



Indian Ocean - South-East Asian Marine Turtle Memorandum of Understanding



Sea Turtle Conservation Center of the Royal Thai Navy

Source: Douglas Hykle, IOSEA Coordinator

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Introduction



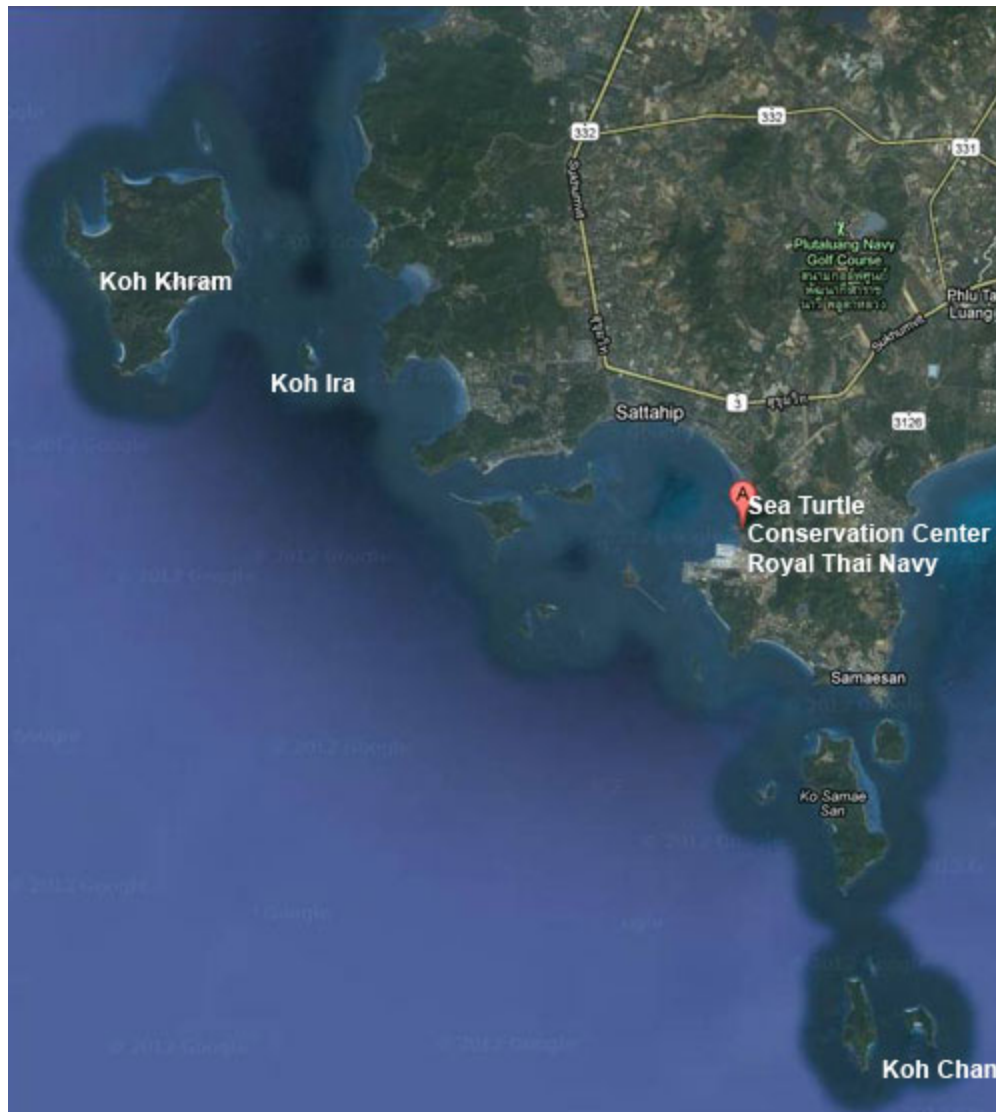
The Royal Thai Navy proudly hosts an impressive Sea Turtle Conservation Center situated in Sattahip district, Chon Buri province, on the shores of *Ao Dong Tan* (Gulf of Dong Tan), about 160 km southeast of Bangkok. Seeing the facility first-hand, it is hard to imagine any other navy in the world having made such a significant long-term investment of resources towards the conservation of endangered sea turtles.

The Center employs 36 full-time staff in the operation of the facility, which serves the purpose of public education as well as captive-rearing and release of turtle hatchlings.

The Center's close proximity to the thriving metropolis of Bangkok (only a 90 minute drive away) and the nearby resort town of Pattaya ensures that it receives a constant stream of visitors throughout the year. The fact that even the Rear Admiral of the Air and Coastal Defence Command is prominently involved in public turtle releasing ceremonies to mark auspicious occasions, must instill a unique sense of pride and purpose among the officers working on the naval base.

History

Public information material produced by the Center notes that, in the past, the abundance of marine resources in the Gulf of Thailand allowed the government to grant a concession for collection of sea turtle eggs in the area of Sattahip district. Over time, however, the impact of the concession and the deterioration of sea turtle habitat prompted the government to declare some marine and coastal areas – including Khram, Ira, and Chan islands – to be part of a military zone. Under the Military Safety Zone Act (1935) and the Fishery Act (1947), the protected areas were reserved for sea turtle nesting and helped to deter human intruders. Today these islands represent an oasis in the northern Gulf of Thailand, where most of the mainland coast is no longer suitable for turtle nesting because of permanent or semi-permanent structures, artificial lighting and other forms of human disturbance.



Notwithstanding the creation of the military zone, the ongoing development of fisheries and tourism in the area contributed to a further decline in the sea turtle population. As the navy conducted more public awareness activities about sea turtle conservation, more and more visitors visited Kham Island, which is only about 3.5 km from the mainland. For more convenience and safety for the public, and to reduce disturbance of sea turtles that lay their eggs around the island, the Air and Coastal Defence Command decided to establish a sea turtle nursery at the Command beach and also to build an information center to educate individuals and groups of visitors requesting to visit the site.

In 1989, the Navy approved the designation of Sattahip Naval Base, under the Air and Coastal Defence Command to be responsible for Kham Island which, to this day, remains the most important source of turtle nesting in the northern Gulf of Thailand. The Sea Turtle Conservation Center was formally established in 1992 as an initiative of Her Majesty the Queen. Furthermore, the authorities declared critical nesting areas – including the islands of Kham, Ira, and Chan – as protected areas under the remit of the Navy's Natural Resources and Sea Turtle Conservation Unit.

Main objectives of the Center

The mainland facility and its associated field stations are well equipped to fulfill the multiple objectives of the Sea Turtle Conservation Center, which can be summarized as follows:

1. To instill among youth and the general public a conservative value of natural resources.
2. To educate people and youth about sea turtle conservation issues.

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http://www.ioseaturtles.org/pom_detail.php?id=122

3. To conduct research related to sea turtle behaviour and diseases, and contribute to the elimination of diseases in coordination with relevant institutions.
4. To serve as a sea turtle breeding center in the Gulf of Thailand, mainly for green turtles and hawksbill turtles.
5. To cooperate with relevant organizations in sea turtle conservation nationwide and worldwide.
6. To be the main information center about sea turtles in Thailand.

The part of the Center that most visitors see and experience first-hand is primarily concerned with public education and awareness. The imaginative architecture of the purpose-built educational media center provides a wonderful backdrop for photographs and leaves no doubt about the enthusiasm and energy invested in the development of the facility over past two decades. A recent expansion was officially inaugurated on 12 August 2012 to celebrate the 80th birthday of Her Majesty the Queen.



The multimedia center is a place where visitors can take in, at a leisurely pace, attractively-presented information about sea turtles and the work being done in Thailand to conserve them. A typical visit begins in an auditorium room which can accommodate fairly large groups and is designed for screening short videos tailored to particular audiences, young and old, Thai and non-Thai. An exhibition room introduces the different sea turtle species and their biology, displays sea turtle nesting sites in Thailand and presents current information on the conservation of the species. Included among the displays are numerous photographs of members of the Royal Family participating in various ceremonial turtle releases. A separate aquarium building displays more information on the evolution and life cycle of sea turtles.



Hatchlings are raised and kept for public display in a series of 16 large shaded tanks, located near the education center. Each tank holds hatchlings and juveniles of different ages, which form part of the release programme described in more detail below.



The latest addition to the Center is a large covered artificial pond, with a glass viewing area, where visitors can observe larger adult turtles. That the construction of the new pond was financed entirely through corporate and private donations speaks to the level of support that the Center finds in the surrounding community.



A gift shop, recreation area and restaurant add to the relaxing atmosphere of the Center, and make it a perfect place to spend a good part of a day. A guide is on standby to give explanations and take visitors around to explore the facility, which is open to the public daily from 8.30 a.m. to 17.00 p.m. free of charge. A sandy beach, where turtle releases take place periodically, gives visitors access to the sea.



The Center's visitor numbers are equally impressive, with well over 2 million guests having toured the facility since 2001, according to statistics provided by the Navy. Annual visitations are reported to have grown from 200,000 to nearly 400,000 over the past decade, with some months exceeding 50,000 visitors (an average of well over 1,500 per day)! December to March – when the weather is most pleasant – are the busiest months; while May, June and July are relatively more quiet.

The Center regularly attracts large groups of students, civil society groups, company and government agency outings, as well as private individuals – including Thai celebrities and other VIPs. In February 2012, a group of 20 members of the Senate Transportation Committee visited to gain a better understanding of how the facility is working to conserve sea turtles. All of this bodes well for promoting awareness and support for sea turtle conservation in Thailand, at least among people who have an opportunity to visit the Center and come away with a better understanding of the factors contributing to the decline of turtle populations in the wild.

Additionally, the Center has very done well over the years to cultivate interest in its periodic ceremonial releases of sea turtles, with several prominent international media outlets picking up on the stories from time to time. Although the Center's website is available only in Thai language, basic information on its important work is well publicised on numerous English-language websites and blogs in Thailand.

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Details of the second aspect of the Navy's work – raising young turtles in captivity for release – are probably much less known to the general public. Yet this less visible undertaking is arguably far more important to the long-term survival of Thailand's sea turtle populations. All of the outstanding public education and awareness work conducted by the Center would be of little consequence if, after some years, there were few sea turtles left in the wild to breed.

Breeding and rearing techniques of the past

Already in 1950, the Navy established a sea turtle hatchery at Naa Baan beach on Khram Island. It was a two-storey wooden building, used to keep a portion of the sea turtle eggs collected by the commercial concession holder. At that time not less than 10 percent of the eggs collected were incubated and released

directly into the sea as hatchlings. There was no rearing stage, unlike today's practice of raising hatchlings in tanks at a nursery on the mainland.

It is not known whether any statistics may have been kept in those days (or if they survived over the years) to document the number of nesting turtles, the number of eggs collected/sold by the concessionaire, or the numbers of turtles successfully released as hatchlings. These data would be invaluable to assess trends in the turtle population over time, especially if they were differentiated by species.

Present-day breeding and rearing practices

In 1984, Admiral Prajade Siridej, Commander-in-Chief of the Royal Thai Navy, assigned his deputy to be Chairman of Board of Marine and Coastal Environment Conservation and Development. Admiral Vinyan Santivisit was in charge of three Navy conservation projects at the time. The sea turtle conservation project was the one to which he paid particular attention, because the Navy had already been working to conserve sea turtles before other government agencies. However, its work was not so well known due to a lack of public relation and awareness activities.

Significantly, Admiral Vinyan ordered a suspension of the sale of sea turtle eggs and instructed that all eggs should be collected and hatched. The hatchlings would be reared on Khram Island until the age of 3-6 months before release back to nature. On occasion, various other complementary activities and awareness programmes were conducted.

Nearly three decades later, Navy officers are assigned to guard sixteen beaches on the islands of Khram, Ira, and Chan, where nesting of green and hawksbill turtles still occurs, in order to prevent poaching of eggs and to maintain the habitat in a state conducive to nesting. About 40 staff are deployed on Khram Island on a rotational basis. The Department of Marine and Coastal Resources (DMCR) of the Ministry of Natural Resources and Environment also assigns staff to work on the island for three months of the year (May, June and July), during the peak nesting season.

The duties of the staff working on the islands include beach monitoring, egg collection and translocation of eggs to the hatchery. Daily beach monitoring starts from 5.30 to 6.00 a.m. The staff search for nests and clean up the beaches at the same time to make sure that they are always in good condition for a sea turtle to lay eggs. When a nest is found, the staff collect and relocate eggs to the hatchery area. After emergence, the hatchlings are transferred to nursery ponds for rearing until they can be safely transported to the mainland.

After spending one month in ponds on Khram Island, the hatchlings are transferred by boat the mainland Center at Sattahip, about 15 km away (straight-line distance). About 100 baby turtles are placed in a large plastic box with about 3 cm of thick wet sand underneath. The box is covered by a wet gunnysack to keep the temperature and the moisture constant. The container is put inside with care to avoid sunlight and bumping which could cause the baby turtles to die en route. The journey by supply ship from Khram Island to the mainland takes from 3-5 hours.

After arriving at the Sea Turtle Conservation Center, the hatchlings are released into the nursery tanks. From the age of 1 to 3 months, the turtles are fed with portions of Yellow Stripe Trevally fish. Each turtle is raised until 3 to 6 months and, if it is in good condition, it will be released back to the sea. Nowadays, the hatchlings are released at Khram Island or other ecologically-appropriate islands, which involves another journey by boat or plane. A certain number of the young turtles are raised in the tanks for a longer time for use in public ceremonial releases at the Center or elsewhere. Also, a percentage of the hatchlings from Khram Island are taken further afield to Koh Mannai, about 100 km further along the coast of Rayong province, where a similar nursery operation exists.

Information on the Navy's Sea Turtle Conservation Center website suggests that strict protocols are followed for the extraction and relocation of eggs from nests, as well as the operation and maintenance of the hatchery and nursery, including the nutrition and care of the young hatchlings.

This special care is obviously critical, because all of the manipulations carried out on the eggs and hatchlings have the potential to introduce additional sources of mortality. At each stage of the process – digging up the nest, relocating the sensitive eggs, raising the hatchlings in tanks where they may be susceptible to disease and injury (from biting), transporting the month-old turtles to the mainland, raising them in new tanks until they are ready for release, and transporting them back to the islands – the risk of some of the turtles becoming weak, infected with disease or even dying is compounded.

Even the sand temperature within the hatchery needs to be carefully monitored since the nest temperature determines whether more female or male hatchlings are produced – with higher temperatures producing more females (or causing death at the extreme). In a neighbouring country, certain hatcheries were found to have inadvertently produced mainly female leatherback turtles for several decades, a factor which is thought to have contributed significantly to the total crash of the turtle population. Fortunately, overhead shading can be deployed and adjusted to bring the temperature range within desired norms.

Hopefully, the Navy keeps detailed statistics on the mortality of turtles during all of these processes so that modifications can be made whenever problems are detected. Long-term statistics, kept over many decades, may be useful for observing trends and can also be of value in assessing the efficacy of the captive-rearing programme against the alternative of protecting most of the nests *in situ* and allowing them to hatch naturally, whenever possible.

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It is not known whether records are kept on the number of nests of each species laid every year, or the percentage of eggs that are successfully hatched. However, figures are available on the numbers of green and hawksbill turtle eggs collected annually since 1992, showing an increasing trend for hawksbills, with a prominent peak in 2011, and a declining trend for green turtles. The number of turtles released each year since 1998 has generally ranged from about 1,000 to 5,000 animals of both species combined. 2011 was an exceptional year for releases, with over 8,000 hawksbill turtles and 5,000 green turtles having been released to the sea.

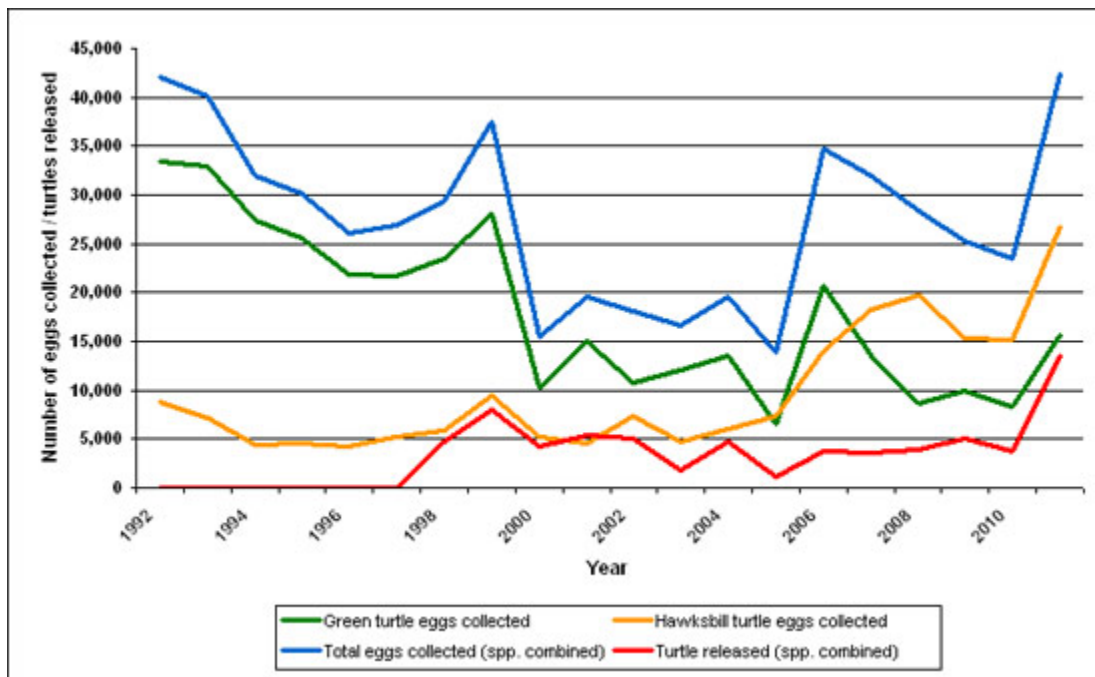


Figure 1. Number of eggs of green and hawksbill turtles collected by the Navy since 1992, and number of turtles released annually since 1998. (Courtesy of the Navy STCC).

As an aside, it is worth pointing out that the Sattahip Center and Kham Island are not the only captive-rearing and release facilities in Thailand. The Sea Turtle Conservation Center, Phang-Nga Naval Base, in the southern part of Thailand, opened a new sea turtle nursery building in September 2012 in order to celebrate the 80th birthday of Her Majesty Queen Sirikit. Another such facility is operated by the Marine and Coastal Resources Research Center (MCRRC) in Chumphon province. Additionally, a number of hatchery/captive-rearing facilities are operated by the private sector and non-governmental organisations, such as the Mai Khao Marine Turtle Foundation in Phuket province, Koh Talu Resort in Prachuabkeereekhan province, etc.

A number of community groups and hotel resorts cooperate with the Navy, DMCR and provincial authorities to receive hatchlings for captive-rearing and release during festivals held every year. Examples can be found on Koh Tao, Koh Samui, Phuket province, Songkhla province, etc.

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Head-starting as a management tool

The practice of "head-starting" sea turtles is based on the premise that raising hatchlings in captivity for release when they are more fully developed will boost their survival in the wild – as compared to an often quoted figure of "only one in a thousand" wild hatchlings surviving to adulthood. The question that has preoccupied the sea turtle conservation community for many years is not so much one of "can it be done?", but rather "should it be done?".

The debate has many dimensions, among them: Are head-started turtles behaviorally and functionally normal? Is their survivorship really enhanced? Is the investment of resources in captive-rearing cost-effective, as compared to tackling the known threats to turtles in the wild (such as mortality in fishing gear, over-collection of eggs, killing for meat and shell, and destruction of turtle habitat)? Are the apparent gains in enhanced public awareness offset by the limited contribution of viable recruits to the wild population?

These questions are relevant to the countless number of sea turtle hatchery and head-starting programmes around the world, which are particularly prevalent in many countries around the Indian Ocean. While the answers may be difficult to obtain, perhaps a couple of even more basic questions deserve serious investigation: Are the turtles released from these head-starting programmes being detected in the wild and are some of the animals returning 15-20 years later, as adult females, to lay eggs?

Fortunately, there are tools at the disposal of researchers to begin to address these questions, though the answers will not necessarily come easily or quickly. Durable metal tags applied to the flippers can be recovered from animals that are re-captured many years later, giving some clues as to their movement and survivorship. Very intensive tagging is required to produce meaningful results. Smaller versions of these metal tags can even be applied to younger turtles that are released. Somewhat more expensive microchips (also known as passive integrated transponder devices or PIT tags) can be implanted in muscle, under the skin. Upon recovery of the animal, the tiny glass tag can be detected by a special reader to confirm its identity. Even more costly satellite transmitters, which have become ever smaller over the past couple of decades, can be affixed to the carapace of a turtle and used to track its movements for extended periods of time, even longer than a year.

It would be interesting to know whether a concerted attempt is being made in Thailand and in the South East Asia region to elicit, coordinate and promote recovery of this valuable tag information, and to prepare an analysis that might eventually help to give indications of the efficacy of head-starting. The Southeast Asian Fisheries Development Center (SEAFDEC) would be well-placed to coordinate such an initiative, having excelled for many years in bringing together countries of the region under a common sea turtle conservation project.

For its part, the Royal Thai Navy's Sea Turtle Conservation Center has done an admirable job in drawing the attention of the general public, as well as interested foreign visitors, to the sea turtles that remain to be found in the waters of the Gulf of Thailand. As long as Khram Island is able to produce a steady supply of hatchlings, the Center's stated objectives will be accomplished for some years to come.

Douglas Hykle
IOSEA Coordinator
Bangkok, November 2012

References:
<http://www.navy.mi.th/turtles/> (website in Thai language)
Navy Commander Kwanmoung Karestre (pers. comm.)

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Footnote

In October 2012, Dr. George Balazs, a distinguished sea turtle specialist from Hawaii, and IOSEA Coordinator Douglas Hykle, were warmly received at the Royal Thai Navy's Sea Turtle Conservation Centre by Captain Somprasong Visondilokpan, Commander Kittti Wongrak (outgoing officer, responsible for overseeing the Centre's day-to-day operations) and Commander Kwanmoung Karestre (Commander Kittti's

successor). The visitors were also accompanied by Mr. Somchai Mananunsap and Mr. Suthep Jualaong, both of the Department of Marine and Coastal Resources, who earlier in the day gave a tour of the sister captive-rearing facility managed by DMCR on Koh Mannai.



From left to right: Mr. Somchai Mananunsap, Commander Kitti Wongrak, Captain Somprasong Visondilokpan, Dr. George Balazs, Mr. Douglas Hykle, Mr. Suthep Jualaong, and Commander Kwanmoung Karestre.