2.12) Activities underway to improve the conservation nesting populations of marine turtles.

No conservation activities have been planned in Viet Nam to improve the protection of leatherback turtles, their eggs or nesting habitat. However, the Vietnamese Government has prepared a Marine Turtle Action Plan to guide conservation activities for all species until 2010. Within this plan are activities such as environmental education, awareness raising, species identification, beach protection and policy changes. An education package has been released and trialed in some schools, enforcement and legislation awareness training has been provided to local Government staff, police and other enforcement officers (Hamann et al. 2005).

2.13) Other biological studies conducted on leatherback turtles

None

3. Foraging populations

3.1) Details of leatherback turtle census or tagging results such as tag recovery data.

There are no known tag recoveries. However, the latest stranding recovery of leatherback turtle was found alive and identified by staff from the Department of Marine Conservation Research Sciences and Research Institute for Marine Fisheries (RIMF). Some biological data was collected from this individual.

- o Carapace length: 124 cm, Carapace width: 90 cm, Head length: 37 cm, Head width: 23 cm, Front flipper: Length - 74 cm, Width - 24 cm, Rear flipper: Length - 35 cm, Width - 23 cm, Total Body Weight: 170 kg, Tag right flipper: VN(N)0110, Tag left flipper: VN(N)0111, Captured Date: 16th April, 2005, Released Date: 19th April, 2005 at 10am nearby Nghia Hung Commune, Nam Dinh Province. Phan Hong Dung (2005) Unpublished data

3.2) Seasonality of leatherback turtles in coastal and offshore waters

Northern Viet Nam: From March till July

Southern Viet Nam: From June till October

Also see section 2.3 of this assessment

3.3) Approximate size range of leatherback turtles

The carapace length of leatherback turtles caught by fishers, or that have stranded on beaches range from 90-220 cm. In August 2002, an adult female leatherback turtle caught in central Viet Nam contained large yellow ovarian follicles indicating that she was preparing to breed in that year (Hamann et al. 2002). The size of leatherback turtles that have stranded in Viet Nam are supplied in Table 3.

Table 3. Sizes of leatherback turtles that have stranded in Viet Nam (data from Pham Thuoc 2003)

Seawater areas	Rate of occurrence	Min-Max Caught Size (carapace length) (cm)
The Tonkin Gulf	Very rare	90 - 200
The Central	Very rare	120- 220
Southeast	Very rare	120 - 180
Southwest	Very rare	90 - 120

3.4) Information on the diet of leatherback turtles.

There is no known information on diet. However, they are most often caught in the jellyfish season (Phan Hong Dung, Unpublished data).

3.5) Other biological studies conducted on leatherback turtles in foraging areas.

Not applicable

3.6) Threats to foraging populations of leatherback turtles.

The threats to foraging leatherback turtles in Viet Nam are listed in Table 4. Data from Hamann et al. (2005) indicate that current incidental catch rates in trawlers and coastal gill nets is one turtle every two years per province in the six central provinces (Ha Tinh, Quang Tri, Thua Thien Hue, Quang Ngai, Binh Dinh and Khanh Hoa).

Additional threats that have been identified, but not quantified include tuna longline vessels, purse seine vessels and drift net operations.

Table 4. Summary of threats to leatherback turtles foraging in Viet Nam

Threats at this site/area	Current occurrence			Historical occurrence			
	Low	Med	High	Unknown	Low	Med	High
Directed take of leatherback turtles at sea			Not applicable				Not applicable
Trawl fisheries	X			X			
Gillnet fisheries	X			X			
Longline fisheries			Unknown	X			
Purse Seine	X			X			
Boat strikes			None reported	X			
Plastics and other debris (at sea)			Unknown	X			
Industrial effluent			Unknown	X			
Inshore oil pollution			Unknown	X			
Natural threats/predation			Unknown	X			

Table 5. Relative impacts of various fishing industries on marine turtles in Viet Nam. Data from Phan Hung Dung (RIMF), Hamann et al. (2002), Cox (2003)

Type of fishery	Months of operation	Number of boats	Impact – low, medium, high or unknown	Reference
Gill net	Year round	>16,000	High	MoFI inf. Centre
Trawling net	Year round	About 40,000	High	MoFI inf. Centre
Drift net	Year round	About 12,000	High	MoFI inf. Centre

3.7) Fisheries bycatch of leatherback turtles and the fisheries involved

In 2005 the number of registered vessels had increased to 85,000. Most of these (73,000) take place in the coastal zone. These registered vessels are using the following different kinds of nets:

- o 42.3% are registered as bottom trawler nets
- o 12.3% are registered as purse-seining nets
- o 19.2% are registered as gill nets
- o 7.0% are registered as lift netting gears
- o 14.2% are registered as longline nets
- o 5.0% are registered as other nets.

The Vietnamese Ministry of Fisheries estimates that gill net, trawlers, and drift nets are having the most substantial impacts on marine turtles (Table 5; Hamann et al. 2002).

3.8) Other activities being undertaken to improve the conservation of leatherback turtle foraging populations.

- Law of Fisheries of VN
- National Action Plan on Marine Turtle Research, Conservation and Management in VN beyond 2010
- Established National MPA system network
- Marine biodiversity and conservation human capacity building

4. Concluding remarks

Areas of change	Summary including report references
Legislation changes	The State shall issue policies to ensure the sustainable fisheries development; shall encourage and create favourable conditions for organizations and individuals to rationally exploit and use fisheries resources and shall ensure the rehabilitation of fisheries resources and aquaculture development at seas, lagoons and other natural waters.
Action/recovery plans	National Action Plan on Marine Turtle Research, Conservation and Management in VN beyond 2010 (Ministry of Fisheries 2004)
Awareness raising programmes	WWF, IUCN, MoFI & RIMF education and fisheries bycatch awareness raising
Research activities	For green and hawksbill turtles at nesting beaches
Fishery controls	<ol style="list-style-type: none"> 1. The fishing trade shall be registered 2. Fishing vessels shall be registered and inspected. 3. Fishing gear and devices shall have properly modified.
Managed turtle based tourism	There is ecotourism potential at locations such as Con Dao, Ninh Thuan and Phu Quoc whereby turtle-based tourist projects are possible. Such as nesting beach tours, diving tours or turtle sponsoring activities.
Annual nesting beach surveys	Occur at Con Dao National Park and at Nui Chua Beach in Ninh Thuan province with support from WWF and local Government agencies
Managed hatcheries	Only for green turtles at Con Dao – most nests however are left in situ.

5. References

- Bourret R (1941) 'Les tortues de l'Indochine. Institut Oceanographique de l'Indochine.' (Station Maritime de Cauda, Nha Trang).
- Cox S (2003) 'Reducing the impact: Opportunities for Vietnam to reduce fishery interactions with sea turtles.' WWF Indochina Programme.
- Hamann M, Chu The Cuong, Nguyen Duy Hong, Pham Thuoc (2002) 'Baseline Survey of Marine Turtle Abundance and Distribution in the Socialist Republic of Viet Nam, 2002.' Prepared for the Viet Nam Ministry of Fisheries and the Marine Turtle Conservation Project Steering Committee.
- Hamann M, Bui Thi Thu Hien, Cox, N, Thompson J, Schauble C, Chu The Cuong, Tran Minh Khoung and Nguyen Duy Hong (2005) Marine Turtle Conservation in Viet Nam – Towards 2010. Marine Turtle Newsletter 107: 5-6.
- Hamann M, Chu The Cuong, Nguyen Duy Hong, Pham Thuoc, Bui Thi Thu Hien (2005) Distribution and abundance of marine turtles in the Socialist Republic of Viet Nam. *Biodiversity and Conservation* DOI 10.1007/s10531-005-4880-4.
- Le Xuan Ai (2003) Sea turtle conservation and research in Con Dao Islands. In 'Viet Nam First National Workshop on Marine Turtle Conservation 2001'. Hanoi, Vietnam. (Eds C Schäuble and Bui Thi Thu Hien) pp. 145-146. (IUCN, Vietnam).
- Le Xuan Ai (2001) 'Marine turtle status report in Con Dao National Park. .' (WWF-Indochina, Hanoi Published House).
- Ministry of Fisheries (2004) 'Marine turtle conservation action plan until 2010 in Viet Nam.' (Viet Nam Ministry of Fisheries 175/QD-BTS).
- Nguyen Thi Dao (1999) 'Marine turtle status report in Con Dao National Park.' (WWF-Indochina, Hanoi).
- Nguyen Khac Huong (1978.) Some sea turtles of the southern seas area of Viet Nam (in Vietnamese). *Proceedings of Marine Research* 1, 275-287.
- Phan Hong Dung (2003) The research, management and conservation on sea turtles in Viet Nam. In 'Proceeding of the 4th workshop on SEASTAR2000'. Bangkok, Thailand, 16-19 December 2003. (Ed. SEASTAR) pp. 15-20. (SEASTAR).
- Pham Thuoc (1999) Research, conservation and management of marine turtles in Viet Nam: Country Status Report. In 'Report of the SEAFDEC-ASEAN Regional Workshop on Sea Turtle Conservation and Management'. Kuala Terengganu, Malaysia, 26-28 July 1999. (Ed. SEAFDEC) pp. 178-187. (SEAFDEC).
- Pham Thuoc (2003) Status of research, conservation and management of sea turtle resources In Vietnamese waters. In 'Proceedings of Vietnam's First National Workshop on Marine Turtle Conservation, 2001'. Hanoi, Vietnam. (Eds C Schäuble and Bui Thi Thu Hien) pp. 157-174. (IUCN - The World Conservation Union, Vietnam,).
- Tran Minh Hien (2002) The status of marine turtle conservation in Vietnam. In 'Proceedings of the western Pacific sea turtle cooperative research and management workshop.' Honolulu. (Ed. K I) pp. pp. 191-194. (WPFMC).