

PROTECTIVE AREAS FOR INTERNESTING GREEN TURTLE (*CHELONIA MYDAS*) POPULATIONS IN THAILAND

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ABSTRACT

Distribution pattern during internesting period of green turtles (*Chelonia mydas*) nested at two major nesting grounds in Thailand (Huyong Island, Andaman Sea and Khram Island, the Gulf of Thailand) were analyzed. The distribution data were obtained from the Platform Transmitter Terminals (PTTs) attached to the 19 nesting green turtles during 2000-2002. The result showed that during 2-4 months internesting period, 95% of the observed locations distributed within 6 km from the shore lines of both the nesting islands. This indicates that the present 3-km protected boundary is not sufficient to conserve nesting green turtle populations during internesting periods. The author suggested extending of additional 3-km protected boundary to guarantee the survival of nesting green turtle populations in Thailand.

INTRODUCTION

Green turtle (*Chelonia mydas*) is one of the 4 sea turtles found nesting in Thailand. Two major nesting sites of green turtles are Huyong Island on the west coast and Khram Island in the Gulf of Thailand. Both nesting islands are patrolled by the Royal Thai Navy all year round. Thus, it is secure for the nesters and their eggs on the nesting beaches. Each nesting season, green turtle spends 2-4 months (Klom-in 2002) near to the nesting beach (Carr et al. 1974, Dizon & Balazs 1982). In 2000, with the launch of SEASTAR2000 program sponsored by Kyoto University, platform transmitter terminals (PTTs) have been employed to study post-nesting migration of green turtles nesting on Huyong and Khram Islands. Various analyses have been performed throughout the data set. In this report, we investigated home range of the location data during internesting period. The result will be further

proposed as a part of conservation plan for green turtle populations in Thailand.

MATERIALS AND METHODS

Green turtles nested at Huyong Island (9 individuals) and Khram Island (10 individuals) were attached with Platform Transmitter Terminals (PTTs) during 2000-2002. The PTTs were model Kiwisat 101 produced by Sirtrack Co, Ltd., New Zealand. The PTTs were attached on the cleaned second middle scute of the turtles with epoxy glue, putty, and carbon fiber. The location data were obtained via Argos system (www.argos.com). The location data was plotted on GIS software with a base map 1: 50,000. The data then were identified as internesting, migratory, and at feeding ground periods using swimming speed and geographic criteria

(Kittiwattanawong et al. In press) as shown in Table 1. Each turtle was named and tagged with both microchip and inconel tag. Further analysis was applied to 5 individuals (Rach Dhamnern, Rusana, SriFaNaKorn, Sri Nuan 02, and Sri Phuket) from Huyong Island and 9 individuals (Boon Longe, ChaoSamut, Chonburi, Khram Noi, Khram Yai, NgamTa, Sattahip, Sri Anunt, and Sri Khram) from Khram Island which possessed interesting location data.

Kernel home range analysis was applied the location data assigned as interesting period using Animal Movement extension software for ArcView (Hooge &

Eichenlaub 1997). The location data of each PTTs attached turtles were pooled according to nesting sites. Distribution probability range at 95% was used as a significant level. Existent protected boundaries of Khram Island (no trawling within 3 km from the shore, Fisheries Act 1947) and Huyong Island (conservation area within 5 km, Natural Park Act 1961) were buffered from the coast lines of each island and its adjacent area. Further boundaries were extended every 1 km until cover the interesting ranges and proposed as protective areas for nesting green turtles.

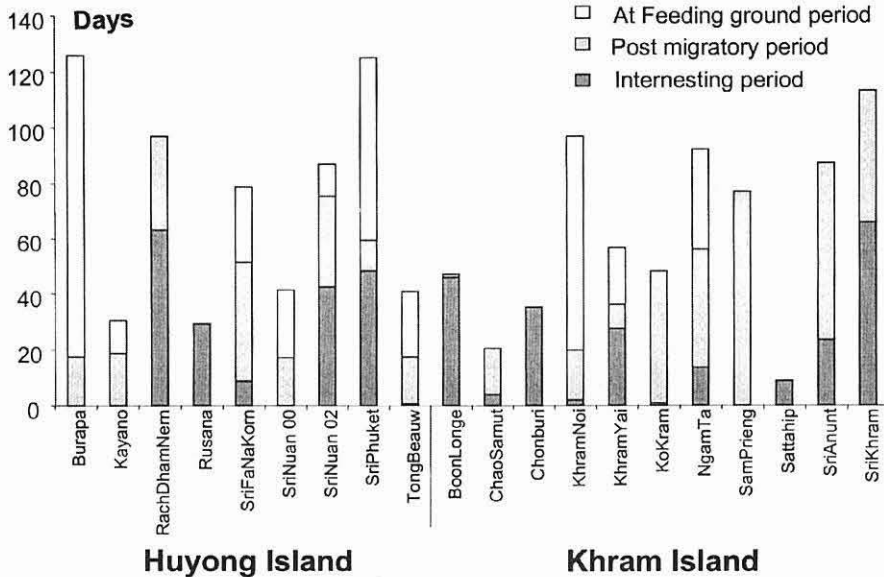


Fig.1 Monitored periods (Y-axis) of PTTs attached green turtles (*Chelonia mydas*) nested at Huyong (9 individuals) and Khram Islands (11 individuals). Each turtles were named as shown in X-axis. The periods were classified as interesting, post migratory and at feeding ground periods.

Table 1. Coverage of 95% Kernel home range areas and the home range coverages outside the buffer zone at 3, 4, 5, and 6 km from the shore line of Huyong, Khram Islands and their adjacent areas.

Area	Huyong Island		Khram Island	
	km ²	%	km ²	%
95% Home range	48.22	-	203.05	-
Outside 3 km boundary	9.07	19	41.46	20
Outside 4 km boundary	3.63	8	13.57	7
Outside 5 km boundary	0.71	1	3.05	2
Outside 6 km boundary	0	0	0	0

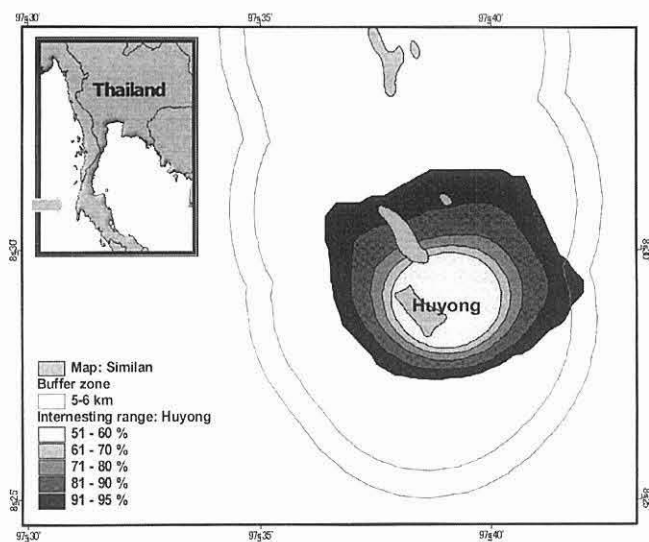


Fig.2 Home range during interesting period of 5 green turtles (*Chelonia mydas*) nested at Huyong Island, Andaman Sea.

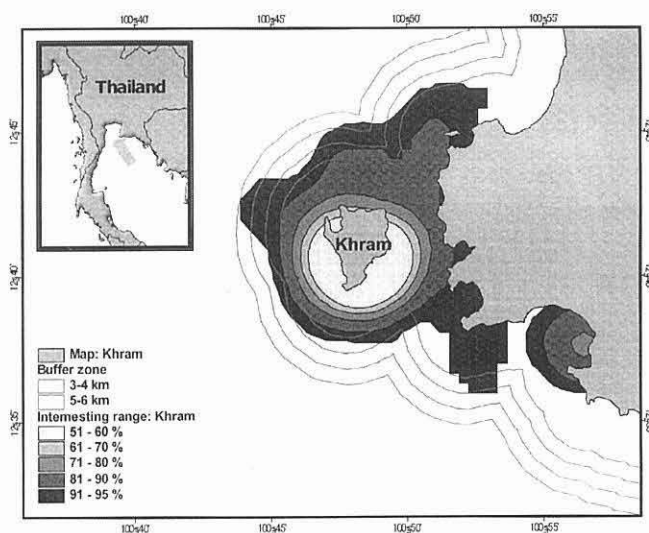


Fig. 3 Home range during interesting period of 9 green turtles (*Chelonia mydas*) nested at Khrum Island, the Gulf of Thailand.

RESULTS AND DISCUSSION

Home ranges during interesting period of monitored turtles nested at Huyong and Khrum Islands were displayed as Figure 1 and 2, respectively. During interesting period, the green turtles distributed within 6 km from the nesting islands. At Huyong Island, the turtles distributed within smaller area compared to the

distribution at Khrum Island (Table 1.). The result revealed that average 71.5 % of the home range coverage was within 3 km boundary at the both nesting sites. The coverage decreased in same trend with the increasing distance from the nesting sites (Tab 1.).

CONSERVATION IMPLEMENTATION TO HUYONG ISLAND

Since Huyong Island was a part of national parks, the sea within 5 km has been claimed as no take zone by Natural Park Act 1961. The interesting coverage of revealed that there was only 1 % chance that the green turtles would distribute outside the protected area. Hence fishing activities seem not to be a diminishing factor, if there is regular enforcement. Artificial reef might be a possible solution to protect from illegal trawlers. However, the activities of tourist visiting the island might cause adverse effect to the number of nesters. For instance, higher number of boat may increase a risk to injure sea turtles with propellers or tourist divers may scare nesters. Restriction of the number of tourist and tourist boat might be considered to minimize disturbance.

CONSERVATION IMPLEMENTATION TO KHRUM ISLAND

Khrum Island is declared as military zone. The nesting beach is entirely saved from a egg collecting poacher. The sea within 3 km is claimed as no trawling zone by Fisheries Act 1947. Even though, this boundary covered a major part of the interesting coverage (71 %), extending of the protected area to 5-6 km will exclusively secured the survival of nesters.

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