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**Threats to Marine Turtles  
in Thines Kiparissias Bay  
(Greece)**

**REPORT BY THE NGO ARCHELON**

*Document prepared by  
ARCHELON*

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



**Conservation problems during 2013  
at the nesting habitat of *Caretta caretta*  
in southern Kyparissia Bay  
(Natura 2000 - GR2550005 “Thines Kyparissias”)**

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

Athens, October 2013

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## ***Prologue***

This report, a follow up to the previous report submitted in October 2012, presents the main events in the efforts to protect the habitats of southern Kyparissia Bay (Natura 2000 site GR2550005 “Thines Kyparissias”) in general and the marine turtles in particular, from October 2012, when Greece received a Reasoned Opinion from the European Commission (infringement case EL2011/2156), until today. Specifically this report focuses on the actions taken by the Greek government and the local authorities to rectify the issues raised in the Reasoned Opinion, and the actual situation at the nesting area during the nesting season of 2013 as witnessed through the field project of ARCHELON.

## **1. BACKGROUND**

### **1.1. Location and core nesting area**

The Bay of Kyparissia, at the western coast of central Peloponnese, contains the second most important loggerhead sea turtle (*Caretta caretta*) nesting habitat in the Mediterranean Sea (Margaritoulis et al., 2003). Also the shores of Kyparissia Bay contain one of the largest remaining sand dune systems in Greece. The sandy coastline consists of about 44km continuous beach from river Alfios in the north to river Arcadikos in the south, with a small number of additional beaches separated by rocky outcrops further south. Maps of the region are shown in Illustrations 1 and 2. Although turtles nest along the entire 44km beach, the majority of nesting (about 85%) occurs within the southernmost 9.5km, i.e. between the rivers Neda and Arcadikos (Margaritoulis & Rees, 2001). This 9.5km part of beach is considered the core nesting area and it is entirely included in the Natura 2000 site GR2550005 “Thines Kyparissias”. The core nesting area is divided for monitoring purposes by ARCHELON, in four sectors (A, B, C, O) of which the northernmost three (A - C, totalling about 7.3km) are the least developed and are backed by stretches of coastal pine forest, low dunes and cultivated fields, while the southernmost sector (O, about 2.2km) is characterized by many disturbances, affecting turtle nesting and hatching, as it contains the expanding coastal village of Kalo Nero. The village of Elaia and the small settlement of Agiannakis are found at a short distance from the beach behind the Sectors B and C (Illustrations 3 and 4).

The marine area of Kyparissia Bay includes another Natura 2000 site (GR 2330008 “Marine area of Kyparissia Bay: Katakolo Cape – Kyparissia”), a part of which is found in front of the core nesting area (Illustration 2).

### **1.2. Local government**

The Municipality of Trifylia, based in the town of Kyparissia, administrates the entire core nesting area. The Municipality belongs to the Region (Perifereia) of Peloponnese, based in Tripoli, and to the Decentralized Administration (Apokentromeni Dioikisi) of Peloponnese-Western Greece-Ionian Sea, based in Patras.

### **1.3. The long-term field project of ARCHELON**

Since the beginning of the 80s, ARCHELON has organized and operated a seasonal conservation project in Kyparissia Bay. Tagging of turtles started in 1982 (before the founding of ARCHELON, by students hired by the Ministry of Environment) and systematic beach surveys commenced in 1984. In the period 1984-1989 the entire long beach of Kyparissia Bay was surveyed and since 1990 the monitoring project was restricted to the southernmost 9.5km of beach, which were assessed as the core nesting area, as in this part about 85% of all nests in Kyparissia Bay occur (Margaritoulis & Rees, 2001). Since 1992, all nests at the core area are protected against predation by foxes, inundation by the sea, and disorientation of hatchlings because of bright lights. The massive protection of nests, started in 1992, has caused an increase in the annual number of nesting turtles after 14 years (started in 2006); this 14-yr period coincides with the minimum age at maturity of *Caretta caretta* in the Mediterranean (Casale et al., 2011). In addition, ARCHELON carries out an extensive public awareness programme to inform visitors and residents, about sea turtles and their nesting habitat, and the prominent threats they face (Rees et al., 2002).

#### **1.4. The LIFE-Nature project and the Specific Environmental Study (EPM)**

In the context of a LIFE-Nature project (LIFE98NAT/GR/5262), approved by the Ministry of Environment and the Ministry of Agriculture, ARCHELON commissioned a consultancy to elaborate a Specific Environmental Study (EPM) for southern Kyparissia Bay, according to Technical Specifications approved by the Ministry of the Environment. The EPM, accompanied with a Management Plan and a draft Presidential Decree, were submitted for approval and application to the Ministry of Environment in May 2002. These documents comprised a precondition for the Ministry to issue a Presidential Decree and establish a Management Agency that would oversee the effective conservation of the NATURA 2000 site in southern Kyparissia Bay (Efthymiou et al., 2002).

Regrettably, the Ministry of Environment did not proceed with the application of the Specific Environmental Study although it had classified it as technically acceptable (Ministry of Environment letter No 61801/4642/13-11-2002 to the European Commission). As a result, the sea turtle nesting area and the other habitats in southern Kyparissia Bay remained unprotected. In the absence of a Management Agency, illegal constructions and other developments continued without any Environmental Impact Assessment, and often without any license whatsoever. Roads, houses, beach bars and bright artificial lights now stand in areas that were until recently relatively undisturbed; the nesting area is gradually degrading, becoming increasingly unsuitable for sea turtles and their nests (Vallianos and Margaritoulis, 2011).

## **2. THE REASONED OPINION (OCTOBER 2012)**

### **2.1. Infraction case 2011/2156**

The Greek authorities have not yet established and implemented an effective system of protection for sea turtles, their nests and the nesting habitat in southern Kyparissia Bay, despite its inclusion in the Natura 2000 network and the successful elaboration of a Specific Environmental Study in the context of a LIFE-Nature project. Important conservation issues remain unresolved and have resulted in the gradual degradation of the habitats as well as to direct and indirect disturbances to sea turtle nesting.

As a consequence of the above, in October 2012 Greece received from the European Commission a Reasoned Opinion (EL2011/2156 ENVI) for violation of articles 6 and 12 of Habitats Directive 92/43/EEC.

### **2.2. The commitments of Greece (November 2012)**

In reply to the European Commission on the Reasoned Opinion, the Ministry of Environment committed to take protection measures for the area (Ref 5074/22-11-2012). The measures to be taken included: (a) the immediate control of anthropogenic disturbances, and (b) the implementation of an Action Plan for the medium and long-term protection of the area. Specifically:

#### Immediate control of anthropogenic disturbances

The existing inspection mechanisms at local and central level should be mobilized in an effort to tackle disturbances and pressures caused by various works and activities in the nesting area. There should be particular actions by the competent departments of the Ministry of Environment, the Peloponnese Region, and the Decentralized Administration towards the identification and control of activities affecting the nesting area.

#### Action Plan

A suspension of various activities in the area would take place until the issuing of a Ministerial Decision which would prescribe the protection status until the adoption of a Presidential Decree, according to article 6, paragraph 9, of Law 3937/2011.

Specifically, the Action Plan would consist of the following main steps:

- Pending the issue of the Ministerial Decision, the following should take place: (a) suspension of building permits, (b) control of planned infrastructure works, and (c) suspension of licenses for beach recreational usage by local communities.

- A Ministerial Decision will be issued, which will define the sound management of the area on the basis of the existing Specific Environmental Study (EPM), until the issuing of a Presidential Decree.
- In the Ministerial Decision the management body for the area would also be defined, which would supervise the responsibilities, among the competent authorities, concerning the application of management measures.
- Updating of the existing Specific Environmental Study (EPM) for southern Kyparissia Bay and issuing of the associated Presidential Decree.

Finally, the Ministry reported its intention for the creation of a Steering Committee, which would coordinate and monitor the implementation of the above commitments.

### **3. FOLLOW UP OF THE COMMITMENTS**

#### **3.1. The Steering Committee**

On 4 March 2013 the Deputy Minister of Environment formed a Steering Committee for the conservation of Kyparissia Bay, with its main responsibility described as “having the overall monitoring and coordination of the actions of competent authorities towards the immediate mitigation of disturbances and pressures, as well as the mid-term and long-term legal protection of Kyparissia Bay”. The Steering Committee comprised of Prof Amalia Karagouni-Kyrtsoy (Microbiology Dpt of Athens University) as President, four advisors and employees of the Ministry of Environment, including its Nature and Legal Departments, the Director of the National Marine Park of Zakynthos (NMPZ), and a representative of relevant NGOs (ARCHELON and MEDASSET). Until today (20 October 2013) the Steering Committee convened three times (20 March, 6 June, and 11 October), with the outcome of each meeting described briefly below.

In the first meeting (20 March) it was announced by the President that an expert from the University of Athens would update the existing dune and vegetation maps, and the President with the representatives of NMPZ and ARCHELON would delineate the nesting zone and propose provisional management measures for the 2013 nesting season. The promotion of management measures would be facilitated through meetings with regional and local authorities. Regrettably, the members of the Committee that have been assigned to propose management measures never convened to prepare the provisional measures. As these measures should have been ready by June, ARCHELON proceeded with drafting the management measures and sent them to the President of the Committee in view of the Authorities Meeting of 25 April 2013 (see section “The actions of the authorities”), where they were also presented. Besides the above meeting, no other meetings of the Committee with regional and local authorities are known to have taken place.

At the second meeting of the Steering Committee (6 June), following an invitation by the President the Mayor and two Deputy Mayors of Trifylia Municipality were also present. The representative of the NGOs informed the Committee in detail of the serious problems and disturbances that had started to appear on the nesting beach, while turtle nesting had started, and required that the Committee takes action for: (a) the immediate issue of a Ministerial Decision with the beach management measures for the 2013 nesting season, (b) the blocking of the roads, that provide vehicular access to the nesting beach, including the five illegal roads constructed illegally in 2011 and 2012 by a real estate firm with plans to build fifty holiday houses along the core nesting area, (c) the hiring of guards in order to prevent human disturbances at night. As it will be described in the following sections the Ministerial Decision was issued on 23 July, towards the end of the nesting season, the blocking of the five roads was not done (after an unsuccessful effort) and no guards were hired to control human presence at night.

At the third meeting of the Committee (11 October), the President made a presentation of the nesting zone area using ARCHELON’s last three years’ nesting data, with the opinion that the sand dune study, recently completed by an expert, and the delimitation of the nesting zone would suffice for a Specific Environmental Study (EPM). Members of the Committee replied that these studies cannot substitute an EPM which regulates land use and several activities in the wider area and which would be the basis for the issuing of a Presidential Decree safeguarding the area in the long term. Further, the

NGOs' representatives criticized the ineffective operation of the Committee and especially its failure to impose management measures for the current nesting season, as it has been specified in the Ministerial Decision of the Committee's formation.

It should be noted that as the nesting season progressed with many problems (see below "The Actual Situation in the Field") and there was not any output from the Committee concerning its main objectives (i.e. monitoring of actions and coordination of competent authorities, elaboration of provisional management measures, planning of mid-term and long-term protection measures). ARCHELON reminded several times in writing the President of the Committee's main responsibilities in mitigating the disturbances, providing and applying the beach management measures on time, and promoting the updating of the Specific Environmental Study which would lead to a Presidential Decree for the long-term protection of the area.

In conclusion, ARCHELON considers that the Committee has not been only unsuccessful in meeting its mandate, as this is described in the Ministerial Decision of its formation, but its involvement in the local politics caused more harm than benefit to the conservation efforts in southern Kyparissia Bay, and at the same time bore a severe impact on ARCHELON's field project (see below "The field project during the 2013 nesting season").

### **3.2. The actions of the authorities**

On 25 April 2013 a meeting was organized at the Town Hall of Trifylia Municipality (town of Kyparissia) by the Secretary General of the Decentralized Administration of Peloponnese. The meeting was attended by the Secretary General of the Ministry of Environment, the Regional Governor of Peloponnese, the Mayor of Trifylia, the President of the Steering Committee, several officers from the Ministry of Environment and from regional/local authorities, and ARCHELON's representative. The object of this meeting was the "immediate management measures for the upcoming summer season", since the sea turtle nesting season was about to start in less than a month. In view of the inactivity of the Steering Committee in preparing the management measures on time, ARCHELON submitted to all relevant authorities present at the meeting its proposal for the management measures that should be taken for the nesting season of 2013. The proposal included, among others, measures for visitor information about sea turtles and the nesting habitat, their access to the nesting beach, the creation of sign-posting, the conditions for using beach furniture, and regulations for light pollution, beach cleaning and human presence on the beach at night. Several of these measures were included in the relevant Ministerial Decision issued on 23 July (see below).

The Municipal Council of Trifylia, upon request of 18 members, held an extraordinary meeting on 2 May 2013 to discuss whether the plans of the real estate firm to build fifty holiday houses, along the beach front between Agiannakis and Elaia (Sector C), comply with the spirit of environmental protection and the concept of sustainable development of the area. At the concomitant ballot on the issue 22 members of the Municipal Council voted, of which 20 members voted against the plan, with 2 abstentions. It is worth to note that the real estate firm constructed the five illegal roads in order to be able to divide its large estate to smaller plots and hence acquire permission to build the 50 holiday houses (Illustration 5). The division of a large estate to smaller plots is possible only when the in-between roads are characterized as "communal" or of "public use", which characterization the Legal Dpt of the Ministry of Environment readily provided by issuing a Legal Opinion on 13 March 2013, although the environmental law has been violated (the illegality of the construction was confirmed by the authorities and the real estate firm received a fine) and without making any reference to the legal obligations stemming from the Natura 2000 status of the site and the Habitats Directive!

On 23 May 2013 a new Ministerial Decision (FEK 280/24-05-2013) suspended the issuing of new permits for building and other works (e.g. pumping installations, drilling, fencing of fields, and cultivation of land between the coastal forest and the beach) behind the beach sectors A, B, and C of the core nesting area. The suspension will last until the issue of the Ministerial Decision, which will clarify the protection status of the area.

On 23 July 2013 a Decision of the Minister of Environment (Beach Management Measures) clarified the terms under which the Municipality of Trifylia could concede the "simple beach use" for the season 2013. According to this Decision the three beach bars that had operated during previous

summers in sectors A, B and C (beaches of Vounaki, Agiannakis and Elaia) were not allowed to open. However, beach furniture was allowed in these areas as well as in the area of Kalo Nero (O Sector), provided that the precise beach segments allowed to receive beach furniture would be designated in cooperation with ARCHELON and that the sun beds would be removed at sundown. Moreover, the Decision, following the proposal of ARCHELON which was submitted in the meeting of authorities on 25 April 2013, provided terms during the nesting season concerning beach cleaning, light pollution, human presence at night, vehicular traffic, and the operation of the ARCHELON information kiosk in Kalo Nero. Unfortunately, apart from the non-operation of the three beach bars, the terms of the Ministerial Decision were not enforced by the Municipality of Trifylia, as it is described in the following chapters. Further, the Decision was issued very late, towards the end of the nesting season.

#### **4. THE ACTUAL SITUATION IN THE FIELD (NOVEMBER 2012-OCTOBER 2013)**

##### **4.1. Building and illegal actions continue**

Since late November 2012 a new house has been under construction, behind the core nesting area near Vounaki hill (sector B). Building took place in the sand dune zone and resulted in the deterioration of the sand dunes and destruction of dune vegetation (Photos 1, 2). Details on the construction license were requested from both the Planning Authority (Poleodomia) of Trifylia and the Public Land Authority (Ktimatiki Ypiresia) and the examination of the case revealed that a permit has been issued for building of three holiday houses outside the urban-planning area (ektos sxediou). It is worth noting that the Ministerial Decision, which suspended the issuing of new building permits, has not affected the building of these houses, as the Decision concerned only the issuing of new building permits.

On 20 February 2013 a large part of land, including dunes, behind the core nesting area (sector C) was ploughed. This is the area between Agiannakis and Elaia where the five illegal roads were constructed during 2011 and 2012 by the real estate company. The ploughing was repeated on 3 April 2013, in the presence of a Deputy Mayor of Trifylia, and resulted once more in the destruction of dune habitat and associated vegetation (Photos 3, 4). Both events were duly reported to all competent authorities (local, regional and central) (ref: 26988/23-1-2013, 27020/22-2-2013, 27077/22-4-2013). Further, the ploughing of the dune area was publicised in several media.

##### **4.2. The field project during the 2013 nesting season**

The annual field project of ARCHELON during 2013 started on 15 May and terminated on 30 September. During this period at least 1300 nests were located and protected in the 9.5km core nesting area (Neda River to Arcadikos River). This increase in nest numbers was expected as since 2006 there is an upward trend in the turtle population nesting in southern Kyparissia Bay. The increase in nest numbers combined with the increase of neophyte turtles (i.e. turtles nesting for first time) is attributed to the massive protection of nests applied in the core nesting area since 1992 (Margaritoulis et al., 2013). The 14-year period from the start of massive nest protection (1992) until the onset of upward trend in nest numbers (2006) coincides with the minimum age at maturity of *Caretta caretta* in the Mediterranean, estimated at about 14 years of age (Casale et al., 2011).

*Note: In the 12-year period (1994-2005) nesting effort in the core area (sectors A-C, O) averaged 552 nests per year. However, in the last 7 years (2006-2012) there has been a considerable increase in nest numbers with an average of 730 nests per year.*

Nevertheless, the frequent reports by ARCHELON denouncing illegal activities (opening of roads, ploughing of dunes, destruction of dune vegetation, etc.), the political pressures exercised by the real estate firm, and the ineffectiveness of the Steering Committee to implement adequately its responsibilities had a severe impact on the smooth operation of the annual field project of ARCHELON. The most serious incidents were the following:

- Non-operation of the information kiosk in Kalo Nero (for first time since the early 90s).
- On 13 June 2013 during the morning survey in the area of Vounaki (B Sector) the ARCHELON car was broken into and scientific data and monitoring equipment were stolen. The incident was reported to the Police.

- In the early morning of 12 July, following a night survey in Kalo Nero, all four tires of the ARCHELON car were found punctured. The incident was reported to the Police as well as to local and national media.
- The owner of the private field, which was rented by ARCHELON and used as a volunteer camp since 2009, ceased cooperation because he was threatened. Eventually, ARCHELON moved the volunteer camp to an organized campsite in the village of Giannitsohori (Ilia), about 11km from the previous camp. It is worth noting that the campsite owner was also pressured to expel ARCHELON from the campsite but did not succumb to threats.
- The real estate firm employed guards to protect their land from illegal campers. At the start of the nesting season employees of the real estate firm approached ARCHELON and requested permission to follow volunteer teams on their morning surveys. The request was granted under the condition that they would only observe the work done and not interfere with it. They also had to agree to remain at a distance (minimum of 10m) from the volunteers at all times. However, throughout the period that the “employed observers” were following the volunteer teams (25 May-30 September), these conditions were not adhered to on multiple occasions. These behaviours caused a continuous stress to ARCHELON volunteers throughout the nesting season (see also Appendices).
- During the morning surveys ARCHELON teams observed an increase of non-nesting emergences (turtle tracks which do not result in nesting), including very short tracks where the turtles returned to the sea before venturing to the high beach for nesting. These incidents apparently indicated an increased level of night disturbances. Further, ARCHELON volunteers and others witnessed people on the beach at night (a) erasing turtle tracks in order to interfere with the morning survey data collection, (b) using bright lights to scare away turtles attempting nesting, and (c) taking flash photos of the volunteers performing their night work (tagging female turtles) even when requested not to do so. These incidents resulted in the need for ARCHELON to introduce extra beach patrols at night, in addition to the standard tagging work, in order to minimize potential disturbance to nesting turtles. These extra surveys commenced on 14 June and ceased on 10 August 2013. In some cases ARCHELON night survey teams experienced aggressive and threatening behaviour from unknown men on the beach at night. In several cases the intervention of police was asked.
- Erasure of turtle tracks and vandalism of nests (see Appendices for details).

### **4.3. Anthropogenic disturbances at the core nesting area (O & A-C)**

This section focus on the anthropogenic disturbances that resulted in direct and indirect damage to sea turtles (adults and hatchlings), their nests, and the nesting habitat in southern Kyparissia Bay during the 2013 nesting season, as these disturbances were experienced through the standard field work of ARCHELON. Because the beach at Kalo Nero (Sector O) differs greatly from the remaining beach (Sectors A-C) in both physical characteristics and in magnitude of disturbances, these two beach parts are examined separately.

#### **4.3.1. Sector O: The beach of Kalo Nero (length: 2.2 km)**

The distinction of Kalo Nero from the rest of the nesting beach is very important. This area is already severely affected by tourism development. It needs to be closely managed under principles of sustainable development, so that the natural environment is not irrevocably damaged and the beach returns to a conservation status suitable -as much as possible- for sea turtle nesting.

When ARCHELON began monitoring the nesting activity on this beach, Kalo Nero was a small village with most families occupied with agricultural activities. Agriculture is still a significant source of income in the area, but Kalo Nero has quickly developed to a tourism resort.

Despite the Ministerial Decision of 23 July 2013 (Beach management measures), the situation in Kalo Nero has not improved at all over the 2013 nesting season but it became worse, since the Municipality of Trifylia did not apply the measures described in the above Decision, and the Decision appeared towards the end of the nesting season.



A detailed description of the noted disturbances in Kalo Nero beach is given in the Appendix 1.

#### **4.3.2. Sectors A, B, and C (length: 7.3 km)**

If sea turtles are to be effectively protected in Kyparissia Bay, these three Sectors (A: Vounaki beach, B: Agiannakis beach, C: Elaia beach) concentrating about 75% of all nests in the 9.5km core nesting area, must be maintained at its current almost pristine condition or as close to it as possible. This area is characterized by a very wide beach with an appropriate inclination, backed by low sand dunes with vegetation. Unfortunately, also for these beach sectors the majority of the main conservation issues remained unresolved during the 2013 nesting season and in addition to that several unpleasant developments, described elsewhere, have taken place. The only positive fact during 2013 has been the non-operation of the three beach bars at Elaia, Agiannakis and Vounaki, since the Municipality issued no licenses.

A detailed description of the documented problems in beach sectors A, B, and C (beaches of Vounaki, Agiannakis, and Elaia) is given in the Appendix 2.

### **5. CONCLUSIONS AND RECOMMENDATIONS**

Despite the commitments of the Ministry of Environment, in response to the Reasoned Opinion by the European Commission for southern Kyparissia Bay, in taking appropriate measures to safeguard the core nesting area of the loggerhead sea turtle, the majority of conservation issues remained unresolved during the 2013 nesting season. In addition, the plans of a real estate firm to build up to 50 holiday houses for sale behind the core nesting beach triggered strong political repercussions at the central government and the local Municipality, which caused mixed feelings among the local community, and had an impact on the execution of ARCHELON's fieldwork.

The Steering Committee, formed by the Ministry to coordinate conservation efforts and promote the long-term protection of the area, did not actually contribute to the solution of the main conservation issues, and in several cases its inactivity or ill functioning made the situation even worse. No measures were taken on time to mitigate the problems within the nesting season, and no substantial steps were taken to promote the long-term conservation of the area.

This situation can only be resolved through the elaboration of a proper Specific Environmental Study (EPM), or through the updating of the existing one (submitted to the Ministry in 2002 after the completion of the LIFE-Nature project by ARCHELON), in both cases undertaken by an independent expert consultancy; and the issuing of a Presidential Decree, following a deliberation process with the local community, as advocated by the existing legislation. Further, the creation of a Management Agency, including representatives from the local community, is necessary to administer this important area and supervise the agreed management measures, which will safeguard in the long-term the core of the second largest nesting area of *Caretta caretta* in the Mediterranean.

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## APPENDICES

### Appendix 1: Disturbances in Kalo Nero beach (Sector O) during 2013

#### ARCHELON's Seasonal Information Station

The Municipality of Trifylia did not allow ARCHELON to put up the seasonal information station in Kalo Nero, which was operating every year since the beginning of 90s. As a result, the visitors in the area could not be systematically informed about the efforts of the NGO to protect this threatened species. This, combined with the lack of information sign-posting, has caused a considerable increase in the number of tourists on the beach at night, thus causing disturbance to female turtles that come to lay their eggs and highly threatening to hatchlings which emerge from their nests and try to reach the sea.

#### The Coastal Road

The 1.7 km coastal road behind the beach of Kalo Nero is used not only for accessing hotels and houses in the area but also as a car-park for beach visitors and as a free camping area for caravans (Photo 5). Especially during the high tourist season (July and August) which coincides with the late nesting season – early hatchling season the density of cars and caravans was very high during night hours, so that sea turtles attempting to nest were disturbed by vehicular lights or human presence and hatchlings were at risk of being trampled by tourists on the beach and/or disorientated by artificial lights. It is worth mentioning that in ARCHELON's proposal for the management measures, submitted in April 2013 to all relevant authorities, including the Municipality of Trifylia, the need to control vehicular access along this road during the night is stressed.

#### Platforms on the Beach

In addition to the road, elevated platforms extend over the beach and are used by restaurants and bars located on the landward side of the coastal road. In recent years, these platforms were leased out by the Municipality under the guise of “simple beach use”. The Regional Public Land Authority (Ktimatiki Ypiresia) examined the beachfront of Kalo Nero in 2011, declared the platforms illegal and issued orders for their demolition. Although the need for their demolition was repeated in the Ministerial Decision of 23 July 2013, this was not implemented by the responsible authorities (Municipality of Trifylia and Region of Peloponnese).

#### Light Pollution

Public road lights are installed on electricity poles along the coastal road of Kalo Nero. The lights hang from a height of five to seven metres and most are uncovered from all sides. Most road lights are very close to the beach, i.e. within 10m from the back of the beach. Additional light pollution is caused by hotels, restaurants and bars on the beach platforms, spot lights shining right on the beach, and lights from parked camper vans (Photo 6).

Not only were neither the public nor the private lights not modified during 2013, but more spot lights were installed (Photo 7).

The height of road lights at Kalo Nero and their proximity to the nesting zone renders useless the standard method of “nest-shading”, used by ARCHELON in other areas, to protect emerging hatchlings from light disorientation, and forces the practice of “nest-boxing”. This is an unorthodox method comprising of a wooden box placed over the nest in such a way that in case of hatchlings' emergence these remain inside the dark box and avoid disorientation by bright lights. The box is regularly checked during the night at regular intervals (e.g. every hour) and in case of emerged hatchlings, these are transferred and released in a nearby dark beach section. It should be noted that this practice may have consequences in the later behavior of the hatchlings, since they do not immediately head for the sea after exiting the nest, but remain trapped for a while, inside the box. During 2013, the method of “nest-boxing” was used to 50 nests in Kalo Nero beach (about 17% of all nests in Kalo Nero). It should be noted that relocation of these nests in other parts of Kalo Nero beach cannot happen, for in the few suitable places that remain without bright lights and other disturbances there is a dense occurrence of natural nests.

### Beach Use and Beach Furniture

Based on legislation and the recent Joint Ministerial Decision (FEK 1094/2-5-2013) prescribing beach use, Municipalities can lease portions of the beach to tourism and leisure related businesses. Under specific guidelines, both the public availability and the protection of the environment must be maintained, with the local Municipalities responsible to ensure guidelines are followed. Moreover in the case of protected areas the assent of the Minister of Environment is required in order for the special terms of the leasing to be clarified.

Sun beds and umbrellas were placed on the beach front of Kalo Nero as early as mid May, two months before the issue of the Ministerial Decision of 23 July, which was a precondition for the necessary permission from the Municipality. Even after the issue of the Ministerial Decision, the cooperation of ARCHELON in order to indicate the exact location of the beach furniture was never asked by the Municipality. As a result sun beds and umbrellas occupied a large part of the beach in Kalo Nero and were not removed during night time (Photo 6). On many occasions, the beach structure was manipulated and wooden paths, showers, and other structures were added on the beach sand. This made a significant part of the beach inaccessible to sea turtles, while the few nests that were successfully made were in danger of direct or indirect damage (Photo 8).

### Planned Construction of Wave Breakers

For over a year the local and regional authorities have proceeded with the examination of a preliminary Environmental Impact Assessment for constructing a set of eight wave breakers parallel to the coastline of Kalo Nero (Natura 2000 site GR 2330008 “Marine area Kyparissia Bay: Katakolo cape – Kyparissia”), in order to mitigate coastal erosion. In July 2013 the Hellenic Center for Marine Research (HCMR), following a site visit on 4-5 April 2013, sent to the Municipality of Trifylia and the Ministry of Environment their expert opinion about the planned constructions. The expert opinion of the HCMR concludes that the construction of these wave breakers will result to a complete deterioration of the coastal ecosystem and will have a major impact for sea turtle nesting. However, the Municipality of Trifylia insists on the construction of such wave breakers.

### Vandalisms on Nests and Erasure of Turtle Tracks

Since the beginning of the 2013 field project in southern Kyparissia Bay ARCHELON researchers have observed a number of turtle tracks that have been partially or totally erased by humans in the area of Kalo Nero. A percentage of these nests, not possible to be located on the day following egg-laying because of the erasure of tracks, were identified at a later date by either observing the tracks of emerged hatchlings or by predation from foxes or dogs. In addition to the deletion of tracks in this area a number of nests were vandalised by removing their fencing either in part or in total. In some cases, such vandalisms took place in front of the researchers who were forced to request the intervention of the police and the coast guard (Photo 9). A number of the vandalized nests were identified again at a later day through hatching or predation.

## **Appendix 2: Disturbances at beach sectors A-C during 2013**

### Light Pollution

The light pollution in this area was reduced compared to previous years due to the non-operation of the beach bars, the rest of the existing public and private lights were not modified in order not to cause hatchling disorientation. As a result this relatively small number of artificial lights attracted frequently hatchlings from distances of 400 metres or more. Hatchling tracks were often observed during the morning survey heading towards the sand dunes, instead of going towards the sea.

### Roads

At the beaches of Agiannakis and Elaia, two existing rough roads arriving perpendicular to the beach were paved with compacted soil in 2006 and asphalted in 2009. Although these access roads pre-existed, their paving destroyed the sand dunes and the associated vegetation where the roads meet the beach. Particularly in Elaia, part of the sand dunes is used as a car parking area (Photo 10).

The five new illegal roads that were constructed by the real estate firm NEOS KOTINOS S.A. in 2011 and 2012 between the above two asphalted roads (Sector C), connecting the forest road to the beach, resulted in a further destruction of sand dunes and their vegetation. Further, these five roads attract cars and camper vans right on the high beach among the dunes and this causes more destruction (Photo 13). Since no licence whatsoever had been acquired, including the required by Natura 2000 legislation Environmental Impact Assessment, for the construction of these roads, the Region of Peloponnese imposed a fine to the real estate company. Although according to the decision of the Secretary General of the Peloponnese Decentralized Administration (ref. 60872/4175/11-07-2012) the real estate company should take immediate measures in order to block the access of vehicles to the beach and take action towards the restoration of sand dunes, no such actions were taken so far by the company.

Another road providing access to the location of the old beach bar at Vounaki (not in operation during 2013) was compacted in 2007 but it is not yet paved with asphalt. In this location, the sand dunes are also used as a car parking area.

### Vehicles

During the whole 2013 nesting season a large number of 4x4 vehicle tracks were monitored on the beach almost in a daily basis. In some cases the vehicle tracks were found at a distance of less than 30cm or even on the protected nests (Photos 11, 12). The vibrations of the vehicles can cause damage to turtle eggs since they may detach the embryos and potentially cause hatchlings to emerge prematurely. Moreover vehicles moving on the beach cause damage to the sand dune vegetation. In all entrances to the beach sand dune vegetation is absent, since these parts are used as parking areas (Photo 13).

The movement of vehicles on the beach was continued with the same frequency also during the hatching season. Tracks of hatchlings that were trapped within car ruts were observed for hundreds of meters before they could exit them or die of exhaustion or predation (Photo 14).

ARCHELON's proposal of management measures which was submitted to the authorities (incl. Municipality of Trifylia) on 25 April 2013 contains the restriction of vehicular access to the beach. The Municipality attempted on 5 August to materialize this measure by mounting traffic bars at the roads; however they used concrete to anchor the bars which caused further destruction to the dunes and their vegetation (Photo 15).

### House Construction

Except the three new summer houses that are being built in Vounaki area (Sector B) and were not affected by the suspension of building permits (Ministerial Decision 28353/23 May 2013), the plans for construction of up to fifty holiday houses along the entire beach length between Agiannakis and Elaia (sectors B and C) still exist. According to the real estate firm the seaward boundaries of this strip of land are on the beach line, covering almost the entire sand dune ecosystem between Agiannakis and Elaia (Photo 16, Illustration 5).

### Free Camping

The coastal forest of Elaia, close to the sand dunes between Agiannakis and Elaia, attracts a large number of free campers every year. During the high summer season (July and August) of 2013 it was estimated that more than 2,000 people were camping simultaneously in the forest. Free camping is against the law in Greece and the local Police regularly received calls to patrol the area, but since free campers are a source of income for the local community, law enforcement is not strict with regard to free camping.

### Disturbing Turtles at Night and Erasure of Turtle Tracks

As in Kalo Nero beach (O sector) also in sectors A and mainly B and C were observed on almost a daily basis, during the morning survey, attempts to erase partly or entirely turtle tracks. Moreover in these sectors several turtle tracks were zigzagged or abruptly returning to the sea. These observations combined with information from third parties revealed that at night unknown persons were on the beach disturbing on purpose the emerging turtles with use of strong beam lights.

## ILLUSTRATIONS

**Illustration 1: Map of western Peloponnese, showing the position of southern Kyparissia Bay.**

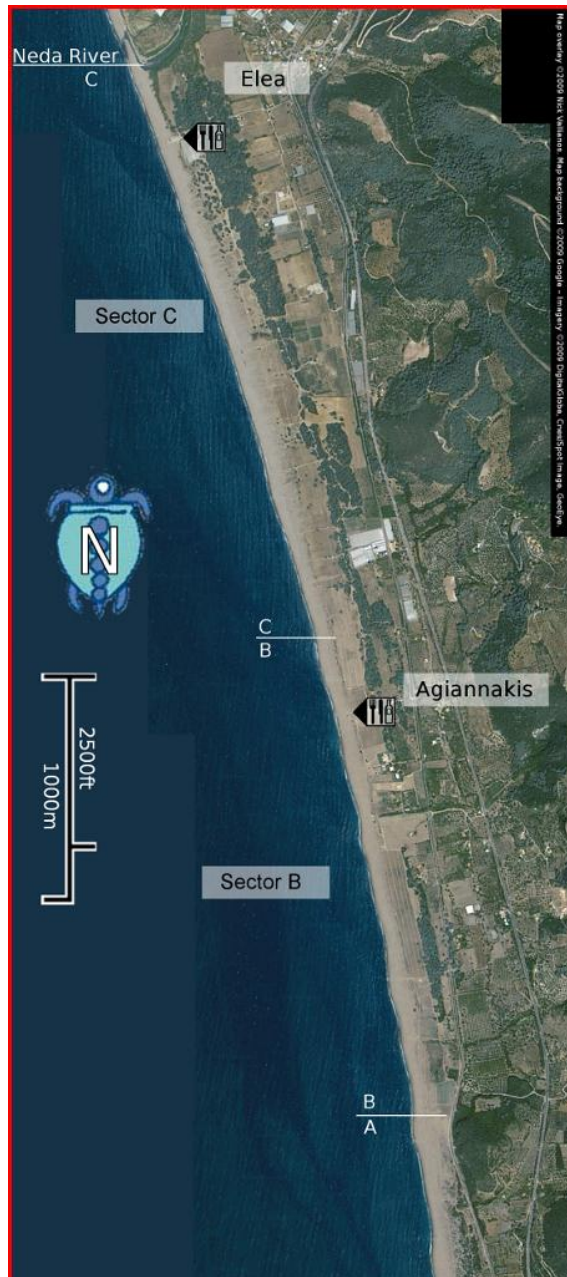


**Illustration 2: Map of the core nesting area (Neda River – Arcadikos River) in southern Kyparissia Bay showing its position within the boundaries of two Natura 2000 sites, the terrestrial one (GR2550005) and the marine one (GR2330008).**





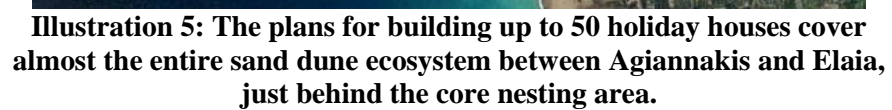
**Illustration 3: The northern part of southern Kyparissia Bay (Sectors B & C).**



**Illustration 4: The southern part of Kyparissia Bay (Sectors O & A).**







## Photos



Photo 1: Building of the new house in the sand dune zone during January 2013.



Photo 2: Building of the new house in the sand dune zone during June 2013. Suspension of new building permits did not affect the already issued permits.



Photo 3: Destruction of dune vegetation following the ploughing in the sand dune zone (Sector C).



Photo 4: Ploughing in the sand dunes at Sector C.



Photo 5: Camper vans at the coastal road of Kalo Nero, behind the nesting beach (Sector O).



Photo 6: Light pollution from restaurants, bars and public road lights create a severe problem in Kalo Nero. Beach furniture was not removed during night time.



Photo 7: New spot light during the 2013 nesting season at Kalo Nero (Sector O).





**Photo 8: The shading of a nest, to protect emerging hatchlings from light disorientation, was vandalized and partly removed by a beach bar owner and sun beds were placed in front of the nest, obstructing hatchlings to reach the sea.**



**Photo 9: Hotel owner removing the anti-predator protection of a nest, despite protests by ARCHELON researchers.**



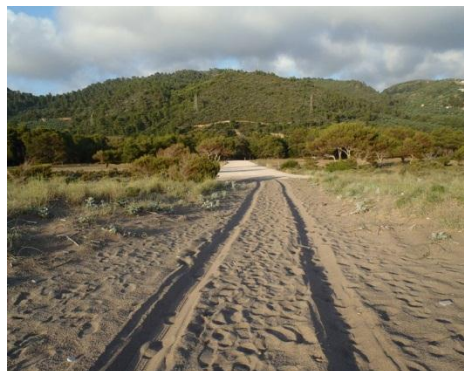
**Photo 10: The sand dunes of Elaia village converted to a car park area (Sector C).**



**Photo 11: Vehicle behind a protected nest in Sector C. Bamboo sticks are used to anchor anti-predator grids.**



**Photo 12: Vehicle tracks very close or even above the protected nests.**



**Photo 13: Dune vegetation is absent in front of the five illegal roads. These illegal roads provide vehicular access to the core nesting beach (Sector C).**



**Photo 14: Hatchlings trapped into car ruts cannot reach the sea and usually die of dehydration or predation.**



**Photo 15: Pouring concrete in the sand dune zone for the installation of the traffic bars (proved unsuccessful).**



**Photo 16: Wood stakes indicating the boundaries of the large estate within the sand dune ecosystem (Sector C).**