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

INTERMID REPORT ON NESTING ACTIVITY OF THE LOGGERHEAD SEA TURTLE (*Caretta caretta*) ON THE MEDITERRANEAN COASTS OF SPAIN AND ALBANIA, AND CONSERVATION ACTIONS DURING THE PROJECT LIFE MEDTURTLES

Jesús Tomás
Marine Zoology Unit, Cavanilles Institute of Biodiversity and Evolutionary Biology, University of Valencia, Spain
(Coordinator of activities A2 and C1)

April 2022

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

Summary

In this report we present the results of the action to monitor and protect the nesting activity of the loggerhead sea turtle (*Caretta caretta*) in the Mediterranean coast of Spain and Albania during the project LIFE MEDTURTLES (nesting seasons of 2020 and 2021).

Since 2001, sporadic loggerhead sea turtle nests and nesting attempts have been recorded in the Spanish Mediterranean coasts, as well as in other coasts of the European western Mediterranean, in what seems to be an increasing trend in nesting of this species in this basin. In Spain this trend is notorious since 2014, with records in Spain's beaches every year. Protection and management for successful incubation of eggs has been variable in the country. Relocation have been mandatory in many cases since most of the nests are being laid in urban/tourist beaches featuring promenades, buildings, lighting over the beach, and many of them being cleaned every morning with machinery. In the last two years, the UVEG team (University of Valencia, Spain), has collected information on nesting activity in the whole Spain's Mediterranean coasts, in collaboration with regional and national environmental institutions. Moreover, the UVEG team has contributed to the protection of two nests in the Valencia region and has assisted in the detection and relocation of other two nests in the Murcia region (South-East Spain). These nesting events, although sporadic, have been proven to be a successful way to involve public and private institutions in the conservation and awareness of this species in the region. Public awareness and training campaigns have been carried out over the last two years in order to increase detection of these events. However, the economic support of conservation projects and institutions is necessary for a successful protection of the clutches in order to keep this increasing trend in numbers.

Nesting of loggerhead turtle in Albania has been confirmed lately, since 2018. During summer season of 2020 and 2021 a constant beach monitoring has been done in the areas where nesting activity was reported before, as well as in new areas introduced from the information gathered from people and fishermen, as part of the LIFE MEDTURTLES project framework (Action C1). Despite the many days of monitoring, only one nest has been found during the 2020 monitoring season in Seaman beach. Seaman had no previous nesting records for loggerhead turtle, thus showing how important is to expand monitoring as much as possible in the future in this country, something that will be continued in the nesting season of 2022.

REPORT on Management of sea turtle nesting activity in SPAIN under the project LIFE MEDTURTLES: The role of the University of Valencia (UVEG) team.

VNIVERSITAT DE VALÈNCIA

Management plans, collaborations and data compilation at national level.

Following the meeting organised by the Spanish Ministry of Environment (MITERD) in Valencia in 2018, a debate and exchange of experiences among sea turtle specialists, including the ones of the UVEG team, the technicians of the ministry and the environmental offices of the regional governments has been frequent. In January 15th 2020, J. Tomás (UVEG) attended a meeting organized by the Spanish Ministry in Madrid to discuss the strategy for marine turtle conservation in Spain. 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 experts were invited to this meeting, in which the UVEG team explained the actions to be carried out in the Valencia region for turtle nesting activity during the LIFE MEDTURTLES project. During this meeting the contents of the Action Plan for marine turtle conservation and the protocol for managing nesting events were discussed.

UVEG team also participated as a consultant in the two-days online meeting organised on March 10th-11th 2020 by the Spanish Ministry of Environment with the panel of sea turtle experts. In this meeting, the actions related to conservation and management of nesting females and clutches throughout the Spanish Mediterranean coasts were discussed. This meeting was organised to find consensus and better define strategies and management recommendations to be included in the National Protocol for nesting sea turtle conservation in Spain.

After this meeting, a draft of the protocol was forwarded to the experts (including J. Tomás) for final amendments, in order to have a definitive version to be applied in all the Spanish Mediterranean Regions from Summer 2020. The UVEG team reviewed three different versions of this draft for the Spanish Ministry. When the draft was sent to regional governments to receive their input in May 2020, the regional government of the Valencia Community asked the UVEG team to review this protocol and to adapt it to the Valencia Region needs.

A definitive version of the '*Acting common protocol for attending nesting events of marine turtles in Spanish coasts*' was released by the Spanish Ministry in September 2020 and distributed to the different Regions. Then, the dissemination of the protocol and action plan to municipalities and stakeholders of the Valencia Region was delayed

to the 2021 nesting season. The UVEG team was in close contact with technicians of the Spanish Ministry to coordinate actions related to detection and protection of nesting activities in the 2021 and following seasons. Furthermore, the UVEG team is in close contact to other teams formed by regional governments, universities, and rescue centres in other Spain's Mediterranean Regions to coordinate the conservation actions and to exchange information on nesting activity in the Spain's Mediterranean beaches. These contacts resulted in close collaboration and specific actions in nesting events and clutches laid in Murcia region (Southeast Spain) in 2020, including the relocation of one clutch to a safer place and the finding of a clutch (after detecting hatchlings crawling on an isolated beach) by the UVEG team (Figure 1). This collaboration was essential since the team in Murcia region had little experience in clutch relocation (the first of these two nests was laid too close to the sea in an urban-tourist beach and needed relocation), and this team could not find the second clutch (detected after seen a hatchling crawling on the beach) for three days until the UVEG team helped them. Nest excavation made by the UVEG team resulted in the finding of four live hatchlings in the nest chamber, five days after the first emergence detected.

Figure 1. *Images of the collaboration of the UVEG team with the authorities of the Murcia region (Southeast Spain) in detection, management, and relocation of nesting events and clutches laid in this region in 2020.*

On May 10-11th 2021, the Spanish Ministry of Environment 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 objectives of this training action were to support those responsible of taking actions attending the sea turtle nesting events in the different Mediterranean regions of Spain, as well as to teach managers and technicians in the processes of detection, management and handling of females and clutches of the species. The training action had also the objective of standardize best methodologies for detecting and protecting nests among regions. J. Tomás, from UVEG team, attended to this meeting as invited speaker and consultant, sharing his experiences and knowledge with technicians and managers of the environmental offices of the regional governments from 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*'.

Also, 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. The UVEG team consolidated contacts with technicians and managers of the different Spanish Mediterranean regions to coordinate actions to protect loggerhead turtle nests in the 2021 nesting season. This collaboration resulted in the assistance to the regional team in Catalonia in the tagging with a satellite transmitter of a loggerhead turtle nesting female in Tarragona province. The track of this turtle will be incorporated to the pool of tracks collected by the UVEG team throughout the LIFE MEDTURTLES project to create distribution maps of the species as part of the activity C3 of the project.

Summary of nesting activities in Spain

Before these coordination efforts among regions and institutions, the UVEG team has been attending loggerhead turtle nesting events in Spain since 2001 (Tomás et al. 2002), most of the times using particular funds. Clearly, the Valencia Community has been beneficiated from the experience of the UVEG team, with 6 successful relocation clutches, many nesting attempts recorded and four adult nesting females satellite tracked. This experience has also beneficiated other regions, as said before, consolidating the UVEG team as a reference in managing nesting events of marine turtles in Spain. The LIFE MEDTURTLES project has provided resources for this team to increase effort and efficiency in attending these events, both in the Valencia Community and neighbouring regions, increasing the detection and, thus, the protection of loggerhead sea turtle clutches. The UVEG team is also collaborating with other teams in the compilation of all data of nesting events in Spain since 2001, hosting the most complete database, in order to determine trends (Figure 2), and to increase knowledge on the nesting behaviour of the species in this country.

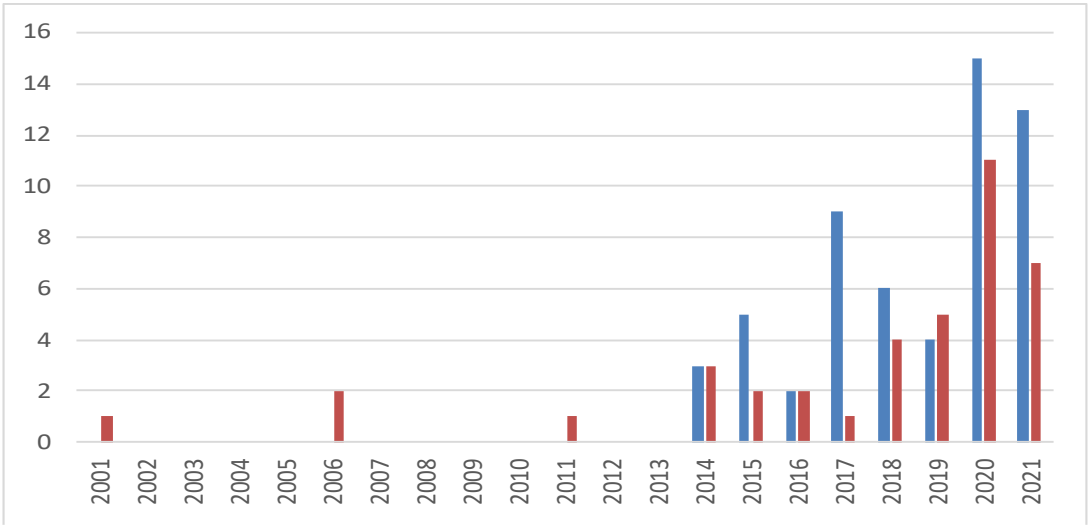

Figure 2. *Annual number of nests (red) and nesting attempts (blue) recorded in the Spanish Mediterranean coasts from 2001 to 2021 (both included).*

Although the increasing trend of nesting activity was already observed in Spain before 2019 (see Figure 2), the results on nesting records in 2020 has been remarkable (Figure 3), probably due to these collaborations among institutions, the consequent increase in awareness campaigns and the support of conservation projects such as LIFE MEDTURTLES.

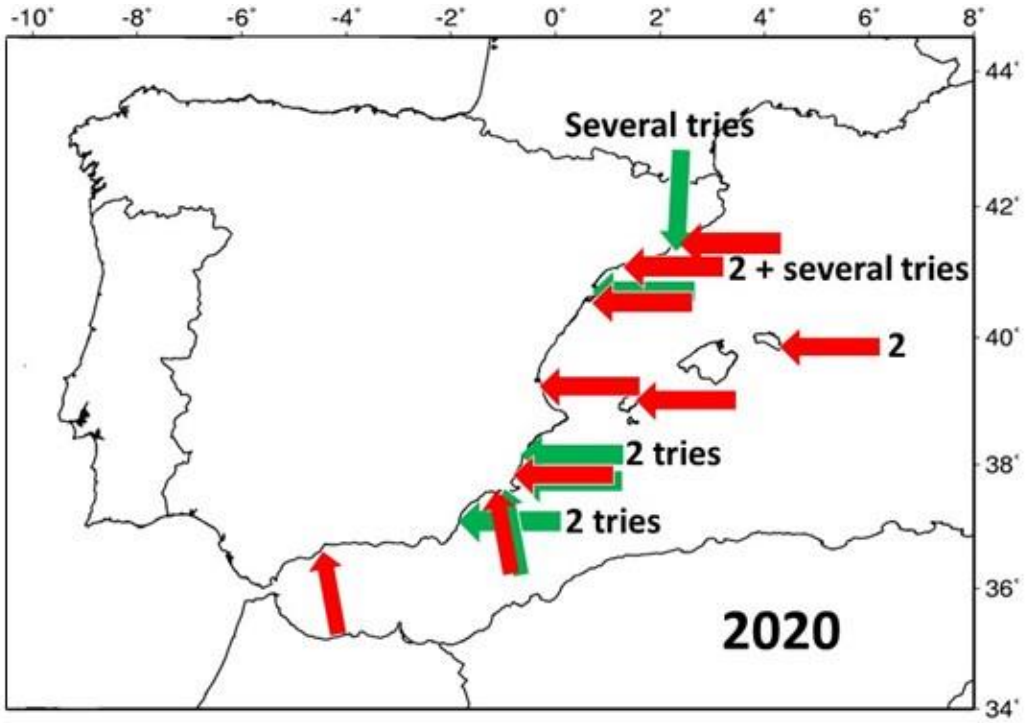

Figure 3. *Nests (red) and unsuccessful nesting attempts (green) recorded in the Spanish Mediterranean coasts in 2020.*

The season 2021 showed a slow decrease of the events recorded (Figure 2), however, we have bear in mind that Spain experienced an increase in COVID cases in June and July 2021 leading to restrictions of mobility. For instance, in the Valencia region it was curfew, forbidding people to be on the streets and beaches at night.

None the less, a good number of loggerhead turtle nests and nesting events were also recorded in all regions of the Spain's Mediterranean coasts, including the Valencia region (Figure 4). Catalonia region received most of the nests recorded. In the last two years, the UVEG team and associates of the Valencia region has collaborated with teams working in Catalonia in tagging nesting females and post-hatchlings from head-starting programs.

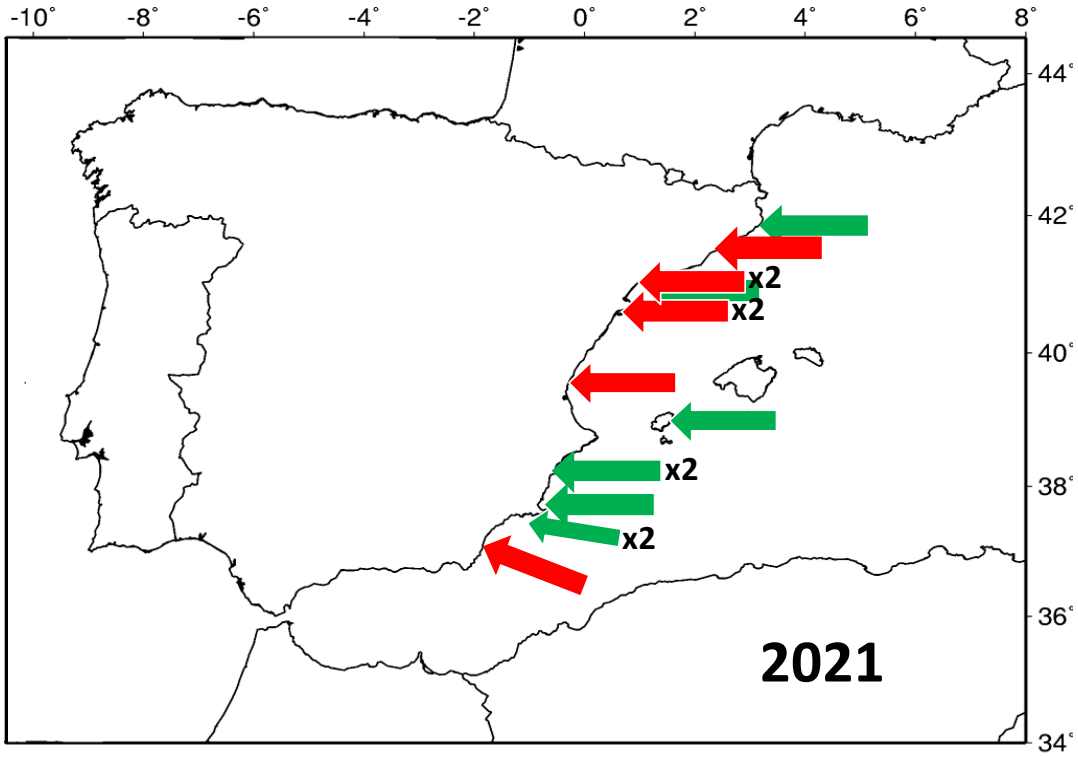

Figure 4. *Nests (red) and unsuccessful nesting attempts (green) recorded in the Spanish Mediterranean coasts in 2021.*

Nesting activities in the Valencia region in 2020 and 2021

2020

Three nesting events were attended in the Valencia region in 2020, one with egg laying. The first two occurred at the end of June on beaches of the municipality of Orihuela, South Alicante province, with an interval of four days. Unfortunately, the turtle went back to the sea in the first one. In the second event, the turtle was seen digging, but the network failed in this case due to a failure in the office of the emergency calls. However,

the next day trained collaborators of the UVEG team were sent to the beach and confirmed that the turtle did not lay eggs. No more events were recorded in the area the following days, but other events did it in the southern region of Murcia; hence we believe that all these events belonged to the same turtle moving north to south, trying to nest without success in different beaches.

On July 29th 2020, the protocol worked perfectly and the UVEG team, with other institutions collaborating, moved to a beach in Cullera (Valencia province) to attend another event. The nesting turtle was sighted and reported by a local fisherman at night on the beach. The turtle laid eggs and was retained at the beach following the instructions of the UVEG team until our arrival. The turtle was tagged with a flipper tag, a pit-tag and a satellite transmitter to follow its post-nesting behaviour (Figure 5). Blood and skin samples were taking for further studies on population genetics and an ultrasound scan revealed eggs of a second clutch in formation. Two weeks after nesting in Cullera, the turtle emerged to nest three times in beaches of Almeria province (Southeast Spain), hundred kilometres away, without success before leaving the Spain's Mediterranean waters (see below).

The turtle laid a total of 85 eggs that were moved by the UVEG team to a protected nesting beach (68) and to artificial incubator (17), following the regional protocol of the Valencia region (Figure 5). The relocation was necessary because the original beach is a beach of high tourist use, with promenade, bars and artificial light.

After hatching, the UVEG team proceeded to study the clutch success. As in previous nesting events in Spain, both with and without clutch relocation, we observed many undeveloped eggs. This may be due to different causes, such as bad feeding and bad store of energy reserves by the female turtle or due to deficient fertilization by males. Further studies are needed to determine this high percentage of undeveloped eggs. Incubation temperatures were also monitored with temperature recorders.

From 56 developed eggs, 37 hatched successfully, with 23 hatchlings released back to the sea in the same nesting beach at Cullera and the rest moved to rescue centre facilities in Valencia for a head starting program. These head-started turtles were released in the same beach of Cullera a year later, being four of them satellite tagged by the UVEG team with LIFE MEDTURTLES funds (Figure 5). The tracks of these post-hatchlings and the one of the nesting female will join the many loggerhead turtle tracks collected during the project by the UVEG team and associates in order to create distribution maps to be used in activity C3 of this project.

Interestingly, this nesting female crossed the Mediterranean Sea to the coasts of Libya and went back to the western Mediterranean. Currently the turtle is still transmitting from the Algerian basin, and we expect this turtle to come back to nest again in 2022 season.

Figure 5. *Different moments of the management of the nesting event occurred in Cullera (Valencia province) in 2020 and the release of head-started post-hatchlings in 2021.*

2021

Only two nesting events were recorded in the Valencia region in 2021. As in 2020, a turtle was seen twice trying to nest in beaches of Orihuela (Alicante) at the end of June, again without laying eggs. The UVEG team checked the place of the second emergence, near a business of pedal-boat rental, but just to confirm the absence of eggs (Figure 6).

Figure 6. *Unsuccessful emergence of a loggerhead turtle in a beach of Orihuela (Alicante) in 2021.*

On September 28th, a call to the emergence phone number indicated the presence of small turtles crawling by a promenade in a beach of El Puig (Valencia). the UVEG team contacted the local police, and went to the area, confirming the presence of loggerhead hatchlings on the beach and over the promenade and the adjoining vegetation. The hatchlings were attracted by the light of the promenade and buildings near the beach. The UVEG team managed to locate the exact position of the nest chamber. After verifying that there were no more hatchlings emerging from the nest, they proceeded to study the clutch to determine the hatching success and take samples from egg shells and dead embryos.

A total of 13 hatchlings were rescued, but we were informed that passers-by released more hatchlings to the sea before our arrival. Those 13 hatchlings were moved to the Valencia rescue centre at the Oceanogràfic to be included in the head-starting program. One of these hatchlings presented a trauma in the skull and passed away; however, the next day another call from citizens indicated the presence of other two hatchlings of the same clutch on the beach. Those were collected and also moved to the rescue centre. In total, 14 hatchlings are currently at the rescue centre. The UVEG team is purchasing satellite transmitters for several of those hatchlings.

In total, the clutch had 120 eggs, and the clutch study revealed that at least 70 hatchlings emerged alive from the nest, but following the many tracks on the sand, none of them headed to the sea, hence all them were collected and released by passers-by or moved to the rescue centre. This event allowed us to confirm what is already described in other places: the threat of promenade lighting for hatchlings emerging from nests. The UVEG team is taking action developing a campaign addressed to coastal municipalities for they to rethink the lighting of promenades and beachfront houses.

Figure 7. *Nesting event at el Puig (Valencia) in September 2021. of a loggerhead turtle in a beach of Orihuela (Alicante) in 2021. The picture on the right-up shows the illumination at the beach that night, since it was taken with no flash. The lower picture shows the clutch contents after the nest study performed by the UVEG team.*

Awareness campaigns

The LIFE MEDTURTLES project has allowed to relaunch the campaign "ALERTA TORTUGA" created in 2015 in the Valencia region. The campaign was created after the nest recorded in San Juan, Alicante in 2014. However, after several years we detected the need of reinforcement of this campaign. Under the project, the UVEG team, in collaboration with the local NGO Xaloc and the regional government, has developed and spread the campaign for detection of nesting females, turtle tracks, and hatchlings crawling on the beaches (Figures 8 and 9).

Figure 8. *Poster of the campaign for detection of nesting females developed under the project LIFE MEDTURTLES.*

Figure 9. *Poster of the campaign for detection of hatchling on beaches developed under the project LIFE MEDTURTLES.*

Due to the closure derived from the COVID19 situation, this campaign was communicated through email and phone contacts to all coastal municipalities of the region, except in few beaches of Valencia province, in which poster were set on site. However, in May 2021 the UVEG team organised a meeting and a training session in Santa Pola (Alicante). Environmental technicians, local police, beach cleaning teams and beach rescue teams of five municipalities of the South of the Alicante province (ranging about 60 Km of coast), and representatives of local NGOs, attended to this meeting. As seen before, several nesting activities have been detected in these coasts in 2020 and 2021. After this meeting, posters of the campaign ALERTA TORTUGA were placed on beaches of this municipality (Figure 10). A second meeting and training session in this area is scheduled for June the 1st 2022.

Moreover, the UVEG team has assisted and trained local NGOs, such as Ecologistas en Acción Elche, on night and early morning patrols on beaches of this area, and also on the development of their own awareness campaigns (Figure 11). These campaigns and the patrols have been organised in agreement with the protocol for attending nesting events in the Valencia region, which is coordinated at regional level by the UVEG team.

Figure 10. *Posters of ALERTA TORTUGA campaign set on beaches of Santa Pola (Alicante) in summer 2021.*

Figure 11. *Campaign for detection of nesting events carried out in summer 2021 by the UVEG team and the NGO Ecologistas en Acción in Alicante province.*

Conclusions

The increasing number of records in the recent years probably reflects more the increasing in effort, allowing the detection of nests in natural beaches much less visited. However, we cannot discard a potential colonization process occurring currently in the western Mediterranean (Carreras et al. 2018). In fact, the increasing of records is allowing to increase knowledge of this potential colonizing stock of nesting loggerhead turtles. For instance, two areas of special concentration of nesting events seems to be defining: the South of Catalonia region and the area including the South of Valencia Community and the region of Murcia; although nesting is still scattered throughout the coast.

Moreover, first remigrants (i.e., turtles nesting in different seasons) have been detected thanks to tagging and satellite telemetry applied on nesting females under the present project. Also, different nesting strategies have been observed; with some turtles exhibiting a certain degree of philopatry and other turtles nesting consecutively, within the season and/or between seasons, in beaches hundreds of kilometres away.

Tagging of nesting females and post-hatchling will help in providing information on the biology of these understudied age classes at the western Mediterranean Sea. This information will be used in the activity C3 of the project LIFE MEDTURTLES to inform fishermen about the areas of special use of these important size classes for the conservation of the species in the area.

The work of the UVEG team has allowed to detect anthropogenic threats for nesting females and hatchlings of the loggerhead sea turtle in our coasts, carrying out tasks to reduce the effect of these threats.

References

Carreras C, Pascual M, Tomás J, Marco A, Hochsheid S, Castillo JJ, Gozalbes P, Parga ML, Piovano S, Cardona L. 2018. Sporadic nesting reveals long distance colonisation in the philopatric loggerhead sea turtle (*Caretta caretta*). Scientific Reports 8:1435 | DOI:10.1038/s41598-018-19887-w

Tomás J, Mons JL, Martín JJ, Bellido JJ, Castillo JJ. 2002. Study of the first reported nest of loggerhead sea turtle, *Caretta caretta*, in the Spanish Mediterranean Coast. Journal of the Marine Biological Association of the United Kingdom 82: 1005-1007.

REPORT

Results obtained from nesting monitoring during the summer 2020- summer 2021 periods

C1 Mitigation of threats at nesting sites

HAS - Herpetofauna Albanian Society

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

INTRODUCTION

After being suspected and investigated for many years in Albania, nesting of loggerhead turtle (*Caretta caretta*) in Albania has been confirmed lately, in *Divjakë* during the summer of 2018 **Figure 1.1**. Despite being considered as sporadic nesting which seems to happen throughout the coastline, with the three main areas being *Gjiri i Drinit*, *Gjiri i Lalzit* and *Kepi i Rodonit*, as well as *Divjakë*, more data and reports from people show a great increase in the possible cases for sea turtle nesting, even in new areas with no previous data, thus making constant monitoring for sea turtle nests a necessity for Albania.

Considering all of this information, during summer season of 2020 and 2021 (the usual nesting season for sea turtles in Albania), as part of the LIFE MEDTURTLES project framework (Action C1), a constant monitoring has been done in the above-mentioned areas, as well as new areas introduced from the information gathered from people and fishermen as part of Action E2 of the LIFE MEDTURTLES project framework. Please find below the materials and methods used in this activity, as well as the results obtained.

Figure 1.1 *Images of the first loggerhead sea turtle nest in Albania, found in Divjakë, during the summer of 2018, images from Herpetofauna Albanian Society*

MATERIALS AND METHODS

In order to complete the objectives of Action C1, 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 a much larger coastline length (around 16km) over a shorter time period. Constant monitoring has been done over all the areas with the highest nesting potential (*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 agencies very important progress has been made by the lot of brochures handed out to raise awareness and to give the right information regarding sea turtles and their nests, placing many awareness raising signs, organizing interviews with local and national media, as well as discussing with hundreds of citizens, **Figure 2.2**. From this information gathered as part of Action E2, three areas were introduced during 2020 and 2021, *Seman*, *Darëzezë*, *Spille*. Please find a detailed explanation of the monitoring numbers in **Table 2.1**. In 2022, from the new information of Action E2, Herpetofauna Albanian Society is also planning on introducing three new areas, *Nartë*, *Velipojë*, and *Rrillë*.

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 2020-2021 monitoring seasons by area*

	Years		
	2020	2021	Total
Gjiri i Drinit	9	7	16
Gjiri i Lalzit and Kepi i Rodonit	8	5	13
Divjakë	22	17	39
Seman	17	11	28
Darëzezë	2	3	5
Spille	-	2	2
Total	58	45	103

Note: the table only includes 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).

RESULTS

Despite the many days of monitoring, only one nest has been found, the loggerhead turtle nest found during the 2020 monitoring season in Seaman beach, **Figure 3.1**, as one of the areas introduced to the monitoring program as part of the information gathered through Action E2, with no previous nesting records for loggerhead turtle. After finding this nest on the 8th of June in 2020, the staff of Herpetofauna Albanian Society closely monitored the nest for all it's hatching period, providing a bigger nest cage than those originally planned by the LIFE MEDTURTLES project framework, as the nest was very close to a populated beach, making the nest more vulnerable if not for the bigger nesting cage. This cage was built in collaboration with a subcontractor working for the Trans Adriatic Pipeline, and a barricade was also built to prevent excess water from flooding the nest (because the nest was closer than usual to the coast), **Figure 3.2**. Despite the effort of Herpetofauna Albanian Society to keep the nest safe, a violent storm struck the coast of Seman, and by that point, the moisture levels in the nest greatly increased above the required levels, thus making it unable for the nest to successfully hatch, and thus failing.

But, as mentioned above Seman was a new area introduced in the monitoring program, with no previous nesting records for loggerhead turtle which was just added as part of the information gathered through Action E2, thus showing how important it is to expand our monitoring as much as possible in the future, something that we will continue to do even the 2022 monitoring season with the inclusion of *Nartë*, *Velipojë*, and *Rrillë*, hoping to find and be able to care for more sea turtle nests in Albania.

Figure 3.1 *Images of the loggerhead sea turtle nest found by Herpetofauna Albanian Society during the 2020 monitoring season, before and after the storm and flooding, images from Herpetofauna Albanian Society*

Figure 3.2 *Images of the nest cage and the barricade for the 2020 Seman loggerhead sea turtle, images from Herpetofauna Albanian Society*