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**Follow-up of Recommendation No. 9 (1987) of the
standing committee on the protection of Caretta
Caretta in Laganas bay, Zakynthos (Greece)**

- REPORT BY THE COMPLAINANT -

*Document prepared by
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ARCHELON, the Sea Turtle Protection Society of Greece



Conservation efforts during 2020 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

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Contents

Prologue	p. 4
1. Background	p. 4
1.1. Location and the National Park's creation	p. 4
1.2. The long-term field project of ARCHELON	p. 4
2. The actual situation in the field during the 2020 nesting season	p. 5
2.1. The terrestrial habitat	p. 5
2.1.1. Brief description of the nesting beaches	p. 5
2.1.2 Threats/pressures on nesting beaches during 2020	p. 6
2.2. The marine area	p. 7
3. Conclusions and Recommendations	p. 8
3.1. Recommendations for the terrestrial habitat	p. 8
3.2. Recommendations for the marine area	p. 8
Illustrations	p. 9
Photos	p. 10

Prologue

This short report, a follow up to previous reports submitted annually, outlines the major events in the efforts to protect the sea turtles and their habitats in Laganas Bay (Natura 2000 site GR 2210002 “Kolpos Lagana Zakynthou kai nisides Marathonissi & Pelouzo”) during the 2020 reproductive period. In particular, this report presents the conservation status of the terrestrial as well as the marine habitat, as recorded through the fieldwork of ARCHELON.

1. Background

1.1. Location and the National Park’s creation

Laganas Bay, at the southern part of Zakynthos Island, in the Ionian Sea, hosts one of the largest reproductive habitats of the loggerhead sea turtle (*Caretta caretta*) in the Mediterranean Sea. The nesting habitat of Laganas Bay consists of a terrestrial part comprised of six distinct nesting beaches (Marathonissi, East Laganas, Kalamaki¹, 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. Map of the region is shown in Illustrations 1 and 2.

Due to the significance of Laganas Bay as a nesting habitat, and the pressures it faces from mass tourism and development, the Greek State has attempted, since 1984, to protect it through various legislative acts. However, these were generally poorly enforced. Following consistent pressure from NGOs, the Council of Europe (Bern Convention) and the European Commission and after several years of deliberations, the National Marine Park of Zakynthos (NMPZ) was eventually established in December 1999 and its 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. ARCHELON collaborates with the MA of the NMPZ since the Agency’s establishment.

It should be noted that due to a new law (4685/2020), all the Management Agencies of protected areas turned into Management Units, supervised and coordinated by a central agency - the Natural Environment and Climate Change Agency (known by its Greek acronym as “OFYPEKA”). The quick and smooth transition to the scheme of Management Units under “OFYPEKA” is considered vital for the protection of the habitat in general and the marine turtles in particular.

1.2. The long-term field project of ARCHELON

ARCHELON has been systematically monitoring the Bay’s nesting beaches since 1984 and records annually the nesting activity as well as associated conservation measures. The long-term project of ARCHELON, carried out yearly from early-May through mid-October, involves monitoring of the nesting population, protection of nests and hatchlings, recording of turtle strandings, as well as recording of violations on the nesting beaches and at the marine area. In addition, it includes an extensive public awareness programme to inform visitors and residents.

The 2020 nesting season was marked by the COVID-19 pandemic. ARCHELON was affected gravely by travelling restrictions that resulted in extremely low number of volunteers arriving, but still managed to operate the monitoring and conservation project in Laganas Bay. Due to the expected shortage on ARCHELON’s volunteers, the monitoring protocols were adjusted to ensure absolutely necessary data collection and nest protection. In particular, ARCHELON had to adjust the field work to maintain small teams that were safe from the spread of the coronavirus. For that reason, the fieldwork was modified, and priority was given to the recording and protecting of nests and hatchlings, while all other actions, aiming at raising public awareness, recording of threats and violations, were reduced.

In 2020, fieldwork on the six nesting beaches of the Bay commenced on 25 May and terminated on 10 October. According to preliminary data, on the six nesting beaches of the habitat more than 1,840 nests were recorded, raising the average annual number of nests since the beginning of nest counts in 1984 to about 1,200 nests. As mentioned already, the monitoring of threats and violations was very limited. According to the results of this reduced effort, ARCHELON recorded 16,573 violations against the PD regulations only on the terrestrial part

¹ The MA of the National Marine Park of Zakynthos refers to the beaches of East Laganas and Kalamaki as Kalamaki and Crystal respectively.

(e.g. regarding light & noise pollution, beach furniture, pedalos, horses, vehicles, people on beach either during night hours or at back of the beach) (see Section 2.1.2.), while at the protected marine area no systematic recording was conducted (see Section 2.2.). ARCHELON personnel reported to the NMPZ's MA all observed incidents both in the marine area and on the nesting beaches.

Regarding turtle strandings, 27 incidents (26 dead and 1 injured/sick) were recorded from the beginning of 2020. Of the total number of strandings, 5 sea turtles were located within the marine protected area of Laganas Bay. Examination of the stranded animals showed interaction with fisheries (fishing gears) as well as signs of injuries caused by boat collision (Photo 1).

2. The actual situation in the field during the 2020 nesting season

This section focusses on the anthropogenic disturbances that resulted in direct and indirect impacts on sea turtles (adults and hatchlings), their nests and the nesting habitat in Laganas Bay during the 2020 nesting season. These disturbances were experienced through the fieldwork of ARCHELON.

2.1. The terrestrial habitat

2.1.1. Brief description of the nesting beaches

Marathonissi (zone A2: Nature Protection Site, maritime zone B): The beach on Marathonissi island produces predominantly male hatchlings. This makes this short beach an extremely important one at a Mediterranean level, as the other beaches produce mainly female hatchlings. The beach is a popular destination for day-visitors who arrive by boats, however, only up to 200 people are allowed at any time, according to the management measures of the MA. Over the last years, nest numbers on Marathonissi show a significant decrease (average 64 nests/year in the period 2005-2019 in contrast to 121 nests/year in the previous period 1984-2004).

East Laganas (zone II3: Nature Protection Site, maritime zone B): This long beach is partially backed by an extensive sand dune zone. A limited number of hotels and taverns, which were built before the NMPZ's establishment, is found along the back of the beach. These businesses and some additional operators rent beach furniture and pedalos/canoes along the beach. In a small distance behind the beach (2 km) 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.

Kalamaki (zone II3: Nature Protection Site, maritime zone B): 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 NMPZ's establishment. This business and one additional operator rent beach furniture, while one more business with pedalos/canoes operate on the beach.

According to the Presidential Decree 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): 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. It is noted that WWF-Greece in 1994 acquired the private land behind Sekania preventing development.

Daphni (zone II1: Nature Protection Site, maritime zone A): In the period 1984-2002 Daphni beach hosted the second highest number of nests on Zakynthos. Since then however nest numbers show a significant decrease (average 150 nests/year in the period 1984-2002 in contrast to 95 nests/year in 2003-2019) 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). On the contrary, the Presidential Decree foresees no operation of businesses at the back of the beach, while the maximum number of beach users should not exceed 100 people at any time.

Gerakas (zone II2: Nature Protection Site, maritime zone A): Gerakas beach is accessed 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 should not exceed 350 people at any time, while the maximum number of beach furniture is 60 umbrellas/120 sunbeds.

2.1.2 Threats/pressures on nesting beaches during 2020

A) Habitat loss/degradation:

Natural deposition of pebbles on the north-west part of Gerakas beach: In recent years huge amount of pebbles are deposited because of wave action during winter months (Photo 2). Consequently, this part of the beach is not suitable for nesting.

Illegal constructions at Daphni beach: Daphni beach is subject to many illegal activities such as building, road constructions, flattening of dunes and sand removal. Following recommendations by the Council of Europe, the removal of illegal buildings at Daphni has been an obligation of the Greek State since 1987, when only 2 businesses existed (Recommendation No. 9, Bern Convention). Although at present the operating illegal businesses are 7, no action for their removal has been taken and the relevant issued demolition protocols are not applied. As a result, illegal activities continue year by year, resulting in beach degradation and direct disturbance on sea turtle nesting and incubating nests (Photo 3a, 3b).

Large scale illegal actions: In recent years, the following illegal actions took place within the boundaries of the NMPZ. In particular: (I) Between the nesting beaches of Gerakas and Daphni (zone Φ1: protected landscape) road construction works took place in December 2015 and also in March/April 2018 (Photo 4a). (II) In the area behind Gerakas beach (zone Π2: nature protection zone) where building is prohibited, one new stone house and one stable were constructed (Photos 4b, 4c). Although fines were imposed, neither demolition nor restoration works took place until now.

The landfill site: Within the boundaries of the NMPZ (behind Vrodonero beach, between Kalamaki and Sekania) exists an over-filled landfill site. Since 2018 it is closed but not yet restored by the Municipality (despite the imposition of fines by the Prefecture), continuing to constitute a permanent toxic pollution threat to both the nesting beaches and the marine area (Photo 5).

B) Light Pollution:

Light pollution is a serious threat for sea turtles, as it causes not only hatchling disorientation but also disturbs the nesting females and can result in the abandonment of nesting attempts. During 2020 nesting season ARCHELON recorded the existing light pollution twice (i.e. both during the low and the high touristic season). In particular, there were recorded 9 permanent sources of light on East Laganas, caused by the airport of Zakynthos, private businesses (i.e. hotels, beach bars) and public streetlights at the back of the beach. Also, Daphni beach faces serious light pollution problem because of the operation of 7 illegal businesses behind the beach, some of which had lights on during late hours (Photo 6). Additionally, the severe light pollution from West Laganas (which is next to East Laganas and is characterized by intensive coastal building and mass tourism) is affecting almost all the 6 nesting beaches of the habitat (Photo 7). As a result of the above, ARCHELON recorded 41 cases of hatchlings' disorientation on East Laganas, 35 cases on Kalamaki, 36 cases on Daphni and 19 cases on Marathonissi.

C) Violations of legislation:

According to the PD, the implementation of protection management measures must be ensured on the nesting beaches of the NMPZ. Doubtless the COVID-19 pandemic severely affected tourism on Zakynthos island, as both the tourist season and the number of visitors were shortened. In particular, the tourist season was limited from mid-July until mid-September, while the number of visitors was significantly lower compared to previous years. Nevertheless, the provisions of the PD were violated for one more year as it is described below.

Beach use and beach furniture: The businessmen infringed the regulations concerning the nesting beaches and did not apply the terms of the PD. Specifically, the foreseen maximum numbers and density of beach furniture, as well as the distances from the back of the beach were not observed, while the removal of beach furniture at sundown was implemented either not at all or incorrectly (Photos 8a, 8b). From 4 July (when beach furniture were placed) until October (when beach furniture was removed) ARCHELON recorded 15,463 violations regarding the removal of sunbeds (either being completed left out overnight or folded on their side) in Gerakas, Kalamaki and East Laganas. This fact made those parts of the beaches non accessible for turtles and caused them to abandon nesting attempts (Photo 9a). Moreover, regarding the maximum numbers, ARCHELON project members recorded in mid-August 150 sunbeds in Gerakas (while the foreseen by the PD number is 120, see Section 2.1.1.) and 614 sunbeds in Kalamaki and East Laganas (while the foreseen by the PD number

is 300, see Section 2.1.1.).

Apart from the beach furniture businesses also private umbrellas were recorded on a daily basis on Kalamaki and East Laganas despite being prohibited, in numerous cases their position did not oblige with the distances from the back of the beach (Photo 9b).

Pedalos and Boats: The operators of pedalos and canoes are supposed to moor these in the water or to remove them from the beach at sundown. During 2020, pedalos were recorded to be stored on the beachfront in Kalamaki and East Laganas, blocking the access for turtles (Photo 10). Throughout the season ARCHELON researchers recorded 216 violations on the nesting beaches during nighttime.

Human presence on the nesting beaches at night (sundown to 7 a.m.): On the 6 nesting beaches there are 9 wardening posts, which need to be staffed on a 24-hour basis. Unfortunately, during 2020, the MA of the NMPZ due to lack of wardens throughout the season (only 14 wardens were available), was unable to achieve effective wardening. As a result, incidents of human presence were frequently recorded by the field project of ARCHELON, especially on East Laganas from 10 August onwards, when the restrictions against COVID-19 enforced all bars and clubs of West Laganas to close by midnight.

Beach users: Beach visitors are required to remain close to the shoreline and to avoid the nesting zone at the back of the beach in order to allow incubating nests to be protected from trampling, as well as shading and damage from umbrellas. Moreover, in the cases of Marathonissi, Daphni and Gerakas the permitted maximum number of beach users is 200, 100 and 350 respectively. Due to the COVID-19 effect on Zakynthos tourism, these provisions were violated in a number of cases only during the high tourist season (i.e. mid-July until end-August). In recent years the MA has tried to deal with the massive turn out of tourists on the nesting beaches by placing ropes, restricting access to the nesting zone, along the beaches of Marathonissi, Gerakas as well as on a part of East Laganas (Photo 11). There is imperative need for the same measure to be applied to the beaches of Daphni, Kalamaki and the whole of East Laganas.

Vehicles: Sand compaction caused by vehicles can cause damage to turtle eggs and potentially cause hatchlings to emerge prematurely. Emerging hatchlings can be trapped within car ruts and if they cannot scramble out of them, they die of exhaustion, dehydration or predation. Moreover, vehicles moving on the beach cause damage to the sand dune vegetation. Despite the existing restrictions of the PD and despite the reduced number of tourists due to COVID-19 pandemic, a notable number of vehicles, quad bikes and tracks were observed on several beaches of Laganas Bay (Photo 12).

Horses: There is a significant growth of commercial horse-riding activity in the sand dunes behind East Laganas. Although horses have significant negative effect not only on incubating nests but also on the sand dunes, this activity was observed on almost a daily basis during the entire 2020 nesting season (Photo 13).

2.2. The marine area

The marine area of Laganas Bay is a Nature Protection Site according to the PD (Zone Ia). However, its carrying capacity regarding vessels was never studied. This lack of assessment combined with the problematic legislation regarding vessels' licensing², has resulted in rapid and uncontrolled increase of boating activity in recent years. In 2020, according to Coast Guard data, 463 vessels operated in the NMPZ protected waters. This uncontrolled boat growth combined with the lack of wardening by the MA and the local Coast Guard, resulted in an overall harassment of sea turtles in the marine area of Laganas Bay, as an increased number of violations is recorded on an annual basis.

These violations regard to either the maritime traffic regulations of the PD (i.e. speed limit of 6 knots, ban of boats in zone A, ban of anchoring in zone B) (Illustration 2), or to the turtle spotting activity, for which specific guidelines³ were drafted by the NMPZ's MA and ARCHELON and since May 2018 were included in a

² General Port's Regulations 20 (Government Gazette B 444/26-4-1999 as amended) and 38 (Government Gazette B 748/19-5-2004 as amended).

³ The guidelines for Turtle-Spotting, which are required to be implemented by all boat operators, minimize disturbances of sea turtles during observation and 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) the ban of disturbing or noisy behavior, (g) the ban of physical contact with sea turtles, (h) the ban to feed sea turtles and (i) the ban to dive off vessels to swim with sea turtles.

legislative act of the Coast Guard⁴.

Due to the COVID-19 pandemic, violations in the marine area took place mainly in August, when the high touristic season coincides with the end of the nesting season and therefore with lower numbers of nesting females. As mentioned already, the field project of ARCHELON had to minimize this year the monitoring of threats and violations accordingly to available human capacity. However, the lack of data regarding the number of marine area violations should not be interpreted that the problem has been resolved. There is imperative need for the situation in the marine area to be improved, as even in a summer season with considerably lower number of visitors, still many violations took place.

3. Conclusions and Recommendations

For one more year none of the long-term pressures of the habitat (e.g. degradation of Daphni beach, landfill site, large scale illegal actions, light pollution, uncontrolled vessels' activity in the marine area) was resolved. Moreover, even though the pressure from mass tourism on Zakynthos island was greatly reduced due to the COVID-19 pandemic, there were still violations both on the nesting beaches and at the marine area on a daily basis. As a result, degradation of the habitat and damage to sea turtles continues. National and international pressure is essential to effectively protect both the habitat and the species, while the quick and smooth transition to the new scheme of the Management Units under "OFYPEKA" is considered vital to avoid further degradation.

3.1. Recommendations for the terrestrial habitat

- A permanent and sustainable solution for Daphni beach (point 1, Recommendation No. 9 of Bern Convention) is crucial to not only prevent any further developments but also to remove all the illegal constructions.
- The area of the illegal sanitary landfill must be restored.
- All recent illegal constructions (road, buildings) must be demolished, and the habitat must be restored.
- Light and noise pollution at all nesting beaches of the Bay should be minimized (point 7, Recommendation No. 9 of Bern Convention).
- The law enforcement must be ensured by all competent authorities (especially regarding beach furniture).
- Adequate wardening on a 24-hour basis is essential.
- The elaboration of a Management Plan, which would include all the specific conservation measures, should be urgently resumed and strictly enforced.

3.2. Recommendations for the marine area

- The existing legislation for vessels' licensing must be amended.
- The carrying capacity of the Bay must be studied as soon as possible.
- The existing legislation (PD and the Coast Guard decision regarding the Turtle-Spotting Guidelines) must be strictly enforced.
- Adequate wardening is absolutely essential in order for the violations to be reduced.

⁴. Ref. No. 2131.13/2063/29-05-2018.

Illustrations



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

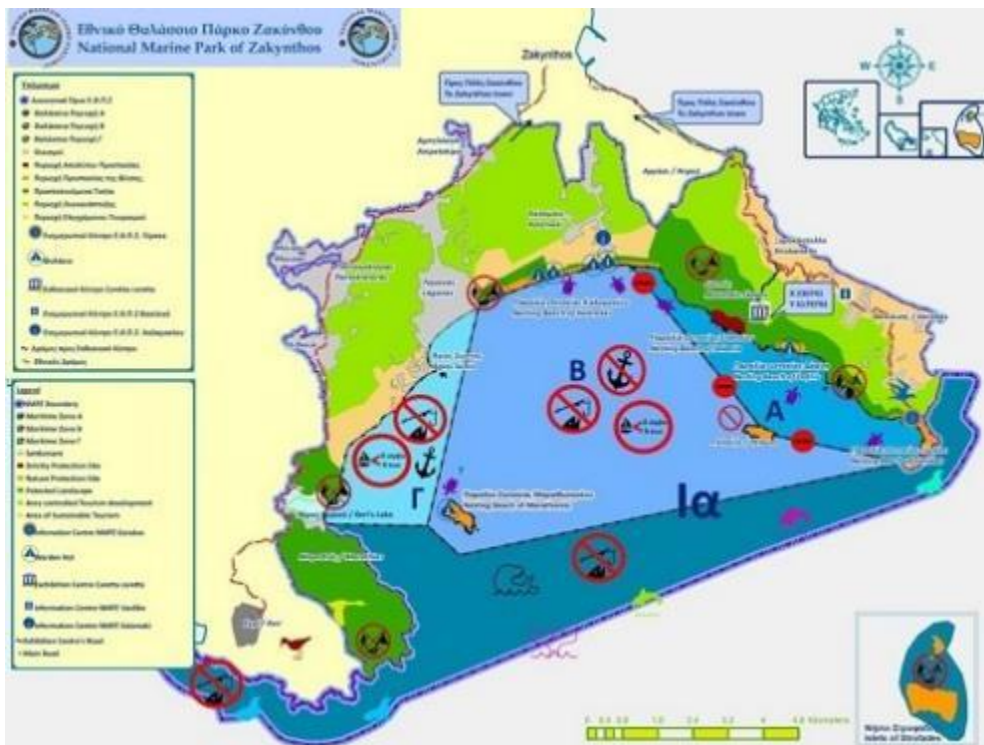


Illustration 2: Zonation scheme of the protected marine area of the NMPZ.

Photos



Photo 1: Sea turtle stranding due to boat strike in July 2020.



Photo 2: The north-west part of Gerakas beach is not suitable for nesting due to natural deposition of pebbles.



Photo 3a: Illegal constructions and businesses on Daphni beach.



Photo 3b: Shower run off from the illegal businesses affecting incubating nests (Daphni, August 2020).



Photo 4a: The illegal road (providing access to the sea between Daphni and Gerakas beaches) constructed in 2015 and 2018 was never demolished or restored.



Photos 4b, c: Illegal buildings behind Gerakas nesting beach that are not demolished so far.



Photo 5: The illegal landfill located within the boundaries of the NMPZ.



Photo 6: Light pollution at Daphni beach originating from illegal businesses (August 2020).



Photo 7: Light pollution originating from West Laganas was visible from almost all nesting beaches in Laganas Bay (photo taken from Sekania, July 2020).



Photo 8a: Beach furniture removal was implemented either incorrectly or not at all (East Laganas, August 2020).



Photo 8b: The minimum distances from the back of the beach were not observed (Kalamaki, September 2020).



Photo 9a: Abandoned sea turtle nesting attempt as the nesting zone was blocked by sunbeds (Kalamaki, July 2020).



Photo 9b: Private beach furniture not complying with the minimum distances from the back of the beach (East Laganas, August 2020).



Photo 10: Pedalos blocking beach access to female sea turtles attempting nesting (East Laganas, August 2020).



Photo 11: Use of ropes by the NMPZ to block access of visitors towards the nesting zone at the back of the beach (Marathonissi, August 2020).



Photo 12: Quad bike on the nesting beach (East Laganas, September 2020).



Photo 13: Horse riding on the nesting beaches was observed on a daily basis (East Laganas, September 2020).