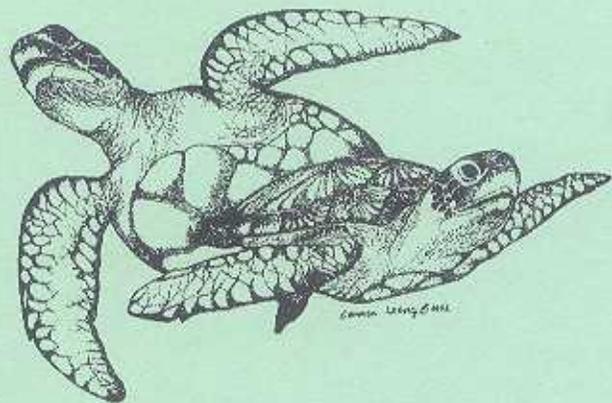




**PROCEEDINGS
OF THE TWENTY-THIRD ANNUAL
SYMPOSIUM ON SEA TURTLE BIOLOGY
AND CONSERVATION**



**“Living with
Turtles”**

17 to 21 March 2003, Kuala Lumpur, Malaysia

Compiled by: Nicolas J. Pilcher

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
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CURRENT STATUS OF GREEN TURTLE POPULATION IN DERAWAN ISLES, EAST KALIMANTAN: A STARTING POINT

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The Derawan islands are known as one of major rookeries of green turtle (*Chelonia mydas*) in Indonesia, yet scientific reports about this rookery are scarce. Here we compile and analyze data on satellite imagery of the isles, carapace lengths of nesting turtles, nesting census and success, clutch size, hatching success, and estimates of population size. Based on those limited data, we discuss further research required to estimate viability of the population, and to draw-up an appropriate recovery action plan. We also discuss the potential of turtle-based ecotourism as a tool for community based turtle conservation in this area.

LOGGERHEAD NESTING IN KORONI, SOUTHERN PELOPONNESUS, GREECE: NESTING DATA 1995-2002

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Introduction

Greece hosts about 60% of all documented loggerhead nests in the Mediterranean (Margaritoulis *et al.*, in press). Most of the 16,000 km Greek coastline has been investigated for turtle nesting in the context of various projects, mostly undertaken by ARCHELON (Margaritoulis *et al.*, 1995). Nesting is widely distributed from the island of Corfu (in the NW) to the island of Rhodes (in the SE) with five “major” nesting aggregations, i.e. Zakynthos, Kyparissia Bay, Lakonikos Bay, Bay of Chania and Rethymno (Margaritoulis, 2000) (Fig. 1). Nesting in Koroni was first noted during an basic survey of southern Peloponnesus beaches in 1982. From 1995 onwards, the nesting beach at Koroni was systematically monitored. Herein, we present the main nesting data for eight seasons (1995-2002) at Koroni.

Koroni is a small town at the tip of a peninsula, delimiting the western boundary of the Bay of Kalamata (Messiniakos Kolpos) in southern Peloponnesus, Greece (Fig. 1). From the southern side of the town, starts a 2.7 km beach, known locally as Memi (eastern part) and Zanga (western part). The beach has a SE orientation, consists of fine sand with pebbles at places and is generally backed with vegetation, cultivated fields and occasional buildings. A road passes behind the beach at its western part. Due to the proximity of Koroni town and the passing road, parts of the beach are well frequented during the summer months by locals and tourists. Some stretches of beach are covered with umbrellas and beach-chairs for hire and in one spot there is a sea-sports operation that rents small catamarans, kayaks and wind surfers.

Methods

The nesting beach was systematically monitored, on foot, and adult female tracks were counted and classified as “nesting” or “non-nesting”. Nests were marked and followed until emergence of hatchlings or until 70 days of incubation. Egg chambers were located by hand excavation until appearance of top eggs.

To mitigate nest predation by mammals, fences were deployed over nests, to varying extent over different seasons. Variation in levels of protection was a result of availability of materials and manpower. Excavation of post-hatched nests (and nests that had not hatched after 70 days) was undertaken to assess clutch size (CS), hatching success (HS) and hatchling emergence success (HES). The nest site was carefully dug by hand, to avoid injury to any remaining live hatchlings. The nest contents were then removed and sorted into empty shells, unhatched eggs and hatchlings (dead or live). Timing of nest excavation varied between seasons from about 4 days to two weeks after the emergence of the first hatchling. Incubation duration (ID) was defined as the elapsed time (in days) from egg laying until appearance of the first hatchling. HS, HES and ID were recorded only for non-relocated, non-inundated and non-depredated nests, whereas CS was calculated from non-predated nests.

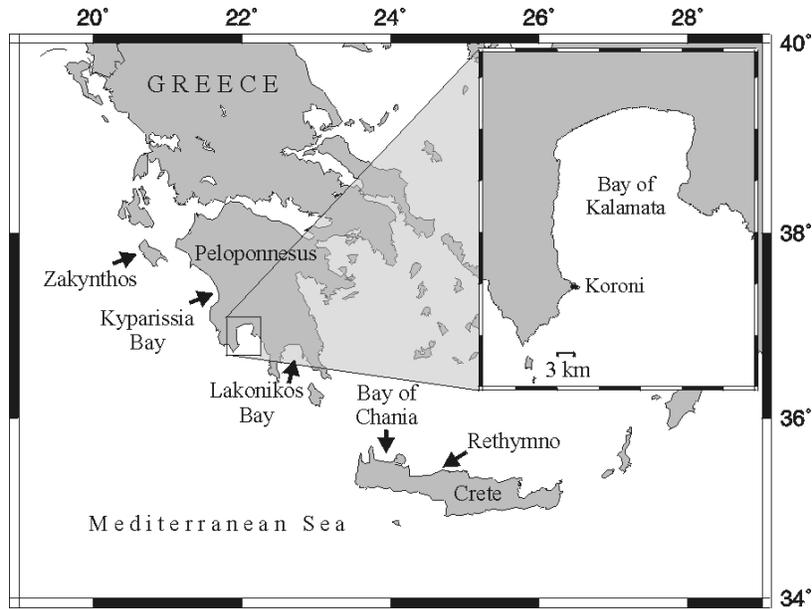


Figure 1. Map of Greece showing the location of Koroni and other loggerhead nesting areas.

Results and Discussion

The nesting magnitude from 1995 until 2002 ranged from 35 to 66 nests/season (mean: 53.0 nests/season, $n = 8$) (Table 1). Nesting success varied from 28.2% until 46.1% and nesting density ranged from 13.0 nests/km to 24.4 nests/km (mean: 19.6 nests/km, $n = 8$).

Using criteria proposed by Margaritoulis (2000) for classification of nesting areas in Greece, the beach at Koroni was considered as one of “moderate nesting”, as it hosted less than 100 nests/season. However, the annual nesting density was substantial and even higher than nesting densities reported in some “major” nesting areas of Greece, e.g. Lakonikos Bay and Bay of Chania (Margaritoulis and Rees, in press).

Further, the nesting habitat at Koroni, despite the small number of nests, was considered important because of its location. No genetic difference (as inferred from mtDNA analysis) was found in the loggerhead population nesting in the five “major” nesting areas of Greece (Ladoukakis *et al.*, in press). It is known that loggerheads are more flexible than other sea turtles with regards to nesting site fidelity (Dodd, 1988 and references therein). Small nesting beaches between “major” nesting areas could contribute in the homogeneity of the nesting population. Koroni beach, found between the western nesting aggregates in the Ionian Sea (Zakynthos, Kyparissia Bay) and the eastern-southern ones of Lakonikos Bay and Crete, probably plays such a role.

Annual values of CS, HS, HES and ID (Table 1) lie within the ranges reported for Greek loggerheads (Margaritoulis, 1988; Margaritoulis *et al.*, in press). Comparing the average ID per season that ranged from 48.3 days to 54.0 days over seven seasons (Table 1) with the recently reported value (56.6 days) of pivotal ID for loggerheads in Kyparissia Bay (Mrosovsky *et al.*, 2002) we can infer that hatchling sex ratio in Koroni is likely predominantly female.

During the six seasons when monitoring of predation was conducted (1997-2002), 2-37 nests/season were predated. This amounts to 3% - 65% of the total annual number of nests (Table 1). The highest predation rate (65%) occurred in 2000 when, because of lack of manpower, nest protection measures were very much reduced. Natural nest predation rate at Koroni is likely to be around 60% (as found in 2000 when little nest protection was undertaken), and compares to that found in major nesting areas in the Peloponnese, for example approximately 50% for Kyparissia Bay (Margaritoulis 1988) reports. Thus the nest screening carried out in other years is seen to be an effective way of reducing nest destruction and increasing hatchling production.

Table 1. Nesting levels, main reproductive data and predated nests at Koroni.

Season	1995	1996	1997	1998	1999	2000	2001	2002
Tracks	149	76	138	154	183	170	131	189
Nests	61	35	49	64	66	57	37	55
Nesting success (%)	40.9	46.1	35.5	41.6	36.1	33.5	28.2	29.1
CS - Mean	-	118.4	111.5	111.5	115.7	111.6	-	122.1
CS - Range	-	77-154	47-146	33-185	70-168	71-151	-	2-171
CS - N	-	14	25	44	60	14	-	30
HS (%)	-	73.7	71.6	60.4	78.3	85.3	-	83.0
HES (%)	-	71.3	63.1	54.6	69.8	74.2	-	73.5
N	-	14	25	42	60	14	-	29
ID - Mean	-	54.0	53.7	50.3	51.9	48.3	50.7	52.4
ID - Range	-	51-57	48-65	47-58	45-62	42-56	43-59	47-64
ID - N	-	11	24	35	53	6	12	25
Predated nests	-	-	12	13	2	37	13	12
Predation rate (%)	-	-	24.5	20.3	3.0	64.9	35.1	21.8

Conservation Outlook

Besides nest predation, other threats to turtles at Koroni include human disturbances on the beach during day and night, disorientation of hatchlings by bright lights and occasional nest inundation by the sea due to southern winds. To mitigate human perturbations the project was enriched since 1999 with a public awareness component. This included the establishment of an information station at the town waterfront in collaboration with the local Municipality. The station is staffed with trained volunteers who inform locals and visitors on the conservation needs of the sea turtles.

Loggerhead turtles are protected in Greece and all “major” nesting areas are managed under various schemes (Dimopoulos *et al.*, in press). Although no specific legislation exists for the protection of the nesting beach at Koroni, it is expected that the continuation of the monitoring work and the public awareness programme, in close cooperation with the local community, will provide a strong basis for the conservation of this important nesting area.

Acknowledgements

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THE STATUS OF SEA TURTLES IN IRAN *

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The Islamic republic of Iran has a coastline of more than 2000 km on the northwestern shores of the Persian gulf and Oman sea. Part of the coastline, about 900 km, is made up of sandy beaches which are used by sea turtles for egg laying from mid-March until the end of May.

Moreover, there are some 20 islands among which the most important are Hormoz, Queshm, Shidvar and Mond, as important nesting sites for sea turtles. Considering the specific undisturbed situation on some islands, the lack of human populations, local fauna and sandy shores, they are more important than continental shores as nesting sites for sea turtles.

In addition to the nesting seasons in some areas, in other parts of the country there are many juvenile and adult turtles in shallow waters year-round, and it appears that these turtles use these area as foraging and developmental habitats.

The most abundant species in the Gulf area is the Hawksbill (*Eretmochelys imbricata*) which uses mostly the beaches on Nakhiloo, Ommolkaram, and Shidvar islands for nesting and laying eggs. There are also unconfirmed reports of Green and Loggerhead nesting. In the Oman sea, the green turtle is the most abundant species, while there are also reports of olive ridleys in the area. My work has centered on studying nesting of hawksbill in the Gulf, especially in the Mond islands, from where measurements of 10 nesting turtles and nests were obtained.

PRESENCE OF SYMBIOTIC AGENTS IN TRANSFERRED NESTS OF THE LEATHERBACK TURTLE (*DERMOCHELYS CORIACEA*) AT PARGUITO BEACH, NUEVA ESPARTA, VENEZUELA

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Introduction

The island of Margarita represents the most important nesting site for the Leatherback turtle (*Dermochelys coriacea*) in Venezuela. Due to the present critical status of the populations of this species at a world level, the use of hatcheries that protect the eggs and guarantee a high hatching success is becoming more necessary, and a potential measure in international efforts for the recovery of populations. Based on this, studies which promote an improvement in hatchery operations such as the area