



FINS

Vol. 10, December 2020

Newsletter of  **ACCOBAMS**



2020 has been complicated for us as well ...

Original photo by N. Pierantonio/Tethys Research Institute. Edited by the ACCOBAMS Permanent Secretariat

TABLE OF CONTENTS

From our new Executive Secretary	4
Message from the Chair of the Scientific Committee	5
WHAT HAS BEEN GOING ON IN THE BLACK SEA ?	6
A long journey of a stranded sperm whale from Antalya to Istanbul	7
CeNoBS project contributes to MSFD implementation in the Black Sea	8
BlackCeTrends - Large coverage initiative for acoustic survey of cetaceans in the Black Sea	10
Vessel surveys of coastal waters around the Black Sea	12
NEWS FROM THE ADRIATIC SEA	14
Fin whales of the Gulf of Trieste	15
Despite Covid-19 pandemic crisis Tethys' Ionian Dolphin Project reaches its 30 th anniversary	16
The (un)-common dolphin in the Northern Adriatic Sea	18
A Worrying Decline in the Presence of Bottlenose Dolphins in Montenegro & the Importance of Citizen Science During COVID-19	20
DURING THIS TIME IN THE ACCOBAMS AREA ...	21
We are pleased to present MIRACETI	22
News from IMMRAC 2020	23
Dolphin attacked by shark in first recorded incident in Israel	24
Update about the ACCOBAMS High Quality Whale Watching® Certificate	25
The Atlantic side of the Ligurian Sea	26
The educational tool CETAMER	28

WHERE ARE WE ON THE MARITIME TRAFFIC ISSUE ? 29

The entrance of a group of fin whales in the Port of Barcelona forced maritime traffic to be temporarily stopped 30

Interaction between orcas and sailboats at western Iberian Peninsula 32

SAvE Whales: A pioneering high-tech, interdisciplinary project to save sperm whales in the Mediterranean from being killed by ships 35

Proposal to develop and evaluate mitigation strategies to reduce the risk of ship strikes to fin and sperm whales in the Pelagos Sanctuary 37

SURVEYING THE ACCOBAMS AREA 39

IUCN Red List of Cetaceans to be updated with results from ACCOBAMS Survey Initiative (ASI) 40

Four week survey off French Riviera, spring 2020 41

A feasibility study into the integration of unmanned aerial vehicles with conventional cetacean surveys 42

Ferries and environmental DNA: Underway Sampling From Commercial Vessels Provides New Opportunities For Systematic Genetic Surveys Of Marine Biodiversity 44

Latest results from the multidisciplinary "FLT Mediterranean monitoring network" 46

Long term systematic monitoring through aerial surveys: the latest Italian contribution 48

FROM OUR NEW EXECUTIVE SECRETARY



Last April I have been given the honour and the joy to become a member of the renowned ACCOBAMS family.

Although my move to Monaco had tumultuous contours as it coincided with the breakout of the pandemic in Europe, preventing me from meeting ACCOBAMS representatives, actors and partners in a face-to-face context, my adaptation to the ACCOBAMS framework was enabled thanks to the commitment and efficiency of the Secretariat's team.

Nevertheless, the prolonged lockdown circumstances obliged us to organize, for the first time, an online meeting of the Bureau early December.

I take the opportunity to congratulate the newly elected Chair - Mr. Fahrettin ULU (Turkey) - and the four Vice-Chairs of the Bureau - Ms. Elvira Garcia-Bellido Capdevila (Spain), Mr. Gaby Khalaf (Lebanon), Mr. Duncan Borg (Malta), Mr. Abdelali Loudrhiri (Morocco) - for their appointment by the Meeting of the Parties in November 2019, wishing them all possible success during the 3-years period, while hoping to meet them in person very soon, as well as all ACCOBAMS actors, national representatives and partners.

Working in this active organisation gathering important amounts of knowledge and experiencing collaborative endeavours reinforces my daily commitment and enthusiasm towards contributing to our noble objectives. I firmly believe that ACCOBAMS strength lies in its ability to closely collaborate and join efforts regionally also with partners and other organisations in the pursuit of common goals, always in the respect of our - and their - fields of competence.

As a new family member of ACCOBAMS I hope you rest assured that I will faithfully follow ACCOBAMS mandate and priorities, and strive towards achieving in 2022 the objectives that have been defined by the Meeting of the Parties in Istanbul.

Best wishes!

Susana Salvador

Executive Secretary

MESSAGE FROM THE CHAIR OF THE SCIENTIFIC COMMITTEE



Dear friends and colleagues,

The past months have been quite complicated, and we all have experienced a new way of living, doing research, participate to meetings and organize ourselves. The Covid-19 pandemic has indeed changed our lives and we are all looking forward to resuming some sort of normality and tranquillity.

November and December 2019 have been quite busy with several important meetings, such as the 7th Meeting of the ACCOBAMS Parties, held in Istanbul, Turkey in November and the World Marine Mammal Conference, held in Barcelona in December. During these two occasions we spent time discussing science, conservation and management and had great time socializing. None of us could have anticipated the horrible times we were going to witness starting March 2020.

The ACCOBAMS family has reacted very well to this world-wide crisis; we have started working from home and we have moved to virtual meetings. Business as usual has been maintained and ongoing projects have progressed well, despite some obvious and expected delays. The main pillars of the ACCOBAMS scientific projects are ongoing, we made great progress with the ASI and CeNoBS data analysis, we are finalizing the IUCN Red List (re)-assessments for cetaceans in the Mediterranean and Black Seas and effort on by-catch and depredation is up-to-date.

This edition of FINS proves that ACCOBAMS partners are strong and solid and despite the global crises have continued their activities and pursued their mission to improve conservation for Mediterranean and Black Seas cetaceans. The articles featured in this edition cover several topics, ranging from the Atlantic Ocean, to Israel and the Black Sea, covering most of the ACCOBAMS area.

I am particularly proud of the high scientific level achieved in the last challenging months on so many different fronts and topics and wish the entire ACCOBAMS community to keep up with the great conservation progress, looking forward to being able to meet again in person and finally share some moments together, as we were used to do.

Simone Panigada

Chair of the Scientific Committee

WHAT HAS BEEN GOING ON IN THE BLACK SEA ?



A long journey of a stranded sperm whale from Antalya to Istanbul

Ayaka Amaha OZTÜRK

7

CeNoBS project contributes to MSFD implementation in the Black Sea

Marian PAIU

Dimitar POPOV

Ayaka Amaha OZTÜRK

Pavel GOL'DIN

8

BlackCeTrends - Large coverage initiative for acoustic survey of cetaceans in the Black Sea

Marian PAIU

10

Vessel surveys of coastal waters around the Black Sea

Dimitar POPOV

12

A LONG JOURNEY OF A STRANDED SPERM WHALE FROM ANTALYA TO ISTANBUL

Although there are several opportunistic sperm whale (*Physeter macrocephalus*) sightings in Turkish waters, strandings have been very few; only about five cases in the last 55 years. Therefore, Turkish Marine Research Foundation (TUDAV) gives particular attention to this deep diving species' strandings.



TUDAV team took an action to unearth a sperm whale, which stranded on the Mediterranean coast of Turkey, Antalya Kumluca Beach, 14 August 2020, and buried there for scientific studies and preparation of its skeleton as a museum material.

It was impossible to understand the cause of death because of the advanced stage of decomposition. The experts of Faculty of Aquatic Sciences, Istanbul University, and TUDAV decided that the whale, approximately 13 -14m in length, must remain underground a little longer for completing the cleaning process. On 6 October 2020, the whale was excavated very carefully, which took around 5 hours. After having been carefully prepared for the long voyage, the skeleton was transported by truck from Antalya to Istanbul, travelling approximately 700km. The bones were then buried in Istanbul again and they will be dug up once more after sufficient decomposition has taken place to be prepared as a museum material.

Unfortunately, the team found some plastic litter in the stomach, including a plastic jar for milk or yogurt. Although the specimen was semi-decomposed when found at the beach, the cephalopod beaks remained intact even after the burial of nearly 2 months, thanks to the plastic jar! It is very sad to see that even this species, one of the Mediterranean's record holders for diving, is vulnerable to marine litter.



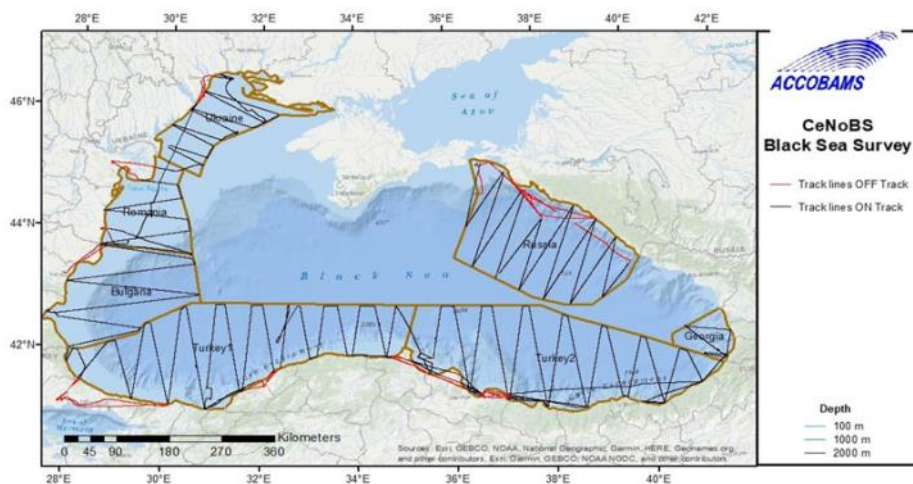
CeNOBS PROJECT CONTRIBUTES TO MSFD IMPLEMENTATION IN THE BLACK SEA



The Black Sea is one of the most vulnerable regional seas and EU Member States in the region, namely Romania and Bulgaria, are responsible for implementation of EU Marine Strategy Framework Directive, in close collaboration with the other non-EU countries.

Researchers from Mare Nostrum NGO, National Institute for Marine Research and Development “Grigore Antipa”, Romanian Ministry of Environment, Water and Forests, Green Balkans NGO, Institute of Oceanology - BAS, Black Sea Basin Directorate, Bulgaria; Ukrainian Scientific Centre of Ecology of Sea; Turkish Marine Research Foundation TUDAV and Black Sea Technical University, Turkey and ACCOBAMS Secretariat have joined forces in **CeNoBS** project (www.cenobs.eu) for a common aim - research and conservation of cetaceans in the Black Sea and their habitats, collecting data on the negative impacts on them and finding solutions, thus improving coordination among the Black Sea countries and harmonizing monitoring programs.

The two descriptors which the project focuses on are Descriptor 1 – marine mammals/cetaceans and Descriptor 11 – underwater noise in the Black Sea. The results from this collaboration will improve the second cycle of MSFD implementation, by achieving greater consistency and coherence in determining, assessing and achieving good environmental status.



In 2019 a historical milestone was achieved for cetacean studies in the Black Sea with international aerial surveys of unprecedented coverage including air spaces of Bulgaria, Georgia, Romania, Turkey, Russia and Ukraine, thanks to CeNoBS and EMBLAS Plus projects.

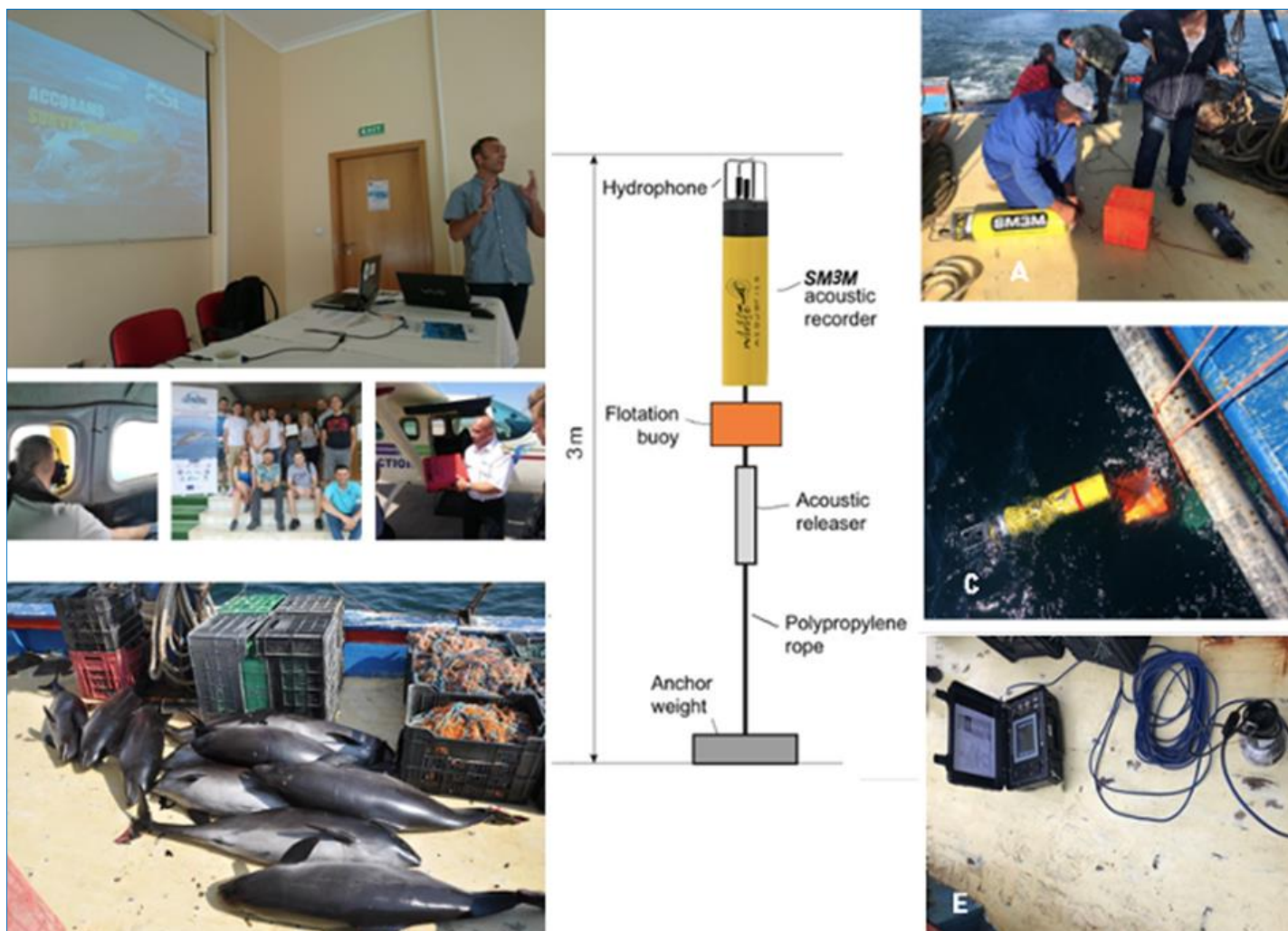
This provided robust estimation of Black Sea cetacean abundance – key criterion for assessing their status. A total of 1,755 cetacean sightings were observed during the aerial survey, with 3,669 individuals from 3 different species. A total of 15,246 kilometres have been surveyed by the two planes in the different blocks, with 9,354 Km on effort and 5,892 km off effort.

Other key topic is bycatch - major human impact on cetaceans globally with the Black Sea not being an exception. It is identified as one of the criteria for Descriptor 1. Studies on bycatch level were conducted in Bulgaria, Romania, Ukraine and Turkey. Researchers have checked more than 270 km of gillnets and recorded 153 bycaught cetaceans with highest share of porpoises – 149. Scientific and environmental organizations from these countries have dedicated their work to find a solution to this problem. One of the most valuable achievements is the contact with the fishing communities as a stakeholder. Their points of view, experience and problems are an integral part of finding a solution. An approach that is deeply rooted in the values of the EC and its instruments.

The project included significant activities on capacity building and supported development of harmonized and state-of-the-art monitoring program for the region. This will fill the lack of baseline data on the distribution/abundance of Black Sea cetacean populations and on bycatch pressure as well as that of national expertise to implement effective noise monitoring. The partners have a great opportunity to enhance coordination among the Black Sea countries through the dissemination of the project activities, results and outcomes.

All participating countries are ACCOBAMS parties thus contributing to the achievement on the Agreement's aims to preserve cetaceans and their habitats within its geographical scope and to reduce threats by improving current knowledge on these animals and implement appropriate conservation activities is essential for all of them.

Support MSFD implementation in the Black Sea through establishing a regional monitoring system of cetaceans (D1) and noise monitoring (D11) for achieving GES"- CeNoBs is co-funded by the European Union thought European Commission Directorate-General Environment grant. 110161/2018/794677 SUB/ENV.C2 and ACCOBAMS. Project value: 548.285.



By:
Marian PAIU, Mare Nostrum NGO, marian_paiu@marenosttrum.ro
Dimitar POPOV, Green Balkans, dpopov@greenbalkans.org
Ayaka Amaha OZTÜRK, Turkish Marine Research Foundation, tudav@tudav.org
Pavel GOL'DIN, UkrSCES, pavelgoldin412@gmail.com

BLACKCeTRENDS - LARGE COVERAGE INITIATIVE FOR ACOUSTIC SURVEY OF CETACEANS IN THE BLACK SEA

An international project “BlackCeTrends” has been launched, in which six institutions from all around the Black Sea: Mare Nostrum NGO (Romania), Green Balkans NGO (Bulgaria), UkrSCES & BioEcoLinks (Ukraine), Turkish Marine Research Foundation TUDAV (Turkey) and Ilia State University (Georgia), together with British acoustic device manufacturer [Chelonia Ltd.](#) with the objective of assessing the trends in Black Sea cetaceans using a passive acoustic monitoring method. The main activity of the project is collection of acoustic data to understand the presence of cetaceans, especially harbour porpoises, by deploying fully automated passive acoustic monitoring instruments of the new generation, F-PODs.

F-PODs are provided for free for a permanent loan as long as they are in use by Chelonia Ltd. They are designed specifically to detect and record the high-frequency sounds of dolphins and porpoises, and they were newly developed from C-PODs, which have been extensively used in the North and Baltic Seas. The collected data are downloaded periodically, approximately every 1-4 months, and the results are processed by specialized software.

Four or five devices have been provided to each of the partners, of which nine are already in place, in the western part of the Black Sea (Figure 1) and all the others will be deployed in the near future.

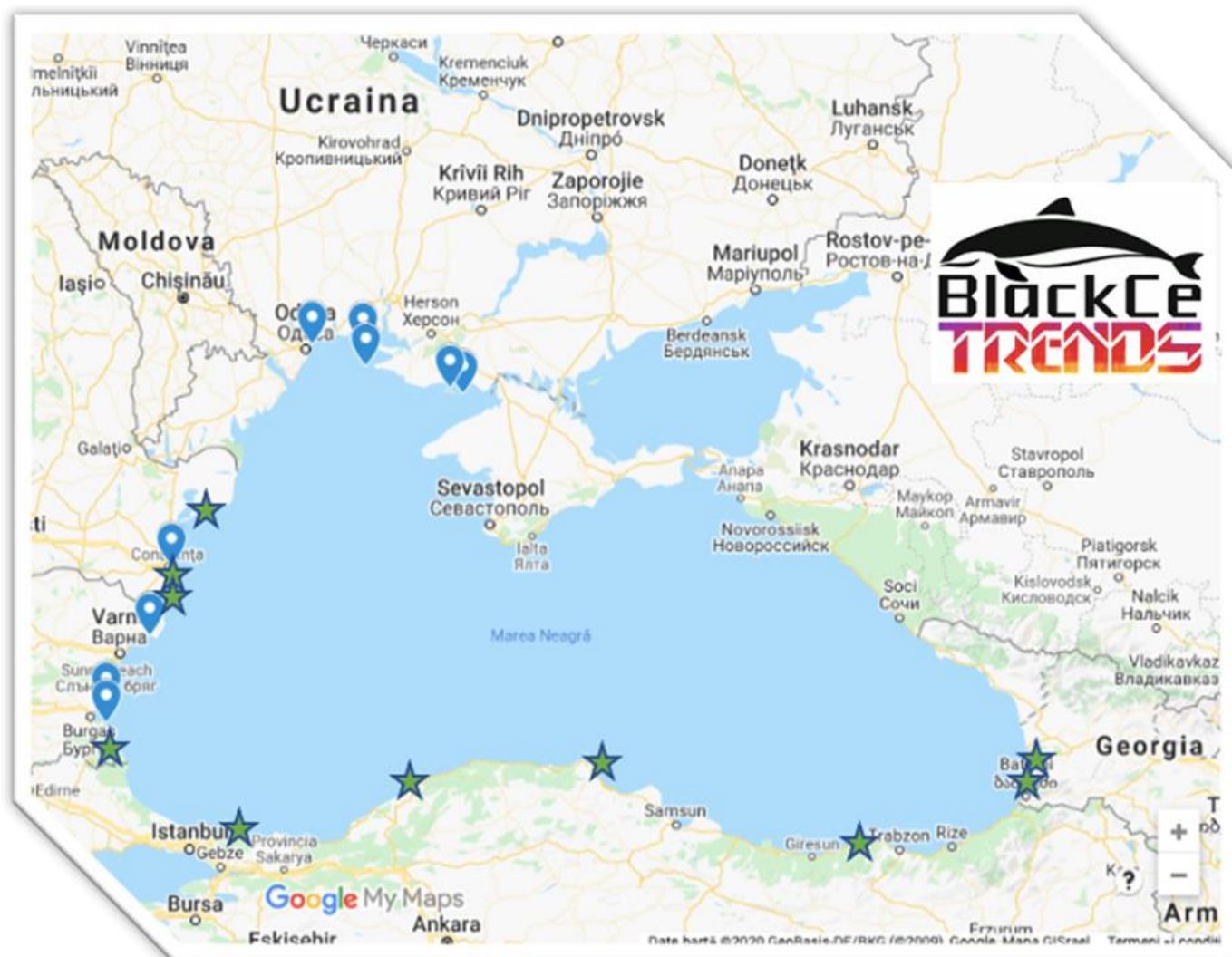


Fig. 1. Blue pins - the sites where the F-PODs were deployed till the end of October 2020. Green stars – the sites where the rest of the F-PODS will be deployed.

The preliminary recording in Bulgaria and Romania showed clear acoustic detections of porpoises and dolphins for the period of deployment under water (Figure 2).



Figure 2. Snapshot of F-POD related activities (deployment, recovery, analysis etc.)

The project is expected to last two years. We hope to collect a lot of interesting and useful data during this period, which will complement the visual observations that the participating teams have been conducting regularly for the last years, as well as serve to protect these beautiful and important animals for the Black Sea ecosystem. Passive acoustic monitoring has been considered useful particularly for detecting harbour porpoises, shy and cryptic animals, which spend most of time under water. Acoustic tools allow us to learn more about seasonal occurrence and diurnal patterns of feeding and other types of behaviour of this small cetacean species, which is represented by an endemic endangered subspecies in the Black Sea.

We express our gratitude to Dr Nick Tregenza and the team of Chelonia Ltd. for kindly providing F-PODs and technical support and those who have helped us in the process with deployment and recovery of the devices and we mention here just some of them: AQUA-MAR DIVING CENTRE (RO), BLACK SEA MUSSELS Ltd, BLACK SEA SHELLS Ltd (BG).

VESSEL SURVEYS OF COASTAL WATERS AROUND THE BLACK SEA

2019 was a historical year for cetaceans' studies in the Black Sea with international aerial survey of unprecedented coverage including air spaces of Ukraine, Romania, Bulgaria, Turkey, Georgia and Russia thanks to [CeNoBS](#) and [EMBLAS](#) projects.

That year saw also another historical highlight in terms of collaboration between Black Sea researchers of cetaceans as series of vessel-based distance sampling surveys were conducted in territorial waters of Ukraine, Romania, Bulgaria, Western Turkey and Georgia during different seasons.

Researchers from Ukrainian Scientific Center of Ecology of the Sea have conducted their survey in the end of May and start of June covering more than 390 km of transects on effort and recording 52 sightings of cetaceans. Most numerous were harbour porpoises with 29 sightings, while two dolphin species' encounters were almost equal: bottlenose with 12 and common dolphins with 11.

In Romania, Mare Nostrum NGO conducted a spring survey that started on 21 April and, after some bad weather days, was completed in period 20-24 May. 420 km of transects were completed gaining 42 sightings. Most frequent have been encounters of bottlenose dolphins – 18, followed by sightings of common dolphin that were 14. Harbour porpoises were encountered only on 10 occasions. In summer, a second survey was planned but due to prevailing strong winds in August it was interrupted. Still, 152 km of transects were covered recording 26 sightings of only two species – bottlenose dolphin dominated with 21 observations, while harbour porpoises were quite rare being sighted only 5 times. Common dolphins were not encountered at all during the transects, but between there were several sightings. Finally, in the fall of 2019 a Joint Cruise was organized within the ANEMONE project (www.anemoneproject.eu) where a mixed team (Romanian and Turkish) was collecting data on cetacean sightings.

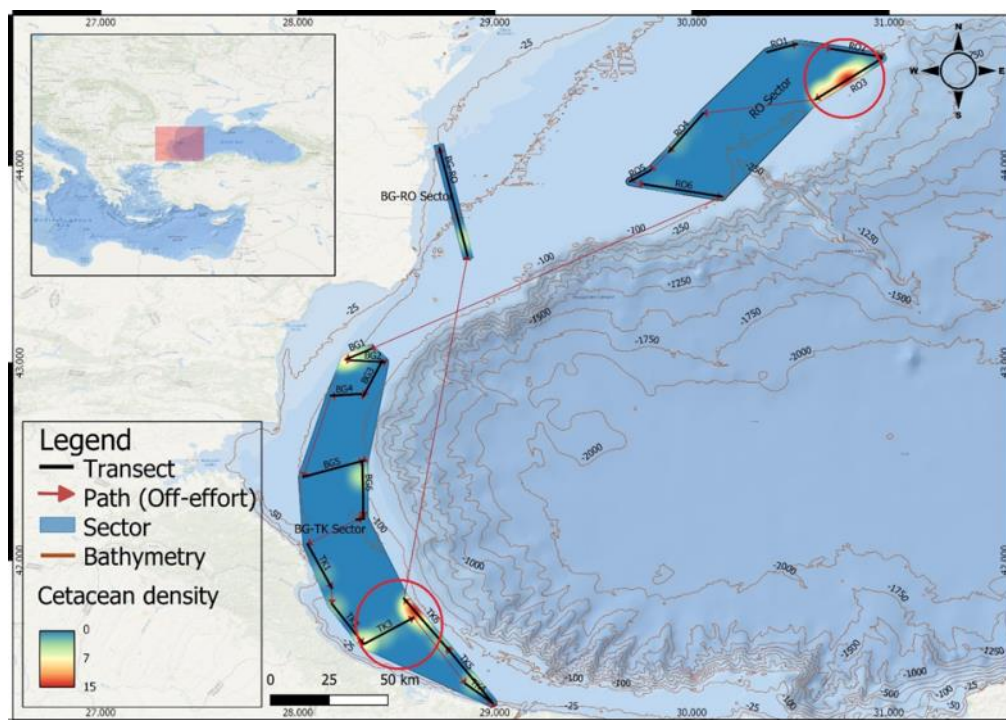


Fig. 1. Cetacean heatmap for the ANEMONE Joint Cruise. Red circles highlight the major hotspots. (Paiu et al., 2020 - DT2.3.1)

In Bulgaria, Green Balkans NGO continued their monitoring of territorial waters for the 3rd consecutive year. Two surveys were conducted in 2019 – one in spring and one in autumn. Spring survey was made in the end of April and first days of May covering more than 440 km of transects and registering 168 sightings of cetaceans of all three species. Just like in Ukrainian waters at that time, most numerous were encounters of porpoises – 137. Dolphins were seen on 31 occasions with almost the same frequency: 16 sightings of bottlenose and 15 of common dolphins. The autumn survey was made in October and the team has covered almost 410 km on effort recording 54 sightings. Most numerous were encounters of common dolphins – 23 followed by bottlenose dolphins with 18 while harbour were observed at only 10 occasions.



During the same period, TUDAV's team was conducting vessel survey in adjacent region covering Western part of Turkish territorial waters in the Black Sea between Igneada and Karadeniz Eregli, covering 418 km of transects on effort. In total 82 sightings have been recorded with these being almost exclusively dolphins – 40 sighting for each of two species. Harbour porpoises were observed only twice.

In Georgia, Ilia State University team has continued their regular monitoring covering a strip of 7 nautical miles of Georgian territorial waters along the coast. Being a well-known wintering site for Black Sea cetaceans was confirmed by the winter survey in February when 151 sightings were recorded along 202 km of transects. The harbour porpoise was the dominant species with 96 sightings, while common dolphins were encountered 55 times. Spring survey conducted in March registered 118 sightings of same two species but this time common dolphin was seen more often – 65 sightings while harbour porpoise had 53. In May, a third survey was conducted registering highest number of sightings – 174. Once again common dolphin was more frequently seen with 123 sightings while harbour porpoises continued to lower their density with 51 encounters.

Surveys in Romanian and Turkish waters were made within ANEMONE project; Ukrainian survey was part of EMBLAS project while Bulgarian surveys were supported by OceanCare.



NEWS FROM THE ADRIATIC SEA



Fin whales of the Gulf of Trieste

Tilen GENOV 15

Despite Covid-19 pandemic crisis Tethys' Ionian Dolphin Project reaches its 30th anniversary

Joan GONZALVO 16

The (un)-common dolphin in the Northern Adriatic Sea

Tilen GENOV 18

A Worrying Decline in the Presence of Bottlenose Dolphins in Montenegro & the Importance of Citizen Science During COVID-19

Tim AWBERY 20
Aylin AKKAYA

FIN WHALES OF THE GULF OF TRIESTE



In early November, researchers from Morigenos – Slovenian Marine Mammal Society (ACCOBAMS Partner) located and observed two fin whales (*Balaenoptera physalus*) in Slovenian waters of the Gulf of Trieste, thanks to a report by one of Slovenian fishermen. As many readers of FINS might know, the fin whale is the second largest animal on our planet (second only to the blue whale, *Balaenoptera musculus*) and the only regularly present baleen whale in the Mediterranean Sea.

Even though the northern Adriatic Sea is not a typical habitat for this species, it is recorded in this region every few years on average, while the last confirmed sighting in the Gulf of Trieste was in 2011 and before that in 2009. In 2003, a carcass of a young female was found off Piran, Slovenia. The carcass was sunk to the sea bottom in order to subsequently retrieve the skeleton, which is now displayed in the Slovenian Museum of Natural History.

Fin whales in the northern hemisphere grow up to 22.5 m and 50 tons, while their southern hemisphere counterparts can grow up to 26 m and 80 tons. They mainly feed on small crustaceans called krill, and on some small fish species. The fin whale is currently listed as Vulnerable on the IUCN Red List, both globally and in the Mediterranean Sea. A re-assessment is currently taking place for the Mediterranean subpopulation of fin whales. In the Mediterranean, the fin whale is primarily threatened by ship strikes, underwater noise, chemical pollution and microplastics.



We photographed both whales and obtained aerial footage of them. Based on photographs of dorsal fins and other body parts we may be able to determine if these whales have been observed elsewhere by our colleagues working in other parts of the Mediterranean Sea, while aerial footage will help determine their overall body condition.

Based on preliminary matching, it does not appear these two whales have been photo-identified elsewhere, although the investigation is ongoing. The whales appear somewhat skinny, especially considering that they should have fed extensively over the summer in their preparation for winter. However, it is not believed their condition is cause for concern.

At Morigenos we are extremely happy to have a great ongoing collaboration with local fishermen, without whom we would not be able to collect such valuable data.

We ask those at sea in the Gulf of Trieste to report any whale sightings to us at +38631771077 and thereby help us collect important information about the movements and the health condition of these animals. We also ask boat owners to reduce potential negative impacts on these whales by not approaching them closer than 200 m. The presence of boats may cause unnecessary disturbance, particularly for animals of unknown health condition and out of their typical habitat.

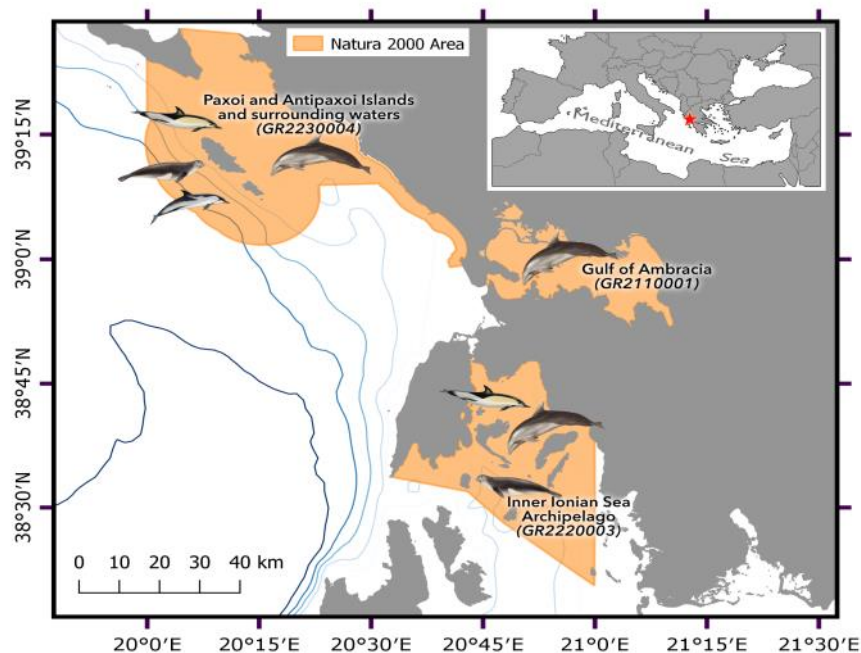
DESPITE COVID-19 PANDEMIC CRISIS TETHYS' IONIAN DOLPHIN PROJECT REACHES ITS 30TH ANNIVERSARY



Year 2020 has not been an easy one, the on-going Covid-19 pandemic crisis is having an unprecedented effect in many fronts (in all fronts!) and cetacean research and conservation is no exception. As the summer was inexorably approaching, while many of us were on lockdown spending far more time sitting in front of our computers than originally planned, we had to face tough decisions. These went from reducing our fieldwork, to modifying our research calendars or, sadly, cancelling our research campaigns altogether.

For projects like the Ionian Dolphin Project (IDP), by Tethys Research Institute, running citizen science programmes where non-scientists can join us in the field to meaningfully contribute to our scientific research, this cruel pandemic was particularly challenging. On top of the usual research protocols we follow, we had to incorporate strict health and safety measures to minimize any risks and guarantee the well-being of our staff and project participants.

I am happy to report that the IDP, despite Covid-19 pandemic, started its research activities on the first of July 2020, which continued until the end of September. This marked our 30th year working in the coastal waters of the Eastern Ionian Sea, Greece. Hellenic waters still harbour a remarkable diversity of cetacean fauna compared to other parts of the Mediterranean. Some dolphin populations must deal with increasing human encroachment, while others have disappeared altogether from portions of their former range. Research and conservation activities conducted in the context of the IDP are identifying measures to slow-down, halt or reverse such trends.



Everything started in 1991, when Tethys began a study in the Inner Ionian Sea Archipelago, a Natura 2000 area. Initially intended to be a long-term investigation on the ecology and behaviour of common dolphins in a central Mediterranean hotspot, the study instead became a documentation of their sharp decline. Bottlenose dolphins are found in relatively small numbers, but they seem to have relatively stable trends. This is one of the few Mediterranean areas where monk seals can still be predictably encountered, and some of its remote and uninhabited islets provide key habitat for this charismatic endangered marine mammal also subject of our research.

Ten years later, in 2001, Tethys started another study in the Gulf of Ambracia (also known by its Greek name as *Amvrakikos*), where bottlenose dolphins are the only cetacean species present. These dolphins, members of a highly 'resident' community, displaying a quite unique behaviour and ecology, are present in the Gulf at one of the highest observed densities for this species in the Mediterranean.

Preliminary data opportunistically gathered during the past few years suggests that the waters beyond the limits of our historic study area, the Inner Ionian Sea Archipelago, specially the waters around the islands of Paxoi and Antipaxoi, are of strong interest due to the regular presence of both bottlenose and common dolphins. Therefore, starting this year, coinciding with our 30th anniversary, the IDP has incorporated a third study area; the *Paxoi and Antipaxoi islands and surrounding waters*, Natura 2000 Area site GR2230004¹.

These 30 years of research effort in this part of the Mediterranean would have not been possible without the contribution and efforts of many. Over these three decades, about 100 collaborators, some of them currently leading their own projects and marine conservation organizations, worked enthusiastically to make the IDP the project it is today.



We have had close to 2,000 participants in our citizen science programme, who with their passion, thirst for new experiences and hard-work made our project far better than it would have been without them. Special mention goes to the Pioneers, who established basic and strong grounds upon which the IDP has been able to consolidate and grow; Elena Politi (funder of the IDP, Director 1991-1996 and Co-director 1997-2003), Giovanni Bearzi (Co-director 1997-2003 and Director 2004-2010) and our Greek friend Alexandros Frantzis (Co-director 1995-1996). To all of them goes our deepest gratitude and respect. These are hard, challenging pandemic times and it is hard to foresee what is going to happen. All we can say, is that Tethys' Ionian Dolphin Project, will do its best to continue working towards the conservation of our marine ecosystems and their most charismatic representatives.

Credits and acknowledgements

Foundation Segré is providing significant support to the activities conducted in the Inner Ionian Sea Archipelago. OceanCare is our longest-term regular supporter, followed by UNEP's Regional Activity Centre for Specially Protected Areas (SPA/RAC). In 2020, additional support came also from the newly created Ionian Environment Foundation.

Considerable support has been also granted by a number of partners, collaborators and other organisations that contributed funding or played other important roles since the work began in 1991. Between 2006-10, substantial funding came from Earthwatch. Important financial and other support was also provided in previous years by WDCS The Whale and Dolphin Conservation Society, and by UNEP's Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS).

¹ <https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR2230004#2>

THE (UN)-COMMON DOLPHIN IN THE NORTHERN ADRIATIC SEA

A recent review study looking at the occurrence of common dolphins in the Gulf of Trieste and the northern Adriatic Sea was recently published in *Aquatic Conservation: Marine and Freshwater Ecosystems*.



Female common dolphin (Delphinus delphis) photographed in the Gulf of Trieste, northern Adriatic Sea. This dolphin was re-sighted between eastern Ionian Sea and northern Adriatic Sea, making the longest documented movement of this species worldwide.

Photo: Tilen Genov, Morigenos.

The common dolphin (*Delphinus delphis*) used to be very *common* in the Adriatic Sea and other parts of the Mediterranean Sea. However, from the 1970s onwards it had become so rare that the Mediterranean population is now listed as Endangered on the Red List of the International Union for the Conservation of Nature (IUCN). During the last 30 years, this species has largely been considered as regionally extinct from the Adriatic Sea, likely due to well-documented intentional and systematic killing during mid 20th century, as elucidated by previous studies. Back then, both Italy and the former Yugoslavia used to pay monetary rewards for every dolphin killed, because dolphins were considered pest that compete with the fisheries. Apart from direct kills, the population declines were likely also due to overfishing and the general degradation of the marine environment.

Once common, today extremely rare

When it comes to the Gulf of Trieste, the northernmost part of the Adriatic (and Mediterranean) Sea, sources from the 1970s report that the last large groups of common dolphins in the Gulf were seen in the 1940s. Since then, there have been no records of this species from the Gulf of Trieste, nor from surrounding areas, until the records presented in the new review study. The 18-year systematic research carried out by Morigenos in the Gulf of Trieste also confirms that the bottlenose dolphin (*Tursiops truncatus*) is the only regular dolphin species in these waters. Interestingly, despite this, in Slovenian popular science literature, the common dolphin has nevertheless repeatedly been listed as a native Slovenian species, even though there were no actual documented cases of this species in Slovenia. A report from 1888 refers to a dead specimen from Zaule near Trieste, supposedly preserved in the Trieste Museum of Natural History.

The museum no longer holds that specimen, even if it did so in the past. Based on this record, and given that the distance between Zaule and the Slovenian–Italian border is only a few kilometres, the common dolphin was included in the list of mammals of Slovenia, on the premise that it must have crossed Slovenian waters at some point. The species is also listed in the Slovenian Red List of Mammals as Endangered. However, the common dolphin has never actually been documented in Slovenian waters prior to records reported here.



Common dolphin mother-calf pair, photographed in the port of Monfalcone, Italy. Photo: Tilen Genov, Morigenos.

First confirmed records in the Gulf of Trieste and Slovenia

We documented several records of common dolphins in the Gulf of Trieste between 2009 and 2012, through sightings of live animals or recovery of dead stranded animals. Dorsal fin markings allowed the photo-identification of some of these, suggesting that at least four different live individuals occurred here in recent times. The first confirmed case of the common dolphin in Slovenia and the Gulf of Trieste was documented in 2009, when divers photographed a dolphin off Izola and sent photographs to us. Based on these photographs it was easy to determine that this was the rare common dolphin.



A year later we documented a female with a calf in the port of Monfalcone, Italy, where they spent several months. Based on photo-identification and with the help of our colleagues from Tethys Research Institute working in Greece, we discovered that the female had already been sighted in the Greek Ionian Sea, more than 1000 km away. Her trip to the Gulf of Trieste represents the longest documented movement in this species worldwide, which we reported some years ago. Unfortunately, her calf disappeared in early 2011, which likely meant it had died. We kept seeing the female for a few more months, after which she left the area. The same year we recovered a highly decomposed carcass of a dolphin calf near Izola, Slovenia. Due to advanced carcass decomposition, we could not immediately determine the species. However, after carefully examining the cleaned skull bones, we were able to identify the animal as the common dolphin. Common dolphins are distinguishable from all other dolphin species by the anatomy of their skull, which features special grooves in their palatal bone. Even though it is impossible to determine whether this was the same calf we had observed before, it is highly likely to be the same animal. Finally, in 2012, another individual was repeatedly observed in different locations of the Gulf of Trieste. Photo-identification showed that this was a new individual, not seen in previous years.



Features used to confirm the long-distance match of a common dolphin between the eastern Ionian Sea and northern Adriatic Sea. Left: dorsal fin and rostrum of the individual photographed in the Inner Ionian Archipelago, Greece, in 2008 (photos by Annalise Petroselli, Tethys Research Institute). Right: dorsal fin and rostrum of the same individual photographed in the Gulf of Trieste, Italy, in 2010 and 2011 (photos by Tilen Genov, Morigenos). From Genov et al. 2020.

It is interesting that these new records are relatively numerous for such a short time period, especially considering the rarity of the species and the total number of published cases in the entire Adriatic Sea to date. Unfortunately, the species continues to be rare in the region and many other parts of the Mediterranean Sea. Hopefully this contribution can serve as a baseline and encourage potential future cases to be reported, in order to provide further insights into the occurrence of common dolphins in the region. The study is freely available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/aqc.3407>

Reference

Genov T, Kotnjek P, Centrih T. 2020. Occurrence of common dolphins (*Delphinus delphis*) in the Gulf of Trieste and the northern Adriatic Sea. *Aquatic Conservation: Marine and Freshwater Ecosystems*. <https://doi.org/10.1002/aqc.3407>

By Tilen GENOV, Morigenos - Slovenian Marine Mammal Society, tilen.genov@gmail.com

A WORRYING DECLINE IN THE PRESENCE OF BOTTLENOSE DOLPHINS IN MONTENEGRO & THE IMPORTANCE OF CITIZEN SCIENCE DURING COVID-19

Montenegro Dolphin Research (MDR) project was started in September 2016 by DMAD to fill an existing knowledge gap in a country that, alongside with Bosnia, is the only one in the Adriatic without a marine protected area. The project aims to increase knowledge about the distribution, behaviour and residency patterns of cetaceans in the Southern Adriatic. The study is the first continuous, dedicated survey effort and focuses on Montenegro's coasts as well as a section of offshore waters (Figure 1). Thus far, MDR have conducted 111 boat-based surveys and 497 land-based surveys in the first four years (Sept 2016 – Sept 2020) with a combined survey time of 2,113 hours.

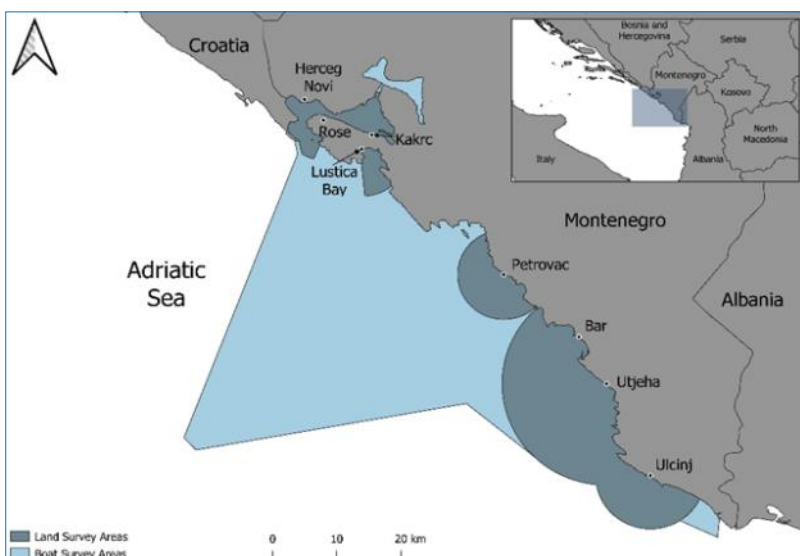


Figure 1 - Survey area in Montenegro. Light blue represents the boat survey area whilst dark blue represents the land survey area.

During this time there has been a notable decrease in the percentage of surveys where bottlenose dolphins were sighted (43% in year 1 (16/09/16 – 15/09/17), 39% in year 2 (16/09/17 – 15/09/18), 25% in year 3 (16/09/18 – 15/09/19) and 22% in year 4 (16/09/19 – 15/09/20)) (Table 1). Due to the longevity of bottlenose dolphins, it is currently too early to draw trends in the population, but DMAD implore Montenegrin decision makers to take precautionary measures to protect bottlenose dolphins, including the establishment of Montenegro's first marine protected area.

Table 1 - The number of surveys where dolphins were present

YEAR	YEAR 1	YEAR 2	YEAR 3	YEAR 4
NUMBER OF SURVEYS WITH DOLPHIN PRESENCE	81	64	39	20
TOTAL NUMBER OF SURVEYS	201	163	151	93

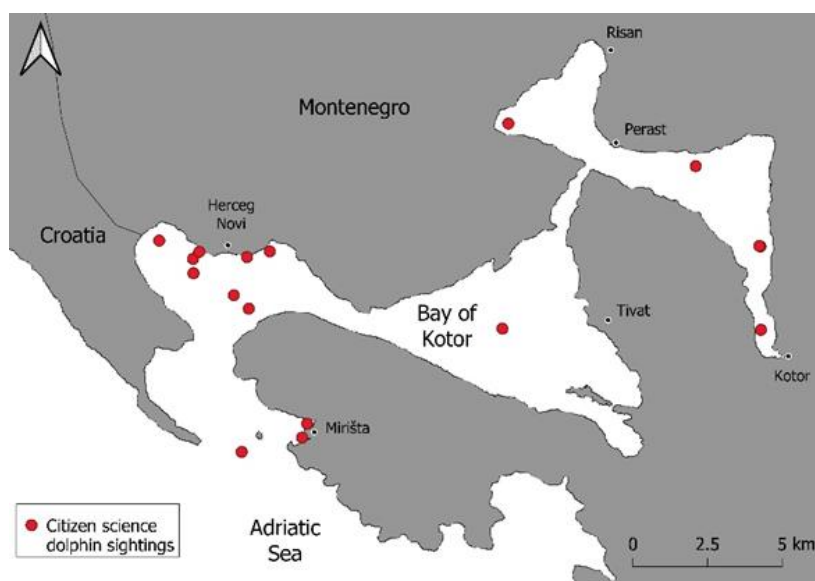
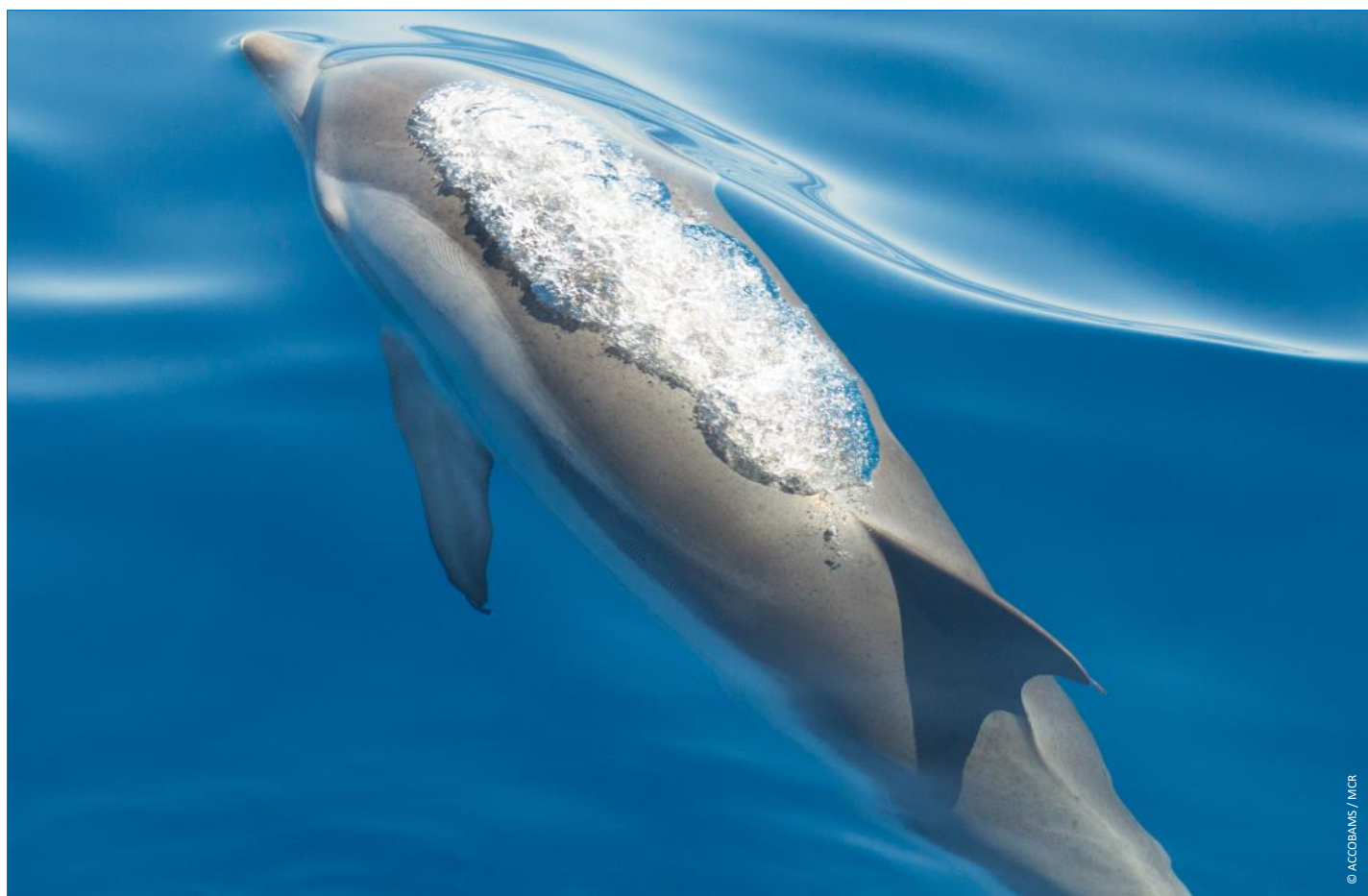


Figure 2 - Citizen Science dolphin sightings in the Bay of Kotor, Montenegro

Like the rest of the world, COVID-19 adversely affected us, imposing restrictions that meant we were unable to survey from the 10th of March to the 2nd of July 2020. This left us with a considerable hole in our data, so we turned to locals for help. It was unfeasible for them to collect in-depth data, but we were able to obtain reliable coordinates with photographic evidence on more than 20 occasions including 17 in the Bay of Kotor (northern Montenegro) alone (Figure 2).

BY:
Tim AWBERY, DMAD - Marine Mammals Research Association, tim.awbery91@gmail.com
Aylin AKKAYA, DMAD - Marine Mammals Research Association, akkayaaylinn@gmail.com

DURING THIS TIME IN THE ACCOBAMS AREA ...



We are pleased to present MIRACETI

Hélène LABACH **22**
Julie JOURDAN
Morgane RATEL

News from IMMRAC 2020

Dani KEREM **23**
Ori GALILI
Oz GOFFMAN

Dolphin attacked by shark in first recorded incident in Israel

Aviad SCHEININ **24**

Update about the ACCOBAMS High Quality Whale Watching® Certificate

Morgane RATEL **25**
Aurélie MOULINS

The Atlantic side of the Ligurian Sea

Menkab Team **26**

The educational tool CETAMER

Nathalie DI MEGLIO **28**

WE ARE PLEASED TO PRESENT MIRACETI



In June 2020, three French NGOs, the Groupe d'Etude des Cétacés de Méditerranée (GECEM, created in 1992), Souffleurs d'Ecume (created in 2000) and the Groupement d'Intérêt Scientifique pour les Mammifères Marins de Méditerranée (GIS3M, created in 2007), merged to form together MIRACETI.

For 13 years, GIS3M has been leading a French network of actors involved in the study and conservation of cetaceans in the French Mediterranean Sea. This model, which made it possible to initiate a collaborative approach for this community, was reaching its limits and no longer allowed, in the current context, to pursue, develop and maintain actions to achieve its objectives. GIS3M, GECEM and Souffleurs d'Ecume worked together for three years to propose a new model of cooperation for the study and conservation of cetaceans.

Today, they are joining forces by gathering together in a new associative project called MIRACETI. This merger took effect on 27 June 2020.

MIRACETI aims to improve knowledge and contribute to the preservation of cetaceans and the marine ecosystem. It promotes a transversal and multidisciplinary approach for the collection and interpretation of cetacean data, for the enhancement and sharing of knowledge and for the development of sustainable conservation measures.

MIRACETI has its head office and offices in Martigues La Couronne (France), place des traceurs de pierres. The association brings together the employees of the 3 associations under the direction of Hélène Labach. It is administered by a Board of Directors made up of members from the governance of the 3 associations.

For more information, follow us on [Facebook](#) and [Instagram](#)

The MIRACETI Team



By:
Hélène LABACH, MIRACETI, hlgis3m@gmail.com
Julie JOURDAN, MIRACETI, julie.jourdan@gecem.org
Morgane RATEL, MIRACETI, morgane.ratel@souffleursdecume.com

NEWS FROM IMMRAC 2020

COVID-19 has hardly interfered with IMMRAC's activity, re sea sightings and stranding network. As for the former, noteworthy were a series of sightings of a false killer whale (*Pseudorca crassidens*) pod in May, June and July, probably the same one reported by Michel Bariche off Tripoli, Lebanon on May 12, 2020 (<https://www.facebook.com/groups/109615625861815/permalink/1609580935865269/>), at several sites along the Israeli coastline, from Rosh Hanikra at the Lebanese border to Ashdod in the south. These sightings, combined with quite a few more since our latest report (Kerem et al, 2012), e.g. Ryan et al 2014 , Bas et al 2017, IMMRAC unpublished, raises the possibility that rather than being the easternmost reach of visitors from the Atlantic, a permanent population may reside in the Levantine Basin, occasionally entering the Aegean Sea (Dede et al, 2020). The carcass of a very young calf, possibly a newborn (165 cm) that washed up in central Israel on 07072012 lends further supports for this possibility.

Regarding other cetacean species, ongoing stomach content analysis of stranded common bottlenose dolphins evidences an almost total shift of diet from endogenous to alien lessepsian migrant species (Brand et al, in prep).



Member of an 8 strong false killer whale pod sighted off northern Israel, May 4th, 2020.
Photo credit Eran Levy, Marine Department, Israel Electric Company.

References

- Kerem D, Hadar N, Goffman O, Scheinin A, Kent R, Boisseau O, Schattner U. 2012. Update on the cetacean fauna of the Mediterranean Levantine Basin. *Open Marine Biology Journal* 6: 6-27.
- Ryan C, Cucknell A.C, Romagosa M, Boisseau O, Moscrop A, Frantzis A, McLanaghan R. 2014. A visual and acoustic survey for marine mammals in the eastern Mediterranean Sea during summer 2013. Unpublished report to the International Fund for Animal Welfare, Marine Conservation Research International, Kelvedon, UK.
- Baş A.A, Erdoğan M.A, Ulusoy E, Aslan B.E, Kurt M, Port J, M. Basmacı M, Baş E. 2017. Marine mammals of the North Levantine Sea - Annual Report 2016-2017. Marine Mammals Research Association, DMAD.
- Dede A, Tonay A.M, Gönülal O, Öztürk A.A. 2020. First sighting of false killer whales (*Pseudorca crassidens*) in the northern Aegean Sea. *Black Sea/Mediterranean Environment* 26(1): 106-111.

By:

Dani KEREM, Israeli Marine Mammal Research and Assistance Center, dankerem@research.haifa.ac.il
Ori GALILI, Israeli Marine Mammal Research and Assistance Center, maritime@research.haifa.ac.il
Oz GOFFMAN, Israeli Marine Mammal Research and Assistance Center, maritime@research.haifa.ac.il

DOLPHIN ATTACKED BY SHARK IN FIRST RECORDED INCIDENT IN ISRAEL



For the first time in Israel, a dolphin has been photographed with scarring left by a shark attack.

Bottlenose dolphins (*Tursiops truncatus*) have been monitored via photo-identification (PhotoID) for over 20 years. Since 2005, effort has increased with 863 additional surveys and 347 bottlenose dolphin sightings up until the end of 2019. An impressive 44,564 dorsal fin images have been processed and analyzed so far.

In November 2019, dolphin number ID 1359 was first observed with a shark bite scar. In the catalogue, we have 288 adult bottlenose dolphins. Out of these, 186 have easily distinctive dorsal fins. In our long term ecological research, this is the first scar observed from a shark attack on a live dolphin in Israeli Mediterranean waters. Based on the photos and consultations with marine mammals and shark experts from around the world, the researchers unanimously determined that these were scars resulting from a shark attack. First, we consulted the list of shark species known to feed on dolphins (Heithaus, 2001) and narrowed the list down to shark species known to occur in the eastern Mediterranean Sea. Then, we examined the scar's shape and the toothmarks. From this analysis, we believe that the shark involved in the attack was either a dusky shark (*Carcharhinus obscurus*) or a bluntnose six-gill shark (*Hexanchus griseus*). The shortfin mako (*Isurus oxyrinchus*) was ruled out because their bite would be more scattered, less rounded and more V-shaped. Unfortunately, it is impossible to tell the shark species for sure after the wound has healed, due to healing inconsistencies.

Israel has become a safe haven for sharks as all shark and ray species are protected by law and it is not allowed to fish, sell or import them. With proper enforcement, shark aggregations are becoming a common occurrence in Israeli waters. Is it an unusual incident of assault or a new phenomenon? Only long-term ecological research on the local dolphin population will tell!



UPDATE ABOUT THE ACCOBAMS HIGH QUALITY WHALE WATCHING® CERTIFICATE

In 2020, the ACCOBAMS High Quality Whale Watching® Certificate has been integrated as a case study in the Whale Watching Handbook as a Multi-Stakeholder Certification Scheme Developed For Sustainable Whale Watching in the Mediterranean Sea. <https://wwhandbook.iwc.int/en/case-studies/the-accobams-high-quality-whale-watching-certificate>.

IMPLEMENTATION IN FRANCE

By Morgane RATEL, MIRACETI, morgane.ratel@souffleursdecume.com

The "High Quality Whale-Watching®" brand has been deployed in French Mediterranean Sea since **2014**. In 2019, **38 structures** offering cetacean observation were identified. Among them, **14 were certified** as "High Quality Whale-Watching®" in 2020.

In 2019, a pilot study financed by the French part of the Pelagos Sanctuary, entitled «*Evaluation of the impact of whale-watching activities on cetacean populations in the French Mediterranean Sea and the implementation of the "High Quality Whale-watching ®" label*» was carried out by - previously - Souffleurs d'Ecume and the VertigoLab consultancy agency. The project has made it possible to obtain preliminary results relating to the impact of the vessels on the behaviour of cetaceans as well as the impact of the brand on the behaviour of operators; and to make **recommendations to achieve financial autonomy for the brand**. A feedback and reflection meeting with the certified operators, ACCOBAMS, the Pelagos Sanctuary, the Ministry of Ecological Transition and MIRACETI was thus organised on 3 November to discuss collectively the new prospects for the brand's improvement and economic development. The report of this study will soon be available.

A additional project (« *MARKER: Evaluation of the pressure of whale-watching activities on cetaceans and of the ecological and socio-economic effectiveness of the "High Quality Whale-Watching®" distinction mark* ») funded by Interregional Direction of the Mediterranean Sea (governmental body) will start in 2021. It aims to **develop indicators and an evaluation strategy** for the DCSMM monitoring programme.

Finally, we would like to inform you of the publication of an article on whale-watching in France: J. Chazot, L. Hoarau, P. Carzon, J. Wagner, S. Sorby, M. Ratel & A. Barcelo, A. Recommendations for Sustainable Cetacean-Based Tourism in French Territories: A Review on the Industry and Current Management Actions. [Tourism in Marine Environments](#), Volume 15, Numbers 3-4, 2020, pp. 211- 235(25).

IMPLEMENTATION IN ITALY

By Aurelie MOULINS, CIMA Research Foundation, aurelie.moulins@cimafoundation.org

In the framework of the EU Interreg V-A Italy-France (Maritime), CIMA Research Foundation is in charge of deploying the HQWW® Certificate, in the three Italian regions: Liguria, Sardegna, Toscana, using the French know-how. The partnership with ACCOBAMS was signed in the early 2019 in order to organize the first steps of the implementation in collaboration with the Permanent Secretariats of ACCOBAMS and Pelagos Agreement. **The training course** was planned as a 2-day session in order to facilitate the operator participations. Two editions were organized in spring (2019 and 2020). Up today, a total of 57 participants participated to the training representing 18 operators. The first **disciplinary regulation contracts** were signed in 2019 and certified operator licensed were able to fly the HQWW® flag onboard. **The certified operator reporting** template was set in order to facilitate feedbacks to the Permanent Secretariats and provide information about activity. The **smartphone App IlogWhales** was developed to facilitate collect and share sighting data from their tours following the criteria of ACCOBAMS Resolution 6.20 Annex 4. This summer, the App was tested with one certified operator (Consorzio Liguria ViaMare) collecting data during 35 trips. The **internet webpage** was created in order to present the Certification in Italian language and list the Certified operators.

<https://www.cimafoundation.org/fondazioni/ricerca-sviluppo/HighQualityWhaleWatching.html>

The next steps will be crucial especially considering the global crisis that the tourism industry has to face with the Cov-19 emergency. **An eLearning training course** has been prepared as an alternative to the traditional face-to-face classroom. **The audit** of the certified operator will take place in summer 2021.

We acknowledge about the article: *Whale Watching in the Pelagos Sanctuary: status and quality assessment*. P. Tepsich et al. [Frontiers in Marine Sciences](#). DOI: 10.3389/fmars.2020.596848.

THE ATLANTIC SIDE OF THE LIGURIAN SEA

In the last year, some of rare cetaceans species occurred in the Northern point of *Pelagos Sanctuary*. In monitoring the study area between Genoa, Savona and Finale Ligure submarine canyons, Menkab association recorded three different species not regularly sighted within Mediterranean Sea: killer whales, false killer whales, and humpback whales. The international network of researcher involved and contacted by Menkab scientists gave exciting output for understanding movements pattern of these animals. One more time, photoidentification has been a useful and uninvasive tool for tracking the route of 5 killer whales sighted in December 2019, in Genoa and Vado harbours, the Northern extreme of western Mediterranean Sea. These individuals were previously identified by Marie-Thérèse Mrusczok, researcher of Orca Guardian Iceland, in the Snaefellsnes Peninsula on the West coast of Iceland. This matching was classified as one of the longest movements ever recorded from Atlantic Ocean to Mediterranean Sea.



Among mammals, cetaceans are probably the most unpredictable species, which can explore different areas. In this framework, last August, Ligurian Sea offered another unexpected encounter. Two humpbacks whales, mum and a calf, have been sighted in front of Genoa during an ordinary trip of the company Liguria Whale Watching. The spotter, Alessandro Verga, sighted the blows, while the photographer, Daniela Papi, took pictures of the flanks and fluke of the two humpbacks. Several breaching astonished the crew and the crowd on board. The day after, Menkab team received the photos useful for

photoidentification and started an international communication to get an answer to the question: where they come from? The answer came in few days. Researcher working on North Atlantic Humpback Whales Catalogue (NAHWC) and Happy Whale (<https://happywhale.com/>) network gave the answer with a positive matching: before Genoa sighting of 26th August 2020, the adult was sighted in Dominican Republic in February 1986 and named as NA5503. After the news of the matching, Menkab researchers contacted several research groups to keep tracking the movements of the two *Caribbean whales* within the Mediterranean, but no further sightings have been reported. This was the second evidence in 9 months of an Atlantic species exploring the Mediterranean Sea.

In September, a third unexpected species, false killer whale, was sighted in front of Savona, but no further sign of the humpbacks.

In November, the two *Caribbean humpbacks* were almost forgotten. Meanwhile, our team performed some surveys to get data on sperm whales winter occurrence. In five daily surveys, we saw a couple of Cuvier's beaked whales, mum with a calf, and 4 sperm whales - two of them already within Menkab catalogue, sighted respectively in 2005 and 2010. On the way back of 13th November, at sunset, Giulia and Samuele spot a big back



Approaching the animal, Biagio saw the whale swimming parallelly to our boat and just few meters under the surface...a couple of second to realise that two big white fins were visible and a big head with bumps: not so many species have those features...*"It's a humpback!"* he screamed.

The crew was completely amazed till everyone realised how thin and emaciated the whale was. It came closer and closer to the boat and touched it with the rostrum. Giulia and Samuele took photos of the body and of the dorsal fin, while Gabriele with the drone and Biagio with the Gopro got aerial and underwater videos for assessing the body conditions (link video <https://vimeo.com/479936460> realized by Artescienza). The few images taken were used to perform photoidentification. Luckily, there were no signs of ship collision. In the end, the crew feeling was that this whale was starving and completely exhausted, unable either to fluke or to breach – probably in worst conditions than Fluker (or *Codamozza*), the fin whale without fluke that cross Ligurian Sea in June 2020.

Analysing the dorsal fin profile and the white patches of the pectoral fins, Biagio and Giulia, helped by Alessandro from Liguria Whale Watching confirmed the matching: the whale was the same adult (NA5503) sighted in August. Unfortunately, this whale did not found the way back to the ocean, and the calf was not with her anymore. The day after, Menkab team did another survey but didn't spot the whale in the area.



Understanding the role of Mediterranean for several Atlantic species and population is still hard. We believe that collaboration between researchers should be enhanced to improve our knowledge on cetaceans movement on wide scale, from Atlantic and also within the Mediterranean: the answers behind these two events are concrete examples on how fruitful a well-established research network is.

By the Team of "Menkab il respiro del mare", arcimenkab@gmail.com

THE EDUCATIONAL TOOL CETAMER

As part of its action to raise awareness regarding the challenges cetaceans face in the ACCOBAMS area, the Permanent Secretariat has acquired an educational tool called CETAMER (Ligurian version). This pedagogical and collaborative tool was designed on an original idea of the EcoOcean Institute. Its aims are to educate and raise awareness among different audiences (general public, schools) on the knowledge and protection of the marine environment and cetaceans, as well as to reflect on the challenges rising from the sharing of the same environment by wildlife and humans.

This ludic tool is designed to make the public think about possible solutions for an eco-compatibility of anthropogenic activities and their consequences (marine waste and chemical pollution, fishing, wind turbines at sea, collisions ...) with marine fauna and their habitats. Through these pedagogical activities using the CETAMER tool, we want to make participants want to:

- * Better understand the marine environment beyond the shores, as well as its biodiversity and in particular the cetaceans which are protected species.
- * Raise awareness on the issues arising from sharing the marine space between the fauna and human activities.
- * Develop eco-citizenship: encourage reflection and commitment to concrete actions to reduce threats to the marine environment.

This pedagogical tool can only be used with the presence of a facilitator trained in the specifics of this tool. The animation can be carried out either on a stand with a passing public or in a room with a group on animations that can last up to 1h30.

Two versions of the CETAMER tool are already available, dealing with the specificities and challenges specific to each of these two regions:

- "Gulf of Lion" version
- "Liguro-provençal Sea" version

The tool consists of a board, cards, counters, a booklet for the facilitator and a booklet for children.
This tool can be adapted on request to different regions of the Mediterranean and their specificities.

MATERIAL

Le plateau du jeu est un support aimanté représentant la Mer Ligure et dans lequel sont symbolisés, à l'aide de couleurs différentes, 3 habitats dans lesquels sont numérotées des cases.

- Le Plateau continental : 6 cases
- Le Talus : 12 cases
- Le Large : 20 cases

Le jeu se joue avec 4 dés :

- 1 dé « habitat » à 6 faces avec 2 fois chacune des trois couleurs correspondantes aux 3 habitats visibles sur le plateau de jeu
- 3 dés « harmonie » :
 - 1 dé à 20 faces
 - 1 dé à 12 faces
 - 1 dé à 6 faces

1 pion « dauphin » pour se positionner sur le jeu.

15 pions « espèces » de cétacés

21 pions « activités humaines »

53 cartes réparties en 3 catégories :

- 7 cartes « espèces » de cétacés
- 8 cartes « défis »
- 38 cartes « connaissance » :
 - 10 cartes « activités humaines »
 - + 28 cartes « le sais-tu ? »

WHERE ARE WE ON THE MARITIME TRAFFIC ISSUE ?



The entrance of a group of fin whales in the Port of Barcelona forced maritime traffic to be temporarily stopped **30**

Carlos BRAVO

Interaction between orcas and sailboats at western Iberian Peninsula **32**

Ruth ESTEBAN

SAvE Whales: A pioneering high-tech, interdisciplinary project to save sperm whales in the Mediterranean from being killed by ships **35**

Niki ENTRUP
Alexandros FRANTZIS

Proposal to develop and evaluate mitigation strategies to reduce the risk of ship strikes to fin and sperm whales in the Pelagos Sanctuary **37**

Simone PANIGADA

THE ENTRANCE OF A GROUP OF FIN WHALES IN THE PORT OF BARCELONA FORCED MARITIME TRAFFIC TO BE TEMPORARILY STOPPED

On the morning of August 21, 2020, [a group of four fin whales \(*Balaenoptera physalus*\) forced maritime traffic to be stopped in the Port of Barcelona](#) (Spain) for about a couple of hours ⁽¹⁾.

The [group of cetaceans](#) ⁽²⁾, made up of three adults and a calf, was detected less than two miles from the coast by a boat of the Urban Guard's Beach Unit that was sailing through the area, which observed the cetaceans heading towards the interior of the port of Barcelona. The Guardia Urbana boat tried to divert the whales so that they would not collide with the numerous recreational boats that, encouraged by the good weather and the quiet waters, had decided to enjoy the sea and were leaving the port. Maritime Rescue was alerted and maritime traffic was paralyzed in the port of Barcelona, to allow the animals to leave.

The cetaceans entered the area of large ships of the port and there, Guardia Urbana's officers managed to reverse the course of the cetaceans and direct them towards the breakwater, where the mammals set their course towards the high seas, about two hours after the start of their adventure through the port. The Port Authority of Barcelona needs to be congratulated for stopping maritime traffic to avoid possible collisions of ships with this group of fin whales.

Unfortunately, the Port of Barcelona has not always been the scene of news with a happy ending for these cetaceans. By way of example, a few years ago, [a fin whale died after being struck by the South Korean freighter Hanjin Shipping](#), which was sailing through waters near the city of Barcelona. The 20-meter-long cetacean was hooked on the bow of the ship and was dragged for six miles until it reached the port ... dead ⁽³⁾.

The sighting of fin whales in the vicinity of the coasts of Barcelona and other areas very close to the coast of Catalonia, Valencia and the Balearic Islands is relatively frequent, which is a sign of the importance of these waters for this species and others present in the zone.

In fact, at an average distance of only 38 km from the Catalan and Valencian coasts, to the west, and about 13 km from the coasts of the Balearic islands, to the east, a continuous strip of maritime waters with an average width of about 85 km and a total calculated area of 46,385.70 km² has been declared by the Spanish Government as marine protected area in June 2018, the so-called Cetacean Migration Corridor.



This corridor is limited to the north by the Cape Creus area, in Gerona, and, to the south, by Cape Nao, in Alicante. In December 2019, it was included in the SPAMI list of the Barcelona Convention.

This space is of high ecological value, not only because it is an area of migratory passage for fin whales to their feeding areas in the north of the Mediterranean, but also because it is a habitat and a feeding area for a wide range of other species of marine fauna. Specifically, the presence of other cetaceans has been confirmed, such as bottlenose dolphins (*Tursiops truncatus*), striped dolphins (*Stenella coeruleoalba*), common dolphins (*Delphinus delphis*), pilot whales (*Globicephala melas*), Risso's dolphins (*Grampus griseus*), sperm whales (*Physeter macrocephalus*) and Cuvier's beaked whales (*Ziphius cavirostris*); as well as sea turtles such as loggerhead turtles (*Caretta caretta*) and different species of sharks and seabirds.

However, the area where the Cetacean Migration Corridor is located is subjected to a very high intensity of maritime traffic, both passenger and freight ships, which usually navigate at high speeds, increasing the risk of fatal collisions with cetaceans, in addition to aggravating other problems such as underwater noise.

In recent years, the Spanish Government has rejected licenses and finally banned new oil and gas exploration and exploitation within the whale migration corridor. However, there are many additional challenges ahead that need to be addressed within the Conservation Management Plan for the MPA, in particular the sustainable handling of shipping to reduce significantly its impacts: underwater noise, CO2 emissions, air pollutants (SOx, NOx and particulate matter) and ship strikes. One of the most pressing measures certainly is the reduction of vessel speed, an operational measure which contributes in the most cost-efficient way to reducing those environmental impacts of maritime transport.



References

1. A family of whales forces to cut maritime traffic in Barcelona (La Vanguardia, 21/08/2020)
<https://www.lavanguardia.com/local/barcelona/20200821/482925385713/ballenas-barcelona-port-de-barcelona.html>
- 2.- Video: https://www.youtube.com/watch?v=iIY4yc4ho_Q
- 3.- A fin whale dies when it collides with a ship near the port of BCN (El Periódico, 04/06/2009)
<https://www.elperiodico.com/es/barcelona/20090604/un-rorcual-muere-al-chocar-con-un-barco-cerca-del-puerto-de-bcn-234860>

INTERACTION BETWEEN ORCAS AND SAILBOATS AT WESTERN IBERIAN PENINSULA

Since July 2020, forty-four encounters between orcas and boats have been registered, where the animals approached and showed interest in the mobile parts of the boats, which were categorised as interactions. It all started in the Strait of Gibraltar, where orcas are normally observed in spring and summer feeding on bluefin tuna. They are considered to be a subpopulation within the North Atlantic Ocean, recently categorised as Critically Endangered by the International Union for the Conservation of Nature (IUCN) Red List, whose closest relatives would be individuals sporadically observed in the waters of the Canary Islands, and which would be genetically isolated from individuals that inhabit Norwegian and Icelandic waters. They are normally observed while passing through the southern and central coast of Portugal and northern Spain, in Galicia, where most of the individuals identified belonged to the Strait of Gibraltar subpopulation.

An international Working Group (WG) of cetacean experts and competent administrations was formed naturally out of previous existing collaborations, to provide insights on this atypical situation, inspect the boats that were targeted by the orcas, interview the crew, identify the animals, collect information on previous cases and similar behaviours, and contact international experts around the world. The WG has been analysing each case in great detail and is in permanent contact with coast-guards, the Spanish Ministry of Ecological Transition and the Demographic Challenge (MITECO), the Instituto da Conservação da Natureza e das Florestas (ICNF) from Portugal and regional governments to compile all the available information. The scientific group is formed by Dr. Alfredo López from the Universidade de Aveiro-CESAM, Mr. Jose Cedeira from CEMMA; Mrs. Cristina Martín from TURMARES Tarifa, Mr. Ezequiel Andréu Cazalla from the Garum Tarifa Association, Mrs. Rocío Espada from Ecolocaliza and LBMarina from the University of Seville, Mr. Francisco Martinho from ECCO Ocean, Mrs. Marisa Ferreira from SPVS and Dr. Ruth Esteban from the Museu da Baleia da Madeira and Ocean Sea. Institutional members include Mrs. Elvira García Bellido from MITECO and Mrs. Marina Sequeira from ICNF, Portugal, both are ACCOBAMS National Focal Points of their respective countries.

During the different interactions, up to 3 different orca juveniles have been identified by the WG as directly involved in the events. In addition, in some interactions, other adult individuals were observed further away from the vessels, never approaching them so they are considered as most likely not involved in the interaction.

The three interacting killer whales have been named the GLADIS (BLACK, WHITE and GRAY) and were all observed in previous years on the Strait of Gibraltar. However we have not been able to assign these animals to any specific pod, as juvenile specimens are less maternally dependent, and therefore can change groups very frequently, especially if there are other juveniles around.



Grey Gladis inspecting one of the vessels in Galicia

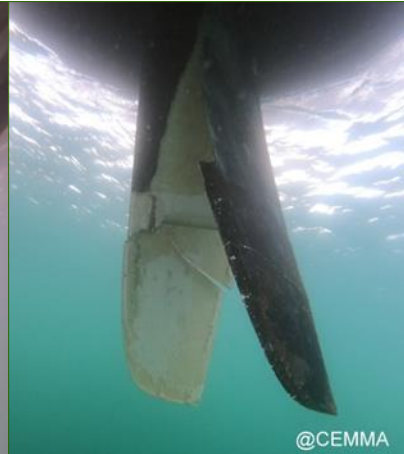
Black Gladis at the stern of a boat in Galicia

In addition, during the interactions, no images were obtained of the rest of the group, so the other animals could not be identified. Moreover in the last years there wasn't any dedicated study in this subpopulation, so the monitoring of individuals had not been done properly, and we are trying now to go back in time, with the available information that we have at the moment.

In the Strait of Gibraltar, juvenile killer whales are commonly observed approaching different types of boats. However, this is the first time that the animals have been observed actually touching the boat. During these new interactions the animals generally approached the boats without being noticed; the animals inspected the hull, being normally observed in the stern of the boat, sometimes upside down really close to the boat. The interactions were mostly limited to the rudder of the boat, with some marks found on the hull or signs of physical contact of the animals along the structure of the vessel, which sometimes led to breaking partly or completely the rudder. Severely damaged ships accounted for just 12% of all orca contacts, interactions and sightings. Animals also sometimes were observed intensely bubbling and tail-slapping. Usually the interactions ended when the boats were stopped either by switching off the engine and/or lowering the sails, or when the rudder got broken, sometimes in less than 15 minutes after the interaction started. However in some cases the animals continued touching the vessel even after it was stopped, up to 60 minutes.



Rudder bent on horizontal axis with thrust marks



Open rudder body

After the first interactions in the Strait of Gibraltar at the end of July 2020, two of those three juveniles were observed with wounds which could be assigned to some kind of human interactions, and not to the typical rake-marks resulting from intra-species interactions. In particular one of the animals presented an open straight cutting wound in the head, and the other individual had grouped linear cutting wounds in the peduncle.



Black Gladis with a cutting wound in the hear.



White Gladis with cutting wound in the peduncle

In the Strait of Gibraltar six interactions happened in July, along the Portuguese coast in August five interactions were registered, twenty-three interactions happened off Galicia also in August-September, and finally these animals went south again, to Portugal in October, where another ten interactions are now concentrated in southern Lisbon. Most of the vessels targeted in the interactions were small sailing boats, however also three catamarans, and two fishing vessels were targeted.

In any of the interactions, people were never endangered by the direct activity of the orcas. However, there were some risky situations during night-time and long-lasting interactions, due to abrupt movement of the steering wheel or turns of the boat, which caused distress to the crew members due to their lack of experience with killer whales and their behaviour.

The WG tries to maintain close communication with the coast-guards and local organizations; mutual support has been maintained in case of need. Navigational warnings were announced by radio in the places where the interactions were concentrated at each moment. Even the navigation of small sailing boats was limited in the coastal waters of Galicia, when the interactions were concentrated in northern Spain.

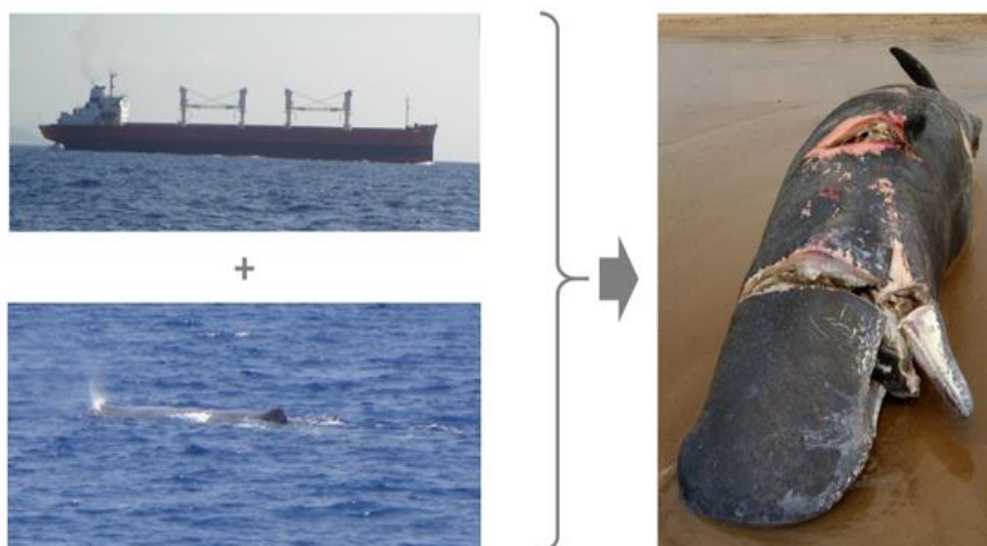
Concerning the motivation of these animals to interact in such a manner with boats, the WG can only set some assumptions. We know this behaviour is made by juvenile orcas, so it could simply be induced by their own interest and curiosity, since by touching moving parts of the boat they can move or even stop a large moving object. On the other hand after the first interactions happened, some of those animals were observed with wounds that might be assigned to an anthropogenic origin, so there is always the possibility that this novel behaviour was triggered by an adverse encounter from which unfortunately we don't have any more evidence.

Most probably we will never understand why this novel behaviour is happening, but what matters now it is that we should continue collaborating and putting our effort into minimizing the consequences that these episodes can have for both animals and humans.

If you know about an interaction between boats and orcas, in particular the ones occurring in the western Iberian Peninsula, or you know somebody that might have information, however we are also interested in similar cases around the world, you can contact us by e-mail: gt.orcas.ibericas@gmail.com

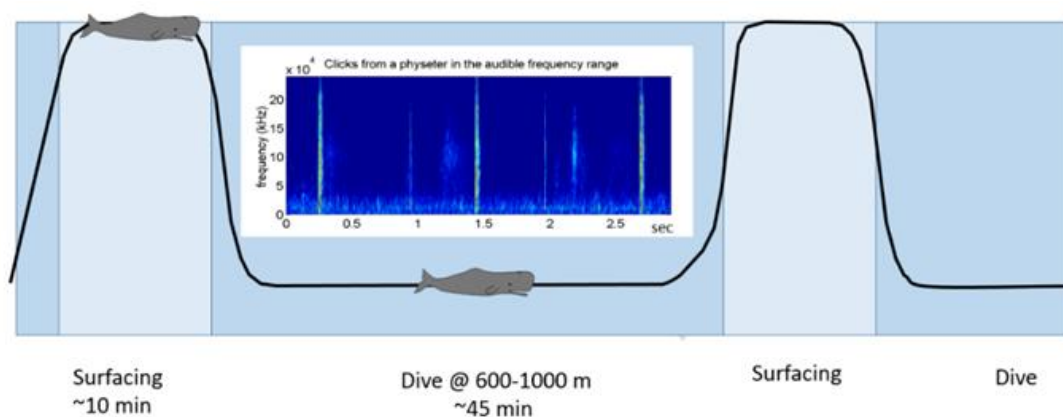
SAVE WHALES: A PIONEERING HIGH-TECH, INTERDISCIPLINARY PROJECT TO SAVE SPERM WHALES IN THE MEDITERRANEAN FROM BEING KILLED BY SHIPS

In 2019 the interdisciplinary project *SAvE Whales* (**S**ystem for the **A**voidance of ship-strikes with **E**ndangered **W**hales), a pioneering project led by Greek sperm whale expert Dr. Alexandros Frantzis and funded by OceanCare, has been launched. Objective of the project is to develop a real-time sperm whale observatory off south-western Crete, combining expertise from the fields of marine biology, underwater acoustics, applied mathematics, computer networking, informatics and real-time marine traffic data. Four major partners have joined forces to reach the objectives of the project and these are the [Foundation for Research and Technology Hellas \(FORTH\)](#), [MarineTraffic](#), (the largest publicly available vessel-tracking service, which uses AIS data), [Pelagos Cetacean Research Institute](#) and [OceanCare](#).



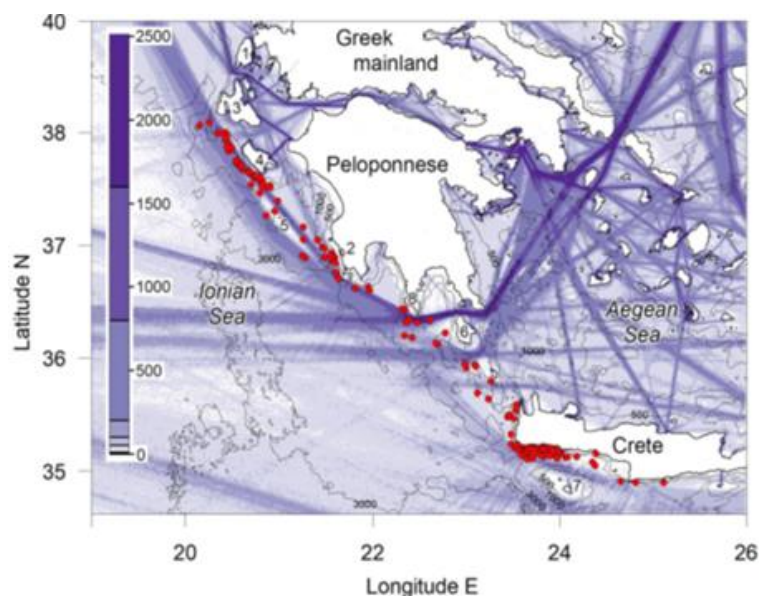
SaveWhales: The problem

The observatory will consist of three moored stations, each one equipped with a hydrophone at a sufficient depth to pick up the click sounds produced by the animals during their dives. The data will be transmitted in real time to the analysis center on land, where they will be combined to estimate the location of the animal(s). The localization results will be automatically forwarded to MarineTraffic for notification of nearby vessels. This allows the captains of large vessels that cross the area to change their course in time in order to prevent collisions with sperm whales. The buoys rely on solar energy and have 2-way communication capability with the analysis center at FORTH through mobile internet.



Typical dive cycle of a sperm whale

“With innovative technology and a multidisciplinary approach we will make whatever possible to save these whales from extinction,” says Dr. Alexandros Frantzis, president of Pelagos Cetacean Research Institute, who discovered this sperm whale population of the eastern Mediterranean 23 years ago.



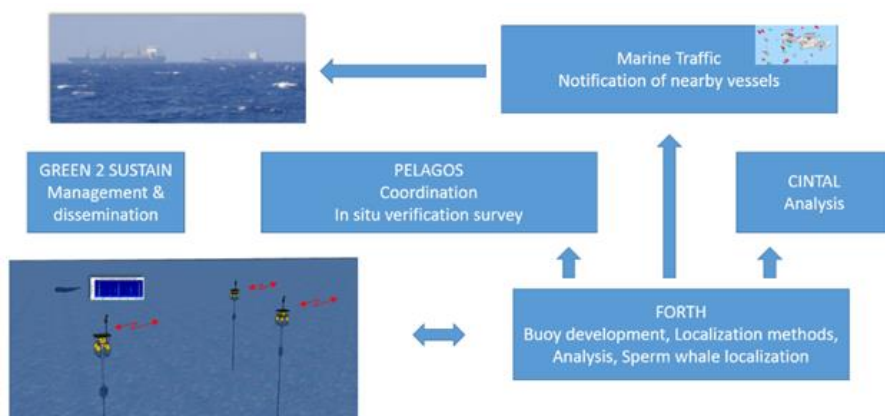
Shipping densities and sperm whale observations (red dots) from Frantzis et al. 2019

SAvE Whales went into a 3-year pilot phase in July 2019 and now successfully completed two seasons, even though this year's season came to a dramatic end. Medicane 'Ianos', which caused major damage in Greece in September, led to the loss of two buoys. Their replacement is currently under way such that the full system will be ready for deployment in spring 2021. Apart from that, all tests were successful and several sperm whale groups were detected and localized by SAvE whales with high precision.

"We trust in this pilot which could become a true whale-saving model to be applied also in other regions, especially where no other measures as moving shipping lanes can be applied", says Sigrid Lüber, president of OceanCare. However, OceanCare also stresses that technical innovation alone cannot solve the problems of ship strikes and is a complementary measure. Moving shipping lanes outside of cetacean critical habitat, but also reducing vessel speed, particularly of cargo vessels, which is a crucial, long overdue measure and a win-win-win situation lowering the risk of fatal ship strikes, noise pollution, and CO₂ emissions at the same time, are the "conservation package to be applied".

Parties are called upon imposing measures adopted with ACCOBAMS Resolution 7.12 which include clear recommendations how ship strikes, in particular with large whales, can be avoided.

Flow of information within SaveWhales



PROPOSAL TO DEVELOP AND EVALUATE MITIGATION STRATEGIES TO REDUCE THE RISK OF SHIP STRIKES TO FIN AND SPERM WHALES IN THE PELAGOS SANCTUARY

This project - funded by the Pelagos Agreement - aims to develop and evaluate mitigation strategies to reduce the risk of ship strikes in the Pelagos Sanctuary. The target species for this project are fin and sperm whales, the largest cetacean species present in the Mediterranean Sea and the most affected by ship strikes. Fin whales and sperm whales are classified as Vulnerable (VU) and Endangered (EN) under the IUCN Red List Criteria respectively, underlying the urgent need to reduce and mitigate any anthropogenic pressure. The main aim of this project was to use the extensive experience of a number of research groups (Tethys Research Institute, British Antarctic Survey, International Fund for Animal Welfare, WWF France, Souffleurs d'Ecume, Quiet-Oceans sas, Université de Bretagne Occidentale, and Yacht Club Monaco (YCM)) to gather new data in order to provide a spatial analysis of ship strike risk for both species, with the final goal of defining operational indicators to quantitatively evaluate mitigation strategies. Therefore, the final goal of the project is the implementation of a series of actions followed by practical recommendations to optimize the effectiveness of currently existing schemes.

Currently, there are key data gaps in the understanding of whale distribution patterns and the recent rates of injury and mortality from ship strikes. The project has addressed these knowledge gaps by using new satellite imaging technologies - looking at high-resolution images - to remotely detect whales as a mean of validating predictive models of whale distribution. Another important component of the project relies on the detailed examination of collision events reported for both species, from strandings and photographic records of free-ranging injured animals, to assess any trend in collision rates. Detailed analyses of available traffic data have contributed to drafting risk maps for both species, while a public awareness campaign has allowed the different scenarios to be presented to the wider public. By involving different stakeholders in this process, the hope is to increase the success rate of mitigation efforts.



These results have been combined with data on shipping to conduct spatially explicit risk assessments, define risk collision indicators to support decision making, and consider how risk might be reduced by changes to ship's routing or operational practices, including vessel responses to real-time information. Particular attention has been given to combining different sources of data and predictive models to provide routing advice at spatial scales that are practical for shipping.

The analysis of both strandings and sightings confirmed the risk assessed for these species in previous studies. Fin whales had the highest number of reported collisions, confirming that this species is the most vulnerable to ship strike events. The highest number of collisions in stranded fin whale individuals is reported in summer, consistently with the increase of ferries and passenger ships that typically occurs in the area in the summer months, and with the species higher encounter rates in their summer feeding area. Injured sperm whales appear to be associated, more than the fin whales, with the main cargo route, that travels parallel to the Italian and French coastlines. Injured fin whales appear instead to be more associated with main passenger ship routes that cross the basin, covering a wider latitudinal range, intersecting with the pelagic waters.



Optical satellite imagery was used to detect whales in order to compare whale distribution with predictive models based on habitat variables. The aim was to evaluate the potential of habitat models to predict whale distribution patterns at spatial and temporal scales that could be used for small-scale routing or localised speed reduction measures to reduce ship strike risk. Predictive habitat models used daily and derived oceanic fronts of satellite-derived sea-surface chlorophyll content and sea surface temperature to determine whales' distribution. During the survey period, the habitat values across the Pelagos area were complex and changed quite rapidly, making predicting whale locations difficult due to time lags between modelled suitable habitats and encountered whales.

The Collision Network aims to federate shipping companies and port authorities on the issue of collision between whales and ships in the Pelagos Sanctuary. The objective of this network is to promote the transmission of sensitive information concerning actual or avoided ship strikes from shipping companies and port authorities towards the scientific community. Within the framework of the project, the aim was to enable the collection of new reports of collisions (past or recent) to update the IWC database and contribute to the re-evaluation of risk. The first step of the task was to update the Collision Network already existing in the French Mediterranean Sea, and the second step was to initiate an implementation in the Principality of Monaco and in Italy in the Pelagos area.

The collision risk has been estimated by cross correlating shipping and cetacean distribution data, using two indicators: a) the Injury Weighted Travelled Distance (IWTD), and b) the estimated number of Near Miss Events (NME). In the Pelagos area, ferries are the ships that have the highest IWTD since they travel intensively at high speed. The NME indicator has increased during the last decade by 40% and 70% for passengers and cargo vessels respectively, following the increase of the traffic (about 50% increase of the cumulative travelled distance for cargo from 2010 to 2018).

The effectiveness of REPCET has also been tested, and this is based on the analysis of: a) the detection rate of the crew, b) the effective sharing of the positions of large cetaceans, and c) the avoidance manoeuvres implemented or not by the ships entering the reported risk zones. The REPCET system is a cooperative mitigation measure based on sharing real-time sightings of cetaceans. Its efficiency is controlled by the number of vessels that might cross the risk areas issued by a previous vessel during its lifespan (235 minutes and a max diameter of 4630 m). The results show that, because the number of vessels equipped in 2018 was limited to 21 vessels, the number of crossing was also limited, leading to a small number of Near Miss Events avoided and an efficiency below 1%. By equipping with REPCET all cargo, tanker and passenger vessels, this efficiency would raise to 10%. The results demonstrate that the efficiency of the REPCET strategy is strictly linked with the number of vessels equipped. Equipping all cargo, passengers and ferries would improve by 15% the efficiency, and equipping all vessels would improve by 35% the efficiency of the system.

SURVEYING THE ACCOBAMS AREA



IUCN Red List of Cetaceans to be updated with results from ACCOBAMS Survey Initiative (ASI) 40

Santiago SUÁREZ O’SOLAN

Four week survey off French Riviera, spring 2020 41

Alexandre GANNIER

A feasibility study into the integration of unmanned aerial vehicles with conventional cetacean surveys 42

Eyal BIGAL

Ferries and environmental DNA: Underway Sampling From Commercial Vessels Provides New Opportunities For Systematic Genetic Surveys Of Marine Biodiversity 44

*Elena VALSECCHI
Antonella ARCANGELI
Simon GOODMAN*

Latest results from the multidisciplinary “FLT Mediterranean monitoring network” 46

*Antonella ARCANGELI
Marta AZZOLIN
Paola TEPSICH
Léa DAVID*

Long term systematic monitoring through aerial surveys: the latest Italian contribution 48

*Giancarlo LAURIANO
Nino PIERANTONIO
Marina COSTA
Simone PANIGADA*

IUCN RED LIST OF CETACEANS TO BE UPDATED WITH RESULTS FROM ACCOBAMS SURVEY INITIATIVE (ASI)

The IUCN Red List of Cetaceans aims to support conservation strategies for this group of species throughout the Mediterranean Sea and Black Sea. After 8 years, the conservation status of the 12 species with resident populations in the Mediterranean and Black seas is being re-assessed. This update will allow to establish their current risk of extinction and how conservation efforts and science are contributing to improve the status of these iconic species. The current initiative builds on the results of ACCOBAMS Survey Initiative (ASI) as well as information from further regional initiatives. Over 35 experts from 17 organizations, including the [IUCN SSC Cetacean Specialist Group \(CSG\)](#), are contributing to the assessment, the results of which are expected to be published during the first months of 2021.



Image by © E. Pirota / Tethys Research Institute

Established in 1964, The International Union for Conservation of Nature's [Red List of Threatened Species](#) has evolved to become the world's most comprehensive information source on the global conservation status of animal, fungi and plant species.

The IUCN Red List is a critical indicator of the health of the world's biodiversity. Far more than a list of species and their status, it is a powerful tool to inform and catalyze action for biodiversity conservation and policy change, critical to protecting the natural resources we need to survive. It provides information about range, population size, habitat and ecology, use and/or trade, threats, and conservation actions that will help inform necessary conservation decisions.

For further details on IUCN's work in the Mediterranean, please visit:

<https://www.iucn.org/regions/mediterranean>

FOUR WEEK SURVEY OFF FRENCH RIVIERA, SPRING 2020

Groupe de Recherche sur les Cétacés was granted an official research permit from French authorities during the spring covid-lockdown. Our usual research sailboat with a standard towed hydrophone and monitoring station was utilized within the 20 milles inshore area from Cap Ferrat to Port-Cros island. For obvious sanitary reasons the scientific crew was limited to three persons, both with dual expertise in visual and acoustic surveys. This survey was focused on two main objectives : (1) obtaining archives records on the underwater sound background without coastal boat trafic, and (2) having a testimony on striped dolphins (*Stenella coeruleoalba*) presence and behaviour without undue human disturbance. As a matter of fact, coastal dolphins off French Riviera are subject to an intensive, increasing and mostly unregulated dolphin watch activity since 20 years, including the much debated swim-with operations.

A recent study, in partnership with PELAGOS (France), was focused on these inshore dolphins, and stated that several striped dolphin ecological and behavioural parameters changed on a long term basis. From 27 Avril to 22 May, 10 survey days could be carried out and a total of 28 sightings on three species (striped dolphins, sperm whales, fin whales) was obtained, together with sound recordings in various conditions. Obviously, within 300 meter of cetaceans, our boat evolutions were strictly kept in agreement with the code-of-conduct, despite the fact that we were engaged in research activities.



Although data are not fully processed, field evidence suggests that striped dolphins were much more attracted to our research boat compared to the past ten years sightings in the Riviera region. Sound recordings show that nearshore noise levels were 5-10 dB lower, depending on the frequency band, compared with recordings obtained during periods with usual coastal boat traffic.



This brief and unique experience confirms that coastal striped dolphins are under pressure from human tourism activity.

These populations may be threatened unless positive protection measures are introduced ... and implemented.

A FEASIBILITY STUDY INTO THE INTEGRATION OF UNMANNED AERIAL VEHICLES WITH CONVENTIONAL CETACEAN SURVEYS

Aerial surveys are a standard technique for estimating animal abundance across large areas. They typically employ occupied platforms allowing for trained observers to log wildlife encounters and environmental conditions along predefined transects. Recorded parameters include the GPS location of the aircraft and the measured angles to animals, as well as their species ID, number of individuals, group structure, behaviour, etc. Variables such as sea-state, glare from sunlight, and water turbidity are then used to correct detection errors and fine-tune the resulting model.

While this method is applicable in both terrestrial and marine environments, across a range of weather conditions, it remains costly, hazardous, and logistically-challenging to implement. Wildlife monitoring programmes may thus refrain from the aerial approach; this leaves fundamental ecological data uncollected in potentially important habitats for a variety of keystone species. In an attempt to address this issue, a collaboration between the University of Haifa, Israel, and Murdoch University, Australia, has focused on the integration potential of unmanned aerial vehicles (UAVs), i.e., drones, with conventional cetacean surveys. The study referred to three aspects of survey automation: 1. Aviation regulations concerning UAV operation across the ACCOBAMS region; 2. Survey conditions facilitating a deep-learning approach for dolphin detection; 3. Species identification of dolphins in UAV-based data as performed by expert aerial observers.

The first chapter of this study stemmed from the realisation that, in order to achieve the coverage required for a large-scale aerial survey, UAVs will need to be flown at a relatively high altitude and beyond visual line of sight. These two requirements usually mean that the UAVs are being flown outside of the standard operating procedures outlined by aviation safety authorities, and thus exemption permits would be required for survey implementation. The researchers conducted a review of the regulations governing the use of UAVs within each of the party countries. Of these, only seven indicated that it may be possible to obtain permission for non-standard operations such as those mentioned above. However, those countries represent a significant proportion of the northern Mediterranean Sea and contiguous Atlantic area which could feasibly be surveyed if permits were obtained. This chapter further highlighted analytical, logistical and ethical considerations concerning the transition towards UAV-based data.



In the second part of the study, the researchers employed a state-of-the-art convolutional neural network (CNN) for automated object detection and established its optimal performance trade-off between coverage and resolution. This assessment employed footage from designated UAV missions, whereby bottlenose and common dolphins (*Tursiops truncatus* and *Delphinus delphis*, respectively) were photographed in a variety of sea conditions and across a range of flight and imaging parameters. A total of 1,125 images and 6,075 manual annotations were included in the assessment. This analysis focused on the detector's sensitivity to the pixel size of dolphins in the image. The result was a formula for the calculation of the minimal flight altitude required to facilitate detection given any camera sensor and the species under study.

Finally, the third part of this work focused on the effect of sea-state, image resolution, true ID, and number of individual dolphins, on the ability of aerial observers to correctly identify species in images from UAVs. An online survey of 117 images was distributed among participants of the ACCOBAMS Survey Initiative. Each image was followed by multiple optional selections including Mediterranean and Black Sea species of cetaceans. The proportion of correct selections by the reviewers was analysed in a statistical model incorporating the above variables as well as the participants' previous experience and level of confidence in their answers. The study showed that species identification is limited to a ground sampling distance (GSD) of 1 cm/pixel and a sea-state of <1.5 on the Beaufort scale. Previous experience in the aerial methodology was of low significance as a model predictor. The analysis highlighted the limitations of UAV-based animal abundance surveys and provided protocol recommendations for future studies employing unoccupied platforms.

The study will be made available on the ACCOBAMS website in due course and is expected to be published in peer-reviewed literature in early 2021.



FERRIES AND ENVIRONMENTAL DNA: UNDERWAY SAMPLING FROM COMMERCIAL VESSELS PROVIDES NEW OPPORTUNITIES FOR SYSTEMATIC GENETIC SURVEYS OF MARINE BIODIVERSITY

Marine environmental DNA (eDNA) surveys are becoming a promising approach to monitor biodiversity status and its variation over time. Yet, the monitoring of offshore areas could be extremely costly when using dedicated vessels, beside the impossibility to sample simultaneously geographically distant, even if adjacent, areas. The FLT Mediterranean Monitoring Network gave a still unexplored opportunity of testing the use of ferries as an opportunistic platform for eDNA sampling. Since summer 2018 a pilot study was conducted along the Livorno-Golfo Aranci routes (Corsica Sardinia Ferries), collecting water samples from ferries and looking for marine vertebrate molecular signals within the sample set.

We tested, for the first time in the wild, a recently described panel of primer sets (MarVer1 and MarVer3, 12S and 16S regions respectively) specifically designed for the simultaneous detection of marine mammals and other marine vertebrates. The two markers were found to be successful in detecting amplicons from most trophic levels of vertebrate marine communities, and classes, including bony fish, rays, cetaceans and birds. Samples for the eDNA analysis were collected during three cruises during Summer 2018 (run 15 days apart from each other from the 18th of June until the 17th of July 2018) in four pre-established fixed sites and in sites associated with visual cetacean sightings along the pilot Mediterranean route crossing the eastern Pelagos Sanctuary. The High Throughput Sequencing (HTS) results showed interesting diel patterns and appreciable differences in bony fish community across the three cruises. Ferry-based sampling allow collecting samples at any time of the day: we observed an increased abundance of lantern fish amplicons in night-time collect samples (50%), reflecting nocturnal migration through the water column. In general, the number of read counts was significantly higher in nocturnal samples. Such diel differences within our sample indirectly provides evidence of the efficiency of the eDNA approach to detect contemporary signals in the sampled environment. Similarly, cetaceans were detected in correspondence of visual sightings. When cetaceans were found in the fixed sampling sites (thus not during sightings), this occurred mostly at night-time. Besides, a negative association was detected between anchovy amplicon abundance and sea surface temperature, reflecting preference for anchovies to spawn below 25°C.

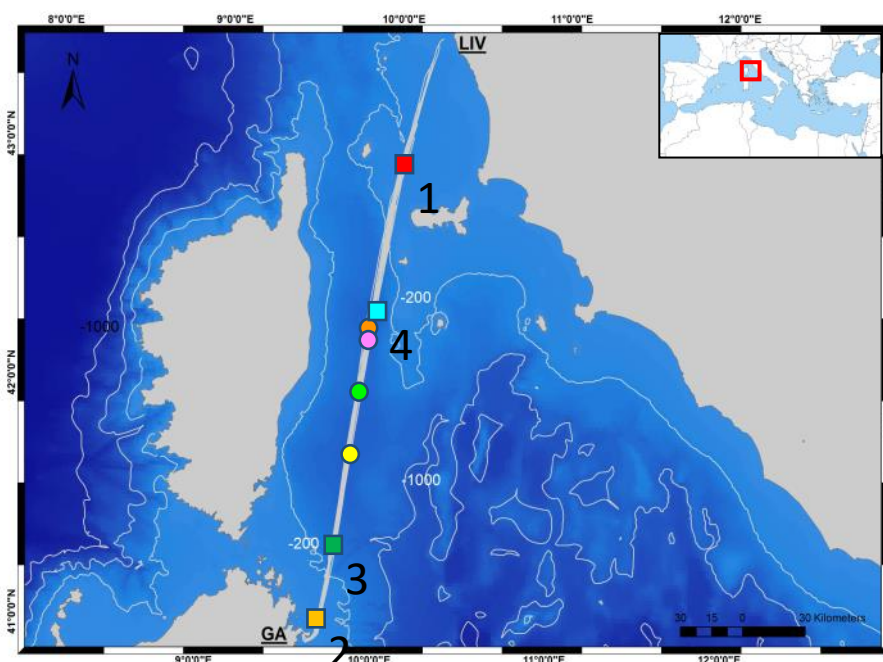


Figure 1.

Sampled sites in summer 2018 (square are Fixed sampling sites, circle are sampling during sightings:

- pink and orange = dolphins
- yellow and green = fin whale

The study demonstrates the feasibility of using commercial shipping as a platform for eDNA marine sampling without dedicated survey cruises. The protocol will therefore be extended to other routes of the FLT network. More generally, the study suggests that commercial shipping routes have potential to act as regular systematic sampling transects opening limitless opportunities for systematic surveys on marine biodiversity.

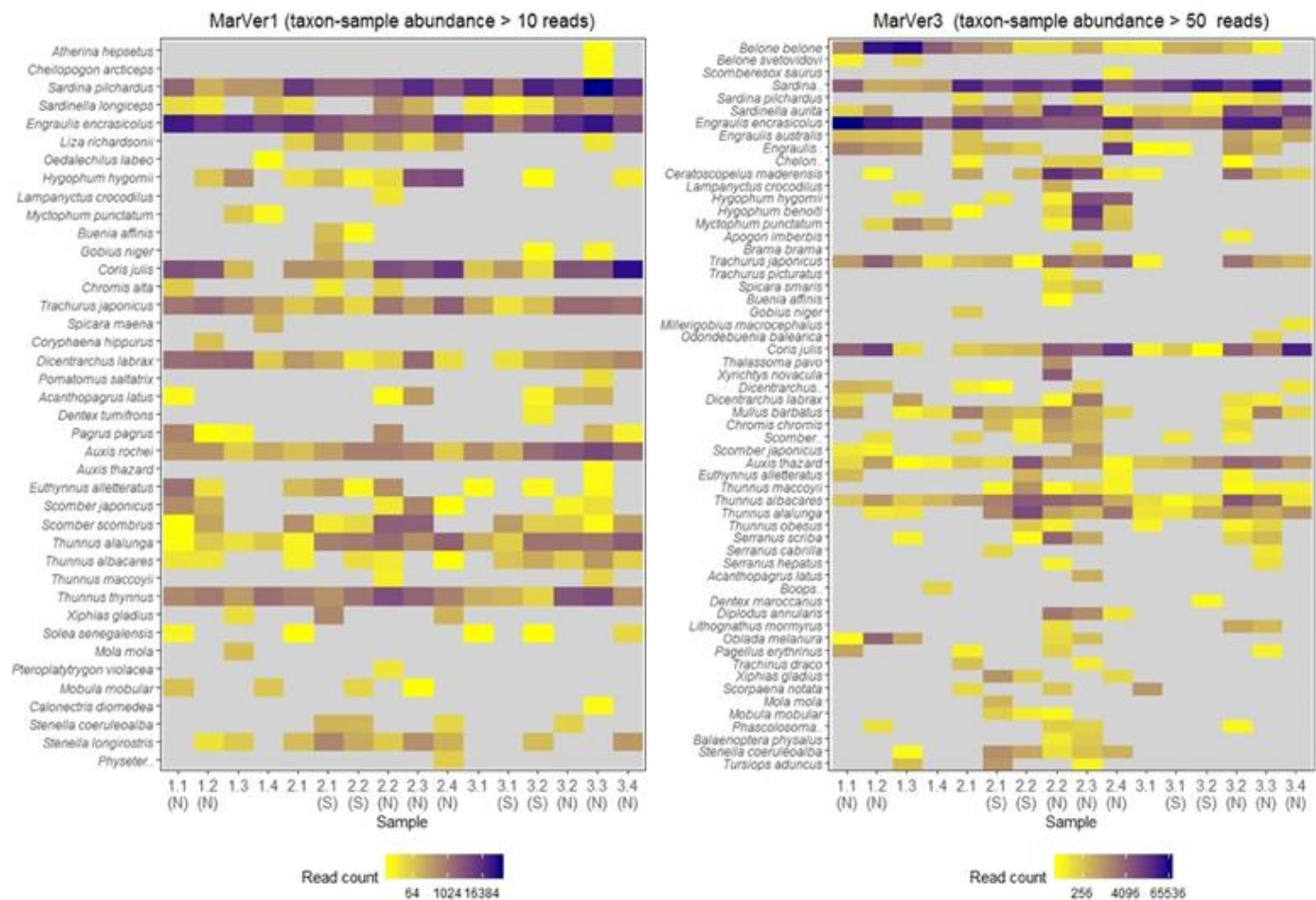
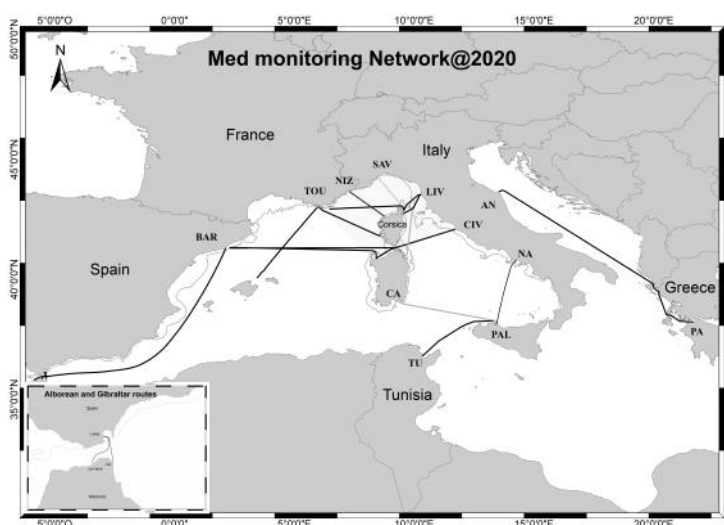


Figure 2.

Heat maps of species occurrence (read counts) as detected using the two markers MaVer1 (left) and MaVer3 (right) over the sampling sites (“S” indicates samples collected during cetacean sightings; “N” identifies nocturnal samples)

LATEST RESULTS FROM THE MULTIDISCIPLINARY "FLT MEDITERRANEAN MONITORING NETWORK"

The Fixed Line Transect Mediterranean monitoring Network includes 17 research structures (Universities, MPAs, research NGOs) and 6 maritime companies from 5 countries in the Mediterranean Sea. The network is regulated through a non-profit agreement coordinated by ISPRA (Italy) with the collaboration of 16 research organizations from Spain, France, Italy, Greece, Tunisia: University of Pisa, CIMA Research Foundation, Accademia del Leviatano, Marine Protected Area of Capo Carbonara, University of Barcelona, University of Turin, University of Palermo, EcoOcéan Institut, Gaia Research Institute, Nereide, University of Tuscia, SZN Anton Dohrn, University of Catania, MareCamp, ATUTAX, University Milano Bicocca. Many other organizations collaborate with the network for data use and analysis (e.g. EmodNet, Tursiomed, Sea Turtle working group on GES coordinated by MNHN), projects (e.g. Pelagos France 2010-2011, ACCOBAMS, DeFishGEar, MEDSEALITTER, SICOMARPLUS), and student tutoring (40 University dissertations).



The aim of the Network is to coordinate a systematic multidisciplinary monitoring of cetaceans, sea turtles, other marine macro fauna and their main threats (i.e. maritime traffic and Floating Marine Macro Litter - FMML) applying standardised protocols along fixed trans-border transects, using passenger ferries as a platform of observation. With the support of the University of Milano Bicocca, the network also introduced since 2018 a new protocol for the collection of eDNA samples. Such joint effort aims to enhance research knowledge, and to contribute to the long-term assessment of the marine environmental status, as well as to the implementation of the legislative requirements.

FLT – results in the Adriatic (Azzolin *et al.*, 2020)

The study investigates the striped dolphin distribution within the EU Adriatic and Ionian Sea Region (ADRION) using topographic and oceanographic variables to build species distribution models (SDMs) with the Maxent software. The higher encounter rates observed in the Gulf of Taranto and the Gulf of Corinth confirm that both sub-regions are crucial for this species conservation. Furthermore, results also indicate suitable areas for the species in the offshore waters of the Adriatic Sea, along the continental slope of the north-eastern Ionian Sea and over its continental shelf. Within the EU ADRION region, striped dolphins prefer areas located at a larger distance from shore, with steeper slopes, deeper waters, and higher sea surface temperature. These analyses allow the identification of important areas for conservation and highlight zones where appropriate mitigation strategies could reduce the impact of human activities to striped dolphins.

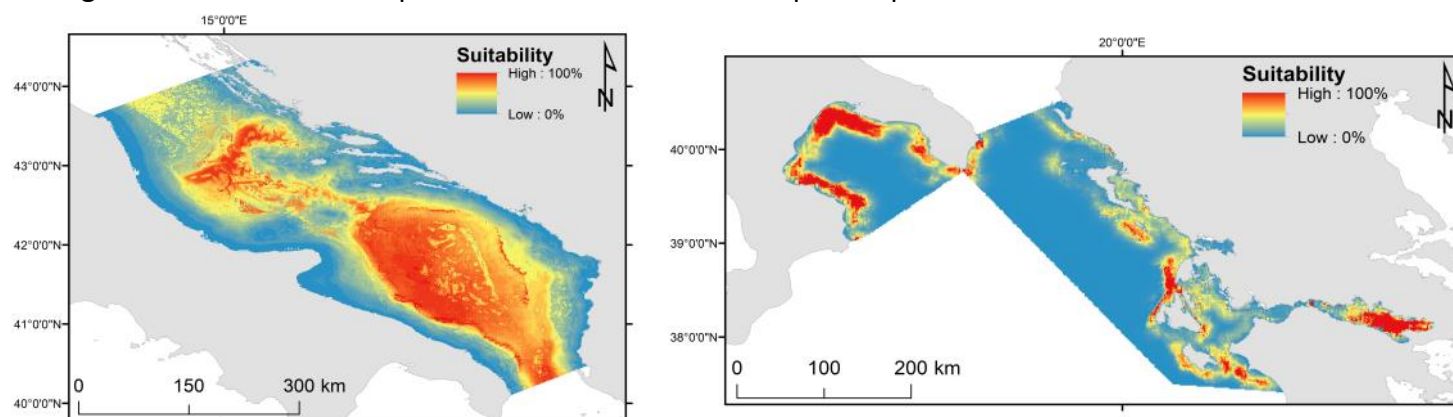
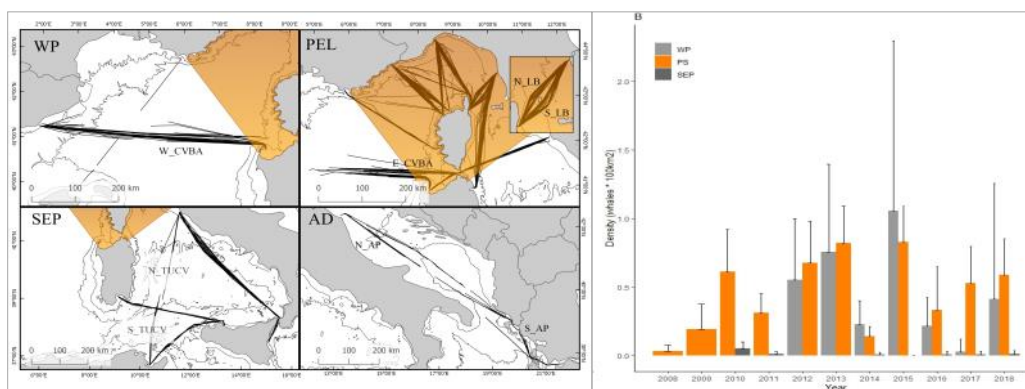


Fig. Summer distribution model of striped dolphin throughout the Adriatic (left) and Ionian Sea (right) according to topographic and oceanographic variables.

Ref : Azzolin M., Arcangeli A., Cipriano G., Crosti R., Maglietta R., Pietroluongo G., Saintingan S., Zampollo A., Fanizza C., Carlucci R. (2020). Spatial distribution modelling of striped dolphin (*Stenella coeruleoalba*) at different geographical scales within the EU Adriatic and Ionian Sea Region (ADRION), Central eastern Mediterranean Sea. *Aquatic Conservation, Marine and Freshwater Ecosystems* <https://doi.org/10.1002/aqc.3314>.

FLT- results on long-term density trends for fin whale (Tepsich et al., in press)

Data were collected along fifteen fixed transects crossing the Western Mediterranean basin and the Adriatic and Ionian region. The species presence, expressed as the density recorded along the transects (using Distance sampling), was inspected for assessing interannual variability, group size, and density trends over an 11 years' period (2008-2018) in four sub-areas (see map). The density indexes suggest variability between high density (rich) years, as 2012, 2013 and 2015, and low density years, 2014 specifically. The “rich” years are also characterized by the presence of groups (small and large) of fin whales in the Pelagos Sanctuary and Western Pelagos sub-areas, whereas only single animals were sighted during “poor” years. Looking at the complex trends, we can distinguish two reference periods following the Habitat Directive: 2007-2012 and 2013-2018. During the spatial scale addressed by the MFS, within the Western Mediterranean Basin, it is possible to confirm an increasing trend followed by a negative trend, with a -40% percentage variation from 2012 to 2018.



Map of sub-areas (left): the Western Pelagos (WP), Pelagos Sanctuary (PEL), South Eastern Pelagos (SEP) and Adriatic region (AD) and mean density of fin whales per year in the sub-areas (right), with error bars representing 95% Confidence Intervals. No fin whale seen in AD.

Ref: Tepsich et al., Trends in summer presence of fin whales in the Western Mediterranean Sea Region: new insights from a long-term monitoring program. (in press). PeerJ.

FLT Europe – EU IMPEL project

The FLT launched in 2020 the FLT EUROPE project, funded by the *European Union Network for the Implementation and Enforcement of Environmental Law* (IMPEL). The aim of the project is to set European shared guidelines for monitoring cetaceans and marine turtles and their threats, such as plastic marine litter, within the framework of the MSFD and HD, using large vessels as a platform of observation. The Networks that participate in the project are the FLT Mediterranean monitoring Network (western Mediterranean and Adriatic-Ionian Region), the ORCA Network (Northeastern Atlantic and Southern Mediterranean), the CETUS network (Continental Portugal to Azores, Madeira, Canaries and Cape Verde, CIIMAR Porto, Portugal, and CETUS Madeira for Madeira-Porto Santo, OOM Madeira).



European Union Network for the Implementation
and Enforcement of Environmental Law

<https://www.impel.eu/projects/fixed-line-transects-europe>

By:

Antonella ARCANGELI, ISPRA BIO Department, antonella.arcangeli@isprambiente.it

Marta AZZOLIN, Life and System Biology Department, University of Torino, Gaia Research Institute Onlus, marta.azzolin@gmail.com

Paola TEPSICH, CIMA Research Foundation, paola.tepsich@cimafoundation.org

Léa DAVID, écoOcéan Institute, lea.david2@wanadoo.fr

LONG TERM SYSTEMATIC MONITORING THROUGH AERIAL SURVEYS: THE LATEST ITALIAN CONTRIBUTION

The Mediterranean Sea is a unique body of water characterised by a long history of interactions amongst people, cultures and its diverse, valuable and unique habitats which support an extensive repository of biodiversity. Unfortunately, way too often, the nature and complexity of these interactions resulted into overall detrimental impacts on the Mediterranean marine environment.

In facts, humans have used and had an impact on marine ecosystems throughout the history of the Mediterranean. As human populations and their economic activity increased, their impacts intensified, but our awareness of the longterm, pervasive effects on marine environments and life is relatively recent and very incomplete.

Fortunately, particularly in more recent times, efforts to understand and mitigate where necessary the potential impacts of anthropogenic activities on Mediterranean ecosystems have intensified at the Regional level. Strong and robust inputs from the single riparian countries, alongside the tremendous efforts of more overarching international bodies and agreements, have deeply contributed to the development and deployment of research and monitoring strategies aimed at informing conservation and trigger management and conservation actions.

In this context, the European Union Marine Strategy Framework Directive (MSFD – Council Directive 2008/56/EC), introduced in 2008, represents a milestone statutory instrument for marine conservation in Europe. Under the MSFD, following a holistic ecosystem-based approach, EU member States shall establish coordinated programmes aimed at achieving and maintaining the Good Environmental Status of EU marine waters.

In the Mediterranean Sea, amongst the most charismatic elements for which the bar of conservation concerns has sharply raised are its cetacean sub-populations and the environments they inhabit. Within the MSFD, marine mammals are included as a functional group for the assessment and reporting under the biodiversity descriptor (D1), but could also be referred to in four other descriptors such as food web (D4), contaminants (D8), marine litter (D10) and underwater noise (D11). In particular, coordinated monitoring programmes aimed at “a description of the population dynamics, natural and actual range and status of species of marine mammals” should be put into place and are a requirements under the MSFD as well as the other pillar of EU environmental protection, the Habitats Directive (Council Directive 92/43/EEC). The systematic monitoring of density and abundance of large vertebrates is also amongst the priorities listed in the Pelagos Sanctuary for Mediterranean Marine Mammals Management Plan, the Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) and in the Specially Protected Areas (SPA) and Biodiversity Protocol under the Barcelona Convention.



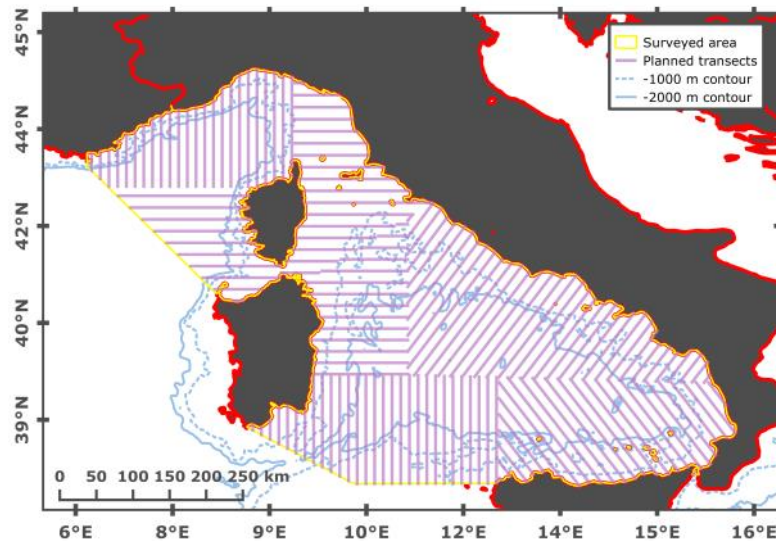
ISPRA

Istituto Superiore per la Protezione
e la Ricerca Ambientale

Research Institute, the International Whaling Commission and Blue World has supported and carried out a series of aerial surveys in the seas around Italy aimed at investigating the occurrence, abundance and trends of cetaceans and other species of conservation concern.

ISPRA just carried out the last monitoring activity related to the second cycle of the MSFD. During the month of October, two teams of researchers from ISPRA and the Tethys Research Institute have been, in fact, flying across a large portion of the west Mediterranean sub region (*sensu* MSFD) collecting information on the presence of cetaceans, marine turtles, elasmobranchs, marine birds and human activities.

By using the line transect distance sampling approach, the abundance and density for all the species with sufficient recorded sightings will be estimated. Furthermore, the coupling of sighting data with other remotely collected information, such as sea surface temperature and chlorophyll concentration, will be used to highlight correlates between the patterns of distribution and abundance of the more commonly observed species and environmental variables. Moreover, since these data have been collected in areas covered by previous surveys, they will represent a new batch in the series of information already available. All the data will contribute to address the needs to populate threshold values and criteria requested by the Marine Strategy Framework Directive.



In 18 days of survey, about 20,000 km of transects were monitored, resulting in 1736 sightings of cetaceans and other megavertebrates, with striped dolphins and loggerhead sea turtles being by far the species with the highest number of recorded sightings. Several other species, such as sperm and fin whales and bottlenose dolphins have been encountered alongside elasmobranchs, primarily spinetail devil rays, and other species of commercial interest such as swordfish and tuna. Together with cetaceans, turtles and birds, plenty of human activities and the by-products of these activities were observed, with floating marine macroplastic being widespread, ubiquitous and ever-occurring across the entire study area, as recently demonstrated also by the ACCOBAMS Survey Initiative, which was carried out in summer 2018 over most of the entire Mediterranean Sea.



ISPRA, is planning new aerial surveys in the 2021-2023 period to comply with the MSFD requests.

By:
Giancarlo LAURIANO, ISPRA, giancarlo.lauriano@isprambiente.it
Nino PIERANTONIO, Tethys Research Institute, nino.pierantonio@protonmail.com
Marina COSTA, ISPRA, marinza.costa@gmail.com
Simone PANIGADA, Tethys Research Institute, panigada69@gmail.com



FINS is published by the ACCOBAMS Permanent Secretariat.

The views and opinions expressed herein are those of the authors and don't necessarily reflect those of the ACCOBAMS Permanent Secretariat.

The FINS logo was donated by Massimo Demma.

www.massimodemma.it

For more information on ACCOBAMS and its activities please consult:

www.accobams.org

 [/accobams](https://twitter.com/accobams)

 [/ACCOBAMSDolphin&WhaleConservation](https://www.facebook.com/ACCOBAMSDolphin&WhaleConservation)

