

**REPORT OF THE TRAINING WORKSHOP ON TECHNICAL MEASURES TO MITIGATE
INTERACTIONS OF ENDANGERED SPECIES WITH FISHERIES AND
TO REDUCE POST-CAPTURE MORTALITY**

CRAM Center, Barcelona (Spain), 14-16 September 2015



Background

The 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) Secretariats are coordinating, in collaboration with RAC/SPA (Regional Activity Center for Specially Protected Areas), a two-year project (2015-2016) which aims to enhance the conservation of endangered marine species, such as cetaceans, sea turtles and seabirds, and to promote responsible fishing practices in the Mediterranean. The project receives substantial financial support from the MAVA Foundation.

The project aims in particular to mitigate interactions (bycatch and depredation) between endangered species and fisheries.

Based on a participatory approach adopted by the national partners with fish workers, six pilot actions are going to be implemented in France, Morocco, Spain and Tunisia:

- Purse seine sardine fisheries in the Moroccan Mediterranean
- Bluefin tuna artisanal fisheries in the Strait of Gibraltar
- Purse seine small pelagic fisheries in Kelibia
- Bottom and surface longline fisheries in the Gulf of Gabès
- Swordfish and albacore longline fisheries in southern Spain
- Longline and gillnet fisheries in southern France and the Balearic Islands.

One coordinator for each pilot action was appointed by the relevant institutions in order to carry out the project activities and to closely collaborate with the Project Monitoring Unit (ACCOBAMS and GFCM Secretariats). The pilot actions foresee a preliminary phase during which data are collected and issues are identified and a second phase in which mitigation measures are implemented in order to mitigate endangered species bycatch and depredation in the relevant fisheries.

In addition, a preliminary study on interactions between endangered marine species and fishing activities will be also carried out in Algeria.

To follow up the outcomes of the project kick-off meeting (April 2015), and as part of the project activities, the Project Monitoring Unit, in collaboration with the regional experts appointed for the technical assistance, organized for the pilot actions' coordinators a Training workshop on technical measures to mitigate interactions of endangered species with fisheries and to reduce post-capture mortality (hereinafter referred to *the Training workshop*).

Introduction of the Training workshop

The Training workshop was held in Barcelona (Spain), on 14-16 September 2015, in the premises of the CRAM Foundation (Fundació per a la Conservació i Recuperació d'Animals Marins) which hosted this event. The CRAM Foundation is a private non-profit organization dedicated to the protection of the marine environment and the species that inhabit it. Its activities focus on clinical and marine wildlife rescue, research and conservation of species and marine ecosystems, and awareness for the conservation of the oceans. The CRAM center hosts and provides veterinary assistance to wild marine species incidentally caught during fishing operations.

The aim of the Training workshop was to present to the coordinators of the project pilot actions the different experiences by international and regional scientists and veterinaries who has been working since long with recovering of marine animals caught in fishing gears and bycatch mitigation measures in fisheries.

The Training workshop was attended by 27 participants, including representatives of the ACCOBAMS and GFCM secretariats as Project Monitoring Unit, the experts of the Project Technical Assistance, the pilot actions' coordinators, a RAC/SPA representative, and by invited speakers from CRAM, IFREMER, University of Barcelona, CNR-ISMAR, SEO/BirdLife, Oceanogràfic de València and SUBMON who presented their work and shared their knowledge on mitigation of bycatch/depredation as well as on reducing post-capture mortality of animals. The meeting was chaired by Mr Martin Hall, Head of Bycatch programme at the International Dolphin Conservation Programs of Inter-American Tropical Tuna Commission (IATTC). The full List of Participants is reported in Annex 1 to this report.

Session 1 of the meeting was dedicated to **Mitigation measures tested and adopted in fisheries worldwide and in Mediterranean waters** and was opened by Mr Hall. **Session 2** was dedicated to **On-board good practices for reducing post capture mortality** and was opened by Mr Jose Luis Crespo (Veterinary, Oceanogràfic de València). Session 3 was dedicated to discuss with the coordinators priorities and technical needs in order to implement their pilot actions. This session was led by Mr Chedly Rais and Mr Jacques Sacchi (Project Technical Assistance). The detailed agenda of the Training workshop is reported in Annex 2.

Opening of the Training workshop

Mr Josep Lluís Pal Margarit, CRAM President, and Ms Elsa Jimenez, CRAM Director, welcomed the participants to the CRAM premises and introduced Ms Tania Monreal-Pawlowsky, CRAM Veterinary, who then presented the CRAM functioning and activities for rescuing marine injured animals (dolphins, sea turtles and birds). She also presented the projects carried out by CRAM on sea turtles' bycatch in longlines highlighting that CRAM had always work in close collaboration with the fishers to promote awareness, establish a permanent cooperation and increase the chances of sea turtles' survival.

The Project Monitoring Unit, the ACCOBAMS and GFCM Secretariats, presented the background of the project, the objectives of the Training workshop and the adopted GFCM management measures to reduce bycatch in Mediterranean and the Black Sea.

The national coordinators introduced themselves and their pilot actions, presenting the issues addressed and the activities to be carried out.

Session 1: Mitigation measures tested and adopted in fisheries worldwide and in Mediterranean waters

Mr Hall opened the session with the presentation **Planning a strategy to reduce bycatch**. He outlined the ongoing experiences on reducing bycatch in the eastern Pacific, and especially bycatch of dolphins in industrial tuna purse seine fishery, bycatch of sea turtles in artisanal longline fisheries and multispecies bycatch in FAD fisheries. He listed and described the main ingredients to feed a good strategy aimed at reducing bycatch in fisheries: 1) incentives for fishers; 2) data to identify causes; 3) good interactions with fishers; 4) experimentation; 5) ecological assessment of solution; 6) facilitate adoption; 7) intelligent regulation. He also described specific and generic solutions to mitigate bycatch and underlined the importance of a systematic approach to avoid unwanted captures, to increase the amount of release events from the gear as well as from the deck and to reduce bycatch per unit effort (BPUE) by applying technological and operational changes in the fisheries and management measures (spatial and temporal closures, etc.). This would turn into *fish better* and *less*. He also remarked the importance of the local ecologic conditions, i.e. the local knowledge of the ecosystems. For example, in the Mediterranean Sea, sea turtles spent more than 85 percent of the time within the first 6 m from the surface. Such type of information was considered crucial to adopt locally effective bycatch mitigation measures. Finally Mr Hall presented the results of studies carried on worldwide to test the effectiveness of specific fishing technics and fishing devices to reduce bycatch of vulnerable species (e.g. pingers for dolphins and porpoises, bycatch reduction technologies (BRTs) and illumination devices for sea turtles).

Mr Sacchi presented the draft table of contents of a technical document (under preparation) on mitigation solutions and technics tested worldwide for reducing incidental catches of endangered species and depredation in fisheries. Based on several hundred scientific publications and technical reports, this document was foreseen to provide useful background information on methods and technics that could be suitable for addressing specific situations in the Mediterranean region.

Mr Alessandro Lucchetti, Consiglio Nazionale delle Ricerche - Istituto di Scienze (CNR-ISMAR), presented **The TartaLife Project**. The project covered fifteen Italian regions and aimed at reducing the mortality of *Caretta caretta* and thus contributing to the conservation of the species in the Mediterranean, through two main objectives: 1) Reducing bycatches caused by pelagic longline, bottom trawl and fixed nets disseminating circle hooks and TEDs and testing UV and a new type of collapsible pot; 2) Reducing post-capture mortality, training fishers and strengthening the Marine turtles First Aid/Rescue Centres. He highlighted that the first and most important topic when dealing with sea turtle bycatch (and more in general with protected species), was to define the species behavior, ethology and habitat (biology, migration etc.), to review available information on bycatch and mortality by fishing gear in the selected area, to identify possible bycatch hotspots, technical characteristics of fisheries and fishing gears, and possible actions and solutions with a bottom-up approach to find the consensus of the stakeholders. In this regard, TartaLife started to work with fishers by giving them some responsibility and promoting them as main actors of the project with the aim of reducing sea turtle bycatch. The actions carried out in TartaLife were the dissemination of circular hooks in pelagic longline fishing; the update and dissemination of Turtles Excluder Devices (TEDs) in bottom trawl fishing; the reduction of incidental catch of sea turtles in the passive nets; setup and dissemination of visual repellents and alternative gears; the training of fishers on how to rescue and deliver first aid to accidentally caught turtles; the strengthening of Marine Turtles Rescue Centres (equipment and re-training of staff).

Mr Juan Antonio Camiñas, national coordinator of the Spanish pilot action in the Swordfish and albacore longline fisheries, presented **Mitigation measures to reduce sea turtles bycatch tested by the Spanish Oceanographic Centre (IEO): Experiences in the Mediterranean and other Oceans on factors affecting surface longline selectivity.** The IEO-Malaga Large Pelagic Research Group had been working on fisheries bycatch from 1985 in close collaboration with fishers, other stakeholders and national and international experts. The IEO Malaga Research Group started a scientific onboard longline (LL) fleet observers program in the Mediterranean Sea in 1998. Through this program IEO compiled data and information related to fishing operations, gear characteristics, environmental and biological parameters of target and bycatch species, improving their stocks assessment. In addition to using data from official sources and from onboard observers, IEO carried out pilot actions in collaboration with the professional fleet and the fisheries administration to: evaluate the selectivity of old and new gears; compare selectivity of different hook size and baits combinations; improve the conservation of targeted fishing resources; check the use of attracting lights in target and non-target species; reducing catches of juvenile swordfish and non-target species (as sea turtles); assess the profitability (in terms of catches) of new gears; evaluate the effect of environmental parameters on target and non-target species, etc. Main results indicated that: larger vessels had higher sea turtles capture rates; LL targeting albacore had higher capture rates of turtles; direct mortality increased in the Japanese LL gear; surface LL gears could capture small sea turtles (22 cm carapace length, CL); experimental circle hooks reduced bycatch of turtles in traditional J-shape hooks; captures of sea turtles were dependent on the distance to the coast, etc. Current IEO Research Group aimed to better know the effects of a mesopelagic longline gear (fishing between 100 and 600 m depth) that was gradually introduced from 2007 in Spain and from 2010 in Italy, replacing the traditional surface longline. This fishing gear could have implications for the bycatch rates of sea turtles.

Mr Ricardo Sagarminaga, national coordinator of the pilot action in the longline and gillnet fisheries in southern France and the Balearic Islands, presented **Alnitak experience in mitigating turtles bycatch.** The presentation went over 33 years of assessment, management and monitoring of a sea turtle bycatch risk in the Spanish Mediterranean surface longlining fleet operating the fisheries targeting swordfish, Bluefin and albacore tuna. Analyzing the chronicle of the success story of the mitigation of bycatch risk by over 95 percent in the swordfish longlining fleet of the Spanish Mediterranean, he presented and discussed key lessons learned from collaboration between fishers, scientists and managers. The presentation underlined the importance of empathy and communication as opposed to confrontation, and followed through to key aspects to maintain and reinforce this through time. In addition to developing research with active collaboration from fishers, a key element identified was the organization of periodic workshops for presenting and discussing results and identifying opportunities for further work focusing on solutions that made biodiversity conservation and economic development compatible. In 2006, after a first series of experimental fishing trials, Alnitak and NOAA incorporated the veterinarian perspective to better assess the severity of hooking injuries and accordingly developed the optimal protocols for increasing the chances of survival of sea turtles returned to sea. The presentation concluded with the studies of Alnitak on sea turtle movements, habitat use and behavioral response, using different tracking tools as satellite, video and acoustic tags. The data from this tracking was integrated in the SOCIB website¹ in order to develop an on line 'bycatch risk mapping tool' for the fishing fleet.

¹ <http://www.socib.es>

Ms Rimel Benmessaoud, national coordinator of the pilot action in purse seine fisheries in Kelibia, Tunisia, presented the **Tunisian experiences with acoustic deterrent devices for mitigating interactions with cetaceans**. She explained that over the last years, depredation by cetaceans had continued to increase and became a crucial issue for the fishing sector. The damages generated by dolphins to fishing gears resulted in direct and indirect economic loss. Several studies focused on interactions between dolphins and fishing gears, considering both effects of depredation and incidental mortality of dolphins. In the north-eastern Tunisian coasts, data from stranding monitoring and information from fishers indicates that interactions with dolphins were mainly observed in purse seine fisheries: Tunisian fishers repeatedly expressed concern about the negative effects of bottlenose dolphins *Tursiops truncatus* and seabirds during fishing operations. Aware of this issue, the National Institute of Marine Sciences and Technology (INSTM) had launched a programme to study and monitor the interactions in order to find solutions compatible with the fisher needs and dolphin conservation. Within the programme, different types of pingers and other devices were tested during fishing operations with purse seiners; the results indicated that the acoustic devices had a limited effectiveness in reducing interactions with dolphins, and a short lifespan. Furthermore, they are relatively expensive.

Mr Omar Kada, national coordinator of the pilot action in purse seine fisheries in the Moroccan Mediterranean, presented the **Moroccan experiences with acoustic deterrent devices for mitigating interactions with cetaceans**. He explained that, very similarly to the Tunisian experience, interactions between bottlenose dolphins and purse seine fisheries were particularly detrimental for fishers, causing big loss in catches and damages to fishing nets. He presented the different experiments carried out by the National Institute of Fisheries Research (INRH) for mitigating such interactions, using different types of acoustic deterrent devices (ADDs). The results of the studies showed that the use of the ADDs did not stop dolphin attacks and also acclimatization effect was demonstrated as the limited efficiency of the ADDs decreased with the time.

Following the above detailed presentations, Ms Amina Tifoura (CNRDPA, Algeria) and Ms Sana El Arraf (Centre Régional INRH/Tanger, Morocco) presented the progress made respectively in the preparation of the study on the extent of cetacean fishery interaction in Algeria and of the pilot action on the interaction of killer whales with Tuna fishing in Moroccan waters of Gibraltar strait.

Mr Jacob González-Solís, Institut de Recerca de la Biodiversitat (IRBio) and Dept. de Biologia Animal, Universitat de Barcelona, presented an **Assessment of best practices for minimizing seabird bycatch in demersal longliners in the Mediterranean**. Bycatch mortality in longline fisheries is currently considered the major threat at sea for numerous species of petrels and albatrosses. These incidental catches occur worldwide but mortality levels are mainly determined by the specific traits of the fishery activity in each area and the feeding behavior and local abundance of seabirds. In the Mediterranean, mortality caused by longlines may have serious consequences on seabird populations. Even so, currently no mitigation method is used to avoid seabird catches. From 2011 to 2015 a research was carried out to reduce the seabird bycatch in artisanal demersal longliners from the Catalano-Balearic Sea (Western Mediterranean). The study was accomplished in two phases: 1) assessment of the seabird bycatch rates and 2) trials of mitigation measures to reduce seabird bycatch. A bycatch rate of 0.39 birds per 1,000 hooks set was found, which implies at least about 1802 seabirds die each year on demersal longline fishery from the study area. The most affected species were the three endemic and threatened shearwaters of the Mediterranean (Scopoli's *Calonectris diomedea*, Balearic *Puffinus mauretanicus* and Yelkouan *P. yelkouan* shearwaters), likely

related to their high diving capabilities compared to other seabirds. Main factors enhancing bycatch risk were: setting the longline at sunrise, near to the colonies and during breeding season. Experimental settings showed night-setting was the most effective method for minimizing bycatch mortality without affecting commercial catches. This presentation showed the importance of assessing bycatch incidence at local level and adapting mitigation measures to the specific traits of the fisheries operating in the study area of interest. The study also indicates bycatch mortality rates estimated are unsustainable and calls for an urgent need to implement mitigation measures in demersal longliners from the western Mediterranean.

Mr Pep Arcos, BirdLife International, presented **Birdlife experience on mitigation measures for seabirds**. Seabirds are among the most threatened groups of birds, and bycatch is regarded as one of their major threats throughout the world, particularly for albatrosses, petrels and shearwaters. In the last two decades the issue has received substantial attention, and mitigation measures have been successfully developed and implemented in some regions and fleets. He underlined that the problem has been largely overlooked in the Mediterranean, where three endemic species of shearwaters of high conservation concern are particularly sensitive to bycatch, mainly from longliners: the Balearic *Puffinus mauretanicus*, Mediterranean *P. yelkouan* and Scopoli's shearwaters *Calonectris diomedea*. To address this gap, SEO/BirdLife and BirdLife International are in the phase of extending the Albatros Task Force (ATF) model into the Mediterranean, starting in the main area of overlap of these three species, the North-East Spanish waters, and one of the metiers of major concern, demersal longline. The so called Seabird Task Force (STF) builds on the experience of the ATF, thus first starting with an evaluation of the problem and then testing the best mitigation measures to solve it, while raising awareness and seeking the close collaboration of the fishing sector from the beginning. The work so far has been focused on the evaluation of bycatch rates throughout the year, plus raising awareness. The three species of shearwaters are caught regularly by demersal longliners, with bycatch rates that might jeopardize their long-term survival, particularly in the case of the Critically Endangered Balearic shearwater. Efforts are now directed at the development of the most suitable mitigation measures.

Mr François Poisson, elasmobranch expert from IFREMER, presented **Bycatch monitoring programme in the French Bluefin tuna longline fishery operating in the Mediterranean Sea: focus on elasmobranchs**. In collaboration with fishers a bycatch monitoring programme was initiated in order to assess the magnitude of the bycatch issue the French pelagic longline fishery targeting Bluefin tuna in the Gulf of Lion. The pelagic stingray (*Pteroplatytrygon violacea*) and blue shark (*Prionace glauca*) are commonly encountered as bycatch. Interviews were conducted in order to get the perception of the crews about the by-catch issues, their magnitude and trends since their activity started. Scientists went on-board commercial vessel to document the existing mitigation developed by the crews. Several types of de-hookers were provided to skippers to be tested (see Annex 3). Combining scientific observations and empirical knowledge from skippers and crew, a manual, providing appropriate handling practices to ensure crew safety and increase the odds of survival for released animals will be soon developed and disseminated. In addition, several types of sensors and satellite archival tags were attached to individuals of both species to know better about their habitat utilization. Applying the known habitat utilization and behavior of these animals should help developing other mitigation measures.

Session 1 was concluded by a discussion between the coordinators of the pilot actions and the experts on the state of knowledge on the interactions to be addressed through their pilot action and

on the mitigation measures that could be tested. The exchange of ideas was extremely helpful for the coordinators of the pilot actions to progress on the way of conducting their activities. The main recommendations were as follows:

- The available mitigation devices and measures should be ranked according to their effectiveness, taking also into account the possibility of their adaptation to the Mediterranean context;
- The cost/effectiveness of each available mitigation device should be assessed in relation to the damage avoided;
- The mitigation efficiency should be assessed also in relation to the specific conditions of their implementation such as the fishing season, the weather conditions, day/night conditions, etc.
- The size and distribution of the dolphin population suspected to be involved in depredation should be assessed;
- Innovative approaches should be investigated: satellite tracking of dolphins to inform fishers about their presence, allowing an amount of fish to dolphins, etc.

Session 2: On-board good practices for reducing post capture mortality

Mr Jose Luis Crespo, Veterinario, Oceanogràfic, Ciudad de las artes y las Ciencias de Valencia, opened the second session of the Training workshop presenting **Experiences from the rescue centre**. Rehabilitation centres showed they had been an essential way to rescue injured sea turtles and cetaceans as well as an important tool in marine animal research. These facilities also became a starting point where conservation awareness actions begin for members of the public. Rehabilitation centres operated to host and rehabilitate injured and/or diseased animals. This principal activity allowed linking the rehabilitation process with multiple research fields. These facilities were also directly involved in stranding networks and also relevant staff participated in the post-mortem analysis of deceased animals. Rescue centres were also on the front lines to develop mitigation measures or testing such measures before implementation in the field. Additionally multiple programs were carried out for promoting social awareness from volunteering and educational activities to get media involved and increase profile of the issues facing these animals and the work being done to save them. As an example, the Oceanographic aquarium of Valencia, thanks to the rehabilitation activities and post-mortem analysis had come out with relevant information and discoveries of causes of disease and mortality in cetaceans and sea turtles (e.g. decompression sickness in sea turtles as a consequence of bycatch, lepidemiology of virus diseases on cetaceans, consequences of cetacean interaction with fisheries, etc.). These discoveries were critical to saving more of these animals in the wild and demonstrated direct impact on conservation.

Ms Mariluz Parga presented **Submon experience on training fishers for reducing post-capture mortality of sea turtles**. She highlighted that incidental capture of sea turtles in shallow-set longline fisheries was known as an important cause for the decline of some sea turtle populations in the world. Over the years a large number of studies has been conducted to identify ways to reduce the effect of longline gear on sea turtles. In some instances the 'magic formula' had been found, greatly reducing sea turtle bycatch, but other fisheries were still far from this with no definitive solutions. While ways to reduce turtle bycatch were found, the only effective way of reducing the impact of such bycatch on sea turtles was reducing post-release mortality. This could be achieved by improving

onboard handling, hook-removal and release techniques of captured animals. The knowledge to implement this aspect of bycatch reduction was already available and only needed to be effectively transmitted to the fishing community. Since 2006, Submon trained around 650 longline fishers, observers and managers in Spain, Italy, US, Canada, Colombia, Ecuador, Costa Rica, Guatemala and Mexico. These training events were well received by fishers and perceived as an easy way to help sea turtles, without going through complicated changes in their gear or fishing routine. They understood the importance of their actions on board, and the fact that a change in those actions could entail important benefits. Two factors were important when training fishers: 1) the trainer should have ample experience working on board fishing vessels with sea turtles to answer fishers' doubts and questions, to understand the variety of situations on board and to adapt to them; 2) telling fishers what to do or not to do was not enough as this type of training was about providing fishers with knowledge to be able to decide what to do in each situation and to gain responsibility over their acts and decisions.

Mr Hall concluded the session presenting **Working with fishers to release individuals incidentally captured**. In the presentation, he remarked why it was important to work together with fishers and how to do it toward successfully results. He underlined that fishers would always have a better understanding of the marine environment and its dynamic than scientists and that with reasonable goals, respect, enhancement of fishers' responsibility and intelligent communication and incentives the cooperation could turn in a win-win situation. The objectives of such cooperation should be the change of fishers' attitude, behavior, and motivation while explaining why these changes were needed. The involvement of relevant stakeholders such as local government/authorities, conservation NGOs, industry and fishing community was also considered fundamental for working with fishers efficiently. Mr Hall also remarked that changes in the fishing gear only were not sufficient to obtain results if that was not accompanied by the full collaboration of fishers. He then presented to the meeting the results of the experiences in working with fishers to reduce bycatch in Japan, Nicaragua, Costa Rica, panama, Colombia, Ecuador and Peru.

At the end of the session, the participants **visited the CRAM Center facilities** and Ms Jimenez provided explanations on the different types of activities carried out by the center (including education and conservation) and described the veterinary routines for wild marine animals entangled in fishing gear that were hosted by the center (some photos² of the tour are reproduced in Annex 4). She explained that according to the type of injuries, some of the animals could be released back in the sea after healing while others could not survive and were maintained in captivity.

Session 3: Discussion on experimentation protocols for each pilot action

During this session, the national coordinators presented the strategy of work and actions to be undertaken in their pilot action. The conditions/requisites to implement the different activities were reviewed and commented also in light of the presentations and inputs by the other experts during the previous sessions; the discussions allowed to reconsider the best bycatch mitigation technics that could be tested in the framework of each pilot action.

² The complete photo gallery is available at: <https://www.flickr.com/photos/135642040@N06/sets/72157658889389962>

Conclusions

Mr Hall presented to the meeting the conclusions of the Training workshop identifying the main outcomes of the two-day discussions and presentations on bycatch mitigation and technics to reduce post-capture mortality of entangled animals.

The meeting concluded that similar problems on bycatch and depredation would benefit from regional cooperation. Building a regional team of researchers allowed to maximize human and other resources and to create opportunities for capacity building. The meeting also agreed that standardized and harmonizes forms for the data collection and a common database were required to compare results across the different countries/pilot actions. In this respect the Project Monitoring Unit recalled that a common data collection form, based on the GFCM data collection reference framework (DCRF) for fisheries, was discussed and put at disposal of the pilot actions' coordinators.

The importance of well-focused studies on ecology, behavior and physiology (sensory research) of targets and non-target species was also remarked. All the impacts of technological changes on the species of interest, and in others involved should be considered (encounter rates, capture rates, survival rates on release, etc.) in any bycatch study.

The meeting convened on the following points as fundamental pillars of scientific surveys aiming at **collect data on bycatch/depredation events**:

- At sea data collection by observer programs would provide many additional options to understand, quantify and mitigate problems.
- Observer programs, even at low levels, would support fisheries and bycatch research.
- A multi-taxa vision (ecological assessment) would be needed to decide on solutions.
- Incentives for fishers would be needed to obtain their collaboration when aiming at decreasing bycatch of vulnerable species, though these incentives were not yet identified by the meeting; on the other hand, in the cases of depredation, incentives would not be required as the fishers would be already willing to collaborate with scientists.

The meeting also agreed that the decrease of bycatch events could occur at different phases of the fishing activities and therefore mitigation measures should be implemented to i) avoid capture during fishing operations, ii) increase the rate/effectiveness of releases from the fishing gear, iii) increase the rate/effectiveness of releases from the deck.

In connection with the **testing of fishery mitigation measures/new fishing technics** the meeting underlined that:

- Experiments should be conducted, when possible, on regular fishing commercial vessels and fishing operations.
- Research should be flexible, adapting to the practical needs of the fishers.
- Demonstration on the use of new instruments (e.g. new type of hook) in realistic conditions would be important.
- Voluntary participation would be the way to develop collaborative programs with fishers.

With reference to technics to **decrease post-capture mortality**, the meeting agreed that fishers training on the handling of animals should be a component of all bycatch programs, providing rational explanations rather than authoritarian guidelines and that the best veterinary science should be used as background and that the training on release methods should be carried out in familiar and real conditions.

The important aspect of **‘proper’ communication with fishers** were also discussed during the two-day workshop. Mr Hall stressed that the communication with fishers was a critical ingredient of all successful programs. The trust of the fishing community should be valued as the highest asset of a research team. Understanding the structure and dynamics of fishing communities would be an early step that would facilitate all others and that mechanisms to facilitate the acceptance of changes in the fishing technics should be developed. In addition, the economic impact of such changes should be fully understood, and when the balance would be negative, alternatives should be explored. Participants and organizers should collaborate to develop and gather all sorts of educational materials, instruments, publications relevant to the group.

Closure of the workshop

The ACCOBAMS and GFCM Secretariats reiterated their thanks to the CRAM staff for hosting the event and for the logistic support throughout the meeting. They also expressed sincere appreciation for the work done by Mr Hall as Chair of the Training workshop and for his technical contributions. The Secretariats also thanked Mr Sacchi and Mr Rais for their continuous assistance to the pilot actions’ national coordinators and Ms Lobna Ben Nakhla, RAC/SPA representative, for facilitating the development of the project in Tunisia. The participants expressed their appreciation for the organization of the Training workshop and thanked the Secretariats for the overall coordination and support.

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**Project on mitigating the negative interactions
between threatened marine species
and fishing activities**



Annex 2

Agenda

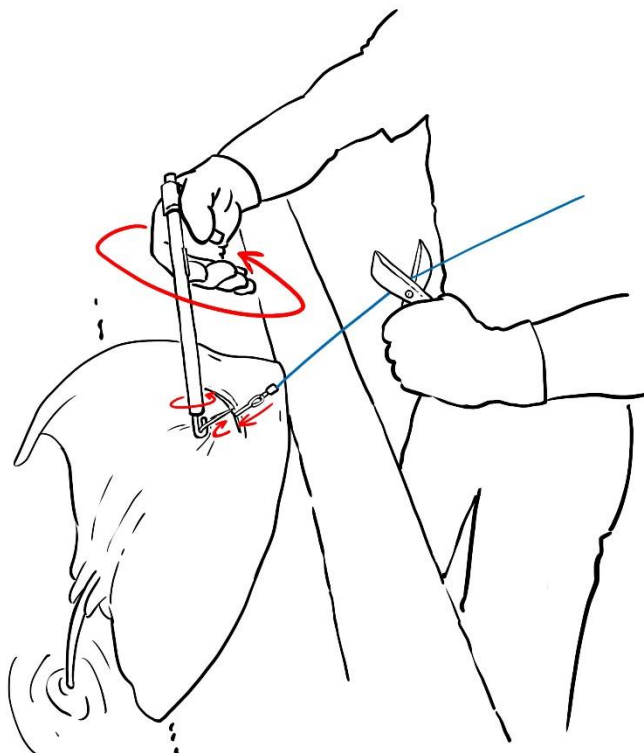
Day 1 – Monday, 14 September	
Introduction of the Training workshop (facilitator: Tania Monreal, CRAM)	
09:00 – 09:25	Official opening of the training workshop <ul style="list-style-type: none"> - Welcome of the hosting center (Elsa Jimenez, CRAM) - Introduction of participants
09:30 – 10:00	Introduction and objectives of the meeting <ul style="list-style-type: none"> - Presentation of the project (Celia Le Ravallec, ACCOBAMS Secretariat) - Overview of the bycatch issue in the Mediterranean Sea (Aurora Nastasi, GFCM Secretariat) - Arrangements and objectives of the training workshop (ACCOBAMS and GFCM Secretariats)
10:30 – 12:30	Presentations on the development of each pilot action with focus on the main endangered species interacting with relevant fisheries <ul style="list-style-type: none"> - Pêcheries à la senne aux petits pélagiques à Kelibia (Rimel Benmessaoud) - Pêcheries aux palangres de fond et de surface dans le Golfe de Gabès (Béchir Saidi) - Pêcherie sardinière à la senne en Méditerranée marocaine (Omar Kada) - Pêcherie artisanale de thon rouge dans le Détroit de Gibraltar (Sana El Arraf) - Pêcheries palangrières de l'espadon et du thon blanc dans le sud de l'Espagne (Juan A. Camiñas) - Pêcheries palangrières et au filet droit dans le sud de la France et les Baléares (Ricardo Sagarminaga) - Etude préliminaire sur les problématiques de captures accidentelles et de prédation en Algérie (Amina Tifoura)
Session 1: Mitigation measures tested and adopted in fisheries worldwide and in Mediterranean waters (facilitator: Martin Hall, IATTC)	
14:00 – 14:45	Developing successful strategies to mitigate bycatch and depredation: what have we learnt? (Martin Hall)
14:45 – 15:00	Presentation of the draft ACCOBAMS-GFCM document on mitigation measures (Jacques Sacchi)
15:00 – 15:15	Q&A
• Sea turtles	
15:15 – 15:30	TartaLife project approach for the reduction of sea turtle bycatch (Alessandro Lucchetti)
15:30 – 15:45	Mitigation measures to reduce sea turtles bycatch tested in the Mediterranean Sea (Juan A. Camiñas)
15:45 – 16:00	Alnitak experience in mitigating turtles bycatch (Ricardo Sagarminaga)
16:00 – 16:15	Q&A
• Cetaceans	
16:30 – 16:45	Mitigating interactions with cetaceans in the Mediterranean – results of the experience with acoustics deterrent devices (ADD) (Chedly Rais, Rimel Benmessaoud, Omar Kada)
16.45 – 16.50	Q&A
• Seabirds	

16:50 – 17:05	Assessment of best practices for minimizing seabird bycatch in demersal longliners in the Mediterranean (Jacob Gonzalez-Solís and Vero Cortés)
17:05 – 17:10	Q&A
• Sharks	
17:10 – 17:25	Mitigation measures for selacians and longline tested in Mediterranean Sea (François Poisson)
17:25 – 17:30	Q&A
17:30 – 18:00	Final discussion and wrap-up (Martin Hall and Jacques Sacchi)

Day 2 – Tuesday, 15 September	
Session 2: On-board good practices for reducing post capture mortality (facilitator: Jose Luis Crespo, Oceanogràfic de València)	
09:00 – 09:40	The experience of the CRAM and Valencia rescue centers (CRAM and Valencia staff)
09:40 – 10:00	Q&A
10:00 – 10:20	Insights on small cetaceans (Chedly Rais)
10:40 – 11:00	Insights on sea turtles (Mariluz Parga)
11:00 – 11:20	Insights on sharks (François Poisson)
11:20 – 11:40	Insights on seabirds (Pep Arcos)
11:40 – 12:00	Q&A
12:00 – 12:30	Working with fishers to release individuals incidentally captured (Martin Hall)
12:30 – 12:40	Q&A
14:00 – 16:00	Practical demonstration with animals and tour of the CRAM center (CRAM staff)
16:20 – 17:20	Presentation of the information documents and material available for fishers across different Mediterranean countries (François Poisson et al)
17:20 – 17:30	Q&A
17:30 – 18:00	Wrap-up (Jose Luis Crespo and Jacques Sacchi)

Day 3 – Wednesday, 16 September (<i>morning only</i>)	
Session 3: Discussion on experimentation protocols for each pilot action (Facilitators: Chedly Rais and Jacques Sacchi)	
09:00 – 12:00	<p>Discussion on experimentation protocols for each pilot action (around 30 min each)</p> <ul style="list-style-type: none"> - Pêcheries à la senne aux petits pélagiques à Kelibia (Rimel Benmessaoud) - Pêcheries aux palangres de fond et de surface dans le Golfe de Gabès (Bechir Saidi) - Pêcherie sardinière à la senne en Méditerranée marocaine (Omar Kada) - Pêcherie artisanale de thon rouge dans le Détroit de Gibraltar (Sana El Arraf) - Pêcheries palangrières de l'espadon et du thon blanc dans le sud de l'Espagne (Juan A. Camiñas) - Pêcheries palangrières et au filet droit dans le sud de la France et les Baléares (Ricardo Sagarminaga) - Etude préliminaire sur les problématiques de captures accidentelles et de déprédation en Algérie (Amina Tifoura)
12:00 – 12:30	Conclusions and closure of the workshop

Example of ray de-hooking devices and technics



Ray de-hooking, ©François Dolambi



Ray de-hooking, ©François Poisson, IFREMER

Photos from the CRAM center

