



Strasbourg, 8 November 2024

**T-PVS/Files(2024)80**

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE  
AND NATURAL HABITATS

---

**Standing Committee**

44<sup>th</sup> meeting  
Strasbourg, 2-6 December 2024

---

**Open file: 1986/08**

**Recommendation No. 9 (1987) on the protection  
of *Caretta Caretta* in Laganas Bay, Zakynthos  
(Greece)**

**- NGO REPORT -**

*Document prepared by  
ARCHELON*

---



ΑΡΧΕΛΩΝ - Σύλλογος για την Προστασία της Θαλάσσιας Χελώνας

ARCHELON - Sea Turtle Protection Society of Greece

**Council of Europe**

DG Democracy – Directorate of Democratic Participation  
BERN CONVENTION on the conservation of European wildlife and natural habitats,  
*Secretariat the Bern Convention*  
Mr. Mikael Poutiers, ([mikael.poutiers@coe.int](mailto:mikael.poutiers@coe.int), [eoghan.kelly@coe.int](mailto:eoghan.kelly@coe.int),  
[bern.convention@coe.int](mailto:bern.convention@coe.int))

Athens, 25 October 2024  
Ref No: 29885

Re: ARCHELON's annual short report concerning sea turtle conservation on Zakynthos Island, Greece.

Dear Mr. Poutiers,

Please find enclosed our report "Conservation efforts during 2024 at the nesting habitat of *Caretta caretta* in Laganas Bay, Zakynthos, Greece" (NATURA 2000 site GR 2210002 "Kolpos Lagana Zakynthou kai nisides Marathonissi & Pelouzo"), which constitutes supporting evidence in relation to the file: 1986/08 Greece: Recommendation No. 9 (1987) on the protection of *Caretta caretta* in Laganas Bay, Zakynthos.

We would appreciate if the included information could be taken under consideration during the 44th meeting of the Bern Convention Standing Committee.

Kind regards

Daphne Mavrogiorgou  
Director



**Attachments:** 1 Report

# **ARCHELON, The Sea Turtle Protection Society of Greece**



## **Conservation efforts during 2024 at the nesting habitat of *Caretta caretta* in Laganas Bay, Zakynthos, Greece**

Short report submitted to  
the European Commission and  
the Standing Committee of the Bern Convention

Athens, October 2024

Copyright © 2024 by ARCHELON

No part of this report may be reproduced in any form or by any means without the written permission of ARCHELON.

\*\*\*\*\*

ARCHELON, The Sea Turtle Protection Society of Greece

Solonos 113

GR-106 78 ATHENS  
Greece

Tel./Fax: (+30) 210 5231342

e-mail: [info@archelon.gr](mailto:info@archelon.gr)

URL: [www.archelon.gr](http://www.archelon.gr)

## Contents

Summary	p. 6
Foreword	p. 8
1. Background	p. 8
2. The Specific Environmental Study (SES) under development for Zakynthos' protected areas	p. 8
3. The 2024 nesting season	p. 9
I. Monitoring, Conservation and Public awareness	p. 9
II. Threats	p. 10
A. Marine area	p. 10
B. Terrestrial habitat loss/degradation	p. 10
Long-term impacts	p. 10
Short-term impacts	p. 11
C. Light and noise pollution	p. 12
4. Discussion and Recommendations	p. 13
ANNEX 1: Description of the (marine & terrestrial) habitat and existing regulations	p. 15
ANNEX 2: Illustrations and photos	p. 17

---

### **Acronyms:**

MP: Management Plan  
MU: Management Unit  
NECCA: Natural Environment and Climate Change Agency  
NMPZ: National Marine Park of Zakynthos  
PD: Presidential Decree  
SAC: Special Area for Conservation  
SCI: Site of Community Importance  
SES: Specific Environmental Study

---

## Summary

This report outlines the findings and presents the issues related to the protection of the loggerhead sea turtles (*Caretta caretta*) and their habitats in Laganas Bay on Zakynthos Island, Greece, during the 2024 reproductive period. Designated as a Natura 2000 site (GR2210002), Laganas Bay hosts one of the largest reproductive populations of the loggerhead sea turtle in the Mediterranean. The National Marine Park of Zakynthos (NMPZ) was established in 1999 by Presidential Decree (PD) followed by its Management Agency (MA) in 2000. A change in the governance of protected areas was introduced in 2020, with the establishment of the Natural Environment and Climate Change Agency (NECCA). The former MA was reconstructed into the Management Unit of Zakynthos and Ainos National Parks and Protected Areas of the Ionian Islands (MU) as an integral part of NECCA.

During the 2024 nesting season, 2,400 nests (preliminary data) were recorded in Laganas Bay by ARCHELON and were protected in collaboration with the MU. This figure represents a new record, since monitoring started in 1984, for the 2<sup>nd</sup> consecutive year; in 2023, 2033 nests were recorded. Out of 25 sea turtle stranding incidents recorded so far in 2024 (1 injured, which was transferred to ARCHELON's Rescue Centre and 24 dead), 5 were located within the marine protected area of Laganas Bay. Although guards/patrols and cordoning-off of the nesting zone were implemented by the MU, serious delays and shortcomings were observed. WWF-Greece operated the fire prevention observatory in the land behind Sekania beach. Moreover, ARCHELON carried out public awareness activities on the beaches, in tourist facilities, and in ARCHELON's seasonal Information Station in Zakynthos town.

ARCHELON collaborates with the MA (now MU) since its establishment. All collected data of ARCHELON are given to the MU for its management needs.

ARCHELON has been carrying out systematic monitoring and conservation work in Laganas Bay every year since 1984. Analysis of previous data has shown that since the establishment of the NMPZ, the contribution of the individual beaches to the overall nesting numbers has shifted. In recent years, the average nesting contribution of Sekania beach decreased, while the contribution of three other beaches (i.e. East Laganas, Kalamaki, and Gerakas) has increased. This long-term shift is likely attributed to better protection measures (i.e. wardening, cordoning-off of the nesting zone, management of beach equipment, and compliance with the maximum number of beach equipment) gradually implemented by the MU and local businesses on these beaches. However, in recent years, a significant decrease in nest numbers has been observed on the beaches of Marathonissi and Daphni. This is related to disturbances of sea turtles by boats in the marine area and uncontrolled human pressure respectively. Considering the long-term trend of the nesting population (data collected for 41 years, 1984-2024), it can be deduced that the sea turtle population nesting in Laganas Bay is stable, with intense annual fluctuations. However, the nesting records of the last two years show a glimpse of hope for the recovery of the population of Zakynthos.

Regarding the threats that sea turtles face, several incidents of non-compliance to the existing protection measures were recorded during the 2024 nesting season both on land and at sea. Daily violations of the 6knot speed limit and disrespect of the non-anchoring zones were recorded in the protected marine area, especially during July and August. The number of licensed vessels in the bay has not been regulated yet and, often, the Turtle Spotting Guidelines were not followed. Apart from Sekania, an Absolute Protection Site with no human visitation, incidents of human presence at nighttime on the beach, of human trampling of nests, and horse riding in the sand dune zone were recorded. Cases of non-compliance related to the requirement to remove beach furniture at night were also recorded.

Additionally, long-term threats due to illegal activities persisted. These include the old sanitary landfill site, the road between the beaches of Daphni and Gerakas, buildings at Gerakas, and buildings/ businesses at Daphni. Local authorities have not implemented existing administrative

decisions for the demolition of these illegal constructions.

Zakynthos island has become a top international tourism destination in recent years. However, there is significant disrespect and disregard to environmental legislation in the area, especially in relation to nature conservation regulations at sea and on the nesting beaches. Although the continued presence of the MU and ARCHELON on the site has ensured sea turtle monitoring and nest protection, the interest of local businesses, landowners, and local authorities to collaborate for better law enforcement in the NMPZ seems to be quite low. The scale of visitation to the beaches and the marine area in Laganas Bay in previous years along with the reluctance to observe environmental legislation calls for (a) stronger communication/ information/ awareness efforts towards local operators, the authorities and visitors, (b) a collaborative approach in improving the enforcement and implementation of legislation, and (c) a more effective surveillance of the beaches and the marine area.

This problematic situation is not expected to improve through the Specific Environmental Studies (SES) and Management Plans (MP) for all Natura 2000 sites, which are currently being drafted as part of a project coordinated by the Ministry of Environment on a national scale. In January 2023 the proposed SES for the protected areas of the Ionian Islands (Zakynthos included) accompanied by a draft of a new PD and an MP were released for public consultation. Despite the immense pressures on the island's protected areas, the current draft of the SES appears to focus on maintaining the status quo, thus intensifying the main issues instead of trying to resolve them. ARCHELON and other environmental NGOs have submitted detailed comments during the consultation period.

Laganas Bay and the nearby Kyparissia Bay (Peloponnese) contain together more than 86% of all loggerhead nests in the European Union. The announcement of the Greek government to establish a large National Park in southern Ionian Sea, containing both sites, is a hopeful development towards the continuing survival of the species.

A set of recommendations appears at the end of the report as guidance for the near future.

## Foreword

This report is a follow-up to previous reports submitted annually, outlining the main events and presenting the issues related to the protection of the loggerhead sea turtles and their habitats in Laganas Bay (Natura 2000 site GR2210002 “Kolpos Lagana Zakynthou kai nisides Marathonissi & Pelouzo”) during the 2024 reproductive period. It contains information on the monitoring and conservation work and the threats in the terrestrial and marine habitat, as recorded in the fieldwork conducted by ARCHELON, in collaboration with the competent Management Unit of Zakynthos and Ainos National Parks and Protected Areas of the Ionian Islands (MU).

## 1. Background

Laganas Bay, at the southern part of Zakynthos Island, in the Ionian Sea, hosts one of the largest reproductive populations of the loggerhead sea turtle (*Caretta caretta*) in the Mediterranean and is therefore designated as a Special Area for Conservation (SAC) and a Site of Community Importance (SCI) (NATURA 2000 site GR2210002).

The significance of the site as a sea turtle nesting habitat was recognized by legislation in 1980, and since 1984 several legislative acts have regulated the increasing touristic development pressure in the area. These acts contributed to safeguarding a big part of the coastal area of Laganas Bay, but they did not eliminate the disturbance on sea turtle nesting beaches and in the marine waters of the Bay. The consistent pressure from NGOs, the Council of Europe (Bern Convention), and the European Commission, led to the establishment of the National Marine Park of Zakynthos (NMPZ) after several years of deliberations. The NMPZ was established in December 1999 and its respective Management Agency (MA) was set up in July 2000. The relevant Presidential Decree (PD) (Government Gazette D906/22-12-1999) includes a zonation system with varying regulations on land and at sea (see Annex 1). In 2020 the management of protected areas across Greece was transferred to a newly established central agency, the Natural Environment and Climate Change Agency (NECCA), while all MAs of protected areas were reconstructed into MUs as integral parts of NECCA. The transition to the scheme of MUs under NECCA was finalized in 2022.

ARCHELON, founded in 1983, has been carrying out systematic monitoring and conservation work in Laganas Bay every year since 1984. Since 2000, it has been collaborating with the MA of the NMPZ (now MU). All collected data are given to the MU for its management needs. Volunteers onsite supervised and trained by ARCHELON personnel, annually (from early-May through mid-October) monitor the nesting activity, protect nests and hatchlings, and record turtle strandings. Additionally, they monitor onsite threats and carry out public awareness activities to inform visitors and residents in the area.

## 2. The Specific Environmental Study (SES) under development for Zakynthos' protected areas

In January 2023 the proposed SES for the protected areas of the Ionian Islands (Zakynthos included), accompanied by a draft of a new PD and a Management Plan (MP), was released for public consultation. ARCHELON alongside other environmental NGOs submitted detailed comments during its consultation period. The main issues of concern raised by ARCHELON, and others, were:

- The proposed SES divides the NMPZ into 42 different zones, with no clear boundaries however, as the maps are not accompanied by relevant coordinates.
- Most of the suggested zones allow for a multitude of permitted land uses. Yet there is no appropriate impact assessment regarding their cumulative impact on the protected species and habitats.
- The proposed SES does not address the ongoing illegal constructions in the existing Protected Zones, but attempts to legitimize them, particularly those involving threats with long-term impact (i.e. the illegal infrastructure on Daphni beach). This legitimization focuses on maintaining the



current situation instead of improving protection according to the needs of the protected species and habitats.

- The SES not only fails to address the carrying capacity of tourism in Laganas Bay (both on the nesting beaches and the marine area) despite the intensive pressures of mass tourism, but it also suggests the removal of the existing capacity limit of 150 hotel rooms, thus allowing further coastal development.
- The SES lacks much needed measures for the implementation and enforcement of the existing protection framework. Taking into account the current situation from the existing PD, as well as the poor implementation of environmental legislation in the area, attention must be drawn to the imperative need for effective law enforcement.

### 3. The 2024 nesting season

#### I. Monitoring, Conservation and Public awareness

In 2024, ARCHELON conducted fieldwork on the six nesting beaches of Laganas Bay from 13 May to 10 October. The project implemented the protocols of monitoring and protection of nests and hatchlings as agreed with the MU, in effective collaboration with the MU’s staff.

Preliminary data indicate that about 2,400 nests were recorded across the six nesting beaches during the 2024 nesting season. This figure is well above the average annual number since 1984 (1,230 nests), marking the second consecutive year of increased nesting activity; the corresponding number of nests in 2023 was 2033. While the overall long-term outlook for the turtle population nesting in Zakynthos is considered stable, there are noteworthy fluctuations in the annual nesting activity (Fig. 1). The records of the last two years seem hopeful for the recovery of the population, even though more time is needed to reach safe conclusions.

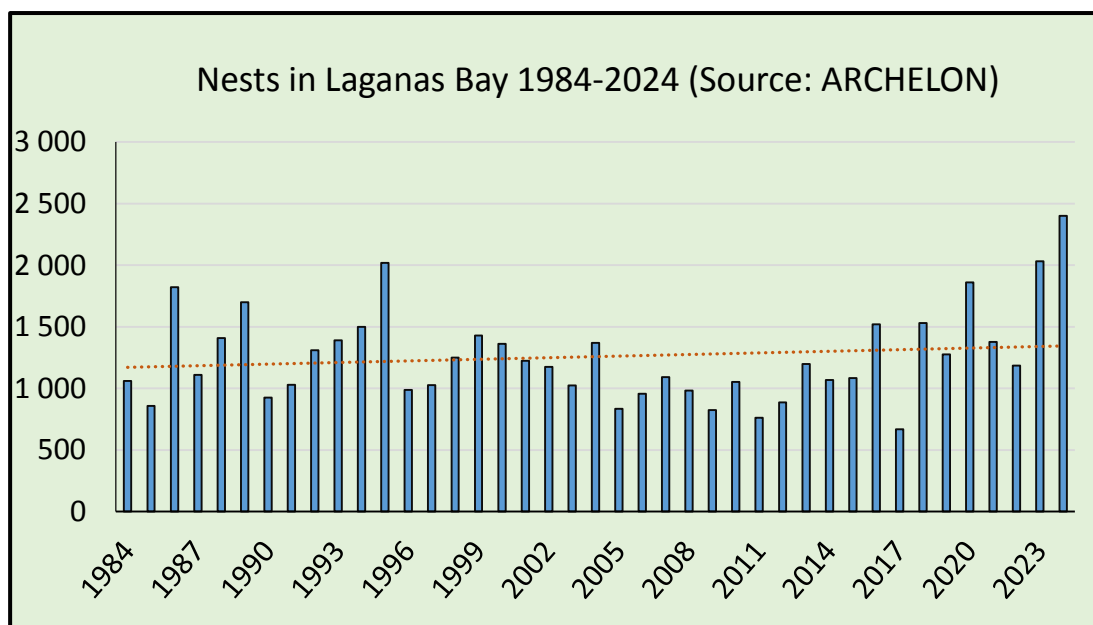


Figure 1: Annual number of nests, recorded by ARCHELON, and respective linear trend for the 41-year period 1984-2024 in Laganas Bay, Zakynthos.

ARCHELON conducted public awareness activities on the nesting beaches, in various hotels, on selected touristic boats operating in the marine protected area of Laganas Bay, and in ARCHELON’s seasonal Information Station located in Zakynthos town. About 43,000 people were informed about sea turtles, the threats affecting them, and the protection measures in place.

Regarding turtle strandings, 25 incidents were recorded from the beginning of 2024 until 10 October, involving 24 dead and 1 injured individual. The injured turtle was transferred to ARCHELON's Rescue Centre. Of the 25 strandings, 5 were located within the marine protected area of Laganas Bay. Examination of the stranded animals in the protected area showed interaction with fisheries (incidental capture in fishing gear, 1 case) as well as signs of injuries caused by boat collision (4 cases) (Photo 1). In all other cases, the cause of death or injury was not apparent.

It should be noted that WWF-Greece operated an observatory against wildfires on its acquired land behind Sekania beach. For yet another year, the MU did not employ seasonal staff due to limited resources. As a result, some warden huts remained unstaffed on a daily basis, even during night hours, as the permanent wardens were not enough.

## II. Threats

This section presents a description of the threats observed in both terrestrial and marine areas. Where possible, a quantitative description of these threats is provided.

### A. Marine area

The large increase in the number of boat licenses issued in Zakynthos has led to an uncontrolled increase of boating activity in the marine area of the NMPZ. ARCHELON has requested official data on the number of motorized and non-motorized boats operating in Laganas Bay during 2024, but has yet to receive a response from the competent authority (Coast Guard). Nevertheless, an extremely high number of boats available for rent and Turtle Spotting activities was observed and has resulted in higher disturbance to sea turtles. Inadequate patrolling of the marine area by the competent authorities has encouraged a general attitude of disregard towards maritime regulations.

Regarding Turtle Spotting, in the early years of the NMPZ's operation, its MA awarded boat owners with a "Turtle Spotting License" on a voluntary basis, provided that they follow a set of guidelines, but the scheme was later abandoned. In 2018, the Turtle Spotting Guidelines were included in a legislative act issued by the Coast Guard of Zakynthos, and thus making them compulsory. However, in 2024 as in previous years, Turtle Spotting appears to have evolved into a "turtle hunt". In total, 1,901 instances of non-compliance with the Turtle Spotting Guidelines were recorded during 151 days of observation (Photo 2a).

Regarding the maritime traffic regulations as outlined by the PD, in 2024, during 151 days of observation, ARCHELON recorded 208 instances of breaking the 6knot speed limit of Zones B and C (Illustration 2). Additionally, there were 1,865 occasions where boats were anchored in Zone B, and 20 cases of boats anchored or passing in Zone A (Photos 2b, 2c)<sup>1</sup>.

The MU repeatedly sent requests for joint patrols to the local Coast Guard, but these patrols were eventually conducted only 4-5 times per week and only for a limited amount of time, from early July until early September. Even though the MU's staff patrolled the area daily and were authorized to issue fines in cases of non-compliance, no such fines were issued, due to lack of training.

Please refer to Annex I, for the maritime traffic regulations of the PD and the Turtle Spotting guidelines.

### B. Terrestrial habitat loss/degradation:

#### Long-term impacts

*Natural deposition of pebbles and clay on the north-west part of Gerakas beach:* In recent years, large amounts of pebbles have been deposited because of wave action during the winter months (Photo 3). Furthermore, clay runoff from the cliffs behind the beach due to rainfall has caused further

---

<sup>1</sup> The instances of non-compliance with current legislation were recorded during ARCHELON's public awareness shifts in the marine area, which take place in specific days and times. As a result, not all non-compliance cases have been recorded.

hardening of the sand. Consequently, this part of the beach has been rendered unsuitable for nesting.

***Illegal constructions and infrastructure:*** For almost 38 years now, the area behind Daphni beach along with parts of the beach itself are being degraded, resulting in direct disturbance to sea turtle nesting and the incubation of nests. The site has been completely transformed by unauthorized activities, such as construction of buildings and roads, sand dune flattening, and sand removal. According to Recommendation No. 9 by the Bern Convention (1987), the removal of illegal buildings at Daphni was ordered by demolition protocols and impending fines. While at the time of the Recommendation only 2 businesses existed at, there are 7 operating illegal businesses today (Photo 4). No action has been taken for their removal. As such, illegal activities continue year after year. It must be noted that the proposed SES designates Daphni beach as a Nature Protection Zone (NPZ-14), allowing however beach bars of up to 50m<sup>2</sup> to operate. This provision is not only inconsistent with the protection of sea turtles and the preservation of the nesting beach, but it also attempts to legitimize a de facto (illegal) situation that has remained stagnant for decades.

Additionally, over the last few years, 3 touristic facilities (private villas for rent) have been built along the rural road leading to Daphni beach (Illustration 3). This is indicative of the touristic pressure exerted on the area. The area is included in its entirety in zone Φ1: protected landscape, where building of houses is permitted. According to the proposed SES, this area is proposed as Zone for the Conservation of Habitats and Species (SDOE-05), where the construction of hotels with a capacity of more than 150 rooms is suggested.

In addition, in December 2015 and March/April 2018, road construction works were undertaken within the boundaries of the NMPZ, specifically on the hills between the nesting beaches of Gerakas and Daphni (zone Φ1: protected landscape). Further unauthorized road construction works were reported in January 2021, despite the relevant fines imposed (Photos 5a, 5b, 5c, 5d). In 2022 the Prefecture of Ionian Islands issued a decision to dramatically reduce the imposed fines from 200,000 EUR to 10,000 EUR (Ref. No.: 38702/7817/16-5-22, Administrative Post Number: 6YI87AE-IIYΨ). Unfortunately, the proposed SES allows for the existence of roads, despite assigning this zone as Nature Protection Zone (NPZ-20). Again, this provision attempts to legitimize the illegal situation in the area.

Furthermore, in the area behind Gerakas beach (zone II2: Nature Protection Site) where building is prohibited, one new stone house and one stable were constructed in 2017. Although fines were imposed, neither demolition nor restoration works have occurred (Photos 6a, 6b). Unfortunately, the proposed SES does not address those interventions and does not foresee their demolition.

Lastly, within the boundaries of the NMPZ (behind Vrodonero beach, between Kalamaki and Sekania) there is an overfilled landfill site. This landfill site has not operated since 2018, yet it has not been restored by the Municipality, despite fines imposed by the Prefecture. Therefore, it continues to constitute a permanent toxic pollution threat to both the nesting beaches and the marine area (Photo 7).

### **Short-term impacts**

***Beach use and beach furniture:*** It has long been observed that the businesses operating beach furniture on the beaches of Laganas Bay do not comply with the PD's regulations. As a result, the required distances from the back of the beach are not kept, while the removal of beach furniture at sunset has either been completely ignored or implemented incorrectly (Photo 8). It should be noted that in previous years the maximum number of beach furniture specified by the PD was also violated. However, in 2024, a significant improvement was noted: during the high tourist season, ARCHELON recorded 120 sunbeds in Gerakas, i.e. the exact number allowed, and 293 sunbeds in Kalamaki and East Laganas, while the maximum number permitted is 300.

During the 2024 nesting season, ARCHELON recorded 56,483 incidents of non-compliance<sup>2</sup> regarding the removal of sunbeds at sunset on the beaches of Gerakas, Kalamaki and East Laganas, in a total of 151 days of observation. Sunbeds left on the beach during the night are obstacles for both the nesting females and the hatchlings. In some instances, beach furniture made whole sections of the beaches inaccessible to turtles and caused them to abandon nesting attempts (Photo 9).

Throughout the nesting and hatching season of 2024, the permitted number of beach users on Gerakas (350), Daphni (100), and Marathonissi (200) as stated by the PD was greatly exceeded. As mentioned under Section 2, the proposed SES and MP fail to address the carrying capacity of tourism on the nesting beaches of Laganas Bay regarding beach furniture and beach users.

Human presence on the nesting beaches at night (sundown to 7 a.m.): According to the MU's relevant Plan, there is a total of 9 posts for guards on the 6 nesting beaches. Staffing these posts on a 24-hour basis would require 27 guards.

In 2024 the MU had 11 guards (i.e. only the permanent staff, as no seasonal staff was hired), which proved insufficient; incidents of human presence during night hours were frequent. This was quite notable on East Laganas and Kalamaki beaches where 1,190 incidents of non-compliance were recorded over a total of 151 days of observation. To support the MU, ARCHELON introduced extra volunteer shifts on the aforementioned beaches from mid-July until mid-August.

Human trampling of nests: The PD requires beach visitors to remain close to the shoreline and avoid the nesting zone at the back of the beach, to protect incubating nests from trampling, as well as shading and damage from umbrellas.

As in previous years, in 2024, the MU used ropes to restrict access to the nesting zone along the beaches of Marathonisi, Gerakas and along sections of Laganas and Kalamaki (Photo 10). Not only was this measure partially applied (the rope was absent in some areas), but it was also applied with a delay (late-June), resulting in a high number of people being at the back of the beach.

Vehicles: Sand compaction caused by vehicles can damage turtle eggs and potentially trigger premature emergence of hatchlings from affected nests. Emerging hatchlings can be trapped in tire ruts and may die of exhaustion, dehydration, or predation. Moreover, vehicles moving along the beach can damage sand dune vegetation. During 2024 the MU placed wooden poles along the back of the beach of East Laganas and as a result this phenomenon was almost eliminated entirely, as only one case of a vehicle on the beach was recorded over 151 days of observation (Photo 11).

Horses: There is a significant growth of commercial horse-riding activity on the sand dunes behind East Laganas. This has significant negative impacts not only on incubating nests but also on the sand dunes. During the 2024 nesting and hatching season, the wooden poles placed by the MU to control vehicle activity, also proved to be effective in relation to this threat, as the horses did not enter the beach. However, the presence of horses on sand dune zone was recorded on a frequent basis (Photos 11-12).

### **C. Light and noise pollution**

Light pollution is a serious threat for sea turtles, as it causes hatchling disorientation and disturbs the nesting females resulting in the abandonment of nesting attempts.

During the 2024 nesting season, ARCHELON conducted provisional recording of the existing light sources causing pollution during the low and the high tourist season. In particular, 36 permanent light sources were recorded on East Laganas, belonging to private businesses (i.e. hotels, beach bars) and public streetlights at the back of the beach. Additionally, Daphni beach faced serious light pollution problems due to the operation of 7 illegal businesses behind the beach, some of which had lights on

---

<sup>2</sup> This number indicates the total number of sunbeds that remained on the beaches after sunset in a total of 151 days of observation.

during late hours. In addition, the severe light pollution from West Laganas affected almost all 6 nesting beaches of the habitat (Photos 13a, b). More than 40% of nests were impacted by light pollution on East Laganas, approximately 23% of nests on Kalamaki, and 33% of nests on Marathonissi.

It is important to note that the reduction of light and noise pollution is not taken into account at all in the proposed SES. As a result, the drafted MP does not include specific management measures for the reduction of those threats.

#### **4. Discussion and Recommendations**

##### **The long-term monitoring**

ARCHELON has been monitoring the six nesting beaches of Laganas Bay since 1984, collecting data on important reproductive parameters. Analyses of nesting data indicate the effects of global warming on this regionally important sea turtle population. Rising temperatures at sea and on land due to climate change, affect the nesting population and its reproductive behavior in various ways: In recent years, the nesting and hatching season have shifted, starting at earlier dates as compared to previous years. 2024 was the year with the earliest recorded nest. Furthermore, the duration of incubation, which strongly depends on sand temperature, has been decreasing over the years. This further exacerbates the already female-biased hatchling sex ratios. Despite this, hatching success and emergence success have increased and this shows that a lethal threshold in sand temperatures has not yet been reached. ARCHELON follows the recent scientific literature on this subject and convenes with leading experts in this field to submit relevant proposals to the MU for appropriate measures when needed.

Analysis of previous data has also shown that since the establishment of the NMPZ, the nesting contribution of the individual beaches has shifted. Whereas previously, more than 53% of nests were deposited on the remote beach of Sekania, rendering an atypical nest density (reaching 1,600 nests/km/season) on this beach, in recent years, the average contribution of Sekania has been decreased. Consequently, nesting has increased on the beaches of East Laganas, Kalamaki, and Gerakas. This change is likely caused due to the effective implementation of protection measures (wardening, cordoning-off of the nesting zone, management of beach equipment, and compliance with the maximum number of beach equipment) by the MU and local businesses on these beaches. On the other hand, over the last years, nest numbers on Marathonissi show a significant decrease. From 2005 to 2023, the average number of nests was 63 nests/year, while in the period from 1984 to 2004 121 nests were recorded per year. Between 1984 and 2002, Daphni beach hosted the second highest number of nests on Zakynthos (average 150 nests/year). Since then, nest numbers have significantly decreased (average 94 nests/year; 2003-2023). In 2024, only 42 nests (preliminary data) were identified.

Considering the long-term trend (41 years) of the nesting population, it can be deduced that the nesting sea turtle population in Laganas Bay is rather stable with intense annual fluctuations, while the record numbers of nests for 2 consecutive years (2023 and 2024) indicate a glimpse of hope for the recovery of the population, but more data is needed to reach more safe conclusions.

##### **Public awareness and law enforcement in a major tourist destination**

Since the establishment of the NMPZ, the island of Zakynthos has become a top tourist destination, which may well receive as many as 1,500,000 visitors/ year. Many of these visitors are primary users of Laganas Bay for recreation and reside in the Buffer Zone of the NMPZ, where the number of tourist accommodation units, along with restaurants, bars, and other entertainment facilities has increased exponentially during the past 20 years. In that Zone, a number of business owners and managers of these facilities have continuously exhibited disrespect and disregard for nature conservation regulations on the beaches and the marine area. The same attitude has been expressed

by some landowners within the Nature Protection Sites and the Protected Landscape Zones of the NMPZ itself. It is important to keep in mind that the main compensation measure to landowners within the Marine Park was the acquisition of the land behind Sekania beach by WWF- Greece in 1994, following a proposal by ARCHELON. With the establishment of the NMPZ in 1999, this area was declared an Absolute Protection Site.

ARCHELON's volunteers carried out several public awareness activities as mentioned in Section 3.I; however it is true that information campaigns and educational activities about sea turtles and the rest of the very important ecological features within the NMPZ have not been developed in proportion to the number of visitors on the island. Hotel owners, tour operators, and beach-related businesses in the area do not appear to be interested in actively supporting conservation measures and law enforcement.

As presented in detail in Section 3 of this report, in 2024 ARCHELON recorded several types of non-compliance incidents in relation to the existing legislation, based on the PD and other national environmental laws. Even though in 2023 the MU staff was bestowed authority to conduct investigations and issue fines, no penalties were imposed in 2024 in neither the terrestrial nor the marine area. This is possibly due to a lack of internal training and procedures that has prevented them from carrying out their new duties.

Although the elaboration of SESs and MPs for all Natura 2000 sites on a national scale could be a window of opportunity for positive developments, unfortunately, as described in Section 2, the proposed SES for the protected areas of the Ionian Islands (Zakynthos included), does not address the existing problems, but also appears to lead to additional degradation of the NMPZ.

### **Recommendations**

- Threats to sea turtles in the marine area must be dealt with efficiently. This includes the regulation of the numbers of boats licensed to operate in the Bay, and the enforcement of the 6knot speed limit, non-anchoring zones, and the Turtle Spotting Guidelines.
- All illegal constructions and infrastructure (old sanitary landfill, road between beaches of Daphni and Gerakas, buildings at Gerakas and buildings/ businesses at Daphni), which have a long-term impact on the naturalness and integrity of the site must be demolished, and the respective habitats must be restored.
- All short-term threats on land (i.e. violations regarding beach furniture, human presence at nighttime on the beach, human trampling, horse riding) must be taken into account and addressed.
- Measures for minimizing light and noise pollution must be implemented and enforced for all nesting beaches of Laganas Bay.
- Law enforcement in both the terrestrial and the marine part of the NMPZ must become a priority, and adequate surveillance by the competent authorities must be ensured.
- A large-scale targeted communication/ information /awareness effort must be deployed in the area towards local businesses, landowners, and local authorities to build a platform of collaboration, inform visitors and support law enforcement.
- The proposed SES and the drafted PD and MP for the NMPZ must take into serious account the comments submitted by the environmental NGOs, including ARCHELON, in order to address the existing threats and achieve effective protection of the habitats.

### **Final Remark**

Laganas Bay and the nearby Kyparissia Bay (Peloponnese) are the largest nesting areas in the Mediterranean and together they contain more than 86% of all loggerhead nests in the European Union. ARCHELON, in 2012, proposed the unification of both areas for better and integral management. The recent announcement of the Greek government to establish a large National Park in southern Ionian Sea, containing both nesting sites, is a hopeful development towards the continuing survival of the species.

## **ANNEX 1: Description of the (marine & terrestrial) habitat and existing regulations**

The nesting habitat of Laganas Bay consists of a terrestrial part comprised of six distinct nesting beaches (Marathonissi, East Laganas, Kalamaki<sup>3</sup>, Sekania, Daphni, Gerakas), of a total length of 5.5km, and a marine part including the entire bay, of a total area of 51,363sqkm. A map of the region is shown in Illustrations 1 and 2.

**Marathonissi (zone A2: Nature Protection Site, maritime zone B/ in the SES it is proposed as Nature Protection Zone 11):** Marathonissi is a small island within the bay and its nesting beach is characterized by low sand temperatures, due to its northern orientation and whitish sand color. Low sand temperatures in Marathonissi produce predominantly male hatchlings. This makes this short beach (370m) extremely important at a regional level, as most beaches around Mediterranean produce mainly female hatchlings. The beach is a popular destination for day-visitors who arrive by boat, however, only up to 200 people are allowed at any time, according to the management measures of the MU. According to the PD the construction of buildings is prohibited.

**East Laganas (zone II3: Nature Protection Site, maritime zone B/ in the SES it is proposed as Nature Protection Zone 16):** This long beach (2.78km) is partially backed by an extensive sand dune zone. A limited number of hotels and taverns, which were built before the NMPZ's establishment, are found along the back of the beach. These businesses and some additional operators rent beach furniture and pedalo/canoes along the beach. In a small distance behind the beach (2km) is the international airport of the island, which is supposed to remain closed during night hours from May to October, to prevent light and noise pollution. At the western end of East Laganas, extends the known as "West Laganas" beach, namely the part of the beach which is in front of Laganas village and is no longer used by turtles for nesting due to strong touristic development and overuse.

**Kalamaki (zone II3: Nature Protection Site, maritime zone B/ in the SES it is proposed as Nature Protection Zone 16):** Kalamaki is a 500m beach, which is located east of East Laganas beach at the northernmost part of the bay. Access to the beach is gained through a single official entrance, but four more illegal entrances exist. At the back of this beach a hotel is found, which was built before the NMPZ's establishment. This business and one additional operator rent beach furniture, while one more business with pedalo/canoes operate on the beach.

According to the PD the maximum permitted number of beach furniture on both East Laganas and Kalamaki is 150 umbrellas/ 300 sunbeds.

**Sekania (zone A1: Absolute Protection Site, maritime zone A/ in the SES it is proposed as Absolute Protection Zone 01):** Sekania beach (650m) is located at the center of no-boating maritime zone A at the east side of the bay. This beach hosts one of the highest nesting densities for *Caretta caretta* in the world. It is the most strictly protected nesting site of the habitat, where human presence is permitted only for scientific reasons.

**Daphni (zone II1: Nature Protection Site, maritime zone A/ in the SES it is proposed as Nature Protection Zone 14):** Daphni beach (600m) is located next to Sekania beach at the east side of Laganas Bay. This beach and especially the area behind the beach, where private properties are found and 7 illegal businesses operate, has been subject to many illegal activities (e.g. building and road constructions, flattening of dunes, sand removal, planting of non-native vegetation, placement of numerous beach furniture). On the contrary, the PD foresees no operation of businesses at the back of the beach, no beach furniture, while the maximum number of beach users should not exceed 100 people at any time.

**Gerakas (zone II2: Nature Protection Site, maritime zone A/ in the SES it is proposed as Nature Protection Zone 15):** Gerakas beach (600m) is found in the southeast part of the bay and is accessed

<sup>3</sup> The MU refers to the beaches of East Laganas and Kalamaki as Kalamaki and Crystal respectively.

via a single entrance. The back of the beach is free of development and light pollution, while a group of operators rent beach furniture on the beach. The PD foresees that the maximum numbers of beach users must not exceed 350 people at any time, while the maximum number of beach furniture is 60 umbrellas/120 sunbeds.

**Marine area of Laganas Bay (zone Ia, Nature Protection Site):** The protection status and permitted activities in the protected marine area of Laganas Bay are defined by the PD, Article 4. This area includes three zones (A, B and Γ) regulating maritime traffic and fishing annually from 1 May to 31 October. In particular, in zone A, no boating and fishing is allowed. In zone B, there is a 6knot speed limit to avoid lethal collisions with sea turtles, while anchoring and mooring is also not permitted. In zone Γ, the only restriction is the speed limit for boats which is 6 knots.

Within Zone Ia, several businesses operate wildlife-watching boat trips focusing on sea turtles. To minimize the negative impact of the observation of sea turtles, the MU, in cooperation with ARCHELON, has issued guidelines for proper observation procedures of sea turtles. These guidelines for Turtle Spotting regulate: (a) approach distance, (b) approach angle, (c) maximum number of boats that can be present in an observation/ queuing distance for boats waiting to enter the observation, (d) maximum duration of observation, (e) obligation to terminate the observation when the turtle seems disturbed or tries to escape, (f) disturbing or noisy behavior, (g) physical contact with sea turtles, (h) feeding sea turtles and (i) swimming with sea turtles. Until May 2018 the guidelines were voluntary, i.e. not endorsed by legislation. Due to poor implementation in May 2018 the competent Coast Guard issued a special decision (i.e. legislative act), which included the proper observation guidelines (Ref. No. 2131.13/2063/29-05-2018). Moreover in 2006 a “Turtle Spotting Zone”<sup>4</sup> was introduced by the MA (now MU), but it is still not supported by legislation.

In the SES, zone A is proposed as Absolute Protection Zone 02, zone B is proposed as Nature Protection Zone 09, while zone Γ is proposed as Nature Protection Zone 10.

---

<sup>4</sup> A zone which hosts a high density of turtles and was supposed to be exclusive for “endorsed Turtle-Spotting Boats” with carrying capacity <25 passengers.



## ANNEX 2: Illustrations and photos



Illustration 1: Map of the six nesting beaches in Laganas Bay.

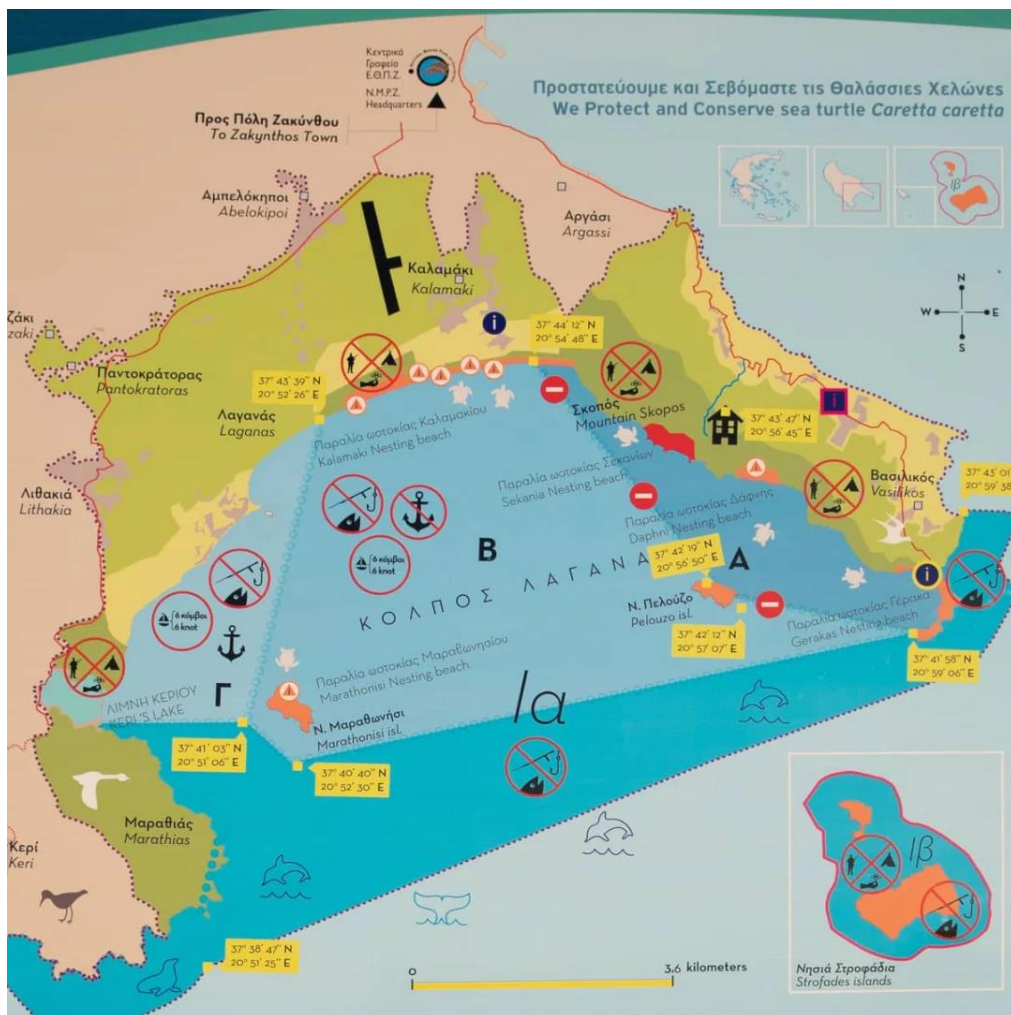


Illustration 2: Zonation scheme of the protected marine area of the NMPZ (for details refer to Annex 1).

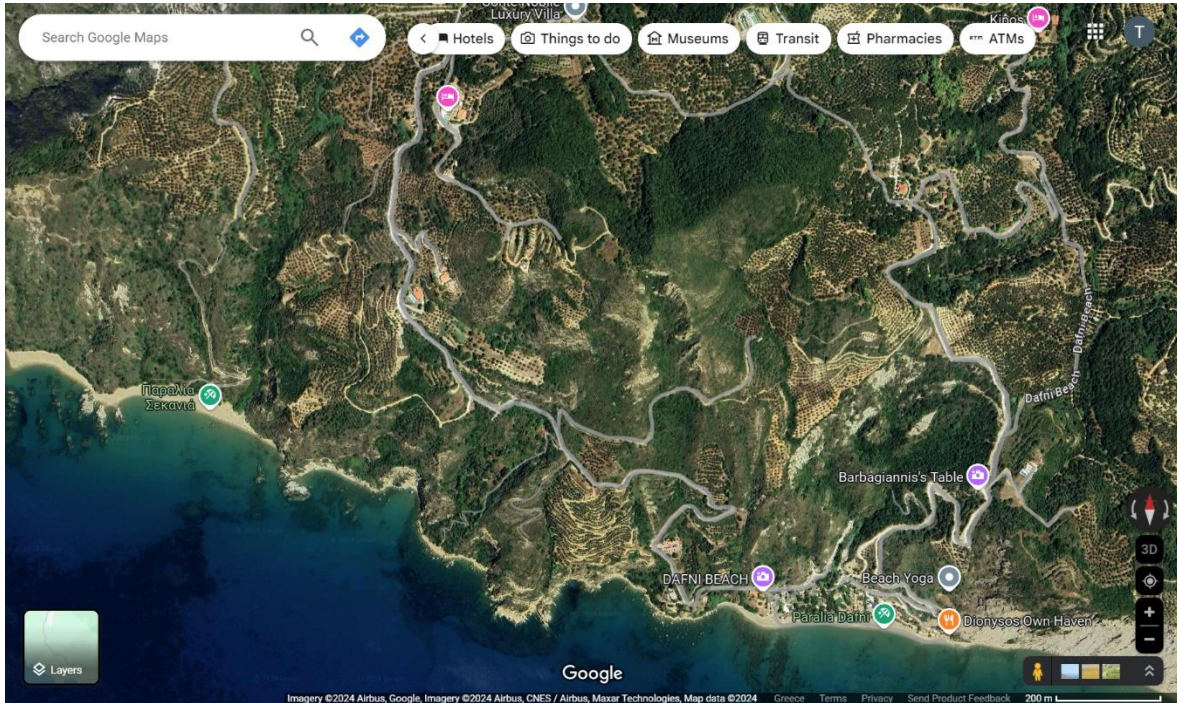


Illustration 3: In the red circles are the houses for rent along the road to Daphni beach, the beaches Sekania (Absolute Protection Site) and Daphni (Nature Protection Site) are noted in yellow (Google Maps, 2024).



Photo 1: Sea turtle stranding caused by boat collision. In the red circle parallel cuts are visible, a sign of propeller cuts (Laganas Bay, July 2024).



Photo 2a: Turtle-Spotting guidelines were poorly implemented (Laganas Bay, July 2024).



Photo 2b: The speed limit of 6 knots was exceeded on a daily basis (Laganas Bay, August 2024).



Photo 2c: Anchored boat next to Pelouzo island in Zone A on the left, sailboat entering Zone A on the right (Laganas Bay, July 2024).



Photo 3: The north-west part of Gerakas beach is not suitable for turtle nesting due to natural deposition of pebbles and clay (Gerakas, September 2024).



Photo 4: Illegal constructions and businesses on Daphni beach.



Photos 5 a, b, c, d: Illegal road (providing access to the sea between Daphni and Gerakas beaches) was constructed in 2015 and 2018, was further continued in 2021, and as of 2024 was never demolished nor restored.



Photos 6 a, b: Illegal buildings (1 house & 1 stable) behind Gerakas nesting beach (both photos were taken in 2017, but the situation remains the same).

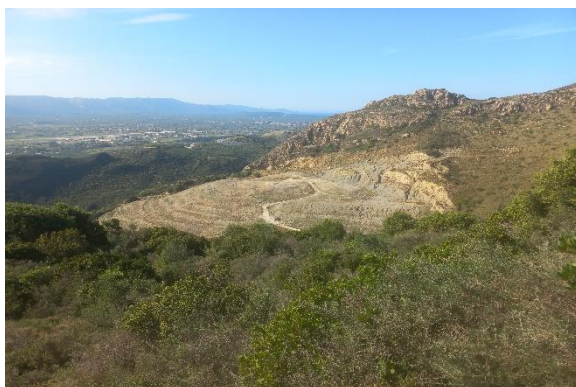


Photo 7: The illegal landfill is located within the boundaries of the NMPZ. The site remains unrestored (October 2024).



Photo 8: Beach furniture removal was implemented either incorrectly or not at all (East Laganas, June 2024).



Photo 9: Beach furniture was preventing sea turtles from reaching the area that is suitable for nesting (Kalamaki, June 2024).



Photo 10: Use of ropes by the MU to block access of visitors towards the nesting zone at the back of the beach (East Laganas, July 2024).



Photo 11: The wooden poles did not allow for vehicles to enter the beach. In the red circle are visible horse tracks, indicating that the horse riders were using the place of the poles as a path (East Laganas, June 2024).



Photo 12: Horse riding on the sand dunes was observed regularly (East Laganas, September 2024).



Photo 13a



Photo 13b

Photos 13a, b: Light pollution originating from West Laganas (Photo 13a) or operating businesses within the protected area (Photo 13b) (East Laganas, August 2024).