Collective actions for improving the conservation status of the EU sea turtle populations (LIFE1S NAT/HR/000997) Project is carried out with the assistance of LIFE financial instrument of the European Union







Collective actions for improving the conservation status of the EU sea turtle populations



LIFE15-NAT/HR/000997 DECEMBER 2021

01/09/2016-31/12/2021

Countries: Croatia, Cyprus, Greece, Italy, Malta, Slovenia

Coordinating Beneficiary:

Croatian Natural History Museum, Croatia (CNHM)

Associated Beneficiaries:

ARCHELON the Sea Turtle Protection Society of Greece (ARCHELON) Blue World Institute of Marine Research and Conservation, Croatia (BWI) Department of Fisheries and Marine Research, Cyprus (DFMR) Nature Trust Malta (NTM) Oceanography Centre University of Cyprus (OC-UCY) Dept. Biology and Biotechnologies "C. Darwin" Univ. Rome "La Sapienza", Italy (UNIROMA1) University of Primorska, Slovenia (UPR) WWF Italy (WWFIT)rper suscipit lobortis





CONTENTS

PREMISES	04
AFTER-LIFE OBJECTIVES	05
REDUCE THE IMPACT OF ANTHROPOGENIC THREATS AT NESTING SITES	06
REDUCE FISHERY-RELATED THREATS AT FORAGING GROUNDS	07
IMPROVE RESCUE CENTERS AND NETWORKS	11
EXTEND MARINE NATURA 2000 AREAS	13
PROMOTE COMMON APPROACHES AND METHODS	14
PROMOTE SEA TURTLES AS A COMMON AND SHARED NATURAL HERITAGE	15



Sea turtles are reptiles that spend all their life at sea, with one important exception: females must return on land to lay eggs and they all born at land. Moreover, like all vertebrates of terrestrial origin they breath air and they have lungs. Nowadays, only seven species of sea turtles exist and three can be found in the **Mediterranean Sea.** Two of them, the **loggerhead turtle** (*Caretta caretta*) and the **green turtle** (*Chelonia mydas*) also reproduce in the basin and in EU countries.

Sea turtles are threatened by human activities both at land and at sea. At land, **the beaches where turtles lay their eggs are increasingly threatened by human activities.** Lights and human presence on the beach can prevent the female to come ashore to nest or to complete the nesting process. The eggs can be damaged by umbrellas, motor vehicles, beach cleaning machinery and others. The lights of houses, hotels, and streets may disorient the just emerged hatchlings, which find the sea attracted by the reflection of stars on the sea surface. They can go in the opposite direction, dying under the sun the next morning or being found by predators. Finally, wild and our domesticated animals roaming freely on the beaches can destroy entire nests by excavating them. At sea, the **mortality caused by incidental catch in fishing gears** represents the most important threat. Turtles are air-breathers and can drown if submerged for long, as it can happen when captured by trawl or set nets. Turtles incidentally captured by longlines (fishing gears with hundreds or thousands of hooks) are usually released alive, but many will die, mainly for the ingested line.



To reduce these threats, several synergic conservation actions were carried out. At nesting beaches, the project directly protected nests (Action C1) and promoted regulations to reduce anthropogenic impact (A2). The impact of fishing tackled through the adoption by fishers of onboard best practice (C2) or of modified fishing gears (C4), through the identification of hot-spot areas (C3) and of "ghost gears", fishing gears left in the sea representing deadly traps for sea turtles and other marine life (C6), or extending natura 2000 marine areas (C7 and C8). These actions were complemented by the improvement of turtle rescue centers and networks (C5) and by public awareness campaigns targeting local communities (E2).

AFTER-LIFE OBJECTIVES

The general aim of the After-Life plan is to enhance the conservation effects started during the project through the continuation of project activities and the promotion of its approaches.

In this respect, the After-Life plan objectives are:

- Reduce the impact of anthropogenic threats at nesting sites;
- Reduce fishery-related threats at foraging grounds;
- Improve rescue centers and networks;
- Extend marine Natura 2000 areas;
- Promote common approaches and methods;
- Promote sea turtles as a common and shared natural heritage.

REDUCE THE IMPACT OF ANTHROPOGENIC THREATS AT NESTING SITES



Direct detection and protection of nests (Action C1) and promotion of regulations to reduce anthropogenic impact (Action A2) will be continued at several nesting sites in three countries.

In **Cyprus**, DFMR with continue to implement the Action C1 through its own resources and the project's equipment. The UAV will help detecting nests in need of protection throughout the island and the vehicle will help monitoring and patrolling the nesting sites. Through the infrared camera installed at Lara Beach, DFMR will monitor possible human presence during the night, which is forbidden by the law. DFMR is the national authority responsible for the marine protected species. Thus, the implementation of after-LIFE actions will be supported by the competent authority through the legally operation of the Action Plan which aims to improve the conservation status of sea turtles in Cyprus.

In **Greece**, ARCHELON will continue to implement the Action C1 through its own resources and the project's equipment. ARCHELON will continue protecting nests in North Kyparissia Bay and Evrotas, will occasionally continue to monitor beach temperatures and determine sex ratio of hatchlings on possible nests in Preveza and will support and consult the Management Agency of the Protected area who will take over nest protection in Kotyhi. ARCHELON will also follow the implementation of the National Action Plan adopted by the Ministry of Environment (Action A2).



In **Italy**, WWFIT will continue Action C1 through its own resources and the project's equipment (e.g. UAV), carrying on the monitoring activities during the breeding season with its network of operators and volunteers in Sicily, Ionian Gulf, and other areas. WWFIT will also continue the dialogue (started with Action A2) with the administrations of the cities where we identified the nests, to develop even more effective protection systems for nesting beaches.

REDUCE FISHERY-RELATED THREATS AT FORAGING GROUNDS





Different project approaches and actions will be continued in several turtle foraging areas in all the six project countries: information of fishers about how to reduce post-release mortality of turtles caught (Action C2), identification of marine hot-spot areas (Action C3), reduction of the impact of ghost gears (Action C6). The reason why a fishing gear modification did not provide expected results (Action C4) will be investigated to inform future projects. In **Croatia**. BWI will continue to educate fishermen on best practices for the release of bycaught sea turtles (Action C2) and continue to develop cooperation with the fishing fleet operating with a variety of tools in two areas encompassed by project activities. These are key marine foraging grounds for sea turtles in Croatia (off the west coast of Istria and off Lošinj archipelago) with significant rates of bycatch. Working with fisherman will enhance the conservation status of sea turtles due to a change/advancement in the fishing practice that will lower the mortality in fishing gear. BWI employees will continue to reqularly provide fishermen with updated information about the conservation status of sea turtles and significance of sea turtle mortality induced by specific fishing gear used by the respective fishermen (e.g., bottom trawls, longlines, set nets) and information on simple treatment techniques fishermen can adopt on board to dramatically reduce the mortality of sea turtles after their release. This information will be provided through personal conversations in meetings with fishermen which will be organized using BWI's own resources or as part of activities in other projects that are ongoing (e.g., LIFE Delfi; LIFE18 NAT/IT/000942) or in the planning stage. BWI maintains a continuous presence at sea in the mentioned areas, where regular research is conducted which allows for contacts with fishermen operating in the area. Additional T-shirts showing simple graphics on turtle release have been printed towards the end of the project and will continue to be disseminated to the public, including fishermen.

The aerial surveys done during the project (Action C3) revealed the need to conduct similar work in the winter season that would encompass the entire basin, which is a goal we will be working towards in the near future, using experience and lessons learned from this activity. This will be done by employing personnel with experience gained through this survey and by seeking funding from both the national CA and EU programmes.

BWI will continue to encourage the public and especially fishermen to use the dedicated citizen science application developed by the project for collecting data on the position of by-caught sea turtles. This tool aims to increase the sensibility of fishermen to sea turtle conservation issues, facilitating the implementation of mitigation measures (Actions C2). Geo-located information on the observed or bycaught species and sighting circumstances (pictures/video of turtles caught or found) sent to a central online platform contributes to updating the identified sea turtle hot-spot areas. Moreover, following hot-spot maps obtained by integration of results from this action, BWI will continue to encourage fishermen to avoid areas where sea turtle catch rate is higher if alternative areas with a comparable target species catch rate are available. Smartphones with the preinstalled app that were given to fishermen will continue to be used until such time they are no longer operational. We expect fishermen that have adopted the habit of reporting sightings will continue using the app on replacement devices as well.

BWI will continue participating in the improvement and further development of the GSM-GPS transmitters developed by UPR within the project by providing access to animals suitable for the deployment of further iterations of the tags.



Data on the movement of GSM-tagged sea turtles originating from tags that were deployed during the project and are still operating will be processed and analysed. The remaining available tags that we had no time to use due to the delay in their production will be applied to sea turtles of suitable size and condition once these become available. The data coming in from these tagging activities will contribute to define hot-sport areas (Action C3). Additional tags will be purchased after the end of the project through the ongoing project of Improvement and Increase of Sea Turtle Rescue Centre Capacity co-funded from the Cohesion fund of European Structural and Investment Funds.

n **Cyprus,** fishermen will continue to use the citizen science app on the smartphones of the project to provides OC-UCY with information on sea turtles captured or spotted, thus improving the knowledge on turtle distribution and hot-sport areas (Action C3). OC-UCY will continue to use the project UAV to conduct aerial surveys over marine areas to identify the presence of ghost gear to be removed (Action C6). OC-UCY already secured funding from HENKEL DIXAN to carry out further ghost gear removals and proceed with their processing and conversion to energy for driving other industrial processes.

In **Greece**, ARCHELON will continue to inform fishermen in Mesolonghi about best practice to reduce post-release mortality (Action C2). Longline cutters (turtle release tools) distributed to fishermen are being used, not only to release turtles but also to release other bycaught animals such as dolphins. Tagging equipment and cameras distributed to Mesolonghi fishermen will remain with collaborative fishers in the area. ARCHELON will continue to cooperate with fishermen in Kyparissia Bay, Lakonikos Bay and Rethymno. Occasional aerial surveys at sea will be performed by ARCHELON officers and collaborators to add and update knowledge on the hot spot areas (Action C3) in the years following the end of the project, thanks to the project equipment (e.g. UAV). The continuation of aerial surveys after the end of the LIFE project will be assured by including the relevant activities in ARCHELON's annual Business Plan and associated Budget.

ARCHELON planned to put more efforts on Module 3 of action C6 (information of fishers about the conservation problem of ghost gears and dissemination of the Code of Conduct prepared by DFMR, adapted to the Greek context). However, the Action was stopped due to Covid-19 lockdown. Therefore, plans are on for accomplishing the action after the end of the project: Informative meetings with Mesolonghi fishermen will take place where the adapted Code of conduct will be distributed. The continuation of Action C6 after the end of the LIFE project will be assured by including the relevant activities in ARCHELON's annual Business Plan and associated Budget.

In **Italy**, in the two project areas (Pelagian Archipelago and Gulf of Manfredonia), UNIROMA1 and local partners will continue to use the project UAVs and fishers will continue to provide data about the turtles caught, also through the citizen app of the project. All these activities will improve information on turtle distribution and hot-spot areas (Action C3).

In **Malta**, NTM will continue with the information campaigns to fishermen (Action C2) throughout the year maintaining and establishing new relationships with fishermen across the island. Information material will continue to be prepared and distributed with fishermen.

In **Slovenia**, UPR will continue cooperation with fishermen in order to maximize adoption of the best practice procedures to decrease post-release mortality of incidentally captured sea turtles (Action C2). UPR will also continue with UAV aerial surveys in order to monitor population trends, together with monitoring of relative abundance based upon BPUE and size class analyses, particular size-at-recruitment of northern Adriatic foraging grounds. The GSM-tags developed by the project will be further optimized and will enable continuation of remote tracking of loggerheads and detection of possible changes in habitat use between years and in relation to changing environmental parameters. Location data obtained through UAV and GSM tags will inform about turtle distribution and hot-spot areas (Action C3) and will be used to describe behavioural patterns of sea turtles in Slovenian sea and develop species distribution models to evaluate potential impacts of climate change.

Extensive testing of the green LED light sticks showed no differences in bycatch rates of sea turtles while at the same time they reduce target catch (Action C4). UPR concluded that at this point in time wider adoption of green LED lights cannot be justified and will conduct further research to evaluate factors that influenced this mitigation measure. Additional gear modification methods for bycatch reduction will be explored.



IMPROVE RESCUE CENTERS AND NETWORKS



In Croatia, the Sea Turtle Rescue Centre on Lošini run by BWI was upgraded by purchasing three new tanks, replacing the plumbing network and pumps, and purchasing other relevant veterinary equipment (Action C5) and will provide help to recovered increasing numbers of injured, sick, exhausted, or otherwise compromised sea turtles. Most of the equipment purchased through this action has long-term durability and will be used for some years after the end of the project. The new tanks, filters with the pumps, heaters, spare bulbs for UV lamps for water sterilization, and overhanging UV lamps (aimed at reducing energy consumption and increasing the amount of UVB available to animals in large enclosures) as well as the replaced plumbing network have remarkably improved the conditions for sea turtle recovery and will continue to be used for the same purpose. Procurement of veterinary equipment (laboratory chairs, table for veterinary instruments, sterilizer, walk-on scale and doppler for small animals) improved the state of auxiliary equipment of the veterinary ambulance which is part of the rescue centre and will continue to be used for the purpose of treatment and providing necessary care to injured and sick sea turtles. Manufacturing of "rescue kits" contributed to the strengthening of the network of relevant stakeholders involved in sea turtle conservation in Croatia. These kits included special carrier-containers appropriate for public transport, first aid items, measurement and sampling gear, rescue manual and printed material and were distributed to vet stations along the Croatian Adriatic coast. After the end of the project BWI will continue to support the involvement of these facilities in recovering injured and sick sea turtles which will allow the successful treatment of additional number of turtles per year. Rescue kits will be supplemented with additional material that was bought according to the needs identified during the project. The regular operation of the rescue centre as well as its further improvement and increase in capacity in the period following the end of the project will be ensured by using funds from the EU financial instrument from the Cohesion fund of European Structural and Investment Funds, with the aim of further reduction of the number of turtles dying from anthropogenic factors (e.g., interaction with fishing and collision with boats). Providing care to the animals and ensuring their recovery after the end of the project will be co-financed by the Ministry of Economy and Sustainable Development of the Republic of Croatia. In addition, to provide needed care after expansion of the rescue activities, BWI employed a fulltime veterinarian.

In **Cyprus**, DFMR will continue to operate the existing "Rescue Centre" with own funds, located in Meneou (Larnaca), increasing, if necessary, the number of turtles that are treated and recover from injuries (Action C5).

In **Greece**, ARCHELON will continue to use the major infrastructure refurbishments at the Rescue Centre (addition of large and small tanks, plumbing system, refurbishment of turtle ICU) and equipment (vet equipment for the new surgery, vehicle) to rescue and treat turtles. Rescue kits distributed to Port Authorities, Management Agencies and on-field projects will continue to be used for the treatment and transfer of injured turtles by Port Police and other relevant Authorities, NGOs etc.



EXTEND MARINE NATURA 2000 AREAS

In Croatia, a proposal for the establishment of a new Natura 2000 site including draft actions for site management was produced based on the identification of hot-spot areas for loggerhead sea turtles in the north-eastern Adriatic identified by using both new data specifically collected by this project and data already available from other sources that was acquired since the start of the project. After presentation and submission of the above-mentioned proposal to the Ministry of Economy and Sustainable Development of Republic of Croatia as a Competent Authority, CNHM will continue to exchange information with the Ministry and work towards meeting all requirements for the establishment of a protected area (Action C8). The Ministry confirmed their dedication to establish a Natura2000 area for loggerhead turtles and invited BWI, CNHM and other stakeholders to follow up the participatory process in defining the boundaries. After its designation, both BWI and CNHM will continue to develop scientifically backed management measures that will hopefully contribute to its future effectiveness. Cooperation with the relevant authorities and established practice in data exchange will enable prompt evaluation and possible change and adaptation of management measures helping concrete conservation. This will benefit the loggerhead population and its conservation status by improving the management of anthropogenic threats in the area.

In **Slovenia**, the results of the project will provide information required for the designation of marine Natura 2000 sites for the loggerhead sea turtle. This falls under the obligations of Slovenia under the EU Habitats Directive, but has not been implemented due to lack of data. The results of this project will fill this data gap and enable such sites to be proposed and eventually designated. UPR is in continuous talks with Ministry for Environment and Spatial Planning, Slovenian Environmental Agency and Slovenian Institute for Nature conservation, conveying information from LIFE Euroturtles and other projects regarding biology and distribution of sea turtles in Slovenian sea.

PROMOTE COMMON APPROACHES AND METHODS



The wide geographical and international extension of the project, with a wide partnership, already contributed to sharing approaches and methods. This will be further expanded in other four countries through the LIFE Medturtles project (medturtles.eu), currently in progress, that is a geographical expansion of the LIFE Euroturtles project.





PROMOTE SEA TURTLES AS A COMMON AND SHARED NATURAL HERITAGE



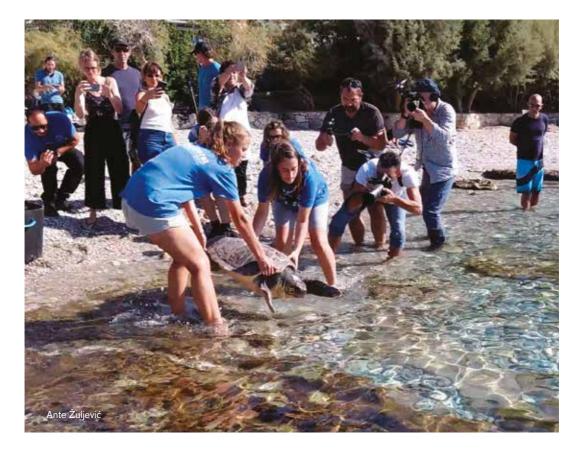
The project produced a variety of information tools for the public awareness campaigns (Action E2) that will continued by the Beneficiaries to promote sea turtle conservation through an improved perception and knowledge of this animals. Moreover, the same public awareness campaigns will be carried out also in additional four Mediterranean countries by the ongoing LIFE Medturtles, that is a geographical expansion of this project.

The project website (www.euroturtles.eu) will continue to be the main dissemination channel after the project ends. CNHM will continue to host the dedicated server for the project and will continue maintaining the internet domain and project website for a minimum of 5 years after the end of the project, using its own resources and infrastructure. All electronic material produced by the project will be stored on a project server and accessible by public. After the project ends, the server will continue to be the project exchange platform and will host the database for the citizen science application. Video on the project activities and documentary on the EU sea turtle population key areas and conservation issues produced within the project will also be available on the project website and project youtube channnel. Furthermore, the education kit will be made available on the project website with presentations and worksheets on sea turtles for schools and accompanying guidelines free to use.

The citizen science application will be available for Android devices to download from the Google Play store (eTurtle; https://tinyurl.com/3m4szss7) so users will have uninterrupted access to use it after the end of the project. Information gathered (as sighting info and maps with locations and species) will be available to

the public on the web and in the application itself. The continued use of the citizen science app will enable communication with the public in the future. In addition, CNHM teamed up with LIFE Medturtles project and provided needed updates so use of the app will continue also as part of that project extending its value and reach to other parts of the sea turtles habitat in the Mediterranean and establishing synergies between LIFE projects.

The guidelines on best practices and monitoring protocols elaborated thanks to the practices learned during project implementation represent useful tools facilitating activities aimed at sea turtle conservation and monitoring of their status under the EU MSFD. These guidelines will be useful both for future projects and competent authorities in the six project countries as well as in other Mediterranean countries. The pdf format of the Guidelines will be available at the project website as the main dissemination channel. Reports produced by analysis of the data collected within the project activities will also be publicly available on the project website. Further, postgraduate students will be invited to carry out their research and analysis on the data available and to get the experience working with the researchers and conservationists that were involved in the project. The results obtained will be published as scientific publications and presented on scientific conferences. Also, social media will continue to be used to disseminate project results.





In **Croatia**, results and lessons learned during the project will be actively disseminated with authorities, professionals, and the public through public appearances in the media, publications, lectures, and general activities carried out in the CNHM and BWI public exhibition places. Informative T-shirts for fishermen showing the proper handling of by-caught sea turtles and info-stickers for general public addressing threats to sea turtles and promoting citizen science app, as well as brochures produced from the project budget will continue to be disseminated as part of the CNHM's and BWI's public awareness activities. Both CNHM and BWI carry out activities aimed at nature conservation and public participation. Therefore, the dedicated staff and number of volunteers of both organizations will continue the activities in educating different age and interest groups and raising public awareness.

Organization of public events will continue after the end of the project. Both CNHM and BWI will continue organizing the awareness days celebrations, such as Natura2000 Day, World Sea Turtle Day, Earth Day, Ocean Day, etc. Cooperation with the media will continue as well, given that public and media will be invited to public events. Mobile exhibition "Conservation of European Sea Turtles" produced within the project will continue to be presented during the organization of public events as a powerful awareness tool. To capitalise and extend synergies, the exhibition has also been adapted for the use in LIFE Medturtles project and is currently translated to several additional languages. As such it will continue to travel throughout the Mediterranean coast. Moreover, both CNHM and BWI will continue to hold lectures and workshops for school groups using the education kit produced as part of the project activities. Citizen science application dedicated for collecting reports of opportunistic observations of sea turtles on the sea, injured or dead turtles or reports on turtle bycatch will be continuously promoted among citizens by both CNHM and BWI. The general aim of the two organizations in promoting and developing citizen participation through citizen science is also a long-term conservation activity.

BWI will keep organizing public releases of rehabilitated sea turtles. Also, it will allow visitors to enter the Sea Turtle Rescue Centre in Mali Lošinj, Croatia, where they can inform themselves about the biology, ecology, threats, and conservation of sea turtles in the Mediterranean.

The listed activities related to data collection, education and raising of the public awareness and public participation will be continued partially using own resources and partially through development of new project proposals and activities.

In **Cyprus**, both DFMR and OC-UCY with continue public awareness campaigns (Action E2) using their own recourses and new recourses from the European Maritime and Fisheries Fund (EMFF) and other funded projects. The informative Posters and Notice Boards will remain in public view in the beneficiaries' premises. DFMR has also installed a notice board in the Polis-Gialia Natura 2000 site where activities of the LIFE Euroturtles took place and this will



also remain in place. Both Beneficiaries will participate in the distribution of dissemination material (informative leaflets) after the end of the project. OC-UCY will also continue to conduct the educational program on sea turtles that was created by OC-UCY during the project and will continue to present and carry out the educational program for sea turtles established for kindergarten and elementary school children across Cyprus with own resources and personnel (Action E2).

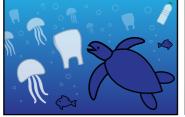
In **Greece**, the informative short video produced for nest protection will continue to be used for viewings for the general public at the Rescue Centre as well as at viewings at the field projects after the end of LIFE Euroturtles. The educational kit produced during the project is an excellent addition to ARCHELON's environmental education material which is used during school visits at the Rescue Centre (more than 100 schools each year) as well as during public awareness actions at the field areas. The mobile exhibition is permanently set at the Rescue Centre to inform the visitors on turtle biology and ecology and the conservation activities implemented by LIFE Euroturtles. Information on the project activities will be available for access at ARCHELON's website.



In Italy, WWFIT will continue raising awareness among the local population and tourists of the exciting areas. The awareness-raising materials created for the project will be used and eventually produced in additional quantities. In particular, we will use the exhibitions produced for the project. They will be permanently set up at WWFIT centers such as the Oasis of Torre Salsa and used for initiatives dedicated to turtles in the summer months in the various municipalities of Sicily affected by nesting.

In Malta, NTM will continue developing campaigns and information sessions to pass on the information throughout the year, but most especially during turtle releases and nesting events.

In Slovenia, UPR will continue to work on education actions at the national level, aimed at the promotion of EU sea turtle population as a common EU heritage. UPR will be continuously displaying the LIFE Euroturtles exhibition at various events, organize public educational events and school lectures.



SEA TURTLES





PLASTIC KILLS! BE AWARE! SLOW DOWN **SLOW DOWN!**



The rescue centers operated by the LIFE **Euroturtles partners:**

BLUE WORLD Institute Kaštel 24, Veli Lošinj, Croatia +385 51 604 666

> ARCHELON Sea Turtle Rescue Centro da Marina, Athens 166 75, Greece

Nature Trust FEE Malta Rescue Centre Marsaxlokk, Malta +356 9999505

MENEOU Turtle Rescue Center, Department of Fisheries and Marine Research of Cyprus +357 9695 2929



The LIFE Euroturtles project has already been exported to other Mediterranean areas in the Western and Eastern parts.

One of the most important achievements of the LIFE Euroturtles project is transfer of approach to joint conservation throughout species distribution range through collaboration with new project Collective actions for improving the conservation status of the eu sea turtle populations: bordering areas - LIFE Medturtles (LIFE18 NAT/IT/000103) that expands the same conservation actions to other 4 EU and Mediterranean countries (Spain, Tunis, Albania and Turkey).



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