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AND NATURAL HABITATS

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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 NGO -

*Document prepared by
ARCHELON*

ARCHELON, the Sea Turtle Protection Society of Greece



Conservation efforts during 2021 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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ARCHELON, the Sea Turtle Protection Society of Greece
Solomou 57
GR-104 32 ATHENS
Greece
Tel./Fax: (+30) 210 5231342
e-mail: info@archelon.gr
URL: www.archelon.gr

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Acronyms:

NMPZ: National Marine Park of Zakynthos

NMPZ MA: Management Agency of the National Marine Park of Zakynthos

SCI: Site of Community Importance

SAC: Special Area for Conservation

PD: Presidential Decree

SES: Specific Environmental Study

MP: Management Plan

Summary

This short report outlines the main events and presents the issues related to the protection of the loggerhead sea turtles (*Caretta caretta*) and their habitats in Laganas Bay (Natura 2000 site GR 2210002), during the 2021 reproductive period. The site hosts one of the largest reproductive populations of the loggerhead sea turtle in the Mediterranean and since 1999 is declared as the NMPZ.

During the nesting season of 2021, more than 1,300 nests of the species were recorded by ARCHELON in Laganas Bay and protected in collaboration with the NMPZ MA. Out of 50 sea turtle stranding incidents (45 dead and 5 injured/sick), recorded so far in 2021, 21 were located within the marine protected area of Laganas Bay. Guards/patrols and cordoning-off of the nesting zone were implemented by the NMPZ MA. WWF Greece operated the fire prevention observatory in the land behind Sekania beach. Moreover, ARCHELON carried out public awareness activities on the beach, in tourist facilities and, during the period August – September, at the information kiosk in Zakynthos town.

ARCHELON has been carrying out systematic monitoring and conservation work in Laganas Bay every year since 1984. Analysis of previous nesting data from the site has shown the effects of global warming on this regionally important sea turtle population, however, a lethal threshold in sand temperatures has not been reached yet. Analysis of previous data has also shown that, after the establishment of the NMPZ, the nesting contribution of the individual beaches has changed. In particular, in recent years, the average contribution of Sekania beach has been decreased with an equivalent increase of nesting contribution on the beaches of East Laganas, Kalamaki and Gerakas. This long-term change is probably attributed to better protection measures (wardening, cordoning-off of the nesting zone, management of beach equipment) effected gradually by the NMPZ's MA as well as by the local businesses on these beaches. However, a significant decrease in numbers of nests has been observed on the beaches of Marathonissi and Daphni during the last years, which is related to disturbances of sea turtles by boats in the marine area of the bay and uncontrolled human pressure respectively. Considering the long term trend (38 years) of the nesting population, as it appears from the annual nest counts, it can be deduced that the sea turtle population nesting in Laganas Bay is rather stable with intense annual fluctuations.

Several incidents of violation of existing protection measures were recorded during the 2021 nesting season both on land and at sea. Specifically in the protected marine area, during July and August there were daily incidents of breaking the speed limit of 6 knots and disrespect of non-anchoring zones. The number of licensed vessels in the bay has not been regulated yet and, more often than not, the Turtle Spotting Guidelines were not observed. Respectively on the nesting beaches (apart from Sekania, which is an Absolute Protection Site, with no human visitation) violations regarding the exceeding numbers of beach furniture and their non-removal at night, incidents of human presence at nighttime on the beach, of human trampling over nests, of driving vehicles and horse riding on the beach were also recorded. Coast Guard and Police are the competent authorities for issuing fines at sea and on the beach respectively, but they were able to appear on site only a few times during the season. Additionally, long term threats due to illegal activities, which were identified in previous years, continued to exist. These include the old sanitary landfill, the road between beaches of Daphne 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 during recent years. However, there is a noted disrespect and disregard to environmental legislation in the area, especially to nature conservation regulations at sea and on the nesting beaches by local authorities and local operators. The continued presence of the NMPZ MA and ARCHELON on the site has ensured sea turtle monitoring and nest protection. However, 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 and the reluctance to observe environmental legislation displayed by local authorities and local operators calls for a much bigger communication/ information/ awareness effort towards local operators, the authorities and visitors, a collaborative approach in improving the legal regulation of management practices and a more effective surveillance of the beaches and the marine area.

Foreword

This short report, a follow up to previous reports submitted annually, outlines the main events, and presents the issues related to the protection of the loggerhead sea turtles and their habitats in Laganas Bay (Natura 2000 site GR 2210002 “Kolpos Lagana Zakynthou kai nisides Marathonissi & Pelouzo”) during the 2021 reproductive period. It contains information on the monitoring and conservation work and the threats in the terrestrial, as well as the marine habitat, as recorded through the fieldwork of ARCHELON, in collaboration with the MA of the NMPZ.

ARCHELON was founded in 1983, aiming at the protection of sea turtles and their habitats and is a non-profit environmental non-governmental organization. It has been carrying out systematic monitoring and conservation work in Laganas Bay every year since 1984. Volunteers trained on-site and supervised by ARCHELON personnel carry out the field work.

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, therefore, is designated as SCI and SAC (NATURA 2000 site GR 2210002 “Kolpos Lagana Zakynthou kai nisides Marathonissi & Pelouzo”).

The significance of the site as a sea turtle nesting habitat was recognized by legislation already in 1980, and since 1984 a number of legislative acts regulated the increasing touristic development pressure in the area. These acts contributed to safeguarding the naturalness of 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 NMPZ, after several years of deliberations. The NMPZ was established in December 1999 and its Management Agency (MA) was set up in July 2000. The relevant PD (Government Gazette D906/22-12-1999) includes a zonation system with varying regulations on land and at sea (see Annex 1).

ARCHELON has been systematically monitoring the Bay’s nesting beaches since 1984. The long term project of ARCHELON, carried out yearly from early-May through mid-October, involves monitoring of the nesting activity, protection of nests and hatchlings and recording of turtle strandings. During the same period, ARCHELON field team monitors the threats that may persist on site and carry out public awareness activities to inform visitors and residents of the area. ARCHELON collaborates with the MA of the NMPZ since the Agency’s establishment. Moreover, ARCHELON, WWF-Greece and MOm (Society for the Study and Protection of Monk Seals) hold one joint seat on the 11-member Board of the MA.

2. The 2021 nesting season

I. Monitoring and Conservation work

In 2021, ARCHELON commenced fieldwork on the six nesting beaches in the Bay on 10 May and terminated on 10 October. The number of volunteers participating in the ARCHELON project was lower compared to the years before the pandemic, to ensure the effective implementation of protection measures against the spread of COVID-19. The project implemented the protocols of nest monitoring as agreed with the NMPZ MA, in good collaboration with the MA’s staff.

According to preliminary data, on the six nesting beaches more than 1,300 nests were recorded during the 2021 nesting season. This figure is above the average annual number since 1984 (approx. 1,200 nests). Despite the intense annual fluctuations, the turtle population nesting in Zakynthos is considered in the long term as stable.

The public awareness carried out by ARCHELON reached approx. 13,000 people and was less extensive than previous years, due to the pandemic. In addition, there was a notable delay in obtaining the permission from the Municipality to install the seasonal info kiosk in the town of Zakynthos.

Regarding turtle strandings, 50 incidents (45 dead and 5 injured/sick) were recorded from the beginning of 2021 until 10 October. Of the total number of strandings, 21 were located within the marine protected area of

Laganas Bay. Examination of the stranded animals in the protected area showed interaction with fisheries (fishing gears, 4 cases) as well as signs of injuries caused by boat collision (3 cases) (Photo 1).

It should be noted that WWF-Greece carried out activities of maintenance against land erosion and operated an observatory against wildfires on its acquired land behind Sekania beach.

The MA of the NMPZ did not employ seasonal staff for one more year due to limited resources. As a result, some warden huts remained unstaffed on a daily basis, even during night hours.

II. Threats

This section presents a description of threats observed in the terrestrial and marine areas. Whenever possible, a quantitative description is also given.

A. Marine area

The large growth in the number of boat licenses, issued in Zakynthos, has led to uncontrolled increase of boating activity in the marine area of the NMPZ. According to the Coast Guard, during 2021 355 motorized and 151 non-motorized boats were operating in Laganas Bay. This extremely high number of boats offered for rent and Turtle Spotting activities has resulted in higher disturbance to sea turtles. Inadequate patrolling of the marine area by the competent authorities has encouraged an attitude and mentality of disrespecting the maritime regulations.

In the early years of the operation of the NMPZ, the “Turtle Spotting License” was awarded to boat owners by the MA and operated voluntarily but was abandoned later. However, in recent years and especially in 2021, Turtle Spotting was observed to having evolved into a “turtle hunt” very often. In total, 840 occasions of non-compliance with the Turtle Spotting guidelines were recorded during 64 days of observation (Photo 2a).

With regard to the maritime traffic regulations (as foreseen by the PD) in 2021, ARCHELON recorded 1,180 instances of breaking the 6 knots speed limit, 321 occasions where boats were anchored in Zone B and 111 cases of anchored/passing boats in Zone A, in a total of 160 days of observation. (Photos 2b, 2c).

The MA repeatedly sent requests for joint patrols to the local Coast Guard, but these joint patrols were eventually conducted only for 2-3 times per week from late July until early September.

See Annex 1 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 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 3). Consequently, this part of the beach has not been suitable for nesting, since.

Illegal constructions and infrastructure: Since almost 35 years now the degradation of the area behind Daphni beach and parts of the beach itself takes place, resulting in direct disturbance on sea turtle nesting and incubating nests. The site has been completely transformed by unauthorized activities such as building and road construction, flattening of dunes and sand removal. Following Recommendation No. 9 by Bern Convention (1987), the removal of illegal buildings at Daphni was ordered by demolition protocols and impending fines. Only 2 businesses existed at the time while at present the operating illegal businesses are 7 (Photo 4). No action for their removal has been taken and as a result, illegal activities continue year after year.

In addition, road construction works took place in December 2015, and in March/April 2018 within the boundaries of the NMPZ on the hills between the nesting beaches of Gerakas and Daphni (zone Φ1: protected landscape). Further unauthorized road construction work was reported to be carried out in January 2021, despite the relevant imposed fines (Photos 5a, 5b, 5c).

Furthermore, in the area behind Gerakas beach (zone Π2: nature protection zone) where building is prohibited, one new stone house and one stable were constructed in 2017. Although fines were imposed, neither demolition nor restoration works took place until now (Photos 6a, 6b).

Lastly, within the boundaries of the NMPZ (behind Vrodonero beach, between Kalamaki and Sekania) exists

an over-filled landfill site. This landfill site has not operated since 2018 but it has not been yet restored by the Municipality, despite the imposition of fines by the Prefecture. It therefore 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 implement the regulations of the PD. As a result, the foreseen maximum numbers and density of beach furniture, as well as the distances from the back of the beach have not been kept, while the removal of beach furniture at sunset has been either totally ignored or implemented incorrectly (Photo 8).

During the nesting season of 2021, ARCHELON recorded 113,596 violations¹ regarding the removal of sunbeds at sunset on the beaches of Gerakas, Kalamaki and East Laganas, in a total of 160 days of observation. In some instances, beach furniture made parts of the beaches non accessible for turtles and caused them to abandon nesting attempts (Photo 9). Furthermore, the number of sunbeds exceeded that allowed by the PD. ARCHELON recorded 188 sunbeds in Gerakas (instead of the permitted 120, see Annex 1) and 683 sunbeds in Kalamaki and East Laganas (instead of the permitted 300, see Annex 1) in high season. Further to that, private umbrellas were observed daily on Kalamaki and East Laganas despite of being prohibited, which were also violating the allowed distances from the back of the beach (Photo 10).

There were low numbers of beach users until late June (due to the pandemic restrictions), but during July and August 2021 the permitted number of beach users on Gerakas (350), Dafni (100) and Marathonissi (200) was greatly exceeded.

Human presence on the nesting beaches at night (sundown to 7 a.m.): According to the relevant Plan of the MA, there are in total 9 posts for guards on the 6 nesting beaches, which, if staffed on a 24-hour basis, would need 27 guards.

In 2021 the NMPZ MA employed 14 guards (permanent staff), but this number proved to be insufficient as incidents of human presence during night hours were frequently observed. This was quite notable on East Laganas and Kalamaki beaches where 1,442 violations were recorded over a total of 160 days of observation. In an attempt to support the MA, the project team of ARCHELON introduced some extra volunteer shifts on the aforementioned beaches in late July.

Human trampling of nests: Beach visitors are required by the PD 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.

During 2021, as in previous years, the NMPZ MA implemented the use of roped areas to restrict access to the nesting zone along the beaches of Marathonisi, Gerakas and on a part of Laganas and Kalamaki (Photo 11). However, in areas where the rope was absent, ARCHELON members recorded a total of 1,438 people at the back of the beach over 160 days of observation.

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. During 2021 and despite the existing restrictions of the PD, 191 vehicles, quad bikes and tracks were observed mainly on East Laganas and Kalamaki beaches over 160 days of observation (Photo 12).

Horses: There is a significant growth of commercial horse-riding activity on the sand dunes behind East Laganas, which has significant negative effects not only on incubating nests but also on the sand dunes. This activity was observed regularly during the entire 2021 nesting season (Photo 13).

C. Light and noise 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.

¹ This number indicates the total number of sunbeds that remained on the beaches after sunset in a total of 160 days of observation.

During 2021 nesting season ARCHELON conducted provisional recording of the existing light sources causing pollution twice (i.e. both during the low and the high touristic season). In particular, there were 33 permanent light sources recorded 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. Additionally, the severe light pollution from West Laganas is affecting almost all the 6 nesting beaches of the habitat (Photo 14). As a result of the above, ARCHELON recorded 139 cases of hatchlings' disorientation on East Laganas, 38 cases on Kalamaki, 23 cases on Daphni and 8 cases on Marathonissi.

3. Discussion and Recommendations

The long term monitoring

ARCHELON monitors the nesting site of Laganas Bay since 1984 and collects important reproductive parameters. Analysis of previous nesting data from Laganas Bay has shown the effects of global warming on this regionally important sea turtle population. The increasing temperatures at sea and on land, due to climate change, affect the nesting population and its reproductive behaviour in various ways. In recent years, nesting and hatching start significantly earlier in the season, in comparison to older seasons. Further, the duration of egg incubation, which depends strongly on sand temperature, is decreasing over the seasons and this augments further the already female bias of hatchling sex ratios. However, hatching success and emergence success are increasing and this shows that a lethal threshold in sand temperatures has not been reached yet. ARCHELON follows the recent scientific literature on this subject and convenes with leading experts in this field, to submit relevant proposals to the NMPZ MA for taking appropriate measures if needed.

Analysis of previous data has also shown that after the operation of the NMPZ, the nesting contribution of the individual beaches has changed. 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 (to about 47%), with an equivalent increase of nesting on the beaches of East Laganas, Kalamaki and Gerakas. This long term change of nesting contribution of the individual beaches is likely caused by the more effectively implemented protection measures (wardening, cordoning-off of the nesting zone, management of beach equipment) by the MA as well as by businesses on these beaches. On the contrary, over the last years, nest numbers on Marathonissi show a significant decrease (average 65 nests/year in the period 2005-2020 in contrast to 121 nests/year in the previous period 1984-2004). 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 97 nests/year in 2003-2020).

Considering the long term trend (38 years) of the nesting population, as it appears from the annual nest counts, it can be deduced that the sea turtle population nesting in Laganas Bay is rather stable with intense annual fluctuations.

Law enforcement in a major tourist destination

As presented in detail in part 2 of this report, a significant number of violations of the existing legislation, which is based on the PD and other national environmental laws, has been consistently recorded in the area of the NMPZ during the 2021 nesting season. Very few fines have been issued for violations in the marine area, due to lack of surveillance by the Coast Guards and no fines have been imposed to businesses or individuals for not enforcing the regulations on the nesting beaches.

Since the establishment of the NMPZ, Zakynthos has become a top tourist destination, reaching about 1,000,000 visitors in 2019. The number of tourist accommodation units, along with restaurants, bars and other entertainment facilities in the Buffer Zone of the NMPZ has increased exponentially. A number of business owners and managers operating in this area have been continuously displaying disrespect and

disregard to nature conservation regulations on the beaches and the marine area. The same attitude has been displayed by some landowners within the Nature Protection Zones and the Protected Landscape Zones of the NMPZ itself. The main positive exception to this situation is the land behind Sekania beach, which was acquired by WWF Greece a few decades ago and is declared as Absolute Protection Site.

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 numbers of visitors on the island. Hotel owners, tour operators and beach related businesses in the area do not seem to be interested in developing a common attitude to actively support conservation measures and law enforcement.

A window of opportunity for positive developments in the regulation and management of tourist activities in the area of the NMPZ might be the on-going review and elaboration of SESs and MPs for all Natura 2000 sites at a national scale, as a part of a project conducted by the Ministry of Environment and Energy.

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, the observation of speed limit of 6 knots, non-anchoring zones, and the observation of the Turtle Spotting Guidelines.
- All illegal constructions and infrastructure (old sanitary landfill, road between beaches of Daphne 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 impact threats on land (e.g. violations regarding beach furniture, human presence at nighttime on the beach, human trampling, vehicles on the beach, horse riding) must be taken into account and addressed in the under elaboration MP for the NMPZ.
- Measures for minimizing light and noise pollution at all nesting beaches of Laganas Bay must be included in the under elaboration MP for the NMPZ.
- 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, land owners and local authorities in order to build a platform of collaboration, inform visitors and support law enforcement.

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, Kalamaki², 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.

Marathonissi (zone A2: Nature Protection Site, maritime zone B): 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 temperatures in Marathonissi produce predominantly male hatchlings. This makes this short beach an extremely important one 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 boats, however, only up to 200 people are allowed at any time, according to the management measures of the NMPZ MA. According to the PD the construction of buildings is prohibited.

East Laganas (zone II3: Nature Protection Site, maritime zone B): This long beach (2.7km) 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 (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): Kalamaki is a 600m beach, which is located east of East Laganas 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 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 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): 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. It is noted that WWF-Greece in 1994 acquired the private land behind Sekania preventing development.

Daphni (zone III: Nature Protection Site, maritime zone A): Daphni beach 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). On the contrary, the PD 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 found in the most southeast part of Laganas Bay and 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.**

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 speed limit of 6 knots to avoid lethal collisions with sea turtles, while anchoring and mooring is also not permitted. In zone Γ the speed limit

² The NMPZ MA refers to the beaches of East Laganas and Kalamaki as Kalamaki and Crystal respectively.

for boats is 6 knots.

Within Zone Ia, several businesses are operating wildlife-watching boat trips focusing on marine turtles. In order to minimize the negative impact of the observation of sea turtles, the NMPZ MA, 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) 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. Until May 2018 the aforementioned 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 since 2006 the “Turtle Spotting Zone”³ is introduced by the MA but is still not supported by legislation.

³ 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.

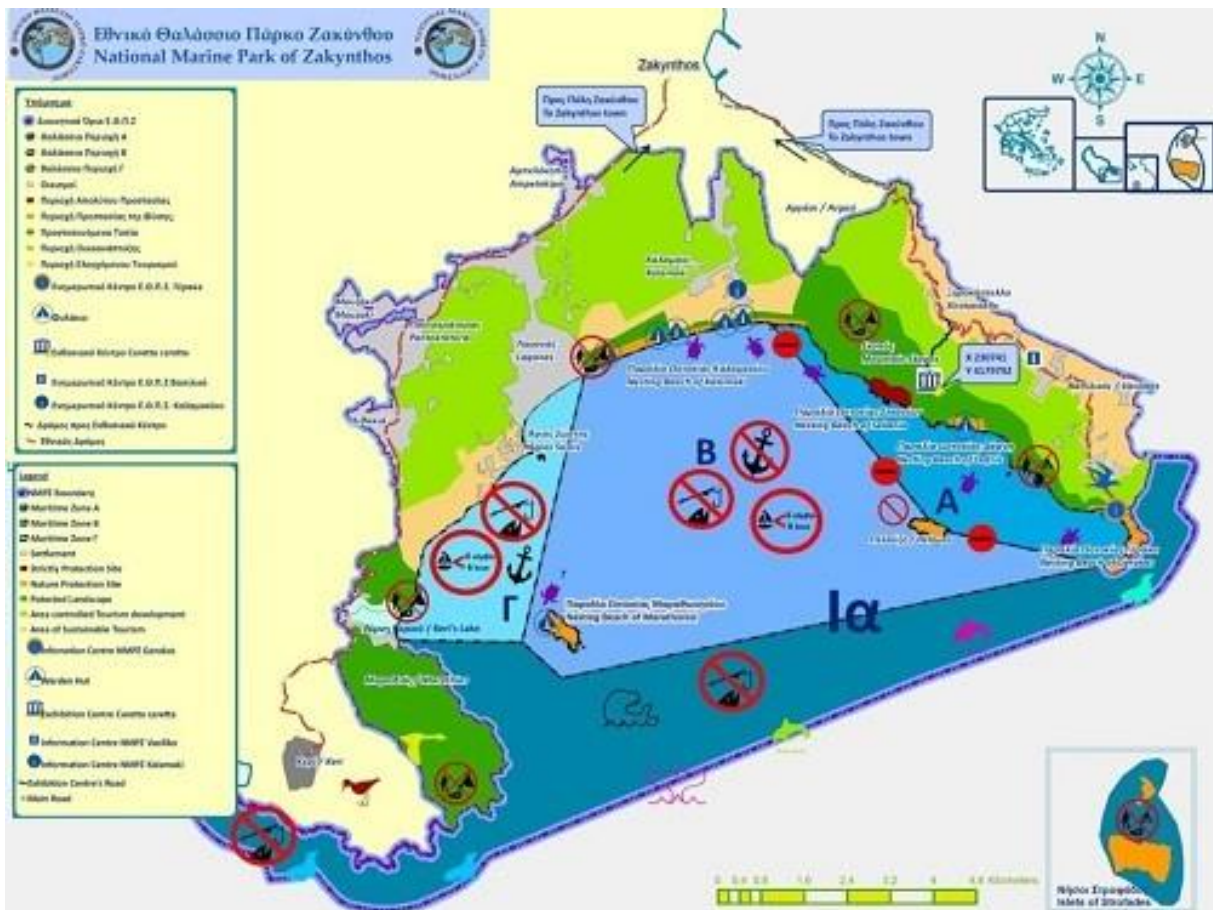


Illustration 2: Zonation scheme of the protected marine area of the NMPZ.



Photo 1: Sea turtle stranding due to boat strike in July 2021 in Laganas Bay.



Photo 2a: Turtle-Spotting guidelines were poorly enforced (Laganas Bay, August 2021).



Photo 2b: Speed limit of 6 knots was daily violated (Laganas Bay, August, 2021)



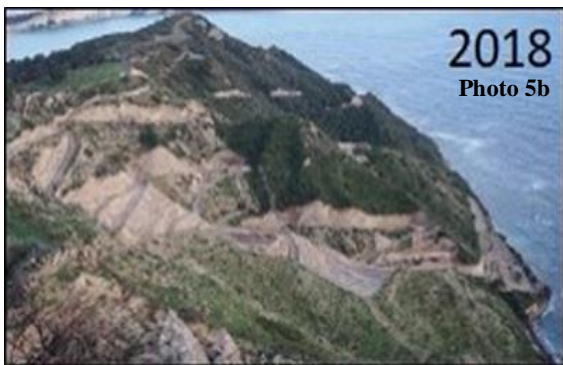
Photo 2c: Anchored boat in Zone A (Gerakas, September 2021).



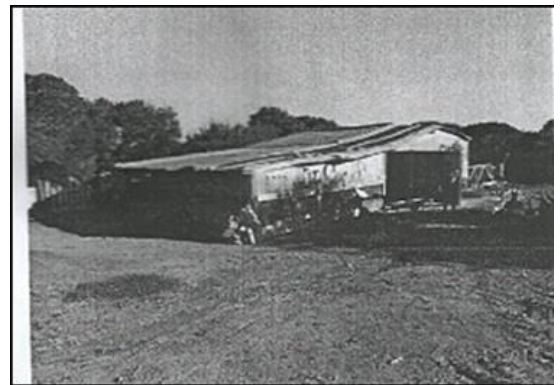
Photo 3: The north-west part of Gerakas beach is not suitable due to natural deposition of pebbles. Also the beach furniture operators avoided this part. As a result, their equipment caused extra pressure to the suitable for nesting part of the beach.



Photo 4: Illegal constructions and businesses on Daphni beach.



Photos 5 a, b, c: Not only the illegal road (providing access to the sea between Daphni and Gerakas beaches) constructed in 2015 and 2018 was never demolished or restored, but also in January 2021 works continued.



Photos 6 a, b: Illegal buildings (1 house & 1 stable) behind Gerakas nesting beach that are not demolished yet.



Photo 7: The illegal landfill located within the boundaries of the NMPZ. The site remains unrestored.



Photo 8: Beach furniture removal was implemented either incorrectly or not at all (East Laganas, July 2021).



Photo 9: Abandoned sea turtle nesting attempt as the nesting zone was blocked by sunbeds (East Laganas, July 2021).



Photo 10: The minimum distances from the back of the beach were not observed (East Laganas, September 2021).

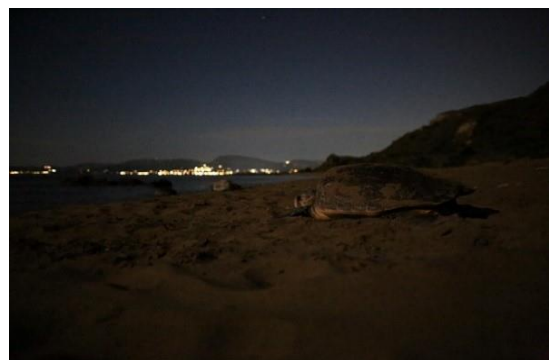


Photo 14: Light pollution originating from West Laganas was visible from almost all nesting beaches of Laganas Bay.



Photo 11: Use of ropes by the NMPZ MA to block access of visitors towards the nesting zone at the back of the beach (Gerakas, September 2021).



Photo 12: Quad bike on the nesting beach (East Laganas, August 2021).



Photo 13: Horse riding on the nesting beaches was observed regularly (East Laganas, September 2021).