

REPORT OF THE SIXTH CONFERENCE ON CETACEAN CONSERVATION IN SOUTH MEDITERRANEAN COUNTRIES



13-15 November 2023, Monastir - Tunisia



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1. OPENING OF THE CONFERENCE

The Sixth Conference on the Conservation of Cetaceans in the South Mediterranean Countries (CSMC6), was held in Monastir, Tunisia from 13 to 15 November 2023. This Conference was co-organized by the ACCOBAMS Secretariat and the Specially Protected Areas Regional Activity Centre (UNEP/MAP-SPA/RAC), in collaboration with INSTM, and was financially supported by the Principality of Monaco and the Government of Malta.

More than fifty participants (experts, researchers, doctoral students and undergraduate students) from the ACCOBAMS region took part in the Conference ([Annex 1](#)).

1.1 Welcome addresses

Susana SALVADOR, ACCOBAMS Executive Secretary (online)

The ACCOBAMS Executive Secretary warmly welcomed all participants to the Sixth Conference on Cetacean Conservation in Southern Mediterranean Countries, hosted by Tunisia. She took this opportunity to express her gratitude to SPA/RAC for their huge collaboration, to INSTM to the ACCOBAMS countries that financially supported the Conference - Monaco and Malta.

She highlighted that almost 15 years after the first CSMC, young participants – mostly students - have become renowned ACCOBAMS scientists and experts, as well as members of the scientific committee, demonstrating their dedication to the cause, while retaining the same enthusiasm.

She added that thanks to the ASI, level of knowledge has been reinforced, as has the regional capacity to mobilize to obtain the necessary information on the conservation status of cetaceans, essential steps in the pursuit of the monitoring efforts indispensable to the action of ACCOBAMS.

Finally, she thanked the 3 Chairs of Session - Simone Panigada, Léa David and Thierry Jauniaux- for their involvement and guidance of the presentations and discussions -, mentioning that the success of this Conference is based on the contribution of everyone.

Dhekra HAYOUNI, ACCOBAMS National Focal Point

The ACCOBAMS National Focal Point welcomed all participants and acknowledged the ACCOBAMS Secretariat and the SPA/RAC for the organization of such conferences. She recalled the aim of the Conference which is to assess the knowledge acquired on cetaceans in the South Mediterranean Sea, to identify potential gaps and to encourage the development of conservation actions in order to promote the implementation of ACCOBAMS decisions and recommendations.

Khalil ATTIA, Director of the Specially Protected Areas Regional Activity Centre (SPA/RAC)

The Director of SPA/RAC recalled that since more than two decades, ACCOBAMS and UNEP/MAP-SPA/RAC have been working together to achieve and maintain a favourable conservation status for cetaceans, in the spirit of the recommendations of the Barcelona Convention Contracting Parties at their COP 14 (Portoroz, November 2005) concerning the relation between the implementation of ACCOBAMS and the SPA/BD Protocol.

In addition, the Director highlighted the importance of the "ACCOBAMS Survey Initiative (ASI)" project as the inaugural systematic endeavor to gather pertinent data regarding the distribution, abundance, and pressures faced by cetaceans in the Mediterranean Sea. The development of the guidance document for assessing the ecological status of cetaceans within the EcAp/IMAP process is also underscored. The data obtained through ASI and the guidance document have played a crucial role in facilitating the preparation of the 2023 Quality Status Report.

He was also pleased to announce the side event titled "Linking Mediterranean Scientists and the Ecosystem Approach for Enhanced Cetacean Conservation in the Southern Mediterranean Region", hosted in the afternoon by SPA/RAC,

which aims to facilitate collaborative dialogue among scientists, decision-makers, and conservationists. Our goal is to explore and implement the ecosystem approach in the context of cetacean conservation across the Mediterranean region.

1.2 Adoption of the Agenda

During these three days, three scientific sessions were organized on the following topics:

- Monitoring cetaceans' populations
- The interactions between cetaceans and human activities
- Cetaceans' strandings

These sessions provided an opportunity to exchange experience and information and to consider the best approaches and actions for better knowledge on cetaceans' populations in the southern Mediterranean region.

A side event "**Linking Mediterranean Scientists and the Ecosystem Approach for Enhanced Cetacean Conservation in the Southern Mediterranean Region**" was organized by SPA/RAC on 13 November 2023.

A training workshop regarding the implementation of a scientific photography protocol adapted to cetacean strandings for developing telenecropsy was held on the last day of the Conference.

The agenda can be found in [Annex 2](#).

2. MONITORING OF CETACEAN POPULATIONS

Chair of the Session, Simone Panigada

Abundance and density estimation is essential in a robust conservation and management scheme, as it can help assess the effects of direct and indirect removals (e.g., caused by ship strikes or pollution) and of management measures (i.e., are they working over time?), and give information on population stock structure. The ACCOBAMS Survey Initiative (ASI), carried out between 2018 and 2019, was the first synoptic effort to estimate the abundance of cetaceans in the Mediterranean Sea. Through a multidisciplinary approach, employing acoustic monitoring, shipboard and aerial visual surveys, and advanced modelling techniques, the ASI was pivotal in establishing cohesive baseline data for cetacean abundance and distribution estimation in the Mediterranean and Black Seas. The ASI dataset is unique, as the data collected concurrently shed light on previously understudied areas and reinforced and updated existing knowledge, providing the necessary knowledge to support science-based conservation and management processes in the ACCOBAMS area. Through a concerted effort and scientific cooperation, the ASI both expanded our understanding of species abundance and distribution and laid a foundation for informed conservation strategies based on the best available scientific knowledge.

The Tunisian Dolphin Project, from a small initiative into a long-term monitoring programme in Tunisia.

Ibrahem Ben Amer, co-author: Mehdi Aissi

Cetaceans are long-lived top predators in the marine ecosystem. In order to have a comprehensive understanding of their population dynamics, behaviour, life history and impact of human activities, long-term/well-funded monitoring programmes are required. Combined with the fact that these megafauna species are mostly under considerable anthropogenic pressures, most of their species are priority for conservation and are being highlighted in relevant conservation priority lists such as the IUCN Red List criteria and Annex II of the Barcelona Convention.

The Tunisian Dolphin Project's was established in 2014 to survey and monitor the bottlenose dolphins (*Tursiops truncatus*) in Tunisia and has been implementing its monitoring regularly until 2023. In its first year, the project started with assessing whether the local population of the bottlenose dolphins access the Bizerte lagoon (37°11'20"N, 9°52'30"E) and for what reason. In the following years (2015 -2019), and with funding and in partnership with different national and international organizations and NGOs, the Project expanded its scope and adapted Mark-recapture (photo-identification) as its main method in studying the dolphin's population in the entire Northern Tunisian coast from the Algerian borders in the west (36°58'20"N 8°45'20"E) to the gulf of Tunis in the east (37°02'30"N 10°29'50"E). During this stage the project has managed to conduct a total of 3160 km of effort and produced a catalogue of 63 marked individuals. Using a closed population model, an estimate was applied in 2019 which estimated that the area

holds roughly 98 dolphin individuals (67 – 129 individuals). Based on the results of this study, the Gulf of Bizerte was nominated as an Important Marine Mammals Area (IMMA) and as a Cetacean Critical Habitat (CCH).

In 2021, the Project extended its activity south to cover the Gulf of Hammamet (36°08'60"N 10°38'30"E) in a collaborative approach with the Agence de Protection et d'Aménagement du Littoral (APAL) and The Specially Protected Areas Regional Activity Centre (SPA/RAC) as part of the Mediterranean-wide InterMED initiative. Using photo-identification, the aim of this stage was also to monitor the bottlenose dolphin population in that area and to assess whether there are any transient individuals between the Gulf and northern Tunisia.

This year (2023), and with funding from the ACCOBAMS Supplementary Conservation Fund (SCF), the project is now expanding its activities to the southern Gulf of Gabes (34°02'20"N 10°22'20"E). At the end of this campaign season (which will continue until 2024), the project will establish a national catalogue for Tunisia which will estimate the dolphin's population nationwide, highlight national important areas for the species, and provide data on anthropogenic threats and impacts.

Poster: Abundance of *Tursiops truncatus* along the Lebanese coast between 2009 and 2023

Myriam Ghosoub, co-authors: Mahfouz, C.; Ouba, A.; Jemaa, S.; Lteif, M.; Khalaf, G.; Fakhry, M.

Marine mammal observation according to the ACCOBAMS guidelines became one of the main tasks implemented by the National Centre for Marine Sciences in Lebanon since 2009 and was integrated into several research projects. The first dataset for marine mammals presented here was obtained following the implementation of the ACCOBAMS Survey Initiative (ASI) in 2018. The observation campaigns were conducted by the NCMS-CNRS-L team on board R/V CANA-CNRS. The line transect method was adopted in all campaigns. Three observers were on the deck at the front part of the boat at a height of 7 m from the sea level, permanently covering an angle of 180° of observation. The vessel speed was 8 knots, and sampling campaigns were implemented when the wind force was less than 3 (Beaufort Scale). The vessel's position was automatically recorded using GPS. Data including time, number of individuals, species, behavior, as well as additional environmental factors were recorded for each observation. In addition, data including weather status, observers' information, and additional remarks were recorded several times during each campaign. Following the 2018 campaigns, seventeen individuals of *Tursiops truncatus* were observed in the Beirut region and one in the Tripoli region. These results will be then compared with the ones that will be obtained from similar observation campaigns and following the same transects during September 2023. Distributional maps will be drawn. This will allow a thorough description and comparison to follow the evolution of the cetacean population in Lebanon and compare their distribution in 2018 and 2023.

Poster: After 17 years, what has been achieved so far in Libya?

Almokhtar Saied

Cetacean species in the Mediterranean Sea face significant threats due to various human activities, and all thirteen species, including eight regular and five occasional ones, are listed on the IUCN Red List of threatened species. Many countries, including Libya, have recognized the importance of conservation and monitoring efforts to protect these species. In Libya, a comprehensive Action Plan was formulated in 2006, serving as a vital guideline for conserving cetaceans in Libyan national waters.

The National Action Plan (NAP) was initially developed to establish a comprehensive understanding of cetaceans in Libya, identify the human activities affecting these species, and define priority actions and measures for Libyan authorities to protect them. Now, after 17 years have elapsed since the initial endorsement of the Action Plan, it is imperative to provide an updated assessment of the progress made in implementing its measures and to review any challenges or obstacles encountered during this period.

This evaluation will help gauge the effectiveness of the NAP and identify areas that may require further attention or adjustments to ensure the continued conservation of cetaceans in Libyan waters.

Poster: Development of a Photo-Identification Catalogue for the Common Bottlenose Dolphin (*Tursiops truncatus*) population in the Eastern Part of Tunisia, primarily in the Bay of Monastir

Rania Frad

A photo-identification study of the common bottlenose dolphin (*Tursiops truncatus*) was conducted in the eastern part of Tunisia, primarily within the Bay of Monastir, during the period of 2022-2023. In total, nine surveys were undertaken, covering a distance of 834 kilometres and resulting in the observation of 22 dolphin groups. Notably, 59.1% of these sightings were associated with feeding activities, whether in proximity to offshore aquaculture cages or trailing trawlers or gillnets.

Over 3,024 photographs were analysed, resulting in the identification of 57 individual dolphins, including both adults and immatures. The primary objective of this study was to establish a photo-identification catalogue for the common bottlenose dolphin population residing in the Bay of Monastir. This catalogue represents the initial step toward developing a long-term monitoring program for these dolphins in the region. In total, 32 well-marked individuals were catalogued, and 13 of them were resighted, including two mother-calf pairs.

The population size was estimated using the Popan model within the MARK software. It is important to acknowledge that this analysis was conducted using a relatively limited dataset spanning two years, and data collection efforts were uneven between these years due to adverse weather conditions and equipment limitations. Therefore, it's essential to consider potential biases in the analysis. However, despite these challenges, this study provides valuable insights into the population's status.

Poster: Passive acoustic monitoring of the bottlenose dolphin *Tursiops truncatus* to determine continuous presence around a Tunisian eastern fish farm

Rimel Benmessaoud, co-authors: Mourad Cherif, Ahmed Ben Romdhane and Wael Kouched

Despite the fact that bottlenose dolphins have been well studied in many parts of the world, their nocturnal activity remains unknown due to the technical limits of nocturnal monitoring. New techniques for monitoring the dolphin occurrence have been developed, based on the echolocation system of this specie. Passive acoustic monitoring (PAM) was used to monitor the presence of bottlenose dolphins (*Tursiops truncatus*) in the vicinity of an aquaculture farm on the Tunisian eastern coast. Our objectives were to better understand the presence of bottlenose dolphins around the aquaculture farm, to get a detailed idea on the use of this habitat and if there are any variables favouring its presence.

Data were collected between June and September 2023 using a cetacean click recorder (RTSYS- SYLENCE LP) combined with a hydrophone (HTI-99-HF). Recordings were examined using *PAMGuard* for analysing the bottlenose dolphin whistles.

Whistles-an indicative of bottlenose dolphin presences- were pooled over time to acquire acoustic encounters, which were analysed to infer continuity of animal presence and test for statistically significant differences between period of day (day and night), months and activities around the fish farm. Whistles were recorded during all deployments and evidenced night-time presence of bottlenose dolphins around cages was recorded. No Significant differences of acoustic encounters were observed between months. Acoustical data proved the continuous presence of bottlenose dolphins, highlighting the importance of the fish farm for their population.

Using acoustics to study dolphin behaviour: experience acquired and proposed studies on the resident population of *Tursiops truncatus* in the Monastir region (Tunisia)

Nejla Bejaoui, co-authors: Juliana López-Marulanda, Rimel Benmessaoud, Wael Kouched and Olivier Adam

Fisheries have different negative impacts on cetaceans: competition for available marine food resources, anatomy damages, bycatch, entanglement, plastic pollution. From the aquaculture, the situation is different because dolphins are also attracted by the nourishment coming directly from the fish farm. In the framework of the MAVA-Déprédation project, the bottlenose dolphin population was monitored around fish farm in eastern Tunisia. 154 groups of Bottlenose dolphins *Tursiops truncatus* were encountered interacting with cages. The group sizes of bottlenose dolphins are ranged from 1 to 8, ($X=2.39 \pm 1.57$, median = 2.03). The remain of behaviour budget is dedicated to foraging activities (65%; $\bar{x}= 15:04 \pm 12:24 \text{min}$) where feeding on fish farm is predominant (61%) and only 4% of its time are devoted to not opportunistic activities (Benmessaoud *et al.*, 2022).

Our team has studied *T.truncatus* acoustic communication in several free ranging populations (Reunion Island and Guadeloupe Island in France) and facilities (Bruges, Belgium), by the use of an innovative device based on a 360° video cam and an array of 4 synchronized hydrophones. This device was used to observe groups of dolphins and to detect their emitted sounds (Lopez-Marulanda *et al.*, 2017). We could focus to describe their movements and their interactions between them and with the device. We analysed the echolocation click trains, their whistles, and their silences (Lopez-Marulanda *et al.*, 2021). We aim to transfer our experience and knowledge to study the resident population of *T. truncatus* of Monastir area (Benmessaoud *et al.*, 2023), and to better understand how some individuals of a population that forages close to the aquaculture facilities, use echolocating click trains for cooperative fishing.

Understanding the feeding mechanisms of the bottlenose dolphin population will not only provide a global understanding of the feeding behaviour of the species but will also make it easier to identify the repercussions of anthropogenic activities, particularly aquaculture, on the behaviour of the species and use this information for the conservation of the populations. Efforts are underway to implement this study in this Tunisian area.

Poster: Diet of Bottlenose dolphins (*Tursiops truncatus*) from the Tunisian coasts: Insights from stomach content analyses

Rimel Benmessaoud, co-authors: Olfa Chaieb, Mourad Cherif, Wael Kouched, Nejla Bejaoui, Hechmi Missaoui

The ecological role of species can be different among populations based on local and regional differences in diet. This is particularly true for top predators such as the bottlenose dolphin (*Tursiops truncatus*), which exhibits a highly varied diet throughout its distribution range. To fully understand the role of this species in marine ecosystems, as well as its interaction with fisheries, local dietary assessments are crucial. The aim of this study is to determine the diet of bottlenose dolphins sampled along Tunisian coasts. Sample analysis aims at describing the diet in terms of prey species occurrence, relative abundance, calculated mass and size distribution.

Between 2019 and 2022, 20 strandings of cetaceans have been reported along the Tunisian coastline of which 45% are those of *Tursiops truncatus* (n=11). From 11 stomachs analysed, only 9 of them (81.82%) presented stomach content. From those who had stomach content, six included cephalopods in their diet. Several cephalopod beaks were found belonging to *Loligo vulgaris* and *Octopus vulgaris*. *Merluccius merluccius* appears to be the most dominant species in the diet, being found in 55.56% of the stomachs and representing 37.03% of the total number of prey and having an IRI equal to 40.6%. The Engraulidae and Sparidae families are also important prey in the diet, with an IRI reaching 12.58% and 10.97% respectively.

Considering the importance of small dolphins in the region, a better understanding of the feeding habits of these dolphins will shed light on the feeding ecology of this threatened species by evidencing interactions with fisheries targeting the same resources and identifying management measures based on an ecosystem approach.

Appréciation du risque sanitaire des espèces de *Brucella* des mammifères marins

Hédia ATTIA EL HILI et Kaouther MAATOUK

Over the last two decades, brucellosis in marine mammals has emerged in cetaceans and pinnipeds in a very significant way. At present, *Brucella ceti* and *Brucella pinnipedialis* are the two bacterial species recognized in marine mammals, but data available on them is still limited. Several genotypes have been identified, and studies on the relationship between sequence type (ST) and pathogenicity or organ tropism have indicated differences in pathogenesis between *B. ceti* sequences in cetaceans. The study of the health risk assessment of *Brucella* species in marine mammals is essentially based on characterizing this pathogen, assessing its sources of emission, propagation and exposure, and the consequences of this bacteriosis.

The results showed that the assessment could be biased, mainly due to the lack of data on the estimated prevalence of this disease in marine mammals and the very limited number of suspected human cases.

By analogy with other species of the *Brucella* genus responsible for abortion in ruminants and fever in humans, preventive measures are essential. Continuous epidemio-surveillance, combined with thorough post-mortem examinations of all species of marine mammals stranded dead or alive, would increase our knowledge of the zoonotic potential of marine *Brucella* species.

Poster: Using biologging to identify and safeguard core habitats of Mediterranean fin whales

Viola Panigada and Simone Panigada

Nowadays, marine mammals suffer from cumulative exposures to human pressures, including pollution, ship strikes, underwater noise, and the ever-growing threat of climate change, which can lead to inter-specific competition with humans, switches in prey availability, or variation in habitat quality. In this context, biologging emerges as a modern tool to inform management strategies to mitigate anthropogenic pressures on marine species. This study implemented satellite telemetry techniques to assess the movements and behaviour of endangered Mediterranean fin whales (*Balaenoptera physalus*), a genetically isolated sub-population, during their regular spring aggregation in Catalan coastal waters. In May 2021 (n = 3), May 2022 (n = 5), and June 2023 (n=3), 11 fin whales were equipped with Argos satellite transmitters, which lasted on average 29.5 ± 11.1 days. By calculating utilisation distributions from tracking data, we identified core (50%) and home (95% isopleths) ranges to delineate areas of high conservation priority. Moreover, we estimated the extent of the overlap between the home ranges and existing MPAs to provide knowledge on the species' occurrence through these areas. A Hidden-Markov model was implemented to translate movement ecology data (including speed, acceleration, and direction) of cetaceans into discernible behavioural states (ARS, associated with foraging, and transit). Our findings revealed limited inter-annual variation in fin whale distribution and core and home range extent. The tracked individuals spent <50% of their time in the Cetacean Migration Corridor SPAMI, over 90% in the North-Western Mediterranean IMMA and even 100% in the North-Western Mediterranean

PSSA. Considerable site-fidelity in foraging hotspots off the coast of Garraf and in the Gulf of Lion/Pelagos Sanctuary areas was revealed. The integration of these multidisciplinary findings, obtained through satellite telemetry, serves as a baseline to enhance the informed management of this Mediterranean sub-population. Given that foraging behaviour predominantly occurred outside currently protected areas, we propose bolstering conservation efforts to mitigate ship strike risks and other human threats in regions characterized by exceptionally high boat traffic. Strengthening ongoing transmitter deployments would both enhance our knowledge of this sub-population and improve its protection through targeted, place-based conservation initiatives, such as those proposed in the Conservation Management Plan.

3. INTERACTIONS CETACEANS-HUMAN ACTIVITIES

Chair of the Session, Léa DAVID

ACCOBAMS missions are to reduce threats and improve cetacean species conservation. Indeed, cetaceans are facing several threats, as degradation and disturbance of habitat, effects of marine litter and chemical pollution, unsustainable fishing gear, ship strikes and acoustic disturbance. To achieve its mission, ACCOBAMS is leading initiatives, and one of them is the CCH process (Cetacean Critical Habitat, to become Cetacean Conservation and Human activities), aiming at identifying areas at risk for cetaceans. This process is based on mapping the distribution and the abundance of cetaceans in the ACCOBAMS area, and in parallel on mapping the distribution and intensity of pressures in the same area and overlapping them. The overlap will give a better idea of areas at risk, where countries will be able to launch an integrated management, choose solutions to conciliate human activities and cetacean conservation. The CCH process benefit of all the integrated and coordinated approach of ACCOBAMS through initiatives and projects to:

- **knowledge** (ACCOBAMS Survey Initiative for population abundance & distribution, ABIOMMED and QUIET-MED I & II for the coordination toward EU MSFD, Strandings network and task force, CCH...)
- **facilitate adaptive management measures** (e.g. PSSA to limit ship strikes, High Quality MMO/PAM certificate, HQ Whale-watching label, etc.)
- **facilitate good practice** (e.g. guideline on noise, guideline on cetacean bycatch release, ...)

The creation of **NETCCOBAMS**, a powerful open and free tool for all stakeholders, will greatly enforce the action of ACCOBAMS towards the conservation of cetaceans from anthropogenic threats and for improving collaboration at the Mediterranean level.

ACCOBAMS needs your knowledge and acknowledge your inputs. Your work feeds ACCOBAMS knowledge. Publish, present, talk, share about your knowledge

Bycatch National Strategy: Reducing bycatch of vulnerable species in Moroccan fisheries

Abdelali Loudrhiri

This article is written under the session "interactions between cetaceans and human activities". It deals with the efforts undertaken by the Kingdom of Morocco to develop a draft national strategy aimed at sustainably mitigating bycatch of vulnerable species in Moroccan fishing activities.

This project consists firstly in collecting data on the bycatch issue in Morocco, and secondly in understanding precisely the causes of bycatch of threatened, vulnerable or rare species (such as turtles, sharks, marine mammals including cetaceans, etc.) in order to test and adapt possible bycatch mitigation measures and techniques in collaboration with the fishing sector.

In this framework, it was appropriate to consider various aspects, including the regulatory context, both national and international, concerning the current status of provisions relating to the protection of vulnerable species, and any gaps.

Extensive consultation with various stakeholders of fishing sector (authorities, seafarers, etc.) was essential. The aim was to perpetuate/generalize efforts to monitor bycatches, analyze data collected, interpret them and, where appropriate, identify suitable mitigation measures (technical or management measures).

At the end of this article, we will summarize the action plan relating to the implementation of the national strategy on the reduction of incidental catches of vulnerable species in fishing activities in Morocco.

Poster: Dolphin Deterrent Device-03-H two-year trial: Repeller or attractor

Mourad CHERIF, co-authors: Rimel BENMESSAOUD, Wael KOUCHED and Ahmed BEN Romdhane

Depredation is defined as the damage or removal of fish or bait from fishing gear by predators. Depredation induces opportunity costs associated with the damage to fishing gear, the time spend in mending depredated, the cost of purchase of new gear, the time required to move to another fishing area in order to avoid possible depredation events, the fuel costs associated with this relocation and the expense of additional fishing effort to compensate for lost catches.

The purpose of our study was to test a new acoustic device "Dolphin Deterrent Device-03-H". During November 2020 to October 2022, ten « DDD-03-H » were tested on ten vessels targeting small pelagics fishes. A combination of questionnaires and participatory experiments were used to evaluate depredation rate, mending costs and catch per unit effort of the sampled vessels.

Comparing the dolphin depredation rate (% Depredation_{DDD-03-H} = 30.15; % depredation_{control} = 29.76), the mending costs (M.C_{DDD-03-H} = 521€; M.C_{control} = 482.03€) and the average landing per unit effort (LPUE_{DDD-03-H} = 7373.84 Kg; LPUE_{control} = 9 039Kg) for boats with and without repellents, it appears that those equipped with repellents have more serious damage. The effectiveness of this type of device was null after two years of trials. Henceforth, the use of this repellent should be abandoned, as it produces the opposite effect.

Poster: Contribution to the characterization of the depredation events in Bou Ismail Bay

Souad LAMOUTI & Mohamed Amine BOUHADJA

Depredation events have a negative impact both on fishermen and cetaceans themselves. In 2017, a preliminary study on bycatch events and depredation events between cetaceans and fishing activities in Algeria (central region), co-financed by the MAVA Foundation and CNRDPA, was coordinated by CNRDPA in collaboration with ACCOBAMS, GFCM and SPA/RAC. CNRDPA plans to extend the study to the entire national territory by carrying out socio-economic surveys in different ports in order to gather local information on the nature of depredation and its effects on fisheries. This work presents the results of surveys carried out in 2023 among sardine, longline and trammel fishermen in Bou Ismail Bay (Central Region).

Estimation of economic loss due to dolphin depredation - (Port of Kélibia - TUNISIA)

Yessine BEN ARFA, Rimel BENMESSAOUD, Mourad CHERIF and Wael KOUCHED

Interactions between bottlenose dolphin (*Tursiops truncatus*) and small pelagic fishery in northeastern Tunisia has become a major concern over the past decade. Concerns of fishermen in the area continue to grow, and requests become more and more frequent.

With a view to generating the most appropriate policies and management measures for this fishery, this work presents a comprehensive socio-economic picture for a better understanding of the phenomenon of dolphin depredation and its economic repercussions.

With reference to the 2021 fiscal year, data collection was established. This process was consolidated by a questionnaire to the target population, generating over 25 indicators. These indicators cover the social status of the fishermen, employment, fishing effort, the structure of the various costs and the economic performance of the activity. As with any economic activity, this fishery has variable and fixed costs. Personnel costs were highest for the two segments identified, S-03 and S-04, at 41.5% and 48.3% respectively. In terms of economic performance, this fishery achieved a gross rate of return of 14.1% and a rather worrying positive net rate of return of 5.7%.

The economic loss resulting from dolphin depredation was divided into total direct economic loss and potential economic loss. Given the difficulty of estimating the potential economic loss, the overall economic loss is summarized in the total direct economic loss. In an activity generating a gross profitability rate of 14.1%, the direct economic loss was evaluated at 6% of sales and 44% of gross operating income. These fairly high rates highlight the loss of earnings caused by depredation. In this respect, increased revenues can be achieved by minimizing the various costs that make up the economic loss. At this stage, the "ramendage" cost is the main cost to be minimized, and this can be done by improving depredation mitigation measures.

Proposal for a cetacean observation protocol during halieutic resource assessment campaigns in Algeria

Souad LAMOUTI, Mohamed Amine BOUHADJA, Azzedine BENNOUI, Nawel AINOUCHE, Samir ROUIDI

Since 2011, two halieutic resource assessment campaigns covering the entire Algerian coast have been annually scheduled: pelagic resource assessment campaigns (ALPELs), and demersal resource assessment campaigns by trawl (ALDEMs).

The ALPELs campaign planning can include visual observation of cetaceans, in addition to acoustic surveys to detect shoals of small pelagics. ALDEM campaigns, on the other hand, have difficulty integrating cetacean observation, although a few observations can be made.

In this work, we present the results of observations made during the ALPEL 2011, 2014 and 2018 campaigns. And ALDEM 2012, 2013, 2023, as well as a proposed protocol for improving data collection.

Poster: Impact of Anthropogenic Marine Litter Pollution in Adana Akyatan Lagoon (East Mediterranean, Türkiye)

Alperen Ertaş and Merve Yaşartürk

The Mediterranean is an important hot spot in terms of anthropogenic marine litter (AML) due to maritime transportation, many rivers drains and recreational activities. Located in the Wildlife Development Area, Adana Akyatan lagoon is one of the 21 officially designated sea turtle nesting sites on the Mediterranean coast of Turkey. Lagoon is one of the nesting points of the green sea turtle (*Chelonia mydas*), which is in the endangered status in the Red List prepared by IUCN. Here, the degree of AML pollution was investigated at eight actively used beach using Clean Coast Index (CCI) in Adana Akyatan Lagoon. Beach litter types and characteristics were determined on the basis of the "Guide on Monitoring Marine Litter in European Seas". During the study, a total of 10.717 items and 229.29 kg were collected. The average litter abundance was 2.679 ± 0.418 items/m² and 57.326 ± 7.165 g/m². The results indicated that the most common type of litter were plastic and cloth/textile (84%) followed by paper/cardboard (56%), the unidentifiable (51%). Litter density showed significant seasonal differences with the highest in summer. Akyatan beach was classified as extremely dirty according to Clean Coast Index. It was observed that the litter in the region averagely consisted mostly of mixed packaging litter (23.75%), domestic litter (20%) and unclassified litter (16.2%) items.

Observations des cétacés au large de Larache (Atlantique Nord Marocain) durant la période de forage en décembre 2021 : Biodiversité et comportement de la baleine à bosse *Megaptera novaeangliae*

Mohammed RAMDANI

La société anglaise UK's Chariot Oil & Gas a conclu un accord avec la société de forage offshore Stena Drilling en septembre 2021 pour utiliser sa plate-forme de forage pour la licence Lixus au large de Larache. Il s'agit d'une exploration du champ gazier.

Les opérations de forage ont débuté en décembre 2021 pour une durée de 6 semaines. Le puits Anchovy-2 a été foré efficacement à une profondeur totale de 2 512 mètres par la plate-forme de forage Stena Don dans 381 m d'eau (début du talus continental). Le puits est situé à 40 km de Larache ville.

La licence de prospection gazière Rissana offshore a une superficie de 8476 km² qui englobe entièrement le permis Lixus de la société Chariot (2390 km²) qui contient les 3 sites "Anchois Gas Discovery" ainsi que les zones les plus prometteuses en poches de gaz dans le Nord-Ouest marocain. La zone Rissana offshore est couverte par les données sismiques 3D en 2019.

Selon les études les plus récentes sur les nuisances sonores sismiques et de forage sur les cétacés, les résultats indiquent que les bruits comprennent globalement trois types : le bruit de martèlement, le bruit de vibration et le bruit de perçage. Le bruit de martèlement est un son impulsif de haute intensité avec un niveau source de 197,1 dB et sa fréquence dominante est inférieure à 10 kHz ; le bruit de vibration est un son non impulsif de faible intensité avec un niveau source de 158,9 dB. Le bruit de forage est le plus faible parmi les trois types de bruit, avec un niveau source de 156 dB et une composante monofréquence significative à 45 Hz. L'évaluation de l'impact des bruits sur les mammifères marins démontre que la portée potentielle des dommages auditifs peut atteindre un rayon de 300 m à partir de la source et que la portée de l'altération du comportement va jusqu'à 1,9 km. Par conséquent, nos observations ont été focalisées sur un rayon de 2 km pendant les opérations de forage.

Nos observations sur les mammifères marins débutent à chaque opération de forage par le pre-watch qui est une surveillance minutieuse de la zone visant à s'assurer qu'aucun cétacé ne s'y trouve avant le début des émissions sonores. Il s'agit d'une surveillance visuelle à 360° et des opérateurs en acoustique passive (PAM = Passive Acoustic Monitoring). La durée du pre-watch va de 60 à 120 min (profondeur > 200 m). Cette durée est conseillée par la plupart des recommandations (120 min pour ACCOBAMS). Le soft-start et le ramp-up sont des procédures d'augmentation progressive du niveau sonore qui visent à éloigner les espèces marines se trouvant au voisinage des sources émettrices de façon à éviter tout risque de dommage physiologique. Un total de 16 observations visuelles de mammifères marins a été noté au cours de la période de forage (décembre 2021). 3 observations pour le dauphin commun *Delphinus delphis* (5 individus) et un cachalot *Physeter macrocephalus* (2 individus). Le grand dauphin *Tursiops truncatus* avec 6 observations et 12 individus, le dauphin commun (*Delphinus delphis*) avec 7 observations et 45 individus ; le dauphin rayé *Stenella coeruleoalba* (avec 20 individus et 6 observations). Le rorqual commun *Baleanoptera physalus* est apparu une seule fois durant toute la période d'étude. La baleine à bosse est observée à deux reprises dans la zone avec un seul individu. L'espèce se montre de plus en plus rare dans les côtes atlantiques marocaines.

Ces observations sont complétées par une analyse des données sur les échouages des mammifères marins dans un rayon de 200 km de la plateforme de forage au large de Larache. Ces données sur les échouages durant la période décembre 2021 - mars 2022 n'ont pas révélé de mortalités liées aux opérations de forage.

4. CETACEANS' STRANDINGS

Chair of the Session, Thierry Jauniaux - Cetacean stranding: Why performing necropsies?

The aim of the necropsy is to identify the most probable cause of death of an animal. Since the end of '80, some stranding networks are focusing on the causes of death of marine mammals using a multidisciplinary approach in association with veterinarians, pathologists, toxicologists, biologists.... This approach helps to understand the mechanism of morbidity, as there is evidence of links between the marine environment and the cetaceans' health. Cetaceans are considered as bioindicators of the quality of an environment also shared by humans. The link between the human, animal and environment healths is identified now as the "one health" concept. At the level of the population, this approach of causes of death approach reveals main threats that may be used to develop or to adapt conservation and protection issues by regional organizations such as ACCOBAMS and ASCOBANS. Two new approaches have been developed by ACCOBAMS to identify main threats: the Emergency Task Force and the telenecropsy to help and to assist local partners in the management of necropsies.

Evolution des échouages de cétacés le long des côtes marocaines entre 1980 et 2022

Imane TAI, co-auteurs : Abdelkrim KALMOUNI, Saïd BENCHOUCHA, Moulay Hachem IDRISSE, Najib EL OUAMARI, Badreddine MEKYASSI, Sid'Ahmed BAIBBAT, El Mahdi EL JOUMANI, Abderrahim CHIAAR, Jaber LAAYDI, Mohamed Naoufal TAMSOURI et Khalid MANCHIH

Le suivi des échouages de cétacés le long de la côte marocaine fait partie des activités de l'Institut National de la Recherche Halieutique (INRH). Il s'agit d'une activité intégrée au sein du Réseau de Suivi des Échouages de l'INRH (RSE). Les membres du RSE travaillent en étroite collaboration avec les représentants des autorités publiques, des forces de l'ordre et de la société civile chaque fois que des informations leurs sont transmises. En 2015, des efforts ont été déployés pour mieux structurer les interventions sur les échouages et renforcer la collaboration entre les différents acteurs en vue d'améliorer la qualité des données collectées. Cette étude retrace l'évolution des interventions sur les échouages de cétacés au Maroc entre 1980 et 2022. Au cours de cette période, un total de 1327 cas d'échouages de cétacés a été enregistré sur le littoral marocain. Initialement, le nombre annuel d'échouages était faible, variant de 1 à 21 cas par an avant 2008. Par la suite, il a augmenté pour atteindre environ 30 cas par an entre 2009 et 2014, puis a dépassé les 100 cas par an à partir de 2015. Les espèces les plus fréquemment observées dans les échouages étaient les dauphins bleus et blancs (*Stenella coeruleoalba*), les dauphins communs (*Delphinus delphis*), les grands dauphins (*Tursiops truncatus*), les petits rorquals (*Balaenoptera acutorostrata*), les rorquals communs (*Balaenoptera physalus*), les globicéphales noirs (*Globicephala melas*), les marsouins communs (*Phocoena phocoena*) et les baleines à bec de Cuvier (*Ziphius cavirostris*). Environ 30 % des cas d'échouage étaient susceptibles d'être liés à des activités humaines directes. Pour la majorité des cas, il était difficile de se prononcer sur la cause du décès en raison de la décomposition avancée des carcasses ou de l'absence de signes distinctifs.

Poster : Echouages des petits cétacés sur les côtes marocaines entre 2015 et 2022 - *Delphinus delphis* et *Stenella coeruleoalba*

Badreddine MEKYASSI, co-auteurs : J. LAAYDI, J. RAFIK, A. BEN-BANI, I. TAI, M. H. IDRISSE, S. BENCHOUCHA, A. CHIAAR, N. TAMSOURI, M. JOUMMANI, S. A. BAIBBAT, A. KALMOUNI

Le suivi des échouages des cétacés fait partie des activités de l'INRH depuis sa création. A partir de 2015, c'est devenu une activité structurée en Réseau de Suivi des Echouages RSE, composé de scientifiques de l'INRH, en étroite collaboration avec les différents intervenants dans les échouages, notamment les administrations publiques et les associations de la société civile soucieuses du suivi de l'environnement marin.

Le présent travail donne un aperçu sur les échouages des petits cétacés, notamment le dauphin commun *Delphinus delphis* et le dauphin bleu et blanc *Stenella coeruleoalba*, intervenus sur les côtes marocaines entre 2015 et 2022.

En total, 516 individus ont échoué durant cette période, composés de 266 dauphins communs (52%), 200 *Stenella* (39%) et 52 dauphins non identifiés (9%).

Les dauphins communs sont plus présents sur les côtes atlantiques (59%) alors que c'est l'inverse pour *Stenella* dont 72% des échouages ont été recensés sur les côtes méditerranéennes.

Le nombre moyen annuel des échouages a été de 34 pour le commun avec un pic de 48 en 2020 contre 25 pour *Stenella* avec un pic de 37 échouages en 2015.

Le sex-ratio a été de 36% de mâles chez le commun contre 35% de femelles, 29% restant non identifiés à cause de l'état de décomposition avancé. Pour *Stenella*, les femelles ont constitué 38%, les mâles 31% et 32% non identifiés.

Sur l'ensemble de la période, les équipes du RSE se sont déplacés pour 27% des échouages. 43% ont été traités à distance dans le cadre de la procédure de collaboration avec les autorités locales, alors que 30% des échouages n'ont pas été répertoriés par le RSE. Le nombre élevé des interventions à distance est dû principalement aux mesures de restriction liées à la crise COVID-19.

Environ 37 % des cas échoués pourraient être associés à une interaction avec la pêche (animaux piégés dans des engins de pêche, nageoires sectionnées ou blessures caractéristiques). Pour le reste, il était difficile de se prononcer sur la cause de mort, soit carcasses en état avancé de décomposition ou pas de signes particuliers.

Poster : Les grands Dauphins le Long des Côtes Marocaines (2017-2022)

E. El Joumani., A. Bouchouima, N. Boumzrague, H. Chfiri, S. Benchoucha, M. Idrissi, N. Elouamari, N. Tamsouri, S. Baibat, B. Mekyll, A. Chiaar et I. Tai

Les grands dauphins (*Tursiops truncatus*) sont des représentants de la famille des delphinidés. Ils sont régulièrement observés échoués sur les côtes marocaines. À partir de 2017, les chercheurs de l'Institut National de Recherche Halieutique (INRH) ont enregistré 76 échouages de cette espèce. Ces échouages ont révélé la présence de populations de grands dauphins à la fois sédentaires et saisonnières dans diverses régions, en particulier sur la façade méditerranéenne.

Durant la période hivernale et printanière, une communauté sédentaire de grands dauphins est significativement présente dans les régions de M'Diq, Martil et Tanger. De plus, dans les régions du nord de l'Atlantique, plusieurs groupes de grands dauphins restent sédentaires tout au long de l'année.

En ce qui concerne la partie sud de la côte atlantique, les observations ont indiqué l'apparition des grands dauphins au large de Tarfaya et au niveau de la baie de Dakhla.

Échouages de baleines à fanon le long des côtes marocaines (2015-2022)

S. Baibat A. Ikkis, S. Benchoucha, M. Idrissi, E. El Joumani., N. Elouamari, B. Mekyll B., A. Chiaar et Tai I

Cette étude met en lumière les tendances des échouages de baleines à fanon le long des côtes marocaines, en soulignant leur saisonnalité et les espèces prédominantes.

Entre 2015 et 2022, les côtes marocaines ont été le théâtre de 140 échouages de baleines à fanon, avec une moyenne annuelle de $17,5 \pm 4,03$ échouages. La grande majorité de ces échouages, soit 81,4%, ont été signalés sur la côte atlantique, totalisant 114 cas.

L'analyse des données mensuelles révèle que plus de 74,2% des échouages de baleines à fanon surviennent de mars à septembre, atteignant leur maximum en mars (12,8%) et en avril (16,4%). L'espèce *Balaenoptera acutorostrata* prédomine parmi les échouages de baleines à fanon au Maroc, représentant plus de 44,2%, suivie de *Balaenoptera physalus* à hauteur de 14,2%. Cette domination est observée aussi bien en Atlantique qu'en Méditerranée, bien que dans plus de 19% des cas, l'espèce n'ait pas pu être identifiée.

En ce qui concerne le sexe ratio, les observations indiquent que les mâles représentent 29,2%, les femelles 18,5%, tandis que plus de 52,14% des cas présentent un sexe indéterminé à cause de l'état de dégradation des carcasses. Les tailles des baleines échouées varient de 4 mètres à 12,5 mètres, couvrant une large gamme de taille.

Echouages en Méditerranée marocaine et ses eaux atlantiques adjacentes durant la période 2015-2022 - Cas de la zone Jebha-Larache

Said Benchoucha, A. Chiar, N. Tamsouri, M. K. Oulad Abdellah, I. Tai, N. Abid et M. Malouli Idrissi

Les échouages des mammifères marins peuvent être le fait d'animaux épuisés soit par des conditions météorologiques exceptionnelles (tempête en mer durant plusieurs jours), soit par des maladies diverses, soit d'origine anthropique (intoxications, famine liée à la surpêche, pêche accessoire, collisions avec des navires etc.). Entre 2015 et 2022, 235 cétacés appartenant à 14 espèces différentes ont échoué au niveau de la région Jebha-Larache. Ces échouages appartiennent à 6 familles : Balaenopteridae, Delphinidae, Globicephalinae, Kojidae, Phocoenidae et Ziphiidae et à 9 groupes : les baleines à bec, les baleines à dents, les baleines à fanons, les cachalots, les dauphins, les globicéphales, les marsouins, les orques et les rorquals. 85% des échouages ont apparu dans la façade méditerranéenne contre 15% seulement dans la façade atlantique. Le littoral de la région de Tanger, enregistre le nombre le plus élevé des échouages, avec un pourcentage de 40%, au moment où 20% sont enregistrés dans la circonscription maritime de M'diq et 17% au niveau de la zone de Fnideq. Les cas des échouages observés dans les régions de Ksar Sghir et de Chefchaouen sont respectivement de 5% et 4% alors que les cas observés au niveau de chacune des régions d'Assilah, de Larache et d'Oued Laou ont été de 3%. Les 235 échouages occurring au niveau de la région Larache-Jebha entre 2015 et 2022, ont été observés sur plus de 70 plages différentes.

Les échouages ont été observés au cours de tous les mois de l'année. Le nombre des échouages le plus élevé a été recensé au cours des mois d'avril, d'août et de février qui ont enregistré respectivement 17%, 13% et 11% des échouages. L'analyse des données des différents échouages enregistrés dans la région montre que le dauphin bleu et blanc (*Stenella coeruleoalba*) est l'espèce la plus échouée, avec un pourcentage de 34% du total des cétacés échoués. Le dauphin commun (*Delphinus delphis*) occupe le 2^{ème} rang avec une proportion de 24%, suivi par le grand dauphin (*Tursiops truncatus*) qui représente 15% de ces échouages. Le petit rorqual (*Balaenoptera acutorostrata*) vient en 4^{ème} rang avec un pourcentage d'échouages de 7%. Le globicéphale noir (*Globicephala melas*), la baleine à bec de cuvier (*Ziphius cavirostris*), l'orque (*Orcinus orca*) et le marsouin commun (*Phocoena phocoena*) contribuent chacun à hauteur de 2% dans ces derniers. Les espèces restantes sont faiblement

représentées dans les échouages et représentent chacune au maximum 1% des cas des échouages. Les femelles représentent 34 % tandis que les males constituent 28% des cas des échouages. Cependant, à cause de leur état de décomposition avancée, le sexe n'a pas pu être identifié pour 38% des cas. La taille des individus échoués oscille entre 1m et 19,50m alors que leur poids varie entre 20kg et 1500kg.

Après l'analyse des causes de la mort des individus échoués, il s'est avéré que 43% des cadavres de cétacés, échoués, présentent des traces de filets de pêche, des blessures ou des organes mutilés ou incisés, jugés être dus à des captures accessoires dans des engins de pêche. 1% des cas présentaient des traces de morsures et donc la cause de leur mort était due à une prédation, 1% des échouages est dû à des collisions avec des navires et 1% des individus échoués est dû des maladies alors que pour 51% des cas, la cause de la mort reste méconnue vu l'état de décomposition avancée des animaux échoués ou l'absence d'un indicateur sur la mort de ces derniers.

Poster : Suivi d'échouage des cétacés, dans la région Fnideq-Jebha (ouest méditerranée marocaine) entre 2015 et 2022

M. N. Tamsouri, M. Malouli Idrissi, S. Benchouha, I. Tai

Les échouages de cétacés représentent une importante source d'information sur la population en mer, les causes de la mort, les informations génétiques, les pathologies et bien d'autres aspects. Dans la région Fnideq-Jebha, à l'instar des autres régions du Maroc, le phénomène d'échouage suscite une attention particulière par les chercheurs de l'Institut National de Recherche Halieutique en raison de l'emplacement géographique de cette zone, qui se situe à l'Ouest-Sud de la mer d'Alboran et communique avec l'océan Atlantique par le biais du détroit de Gibraltar faisant d'elle ainsi une zone de navigation et de transit cruciale.

Le présent travail fournit des informations sur l'état des échouages de cétacés observés dans la zone Fnideq-Jebha entre 2015 et 2022. Au total, 103 individus sont enregistrés appartenant à 9 espèces différentes dont 15 individus sont restés non identifiés. Les espèces les plus fréquemment échouées sont le dauphin commun (*Delphinus delphis*) suivi par le dauphin bleu et blanc (*Stenella coeruleoalba*) et le grand dauphin (*Tursiops truncatus*). L'année 2016 est marquée par le nombre le plus élevé d'échouage enregistré durant 8 ans de suivi avec un taux d'échouage de 25%.

Les causes de la mortalité sont diverses, elles peuvent parfois être liées aux activités humaines. Dans plusieurs cas, elles ne peuvent pas être identifiées.

Poster : Synthèse des échouages des cétacés sur la côte Centre-Est de la méditerranée marocaine (Jebha-Saidia) de 2015 à 2022

Moulay Hachem IDRISSE

Depuis 2015, et suite à la création d'un réseau national de suivi des échouages, en collaboration avec l'ACCOBAMS, le recensement des échouages est réalisé selon un protocole standardisé à l'échelle nationale.

Durant la période 2015-2022, un nombre total de 177 individus de cétacés ont été échoués. 145 spécimens sont identifiés par le nom d'espèce, 3 par le nom du genre et 14 par le nom de famille. 15 autres individus de cétacés n'ont pas été identifiés à cause de l'état de décomposition avancée de leur corps.

Au total 12 espèces de cétacés ont été identifiées pour la période 2015-2022 dans la zone Jebha-Saidia. Les delphinidés prédominent avec 88% et les ziphiidae présentent 5%. Les cétacés non identifiés représentent 6%.

L'analyse de la structure en longueurs totales et en poids des échouages recensés durant la période 2015-2022 montre que la majorité des individus échoués sont en phase adulte.

Overview of cetaceans' stranding records along the Algerian coastline

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The CNRDPA stranding database contains records from 1997 to 2023; other scientists and institutions have collected other previous and concomitant records but the information is not always complete, and some areas are better covered than other. The aim of this work is to review and compile the available data and present the perspectives of the Project named: « Establishment of a new operational network for monitoring cetacean stranding along the Algerian coastline ». The objective is to set up a formally recognised national stranding network, through enhancing collaboration by pooling national efforts, in order to create a single standardised database.

Les délphinidés en Algérie: Echouages et observations *in situ*

Assia HENDA- BENREKAA

La place des Cétacés au sein de l'écosystème pélagique demeure mal connue, notamment au niveau du bassin Algérien. Ceci est lié au déficit d'investigations sur cette fraction biologique, notamment à la difficulté d'évaluer quantitativement le peuplement des cétacés au travers des campagnes océanographiques et/ou des statistiques des échouages. C'est dans ce contexte qu'il nous est apparu opportun de privilégier l'acquisition de données d'observations en mer ainsi que la mise en place d'un réseau de surveillance des échouages sur des sites disséminés le long de la côte algérienne.

Durant notre campagne estivale effectuée au large de la côte algérienne, nous avons mené plusieurs prospections en mer qui ont abouti au recensement d'un total de 245 Delphinidés correspondant à 8 espèces observées avec une répartition irrégulière pour certaines espèces. Par ailleurs, notre réseau d'échouage nous a permis d'identifier 83 individus échoués entre 2007 et 2017.

Poster: Rare stranding events of a Cuvier's beaked whale (*Ziphius cavirostris*) and a minke whale (*Balaenoptera acutorostrata*) in Tunisia

Olfa Chaieb, Kaouthar Maatouk, Nader Ben Hadj Hamida & Mohamed Nejmeddine Bradai

In this note we described very rare stranding events of two cetacean species in Tunisia. A subadult female Cuvier's beaked whale (*Ziphius cavirostris*) of 5.6 m was found freshly dead in Mgassab beach of Nefza (North Tunisia) on December 22, 2022. A juvenile male minke whale (*Balaenoptera acutorostrata*) of 3.9 m washed ashore on Casino beach of Sfax (South Tunisia) on March 31, 2023. We performed dissection only on the beaked whale as the common minke whale was in advanced decomposition stage. Tissues samples from both individuals were preserved in alcohol and at -20°C in the tissue bank at INSTM. The first species is resident in the Mediterranean Sea, but the second one is considered as a visitor. Both species are very rare and were observed only stranded in Tunisia. Here we report the third case of each species occurrence in Tunisia. Skin lesions on the beaked whale head were observed which are likely associated to *Pennella ssp* infestation. This mesoparasitic was found attached with the striped Goose Barnacle *Conchoderma virgatum* and is reported for the first time in a Cuvier whale in Tunisia. The animal was found entangled in a large piece of abandoned fishing net, attached to a wooden cage, around its fluke. Entanglement in marine debris has probably resulted in fatigue and starvation of the animal, as shown by the completely empty digestive tract and the poor body condition, that caused death.

Poster : Importance des examens post-mortem dans la biologie des cétacés : rapport de nécropsie de deux delphinidae *Stenella coeruleoalba* (Meyen, 1833) et *Grampus griseus* (G. Cuvier, 1812) des côtes nord de la Tunisie

Sami Karaa, Hedia Attia El Hili, Hassen Jerbi & Mohamed Nejmeddine Bradai

Les mammifères marins échoués sont des spécimens précieux pour plusieurs études de pathologie et d'autres aspects de la médecine vétérinaire. Le bon suivi des protocoles standards, établis dans le cadre du Réseau National des Echouages (RNE), sur le déroulement des autopsies et les examens post-mortem est capital.

Ce travail rapporte les résultats obtenus suite à quatre nécropsies de deux delphinidae (2 dauphins Bleu et Blanc et 2 dauphins de Risso) échoués sur les côtes nord de la Tunisie entre février 2012 et novembre 2020. L'examen méticuleux des individus autopsiés a permis de relever beaucoup de données et différents types de lésions et d'infestations parasitaires.

Bien que les causes des échouages n'aient pas été déterminées sur tous les delphinidae, l'accès aux spécimens échoués est crucial, non seulement pour les études de pathologie mais aussi pour une éventuelle formation appropriée des étudiants en médecine vétérinaire.

Poster : Apport des sciences participatives dans le recensement des échouages des cétacés des côtes Nord de Tunisie

Sami Karaa & Hassen Jerbi

Les Sciences Participatives (ou Sciences Citoyennes) sont très utiles aux scientifiques qui manquent de moyens pour récolter autant de données. Ces dernières années, l'engagement de la société civile dans le développement des sciences participatives en Tunisie a créé synergie pour renforcer les efforts de conservation des cétacés.

Dans ce travail, nous décrivons trois exemples d'échouages signalés dans les réseaux sociaux entre avril 2019 et décembre 2022 dans le nord de la Tunisie : un cachalot et un ziphius ont été signalés à Chatt Mguassab (Béja) et un pseudorque a été signalé à Chatt El Houichette (Bizerte). D'autres informations sur les échouages de ces espèces sont aussi exposées.

Stranded cetaceans in Tunisian waters recorded via citizen science /social media platform

Hamed Mallat, Emna Derouiche, Yassine Ramzi Sghaier, Rimel Benmessaoud

Citizen science activities are growing in popularity as a practical technique of collecting data and raising public awareness about environmental conservation. One of the main tools utilized to investigate the occurrence and geographical distribution of stranded cetaceans along the Tunisian coastline was social media (Facebook). Between the years 2020 and 2023, the collection contained approximately 70 Signalisations, which featured images and videos of cetaceans transmitted from various towns and coastal locations.

During the COVID epidemic in August 2020, Tunisia launched a new citizen science platform called "TunSea" on Facebook to build a bridge between the public and the scientific community, organizations, fishers, and individuals engaged in numerous fields of local, regional, and global marine research to share knowledge and raise awareness.

Cetacean strandings (both live and dead) and sightings have been documented for a variety of species, the majority of which are bottlenose dolphin (*Tursiops truncatus*) species. Strandings are particularly visible in the "TunSea" Facebook group, where members have been helped by publications detailing the best procedures to follow when witnessing a cetacean species stranded on one of Tunisia's beaches.

Fishermen also shared videos and photos of the rescue and release of a dolphin that had become entangled in their fishing gear. Finally, the platform's data was made available to the National Stranding Network.

The present poster draws attention towards the importance of Tunisian coasts as a possible nursery, and feeding ground for some cetacean's species. It is important to point out that some regions can be considered as IMMA candidates and others as CCH.

We are also calling for an awareness campaign targeting the general public, administrators and users of the sea in order to highlight the ecological importance of cetaceans and the role of each stakeholder in their protection. Moreover, cetacean protection programs necessitate the involvement of both governmental and non-governmental organizations.

Citizen science/ social media, offering a cost-effective resource, and can be employed in recording stranding events and should not be overlooked especially in a country with an extended coastline and limited funding for scientific research.

Poster: Unravelling Lebanon's Dolphin Strandings: A National Network Initiative

Ouba A, Mahfouz C, Jemaa S, Ghsoub M, Lteif M, Khalaf G, Fakhri M

The strandings of marine mammals represent a globally observed and perplexing phenomena, often happening without apparent causative factors. In Lebanon, records of stranded marine mammals date back to 2000, primarily as mere sightings. However, in 2015, a proactive step was taken with the establishment of the National Stranding Network, initiated by The National Centre for Marine Sciences (CNRS-L), in accordance with ACCOBAMS. This network has started to conduct comprehensive postmortem examinations and tissue sampling of stranded cetaceans along the Lebanese coast. The objective of the program is to systematically respond to reported marine mammal strandings and investigating the causative factors for death. These factors may include incidental catches during fishing operations (bycatch), ingestion of marine litter, entanglement, and ship strikes. A team of trained responders also conducts field necropsies to facilitate a thorough assessment. These examinations include data collection, such as gender identification, morphometric measurements (e.g., length, weight, blubber thickness), and the collection of various tissue samples, including muscle, liver, kidney, teeth, and stomach content analysis. Since its initiation, various cetacean species, including five *Tursiops truncatus*, one *Stenella coeruleoalba*, two *Physeter macrocephalus*, and one *Orcinus orca*, have been recorded along the Lebanese coastline, with a majority of these incidents in the southern region. This program provides valuable insights into potential threats and contributes significantly to the conservation of cetaceans in the region and the Mediterranean Sea.

Sighting and stranding of North Atlantic killer whales *Orcinus orca* in the Eastern Mediterranean, Lebanese waters

Mahfouz C, Ouba A, Jemaa S, Ghsoub M, Lteif M, Khalaf G, Fakhri M

Killer whales are rare in the Mediterranean Sea and are considered visitors in the western basin and vagrant in the Eastern basin. In November 2019, a group of five killer whales were cited in the Mediterranean Sea between Spain and Italy. Later between February 3 and 28, 2020, a male killer whale was observed in the Lebanese waters between Beirut and the South of Lebanon, with deteriorated health. Photos of the observed killer whale taken by the NCMS team around Beirut on 19th and 20th of February 2020 on board of R/V CANA CNRS-L, were compared via visual analysis to the already existing data set of 322 North Atlantic killer whales catalogued in west Iceland by the Orca Guardians Iceland team. The cited animal was then identified as SN113 "Riptide" from the Snaefellsnes Peninsula, West Iceland.

In addition, on February 10, 2020, a female killer whale was found stranded in Sarafand, South Lebanon. Unfortunately, the photo-identification was not possible due to the amputation of the dorsal fin, fluke, and parts of the peduncle. However, due to the sex and the shape of the left eye patches, the dead animal could possibly be identified as the female SN114 or the subadult SN115. The dead animal was then dissected, and samples of liver, kidney, muscle, blubber, and teeth were sampled for further analysis. Stomach was also sampled and only one fish, the common dolphin fish *Coryphaena hippurus* was found in the stomach content, along with one cephalopod mandible and three otoliths that were fractured, hence their identification was challenging. To our knowledge, this is the first killer whale stranded along the Lebanese coast.

Cetacean stranding monitoring in Tunisia: main results from 2019 to 2022

Olfa Chaieb, Hedia Elhili & Mohamed Nejmeddine Bradai

Cetacean Stranding surveys provide important data to the scientific community to better understanding the biology and ecology of the species. Here we present main findings of stranding monitoring from 2019 to 2022 in Tunisia, achieved in the framework of the national stranding network. A total number of 99 individuals were recorded, mostly dead (N= 94). They included eight species belonging to four families: Balaenopteridae (*Balaenoptera physalus*: 3.03%), Physeteridae (*Physeter macrocephalus*: 4.04%), Ziphiidae (*Ziphius cavirostris*: 3.03%) and Delphinidae (*Tursiops truncatus*: 72.73%, *Stenella coeruleoalba*: 7.07%, *Grampus griseus*: 4.04%, *Delphinus delphis*: 3.03% and *Pseudorca crassidens*: 3.03%). Data collected on the stranded cetaceans concerned mainly: biometric measurements, sexing, date and location of the stranding events. Necropsy was performed on 11 fresh and moderately decomposed and accessible carcasses of *Tursiops truncatus* for marine debris (≥ 0.5 mm) and diet analyses. Some tissues were preserved in alcohol and at -20°C in the tissue bank at INSTM. The common bottlenose dolphin (*Tursiops truncatus*) was the most abundant species. The presence of adults and calves suggested the presence of resident groups. Three Beaked whales *Ziphius cavirostris* were reported for the first time as new stranded specimens in Tunisia. Most of the sexed individuals were females (60% of the *Tursiops*). Stranding events occurred all the year round, with the highest frequencies in spring (29.29%), summer (32.32%) and autumn (25.25%), and found mainly in the southern coasts (40.40%). No Debris was detected in the digestive tract of all the dissected *Tursiops*, only some pieces of nets which highlighted depredation behaviour. Stomach contents analysis showed that their diet consisted mainly of fish and cephalopods. One bottlenose dolphin was found with gastric lesions associated with the presence of *Anisakis spp.*

5. CONCLUSIONS AND RECOMMENDATIONS

General Recommendations

1. Recommend ACCOBAMS and SPA/RAC to assist Countries in drafting/updating National Action Plans
2. Consider the possibility to run a second IMMAs Workshop to update IMMAs in the Mediterranean Sea, especially for AoIs where data have been collected since the first workshop in 2016.
3. Collaborate with other relevant place-based conservation initiatives (e.g ISRA)
4. Develop national stranding databases and tissue banks to facilitate exchanges and dissemination
5. Encourage publications in peer-reviewed journals

Recommendations on monitoring of Cetacean populations

1. Use different kinds of data to implement long-term conservation strategies. Do not rely only on ASI-like data, but also on platforms of opportunity and local/regional research projects.
2. Organize trainings to facilitate data collection during multidisciplinary surveys
3. Encourage the replication, at local level, of collaborative projects on cetacean monitoring, such as 'Tunisian Dolphin Project', involving all relevant national entities such as local NGOs, Researchers, Universities
4. Recommend SPA/RAC, ACCOBAMS and other international entities, to facilitate communication with potential funders in order to obtain the necessary funds to establish or implement the required long-term monitoring programme, especially based on the IMAP and EcAp initiatives of UNEP/MAP, ACCOBAMS Cetacean Conservation Plans.
5. Encourage data sharing of monitoring information, especially photo-id catalogues to improve sample size for data analysis. Where possible, make sure that stranded animals are also photo-identified to see if they correspond to known individuals.
6. Assist countries to better develop passive acoustic monitoring programs and use shared protocols, exchange information regarding diet and passive acoustic monitoring
7. Facilitate and enhance the use of biologging data to highlight important areas for cetaceans in the Mediterranean Sea.

Recommendations on interactions cetaceans-human activities

1. Invite all cetacean experts to put their data of relevance for the ACCOBAMS Area, into NETCCOBAMS platform before October 2024
2. Promote the development, implementation and enforcement of relevant national legislation regarding human activities in order to reduce their impacts on cetaceans
3. Promote collaboration with fishers (awareness) to better understand by-catch and depredation issues and to implement effective mitigation measures such as reinforcement of purse seine nets
4. Promote and disseminate the assessment of socio-economic impacts of by-catch and depredation and link with other regional projects and programmes (such as those developed by GFCM)
5. Promote the ACCOBAMS High Quality MMOs /PAM certificate, promote national MMO onboard and share collected information
6. Reinforce the dissemination of ACCOBAMS Guidelines on noise for impacting activities at sea (Res 7.13), targeting in particular decision-makers.

Recommendations on cetaceans' stranding

1. Promote at national level One Health Concept to have a multidisciplinary approach to better understand causes of death of cetaceans to identify main threats
2. Develop / implement formal national stranding networks and ensure sustainable funding and involvement of all national official entities (ministries), institutions, NGOs.
3. Involve veterinarian institutions in national stranding networks and organize specific trainings (e.g necropsy, scientific photography, biosecurity and public health...) for people involved in cetaceans' stranding management. Assist Southern Med Countries with the analyses of collected samples from stranded animals
4. Encourage the citizen science concept for the reporting of stranding events (through a dedicated application), while ensuring the accuracy of data and public health aspects (no contact)
5. Encourage Mediterranean experts to immediately send all stranding data to MEDACES and invite ACCOBAMS and SPA/RAC to request reports to MEDACES
6. Provide all collected information related to collision events to the IWC Global Database
7. Disseminate the ACCOBAMS Best Practices on Cetacean Population Genetics
8. Disseminate the ACCOBAMS/ASCOBANS Best practices on cetacean post-mortem investigation and tissue sampling
9. Invite experts and ACCOBAMS/ SPA-RAC National Focal Points to report, as soon as possible, all recorded unusual mortality events or unusual species to the ACCOBAMS Emergency Task Force for Stranding (AETFS) so to enhance regional collaboration

6. CLOSING OF THE CONFERENCE

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ANNEX 2 – Agenda

Monday 13th November	
9h00	Welcome addresses - The Executive Secretary of ACCOBAMS (online), Mrs. Susana SALVADOR - The ACCOBAMS National Focal Point, Mrs. Dhekra HAYOUNI - The Director of UNEP-MAP / SPA/RAC, Mr. Khalil ATTIA - The Director of INSTM, Mr. Hechmi MISSAOUI
9h30	Presentation of the agenda Lobna BEN NAKHLA & Maylis SALIVAS
9h45 - 10h00	Opening of the session « monitoring of cetacean populations » and introductory conference Chair of the session Simone PANIGADA
10h00 - 10h10	Risso's dolphins' population monitoring in the Balearic Islands between 2018 and 2022 <i>Cristina ALDANA MONROIG</i>
10h10 - 10h30	The Tunisian Dolphin Project, from a small initiative into a long-term monitoring programme in Tunisia <i>Ibrahim BEN AMER</i>
10h30 - 11h00	Coffee break
11h00 - 11h10	Abundance of <i>Tursiops truncatus</i> along the Lebanese coast between 2009 and 2023 <i>Myriam GHSOUB</i>
11h10 - 11h20	After 17 years, what has been achieved so far in Libya? <i>Almokhtar SAIED</i>
11h20 - 11h30	Development of a Photo-Identification Catalog for the Common Bottlenose Dolphin (<i>Tursiops truncatus</i>) population in the Eastern Part of Tunisia, primarily in the Bay of Monastir <i>Rania FRAD</i>
11h30 - 11h40	Passive acoustic monitoring of the bottlenose dolphin <i>Tursiops truncatus</i> to determine continuous presence around a Tunisian eastern fish farm <i>Rimel BENMESSAOUD</i>
11h40 - 11h50	Using acoustics to study dolphin behavior: experience acquired and proposed studies on the resident population of <i>Tursiops truncatus</i> in the Monastir region (Tunisia) <i>Nejla BEJAOUJ</i>
11h50 - 12h00	Diet of Bottlenose dolphins (<i>Tursiops truncatus</i>) from the Tunisian coasts: Insights from stomach content analyses <i>Rimel BENMESSAOUD</i>
12h00 - 12h20	Appréciation du risque sanitaire des espèces de Brucella des mammifères marins <i>Hédia ATTIA EL HILI & Kaouthar MAATOUK</i>
12h20 - 12h30	Using biologging to identify and safeguard core habitats of Mediterranean fin whales <i>Viola PANIGADA</i>
12h30 - 12h40	Conclusions and recommendations from the session - Simone PANIGADA
12h40 - 14h00	Lunch Break
14h00 - 15h00	Side Event “ Linking Mediterranean Scientists and the Ecosystem Approach for Enhanced Cetacean Conservation in the Southern Mediterranean Region ” by SPA/RAC

15h00 - 15h15	Opening of the session « interactions cetaceans-human activities» and Introductory conference Chair of the session Léa DAVID
15h15 - 15h35	ByCatch_Stratégie Nationale- Réduire les captures accidentelles des espèces vulnérables dans les activités de la pêche au Maroc <i>Abdelali LOUDRHIRI</i>
15h35 - 15h45	Dolphin Deterrent Device-03-H two-year trial: Repeller or attractor <i>Mourad CHERIF</i>
15h45 - 15h55	Contribution à la caractérisation du phénomène de déprédations dans la Baie de Bou Ismail (région centre) <i>Mohamed Amine BOUHADJA</i>
15h55 - 16h15	Estimation de la perte économique de la déprédation par les dauphins (Port de Kélibia – TUNISIE) <i>Yessine BEN ARFA</i>
16h15 - 16h30	Coffee break
16h30 - 16h50	Proposition d'un protocole d'observation des cétacées lors des campagnes d'évaluation des ressources halieutiques en Algérie <i>Souad LAMOUTI</i>
16h50 - 17h00	Impact of anthropogenic marine litter pollution in Adana Akyatan Lagoon (East Mediterranean, Türkiye) <i>Alperen ERTAŞ & Merve YAŞARTÜRK</i>
17h00 - 17h20	Marine mammals' sightings in Larache offshore (Moroccan North Atlantic) during the drilling period of December 2021: biodiversity and behavior of the humpback whale <i>Mohammed RAMDANI</i>
17h20 - 17h30	Conclusions and recommendations from the session - Léa DAVID

18h30 - 21h00	Evening kindly offered by local NGOs
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Tuesday 14th November	
9h00 – 9h15	Opening of the session « cetaceans' stranding » and Introductory conference Chair of the session Thierry JAUNIAUX
9h15 - 9h35	Evolution des échouages de cétacés le long des côtes marocaines entre 1980 et 2022 <i>Imane TAI</i>
9h35 - 9h45	Echouages des petits cétacés sur les côtes marocaines entre 2015 et 2022 - <i>Delphinus delphis</i> et <i>Stenella coeruleoalba</i> <i>Badreddine MEKYASSI</i>
9h45 - 9h55	Les grands Dauphins le Long des Côtes Marocaines (2017-2022) <i>El Mahdi EL JOUMANI</i>
9h55 - 10h05	Echouages des baleines à fanons le long des côtes marocaines (2015-2022) <i>Sidahmed BAIBBAT</i>
10h05 - 10h25	Echouages en Méditerranée marocaine et ses eaux atlantiques adjacentes durant la période 2015-2022, cas de la zone Jebha-Larache <i>Said BENCHOUCHA</i>
10h30 - 11h00	Coffee break
11h00 - 11h10	Suivi d'échouage des cétacés, dans la région Fnideq-Jebha (Ouest Méditerranée marocaine) entre 2015 et 2022 <i>Mohamed Naoufal TAMSOURI</i>
11h10 - 11h20	Synthèse des échouages de cétacés sur la côte Est de la méditerranée marocaine (Jebha-Saidia) de 2015 à 2022 <i>Moulay Hachem IDRISSE</i>

11h20 - 11h40	Overview of cetaceans' stranding records along the Algerian coastline <i>Souad LAMOUTI</i>
11h40 - 12h00	Les delphinidés en Algérie : Echouages et observations in situ <i>Assia HENDA</i>
12h00 - 12h20	Cetacean stranding monitoring in Tunisia: main results from 2019 to 2022 <i>Olfa CHAIEB</i>
12h20 - 12h30	Importance des examens post-mortem dans la biologie des cétacés : rapport de nécropsie de deux delphinidae <i>Stenella coeruleoalba</i> (Meyen, 1833) et <i>Grampus griseus</i> (G. Cuvier, 1812) des côtes nord de la Tunisie <i>Sami KAARA</i>
12h30 - 14h00	Lunch Break
14h00 - 14h10	Apport des sciences participatives dans le recensement des échouages des cétacés des côtes Nord de Tunisie <i>Sami KAARA</i>
14h10 - 14h30	Stranded cetaceans in Tunisian waters recorded via citizen science /social media platform <i>Hamed MALLAT</i>
14h30 - 14h40	Unraveling Lebanon's Dolphin Strandings: A National Network Initiative <i>Anthony OUBA</i>
14h40 - 15h00	Sighting and stranding of North Atlantic killer whales <i>Orcinus orca</i> in the Eastern Mediterranean, Lebanese waters <i>Céline MAHFOUZ</i>
15h00 - 15h20	Rare stranding events of a Cuvier's beaked whale (<i>Ziphius cavirostris</i>) and a Minke whale (<i>Balaenoptera acutorostrata</i>) in Tunisia <i>Olfa CHAIEB</i>
15h20 - 15h30	Conclusions and recommendations from the session - Thierry JAUNIAUX
15h30 - 16h00	Pre-training session: importance of scientific photo in teleneuropies (online) <i>Etienne LEVY</i>
16h00 - 16h30	Coffee break
16h30 - 17h15	Pre-training session: importance of scientific photo in teleneuropies (online) <i>Etienne LEVY -To be continued</i>
17h15 - 17h30	Feedback from INRH in Morocco <i>Imane TAI</i>
Wednesday 15th November	
8h30 - 13h30	Training session regarding the implementation of a scientific photography protocol adapted to cetacean strandings <i>performed in INSTM premises by Thierry JAUNIAUX (on site) and Etienne LEVY (online)</i>
13h30 - 14h30	Lunch Break
14h30 - 16h00	Debriefing, conclusions and recommendations of the training session <i>Thierry JAUNIAUX (on site) and Etienne LEVY (online)</i>
16h00 - 16h30	Coffee break
16h30 - 17h30	Adoption of recommendations from CSMC6 <i>Lobna BEN NAKHLA & Maylis SALIVAS</i>
17h30 - 17h40	Closure of CSMC6