

2000



COUNCIL OF EUROPE CONSEIL DE L'EUROPE

Strasbourg, 29 September 2000
[tpvs64e_2000.doc]

T-PVS (2000) 64

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Standing Committee
20th meeting

Strasbourg, 27 November – 1 December 2000

File for information

**Conservation of Loggerhead Turtles and associated habitats
(*Caretta caretta*) on Mounda Beach (Kaminia – Potomakia –
Mounda Point), Bay of Katelios, Kefalonia (Greece)**

Report by
the NGO

Katelios Group for the Research and Protection of Marine and Terrestrial Life

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Concerning the Conservation of Loggerhead Turtles and associated habitats (*Caretta caretta*)
on Mounda Beach (Kaminia – Potomakia – Mounda Point), Bay of Katelios, Kefalonia,
Greece

Compiled by
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A. Kefalonia – Coastline of Mounda Beach

The coastline of Mounda Beach (2.500m) is one of the main features of the southeastern part of the Bay of Katelios, South of Kefalonia. The locality of the beach is divided into different regions distinguished by local names. The main characteristic names are the sandy Kaminia and Potamakia.

Southwest of Mounda Beach is the village of Katelios and to the southeast is Skala. The topography of the cliff behind the shoreline is shaped like an amphitheatre. Situated along the southwestern section of the cliff is the village of Ratzakli. Traditionally, due to the geographical location of the village, the beach belongs to Ratzakli.

Mounda Beach is considered to be the most valuable area of coastline on Kefalonia for the reproduction of the sea turtle, *Caretta caretta*. National and international treaties and directives protect the marine turtles and furthermore they are a priority species according to Habitat directive of the EU(92/43).

The research and conservation of the population of turtles was started in 1984. Since this time the beach has attracted both local and foreign research teams. In recent years a local team has undertaken the research on Mounda Beach, the Katelios Group for the Research and Protection of Marine and Terrestrial Life by the permission of the Ministry of Agriculture.

B. The Katelios Group for the Research and Protection of Marine and Terrestrial Life

The Katelios Group for the Research and Protection of Marine and Terrestrial Life is a non-governmental organization (NGO) that researches, conserves and protects the nature with the aim to provide a viable future for the new generation of Kefalonia.

The general activities of the group include:

- Participation in the European Voluntary Service hosting volunteers within the group's two main initiative:
 - Kefalonian Conservation Project
 - Kefalonian Recycling Project
- Production and development of Organic Compost from the sea grass, *Posidonia oceanica*

- Promotion of organic cultivation on Kefalonia
- Environmental and Cultural Education
- Annual Environmental Festival of Katelios
- Promotion of Eco-tourism on Kefalonia

C. Monitoring, Methodology and Sand dunes of Mounda Beach, Under water habitat of Bay of Katelios

From the data collected from the past 17 years monitoring (Marine Turtle Project (*English*), Kefalonian Marine Turtle Project (*English*), and The Katelios Group for the Research and Protection of Marine and Terrestrial Life(Greece)) of the nesting population along Mounda Beach, many fluctuations in nesting numbers have been identified. These fluctuations can be seen in Figure 1.

Although the population of turtles nesting on Kefalonia is modest compared to other Ionian Islands, the nesting habitats are part of a larger marine and terrestrial ecosystem in which the interaction of all biological factors give overall significance to the area. Mounda Beach is an ideal nesting habitat due to the shallow approach, the gentle incline to the beach, offshore feeding areas ie Kakava Reef, limited oceanic currents, temporal marine conditions, maximum exposure to sunlight all year and a minimal number of buildings (at present).

a. Research Methodology

The methodology used to monitor the nesting behavior of the *Caretta caretta* instigated by the Katelios Group is as followed:

- Daily night patrols during the nesting season – June to August (22:00 – 06:00) along Mounda Beach looking for nesting turtles.
- Identification of non-nesting attempts (areas where the female has emerged on to the beach and decided for various reasons not to nest).
- Identification of nests.
- Recording of times of events (emergence, laying, covering etc).
- Counting of eggs whilst the female is nesting.
- Morphometrics (measuring of carapace straight, curved, length and width).
- Recording tag numbers and if the animal has not previously been tagged a new tag is applied.
- Measuring from numerical markers along the back of the beach that were positioned by the group during May to the nests to record their exact location.
- Monitoring of the nests towards the end of the 55 day incubation period looking for hatchling emergence in the mornings
- Excavation of nests after a minimum period of 10 days without any sign of activity to calculate success and mortality rates and to release any trapped hatchlings.

b. Summary of Research

During the 2000 nesting season 25 nests were laid along the stretch of coastline from 12 individuals laying more than a total of 2030 eggs. From these 12 individuals 7 were neophytes (new turtles to the beach) and were therefore tagged by the group, 4 had been tagged during previous seasons and 1 was from Zakynthos (S.T.P.S: Sea Turtle Protection Society). S.T.P.S has also reported the interesting the one of the Katelios Group tagged turtles

in Kiparissia nesting area of of Peloponisos. Three juvenile turtles and three adult were also tagged by the group as a result of being accidentally captured in fishing nest. This action was a direct result from the cooperation with the fishermen of the area.

c. *Sand Dune Habitat of Mounda Beach*

The sand dune habitat, which is protected by the EU Directive 92/43, occupies half of the coastline along Mounda Beach, from Potamakia to Mounda Point. The minimum and maximum widths of the dune system are 100m and 180m respectfully. The dune ecosystem is the one of the most vivacious natural characteristics of the beach housing rare species of fauna and flora. The importance of the dune system needs to be recognized and protective directives need to be acknowledged and enforced by the Kefalonian authorities.

d. *Bay of Katelios and Posidonia oceanica sea plant meadows*

The dominated endless meadows of *posidonia oceanica* sea plant (*) of under water habitat of the Bay of Katelios provide plenty of food and protection for a plethora of fish and protected marine species as turtles, dolphins, monk seals. The reefs of the marine regions of Kakava and Apalohera of the Bay of Katelios give a significant support to the biodiversity of the bay and are the main places in which turtles most found food and where local fisherman meet turtles and other marine species.

* indicatively we report about the huge amount (3000-5000tons/annual) of *posidonia oceanica* which cast up on sore of Katelios village and are recycling by the Katelios Group for producing organic compost.

D. Anthropogenic Activities Effecting the Nesting Habitat and Population of Mounda Beach

a. *Buildings*

The development along Mounda Beach at present is minimal. Below are a list of the current buildings that occupy the beach:-

1. *Mounda Beach Apartments (Potamakia) Completed 1996*

The main problem with this construction is the artificial photic pollution that is emitted from the apartments at nighttime. The lights disrupt approximately 300m of the beach in front of the apartments, an area in which there are minimal turtle nests.

2. *Marina Beach Apartments (Potamakia) Completed 2000*

The many problems from these apartments were created during the initial construction phases. An area 20m high and with a length of approximately 200m has been excavated from the cliff. This has changed the aesthetical natural beauty of the dune system and can be seen clearly across the bay in Katelios. Soil and clay from the excavation has been transported to make a plateau covering an area of 10,000m² in which a small proportion is covered by the three new apartment blocks. Erosional processes have transported clay material and now it has formed a hard cap, which is suffocating the fauna and flora threatening the dune habitat.

3. *Illegal Construction 1998*

In 1998 an illegal wooden building was constructed in the beach area in front of the Mounda Beach Apartments. It still exists on the beach today and is now a permanent feature of the beach.

4. *Kantina Construction 1997*

This construction poses no problem to the beach; however there has been an increase in the numbers of sun beds that occupy the beach in front of the Kantina.

b. *Lights*

At present the photic pollution that comes from the development on the beach is still the main problem that the nesting turtles face. The authorities cannot *officially* enforce any changes to the lights as the Land use plan which has been completed (use of land Z.O.E) has not been approved by the minister of the environment. Lighting from the new area of development is of no significant problem compared to the amount of light pollution emitted from Mounda Beach Apartments.

Light pollution from other sources is a short-term problem as representatives of the group advise the lights to be shielded or closed.

c. *Camping*

The problem from camping was minimal this year due our cooperation with the Port Police in enforcing the recommendation of the protection of *Caretta caretta* by the Ministry of the Environment (YPEXODE).

d. *Vehicular usage on Mounda Beach*

Vehicular usage along Mounda Beach still remains a problem, however it is set to increase in the future with the creation of an illegal road in the Potamakia dune system. The road will increase the problems associated with anthropogenic activities along this section of beach.

E. Action taken by the Katelios Group from the December 1999 – Present Day

Protests/Accusations/Reports

Protests, accusations and reports have been sent to the local, national and international services for the Environment, regarding:-

- A) Destruction of the dune system along Mounda Beach
- B) Mounda Beach being included in Natura 2000
- C) The illegal excavation for the Marina Apartments
- D) For the lack of recognition of the measures recommended by the Ministry of the Environment for the active Tourist businesses on Mounda Beach
- E) Asking for Support from other organizations

The following lists of reports are related to all of the above from 16/12/1999 to the present day.

1. Under the reference number 71/16-12-1999 report of the group to the Department of the Management of Nature, YPEXODE (Ministry of the Greek Environment) with the demand that Mounda Beach should be included within Natura 2000.

2. Under the reference number 84/6-3-2000 report of the group to the Region office Government of Ionian, Prefecture of Kefalonia with the subject of signs being placed on the beach under the jurisdiction of the Prefecture of Kefalonia.
3. Under the reference number 137/31-5-2000 report of the group reminding the Prefecture about the signs being placed on to the beach.
4. Under the reference number 138/31-5-2000 report of the group to the Port Police of Poros, Kefalonia making them aware under the recommendation of the Ministry of the Environment, YPEXODE, of the protection measures that need to be enforced and checked on the beaches 81352/1063/1-3-2000.
5. Under the reference number 139/3-6-2000 report of the group to the Mounda Beach Apartments making them aware under the recommendation of the Ministry of the Environment, YPEXODE, of the protection measures that need to be enforced on the beaches 81352/1063/1-3-2000.
6. Under the reference number 140/3-6-2000 report of the group to the Marina Beach Apartments making them aware under the recommendation of the Ministry of the Environment, YPEXODE, of the protection measures that need to be enforced on the beaches 81352/1063/1-3-2000.
7. Under the reference number 144/7-6-2000 report of the group to the Department of the Management of Nature about the catastrophe of the destruction of the sand dunes system of Mounda Beach, which is the most significant, nesting habitat for *Caretta caretta* on Kefalonia.
8. Under the reference number 145/7-6-2000 report of the group to the Prefecture of Kefalonia demanding for the intervention, to stop the building of an extension to the Marina Beach Apartments.
9. Under the reference number 146/8-6-2000 report of the group to the Prefectoral Council of Kefalonia, Ministry of the Environment YPEXODE, submitting an objection against the extension to the Marina Beach Apartments.
10. Under the reference number 147/9-6-2000 report of the group to the Vice Minister of the Environment YPEXODE asking for the disapproval of the extension making the Marina Beach Apartments a Hotel.
11. Under the reference number 149/14-6-2000 report of the group to the Non-Governmental Organisation, Sea Turtle Protection Society asking for the support in the disapproval of the extension making the Marina Beach Apartments a Hotel.
12. Under the reference number 150/14-6-2000 report of the group to the Non-Governmental Organisations a) "Protection of Nature on Kefalonia and Ithaca", b) "Archipelagos" and c) "Medasset" supporting the disapproval of the extension making the Marina Beach Apartments a Hotel.
13. Under the reference number 152, 153, 154/20-6-2000 report of the group to the Ministry of the Environment YPEXODE (Department of the Management of Nature), Vice Minister of the Environment YPEXODE, Department of General Environmental Subjects YPEXODE, Region Office Government of the Ionian Islands regarding the subject of the Protection of the species, Article 12, Directive 92/43 EU.
14. Under the reference number 161/17-7-2000 report of the group to the Department of Technical Service of the Kefalonia Prefecture with the regarding the Protection of the natural character of the small rivers along Potamakia and other delta that impinge on Kefalonian Nesting Habitats.

F. Press Releases in Local and National Greek Newspapers

“Hmerisios”, Kefalonia 13-6-00 with the title “Don’t give the approval. Katelios Group against the Hotel”

“Hmerisios”, Kefalonia 23-6-00 with the title “Mounda will be like Laganas”

“Chronica”, Kefalonia 6-7-00 with the title “Anybody else for Mounda; Lets occupy the place before the Masterplan is enforced. At night they rotivate the sand dunes and build roads”.

“Eletherotipia”, National Press 29-7-00 with the title “They build and they cover the sand dunes on the beach of Caretta caretta”.

G. Environmental Education, Awareness and the Katelios Festival for the Environment

Slides and presentations in 16 schools across Kefalonia and Ithaca. Environmental education was disseminated to the children about the Kefalonian Recycling Project and the Kefalonian Conservation Project.

Environmental education, awareness and presentations to local and foreign visitors, exhibitions of aspects of local nature and culture in the Environmental and Cultural Centre of Katelios.

Environmental Awareness presentations in public places.

Daily dissemination of information to the local and foreign tourists through the Environmental Kiosk and leafleting the beach.

Constructing and placing information signs

Daily cleaning of all the coastline of Katelios Bay. Average collection of 4 bags of rubbish every day.

H. National and International Cooperation

National

Sea Turtle Protection Society” Archelon”
Greenpeace (Greece)
Medasset (Greece)
EPFKI (Kefalonia)
EKPAZ (Protection of Wildlife of Greece)
EEPF (Greek Society for the Protection of Nature)

International

European Voluntary Service (Brussels)
Global 2000 (Austria)

b. *Stop the Oil Drilling in the Ionian Sea*

Plans have been finalized for Triton Company complete a pilot study to drill for oil starting in January 11km offshore northeast from Poros, Kefalonia. The Katelios Group believes that this action due to the direct and indirect threats it will stress dramatically on the whole immediate marine and terrestrial environment. More farther may has an impact to the National Marine Park of Zakynthos which is most important nesting habitat of loggerhead turtles *Caretta caretta* of the Mediterranean.

c. *Potamakia Area*
Mounda Point –Electricity Sub-station

Any building construction should be strictly prohibited along the whole terrestrial zone from the coastline to 50 m behind the top of the hillside behind the beach. This should be applied along the stretch of beach from the Electricity Sub-station to Mounda Point. All buildings behind this prohibited zone should be subject to an Environmental Impact Assessment. *It is essential that all landowners* that would be affected by this recommendation must receive compensation.

d. *Kaminia Area*
Electricity Sub-station – Kaminia Delta)

In the area between the Electricity Sub-Station to the Kaminia Delta any moderate development (except hotels) has to be strictly subjected to an Environmental Impact Assessment. Building construction should be strictly prohibited along the whole terrestrial zone from the coastline to 50 m behind the road. Special attention must be paid to any potential lighting and noise pollution.

e. *Kaminia Delta – Rocks of Santa Barbara, Katelios*

From the Kaminia Delta to rocks of Santa Barbara (Katelios) any building construction should be strictly prohibited along the whole terrestrial zone from the coastline to 50 m behind the top of the hillside behind the beach. *It is essential that all landowners* that would be affected by this recommendation must receive compensation. Any moderate development (except hotels) has to be strictly subjected to an Environmental Impact Assessment. Special attention must be paid to any potential lighting and noise pollution.

f. *Future Land Usage Map of Mounda Beach*

A management plan is needed to be completed to ensure the co-existence of *Caretta caretta* and moderate development. We recommend that this management plan to be the focus to the proposed European Program LIFE- Natura which currently main prepared by the Region Office Government of Ionian Islands.

g. *Lighting*

Any building within 500m from the coastline must use Low Pressure Sodium lighting or any alternatives. Internal lighting must be away from mirrors and windows to minimize reflection. Windows and doors must have external shutters. External lighting must be protected by trees and other vegetation. Neon lighting must also be strictly prohibited.

h. Rubbish

Rubbish bins with lids (to keep away vermin and other animals) must be placed regularly along the whole stretch of the beach.

i. Signs

Permanent information and no camping signs from the Prefecture must be placed along the whole stretch of the beach in different languages.

j. Noise

Any area of buildings that may produce noise must not be seaward facing.

k. Permission for Disco and Bars

Disco and bars should be strictly prohibited within 1km from the coastline.

l. Parking

There should be two designated areas for paid parking 200m from the coastline at the end of the roads; one leading from Ratzakli to Kaminia and the second from Aliko Hotel to Potamakia.

m. Camping

Strictly prohibited along the whole stretch of coastline. Any campers should be encouraged to use designated organized areas that would also support the incomes of local people. Beach furniture (tents, kiosks, boats) associated with campers must be strictly prohibited.

n. Sun beds and Umbrellas

The Municipality who has the management of the coastline must include in the contract with the sun bed owners that the sun beds are removed every night as the law states Z.O.E ENVIREG.

o. Restoration of Sand Dunes

The authorities must enforce the restoration of the sand dunes by the owner of the Marina Beach Apartments and also to secure cliff face behind the apartments with terracing.

p. Cleaning of the Beach

Any beach cleaning using machinery is prohibited during the nesting season, June – October.

q. Watersports and Boat Speed Limits

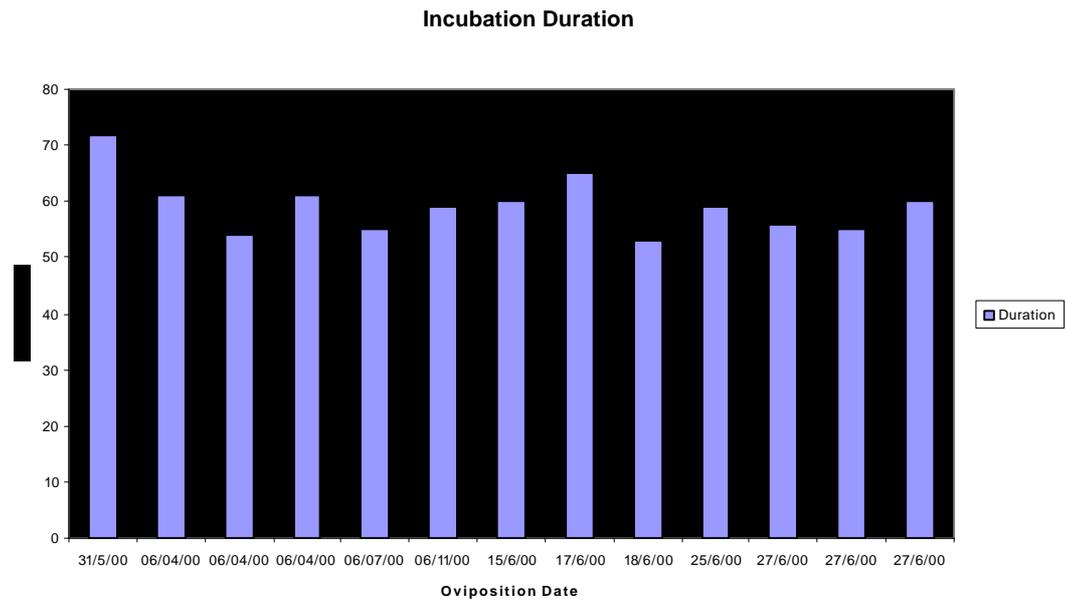
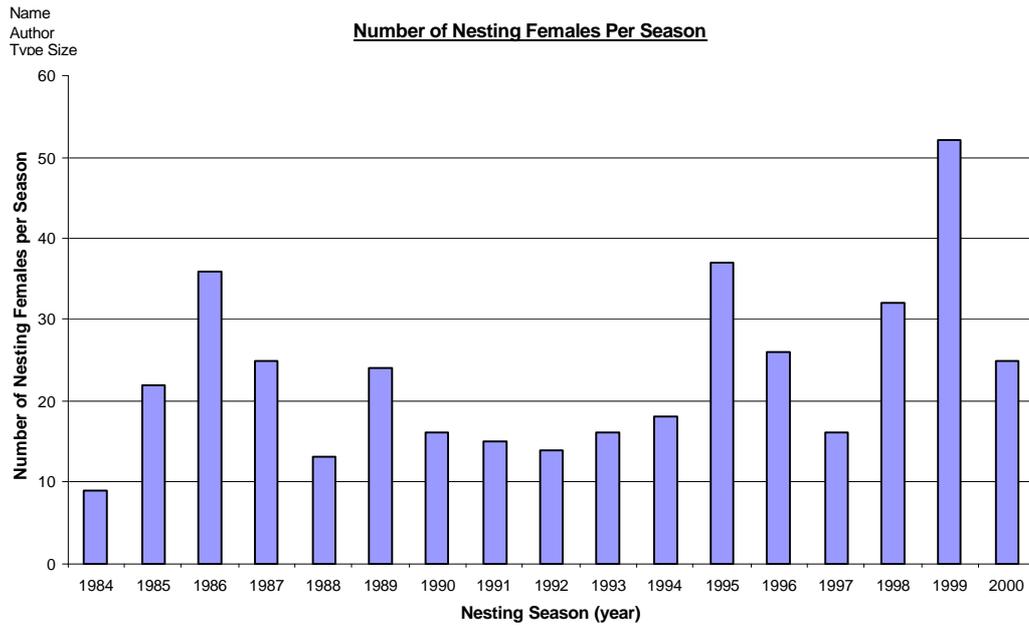
Watersports must be prohibited in Bay of Katelios and boats must keep to the speed limit of 5mph within 1 mile from the coastline.

r. Planting of Vegetation

Suitable vegetation that belongs to the natural habitat must be planted along the roadside from Electricity Sub-station to the Kaminia Delta.

s. Roads

No new roads should be constructed to or behind the beach.



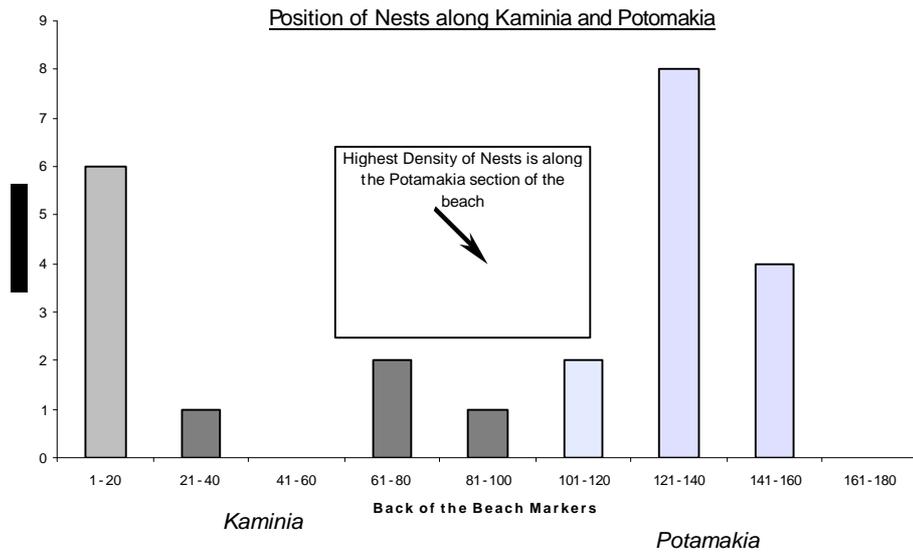
Incubation duration

Oviposition	1st Emerge.	Duration					
31/5/00	08/12/00	71	1P	C66	552	C66	552
06/04/00	08/04/00	61	2P	*	K001		
06/04/00	30/7/00	54	3P	*	K006		71
06/04/00	08/04/00	61	4K	*	K003		60
06/07/00	08/01/00	55	5K	*	C227		60
06/11/00	08/09/00	59	6P	*	K009		55
15/6/00	14/8/00	60	7P	C66	552	K003	
17/6/00	21/8/00	65	8K	*	K003		
18/6/00	08/10/00	53	9K	*	K002		61
25/6/00	23/8/00	59	10K	*	C227		65
27/6/00	22/8/00	56	11P	*	K009		60
27/6/00	21/8/00	55	12P	?52	C114		
27/6/00	26/8/00	60	13P	C66	552	K009	
29/6/00	28/8/00	60	14P	*	K003		59
07/02/00	28/8/00	57	15K	*	K002		56
07/07/00			16P	*	K016		52
07/09/00			17K	*	K006		
07/11/00	09/01/00	52	18P	*	K009	C227	
07/11/00	09/04/00	55	19K	C66	552		55
07/12/00			20P	*	C114		59
07/12/00			21K	*	K003		
17/7/00			22P	*	K018	K002	
19/7/00			23K	*	K002		53
28/7/00			24K	*	H710		57
08/02/00			25P	*	K009		

58,411765

Oviposition	Duration
31/5/00	72
06/04/00	61
06/04/00	54
06/04/00	61
06/07/00	55
06/11/00	59
15/6/00	60
17/6/00	65
18/6/00	53
25/6/00	59
27/6/00	56
27/6/00	55
27/6/00	60

59,166667



Marker	Nest Number
1 - 20	6
21 - 40	1
41 - 60	0
61 - 80	2
81 - 100	1
101 - 120	2
121 - 140	8
141 - 160	4
161 - 180	0

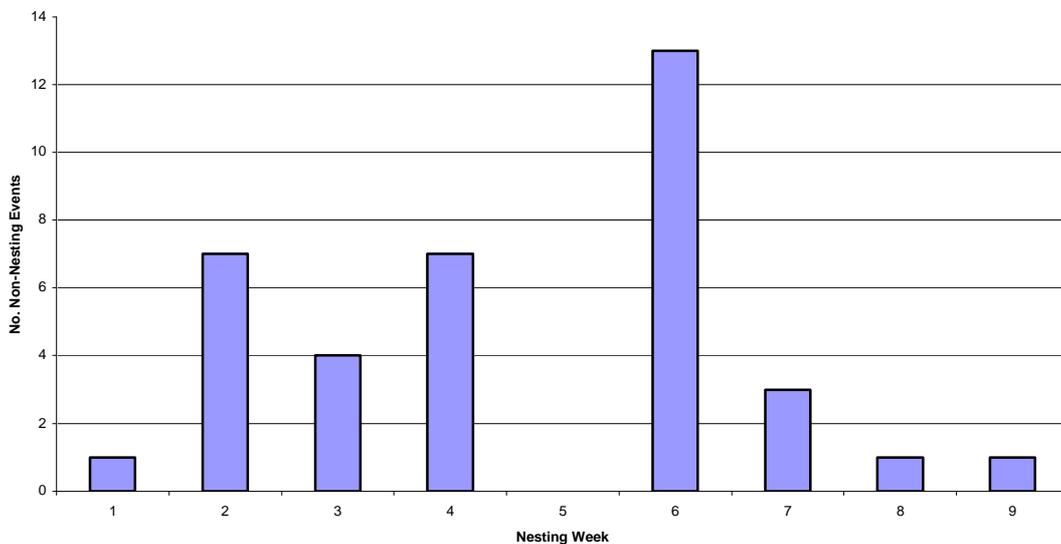
- 1 127/128
- 2 134/135
- 3 118/119
- 4
- 5 03/02/04
- 6 140/141
- 7 122/123
- 8 38/39
- 9 80/81
- 10 6/7
- 11 145/146
- 12 139/140
- 13 122/123
- 14 150/151
- 15 1/2
- 16 126/127
- 17 74/75
- 18 16/17
- 19 127/128
- 20 150/151
- 21 86/87
- 22 154/155
- 23 3/4
- 24 13/14/15
- 25 11/113

Nest 1	Days	Nest 2	Days	Nest 3	Days	Nest 4	Days	Nest 5	Total Nests	Ave. Duration (days)
31/5	<i>15</i>	15/6	<i>12</i>	27/6	*	*	*	*	3	13,5
4/6	*	*	*	*	*	*	*	*	1	One Nest
4/6	<i>39</i>	9/7	*	*	*	*	*	*	2	Nested on other beach
4/6	<i>13</i>	17/6	<i>12</i>	29/6	<i>13</i>	12/7			4	12,6
7/6	<i>18</i>	25/6	*	*	*	*	*	*	2	18
11/6	<i>16</i>	27/6	<i>14</i>	11/7	<i>22</i>	2/8	*	*	4	17,3
18/6	<i>14</i>	2/7	<i>17</i>	19/7	*	*	*	*	3	15,5
27/6	<i>15</i>	12/7	*	*	*	*	*	*	2	15
7/7	*	*	*	*	*	*	*	*	1	One Nest
17/7	*	*	*	*	*	*	*	*	1	One Nest
11/7	*	*	*	*	*	*	*	*	1	One Nest
28/7	*	*	*	*	*	*	*	*	1	One Nest

Interesting

The above table contains the tag numbers of the individuals and the dates that their nests were laid along Mounda Beach (all of the tag numbers beginning with a K were tagged by the Katelios Group during the 2000 nesting season) No individual laid 5 nests which is the maximum that can be laid during the nesting season. Written in italics is the duration in days between nesting events which varies between individual and event, this is referred to as the internesting duration. K006 nested twice during the season with an internesting period of 39 days. The duration of 39 days indicates that the female laid another nest inbetween the 4/6/00 and 9/7/00 on a different nesting beach. K016, K018, C22 556, H710 nested only once during the month of July. This could indicate that Mounda Beach was used as a secondary nesting beach and that the other nests were laid elsewhere along the coast.

Non-Nesting Attempts during the Nesting Season on Mounda Beach 2000



Non-Nesting Attempt Data, Mounda Beach 2000

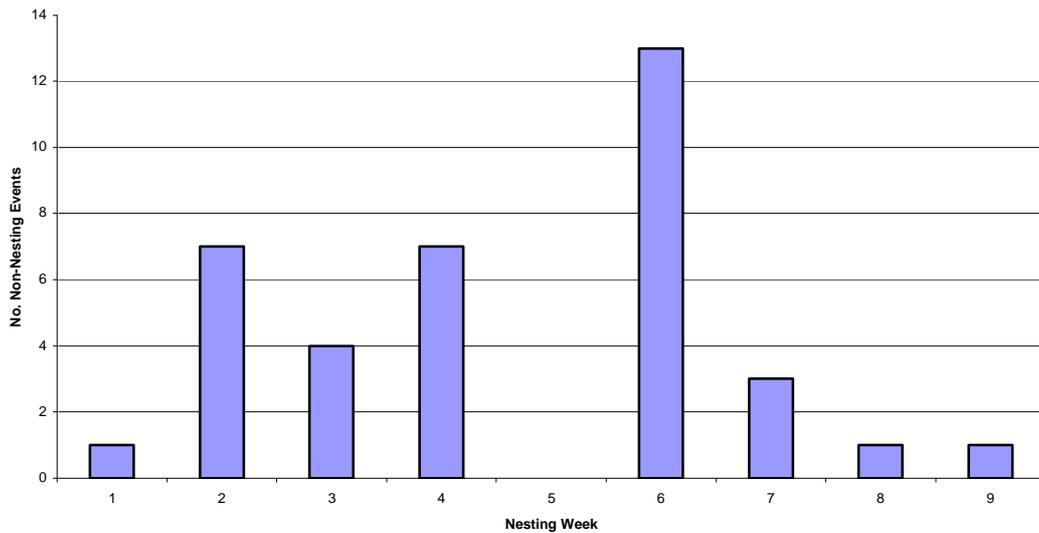
Non-nest No	Date	Tag Left	Right	Marke Left	Marker Right
1P	29/5/00	*	*	145	146
2K	06/06/00	*	*	15	16
3K	06/07/00	*	C227	91	92
4K	06/10/00	*	*	32	33
5P	06/10/00	*	*	129	130
6P	06/10/00	*	*	*	*
7P	06/10/00	*	*	*	*
8P	06/11/00	*	*	*	*
9P	14/6/00	*	*	*	*
10P	14/6/00	*	*	132	133
11K	15/6/00	*	*	*	*
12K	17/6/00	*	K002	*	*
13K	26/6/00	*	*	*	*
14K	26/6/00	*	*	*	*
15P	26/6/00	*	*	*	*
16P	26/6/00	*	*	159	160
17P	26/6/00	*	*	165	166
18P	26/6/00	*	*	*	*
19P	29/6/00	*	K006	130	131
20		*	*	No nor	Nest 20
21P	07/09/00	*	K006	116	117
22P	07/10/00	*	*		
23K	07/11/00	*	*	77	78
24K	07/11/00	*	*		
25P	07/11/00	*	*	116	117
26P	07/11/00	*	*	134	135
27P	07/12/00	*	*	*	*
28K	07/12/00	*	K003	*	*
29K	07/12/00	*	*	116	117
30P	07/12/00	*	K003	77	78
31P	07/12/00	*	K003	*	*
32P	13/7/00	*	K002	*	*
33P	15/7/00	*	K002	131	132
34P	16/7/00	*	*	123	124
35K	16/7/00	*	*	32	33
36P	16/7/00	*	K002	149	150
37K	27/7/00	*	*	32	33
38P	08/01/00	K009	*	*	*

The above table contains the tag numbers of the individuals and the dates that their nests were laid along Mounda Beach (all of the tag numbers beginning with a K were tagged by the Katelios Group during the 2000 nesting season). No individual laid 5 nests which is the maximum that can be laid during the nesting season. Written in italics is the duration in days between nesting events which varies between individual and event, this is laid elsewhere along the coast, referred to as the interesting duration. K006 nested twice during the season with an interesting period of 39 days. The duration of 39 days indicates that the female laid another nest in between the 4/6/00 and

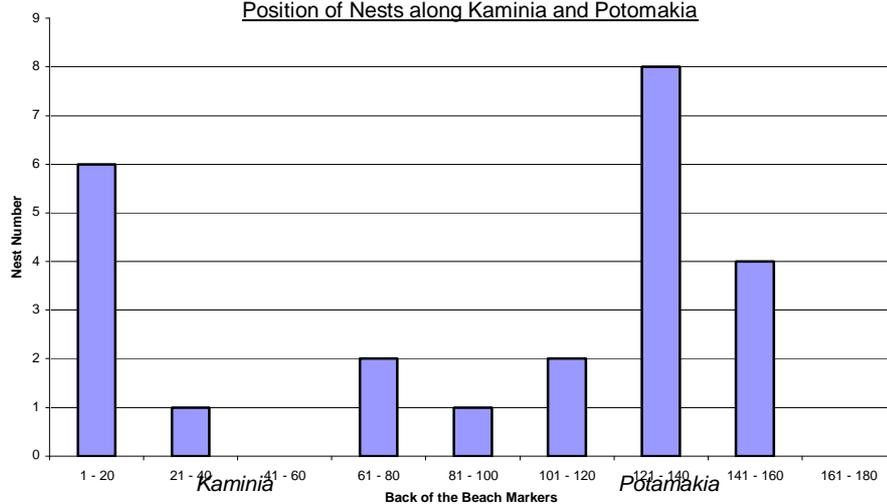
9/7/00 on a different nesting beach. K016, K018, C22 556, H710 nested only once during the month of July. This could indicate that Mounda Beach was used as a secondary nesting beach and that the other nests were laid elsewhere along the coast.

Frequently turtles emerge on to the beach and do not nest for various reasons this is called a "Non-nesting attempt". In the above data many of the non-nesting attempts have no marker reference. This is because the tracks were small and were erased by the sea before the morning watch.

Non-Nesting Attempts during the Nesting Season on Mounda Beach 2000



Position of Nests along Kaminiä and Potamäkia



Graph depicting times of Egg Laying

