

Radiotelemetry studies have enabled SEATRU to determine with accuracy the location of interesting habitats of leatherback turtles in Rantau Abang, resulting in the legal establishment of an offshore sanctuary for these endangered animals. Green turtles, like the other sea turtles, do not reside near nesting beaches, but undertake long-distance migrations of several thousand kilometers between nesting and feeding grounds. A satellite tracking project using the ARGOS tracking system is currently being undertaken in collaboration with the University of Pisa, Italy, to chart their international migration routes.

SEATRU has developed a technique to study the offshore movements of newly-emerged turtle hatchlings by miniaturization of radiotelemetry techniques. By following the hatchlings at sea, we can gain an understanding of where these hatchlings go, the currents they follow, where, what, and when they feed, and the dangers they face. It is only through such studies that we can provide estimates of survival, and hence a better assessment of the impact of current sea turtle hatchery programs throughout Malaysia.

Tagging and Nesting Research. — A long-term tagging and nesting study of green turtles in Pulau Redang was initiated in 1993. This long-overdue project on the largest aggregation of green turtles in Peninsular Malaysia will provide basic, yet vital information on population sizes, monitor annual population fluctuations, study reproductive and nesting behavior, and determine the success of *in situ* and relocated nests. Tags, when recovered and returned from distant locations, will provide information on feeding grounds and migration routes through international waters.

DNA Profiling of Sea Turtles. — This is a collaborative effort between SEATRU and the University of Florida, USA, aimed at DNA fingerprinting of the various major stocks of sea turtles in Malaysia. Through eventual international cooperation, we will be able to determine whether sea turtles which end up in the slaughterhouses of neighboring countries, or fishing nets of fishermen operating either in international waters, or within the territorial waters of coastal states, can be traced to the Malaysian stocks.

Turtle Watch Project. — This project was first initiated by SEATRU and ESSO to study the associations between sea turtles and offshore oilrigs in Terengganu, with the help of oilrig workers as voluntary observers. The success of this project has paved the way for a large-scale nationwide sea turtle observer program, a collaborative effort between the Fisheries Department and SEATRU. The public, including tourists, divers, fishermen, beach users, coastal inhabitants, etc., will be solicited to provide information on sightings of sea turtles. The eventual accumulation of data on these sightings will enable the researchers to determine important habitats and quantify sea turtle mortalities and strandings with respect to species and size.

Orientation and Behavioral Studies. — Light pollution from night fishing operations, industries, hotels, beach chalets and homes located near or at nesting beaches are known to have adverse effects on the homing of nesting turtles, and

hatchling seaward orientation. Studies at SEATRU explore the extent of disorientation caused by light pollution and their effects on nesting turtles and early hatchling survival.

Hatchery-Related Research. — In many nesting locations, hatcheries offer the only hope for safe incubation of eggs because of the intensity of poaching. Hatcheries, being non-natural, can reduce hatch rates and produce an imbalance in the sex ratio of the hatchlings produced due to high incubation temperatures. Research is hence crucial to develop techniques to produce optimal hatch rates and hatchlings which reflect a balanced and natural sex ratio.

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Centre de Reproducció de Tortugues de l'Albera in Spain

The Centre de Reproducció de Tortugues de l'Albera [Center for Reproduction of Tortoises of Albera] (CRT), located in Garriguella, Girona, Spain (near the border of France), comprises specially designed facilities for the maintenance and captive breeding of the Mediterranean tortoise (*Testudo hermanni*), a species threatened with extinction in Spain. The Center is managed by the "Associació Amics de la Tortuga de l'Albera" under the "Programa de Recuperació de la Tortuga Mediterrània a Catalunya" created by the Departament d'Agricultura, Ramaderia i Pesca de la Generalitat de Catalunya in collaboration with the Paratge Natural de l'Albera.

The Center's work is aimed at a program of successful captive breeding of Mediterranean tortoises in order to improve on the high hatchling and juvenile mortality rates found in nature, and then followed by a head-start program of releasing older juveniles back into natural populations in the area.

The Center is open for visitation by researchers, students, and the general public. It is located 500 m outside Garriguella on the road to Vilamaniscle. For further information, contact:

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