



## INDONESIA

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### Introduction

Indonesia is an archipelago country and its 17,500 islands and 81,000 km of total coastlines offer excellent habitat for sea turtles. Out of the seven species of sea turtles in the world, six species have been identified to occur in Indonesian waters. The species are leatherback, olive ridley, hawksbill, loggerhead, flatback, and green turtles (Dermawan, 2004). The flatbacks nest exclusively in Australia but have been observed feeding in Indonesian waters (Kitchener 1996).

The local names of the green turtle are *penyu hijau*, *penyu daging* and *penyu laut*. Green turtles are commonly found and widely distributed throughout the Indonesian archipelagos. This species can be found to nest in quite a vast amount in Berau District of East Kalimantan Province and in small and remote islands throughout Indonesia. In Berau District, this green species has long contributed economically both to the local community and the government. There are about eight nesting sites for greens throughout Berau District such as in Derawan, Sangalaki, Semana, Mataha, Belambangan, Bilang-bilangan, Balikpapan and Sambit Islands. Sometimes Kakaban Island, which is located in the southern part of Sangalaki Island, has also been used by this turtles for nesting even though the nests have often been flooded during high tide. Since January 2002, the local government of Berau District has stopped the concession activity and declared the Sangalaki Island and Derawan Island as protected nesting sites. Pangumbahan in West Java is also one of the major green turtles nesting beaches in Indonesia and the only remaining nesting beach of any importance in Java (Dermawan, 2004).

The local names of hawksbill turtle are *penyu sisik*, *fou koloa*, *penyu genteng*, *penyu kembang*, *penyu katungker* and *wau* (Adisukresno, 1993). At present hawksbill can still be found throughout Indonesia in significant number (Salm 1984 and Salm and Halim 1984). Important nesting areas are in Anambas and Natuna-Riau; Lima Momperang, Pesemut-Belitung, Segamat Island-Lampung, South of Ujung Pandang, Birah-birahan, Derawan-East Kalimantan (Salm and Halim 1984; Schulz 1984 and Soehartono 1993). The hawksbill is exceedingly difficult to monitor for long-term trend, for a number of reasons. First of all, only a small number of animals nest on a broad geographical area. Secondly, hawksbills tend to nest on remote, inaccessible and sometime narrow beaches where the turtle leaves no crawl trace. Finally, hawksbills also exhibit large year-to-year fluctuations in nesting numbers (Dermawan, 2004).

The local names of olive ridley are *penyu lekang*, *slengkrah*, *penyu abu-abu* and *penyu ridel*. Olive ridleys are found in small numbers throughout Indonesia, with the main nesting areas in Sumatera, Alas Purwo East Java, Paloh-West Kalimantan and Nusa Tenggara (Salm and Halim, 1984). Ngagelan Beach in Alas Purwo National Park has the highest nesting of olive ridleys.

Adisukresno (1993), noted that local names of leatherback were *penyu belimbing*, *penyu raksasa*, *kantong*, *kantong gelingsing* and *mabo*. The leatherbacks can be found nesting in the western

coast of Sumatera, South Java, and isolated areas in Nusa Tenggara (Salm and Halim, 1984). However, the largest rookery in Indonesia and also the largest known leatherback rookeries in the world, are located on the coast of Bird's Head Peninsula of Papua, on the beach of Jamursba Medi. According to Hitipeuw and Maturbongs (2002), leatherback is a dominant sea turtle species that nests in the north coast of Bird's Head Region of Papua. Nababan and Jacob (1996) described the leatherback population in Jamursba-Medi had declined rapidly in the last 15 years. In 1984, the nests reached up to 250 per night during nesting season (May – September), on 18 km length of the beach, but in 1996 it dropped to 25-30 nests per night.

The local people call the loggerhead turtle as *penyu tempayan*, *penyu karet* and *penyu bromo*. The loggerheads are rare in Indonesia, but there are unconfirmed reports that they may be nesting in the province of Maluku, where they are found feeding (Salm and Halim, 1984). Loggerheads can also be found feeding in waters close to Taka Bone Rate Atoll, South of Sulawesi.

The flatback turtle is locally known as *penyu pipih*. Indonesian waters is known as the foraging areas of the flatback but they nest exclusively in Australia. As such, it must be considered a shared resource. This species is fully protected in Australia, as are all other sea turtle species. It was found feeding in Papua, but was never found nesting (Limpus 1993 and Kitchener 1996). However, Nababan and Jacob (1996) found one nest of flatback on Jamursba Medi beach in 1995.

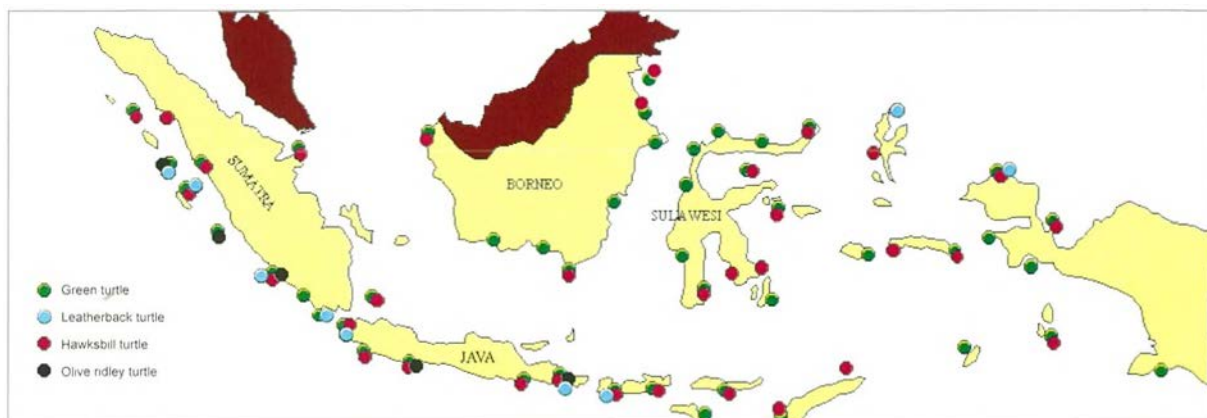


Figure 5. Distribution of Sea Turtle Nesting Beaches in Indonesia

## Sea Turtles Conservation and Enhancement

### Legislations and Regulations

Sea turtles cannot survive if their environment is not healthy. This means that conserving sea turtles must be accompanied by a simultaneous conservation of the marine environment. Besides, since sea turtles are highly migratory, the management of these species should be large-scale in scope. The efforts to conserve these species may not be effective and efficient without involving joint cooperation amongst the concerned countries, both at regional and international levels.

In fact, Indonesia has implemented conservation efforts to promote wise and sustainable use of the turtle species to ensure their continued survival. There are several national legal instruments that have been provided by this country to conserve and manage sea turtles:

- The Indonesian Constitution of 1945; article 33, all of the resources must be used as the greatest for humankind prosperity of the Indonesians.
- Act no. 5 of 1967; basic provision on forestry included conservation area management for sea turtles habitat.
- Act no. 4 of 1982, basic provision for the management of living resources environment.
- Act no. 9 of 1985, chapter 1 article 2 provides that fishery resources consist of all kinds of fish, including other aquatic biota such as turtles, dolphins, seaweeds, corals, etc. chapter 1 Article 4 provides that, for the sake of science, culture or conservation of aquatic nature, the government has established that certain kinds of fish and/or certain locations are protected as aquatic wildlife reserve because of the specific conditions of the aquatic area.
- Act No. 5 of 1990, Conservation of Living Resources and Their Ecosystems; the act regulates the management of wildlife and endangered species, the establishment of marine conservation area, the utilization and cultivation of wildlife (including turtles), the monitoring and supervision of their utilization and cultivation as well.
- The Government Regulation of the Republic of Indonesia No. 7/1999 concerning flora and fauna preservation. All of six sea turtles occurring in Indonesia are in the list of endangered species.
- The Government Regulation of the Republic of Indonesia No. 8/1999 has regulated a headstart program for sea turtles.

According to the international conservation point of view, all those species of turtles have been presumably rare and protected. They are categorized as endangered species in the Red Data Book of International Union for Conservation of Nature and Natural Resources (IUCN), and are put in Appendix I in Convention on International Trade of Endangered Species (CITES). Indonesia is a party of CITES and has ratified the agreement through the Act No. 43 of 1978. CITES states that all species of turtles in Appendix I are categorized as endangered species and are prohibited to trade internationally. In supporting that, Indonesia also signed a biodiversity convention and ratified it through the Act No. 5 of 1994 regarding Ratification of the United Conventions on Biodiversity. Indonesia also signed an MOU of ASEAN/SEAFDEC Conservation and Management of Marine Turtles (Dermawan, 2004).

## Hatcheries

The sea turtles hatcheries are located at Pangumbahan, Sukamande, Pulau Seribu, Kepala Burung, Papua Province, and other areas. These hatcheries are managed by the Ministry of Forestry and Ministry of Marine Affairs and Fisheries. The West Kalimantan Province started a pilot project on beaches hatchery in 1984 at Selimpai Beach, Paloh (Soehadi, 1993). A total of 4,749 hatchlings had been released from the hatchery from 1983-1989. This amount consists of 2,244 greens, 1,641 hawksbills and 832 olive ridleys and 32 other species. After 16 years of operation, the hatchery at Sukamade alone has produced 801,669 hatchlings from four species of sea turtle, the large majority being the greens (Arinal, 1997) as shown in Table 2.

## Protected Areas/Sea Turtle Sanctuaries

Marine conservation areas were established since 1980's under the Ministry of Forestry and Ministry of Marine Affairs and Fisheries. There are about 37 locations of Marine Conservation Areas covering approximately 5.1 million hectares distributed in the Indonesian Archipelago.

## Education/Public Awareness

The activities are carried out by the Ministry of Forestry, the Ministry of Marine Affairs and Fisheries and local Non-Government Organizations that include World Wildlife Fund-Indonesia, Yayasan Alam Lestari, KEHATI and Ford Foundation. The activities are trainings, workshops, adopt a nest program, leaflets, posters and VCDs.



**Plate 37.** Emergence of Green Turtle Hatchlings in Indonesia

## Tagging and Satellite Telemetry Tracking Activities

Tagging activities started in the 1980's at Pangumbahan, Seribu, Sukamade, Segamat-Lampung, Belitung Island and Semut Island. Inconel, titanium and plastic tags were used. Tagging activities on green turtle have been done quite intensively on Sukamande Beach, Meru Betiri National Park since 1984 (Wiadnyana, 2004). During 1984 to 1998, there were about 1,172 individuals of green turtles tagged (mostly female) and about 1,135 individuals were recaptured as shown in Figure 6.

The Japan Bekko Association funded the tagging monitoring program on the hawksbills from 1995 to 2000. There were 124 individuals tagged and only 2 individuals recaptured accidentally by fishermen in the same place where the turtles were released (Wiadnyana, 2004).

The satellite telemetry tracking activities of sea turtles started at Segamat Island, Lampung District in 1989 using the ST-10 PTT sponsored by the Japanese Government. The post-nesting monitoring of the hawksbill was done in 2003 by using ST-10 PTT in Thousand Islands National Park. There were three units of the transmitter, which had been attached on adult females hawksbills. The turtles would be monitored by ARGOS satellite for 6



**Plate 38.** Releasing of Green Turtle Hatchlings in Indonesia

months. The satellite tracking had also been conducted on leatherbacks in Jamursba-Medi beach of Papua Province (Wiadnyana, 2004).

**Table 2.** The Number of Sea Turtle Eggs Incubated at Sukamade Beach, Meru Betiri National Park, Indonesia: 1980-1995

Year	Green		Leatherback		Hawksbill		Olive Ridley		Total	
	H	F	H	F	H	F	H	F	H	F
1980	42,167	4,550	749	676	2,219	132	2,539	273	47,674	5,631
1981	102,200	7,711	1,393	454	–	–	393	22	103,986	8,187
1982	94,449	5,149	1,467	218	580	24	–	–	96,496	5,391
1983	7,752	720	1,491	145	669	54	538	45	10,450	964
1984	70,261	7,028	1,000	117	267	16	220	26	71,748	7,187
1985	71,657	10,101	861	137	595	79	86	12	73,199	10,329
1986	39,889	2,352	927	61	989	135	–	–	41,805	2,548
1987	38,010	1,939	937	50	433	129	–	–	39,390	2,018
1988	45,891	2,989	870	60	769	74	205	10	47,735	3,133
1989	63,205	10,389	232	28	303	52	274	42	64,014	10,511
1990	47,156	7,042	525	124	494	70	–	–	48,175	7,236
1991	22,213	3,148	73	92	498	81	179	27	22,963	3,348
1992	49,075	6,902	195	34	–	–	–	–	49,270	6,935
1993	30,872	11,506	281	54	–	–	248	48	31,401	11,608
1994	22,633	12,013	57	11	53	2	96	19	22,839	12,045
1995	30,115	5,552	–	–	73	23	332	68	30,524	5,653
<b>Total</b>	<b>777,549</b>	<b>99,091</b>	<b>11,058</b>	<b>2,261</b>	<b>7,942</b>	<b>771</b>	<b>5,110</b>	<b>592</b>	<b>801,669</b>	<b>102,724</b>

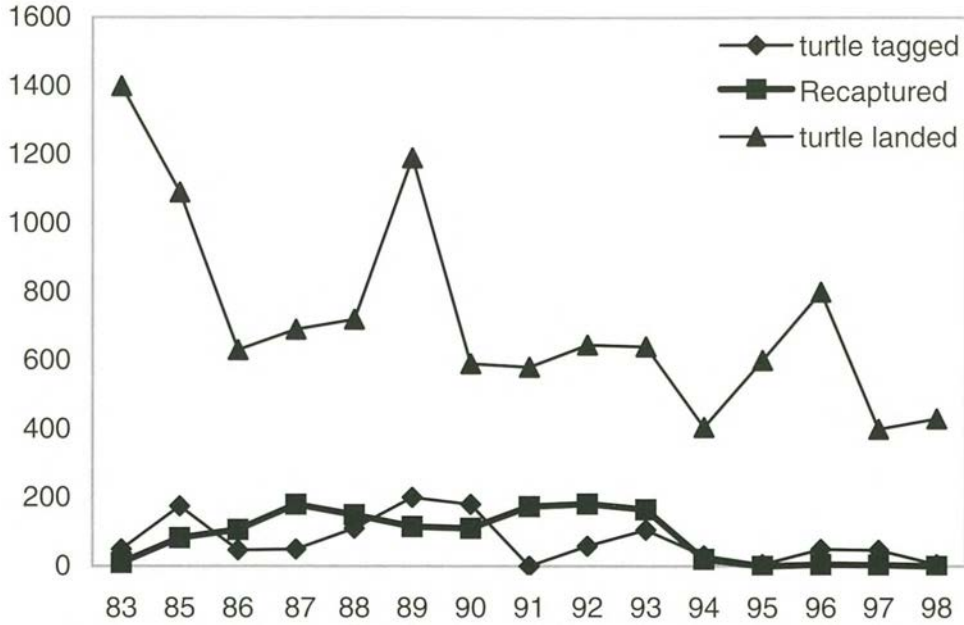
Note: H – hatched  
F – failed

(Source: Arinal, 1997)

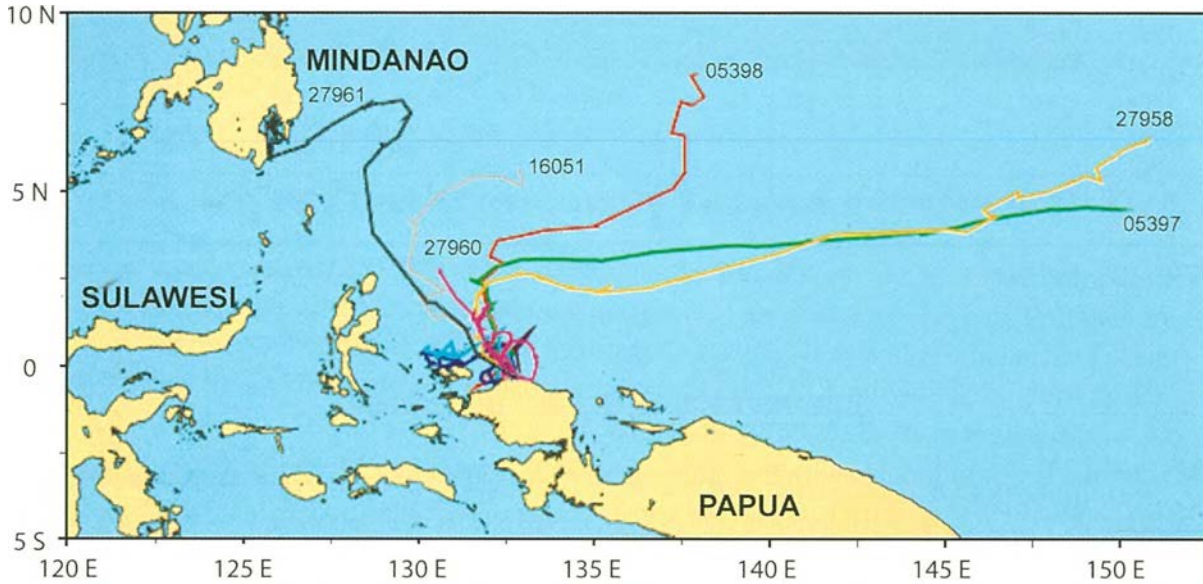
### International/Regional Cooperation

At regional level, Indonesia with the other member countries of ASEAN, also signed the MoU ASEAN/SEAFDEC on the Conservation and Management of Marine Turtles. To follow up this MoU, Indonesia should develop an Action Plan to conserve and manage sea turtles and their habitats in Indonesia. Further regional cooperation has also been established through an international workshop in Manila in March 2001, which was attended by Indonesia, Malaysia and the Philippines to formulate joint vision to conserve marine biodiversity and eco-region in Sulu Sea and Sulawesi Sea. The concept of marine eco-region conservation focuses not only on the management to conserve and utilize natural resources based on marine species and their habitats in an individual basis, but also includes broader aspects that may affect conserving areas such as socio-economics and culture of related communities including their possible threats (Dermawan, 2004).

Other regional cooperation has been continually set up, such as those resulting from the South Pacific Regional Environment Program on Sea Turtle Conservation of 1989; TIHPA; CITES Conference held in Nairobi in 2000; Memorandum of Understanding of ASEAN and Indian Ocean which was held in 2000; and Inter-American Convention on the protection and conservation of sea turtles in force which was held in 2001.



**Figure 6.** Variation of Green Turtles Tagged and Recaptured at Sukamade Beach, Meru Betiri National Park, Indonesia (Source: Wiadnyana, 2004)



**Figure 7.** Satellite Telemetry Tracking of Leatherbacks in Jamursba Medi Beach, Papua (Source : WWF-Indonesia)

The DNA analysis from tissue samples of hawksbill in collaboration with Kyushu University, Fukuoka Japan, and the Ministry of Forestry of Republic of Indonesia is being conducted. Indonesia has also collaborated with NGOs in the conservation of sea turtles. The NGOs are WWF-Indonesia, WWF-Malaysia, WWF-Philippines and IUCN (Dermawan, 2004).

### Research Activities

Due to the widespread distribution and species diversity of sea turtles in Indonesian waters, studies are limited on their biology and its management, particularly hawksbills. Most sea turtles studies

have lasted a short time and were confined to the nesting beaches on Java and nearby islands. Some authors just obtained little information available from limited studies (Nuitja and Akmad, 1982; Sam and Halim, 1984 and Kithchener, 1996). Consequently, the data on population sizes and dynamics, including the ecology and behavior, which support the management of sea turtles conservation, are still lacking. The past experiences showed that the conservation of several sea turtles has been initiated with varying success.

In order to produce information required by the government of Indonesia to establish better management on sea turtles, a collaboration work has been done with several government agencies and NGOs to conduct the on-going research activities on bio-ecology and monitoring including:

- Survey of stocks and identification of major nesting sites and foraging areas;
- Identification of migratory routes and geographical ranges of population;
- Conservation practices on nesting beaches;
- Captive breeding and ranching;
- Trade monitoring; and identification and monitoring of incidental catch of fishing activities on sea turtles; and
- Determination of the impact of coastal fisheries on the sea turtle populations.

The data on the ecology of turtles are needed for its conservation efforts, which would be obtained progressively with the increasing interest on sea turtles studies in Indonesia. Head starting and tagging activities have been done in several conservation areas such as: Thousand Island National Park (TINP), Meru Betiri National Park, Alas Purwo National Park, Pengumbahan Beach and Cikepuh Wildlife Reserve. Currently and in the near future, monitoring post-nesting migration for hawksbill turtles will be done in TINP, Java Sea, and Jamursba-Medi Beach in Papua for leatherbacks.

Research activities on turtle biology and population dynamics are vitally important to provide knowledge and information upon which to base successful management. In the past, the research on sea turtles was limited. Currently, there is an increasing interest among government agencies, universities, NGOs and the private sector for sea turtles research. This is a positive sign in improving the database on sea turtles, which may improve management and conservation of sea turtles in Indonesia. In order to achieve good results on sea turtle conservation and enhancement program in Indonesia, collaboration work with experts from foreign countries, especially from ASEAN, is needed. Several research institutions and NGOs are currently involved in sea turtles research in Indonesia. They are the Research Center For Capture Fisheries (RCCF), the Agency for Marine and Fisheries Research under the Ministry of Marine Affairs and Fisheries (MMAF), Bogor Agriculture University, WWF-Indonesia and the Alam Lestari Foundation.

Key persons who are actively involve in sea turtles issues in Indonesia are listed as follows:

1. Mr. Agus Dermawan  
Directorate of Conservation and National Marine Park,  
DG of Coastal and Small Island,  
Ministry of Marine Affairs and Fisheries,  
Jalan Merdeka Timur No. 16  
Jakarta Pusat, Indonesia.  
Tel: 62-21-3522045  
Fax: 62-21-3522560  
E-mail: agusder81@hotmail.com

2. Dr. Ngurah N. Wiadnyana  
Research Centre, Agency for Marine and Fisheries Research,  
Ministry of Marine Affairs and Fisheries,  
Jl. Pasir Putih I, Ancol Timur,  
Jakarta 14430, Indonesia.  
Tel: 62-21-64711940 / 6459615  
Fax: 62-21-6402640  
E-mail: purispt@indosat.net.id  
wiadnyana\_ngurah@hotmail.com