ACCOBAMS WORKSHOP ON COMMERCIAL FISHERIES INTERACTIONS WITH VULNERABLE SPECIES

Delegates are kindly invited to bring their own documents to the Meeting.
This document will be available only in electronic format during the Meeting.

Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area, concluded under the auspices of the Convention on the Conservation of Migratory Species of Wild Animals (CMS)

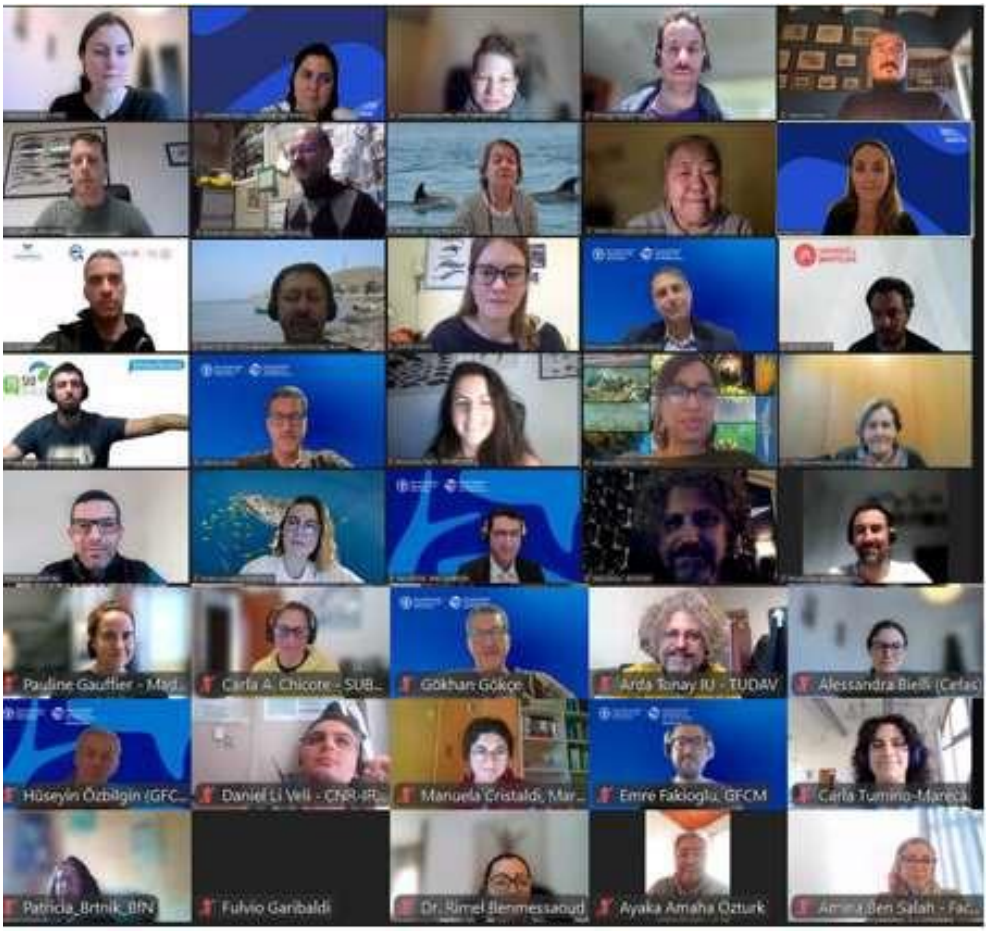
Accord sur la Conservation des Cétacés de la Mer Noire, de la Méditerranée et de la zone Atlantique adjacente, conclu sous l'égide de la Convention sur la Conservation des Espèces Migratrices appartenant à la Faune Sauvage (CMS)

ACCOBAMS

Meeting Report

ACCOBAMS Workshop on Commercial Fisheries Interactions with Vulnerable Species

Online, 28 January 2025



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ACCOBAMS Workshop on Commercial Fisheries Interactions with Vulnerable Species

Online, 28 January 2025

Opening

The **ACCOBAMS Workshop on Commercial Fisheries Interactions with Vulnerable Species** was held online on 28 January 2025, within the framework of three ongoing projects funded by the General Fisheries Commission for the Mediterranean (GFCM) under the FAO, for which the ACCOBAMS Secretariat was involved as coordinating partner.

The workshop aimed to exchange knowledge and experiences on the monitoring and mitigation of incidental catches and depredation involving vulnerable marine species drawing on expertise from a wide network of experts and organizations active across the ACCOBAMS and GFCM areas, and beyond.

This initiative was rooted in a long-standing collaboration between ACCOBAMS and GFCM, established through the 2012 Memorandum of Cooperation, to cooperate and support initiatives focused on assessing, monitoring, and mitigating fisheries interactions with marine megafauna, as demonstrated by previous projects such as MedBycatch (2017–2022) and the Dolphin Depredation project (2018–2022).

The workshop gathered 72 participants, including representatives from five ongoing GFCM-funded projects carried out by national partners: BirdLife (Spain), Çukurova University (Türkiye), Marecamp Association (Italy), the National Institute of Fisheries Research (INRH) of Tangier (Morocco), and WWF Adria (Croatia). The final list of participants appears in Annex 1.

The workshop targeted the following three main objectives:

- **Share experiences, knowledge and insights on interactions between commercial fisheries and vulnerable marine species (including cetaceans, elasmobranchs, reptiles, seabirds, juvenile fish, etc.).**
- **Discuss monitoring and mitigation strategies to address bycatch of vulnerable species and dolphin depredation within the ACCOBAMS and GFCM areas, as well as in other relevant regions.**
- **Promote collaboration among experts, organizations and institutions across countries working on these critical issues**.

These objectives are essential as species such as cetaceans, sea turtles, seabirds, and elasmobranchs face significant risks from incidental capture (bycatch) and depredation, particularly by dolphins, is a cause of strong concerns for fishers and fisheries managers in the Mediterranean, Black Sea, and adjacent Atlantic. The fisheries interaction with marine megafauna can result in injury or mortality to non-target species and economic losses for fishers, yet data on their extent and distribution remain fragmented, hindering the development of effective mitigation strategies and prompting for innovative and adaptive solutions, based on scientific evidence and grounded in collaboration with stakeholders.

The ACCOBAMS Secretariat welcomed all participants and recalled that the workshop represented a key step in enhancing collaboration and knowledge-sharing across countries and institutions, aligning with GFCM and ACCOBAMS efforts to minimize negative impacts on marine biodiversity while supporting sustainable fisheries.

In particular, this workshop highlighted the priorities of the **GFCM 2030 Strategy**, which aims to consolidate scientific knowledge on marine living resources—especially vulnerable species and ecosystems—and to develop effective area-based management tools to mitigate fishing impacts. The workshop also aligned with the **GFCM's Regional Plan of Action for Small-Scale Fisheries (RPOA-SSF)**, which promotes investments to improve the selectivity of fishing gear, reduce incidental catches, and minimize interactions with vulnerable species.

Moreover, it fell within ACCOBAMS commitment to foster regional cooperation for the protection of cetaceans and the conservation of marine biodiversity, with a strong focus on addressing the threats posed by fisheries interactions, particularly bycatch and dolphin depredation. Over the years, ACCOBAMS has strengthened collaboration with other regional and international organizations working on complementary mandates, including the GFCM, the Barcelona Convention, the Regional Activity Center for Specially Protected Areas (SPA/RAC), the Bucharest Convention, the Bonn Convention on Migratory Species (CMS), the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS), and the International Whaling Commission (IWC), among others.
Recent **ACCOBAMS Resolutions**, such as Resolution 8.16 on interactions between fisheries and cetaceans, call for reinforced cooperation among competent bodies and advocate for more robust monitoring of bycatch and depredation, with the goal of reducing these impacts and promoting sustainable fishing practices.

Before adopting the agenda (Annex 2), the ACCOBAMS Secretariat underlined that, the workshop offered a valuable opportunity to present approaches, highlight emerging results, and align efforts for coherent, effective, and science-based action regarding commercial fisheries interaction with vulnerable species.

No. 01 - An approach to tackle seabird bycatch in the western Mediterranean: self-reporting logbooks and mitigation methods.

ORGANIZATION	**SEO/BirdLife, Spain**
SPEAKER	Daniel Rey Faura
COAUTHORS	Antonio Vulcano, Jose Manuel Arcos
ABSTRACT	Bycatch in fishing gear is the greatest hazard to some of the most threatened seabirds in the Mediterranean, particularly shearwaters. Here we present work in the Spanish Mediterranean to assess this threat and develop mitigation measures. Assessment is particularly complex in the region, due to the numerous and highly diversified local fishing fleet, mostly small-scale, that makes it difficult to follow traditional approaches, particularly on-board observations. We present a complementary methodology based on self-reporting logbooks filled in by the fishers themselves on a daily basis and regularly monitored by a network of observers in the fishing ports. This approach was implemented by SEO/BirdLife since 2017, with fishers from 82 collaborating vessels coordinated by eight observers at port. Data were collected from 3,522 fishing days in which 1,142 birds were caught (2017 - 2021), with shearwaters being the most affected (93%). Of particular concern was the critically endangered Balearic shearwater *Puffinus mauretanicus*. Bycatch rates varied between years and areas and according to the configuration and operational characteristics of the gear, being more frequent in the small-scale fleet in late spring. The greatest risk of bycatch occurred when setting during the day, using small pelagic fish as bait, and adding little or no weight to the line. Self-reporting logbooks turned out to be a good method to assess seabird bycatch in small-scale fisheries, with lower effort compared to observer programs, and helped at raising awareness and involving fishermen in finding solutions to mitigate bycatch, showing promise for extension to other areas and gears, mainly in the small-scale fleet. Current work funded by the FAO-GFCM (2023-2025) supports the approach of the logbooks to keep evaluating the issue and puts particular attention on the development of mitigation measures.
KEYWORDS	Seabird, bycatch, mitigation, logbooks

No. 02 - Reduction and mitigation of bycatch of vulnerable species in Turkish trawl fisheries (GSA 24 – Northern Levant Sea).

ORGANIZATION	**Çukurova University, Türkiye**
SPEAKER	Cagatayhan Bekir Ersu
COAUTHOR	Gokhan Gokce
ABSTRACT	This summary presents the preliminary findings of the "Reduction and Mitigation of Bycatch of Vulnerable Species in Turkish Trawl Fisheries" project. Focused on protecting vulnerable species such as elasmobranchs, sea turtles, and marine mammals, the study is being conducted in the Northern Levant Sea (GSA 24) using bottom trawlers as the primary fishing gear. For mitigation trials, two types of grids were tested, 45° PA grids (50 mm bar spacing) for red shrimp and 135° PA grids (95 mm bar spacing) for fish species. The trials were conducted at a trawl towing speed of approximately 2.5 knots with towing durations of 3 hours to reflect commercial fishing practices. Results demonstrated a significant reduction in ray and shark catches, highlighting the effectiveness of these mitigation measures. A short-term post-release mortality experiment (1 hour) was conducted to assess the survival rates of several vulnerable species. Species tested in shallow waters included *Rhinobatos rhinobatos, Gymnura altavela, Rhinoptera marginata, Aetomylaeus bovinus*, and *Dasyatis pastinaca*. In deeper waters, the species tested included *Heptranchias perlo*, *Dalatias licha*, *Hexanchus griseus*, and *Dipturus oxyrinchus*. The experiment involved placing individuals into a survival tank with approx. 1000 L volume: 930 immediately after the completion of the trawl operation. The results from shallow water trials indicated that most individuals of Rhinoptera marginata survived, with only two fatalities, while survival was not observed for individuals in deeper waters (*Heptranchias perlo, Dalatias licha, Hexanchus griseus*, and *Dipturus oxyrinchus*). These outcomes highlight the critical role of depth and methodology in post-release survival. The long-term survival experiments conducted over two periods using net cages for deep-water species confirmed that the methodology was unsuitable as all individuals tested in these conditions died. These findings highlight the effectiveness of grid systems as a significant step toward mitigating the bycatch of vulnerable species in trawl fisheries while emphasizing the need for further development and optimization.
KEYWORDS	Bycatch, post-release, vulnerable species, trawl, mitigation

No. 03 - Reduction and mitigation of the catch of elasmobranchs incidentally captured by gillnets and combined nets along the Croatian Coast (GSA 17 – Northern Adriatic Sea).

ORGANIZATION	**WWF Adria, Croatia**
SPEAKER	Hrvoje Čeprnja
ABSTRACT	Sharks and rays in the Adriatic face significant threats from incidental capture in fisheries, offshore but also in coastal areas with intensive fishing activities. The MedBycatch (2020-2022) project aimed to address this issue by investigating the bycatch of sensitive species, including elasmobranchs, marine mammals, seabirds, and turtles, across the Mediterranean, and showed that sharks and rays bycatch frequently occurs inter alia in small-scale vessel fisheries in Croatia. This emphasizes the need for further testing of widely used set nets within this fleet segment to develop effective mitigation measures to protect vulnerable species and maintain ecosystem integrity. In 2024, a new pilot project, "Reduction and Mitigation of the Catch of Elasmobranchs Incidentally Captured By Gillnets and Combined Nets along the Croatian Coast (GSA 17 – Northern Adriatic Sea)" FAO-GFCM funded project, aims to further add to data collection and to test strategies to minimize elasmobranch bycatch. This project actively engages Croatian fishers and national authorities. Data collection includes on board observations and port questionnaires conducted by scientific experts across key and smaller fishing ports. Mitigation measures include at-sea trials testing two strategies: LED lights on gillnets and modified mesh slack. Additionally, tagging of elasmobranch species using "Spaghetti tags" is being carried out within the project. The aim is to enhance the reach of tagging efforts through social media, targeting fishers directly. Similar to database established by the University of Padova, a new and improved database will be established supporting the sharing and hosting of tagging data in collaboration with the Institute of Oceanography and Fisheries in Split and University in Padova for long-term monitoring of elasmobranch movements and behaviour. It will support the development of effective conservation strategies and fisheries management practices, as well as awareness raising for the reporting of recaptures in the Northern Adriatic (GSA 17).
KEYWORDS	Data collection, mitigation, gillnets, sharks and rays, Adriatic Sea

No. 04 - Clean Catch: combining stakeholder-led approach and technological innovation for evidence-driven management.

ORGANIZATION	**Centre for Environment, Fisheries and Aquaculture Science (Cefas), United Kingdom**
SPEAKER	Alessandra Bielli
ABSTRACT	Incidental capture (bycatch) of sensitive marine species including marine mammals, seabirds, and elasmobranchs in commercial fisheries is a major threat to their conservation and can have socio-economic and well-being consequences for the fishing industry. Key to addressing this challenge is a robust understanding of the population abundance and distribution of these species, along with their bycatch rates, to enable the development and implementation of targeted mitigation measures. Clean Catch is a collaborative research programme that is working directly with the fishing industry to support the UK government's aims to minimise the bycatch of sensitive marine species. In 2019, participating fishers in the programme requested the trial of technologies to reduce cetacean bycatch in their gillnet fishery. The first phase of the Cetacean Bycatch Mitigation Trial (2019-2022) was designed to investigate if Acoustic Deterrent Devices (or 'pingers') and Light Emitting Diodes (LEDs) were practical, robust and effective at reducing bycatch of common dolphin and harbour porpoise, without increasing the bycatch of other sensitive species. A smartphone mobile application was co-designed to enable self-reporting of fishing activity and bycatch events, alongside the use of onboard Remote Electronic Monitoring to capture independent video data. Following feedback on the practicality and design of the trial, a second phase was implemented from August 2024. Here we present how the design of the trial was simplified and scaled to specifically understand the effectiveness of Fishtek Marine's "Banana pinger" at reducing cetacean bycatch, informed by a priori power analysis, and summarise early results.
KEYWORDS	pingers, gillnets, co-design

No. 05 - Depredation 3 project: insights into small-scale fisheries and vulnerable species interactions in Sicilian waters of GSA19.

ORGANIZATION	**Marecamp Association, Italy**
SPEAKER	Alessandra Raffa
ABSTRACT	The Depredation-3 project aims to tackle the challenges posed by interactions between small-scale fisheries and marine species in the Western Ionian Sea (GSA 19) in the eastern Sicilian waters. This initiative, led by Marecamp in partnership with ACCOBAMS and funded by FAO-GFCM, adopts an integrated approach combining monitoring and mitigation activities with innovative technologies and standardized protocols, focusing on mitigating dolphin depredation and bycatch events to ensure the sustainable use of marine resources while protecting vulnerable species. Key actions include extensive monitoring using observer-based surveys, fishers' logbooks, bioacoustic analyses, and structured interviews across four macro-areas from Messina to Portopalo di Capo Passero. Preliminary results indicate significant economic losses from dolphin depredation, with high-value catch species particularly affected. Bycatch incidents involving vulnerable species, such as sea turtles and elasmobranchs, further underline the ecological and economic challenges faced by small-scale fisheries in this region. Mitigation efforts focus on deploying and assessing tools such as the Acoustic Alert System, visual deterrents, and structural adaptations to fishing gear. Bioacoustic monitoring has provided valuable insights into dolphin behaviour, enabling a data-driven refinement of mitigation measures. Collaborative efforts with fishers, including implementing the Floating Laboratories network, enhance real-time data collection, encourage stakeholder engagement, and promote effective conservation strategies. This project bridges scientific research with practical solutions, addressing the complex dynamics of fisheries and vulnerable species interactions. It demonstrates how sustainable fisheries management can be aligned with marine conservation, offering a scalable model for similar initiatives globally.
KEYWORDS	Vulnerable species, dolphin depredation, bycatch, mitigation, Sicily

No. 06 - Depredation caused by the bottlenose dolphin (*Tursiops truncatus*) in the Moroccan Mediterranean and the proposed mitigation measures.

ORGANIZATION	**National Institute of Fisheries Research (INRH), Morocco**
SPEAKER	Mohammed Idrissi Malouli
ABSTRACT	The project "Contribution to understanding the phenomenon of interaction between bottlenose dolphins (*Tursiops truncatus*) and purse-seine fisheries" aims to study cetaceans and more precisely the bottlenose dolphin that causes the problem of depredation in the Moroccan Mediterranean in two main areas: M'diq and Al-Hoceima. This project combines behavioral and ecological studies for this population of dolphins to find a sustainable solution to this problem. In 2024, various methods of monitoring the population of bottlenose dolphins were used, such as passive acoustics, photo-identification and biopsy, surveys and the embarkations on board of purse seiners carried out by scientific observers, these approaches have led to a better understanding of bottlenose dolphin behavior and ecology, By 2025, the National Institute of Fisheries Research aims to continue this monitoring and to deepen analyses, including by extending the observation areas to the Jebha area, and integrating new technologies as a measure to mitigate the problem of depredation, to reduce depredation and minimize economic losses and negative impacts from these interactions between bottlenose dolphins and purse seiners.
KEYWORDS	Depredation, bottlenose dolphin, mitigation measures, Moroccan Mediterranean

No. 07 - Bio-inspired acoustic beacons to limit fishery by-catch of dolphins.

ORGANIZATION	**University of Montpellier - Marine Biodiversity, Conservation & Exploitation, France**
SPEAKER	Bastien Merigot
ABSTRACT	Acoustic repellent pingers have been developed to reduce dolphin by-catch. However, mixed results regarding their efficiency have been reported worldwide on different species and fisheries. Within the DOLPHINFREE project "Dolphins free from fishery by-catch", we have developed a new generation of acoustic beacon, bio-inspired. It emits signals in link with the echolocation system to help dolphins in detecting net presence. Ultimately, the objective is to reduce common dolphin *Delphinus delphis* by-catch in the Bay of Biscay, France. The device also contains a passive acoustic listening system to identify dolphin presence, allowing beacon emission only when detected. Behavioral responses of 47 groups of common dolphins in response to beacon emission have been assessed by experiments at sea during summers 2020 and 2021. The results highlighted that the device led dolphins to echolocate and communicate more (x2.46 in mean echolocation clicks and x3.38 in mean whistle duration, respectively). In addition, observations showed that dolphins calmly left the source emission's area without showing stressful behaviour. Tests made during 1043 fishing operations (FOs) of professional gill netters, to assess the practicality and to provide preliminary data on the efficiency of the new device, have been performed with observers onboard during 228 days at sea in 2021 and 2022. No by-catch was observed for the FOs in which no disfunctioning in their practice occurred. These results being encouraging, complementary tests of bio-inspired acoustic beacons during FOs of professional gill netters are planned during winter 2024 to assess statistically its efficiency in reducing common dolphin by-catch.
KEYWORDS	Acoustics, bycatch, conservation, mitigation, threatened and endangered species

No. 08 - Cetacean bycatch in the ACCOBAMS and ASCOBANS areas.

ORGANIZATION	**ACCOBAMS-ASCOBANS Joint Bycatch Working Group**
SPEAKER	Ayaka Amaha Ozturk
COAUTHOR	Peter Evans
ABSTRACT	ACCOBAMS and ASCOBANS established a Joint Bycatch Working Group (JBWG) in January 2019 to exchange scientific information on monitoring and mitigating cetacean bycatch in the two agreement areas. In the Mediterranean Sea (ACCOBAMS), drifnets for large pelagic fishes were the main concern due to the bycatch of common dolphins, striped dolphins, Risso's dolphins and sperm whales. It has been banned since 2002, but there are still illegal drift nets occasionally. In the Black Sea (ACCOBAMS Area), turbot fishing causes bycatch, mainly of harbour porpoises. A recent study estimated annual bycatch of over 10,000 animals (Popov et al. 2023), well above the sustainable level. The main species in NW Europe (ASCOBANS) with serious bycatch issues are the harbour porpoise, common dolphin, minke whale and humpback whale. Bottom set gill nets, trammel and tangle nets cause mortality for harbour porpoise and common dolphin; pelagic trawls for common and striped dolphins, semi-driftnets for harbour porpoise in the Baltic Proper, whilst entanglement in ground-lines between fish pots as well as ghost netting (discarded and lost netting) for minke whale and humpback whale is causing concern. Seasonal risk maps have been produced for all of the main cetacean species and for every gear type across Atlantic European waters. Bycatch rates have been shown to be unsustainable for harbour porpoise in the North Sea, and may also be in the Celtic Seas. There is also a very high bycatch of common dolphins in the Bay of Biscay, as many as 10,000 animals estimated per year. In terms of mitigation, different measures have been considered and partially implemented, from fishery closures to application of pingers and modification to fishing gear. Various projects have been carried out to investigate bycatch and explore a range of mitigation measures, such as MedBycatch, GFCM's BlackSea4Fish, the Cetambicion Project and most recently CIBBRiNA Project.
KEYWORDS	Cetaceans, bycatch, ACCOBAMS, ASCOBANS

No. 09 - On a new smart acoustic deterrent device based on dolphin recognition through artificial intelligence.

ORGANIZATION	**Institute for Biological Resources and Marine Biotechnologies of the Italian National Research Council (CNR-IRBIM), Italy**
SPEAKER	Alessandro Lucchetti
ABSTRACT	Predation is recognized as the most concerning type of dolphin-fishery interaction, with pingers being the most commonly used mitigation tool. However, a limitation of the currently available pingers is their lack of "interactivity". A new acoustic deterrent device based on artificial intelligence was developed, consisting of four fundamental components: a receiving part or hydrophone, a computational system for dolphin recognition based on AI, an emitting part, and a battery pack. The entire system has been developed with the aim of minimizing both the size and cost of the device (less than €500). This innovative tool employs advanced algorithms to analyse dolphin vocalizations in real time, detecting their presence near fishing nets (whistle detection > 95%; other emissions > 55%). Once the cetacean is identified, the device emits customized acoustic signals to deter it from approaching. Compared to traditional pingers, which emit continuous and non-reactive acoustic signals, this new technology introduces an unprecedented level of interactivity. It not only reduces acoustic pollution in the ocean but also avoids the risk of habituation by the animals, thanks to its ability to modulate and vary the emitted signals according to specific needs. Developed as part of research initiatives such as the European Life Delfi program and the National Biodiversity Future Center, the device represents a promising solution for balancing marine species protection with the demands of fishing activities. Currently in the testing phase, the project is focused on refining the device's performance to further enhance its effectiveness and adaptability in complex marine environments.
KEYWORDS	Artificial intelligence, pinger, dolphin detection, acoustics

No. 10 - Mitigation of bottlenose dolphin's depredation: Tunisian experience & lessons learned.

ORGANIZATION	**National Institut of Agronomy of Tunisia (INAT), Tunisia**
SPEAKER	Rimel Benmessaoud
ABSTRACT	Bottlenose dolphins are most commonly involved in depredation along the Tunisian coast, in particular in areas where fishing activities targeting small pelagic fish overlap with dolphin populations. Purse seiners generally report that depredation causes significant damage to fishing gear as well as reductions to both the volume and composition of their catch. Many fishers have expressed a willingness to collaborate with research initiatives to assess the impact of dolphins and explore potential mitigation strategies. Mitigation measures to reduce bottlenose dolphin depredation in Tunisia are diverse and involve a combination of strategies. These include deploying acoustic deterrents, testing reinforced materials to enhance the resistance of fishing nets to dolphin bites, and adjusting fishing practices by redirecting efforts away from areas with high dolphin densities. The overarching goal is to minimize interactions between dolphins and fishing operations effectively. Certain depredation mitigation measures have been deemed ineffective and subsequently dismissed, while others remain under evaluation, showing promising potential and gradually proving their effectiveness in reducing conflicts between dolphins and fishing activities. Gaining a deeper understanding of the foraging strategies of bottlenose dolphins appears to be a crucial element in developing effective and sustainable conflict mitigation solutions.
KEYWORDS	Bottlenose dolphin, depredation, purse seine, mitigation measures, Tunisia

No. 11 - Fishery interaction with cetaceans: insight from 38 years of stranding monitoring (1986-2023) along the Italian coastline.

ORGANIZATION	**Department of Comparative Biomedicine and Food Science, University of Padova, Italy**
SPEAKER	Guido Pietroluongo
ABSTRACT	The Italian Stranding Network aims to monitor fishery interaction on stranded cetaceans to identify risk patterns and support targeted conservation policies through improved forensic methods and collaboration. Historical and new data spanning 38 years on fishery-related findings and mortalities were analyzed in 5355 cetaceans stranded in Italy, focusing on the most represented species. Literature review and evidence of interaction on stranded carcasses supported the findings' categorization, from animal history to pathological findings. Evidence assessment and post-mortem investigation methods evolved over three macro-periods, from non-standardized reporting (1986–2014, Tier 1) to an integrated national stranding network (2015–2019, Tier 2), and finally to the creation of a new standardized, evidence-based diagnostic framework under the EU-funded LIFE DELFI project (2020–2023, Tier 3). Evidence of fishery interactions was reported in 12.9% of carcasses (691/5355), with significant differences observed between species, sexes, and geographic areas. Geographic analysis identified distinct risk hotspots, such as geographical sub-areas (GSA) 17 for bottlenose and GSA 10 for striped dolphins. The most represented categories of interaction were the "presence of fishing gears" and the "larynx entanglement", particularly affecting bottlenose dolphins. The adoption of the new diagnostic framework attributed fishery-related causes of death to 12.07% of necropsied carcasses during Tier 3 (21/174), with adult male bottlenose dolphins more represented. For the first time in Italy, these results supported recommendations for species- and region-specific mitigation strategies, including gear modifications, seasonal bans, and marine protected areas. Engaging fishing communities in conservation efforts and standardizing forensic investigations across the Mediterranean are crucial for advancing cetacean conservation. This research represents a new model within the ACCOBAMS area and highlights the value of stranding networks in monitoring anthropogenic threats and shaping effective conservation policies.
KEYWORDS	Fishery interaction, stranding, cetaceans, Italy

No. 12 - Sampling for population demography is a tool for bycatch assessment.

ORGANIZATION	**Schmalhausen Institute of Zoology, National Academy of Sciences, Ukraine**
SPEAKER	Pavel Gol'din
ABSTRACT	Assessment of cetacean bycatch may be complicated in data-deficient areas (such as the Azov and Black Seas) due to incomplete catch and bycatch reporting, bad observer coverage, contradictions in effort assessment and impact of IUU fisheries. Now it is additionally complicated by the war in the Azov and Black Seas. Therefore, it is important to use indicators of population structure and demography for indirect assessment of bycatch rate and bycatch impact on populations. Modelling of population demography (e.g. using Bayesian estimation framework) can be used for assessing contributions of different mortality factors to the overall mortality rate, age-specific mortality by each age class and, subsequently, population growth rate (Moore and Read, 2008; Moore et al., 2013). Bycatch is considered as the harvest rate in such demographic modelling. Input data for such a study should include age- and sex-stratified samples of both bycaught (directly sampled onboard) and stranded (i.e., reflecting all causes of death) animals from the same population. Both sources of data are equally necessary. Also, age should be identified by year, so teeth and, when possible, bones, eye lenses and flippers – all the structures used for exact age estimation should be sampled. Other sampling procedures for age determination (e.g., for DNA methylation and metabolomics) may be appropriate depending on the species and its life history. Also, the status of sexual maturity should be checked, especially for data deficient populations and life histories, which may rapidly change under the climate change and bycatch pressure. The respective sampling protocols should be widely introduced elsewhere.
KEYWORDS	Population demography, modelling, age, life history, sampling procedures

No. 13 - Bottlenose dolphins and small-scale fisheries in the Pelagos Sanctuary: searching new mitigation strategies.

ORGANIZATION	**Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d'Aosta, Italy**
SPEAKER	Camilla Testori
ABSTRACT	The common bottlenose dolphin (*Tursiops truncatus*) is a prominent species in the Pelagos Sanctuary, known for its adaptability and opportunistic interactions with fishing activities to supplement its diet. These interactions often lead to conflicts with fishermen, but the extent of the issue remains poorly understood. The TursioNet project, supported by the Pelagos Initiative of the Prince Albert II of Monaco Foundation, aims to address this challenge by developing an automated acoustic monitoring device. This device, installed on fishing nets, will allow real-time mapping of interactions between dolphins and small-scale fisheries in the Pelagos Sanctuary. Initial efforts included surveys with fishermen in Liguria and Corsica to identify high-interactions area where underwater acoustic recorders could be deployed. Over 136 days, more than 1,970 hours of recordings were collected from gillnets distributed evenly across the study area. Analysis focused on echolocation click patterns, revealing that only a small percentage (approximately 1%) of the analysed recordings contained biological signals attributable to cetaceans. These spectrograms are now used to train automated devices, integrating artificial intelligence (AI) technology. Validation tests are ongoing in the dolphin tanks at the Genoa Aquarium, aquaculture cages, and will extend to open-sea validation in the coming months. Additionally, carcasses of dolphins stranded along Liguria region are examined to assess fishery impacts, such as bycatch and net ingestion. The project's findings will estimate the mutual impact of bottlenose dolphins and fisheries, with the aim of developing conflict mitigation strategies and improving conservation efforts for this important species within the Pelagos SPAMI.
KEYWORDS	Pelagos Sanctuary, bottlenose dolphin, fishery interactions, acoustic monitoring

Conclusions

A diverse and collaborative exchange for transboundary challenges and shared priorities

The ACCOBAMS Workshop on Commercial Fisheries Interaction with Vulnerable Species brought together a wide range of researchers and practitioners for a full day of fruitful exchange and reflection. The diversity of projects presented, in terms of geographic coverage, methodological approaches, and target marine species, offered a rich overview of the state of research and ongoing actions across the Mediterranean, Black Sea, Atlantic Ocean, and surrounding areas.

The workshop covered critical issues such as incidental catch of vulnerable marine species — including seabirds, sea turtles, elasmobranchs, porpoises, dolphins, and whales — and dolphin depredation. These interactions are increasing in frequency and are not limited to the areas of ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area) and GFCM (General Fisheries Commission for the Mediterranean of the FAO). Presentations from France and the UK highlighted similar challenges in the Atlantic, reinforcing the need for coordinated, cross-regional responses. These interactions are complex and multifaceted, requiring long-term investment and cooperation across borders

Converging approaches and technological Innovation

Despite regional differences, many projects are converging on similar strategies to monitor and mitigate interactions. This included the use of fishers' ecological knowledge, the testing of selective fishing gear and innovative visual and acoustic devices, as well as efforts to improve data collection and sharing.
Technological innovation was a recurring theme, with several teams exploring advanced tools to reduce bycatch and depredation.
The Clean Catch programme in the UK trialed acoustic pingers and LED lights to reduce cetacean bycatch in gillnet fisheries. France's DOLPHINFREE project developed bio-inspired acoustic beacons that mimic dolphin echolocation and activate only when dolphins are detected. Italy's CNR-IRBIM introduced an AI-powered acoustic deterrent that customizes signals based on real-time dolphin vocalizations. These innovations aim to reduce unintended ecological impacts such as habituation and acoustic pollution, while improving the effectiveness of mitigation measures.

Toward harmonisation and regional integration

The workshop fostered dialogue around the potential harmonisation of methodologies to enable a more comparative and collaborative regional approach. Participants discussed the development and exchange of standardised questionnaires, protocols and data collection frameworks. These efforts are particularly relevant in the context of joint initiatives between ACCOBAMS and GFCM-FAO which are working across various Geographical subareas (GSAs) to support coordinated conservation strategies.

Promising results and persistent challenges

Many projects presented encouraging preliminary results in reducing bycatch and mitigating depredation. The Depredation-3 project in Sicily, for instance, combined observer-based surveys, bioacoustic monitoring, and fisher interviews to assess dolphin depredation and bycatch impacts. Türkiye's trials demonstrated significant reductions in elasmobranch bycatch using grid systems.

However, challenges remain. Post-release survival of deep-water species was low in Türkiye, indicating the need for species-specific handling protocols. In Morocco, the lack of baseline data on dolphin abundance and distribution continues to hinder the development of targeted mitigation strategies. Concerns were also raised about the long-term effectiveness of acoustic deterrents, particularly regarding habituation and the "dinner bell" effect. These findings underscore the importance of adaptive, context-specific solutions and robust long-term monitoring.
The workshop also emphasized that many of the scientific studies addressing these interactions are long-term in nature, often evolving through multiple phases over the years. This includes the continuation of significant initiatives such as the Depredation-3 project, which over the past six years has brought together several organizations in a joint effort to develop shared strategies for monitoring and mitigation. Long-term monitoring of species and anthropogenic threats, including fieldwork and onboard trials, is essential to assess the effectiveness of mitigation measures and to inform sound conservation policies. Such efforts require both time and high-quality data to yield meaningful results

Digital tools and stakeholder involvement

In today's digital age, new technologies and platforms such as social media, mobile apps, and multistakeholder data collection tools, including digital questionnaires and logbooks, offer expanded opportunities for reporting interactions, collecting sightings, and improving data flow between fishers and researchers. These digital tools facilitate more efficient and accurate data collection, fostering improved collaboration and information sharing among stakeholders.

The TursioNet project in the Pelagos Sanctuary is developing AI-powered acoustic monitoring devices to map dolphin-fishery interactions and train detection algorithms based on echolocation patterns. Croatia's tagging campaign is leveraging social media to encourage fishers to report recaptures. These tools are helping to bridge the gap between science and practice, making conservation efforts more inclusive and responsive.

A key message that resonated throughout the workshop was the importance of establishing a shared space for collaboration. Participants emphasized the need for a common platform to exchange results, methodologies, and data. In response, the GFCM is finalizing the development of a Regional Platform on Vulnerable Species. This platform will allow all actors—scientists, fishers, policymakers, and NGOs—to access, upload, and consult information. It is designed to promote transparency, comparability, and cooperation across the region.

Institutional commitment

Experts shared promising preliminary outcomes on reducing bycatch and mitigating depredation in various fisheries and *métiers*. The workshop also highlighted the strong need to maintain open and continuous dialogue, both within this working group and across wider networks, especially considering that this was the first event of its kind organized under the frameworks of ACCOBAMS and the GFCM.
The workshop reaffirmed the importance of long-term commitment and institutional support. Many of the scientific studies presented have evolved over several years and through multiple phases. The Depredation-3 project in Sicily, for example, has been ongoing for six years and involves multiple organizations working together to develop shared strategies for monitoring and mitigation

The commitment of the FAO through the GFCM was underlined by their technical and financial support, including the funding of five major projects currently being implemented by BirdLife, Çukurova University, Marecamp Association, National Institute of Fisheries Research of Tangier, and WWF Adria. These initiatives are essential not only for understanding and mitigating the interactions between vulnerable marine species and human activities but also for supporting sustainable fisheries and the livelihoods of fishers. Achieving balance between marine conservation and socio-economic sustainability remains a fundamental objective.

The GFCM's commitment to addressing bycatch and depredation caused by marine megafauna has been reinforced through the publication of regional reviews and methodological guidelines, as well as the 2023 endorsement of a Resolution establishing a Regional Plan of Action (GFCM/46/2023/4) to monitor and mitigate the interactions between fisheries and vulnerable species in the Mediterranean and the Black Sea. Within this framework, countries are encouraged to implement concrete actions over the short, medium, and long term, with the continuous support of the GFCM.

Closure of the meeting

The FAO/GFCM representative concluded that the workshop offered an excellent opportunity for sharing experiences, exploring strategies, and advancing scientific and practical collaboration on one of the most urgent conservation challenges across the ACCOBAMS and GFCM areas. The high level of engagement demonstrated the strong interest and dedication of the various organizations and countries involved.

Sincere appreciation is extended to all participants, speakers, and contributors for their ongoing work and valuable insights. Special recognition is given to the FAO project partners and the GFCM for their essential and continuous support, which made the organisation of this event possible.

Continued exchange and collaboration are encouraged to build on the momentum generated by this workshop through future meetings and joint initiatives. The outcomes of this workshop represent a significant step toward the development of harmonised approaches and long-term strategies for mitigating interactions between fisheries and vulnerable marine species within the ACCOBAMS and GFCM areas. Constant engagement from all stakeholders will be essential to translate shared knowledge and recommendations into effective and sustainable actions across the region.

Annex 1 - Agenda

Date	Tuesday, January 28, 2025
Time	09:00 AM – 05:00 PM CET
Meeting location	Online, ZOOM

Time	Talk	Speaker
Morning, 9:00–12:00		
09:00 AM	Opening and adoption of the agenda	ACCOBAMS Secretariat
09:15 AM	An approach to tackle seabird bycatch in the western Mediterranean: self- reporting logbooks and mitigation methods	Daniel Rey-Faura, SEO/BirdLife
09:35 AM	Reduction and mitigation of bycatch of vulnerable species in Turkish trawl fisheries (GSA 24 – Northern Levant Sea)	Cagatayhan Bekir Ersu, Çukurova University
09:55 AM	Reduction and mitigation of the catch of elasmobranchs incidentally captured by gillnets and combined nets along the Croatian coast (GSA 17 – Northern Adriatic Sea)	Hrvoje Čeprnja, WWF Adria
10:15 AM	Clean Catch: combining stakeholder-led approach and technological innovation for evidence-driven management	Alessandra Bielli, Centre for Environment, Fisheries and Aquaculture Science (Cefas)

Coffee break, 10:35-11:00 AM		
11:00 AM	Depredation-3 project: insights into interactions between small-scale fisheries and vulnerable species in Sicilian waters (GSA 19)	Alessandra Raffa, Marecamp Association
11:20 AM	Depredation caused by the bottlenose dolphin (*Tursiops truncatus*) in the Moroccan Mediterranean and the proposed mitigation measures	Mohammed Malouli, National Institute of Fisheries Research (INRH)
11:40 AM	Questions & Answers	
Lunch break, 12:00-02:00 PM		
Afternoon, 02:00–05:00 PM		
02:00 PM	Bio-inspired acoustic beacons to limit fishery by-catch of dolphins	Bastien Merigot, University of Montpellier
02:20 PM	Cetacean bycatch in the ACCOBAMS and ASCOBANS areas	Ayaka Amaha Ozturk, ASCOBANS-ACCOBAMS
02:40 PM	On a new smart acoustic deterrent device based on dolphin recognition through artificial intelligence	Alessandro Lucchetti, Institute for Biological Resources and Marine Biotechnologies of the Italian National Research Council (CNR-IRBIM)
03:00 PM	Mitigation of Bottlenose dolphin's depredation: Tunisian experience & lessons learned	Rimel Benmessaoud, National Institute of Agronomy of Tunisia (INAT)
03:20 PM	Fishery interaction with cetaceans: insight from 38 years of stranding monitoring (1986-2023) along the Italian coastline	Guido Pietroluongo, University of Padova
Coffee break, 03:40-04:00 PM		
04:00 PM	Sampling for population demography is a tool for bycatch assessment	Pavel Gol'din, National Academy of Sciences of Ukraine

04:20 PM	Bottlenose dolphins and small-scale fisheries in the Pelagos Sanctuary: searching new mitigation strategies	Camilla Testori, Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d'Aosta
04:40 PM	Questions & Answers	
04:50-05:00 PM	Conclusions	Joan Gonzalvo, Tethys Research Institute
	Meeting closure	Paolo Carpentieri, GFCM-FAO

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Federica	Giorda	-	-

Annex 3 - Presentations on the FAO-GFCM Joint Projects

SEO/BirdLife

SEO BirdlIle

Bi1dLife

An approach ta tackle seabird bycatch in the western Mediterranean: self-report1ing l,ogbooks and mitigation methods

GFCM

ClaifreJ **R: y-faùra,** faùlQLago, A.nt,;inic Vukarm & ?ep A.rços

1

Seabird bycatch in the Mediterranean: context

SEABIRDS

- Small, enclosed sea basin, high human pressure
- Diversified seabird community, >15 spp breeding
- 5 endemic sp/ssp., small populations, threatened

FISHERIES

- Largely small-scale, artisanal, highly

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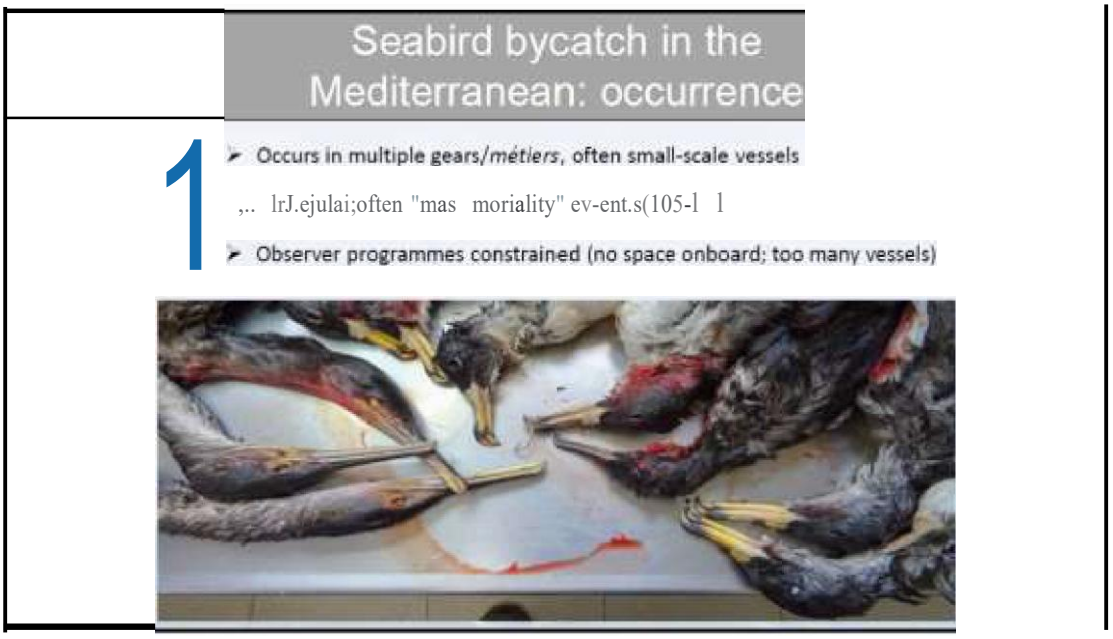
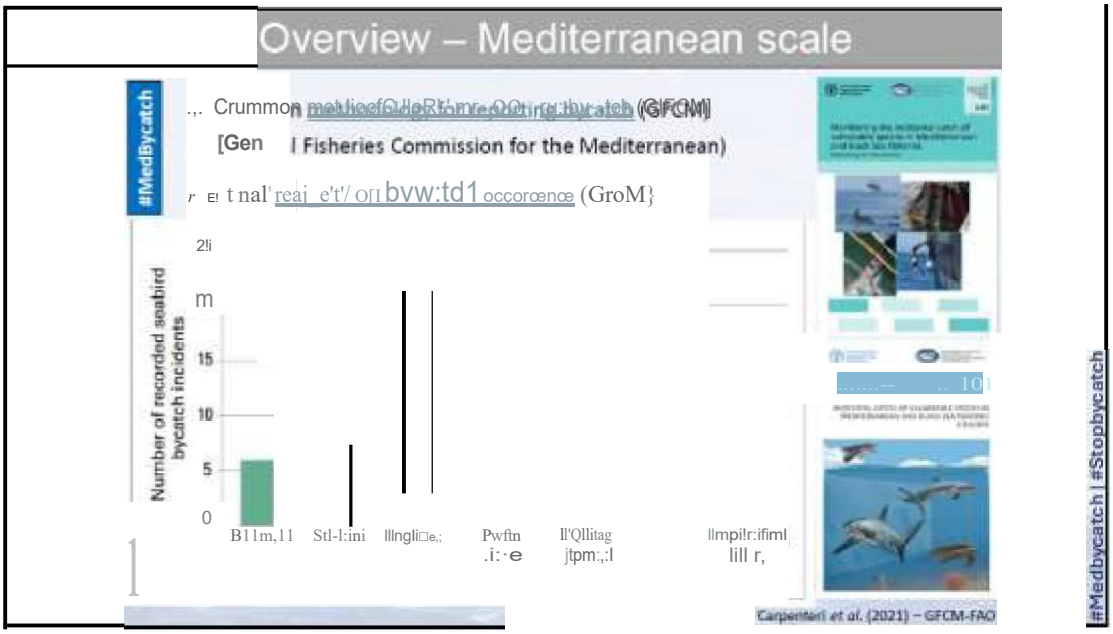
2


Seabird bycatch in the Mediterranean: occurrence
1
Occurs in multiple gears/métiers, often small-scale vessels
Observer programmes constrained (no space onboard; too many vessels)


Overview – Mediterranean scale
#MedBycatch
Number of recorded seabird bycatch incidents
15
10
5
0
Carpenteri et al. (2021) – GFCM-FAO
#Medbycatch | #Stopbycatch

4

Assessing seabird bycatch: self-reporting logbooks

(1) 6ener I information

(2) Fishing gear configuration

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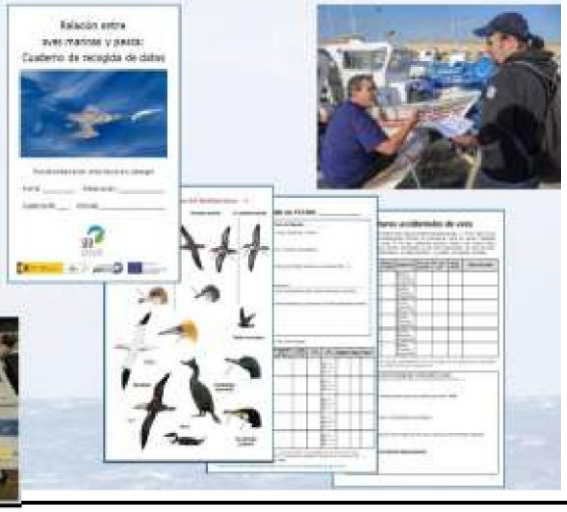
(4) Feieô'ba;tkfirom füherm en 1plen:ept:il;l'Jlj



5

Close follow-up – team on the ground

Vero Cortés
Carles Tobella
Lucía Soliño
María Fargas
David García

6

Logbooks work in the Spanish Mediterranean

- Focus on demersal longline
- 2017 Pilot project STF – 13 vessels

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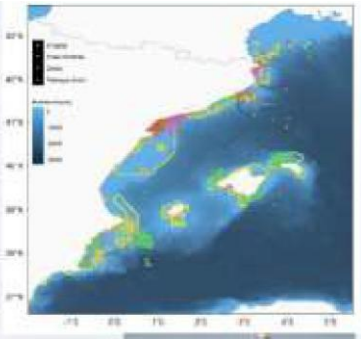
- Coverage (2017-2022)
  - 82 vessels (15 in Balearic Islands)
  - 7855 fishing trips (1257 days in Balearic Islands)



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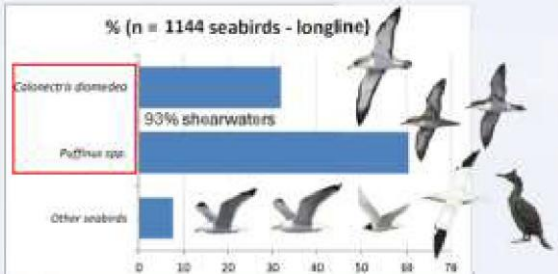
Logbooks: results overview (Spanish Mediterranean 2017-2022)



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- Inferred 2500-6000 seabirds bycaught annually (Spanish Med)

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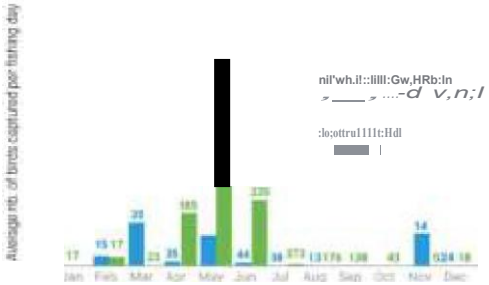
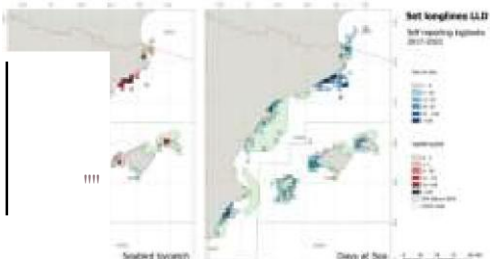
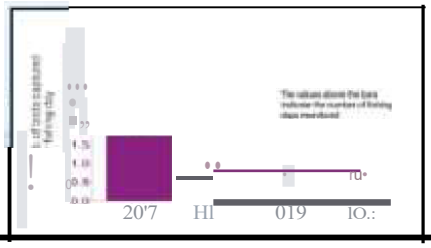
8

Seabird bycatch: where, when? (Spanish Mediterranean 2017-2022)

- Geographical & seasonal variation







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Seabird bycatch: when, how?

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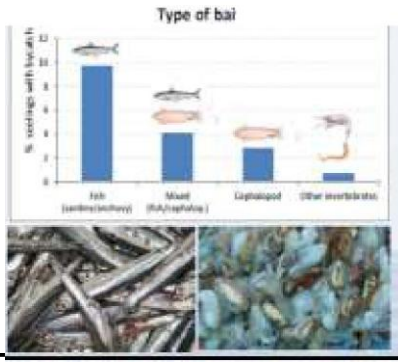

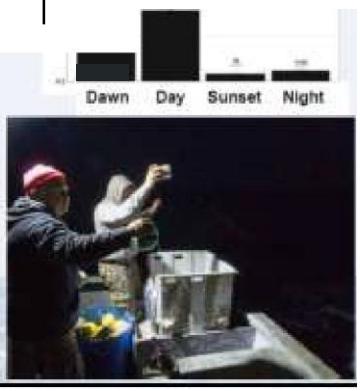

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Further work: Exchange experiences + dissemination

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Current work: GFCM international tender

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, Promet!!!*G M* tlori & protocol (GFCM/44/2021/13}

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➢ Self-reporting logbooks as main way of access and overview

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Current work: Mitigation methods

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Nocturnal setting

Scarybird and scary lines

Adding weights

Nisuri system

14

Çukurova University

WWF Adria

Reduction and Mitigation of the Catch of Elasmobranchs Incidentally Captured by Gillnets and Combined Nets along the Croatian Coast (GSA 17 – Northern Adriatic Sea)
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Hrvoje Čeprnja
Simone Niedermueller
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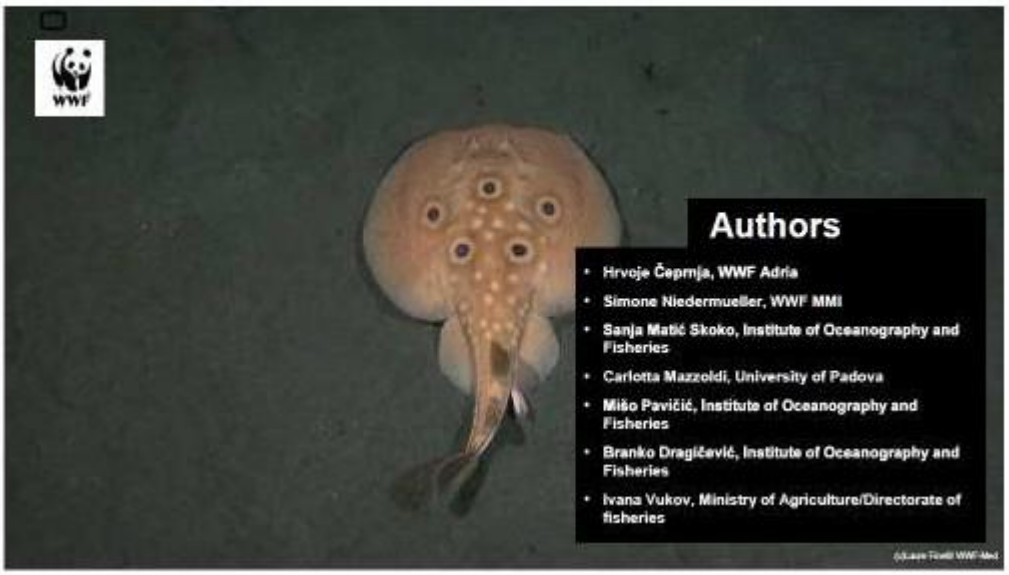
January 2025
Joint Workshop on ongoing FAO/GFCM-funded Projects


WWF
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Collaboration

Food and Agriculture Organization of the United Nations

General Fisheries Commission for the Mediterranean

TheMlni:suy *01* Agrlc-1 Jltw:eD Ir«torate ot FisLaries (flof)

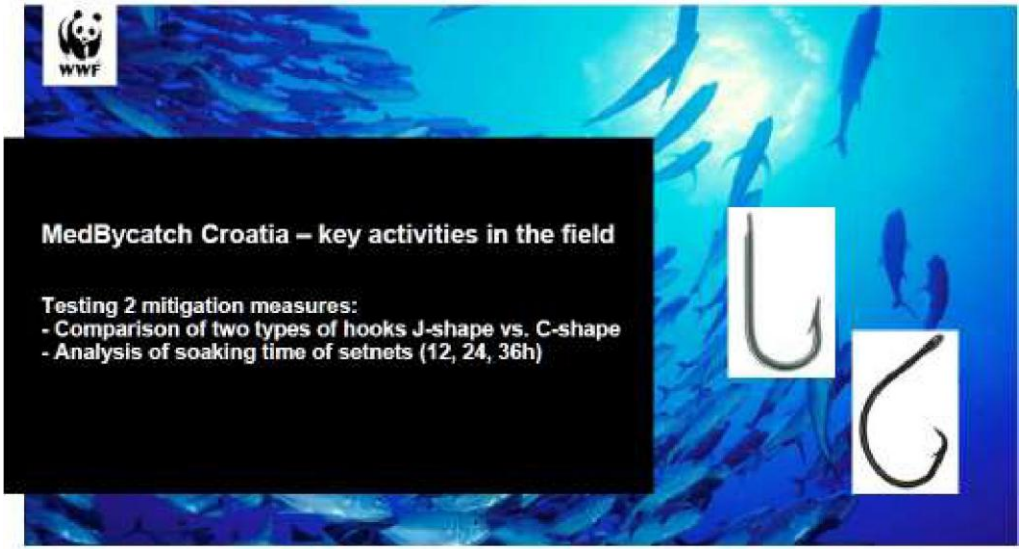
- Nafü:ma'l DataColJeclion Programme {DCF)
- Letter Df intent

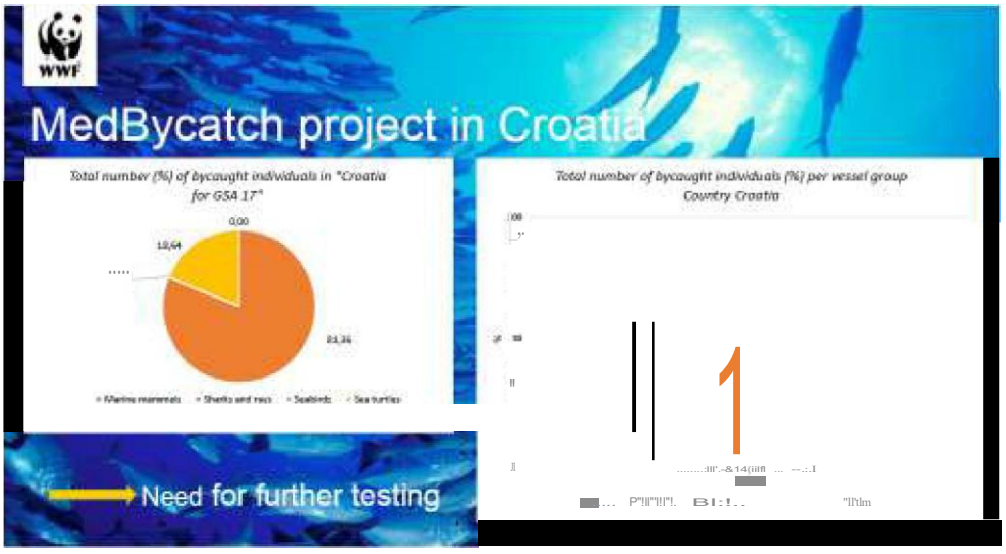
- Flllldir1g
- Developed echnit:al methadology fo.r data conectio:n

WWEAdria

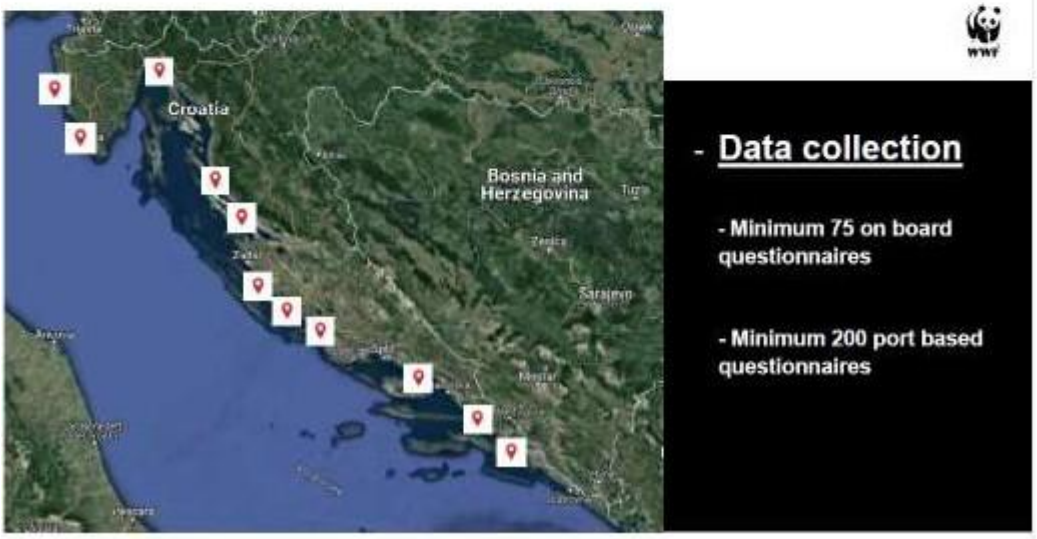
1/!'WF

- Instib.ute ofOceanogrnphy and Fïsfieries (10:R)
- University oJ Padova


MedBycatch Croatia – key activities in the field
Testing 2 mitigation measures:
- Comparison of two types of hooks J-shape vs. C-shape
- Analysis of soaking time of setnets (12, 24, 36h)


MedBycatch project in Croatia
Total number (%) of bycaught individuals in "Croatia for GSA 17"
Total number of bycaught individuals (%) per vessel group Country Croatia
Need for further testing

Medbycatch -> Reduction and Mitigation of the Catch of Elasmobranchs Incidentally Captured By Gillnets and Combined Nets along Croatian Coast
Data collection
Mitigating Bycatch
Tagging
Database
TRACKING SHARKS FOR CONSERVATION


Croatia
Bosnia and Herzegovina
Sarajevo
- Data collection
- Minimum 75 on board questionnaires
- Minimum 200 port based questionnaires

Mitigating Bycatch – LED

- 30 at-sea trials

- LED lights on the gillnets (65 (130) mm square mesh size)

- LED lights set on every 10 m; fishing net will be 1000 m long, control net without LED lights also 1000 m long

Mitigating Bycatch

– modified mesh slack-reduction –

30 at-sea trials
80 (160) mm square mesh size
Gillnet, 2x 1500m

500 m of net with standard (50 %) mesh slack,
500 m of net with reduced mesh slack (35 %)
500 m of net with increased mesh slack (70 %)

bycatch:
Aetomylaeus bovinus, Myliobatis aquila , Dasyatis pastinaca

35 % mesh slackness
50 % mesh slackness
70 % mesh slackness

Tagging research
- "Spaghetti tags"
- Regional data platform for tagging campaigns
- Opportunistic tagging

- Tracking Sharks For Conservation - Tagging & Recapture platform

- University of Padova as host

- Seeking a broad range of platform users and integration in other platform and initiatives

- Data confidentiality & user policy

- Awareness raising to increase reporting of recaptures

together possible
Hrvoje Čeprnja
hceprnja@wwfadria.org
WWF

Marecamp Association

ACCOBAMS Warkshop on.the lnbèractron betmien
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Ciep,edation-3 project inslghts into i:ten1 dio1 1s
batween small-scala fisheries and 111.1!nerabl0 sp&eies in
Sicilian waters (GSA 19)

Leeid partner:
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ACCOBAMS Workshop on the Interaction between Fisheries and Vulnerable Species – 28th January 2025

D.ur'l'tion1:i mo.nths- Fàllr *n,*20i24- February.2025

ProJect 0b)■c'tillu

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Monitoring activities

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Observers on board

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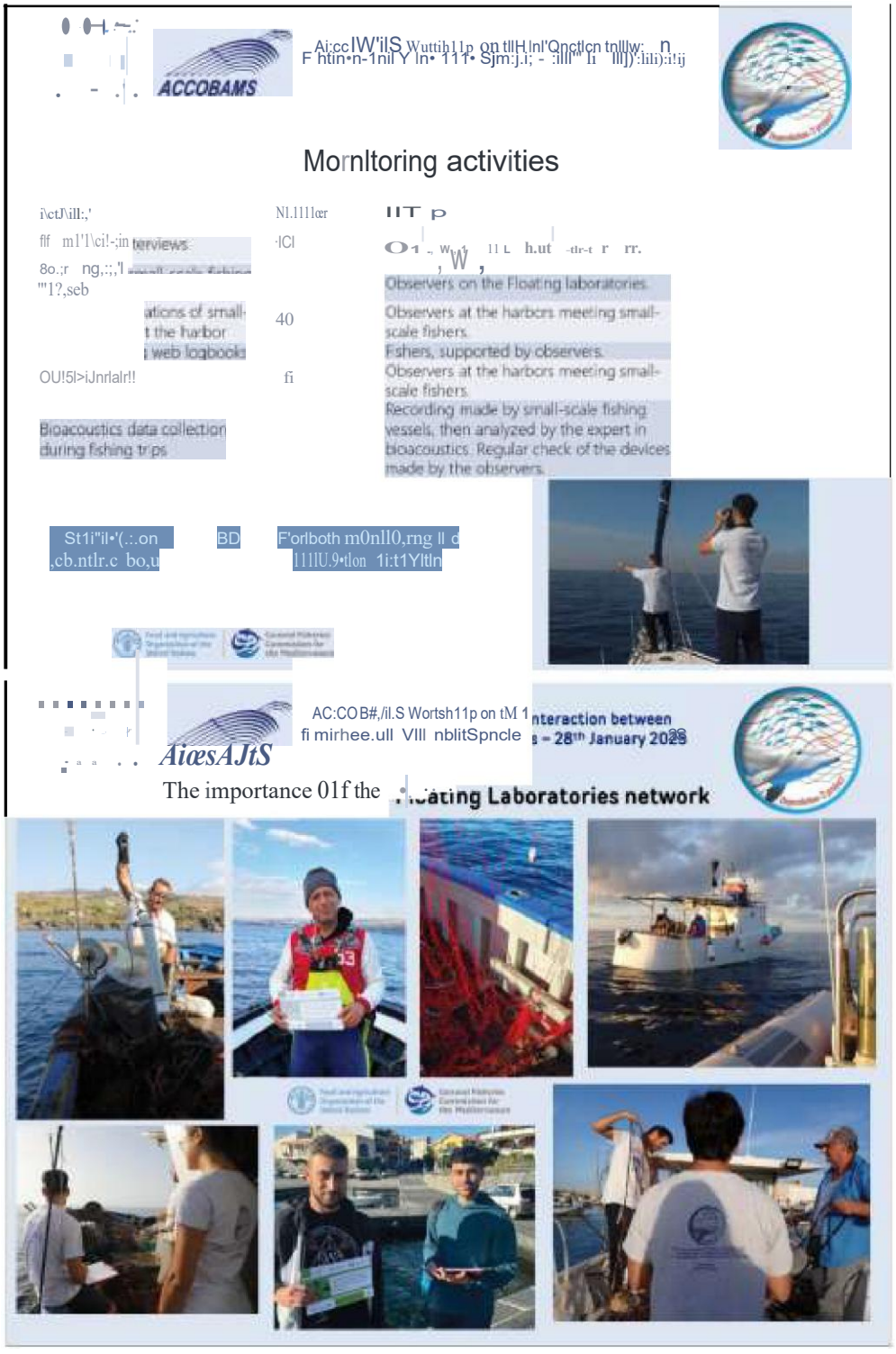
Scientific vessel surveys


ACCOBAMS
Monitoring activities
Observers on the Floating laboratories
Observers at the harbors meeting small-scale fishers
Fishers, supported by observers
Observers at the harbors meeting small-scale fishers
Recording made by small-scale fishing vessels, then analyzed by the expert in bioacoustics. Regular check of the devices made by the observers.
Bioacoustics data collection during fishing trips
ACCOBAMS
The importance of the Floating Laboratories network

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Reports on bycatch cases

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Mitigation trials
Activity
Testing of modified baits in deep-sea longline fishing to reduce damages from dolphin depredation.
Testing lights applied to trammels to reduce dolphin depredation and bycatch of vulnerable species.
Data collection and testing for developing an alarm system for fishers using set nets. AAS aims to alert them to the presence of dolphins likely engaging in depredation activities, enabling timely retrieval of the gear to prevent damage to catches and nets, and reducing the risk of dolphin bycatch.
Testing structural modifications to gillnets to prevent bycatch of dolphins and other vulnerable species while maintaining fishing efficiency.
Visual deterrents
Structural changes

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Contacts.
Dr AlHs■'n.dra R1ff11-al11ssandraraffa@msmcamfl.l:::mO
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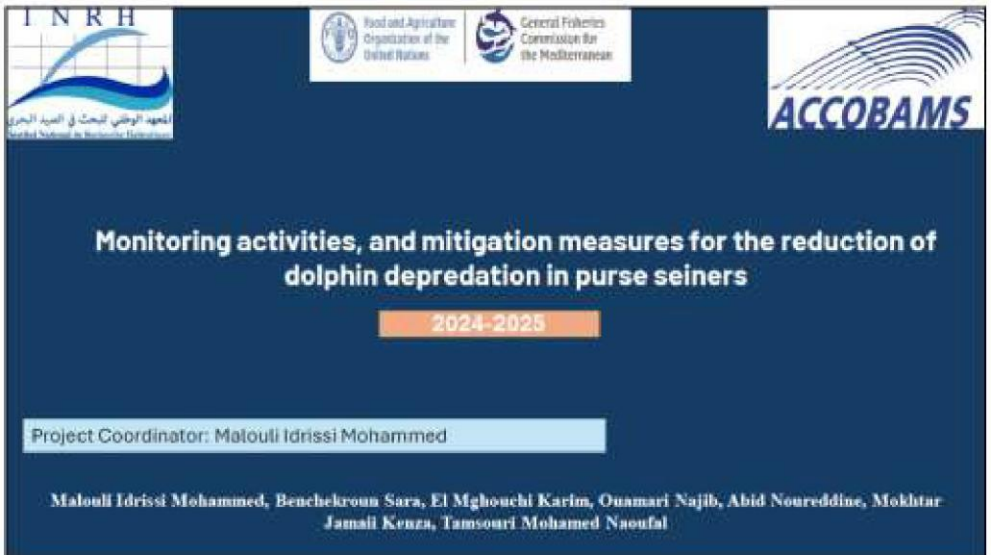
National Institute of Fisheries Research (INRH)



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The study area

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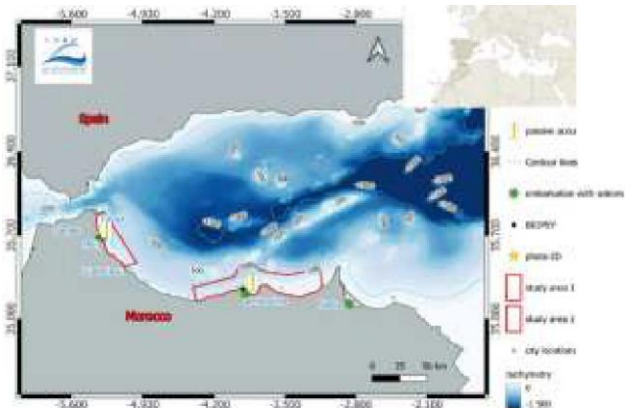

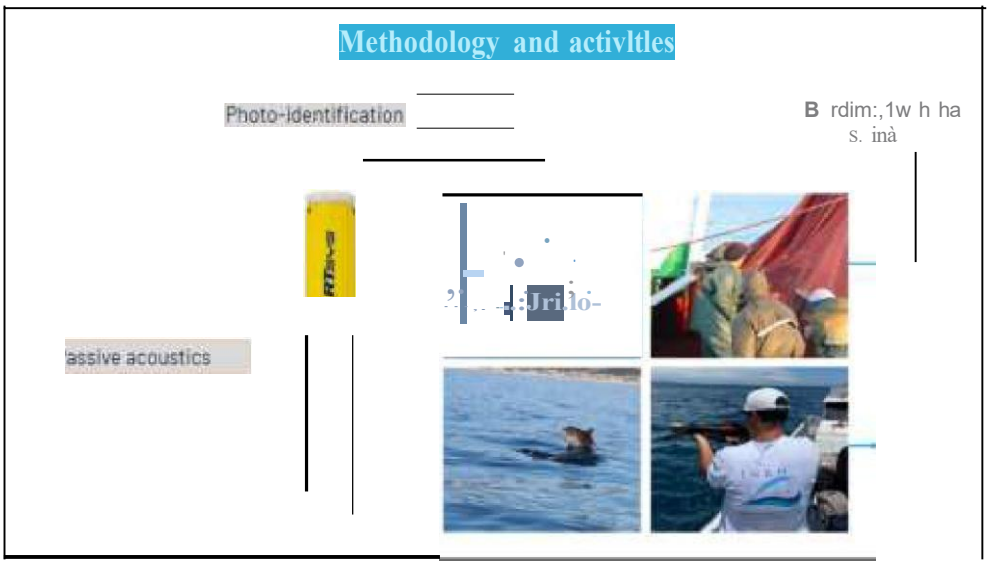
Methodology and activltles
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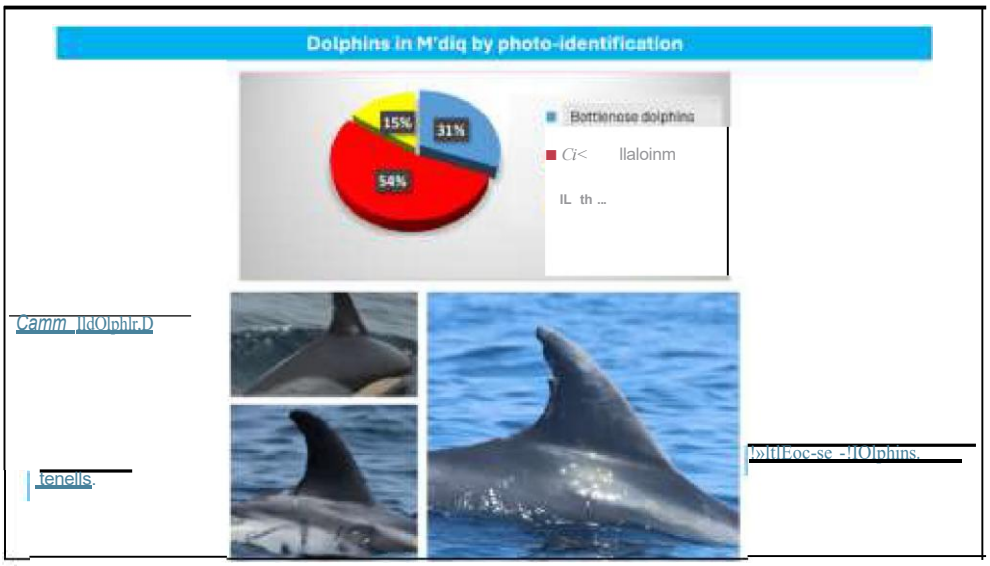
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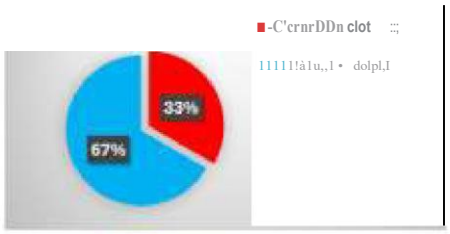
Types of dolphins in Hoceima b.Y photo-identification



Common dolphins

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Photo-Identification

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TRAINING

Passive acoustic

INRH Scientific Team Training May 27-29-2024

... U ng RTSYS hyrlrnpho11a and F pods

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Biopsy

INRH Scientific Team Training June 06-12-2024

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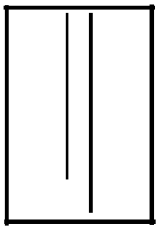
+ P1ep;ling l..!Kw-atoiy equipmem.

- Sampling □f5Jre□i'a'

Passive acoustic

M'diq Area — Use of RTsys and F-PODs

At Hoceima Area — Uss-□ F-POD‖



RTSVS

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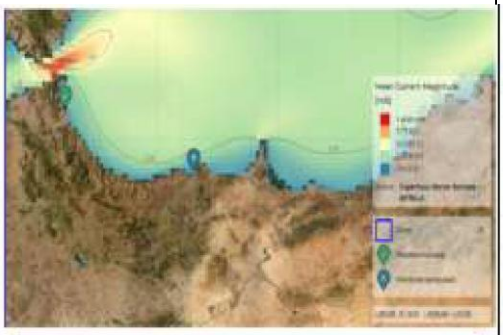

Proposed Positions for Hydrophone Installation

The Blopsy

Objectif

The primary objective o em torl g *iri* blQp!!-y method is to gather caca en th b0Uk-no11e dQI population. thereby ent, i OOi" comi:,reh BSion of their ecolpq nd bk!ioqy.

Analysis Methods

The species being processed are stored in Eppendorf tubes

Stable Isotops analysis

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Genetic analysis

Bot n=d [n;s

September 19 and 20, 2024

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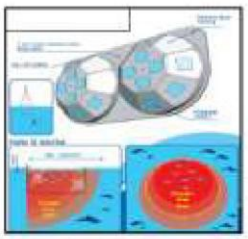
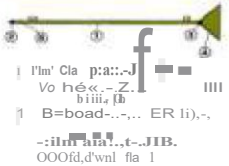
Mitigation Measure



Dolphin Saver



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Passive acoustics

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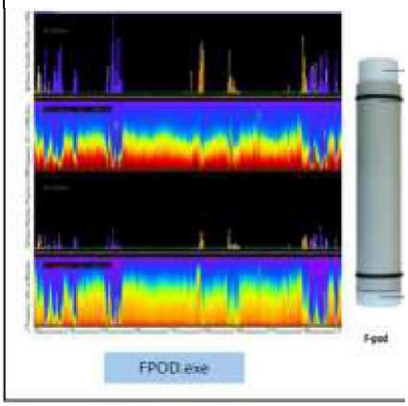

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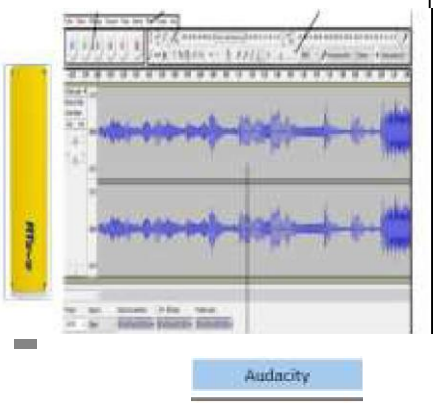

Audacity

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