Universitat de València, Instituto Cavanilles
Catedrático José Beltrán 2
46980, Paterna, Valencia, Spain
T/ +34963544549
F/ +34963543733
W/ https://www.uv.es/cavanilles/zoomarin/index_esp.htm

PROJECT LIFE-MEDTURTLES

LIFE18-NAT/IT/000103

COLLECTIVE ACTIONS FOR IMPROVING THE CONSERVATION STATUS OF THE EU SEA TURTLE POPULATIONS: BORDERING AREAS (LIFE MEDTURTLES)

REPORT ON ACTION C1: MITIGATION OF THREATS AT NESTING SITES

- *Marine Zoology Unit, Cavanilles Instiute of Biodiversity and Evolutionary Biology, University of Valencia (UVEG)*
- *Herpetofauna Albanian Society (HAS)*

AUGUST 2024

Collective actions for improving the conservation status of the EU sea turtle populations: bordering areas (LIFE18NAT/IT/000103). Project is carried out with the assistance of LIFE financial instrument of the European Union / **info@medturtles.eu**

NATURA 2000
ec.europa.eu/life

Action C1: Mitigation of threats at nesting sites. Introduction:

This action is considered as a concrete conservation action, because it will directly benefit the populations of *Caretta caretta* and improve their conservation status (i) by reducing important factors which dramatically decrease the success of sea turtle clutches, such as predation, inundation, damage by beach users (ii) by doing so it will reduce the vulnerability of the populations to climate change in the current limited areas with protection measures.

Predation, inundation, damage by beach users, affect a large proportion of nests, and therefore the production of newborns recruiting to the population is severely compromised. Predators are basically represented by feral dogs and foxes, whose populations have increased thanks to availability of human waste, and so they should be considered as an indirect anthropogenic threat rather than a natural mortality factor. In fact, one of these cases has been reported during the works carried out in the present project (Tomás 2023, see below).

The action aimed to improve (i) the capacity to detect nests, particularly the ones in need of specific protection in areas at risk of predation, inundation, or anthropogenic threat and (ii) the capacity to adequately protect the nests *in situ* or by relocating them in areas with less risk. This action is the continuation of similar actions carried out during the LIFE EUROTURTLES project in countries with well stablished sea turtle nesting activity and large nesting rookeries. However, during the LIFE MEDTURTLES project, this action has been developed in countries (Albania and Spain) with emerging loggerhead sea turtle nesting activity; therefore, actions aimed at detecting nests have acquired special relevance. In Spain, the first nest was detected in 2001, with sporadic nests detected until 2014. Since 2014, loggerhead sea turtle nesting occurs every year in the Spanish Mediterranean coast, however in low numbers and scattered throughout the different Mediterranean regions.

The current capacity to detect nests is limited to stranding networks, citizen collaboration (passers-by) or on-foot ground surveys conducted by the limited personnel of the involved (UVEG, HAS) and other organizations over long coastal tracts. Therefore, some tracts are inefficiently surveyed (low frequency and delayed intervention in case of need) or not surveyed at all. This results in a number of undetected and unprotected nests per year. The LIFE MEDTURTLES C1 action aims to increase nest detection for their protection. Moreover, current conditions suggest an important pressure from tourism and coastal anthropogenic activity threatening the success of unprotected sea turtle clutches.

This action also proposed mitigation of the effects of climate change on the interested sea turtle populations in two ways. First, the populations will be less vulnerable to climate change if nest protection (and high hatching production) occurs over larger areas with a higher habitat heterogeneity and, therefore, with higher chances of having sub-areas favourable for egg incubation under future climate conditions. Second, a larger area with protection measures in place will allow turtles to adapt climate changes by shifting their preferred nesting subarea according to new environmental conditions. In this sense, monitoring of actual and potential nesting beaches seems mandatory. Both the temperature of these beaches and the incubation temperature of the protected nests should be monitored to verify both their success and the production of adequate sex ratios for the maintenance of the populations.

In summary, this action focus on ways to increase nest detection and protection of nesting turtles and clutches in emerging nesting sites through the creation or reinforcement of networks, standardization of protocols and clutch relocation.

Once set up and established this action, this new protection system will be continued after the end of the project by the involved Beneficiaries (including regional and national environmental authorities) with own resources, as they do in other areas.

The increase in loggerhead sea turtle nesting activity detected in Spain in 2023 (se below and D1 report) was one of the main reasons to extend the LIFE MEDTURTLES project until summer 2024, continuing with the activities related to this action C1 in Spain until the end of August 2024 and beyond in time.

Sub-action C1.1 Spain.

Prior to this activity, the UVEG team proposed a parallel action (A2) within the LIFE MEDTURTLES project:

Action A2: Regulations for reducing anthropogenic impacts at nesting sites.

Since sea turtle nesting activity is quite recent in Spain, there are differences in clutch protection among regions, with regions having existing protocols and others without legal/administrative documents which regulate clutch management and protection from both direct anthropogenic threats and the impact of climate change through some regulation of beach use. This action concerns all the potential nesting areas in the project EU-country (Spain) with sea turtle nesting activity, including beaches with previous nesting records and beaches with suitable conditions for nesting. An initiative promoted by the Spanish Ministry of Environment (Ministerio para la Transición Ecológica), and with the participation of many marine turtle specialists from Spain, including the UVEG team, follows to produce an Action Plan for sea turtle conservation, including the management of sea turtle nesting activity at a national scale. The Plan aims to produce the elaboration of municipality regulations for the protection of nesting habitat of the loggerhead sea turtle in relation to the effects of human activities on the coast and at sea. These guidelines should have been implemented by the competent authorities in Spain before the end of the project (for instance, competent authorities: Generalitat Valenciana, Directorate Protection of the Sea and Municipality of Torrevieja, among others from the Valencia region, confirmed their commitment prior to the start of the project).

The action focused in the implementation of this Action Plan in the Valencia Region and surrounding Spanish Mediterranean regions, including the coordination of the UVEG team and regional institutions with those of neighbouring regions. The Action Plan is including a National Protocol to attend sea turtle nesting event. However, to the official date of the end of the project, neither the Action Plan nor the National Protocol have been issued by the Spanish Ministry to the different regions with sea turtle nesting activity, despite the Ministry representatives expressed in a letter that '*This protocol has already been pooled for application in all Spanish Mediterranean regions at a meeting held in Barcelona in May 2023, with the participation of the leading national sea turtle national*

sea turtle specialists and representatives of the different autonomous communities, and its final approval will take place in the coming weeks for its formal adoption and implementation in all areas of the summer of 202.'. In this letter, the Ministry representatives also describe the role of the UVEG team in the elaboration of this protocol.

However, since the National Protocol was presented in May 2023, the UVEG team has been able to successfully disseminate this protocol over municipalities and institutions of the Valencia region (East Spain) during summer 2024. Moreover, since 2017 there has been in the Valencia region a regional protocol for sea turtle nesting events, developed by the regional government together with different entities and specialists, among which is UVEG team. The National Protocol mirrors this Valencia regional protocol in many aspects. Hence, since the National protocol was not officially approved during the LIFE MEDTURTLES project, the UVEG team disseminated the regional protocol among coastal municipalities to gain sea turtle nest protection. Following we summarise the activities carried by UVEG team related to action A2: i.e., dissemination and implementation of protocols for sea turtle nest protection among municipalities of the Valencia region, and coordination with teams of other Spanish regions and the Spanish Ministry for the Ecological Transition to produce the Action Plan and National Protocol.

- Activities of UVEG under Action A2

UVEG team worked with the staff of the Spanish Ministry for the Ecological Transition running the project LIFE INTEMARES to establish synergies between this project and actions A2 and C1 carried out during the LIFE MEDTURTLES project.

UVEG team has been invited and attended to three meetings organised by the Spanish Ministry to discuss the strategy for marine turtle conservation in Spain, including the Action Plan and Protocol for nesting events:

(1) January 15th 2020; this meeting included a workshop on nesting activity by loggerhead sea turtle in Spain. Representatives of the environmental departments of regional governments and a panel of sea turtle researchers were invited to this meeting. Here, the UVEG team explained the actions carried out in the Valencia region for turtle nesting activity during the LIFE MEDTURTLES project and before. During this meeting the Action Plan for marine turtle conservation was discussed.

(2) March 10th-11th 2020; the UVEG team also participated in the two days online meeting organized by the technicians of the Spanish with the panel of sea turtles research experts. Tomás. In this meeting the actions related to conservation of nesting females and clutches throughout the Spanish Mediterranean coasts in the national protocol for sea turtle conservation in Spain were discussed. After this meeting, a draft of the protocol was forwarded to the experts (including UVEG) for final amendments, in order to have a definitive version to be applied in all the Spanish Mediterranean Regions from Summer 2020. After this meeting, The UVEG team has reviewed three different versions of this draft for the Spanish Ministry as specialist institution and as an advisor to the regional government of the Valencian Region. A preliminary version of the "*Acting common protocol for attending nesting events of marine turtles in Spanish coasts*" was released in September 2020 and distributed to the different Spanish Mediterranean regions for review. The dissemination of the National protocol and Action plan to municipalities and stakeholders was delayed to

the next nesting season 2021. However, the UVEG team stablished contacts with technicians of the Spanish Ministry of Ecological Transition to prepare and coordinate actions related to detection and protection of nesting activities in the 2021 nesting season, and also disseminated the existing regional protocol among municipalities.

(3) 10-11th May 2021; the Spanish Ministry for Ecological Transition and Demographic Challenge, under the project LIFE INTEMARES, organised the "*TRAINING ACTION: SATELLITE MARKING OF LOGGERHEAD SEA TURTLE REPRODUCTIVE FEMALES FOR THE FIRST ATTENTION TO THE NESTING EVENTS ON THE SPANISH COAST*" in Valencia. The objective of this training action was to support those responsible of attending the nesting episodes of these species in the different Mediterranean regions of Spain, as well as managers and technicians specialized in the processes of detection, management and handling of females and nests of the species in order to ensure their survival. and improve the conservation status of the species. The training action had also the objective of standardizing best methodologies for detecting and protecting nests among regions. J. Tomás, from UVEG team, was invited as speaker and consultant to this meeting, sharing experiences and knowledge with technicians and managers of the environmental offices of regional governments of Catalonia, Balearic Islands, Murcia, and Andalusia, as well as with members of public and private rescue centres of these regions. In this meeting, J. Tomás gave also the conference entitled: '*Nest translocation: egg management, excavation of the new nest and monitoring of incubation*'. In this meeting, the "*Acting common protocol for attending nesting events of marine turtles in Spanish coasts*" was communicated to managers in every region, with some aspects still put in discussion among attendees and experts invited to the meeting.

(4) On July 2023, an online meeting of experts was organised by the Ministry for the evaluation of the "*draft of the Conservation Plan for the common turtle (Caretta caretta)*" for the Conservation Plan to be ready to be adopted and formally implemented in 2024 throughout the whole national territory, especially in the coastal municipalities of the Spanish Mediterranean coasts. The UVEG team participated in that meeting. A letter prepared by the Subdirectorate General of Terrestrial and Marine Biodiversity of the Spanish Ministry of Ecological Transition and demographic Challenge was provided and uploaded into the UVEG folder of the project's Drive. The letter specifies that: "*Dr. Jesús Tomás, marine turtles' specialist and member of the team of the Universitat de València Estudi General (UVEG, a partner of the LIFE MEDTURTLES MEDTURTLES project), in the framework of this project, has participated in the elaboration of these protocols and strategies, as well as in the July 2023 meeting, as a consultant, reviewing the different drafts of the documents until their final approval*".

To disseminate this protocol, the UVEG team has been carrying out the following activities from 2020 to the first half of 2024:

- The UVEG team has been in close contact with other teams, formed by regional governments, universities, and rescue centres, in other Spain's Mediterranean regions to exchange information on nesting activity in the Spain's Mediterranean beaches and

coordinate the actions to protect nests. These contacts resulted in close collaboration and specific actions (see Action C1 below).

- The UVEG team has organised on site meetings with stakeholders of several coastal municipalities of Castellón and Alicante provinces to deliver material and disseminate the protocol of acting in nesting events since 2021 until 2024 (see Figure 1.1), except for 2021 due to COVID restrictions. A total of 6 meetings have been held, inviting and getting representatives of neighbouring municipalities to the meetings. These meetings were scheduled in May every year, just before the beginning of the nesting season. Additional meetings to disseminate and discuss the protocol have been also organized at the office of environmental agents of the coastal service of the Spanish Ministry of Ecological Transition in the Alicante province (1), with the beach cleaning service of the Valencia Provincial Council (4), and with municipal (2) and national (1) police corps during the project.

-

Figure 1.1. *Meeting for protocol dissemination by the UVEG team with several representatives and stakeholder of municipalities in the south of the province of Alicante, (Santa Pola, May 2022).*

- A total of 60 coastal municipalities of the Valencia Region have been contacted annually by email (sometimes by phone) in order to provide the information about the Acting regional protocol (see above) and our own designed campaign "***Alerta Tortuga***" for best practices when detecting turtles nesting in their beaches. This campaign was developed with the external assistance of the NGO Xaloc Hermanos de sal. The campaign consisted in the production and dissemination of posters including the basics of the protocol (Figure 1.2). This campaign has been disseminated also through several media, radio interviews, and social networks, included de Instagram page created by UVEG team (@uveg.life_medturtles). Several of the municipalities (e.g., Elche, Santa Pola, Torrevieja) placed these posters on signs and OPPIs at the entrance to their beaches (Figure 1.3). For instance, the municipality of Valencia City set a total of 15 posters of the campaign in both, natural and urban beaches over 24 kilometres of coast of this municipality. Posters well also distributed in beach bars.

Figure 1.2. *Posters of the campaign ALERTA TORTUGA for detection of sea turtle nests developed under the project LIFE MEDTURTLES.*

Figure 1.3. *Posters of ALERTA TORTUGA campaign set on beaches of different municipalities of the Valencia region (East Spain).*

- On June 16th, 2022 the UVEG team organised a beach activity and a workshop for the dissemination of the "Alerta Tortuga" Campaign, in collaboration with the NGO Margallò-Ecologistas en Acción Elche. This workshop, covered by media, intended to create a network of volunteers to patrol beaches at night to detect sea turtles nesting in these municipalities of the South of Alicante province. As we can see below, this workshop resulted very positive for further detection of sea turtles nesting in Elche beaches in 2023 and 2024.

Based on the exceptional increase in nesting activity in 2023 (See below), the UVEG team, the environmental representatives of the regional government, and other local private and public institutions of the Valencia region met again in July 2023 to reformulate the regional protocol. The UVEG team actively acted in this modification, writing different parts of the protocol related to nest protection and management. Some of the modifications have been implemented in 2023 and 2024 nesting seasons, in collaboration with different municipalities.

Concerning the Action Plan for loggerhead turtle conservation, at the date of production of this report the Spanish Ministry has already a finished version pending on signatures. It is expected that the official versions of both the Action Plan and the National Protocol will be released before the end of 2024.

Activities related to C1 carried out in Spain.

Beach monitoring

The protocol in the Valencia region existing since 2017 indicated the translocation of the sea turtle clutches found in the beaches of this region to a protected beach near the city of Valencia. However, due to the increase in the number of nests detected, and also to try to standardize the protocol with other neighbouring regions, in 2023 the protocol was modified (see above), in particular to leave the clutches on protected and suitable beaches as close to the nesting site as possible, if it is not suitable for the success of the clutch. In this sense, beach monitoring is mandatory to determine suitable beaches to which relocate the clutches. The UVEG team has been the responsible for making the decision on which beach to relocate the clutches, based on presence/absence of anthropogenic threats, sand characteristics, and beach temperature.

Concerning the monitoring of temperatures to evaluate the quality of different beaches for loggerhead turtle clutch incubation, UVEG team, with the support of the regional government, has been placing Tibdit v2 temperature recorders in beaches of the Valencia Region every year of the project, from late May to early November, to record temperatures along the nesting season. This work has been carried out in coordination with other scientific institutions monitoring beaches from other regions to make an evaluation at national level (see Cardona et al. 2022). However, during the seasons 2021 and 2022 only the UVEG was the only team monitoring beach temperatures in Spain. Up to 15 beaches of the Valencia region (including its three provinces) have been monitored. The temperature data recorded until 2024 season will be incorporated to a wider study on environmental conditions in the Western Mediterranean to elucidate suitability of beaches for loggerhead turtles nesting and successful clutch incubation.

Moreover, UVEG team acquired other type of temperature recorders to monitor clutch incubation temperature of the nests protected during the present project. These loggers (HOBO blue tooth models) have been placed inside and outside the clutches protected in order to monitor the metabolic heating inside the nest, and also to monitor the incubation throughout its duration in real time, advancing measures to mitigate any effects of meteorological phenomena on the clutch. These data will be also incorporated in a wider study thanks to the memorandum of understanding signed between LIFE MEDTURTLES and projects InGeNi-Caretta (from the Spanish Biodiversity Foundation) and LIFE TURTLENEST.

Nest detection

The Valencian Community is a pioneer in the detection of sea turtle nests compared to other regions of the Spanish Mediterranean for several reasons. Firstly, because this region has the oldest and most effective network in Spain for dealing with strandings of cetaceans and sea turtles. This network is coordinated by the UVEG team, together with the regional government and other institutions, and is based on citizen science, promoted by long-term awareness campaigns. As in other regions, any stranding is reported by stakeholders and passers-by to the network through a call to the emergency number (in Spain the number 112). Incorporating communication on detection of nesting events into the stranding network, assimilating both protocols, has been crucial to obtain greater effectiveness in detecting nests in the Valencia region. The LIFE MEDTURTLES project has helped in reinforcing this network by increasing the awareness campaigns. Secondly, as said before, in 2017 all institutions working on sea turtles in the Valencia region (including the UVEG team) met the regional government to elaborate the first protocol to attend sea turtle nesting events. This protocol, the first in Spain, has made possible to act effectively against any nesting event reported.

The actions made by the UVEG team addressed to nest detection are described as follows:

- A preliminary meeting took place in early February 2020 between UVEG team and a local NGO (Xaloc Hermanos de sal) to plan and organise awareness campaigns and dissemination of the protocol. In this meeting we planned the production and dissemination of informative material in the Valencia Region in order to increase the detection of loggerhead turtle nesting events in this Region. As said before, dissemination was planned to be sent to municipalities, but also spread through media, social networks and also in coastal tourist and leisure establishments. However, the COVID-19 closure in April-May difficulted dissemination tasks of the material produced.

- A second meeting (this one online) between the UVEG team and this local NGO was held on May 5th 2020 in order to define the collaboration and follow the progress in actions related to awareness campaigns and informative material to increase the detection of loggerhead turtle nesting in the Region. Informative poster/image on nesting activity and emergency numbers has been produced (see Figure 1.2). However, due to the COVID19 situation it was impossible to put posters until well advanced the nesting season. Instead, it was distributed by e-mail to all coastal municipalities of the Valencia Region, and disseminated through social media (Facebook and Instagram) of LIFE MEDTURTLES and of local pages such as the ones of the local NGO Xaloc, receiving hundreds of visits in 4 weeks. The posters were put in places before 2021 nesting season, increasing their distribution over the following years.

- A collaboration has been established with the NGO Margallò-Ecologistas en Acción to create a network of volunteers to patrol beaches at night to detect sea turtles nesting, in collaboration with the municipalities of Santa Pola and Elche (Alicante province). Beaches of the central coast of this province have been patrolled by volunteers during the 2021-2023 nesting season. The UVEG team has participated in the formation of volunteers, joining them in beach surveys in 2023 and 2024 seasons. The same UVEG team have detected 2 loggerhead nesting turtles during beach patrols in the 2024 season.

- Out of the Valencia region, in the 2020 season the UVEG team has assisted environmental authorities of Murcia Region (Southeast Spain) in the detection and study of two loggerhead sea turtle clutches laid in natural and urban beaches.

- In the Valencia Region, the UVEG team, in collaboration with other institutions, has been able to satellite tag a total of 12 loggerhead turtle nesting females (with LIFE MEDTURTLE and other funds) (see Figure 1.4). The turtle's satellite telemetry reconstructed tracks helped us to warn local institutions and coordinate the actions for attending further potential nesting events in the Valencia region and in other Spain's Mediterranean regions. Several turtles nesting in the Valencia region also nested in Balearic Islands, Catalonia, Murcia and Andalusia; hence we helped to detect and protect other 5 clutches laid out of the Valencia region. These actions show the connection between the UVEG team and the nest detection network in the Valencia region with teams in other regions, and the growing collaboration among teams and regions in Spain.

- Apart from the actions described above, the UVEG team in collaboration with the NGO Xaloc produced posters and sticker to be distributed in sport fishing sections of the brand DECATHLON stores throughout the Valencia region. This was made because sport fishing from beach at night is very common in beaches of the Valencia region, hence sport fishermen can be good allies in turtle nesting detection, as occurred in 2020 in Cullera, Valencia.

Figure 1.4. *Satellite tagging of nesting female turtles in the Valencia region by UVEG team, in collaboration with other institutions. Left: turtle nesting in Cullera, Valencia province, in July 2021, right: turtle nesting in Denia, Alicante province, in June 2023.*

Thanks to all these tasks, the UVEG team has been able to detect a total of 20 loggerhead turtle clutches in the Valencia region between 2020 and 2024 season, so far; helping also to detect at least other 5 clutches in other regions. Moreover, the team also have detected other 9 unsuccessful nesting events in this period in the region, including those of two turtles satellite tagged stopped in their way back to the sea after trying to nest.

Nest protection

The Figure 1.5 shows the numbers of nests and approximate unsuccessful nesting events of the loggerhead sea turtle in Spain since 2001 in Spain and in the Valencia region.

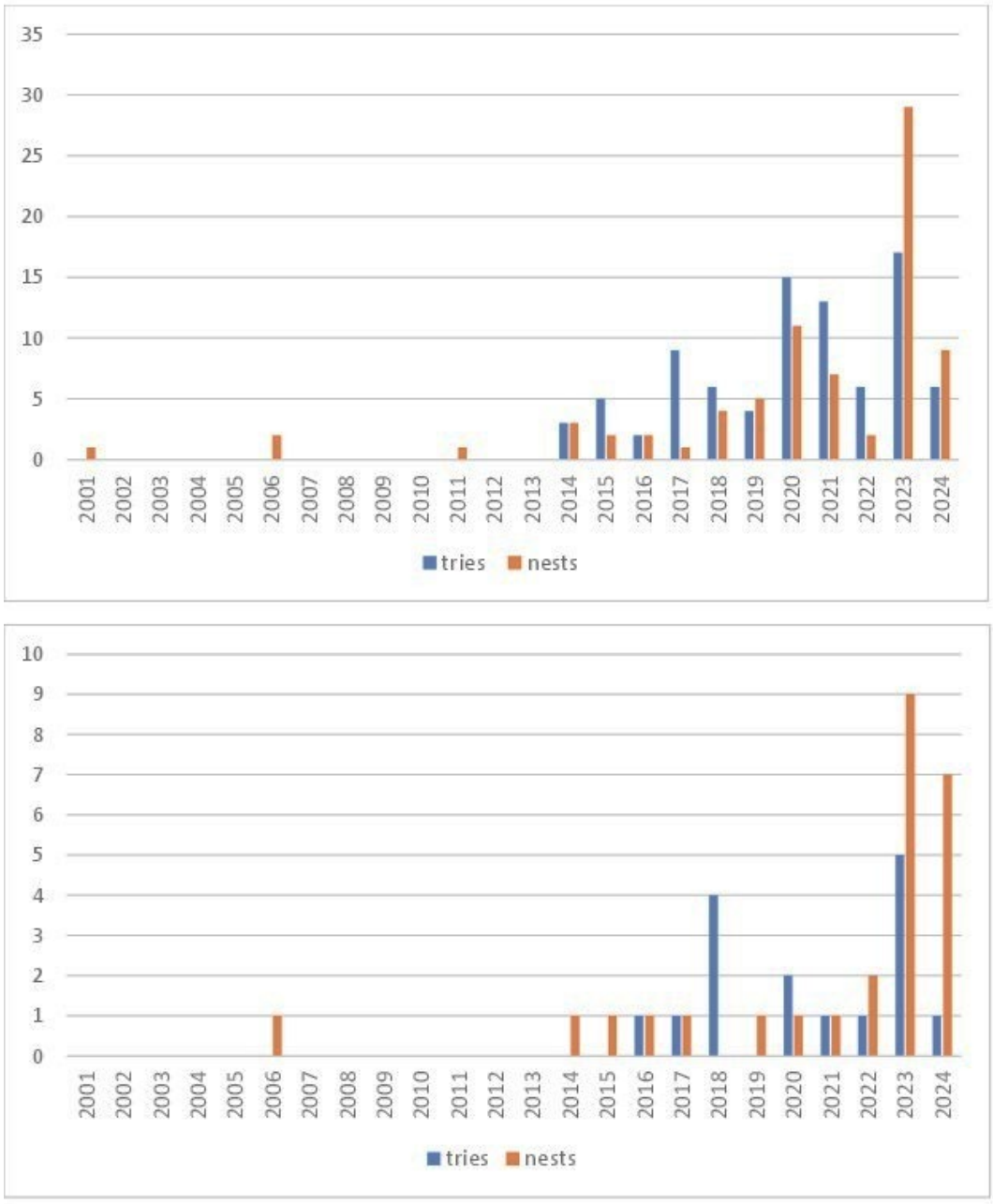

Figure 1.5. *Nests and unsuccessful nesting attempts of loggerhead turtles in Spain (above) and in the Valencian region (below). The LIFE MEDTURTLES project has covered the last five years. Note that 2024 reflects the nests recorded until de end of August, and more nests can be detected.*

According to the existing protocol in the Region of Valencia, when a nesting event is reported, the UVEG team oversees the coordination of all the institutions involved, contacts the reporter to request all the information, goes to the beach to locate the nest and, if necessary, relocates the clutch to a place where the eggs can be successfully incubated. Part of the clutch is taken to a rescue centre at the Oceanogràfic Park in Valencia for artificial incubation in an incubator. Once relocated, the UVEG team coordinates with local NGOs (e. g., Xaloc or Ecologistas en Acción -Elche, among others) and the regional government to protect the clutches from both predation and anthropogenic threats using cages and fences (Figure 1.6). The NGOs also use volunteers for 24/7 supervision of the protected clutches. After hatching, the UVEG team also coordinates with local NGOs the release of the hatchlings (Figure 1.6), with some of the production being transferred to the rescue centre for a head-starting programme. Turtles in this programme are released after one year at the rescue centre (Figure 1.6).

Figure 1.6. *Examples of clutch protection (above) and release of hatchlings and post-hatchlings with volunteers (below) in the Valencia region.*

All of this happens when the nesting female or her tracks are spotted on the beaches. However, several of the nests were discovered following reports of hatchlings on the beach late in the season or, as mentioned above, following clutch predation. For nests where hatchlings are found and for protected clutches, the UVEG team is also responsible for examining the nest and determining hatching success. Live hatchlings found in the nest during the nest study are also taken to the rescue centre for the head-starting programme.

During the LIFE MEDTURTLES project, i.e., 2020-2024, the UVEG team has fully protected 16 clutches, also studied other 3 nests detected after hatchlings' emergence and one more after predation by dogs (Tomás 2023). Moreover, we helped to protect one more nest and helped to detect and study another nest in Murcia region (south to Valencia region). Following we describe specific actions carried out year by year.

- *2020*: The 2020 nesting season was exceptional in Spain's Mediterranean coast, with a total of 11 nests and more than 15 unsuccessful nesting attempts detected, probably due to the increasing effort in detection, the strengthening of regional teams dedicated to this task, and the better connection between monitoring groups and authorities. Two turtles were detected although only ones nested in Cullera (Valencia). The turtle was retained by a sport fisherman; hence we were able to satellite tag the turtle and locate and relocate the clutch for protection.

- *2021*: Despite all the efforts carried out in dissemination (see action A2 above), only one turtle was detected trying to nest in Valencia region beaches in Summer 2021. This turtle tried to nest unsuccessfully twice in two beaches, but at least in one was disturbed by passers-by. A total of 7 nests from at least 5 different turtles were detected in Spain's Mediterranean coasts in the 2021 season, 5 of them in Catalonia, 1 in Andalusia region, and 1 in Valencia province. The UVEG team was requested to provide assistance in the first actions when the Andalusia nest was detected, and also it has been in contact with organizations working in the protection of loggerhead nests laid in Catalonia. More turtle tracks were detected in Murcia region, but with no nest was confirmed in 2021. In the Valencia region, on the 28th of September, hatchlings' emergence was detected in El Puig beach, Valencia province. The adult female was not detected when nesting, probably because at that time there were mobility restrictions at night in Spain due to the COVID19 situation. The clutch was studied by the UVEG teams, showing 60% of success. However, most of the hatchlings were attracted by artificial lighting of the beach promenade. Many hatchlings were carried to the sea by passers-by, but 14 of them were rescued by UVEG team and moved to the rescue centre to be included in the head-starting program, being released one year later at the same beach, with four of them satellite tagged by LIFE MEDTURTLES project (Figure 1.7).

Figure 1.7. *Hatchling recovered and release of post-hatchling of El Puig 2021 nest.*

- *2022*: One turtle was reported nesting at Guardamar del Segura (Alicante) on July the 26th. The UVEG team moved to the beach, collected the eggs and relocate them for protection. The turtle was also satellite tagged. In fact, this was the only clutch protected in the whole Spanish Mediterranean in 2022. As said before, a second nest was reported to the UVEG team in 2022 season, this time in Burriana (Castellón province); unfortunately, when the UVEG team moved to the beach verified that the clutch was predated days before (probably by dogs); Hence it was not possible its protection.

- *2023*: Nesting activity in 2023 increased exponentially, with 27 nests recorded, 9 of them at the Valencia Community, being 8 of them protected and studied by the UVEG team, and associates, with one more detected after hatchlings' emergence in Almassora (Castellón, Figure 1.8). A total of 60 hatchlings from this nest were rescued from the road behind the beach after they were attracted by urban lights. From these 8 protected clutches, 6 were laid in Alicante province and 2 in Valencia Province. Other 4 unsuccessful nesting activities were recorded this year by the UVEG team. In addition, we were also able to reach 7 female turtles while nesting or trying to nest at beaches. All these turtles were sampled for genetic studies and satellite tagged, by project means or with transmitters from associated. This tagging activity helped us to locate second and even third clutches laid by turtles in our region, but also to warn other institutions from other regions about the visits of these turtles to their beaches. In this way, we helped to protect 5 additional clutches laid in these regions (Andalusia, Murcia, Catalonia, and the Balearic Islands) by the turtles tagged on the beaches of the Region of Valencia. In total, by protecting these nests this year, we have released more than 430 hatchlings into the sea and sent more than 60 hatchlings to head-starting programmes.

Figure 1.8. *Relocation and nest study of clutches detected (left), and location of the nest found in Almassora (Castellón, right) in 2023. Note the proximity of the nest (green arrow) to the end of the beach and the presence of light pollution.*

- *2024*: Thanks to the extension of the LIFE MEDTURTLES project, the UVEG team has been able to continue the work of detecting and protecting nests during the summer of 2024. Until the end of the project on 31 August, 6 nests were detected and protected, and another one was detected and studied after observing hatchlings on the beach. However, in the latter case, the nesting turtle was recorded in video and sent days later to the UVEG team by citizens, but the clutch could not be located at the nesting date; although the beach area where the turtle was observed by the informants was monitored until the date of hatching of the nest. After the modification of the regional protocol in 2023, 5 of the 6 nests have been protected in the same beach or in beaches closer to the nesting beach. The 6th was moved to artificial incubation in incubator due to its low clutch size. Figure 1.9 shows images of the work of UVEG team detecting, relocating, and protecting these nests in the 2024 season.

Figure 1.9. *Detection, **r**elocation, and protection of clutches by UVEG team and associates in the Valencia region in the 2024 season.*

Sub-action C1.2 Albania

Nesting of the loggerhead sea turtle (*Caretta caretta*) in Albania has been confirmed during the LIFE MEDTURTLES project. Although no proper nesting sites are found in the country, sporadic nesting seems to happen throughout the coastline. In order to better know the situation of the species in the country organised and systematic monitoring is necessary. The works for nest detection in Albania have been carried out by the Herpetofauna Albanian Society (HAS).

Three areas of potential loggerhead turtle nesting activity, and with no current conservation efforts there, have been foreseen to be weekly monitored during June-August:

1) *Gjiri i Drinit*, where possible nesting activity has been reported over the years but not directly confirmed. Number of nesting activities per year is unknown, but high human presence occurs on the beach. Ground survey and UAV survey have been performed during this project here.

2) *Gjiri i Lalzit and kepi Rodonit*, where one loggerhead turtle nest was reported in 2017. Current number of nests per year is unknown, and high human presence is also observed on the beach. Ground survey and UAV survey have been performed during this project here.

3) *Divjakë*, where one nest was found in 2018. current number of nests per year is also unknown, and high human presence is also detected on the beach. Ground syrvey and UAV survey have been performed during this project here.

Considering all this information, during summer seasons of 2020-2023 (the usual nesting season for sea turtles in the Mediterranean), systematic monitoring has been done in the above-mentioned areas, as well as in new areas introduced from the information gathered from people and fishermen as part of Action E2 of the LIFE MEDTURTLES project framework.

MATERIALS AND METHODS

In order to complete the objectives of Action C1 in Albania, Herpetofauna Albanian Society has introduced aerial monitoring with UAV (Figure 2.1), the first time this method is applied in Albania, as a more efficient method of monitoring larger coastline length (around 16 km) in shorter time period. Systematic monitoring has been done over all the areas with highest nesting potential described above (Gjiri i Drinit, Gjiri i Lalzit and Kepi i Rodonit, Divjakë), as well as in the areas added to the monitoring program from the information of other people and fishermen obtained from action E2, where, in collaboration with the Regional Protected Areas Authorities, very important effort has been made to raise awareness and provide correct information about sea turtles and their nests, through the distribution of many brochures, the installation of many educational signs, the organisation of interviews with local and national media, and discussions with hundreds of citizens (Figure 2.2). Explanation of the monitoring numbers is shown in Table 2.1.

Figure 2.1. *Images of the DJI Mavic 2 Pro UAV used by Herpetofauna Albanian Society for aerial monitoring of the coast for nests, the first time this method is used in Albania, images from Herpetofauna Albanian Society*

Figure 2.2 Images *(from left to right), (1) placing awareness raising signs, (2) handing out brochures and other materials to raise awareness and to give the right information regarding sea turtles and their nests to fishermen and the general public, (3) an awareness-raising meeting organized with a school, images from Herpetofauna Albanian Society.*

Table 2.1 *Numbers of monitoring days completed by Herpetofauna Albanian Society during the 2020-2023 monitoring seasons by area.*

	Years				
	2020	2021	2022	2023	**Total**
Gjiri i Drinit	9	7	9	6	31
Gjiri i Lalit dhe Kepi i Rodonit	8	5	6	9	28
Divjakë	22	16	14	14	66
Seman	17	10	11	12	50
Darëzezë	2	3	3	3	11
Spille	-	2	3	4	9
Total	**58**	**43**	**46**	**48**	**195**

Note: the table includes only the monitoring done solely by Herpetofauna Albanian Society, because, due to our close collaboration with the regional protected areas agencies, we have also received almost daily reports for all the areas listed in the table above (which are not included in the table).

***Figure 2.3**. Photos made during UAV monitoring, left Rana e Hedhun, right Kepi i Rodonit.*

RESULTS

Nesting activity of loggerhead sea turtle (*Caretta caretta*) in Albania has been confirmed. Despite no proper/permanent nesting sites are found in the country, sporadic nesting seems to happen throughout the coastline. Thanks to all the awareness campaigns an increase in people's interest to participate in the protection of sea turtles and their nests has been noticed by the HAS team. Thanks to this activity, we have managed to monitor almost the entire coastline of areas with potential nesting activity. In addition, HAS has also recorded sporadic events reported by fishermen, citizens or beach visitors.

During the LIFE MEDTURTLES project, three (3) loggerhead sea turtle nests have been detected, protected and studied, two of which hatched successfully and 1 failed as a result of moisture from flooding of the nest.

GENERAL CONCLUSIONS

The LIFE MEDTURTLES project has confirmed the presence of sporadic nesting of loggerhead sea turtles in Albania, helping to protect these nests. In Spain, it has reinforced the detection of nests in the Valencia region, thus facilitating the protection of most of them. It is possible that some of the nests laid, especially on natural beaches, may be lost for study; however, the information campaigns carried out during the project have undoubtedly increased the number of nests detected and therefore protected in these countries.

The project has made possible to establish and consolidate contacts with other institutions, both within and outside the working areas, in order to standardise and increase the effectiveness of the methodologies used in the detection and protection of sea turtle nests.

Thanks to the project, a large amount of scientific information on the reproductive biology of this species in emerging nesting sites has been obtained, and will be incorporated to wider studies at national and western Mediterranean levels. This will help to understand the population dynamics of loggerhead turtles in the European Mediterranean in what appear to be phenomena of expansion and colonisation of this species in the basins of this sea. The protection of the loggerhead turtle nests and the other conservation measures applied throughout the project will help the maintenance and possible growth of their populations, facilitating the return to these beaches of some of the turtles born on these beaches to nest as adults.

REFERENCES

Cardona L; San Martıín J; Benito L; Tomás J; Abella E; Eymar J; Aguilera M; Esteban JA; Tarragó A; Marco A. (2022). Global warming facilitates the nesting of the loggerhead turtle on the Mediterranean coast of Spain. *Animal Conservation* doi:10.1111/acv.12828

Tomás J. 2023. First record of Loggerhead Sea Turtle (*Caretta caretta*) clutch predation in Spain. *MedTurtle Bulletin* 3: 9-12.