D52 - Transboundary Workshop - Italy, France & Spain

Underwater noise assessment for decision support in MSP and related policies

11th May 2022
Mediterranean Centre for Marine and Environmental Research (CMIMA, CSIC)
Barcelona (Spain) - *Hybrid format*

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Acronyms

ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area
AIS	Automatic Information System
ASI	ACCOBAMS Survey Initiative
CA	Competent Authority
CCH	Critical Cetacean Habitats
CEA	Cumulative Effects Assessment
CEDEX	Center for Studies and Experimentation of Public Works
DGBBD	General Directorate of Biodiversity, Forests and Desertification
DST	Decision Support Tool
EBA	Ecosystem Based Approach
EBSAs	Ecologically or Biologically Significant Marine Areas
GA	Grant Agreement
IMMA	Important Marine Mammal Areas
IMO	International Maritime Organization
ISPRA	Italian National Institute for Environmental Protection and Research
MED	Mediterranean
MITERD	Ministry for the Ecological Transition and the Demographic Challenge (Ministerio para la Transición Ecológica y el Reto Demográfico)
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
MSP	Maritime/Marine Spatial Planning
OWF	Offshore Wind Farms
PAM	Passive Acoustic Monitoring
POEM	MSP Spanish Plan (Plan de Ordenación del Espacio Marítimo)
PSSA	Particularly Sensitive Sea Area
PU	Planning Units
SEA	Strategic Environmental Assessment
SPL	Sound Pressure Level

SPAMI	Special Protection Areas of Mediterranean Importance
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TG	Technical Group
UK	United Kingdom
UPV	Universidad Politécnica de Valencia
URN	Underwater Radiant Noise
UWN	Underwater Noise
WG	Working Group
WP	Work Package

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Report on the trilateral meeting among France, Spain and Italy

11th May, 2022

In the context of the MSPMED project, a trilateral meeting was carried out in order to assess issues of common concern in the maritime space of the neighbouring areas: Tyrrhenian Sea-Gulf of Lion - Balearic/Sardinian Sea, where the three countries have jurisdiction. This workshop was part of a bigger event called "*Underwater noise assessment for decision support in MSP and related policies"* so it was scheduled back to back with a technical meeting on underwater noise in order to build upon discussions held the previous day (underwater noise workshop) about this pressure, in relation to the impacts on and management of marine mammal populations in order to link marine conservation and MSP through underwater noise assessments.

To address this issue, a total of 35 experts (14 in presence, 21 online) from (1) research institutions, (2) competent authorities and (3) regional initiatives participated in this event. The workshop consisted in the presentation of different initiatives followed by a participative session devoted to develop a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) regarding the initiatives presented and the potentiality for collaboration among them. Afterwards, key questions were answered and discussed among the participants.

This face-to-face event allowed the connection of different experts and the sharing of the last updates regarding their initiatives and projects. Discussions raised the need, and willingness of more initiatives like this and more concrete collaboration among initiatives, countries and experts.

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1. Introduction

1.1. Project overview

The overall objective of the MSPMED project[1] is to favour the Maritime Spatial Planning process in the Mediterranean Sea, by supporting the establishment of coherent and coordinated plans across the Mediterranean marine regions and between Member States, in line with the MSP Directive objectives. The MSP Competent Authorities (CA) of France, Greece, Italy, Malta, Slovenia and Spain, participate directly or endorse relevant national institutions for participating in the project and are involved in its development.

1.2. Context

The event in which this workshop was framed was designed to efficiently address two objectives of the MSPMED project:

1. To share methodologies regarding **underwater noise analysis** (task 2.2.3. – WP2) through a technical meeting between experts from France, Italy and Spain - **Day 1 (10th May)**, and;

2. To foster cooperation on topics of common concern specifically through a **trilateral workshop among representatives from Italy, France and Spain** (task 4.2.- new event proposed with the extension of the project – WP4) - **Day 2 (11th May)**.

The reason of joining these two activities was the presence of some clear synergies between them:

(1) Due to the transboundary nature of the topic, it was considered convenient to involve also experts from Italy in the underwater noise technical meeting (that, in the Grant Agreement (GA) of MSPMED was framed in the case study between Spain and France) to enrich the sharing of methodologies; and,

(2) **These analyses may be used as supporting information to develop measures and recommendations regarding impacts on and management of marine mammal populations; hence, a discussion on this topic with the competent authorities in the framework of international initiatives (i.e. PSSAs or CCH designations) and of MSP and biodiversity conservation might be of great interest, addressing directly the science-to-policy interface, which was the aim of the workshop that this report addresses.**

[1] MSPMED: Towards the implementation of MSP in our common Mediterranean Sea, 2020-2022, co-funded by the European Maritime and Fisheries Fund, https://mspmed.eu/

1.3. Objectives

The aim of this workshop was to address the compromise between environmental protection strategies and economic development policies through a specific focus on the conservation of marine mammals and the development of several sectors as maritime transport and Offshore Wind Farms (OWF), considering the impacts produced by them, such as underwater noise pollution.

Synergies were sought with the proposal of a Particularly Sensitive Sea Area (PSSA) in the Gulf of Lions to the International Maritime Organisation (IMO) and with the ACCOBAMS agreement.

The main objectives of this workshop were to **(i) highlight the results obtained from underwater noise models and other spatial analysis to be applied on the spatial and temporal planning of human activities with respect to nature conservation** and to (ii) obtain **recommendations** to be applied with a **transboundary approach,** to create connections between initiatives that can lead to more efficient results**.**

The workshop was held in presence in the Mediterranean Centre for Marine and Environmental Research in Barcelona on May 11th 2022, also with the option to connect remotely. The agenda can be found in Annex I.

2. Welcome and greetings

María Gómez Ballesteros (IEO, CSIC) welcomed the participants and presented the objectives and the agenda of the meeting (Annex I). In total 35 experts (14 in presence, 21 online) from (1) research institutions, (2) competent authorities and (3) regional initiatives, participated in this event. The list of participants can be found in *Annex II*.

3. Presentations

3.1. H2020- SATURN - The integration of underwater noise in MSP – Andrea Barbanti (CNR-ISMAR) - REMOTE

Dr. Andrea Barbanti, from the National Research Council Institute of Marine Sciences of Italy (CNR-ISMAR) presented the H2020 project SATURN – Developing solutions to underwater radiated noise (URN), focusing on the actions that are being developed in the project towards the analysis of how to integrate underwater radiated noise in MSP. Saturn is built on a risk-based conceptual approach and, in particular, the project identified MSP as one of the policies' streams

to which solutions to underwater noise should be conveyed and specifically, Work Package 4 aims at developing a Decision Support Tool (DST) to include URN in MSP *(Figure 1*).

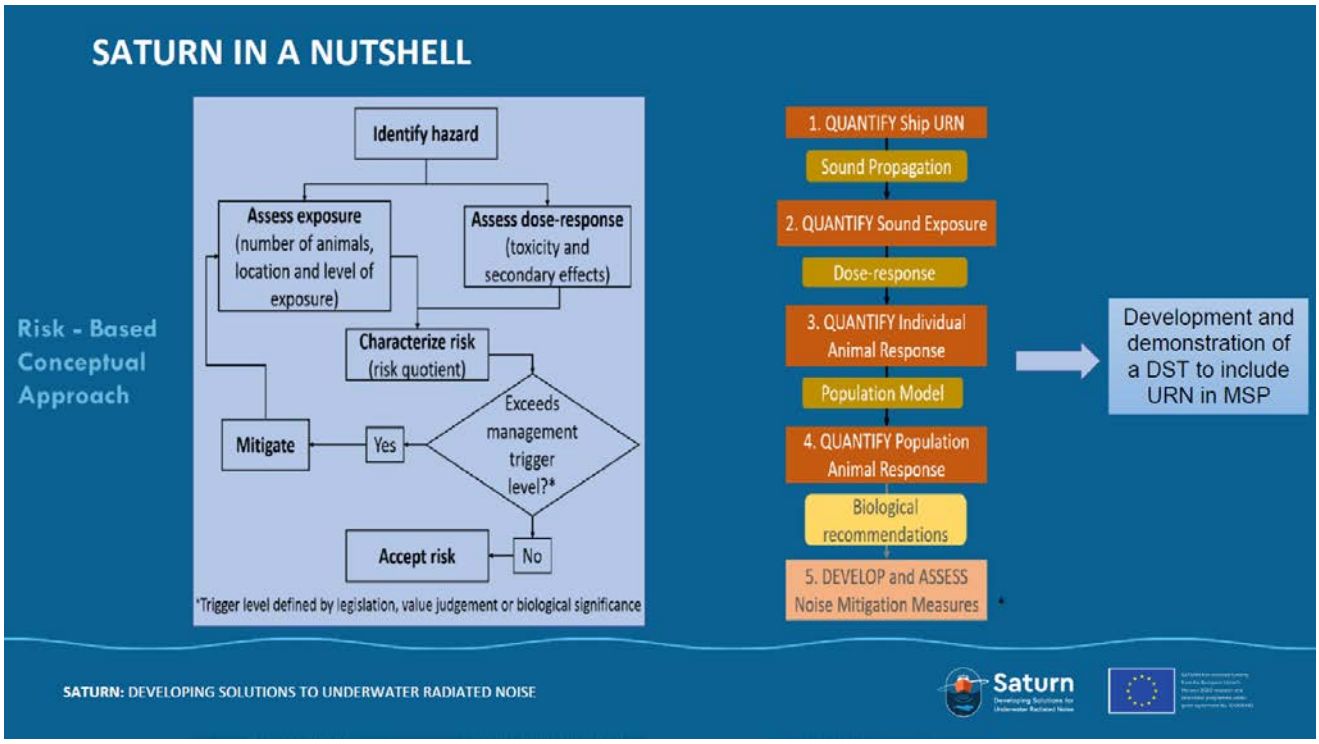

Figure 1: Saturn Project in a nutshell. Source: H2020-SATURN.

Andrea made a reflexion about the reasons to consider URN in MSP:

- To prevent single and cumulative impacts on ecosystems (as part of an Ecosystem-Based Approach (EBA) to MSP).
- To regulate specific uses (i.e. URN sources)
- To regulate coexistence among uses

He explained what it means to “consider” URN in all phases of MSP, which is related to different aspects:

- URN sources,
- URN targets (biota) and risks,
- time trends of both, sources and targets
- planning objectives, specifically directed or driven by URN risks
- planning measures and scenarios taking URN into account
- monitoring of implementation with references to URN
- conceptual and operational linkages with other policy processes (e.g. MSFD, IMO, Provisions, Regional Sea Convention Protocols and Guidelines, Management Plans of Protected Areas).

Andrea showed the activities that are being considered regarding the different phases of a MSP process and the tools that may be needed (*Figure 2).*

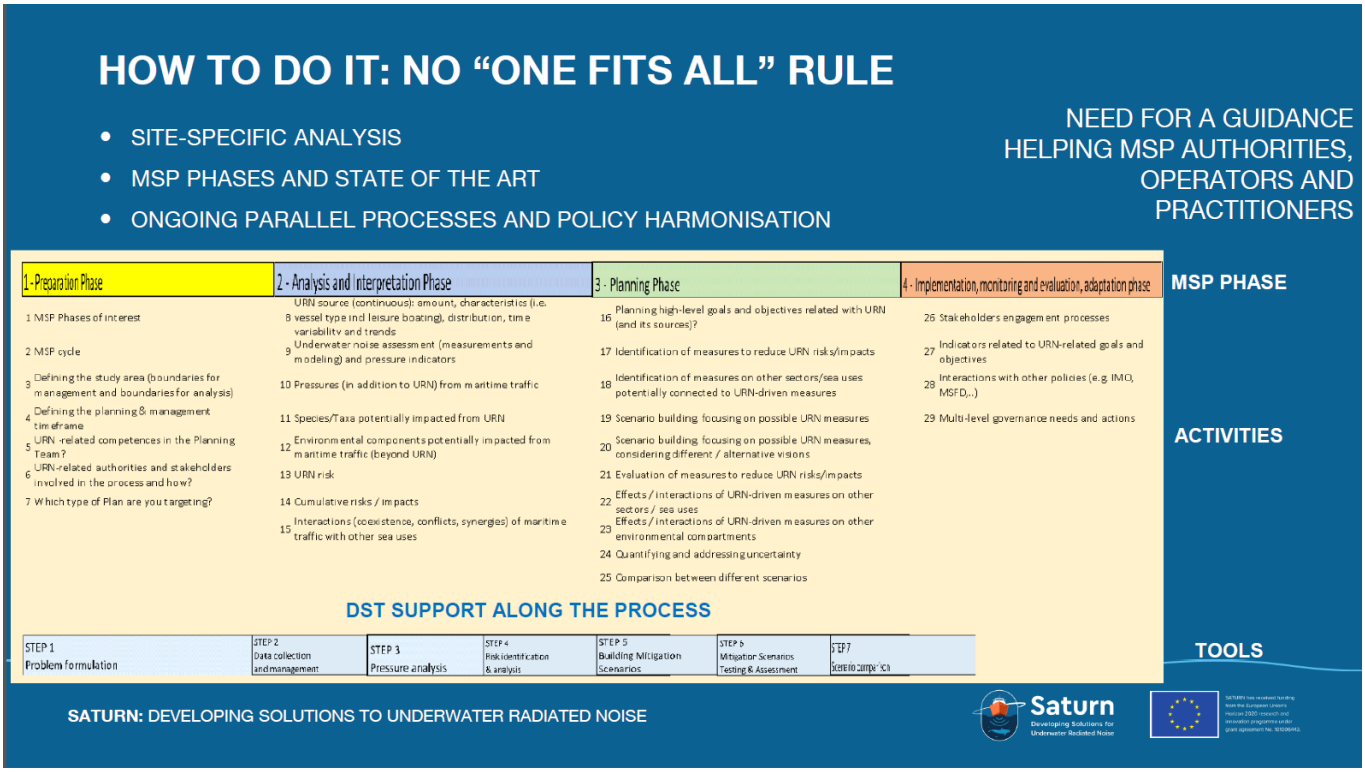

Figure 2: Phases for the MSP project. Source: H2020-SATURN.

In order to analyse how MSP is presently considering URN, they are reviewing the MSP plans of 9 countries: France (Med), Spain (Med), Denmark, Germany, Italy, The Netherlands, Portugal, Sweden and the maritime areas of England within the United Kingdom (UK); as well as Strategic Environmental Assessment (SEA) reports, and other supporting materials as strategies, guidelines and reports. The ambition is to capture macro-signals and some more specific aspects related to risk assessment and evaluation of measures and scenarios. They are also having direct interaction with Competent Authorities and aim to enlarge the analysis to more countries.

To conduct this analysis, they are looking at different aspects of the different phases of MSP:

- Assessment: URN sources, URN pressures and risks on biota, Cumulative Effects and Impacts (Cumulative Effects Assessment, CEA).
- Planning: Goals and planning objectives, measures, scenario analysis, stakeholder consultation.
- Monitoring & implementation: Coordinated and operational implementation processes with other policies, URN-related indicators in MSP monitoring, URN observing systems used in/for MSP

Regarding the preliminary results of the assessment, URN is considered within all plans in the assessment phase, to some degree, with a distinction between impulsive and continuous (or background) noise. URN is linked to OWFs, dredging, defence activities, construction of pipelines, maritime shipping, and, in some cases leisure boating (*Figure 3*). A negative impact on marine mammals is always mentioned though usually without quantitative assessment. Target species seems to be harbour porpoises and grey seals, with mention on effects on fish populations during spawning. Risks include: masking, increased mortality, hearing impairment and behavioural changes. This assessment highlighted that only Sweden performed a CEA and scenario analysis using a tool called Symphony where noise comes up in 5 forms, from different sources and with different frequencies.

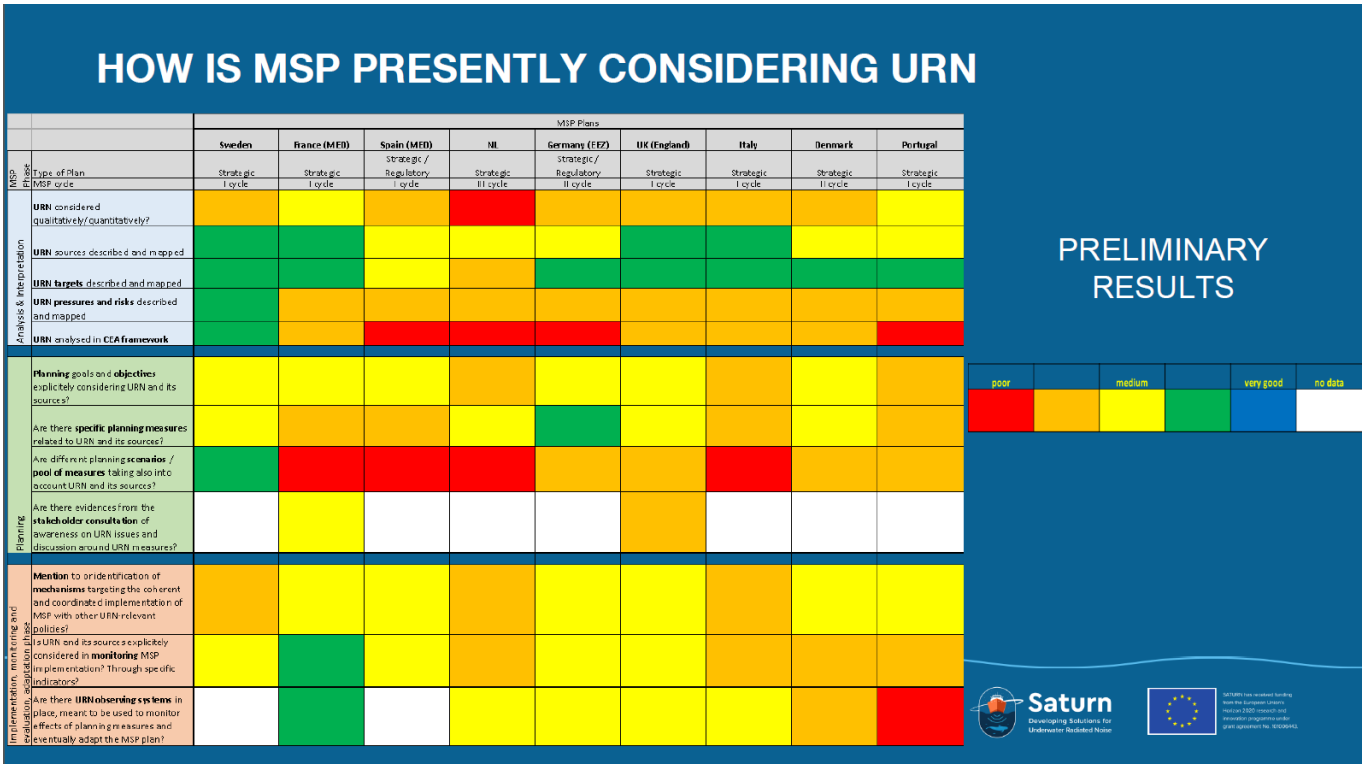

Figure 3 Consideration of URN in MSP. Source: H2020-SATURN.

When it comes to planning, URN objectives and measures come up in all plans, up to a certain extent. They are often generic and derived from existing guidelines: MSFD-D11, OSPAR, HELCOM, ACCOBAMS. This analysis also highlighted that impulsive noise is considered more than continuous noise. Quantitative and spatially-explicit analyses of different measures/scenarios are very rare or absent and there are few evidences of stakeholder's consultations and the role of URN in them.

Regarding implementation and monitoring, URN is often considered in monitoring of MSP plans, especially when it is linked to MSFD. In some cases, there is a specific URN monitoring programme. There is often a link with other policies, although generic and not operationalised towards specific planning goals. Moreover, there is a poor mentioning of IMO guidelines on URN.

However, the connexion between URN and MSP is clear and there is a need of considering mitigation measures for continuous noise.

To conclude, URN is considered but not properly addressed, despite a growing awareness of its (potential, site-specific) importance, now and in future scenarios. There is a need for data, evidence, tools (e.g., Symphony, a tool for ecosystem-based marine spatial planning) to inform robust planning implementation, monitoring, adaptation and to address/evaluate mitigation measures. SATURN will specifically work on developing DST linking URN and MSP.

MSP is identified as a piece of policy dealing with URN although connections with other policies need to be reinforced and operationalized. The connection with MSFD is essential as far as targets and objectives are concerned and the new MSFD-Technical Group (MSFD-TG) noise guidelines (Assessment framework and Threshold Values) are crucial.

QUESTIONS

Cristina Cervera (IEO, CSIC) asked about the fact that countries are considering more impulsive noise than continuous noise. Andrea Barbanti (CNR-ISMAR) answered that, for the moment, they did not find a specific reason for this, although it might be because it is easier to address as you may have a specific area in a construction phase and there could be already guidelines.

In the case of Spain, Cristina mentioned that in the MSP Spanish Plans (POEMs), underwater noise is not considered *per se* as it is in the Marine Strategies, so the connection is based on the link between MSFD and MSP processes in Spain.

Cristina Cervera (IEO, CSIC) wondered about the stakeholder's concern regarding URN, how it is evaluated. The approach was to check whether stakeholders were concerned or if the CA asked specifically about URN. Andrea Barbanti (CNR-ISMAR) answered that besides reviewing reports of the consultation phase (that were not numerous), they contacted CAs to ensure they were reviewing the correct materials as there are several gaps regarding this aspect. In some cases, they were able to find comments on this, that is an indicator of the stakeholder's awareness on the importance of this pressure. Cristina redirected this question to the representative of the Spanish CA as Spain owns one of the gaps regarding this aspect, Aurora Mesa from the General Directorate of the Coast and the Sea (DGCM) from the Ministry for the Ecological Transition and the Demographic Challenge (MITERD), to inquire whether in the consultation process they received many allegations regarding URN. Aurora answered that she is only aware of 1 out of about 230 entries. Cristina added that one reason for this gap in particular could be the phase in which are the MSP processes, that in some countries are still integrating public consultations outputs.

Maite Hernández (DGCM-MITERD) also added that an underwater noise assessment will help to identify the noise generated by small ships (that are not considered in AIS-based assessments), so it might be a way to push the integration of this sector for the next cycle of the POEMs. Andrea Barbanti (CNR-ISMAR) fully agree as this is one of the gaps they found. A lot of improvements need to be done regarding measurements, mapping and analysing the importance of this sector on URN. The only example that they found was from Sweden that explicitly includes leisure

boating in Symphony and the SEA. The project Soundscape developed a specific study in Croatia analysing the important of leisure boating, but yes, it is something to improve, so the next cycles of MSP will consider also this.

Aurora Mesa (DGCM-MITERD) pointed out that one useful tool will be to develop guidelines for CAs to support the consideration of URN in MSP.

3.2. MPA (SPAMI)- Cetacean Migration Corridor of the Mediterranean – Roadmap towards the management plan and preventive measures – Jorge Alonso (DGBBD-MITERD) - REMOTE

Jorge Alonso from the General Directorate of Biodiversity, Forests and Desertification (DGBBD) of MITERD, presented the Cetacean Migration Corridor of the Mediterranean, which is the biggest Marine Protected Area (MPA) within Spanish waters dedicated to cetacean conservation (about 85 km wide and an area bigger than 46.000 km^2). This area constitutes the living habitat or migration area of 10 out of 19 marine mammals, at least 4 out of 6 marine reptiles, and 9 marine birds considered in Annex II of endangered or threatened species of the Habitats Directive[2].

He explained the process conducted to define the area, based on several independent public and private projects that mapped different cetacean species (including the ACCOBAMS Survey Initiative (ASI) project). Several species are present in the area, such as long-finned pilot whales (*Globicephala melas*), highly vulnerable to underwater noise. In fact, the main measures to be taken in this area are related to underwater noise. The origin of the process can be found in the "Proyecto Mediterráneo" whose aim was the "*identification of areas of special interest for the conservation of cetaceans in the Spanish Mediterranean*" (published in 2004). There was a first attempt to include this area in the SPAMI list of the Barcelona Convention in 2017 but it didn't meet some of the criteria, particularly the lack of an official protection status for the area. Eventually, this legal status was awarded by the Royal Decree 699/2018 of 29th June which declare the MPA and proposed its inclusion in the SPAMI list, which finally occurred in 2019.

[2] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

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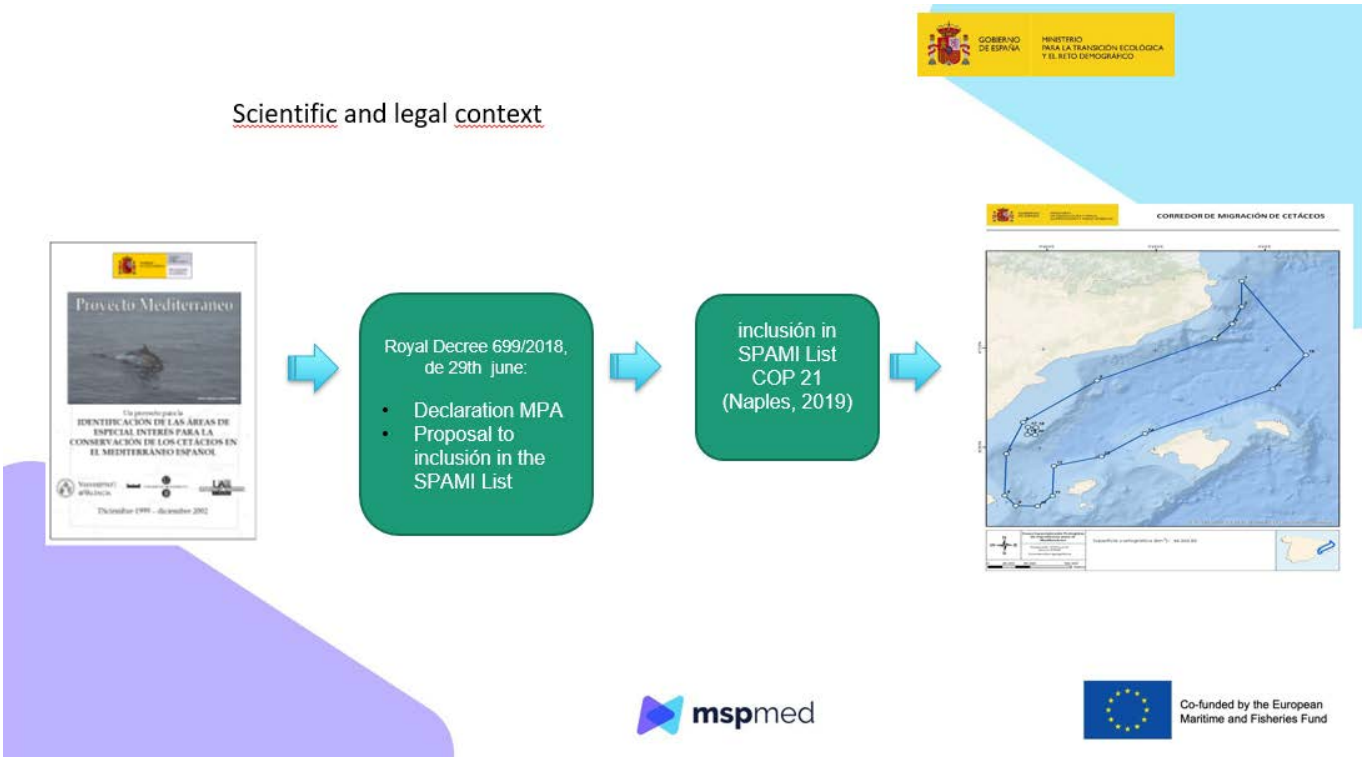


Figure 4. Scientific and legal context of the Cetacean Migration Corridor of the Mediterranean. Source: DGBBD-MITERD.

This Royal Decree established a preventive protection regime stating that:

- Underground geological research by means of active systems (probes, compressed air or controlled explosions, or underground drilling) are forbidden, except for permits for research or exploitation in force.
- Any type of hydrocarbon extractive activity is prohibited, except for research or exploitation permits in force.

There was a commitment to approve the management plan by the end of 2022, however they are currently starting so there might be some delay; although it is on its way. This plan is developed in the framework of the INTEMARES project which include participation of stakeholders from different maritime sectors. This management plan will address all the relevant uses, activities and pressures affecting the area.

Specific issues related to noise pollution to be addressed are: geological research, hydrocarbon extraction, maritime traffic, renewable energy infrastructures construction.

Other works are going to be considered in the management plan:

- A risk collision analysis developed by the Center for Studies and Experimentation of Public Works (CEDEX), that represents the spatial distribution of collision risk and includes not only the traffic of the area but also the type of ships, speed, distances travelled, etc. The

final objective is the identification of areas and hotspots of collision where management plans need to be focused.

- Particularly Sensitive Sea Area (PSSA) proposal in the North Western Mediterranean Sea whose approval results will be considered in the management plan.

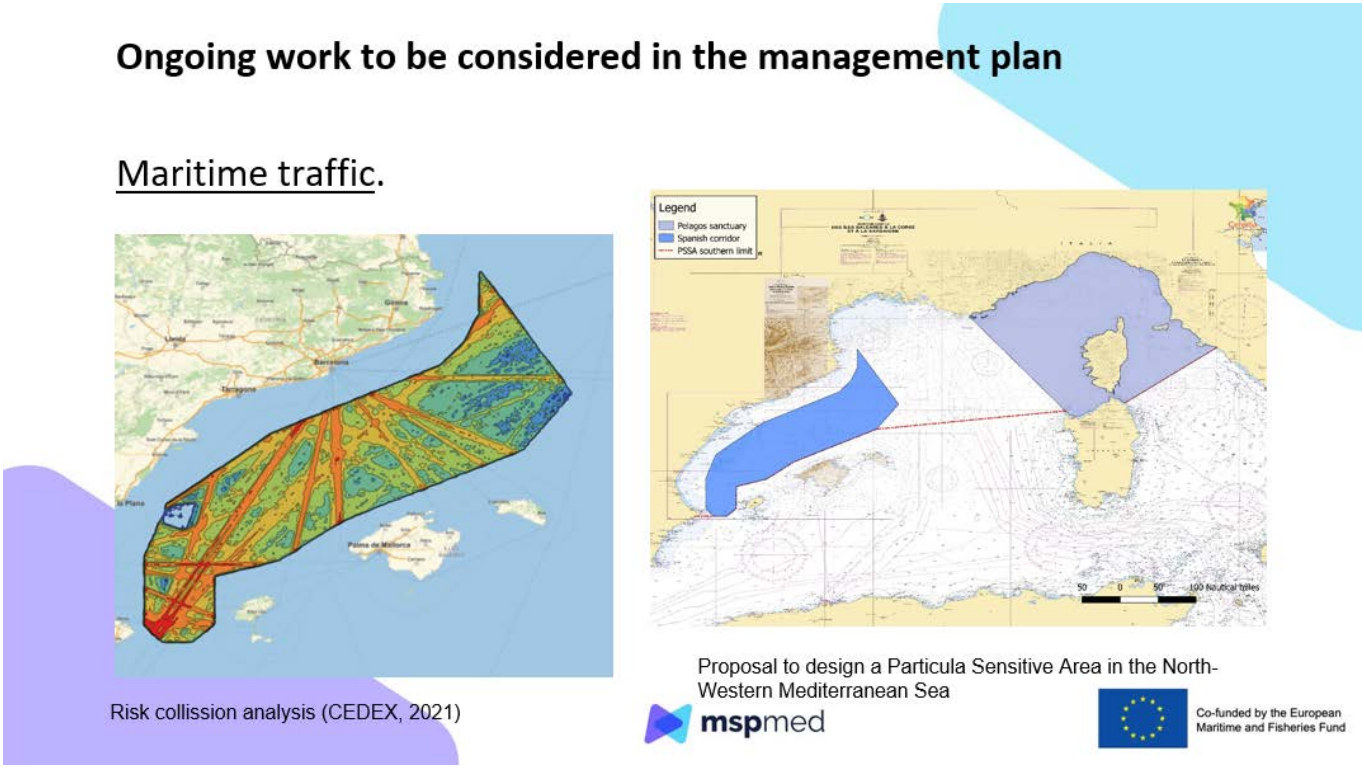


Figure 5. Ongoing works for the Cetacean Migration Corridor of the Mediterranean management plan. Source: DGBBD-MITERD.

Another matter to be considered is the zoning designed in the framework of MSP regarding Offshore Wind Farms (OWF) to avoid impacts on biodiversity, not only in the functioning phase but mostly during the construction phase. The criteria for this zoning established the prohibition of deploying OWF in:

- Special Protection Areas and other areas of interest for birds.
- Areas with habitats of Community Interest.
- Critical areas for species.

OWF could be deployed with restrictions in:

- The Cetacean Migration Corridor of the Mediterranean MPA[3].
- Important Marine Mammals Area (IMMA) and Critical Cetaceans Habitats (CCH).

[3] It is Important to note that the POEMs do not identify any OWF area in the MPA.

QUESTIONS

Andrea Barbanti (CNR-ISMAR) asked whether the criteria for prohibition and restriction areas are to be included in the MSP plans. Jorge Alonso (DGBBD-MITERD) answered affirmatively that these areas have been considered since the beginning of the MSP process. Aurora Mesa (DGCM-MITERD) agreed confirming that these criteria have been included since the first moment they started the discussion on Priority and High Potential areas for OWF.

María Gómez (IEO,CSIC) pointed out that, with regards to pressures in the corridor, it needs to be considered that the frequency of the noise generated by geological research (multibeam echosounder and sub-bottom profiler) is different from the one produced by hydrocarbon exploration (airguns seismic systems) and exploitation, which is very harmful. This is something to keep in mind because to implement Marine Strategies, we have to perform habitat mapping and this technology is necessary in research from oceanographic vessels.

Jorge Alonso (DGBBD-MITERD) expressed that these differences were already considered in the Royal Decree that approved the MPA and the preventive protection regime. They are aware of the differences between impacts of the URN generated by the different techniques. They would like to have the formal guidance of the IEO(CSIC) in this issue. They want to ensure that methods and frequencies to be implemented do not damage the biodiversity. María Gómez (IEO,CSIC) agreed and added that they have to work together along with the experts on underwater noise to set clearly the difference between these two uses, in order to address this issue with scientific knowledge.

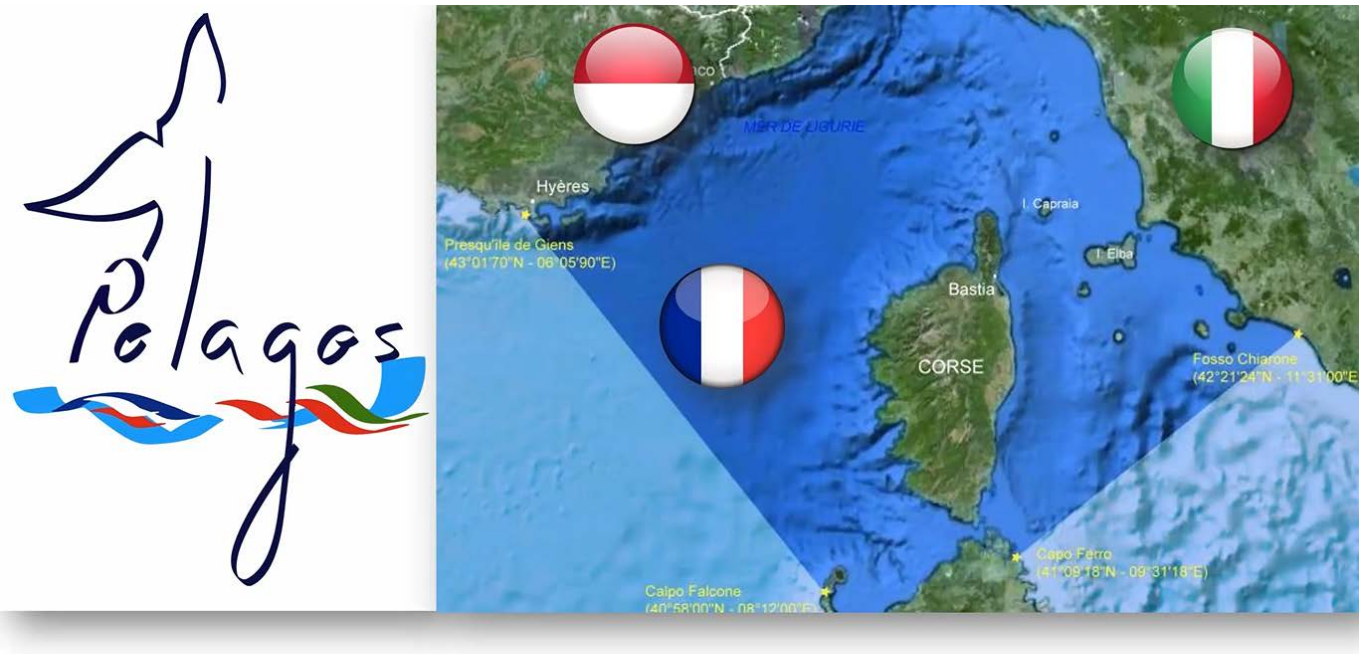
Manuel Bou (IEO,CSIC) pointed out that when talking about potential impacts, it is important to consider threshold levels emitted by the devices because not only the frequency but also the direction of the pulse needs to be considered, because it also conditions the possible harm on biodiversity.

In the chat, Cristina Cervera (IEO,CSIC) asked about the ship collision risk hot spots for the ones they want to set measures. Legally, what kind of measures could be taken at the national level? (considering that, probably the PSSA will complement those that at the national level are not possible). Jorge Alonso (DGBBD-MITERD) agrees that all measures affecting international maritime transport should be approved by IMO (so addressed by the PSSA associated protective measures). He believes that national measures can be adopted (without the approval of IMO) for leisure navigation and to some punctual measures of routeing in coastal areas.

3.3. PELAGOS SANCTUARY - The importance of a transboundary approach for cetacean's protection - Catarina Fortuna (ISPRA)

Caterina Fortuna, senior research fellow at the Italian Nacional Institute for Environmental Protection and Research (ISPRA), and Pelagos Impacts WG Chair (also newly appointed chair of the Pelagos WG on MSP and Underwater noise) presented the main facts and updates regarding the Pelagos agreement.

Caterina sees the Pelagos agreement as the precursor of MSP. Starting by the rationale of the agreement, it was stimulated in the early 90's by a high mortality rate related to fisheries by-catch, especially caused by large pelagic driftnets (banned at the beginning of the 90's as well). Therefore, the first kind of protection was a Decree of the fisheries department coming from the Italian Ministry which stablished a "fisheries restricted area". In 1999 the three countries (Italy, France and Monaco) signed the agreement to improve the conservation of marine mammals by managing human activities. The Pelagos Sanctuary is the first and the only international SPAMI.



- A precursor of the MSP: to improve conservation of marine mammals by assessing & managing the impact of human uses on species and their habitats.
- Contracting Parties: France, Italy, Monaco
- The Sanctuary/International SPAMI (87,500 sq. km ⇨ 3.5% Med)

Figure 6. Pelagos Sanctuary context. Source: Pelagos Sanctuary.

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The high by-catch mortality affected specially delphinids: common dolphins (*Delphinus delphis*), striped dolphins (*Stenella coeruleoalba*) and sperm whales (*Physeter macrocephalus*), which are all very long-living creatures which live in families for which the killing of one individual could create an issue in the whole population; hundreds of them were dying that is why these species are still endangered. The recovery of the populations takes a long time.

There are several risks, apart from by-catch, that are affecting cetacean species nowadays like pollution, noise or ship strikes. Risks regarding noise come mainly from ships and geoseismic surveys. Risks related to shipping strikes, mainly from passenger vessels are relevant as well. All these issues are included in the new management plans.

In relation to the species present in this area, Cuvier's beaked whales (*Ziphius cavirostris)* should be highlighted as very sensitive to noise; therefore, they are usually registered in strandings: Rissos dolphins (*Gramous grisseus*), Mediterranean monk seals (*Monachus monachus*), and Biottlenose dolphins (*Tursiops truncatus*) are also species encountered in this area, which are recolonizing lost habitats. Most of these species are under any threat status within the IUCN red list).

Multilateral cooperation is essential, in order to assure the implementation of the agreement in each country's territory. The agreement itself does not have a centralized management body. Each country has to ensure the application of the provisions in their territories. As each country has a management plan, harmonisation is necessary to assure the protection needed.

Transboundary governance is vital for species like the fin whale (*Balaenoptera physalus)* which are wide ranging. There have been several projects to tag fin whales with satellite tags to study their migratory patterns throughout the Mediterranean, following their favourite preys.

The Pelagos agreement is involved in the process of the proposal of the PSSA in the North Western Mediterranean, which is a very important area for fin whales since it can gather around the 70% of the Mediterranean population. In fact, the ASI data shows that the Spanish Mediterranean waters are highly important for fin whales. It is relevant to consider also that fin whales are more vulnerable when they are feeding at the surface as they are more exposed to potential threats.

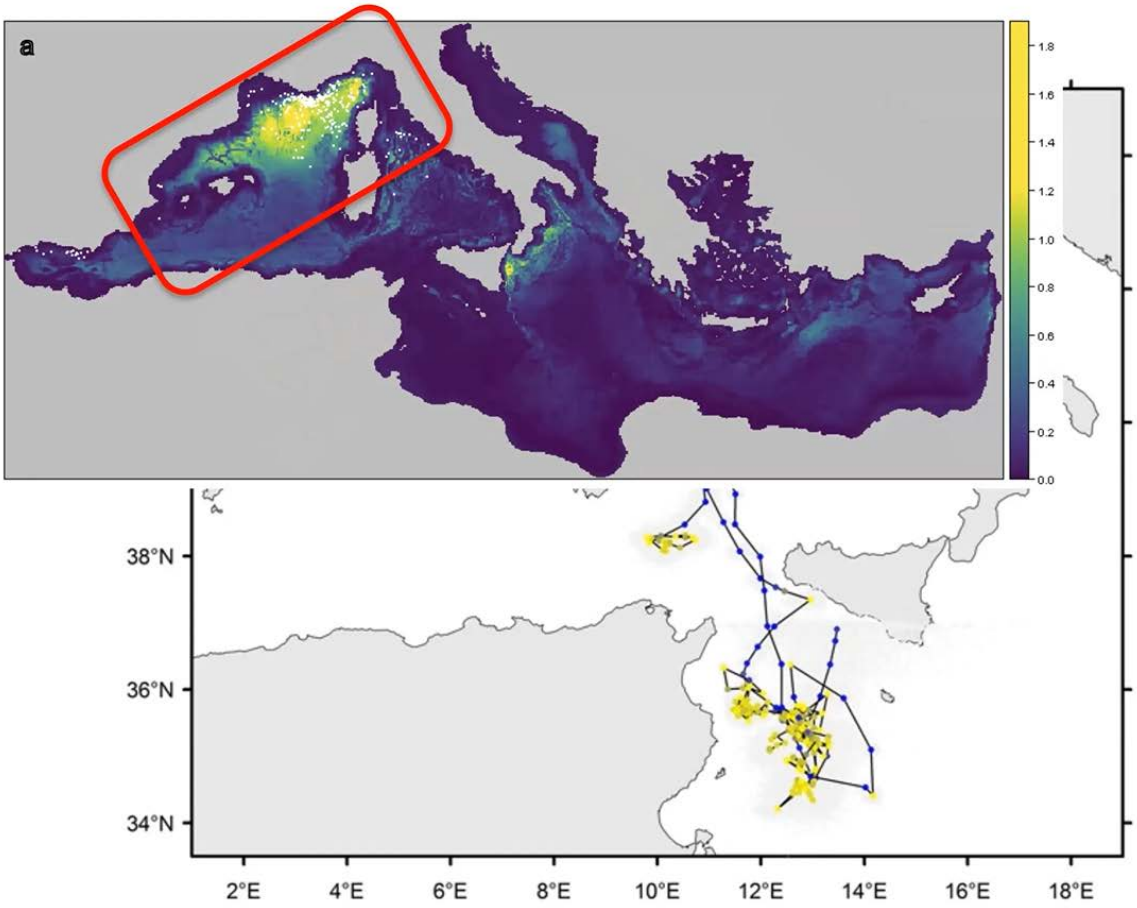

Figure 7. Prediction density of fin whale. Source: Pelagos Sanctuary.

Pelagos is trying to capitalise on previous guidelines, not "reinvent the wheel". Connecting people is one of the key aspects. The idea is creating different subgroups: fisheries, noise, chemical pollution, etc., to work specifically in each issue to obtain accurate information. In this regard, Pelagos must collaborate with the Spanish Cetacean Migration Corridor of the Mediterranean MPA.

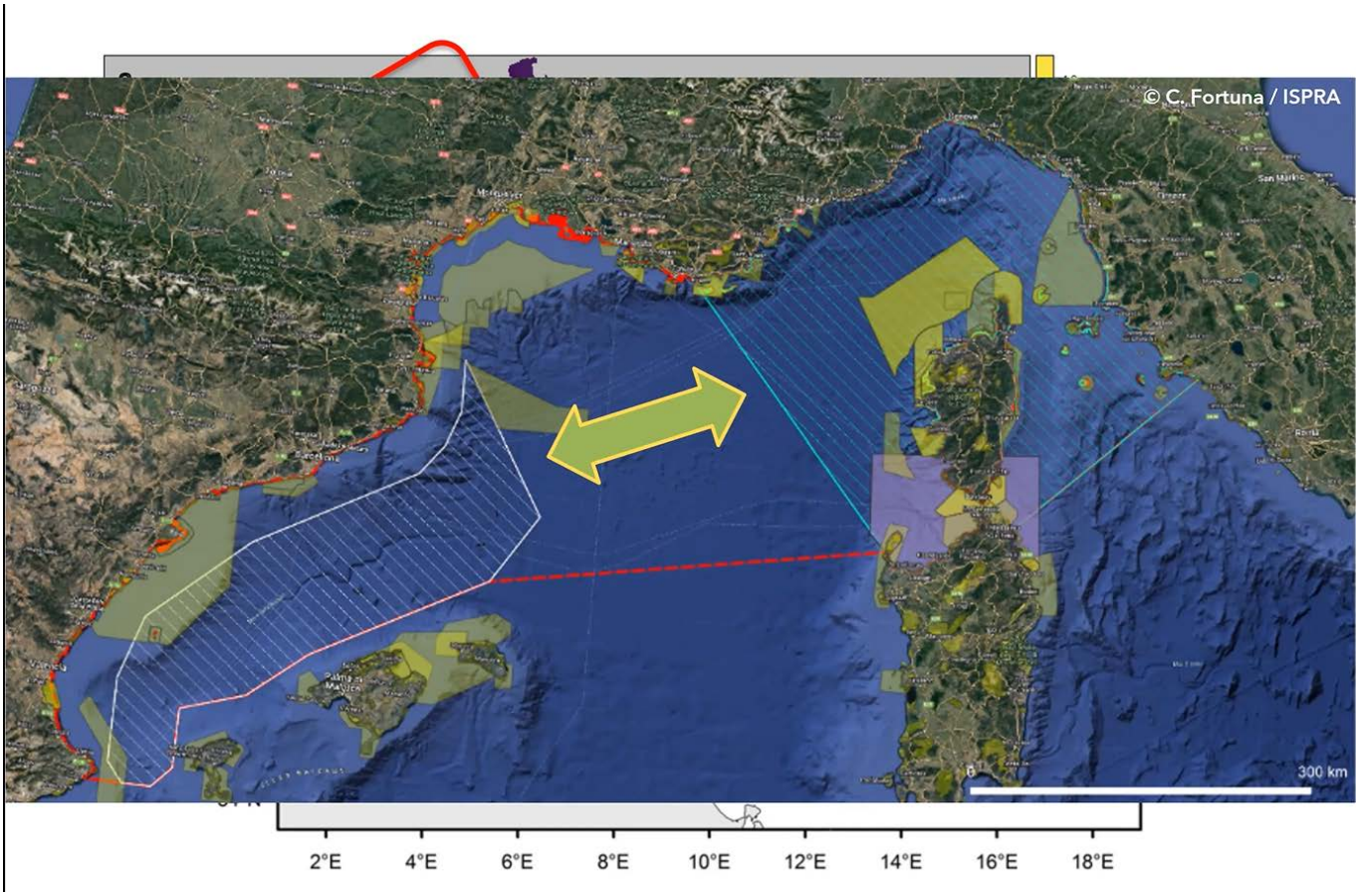

Figure 8. Important fin whale distribution area Source: Pelagos Sanctuary.

She hopes that Pelagos agreement can be seen as a tool for the stimulation of discussion with contracting and non-contracting countries and interested stakeholders.

QUESTIONS

There was no time for questions.

3.4. MSPMED project and Gulf of Lions Case Study – Mónica Campillos (IEO,CSIC)

Mónica Campillos, part of the MSP team at the Spanish Institute of Oceanography, established the context of the workshop through a brief presentation of the MSPMED project (objectives, partners, budged and work packages) and the information of the case study of the Gulf of Lions (objectives, tasks developed and Work Package (WP) in which this workshop is included).

The MSPMED project (*Towards the operational implementation of MSP in our common Mediterranean Sea*) is co-funded by the European Commission – DG for Maritime Affaires and Fisheries (DG MARE). Its two main objectives are:

- To support Member States with the implementation of the MSP Directive (2014/89/EU Directive – Maritime Spatial Planning).
- To promote transboundary cooperation in the establishment of Maritime Spatial Planning (MSP).

The project started in March, 2020 and will finish in October, 2022. The consortium is composed by 11 partners from Spain, Italy, Greece, France, Malta and Slovenia. The budget is 3.135.916,25 € and it is divided in 5 Work Packages (WP):

- WP1: Coordination & Management
- WP2: Setting-up of Maritime Spatial Plans
- WP3: Data use and sharing
- WP4: Cooperation among Member States and Third Countries
- WP5: Communication & Dissemination

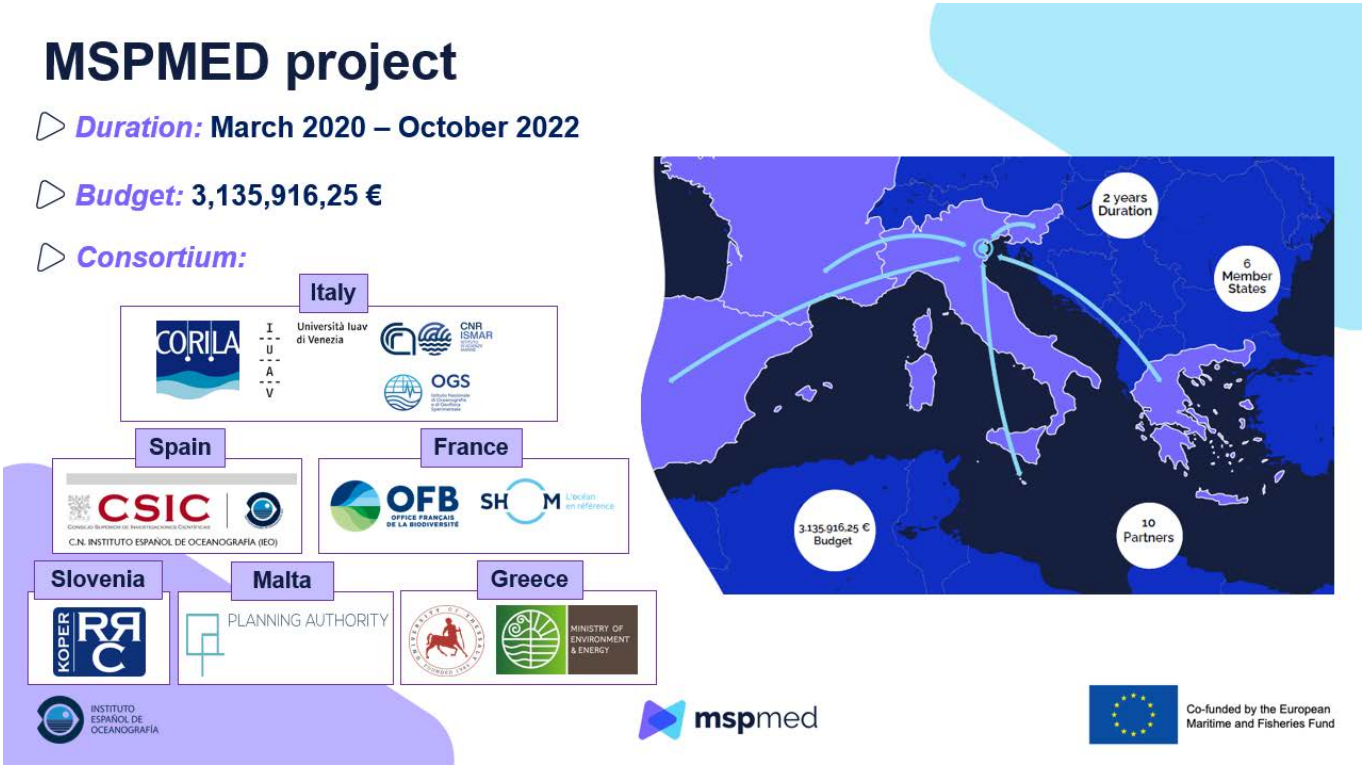

Figure 9. MSPMED project main details. Source; MSPMED project.

To develop the WP2 and support the establishment and implementation of Maritime Spatial Plans, MSPMED develops pilot case studies in different areas of the Mediterranean Sea.

One of these cases studies is the case study between Spain and France developed by IEO(CSIC), OFB and with the support of French Marine Energies (FEM)), for Planning the offshore Gulf of Lions with respect to the ecosystems (WP2 – task 2.2).

Figure 10. Gulf of Lion case study in the context of MSPMED project. Source: Spanish Institute of Oceanography.

The works developed in this case study were focus in:

- The production of a knowledge synthesis about ecological stakes in the Gulf of Lions by OFB and IEO (CSIC) (Subtask 2.2.1).
- The creation of a knowledge synthesis about interactions between offshore windfarms and Mediterranean ecological stakes by OFB, FEM and IEO (CSIC) (Subtask 2.2.2).
- The estimation of noise propagation and noise pollution effects in the pelagic realm by IEO (CSIC) (Subtask 2.2.3) (where the present workshop is included).

This workshop is also framed within WP4, developing Task 4.2: Establishing a solid transboundary cooperation in MSP among bordering Mediterranean Member States.

QUESTIONS:

There were no questions.

3.5. MSPMED Gulf of Lion case study - Underwater noise – Manuel Bou (IEO,CSIC)

Manuel Bou, expert on underwater noise from IEO(CSIC), presented the work conducted within the MSPMED project regarding underwater noise assessment in the Gulf of Lions. He started by differentiating between impulsive and continuous noise. There are many sources of underwater noise (UWN). Noise can produce potential harm in the marine environment. In the case of the Gulf of Lion, this noise could affect the cetacean-rich transboundary area among France and Spain.

Regarding the methodology followed to analyse ship traffic and windfarm operation, the difference between them is the treatment of the noise coming from the windfarm. The idea is to transfer this information into noise maps.

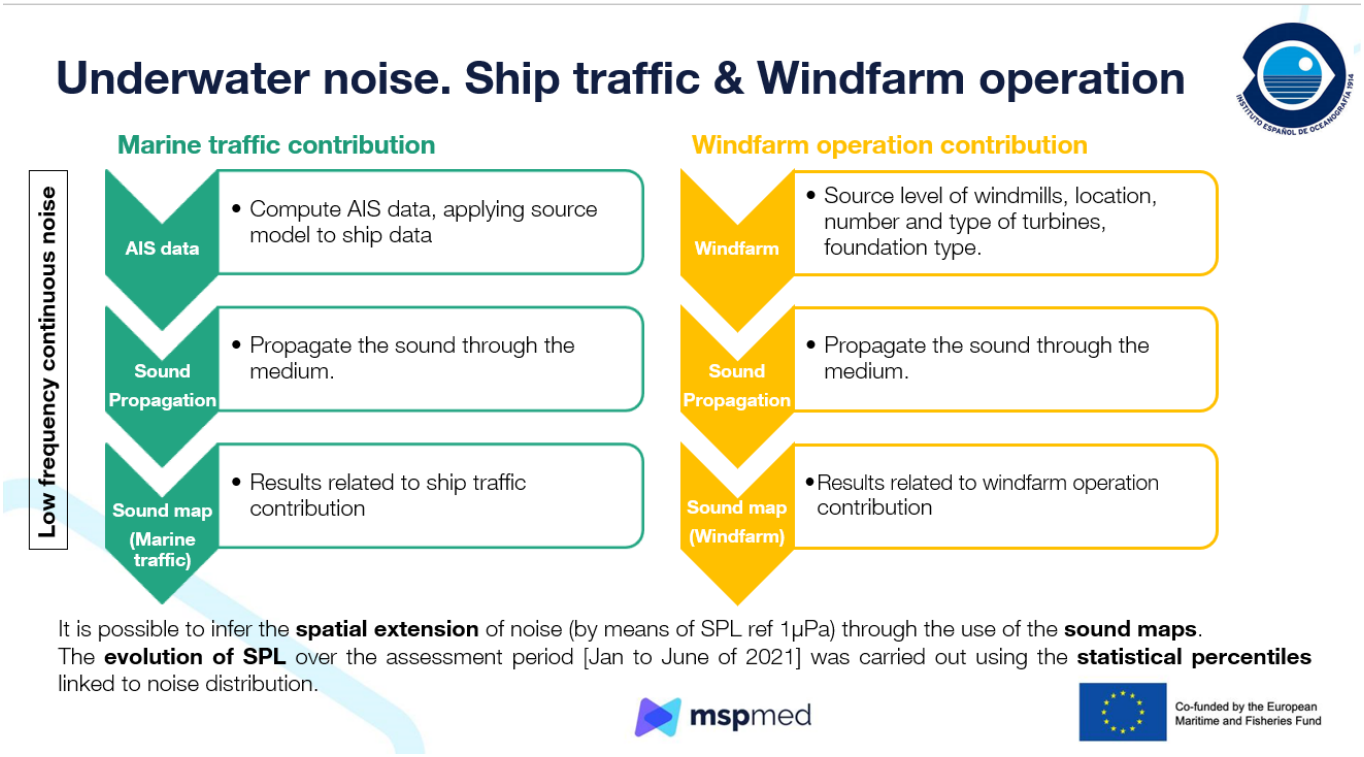

Figure 11. Methodology developed to analyze underwater noise in the Gulf of Lion. Source: Spanish Institute of Oceanography.

In this specific study only anthropic sources were considered, both, sources originated by ship traffic and the one generated by the operation of windfarms. Regarding the methods used to evaluate the contribution of each source to the UWN, it should be noted that the methodology is the same for both, although the source is different. The aim is to obtain a soundmap where the analysis of each effect separately and altogether could be carried out.

Statistical percentiles are used to show the evolution of the noise sources during the assessment period (January to June, 2021), considering frequency bands from 63Hz and 125 Hz, taking snapshots of AIS navigation data each 6h and the time basis of the soundmap is one soundmap/day. Ships as an acoustic source are difficult to study because, apart from the external noises related to the speed, size, etc., there are numerous sources of internal noise, difficult to assess the suitability of the sound propagation models depends on signals, bathymetry, depth frequency, etc. In this case, the propagation model applied considers the seasonally dependence of water column sound velocity. The Sound Pressure Level (SPL) is calculated at each grid cell of the soundmap and the percentage of time that each gridcell is above a given threshold value (from the 70, 90 and 99 percentile) is studied.

Regarding underwater noise analysis made for tentative windfarm operation, there are several studies about the windfarm noise that are anchored but not on the floating windmills. One of this analysis is Hywind Scotland Pilot Park Project, which has been use to analyse this underwater noise model. The tentative installation of 8 windmills was simulated assuming a constant radiation during the assessment period. More realistic calculation should consider the dependence of acoustic radiation with respect to the weather conditions (specially with the wind).

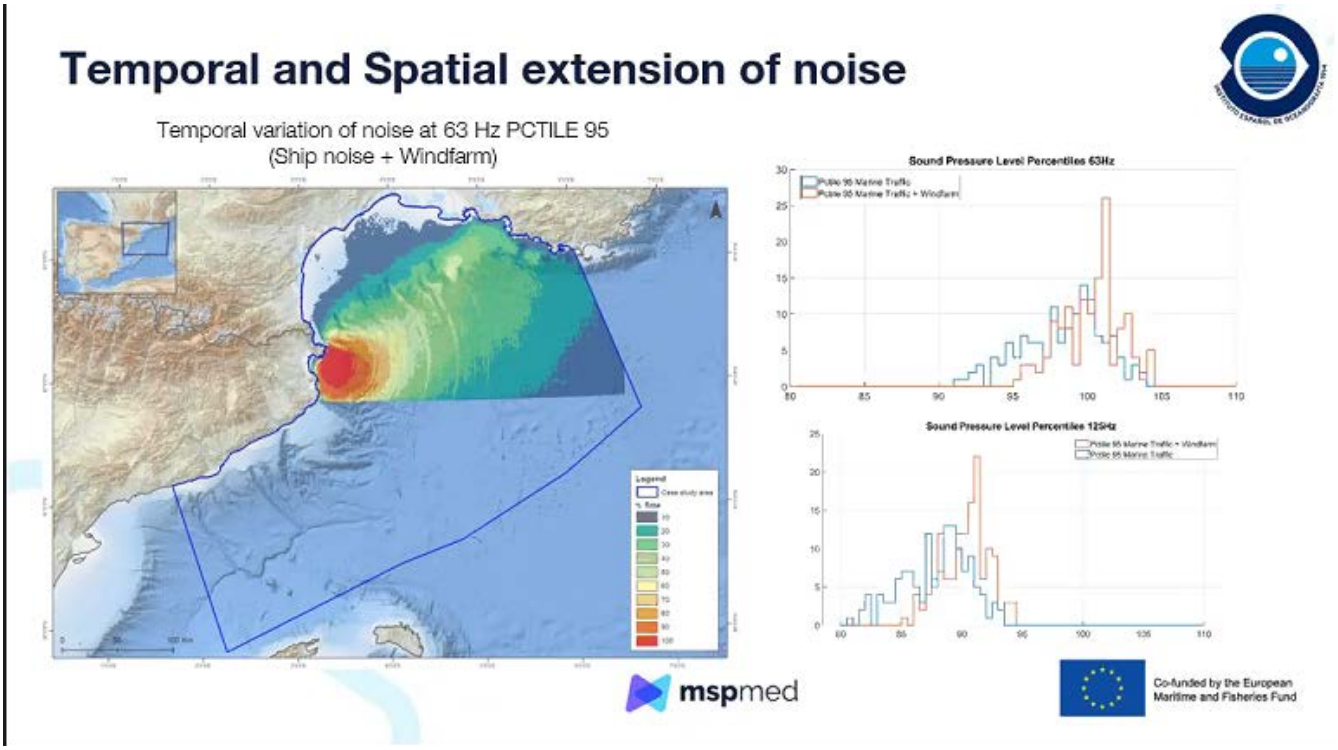

Figure 12. Tentative analysis of underwater noise by OWF in the Gulf of Lion. Source: Spanish Institute of Oceanography

The ongoing work is focused on to apply a risk-based model to study the potential masking over the different species present in the Gulf of Lions. To perform this study, a methodology based on the communication distance reduction[4] will be applied.

This approach considers:

- Selection of Habitat (ASI abundance data will be used).
- Calculation of reference condition (RC).
- Evaluation of Current Condition (CC).
- Adverse effect considered, masking.
- Excess level measured by means of percentage of communication distance reduction.

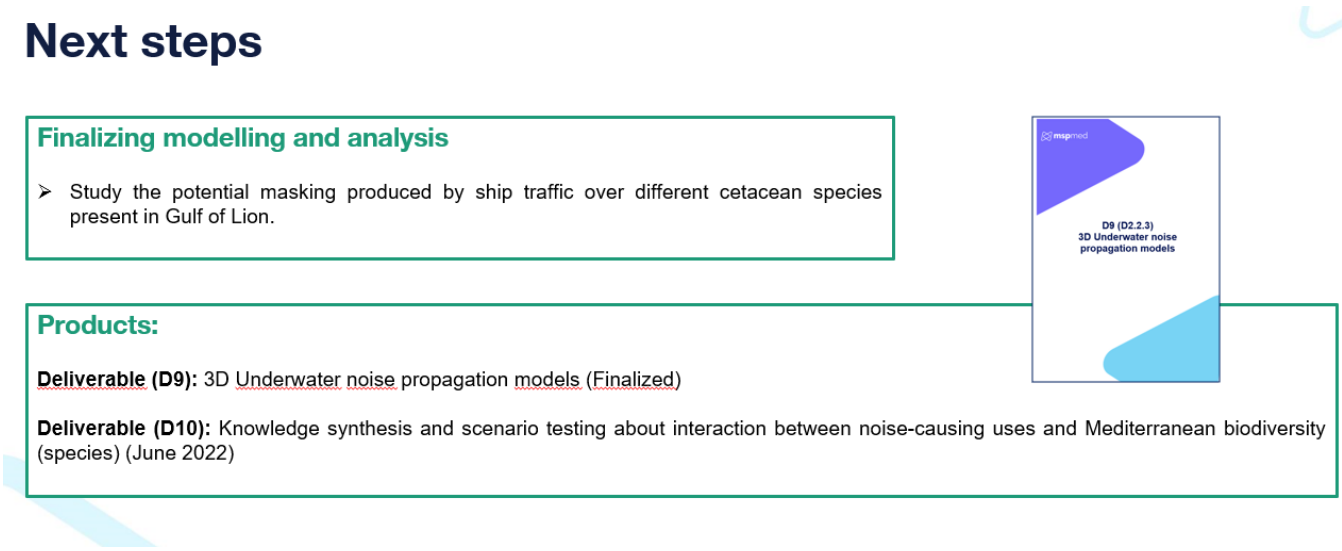

Figure 13. Next steps in the work being carried out in the Gulf of Lion. Source: Spanish Institute of Oceanography

QUESTIONS

Aurora Mesa (DGCM-MITERD) asked whether information from pilot projects about renewable energy as the ones carried out by PLOCAN could be useful to feed the models. Manuel Bou (IEO,CSIC) answered that he does not know if PLOCAN has any information regarding floating windfarms to be used in the tentative analysis of OWF.

Daniele Brigolin (IUAV) asked if the study is also leading with the three-dimensional level of the sound. Manuel Bou (IEO,CSIC) answered that the soundmap is calculated at different depths and the higher value of the water column is selected to consider the worst-case scenario. There are species that live in a specific depth, to evaluate the effect of the UWN on them, we would

[4] Bou-Cabo, M.; Lara, G.; Gutiérrez-Muñoz, P.; Saavedra, C.; Miralles, R.; Espinosa, V. A Risk-Based Model Using Communication Distance Reduction for the Assessment of Underwater Continuous Noise: An Application to the Bottlenose Dolphin (*Tursiops truncatus*) Inhabiting the Spanish North Atlantic Marine Demarcation. *J. Mar. Sci. Eng.* **2022**, *10*, 605. https://doi.org/10.3390/jmse10050605

have to measure the SPL at that depth. So, yes, a three-dimensional level is considered in this study.

3.6. PSSA proposal in the North Western Mediterranean Sea – Elsa Jantet (Ministry for the Ecological Transition of France) – REMOTE

Elsa Jantet from the French Ministry for the Ecological Transition, presented the current status of the PSSA proposal and the aspects related to underwater noise (UWN). This project is shared by France, Italy, Monaco and Spain.

The ACCOBAMS Survey Initiative (ASI) project has made possible to map the presence of marine mammals in the north-western Mediterranean Sea. This area is recognized by its ecological richness.

The PSSA proposal will include all the protected areas of this zone, specifically SPAMIs, Natura 2000 sites, the Spanish Cetacean Migration Corridor of the Mediterranean, the Pelagos Sanctuary and the PSSA of Bonifacio.

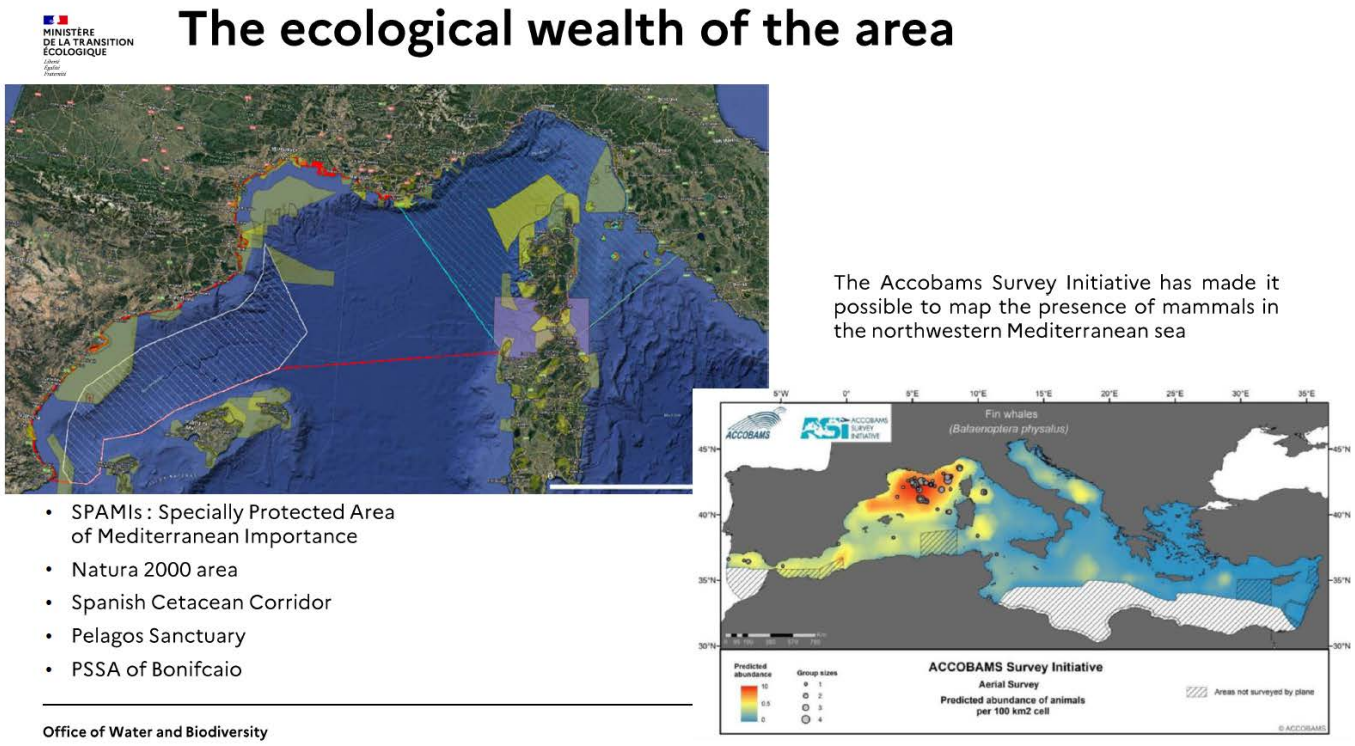

Figure 14. Location of the PSSA. Source: Ministry for the Ecological Transition of France.

The four countries are working together to decide the measures that would be implemented in that area. The aim is to create a "Memorandum of Understanding" by 2023 to harmonize and facilitate the collection of data.

Main associated measures of the proposal are:

- The recommendation of a speed limit of 13 knots for all vessels in the area.
- The recommendation of the use of infrared glasses to help detect cetaceans.
- The use of a device to warn of the presence of cetaceans between vessels.

Elsa presented the calendar including past and future events. At the moment of the event, the plan was to reach an agreement regarding the document which will be transmitted to consultations and to perform the consultation of stakeholders (national and internationals). In June it is expected that the stakeholder's consultation outputs will be integrated in the file and the consolidated IMO file will be presented. Finally, an agreement has to be reached with regards to the file to be transmitted to the IMO (by the end of June, 2022).

The main goal of the PSSA is not directly linked to UWN. The main subject is to reduce collision, but one of the measures is to reduce the vessels' speed which is related to the reduction of UWN and affects the communication between cetaceans.

QUESTIONS

There was a reflexion regarding one fact: if speed is reduced, ships will spend more time in the area, therefore, they will be producing less intense noise but in a longer period of time. It seems there is not a conclusive study regarding this issue. This is one of the information gaps to solve, as stronger scientific studies are needed.

Andrea Barbanti (CNR-ISMAR) asked whether the PSSA proposal stablishes just recommendations or restrictions. Elsa Jantet answered that that is still under discussion.

Eduardo Belda (UPV) pointed out that for these studies we normally use a static picture of cetacean distribution (i.e. ACCOBAMS data). He highlighted that we should consider what happens in different times of the year, where the abundance of sperm and fin whales' changes. Elsa Jantet answered that there have been a lot of discussion regarding this issue. They have tried to define areas and some periods where precaution need to be higher. The maritime traffic is really intense in summer, when most collisions happens. They couldn't find any study to make a more specific definition. It is not an easy task to be more precise. Eduardo Belda (UPV) added that there is a lack of knowledge about cetacean distribution throughout the year, if we cover the lack of knowledge, the measures taken could be more effective.

Caterina Fortuna (ISPRA) explained that if we look at the PSSA proposal as it is now, the measures proposed are voluntary. The region treasures 70% of fin whales population in summer when there is also the highest traffic density; therefore, when most collisions happens (especially coming from passenger vessels). At the moment, in the proposal there is a measure regarding the presence of the animals. If this is accepted, IMO will facilitate the approach for the

implementation of automatic systems by countries involved and measures to protect fin and sperm whales. The idea is to have an automatic system to warn ships that there is a PSSA in place and there are marine mammals; maybe in real time in the future. She specified that if we identify areas where collisions are really high, we could propose those areas to be avoided or to reduce the speed much more. Regarding the UWN, it is important to note the sort of noise because impulsive noise is able to kill some marine mammals, while continuous noise just disturbs them. Therefore, measures will be more focus to stop the impulsive noise.

Manuel Bou (IEO,CSIC) came back to the issue of the lack of knowledge regarding cetacean distribution. Sighting surveys are expensive but we could consider other kind of measurements and initiatives like Passive Acoustic Monitoring (PAM) and the sharing of information between countries. It is true that it is difficult to identify the species with PAM, but a cost-effective marine environment analysis could be conducted.

Elsa Jantet agreed with Manuel and added that they also have prospective measures. PAM is one of the methods that is being considered to have a better knowledge about the location of the animals.

3.7. ACCOBAMS - Designation of Critical Cetacean Habitats (CCH) – Léa David & Maylis Salivas

Maylis Salivas from the ACCOBAMS Secretariat started this presentation introducing ACCOBAMS and its geographical area, where all the parties countries need to implement a conservation plan to achieve and maintain a favourable conservation status for all cetaceans. She explained the concept of Critical Cetacean Habitats (CCH). This concept was coined in 2021, through the Resolution 4.15.

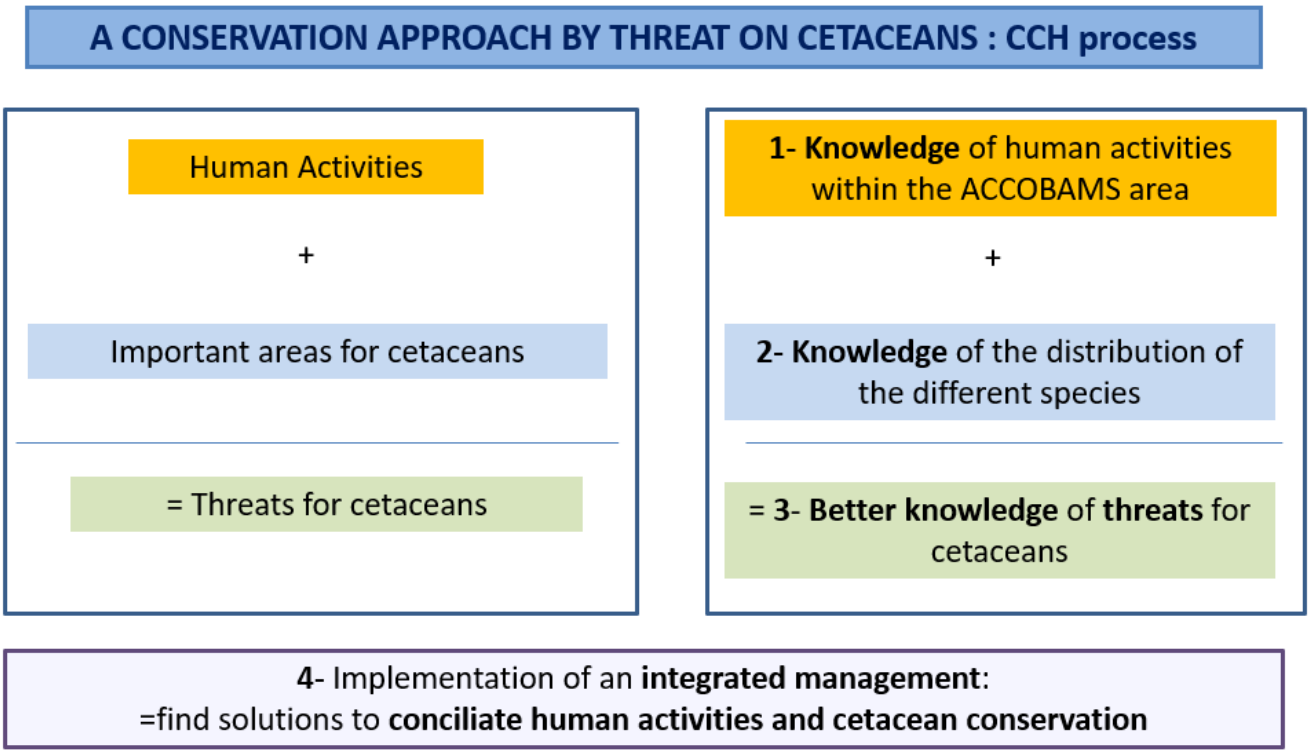

Figure 15. Critical Cetacean Habitats Process. Source: ACCOBAMS.

Within this CCH, it is requested to establish a (1) specially protected marine area (place-based conservation measures) and (2) other tools that face the threats, minimise them and contribute to a favourable state of cetacean's conservation in the region. By this purpose, 22 CCH were adopted in 2010.

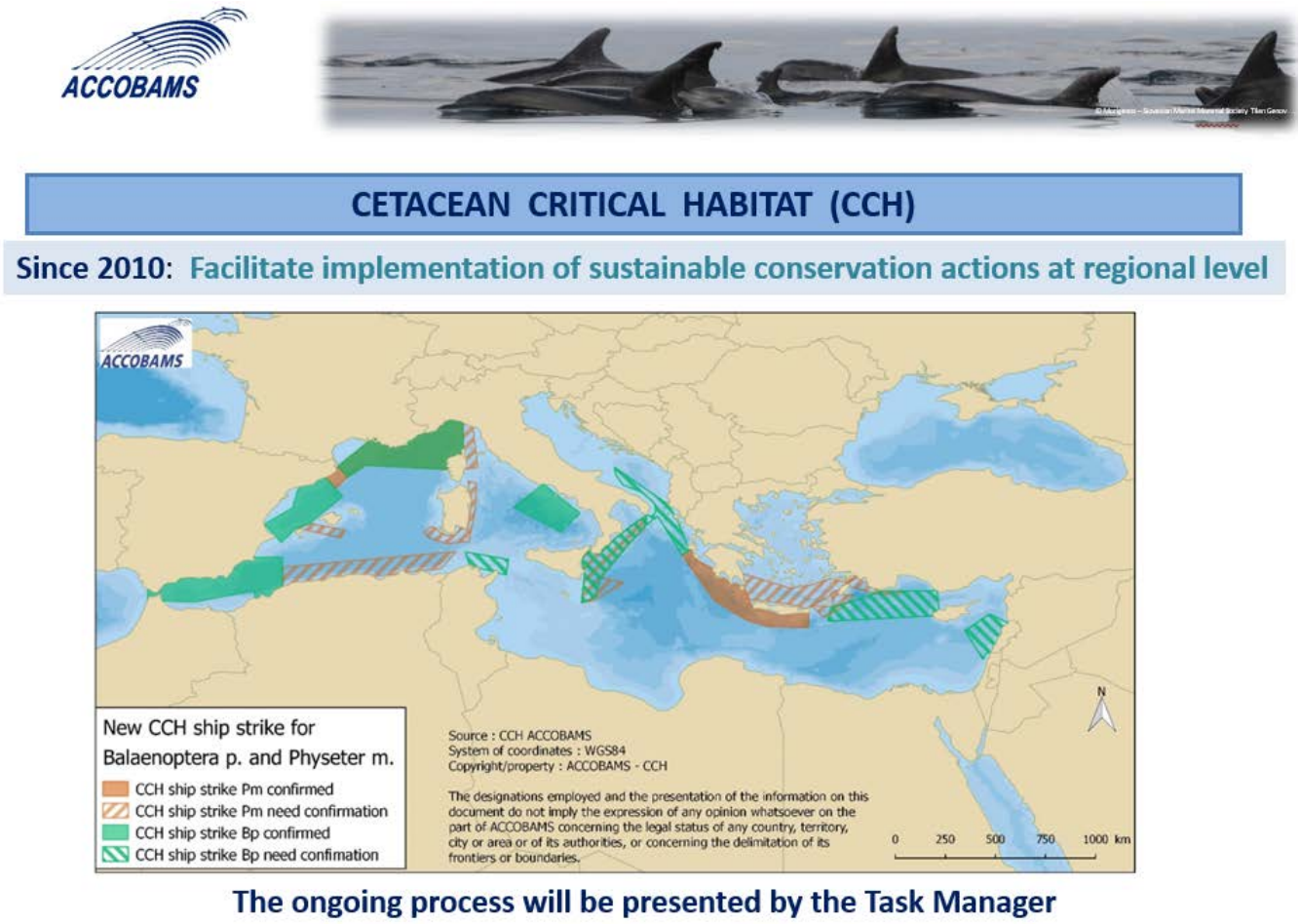

Figure 16. Critical Cetacean Habitats areas located in the Mediterranean Sea. Source: ACCOBAMS.

Léa David, from the ACCOBAMS scientific Committee and Task manager on conservation of CCH, took the floor to explain the aims of the CCH, which are:

- To build a collaborative science-based process with feedback validation
- To build an official communication tool towards Parties and stakeholders, as an interface between science and policy.
- To build a support to help in identifying where and what threaten cetaceans at regional level, to get a synoptic vision.
- To be used to identify suitable management measures (place- based, sectorial based) for an effective conservation of cetacean species.
- To launch implementation at regional level, complementary to any national initiatives in science, management and measures of conservation.

Cetacean Critical Habitat (CCH) refers to:

1. those parts of a cetacean's range that are essential for day-to-day well-being and survival, as well as for maintaining a healthy population growth rate"[5] .
    - Areas used by cetaceans for feeding, breeding, calving, nursing and social behaviour;
    - Migration routes and corridors and related resting areas;
    - Areas where there are seasonal concentrations of cetacean species;

Those definitions also refer to Important Marine Mammal areas (IMMA) and, in addition, CCHs also incorporates the concept of actual human activities and/or potential threats at the (sub)population level; "direct threats":

- Large commercial vessels (cargo, ferries, tanker…) => Ship strike, continuous noise
- Fisheries => Bycatch, depredation
- Whale-watching => Disturbance, Harassment
- Recreational vessels => Disturbance, Harassment
- Oil & Gas activity, coastal building, etc => Noise Hot-spots

The goal is to identify for each CCH suitable management measures (place-based, sectorial based) for an effective conservation of cetacean species and to mitigate the threats.

Therefore, a CCH is an area showing the **co-occurrence of species and pressures,** with a general risk exposure and with levels of confidence (based on expert's knowledge about the threats and impacts in their areas) where management and measures of conservation should be implemented.

She explained the CCH process and updates which is a clear and objective process using GIS tools and agreed rules that are transparent and reproductible for the updates. This process is not considered a study so it does not use raw data but processes existing results from the scientific community. The different agreed layers used during the CCH process will be uploaded on the NETCCOBAMS platform GIS page.

[5] Hoyt, Erich. (2011). Marine Protected Areas for Whales, Dolphins and Porpoises: A World Handbook for Cetacean Habitat Conservation.

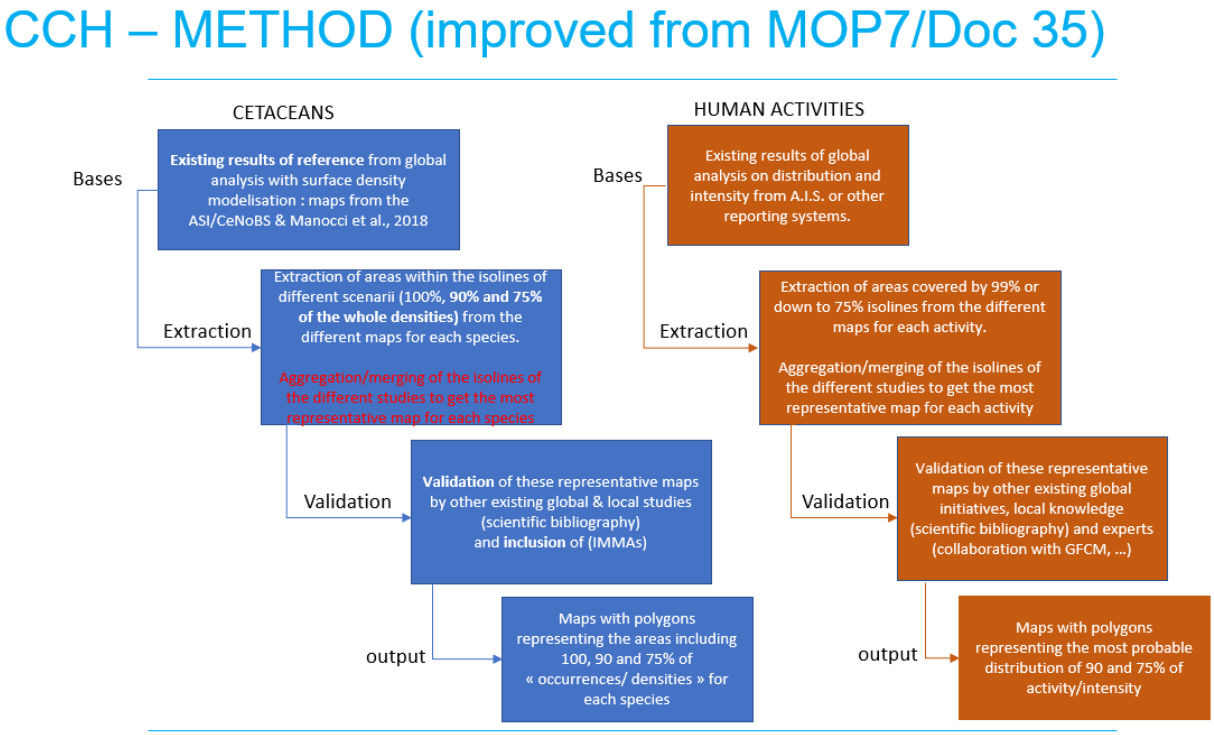

Figure 17. Methodology to identify the Critical Cetacean Habitats. Source: ACCOBAMS

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Léa explained the method to define CCHs:

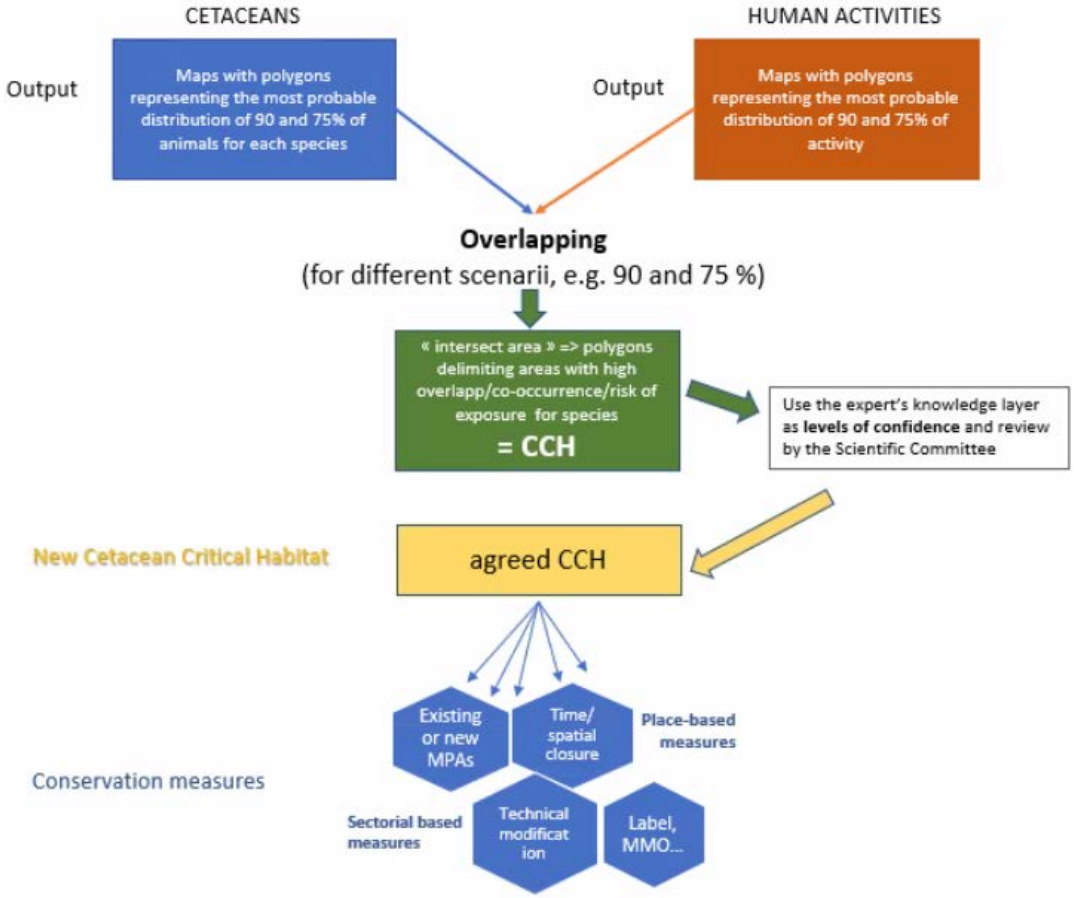

Figure 18. Part of the method to define Critical Cetacean Habitats. Source: ACCOBAMS.

Léa showed some examples of input data for studying cetaceans and its critical habitats that come from scientific results, validated, recognized and of reference for stakeholders. This data shows, for example, that France, Spain and Italy are responsible for the 70% of fin whale distribution in the Mediterranean. In this case, if we consider the intersection between this specie distribution and the maritime traffic, Algerian waters would need to be considered too.

Appropriate measures will depend on the overlapping area between maritime traffic and distribution of cetaceans; sometimes, in narrow areas, it is just a matter of moving the traffic line but in larger areas, it is necessary to apply different measures as mitigation measures (i.e. reducing speed).

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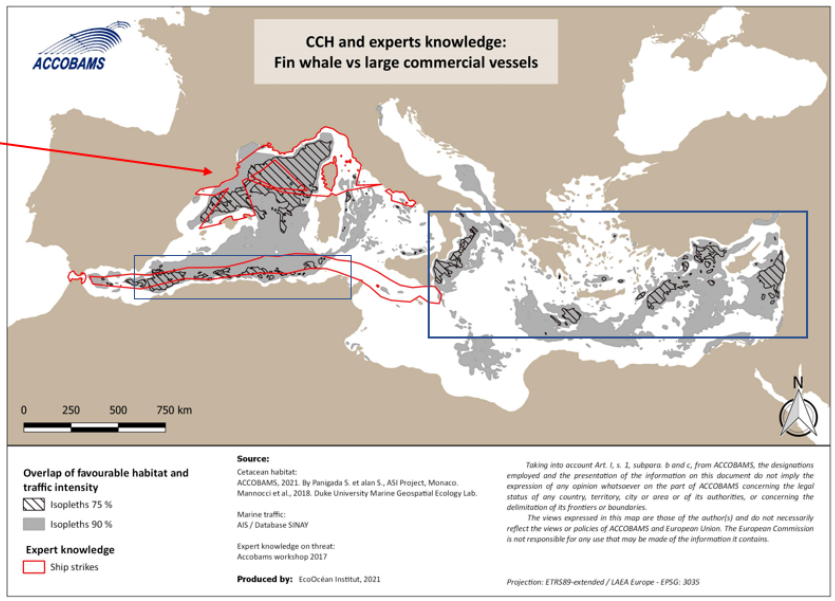
She showed different maps from the NETACCOBAMS PLATFORM showing the CCH – Marine Traffic for fin and sperm whale with a threat of continuous noise, although it is not a final result. They are still working with these data.

CCH – Marine Traffic / FIN WHALE
Threat = ship strike (+confidence from expert's knowledge)

« confident »=> agreed new CCH for this threat and this species



Potential or unknown CCH => Further studies on the topic needed

Figure 19. Critical Cetacean Habitats for fin whale. Source: ACCOBAMS.

The next steps they want to do it is to build cumulative threats maps (per species, per threats, per area, etc).

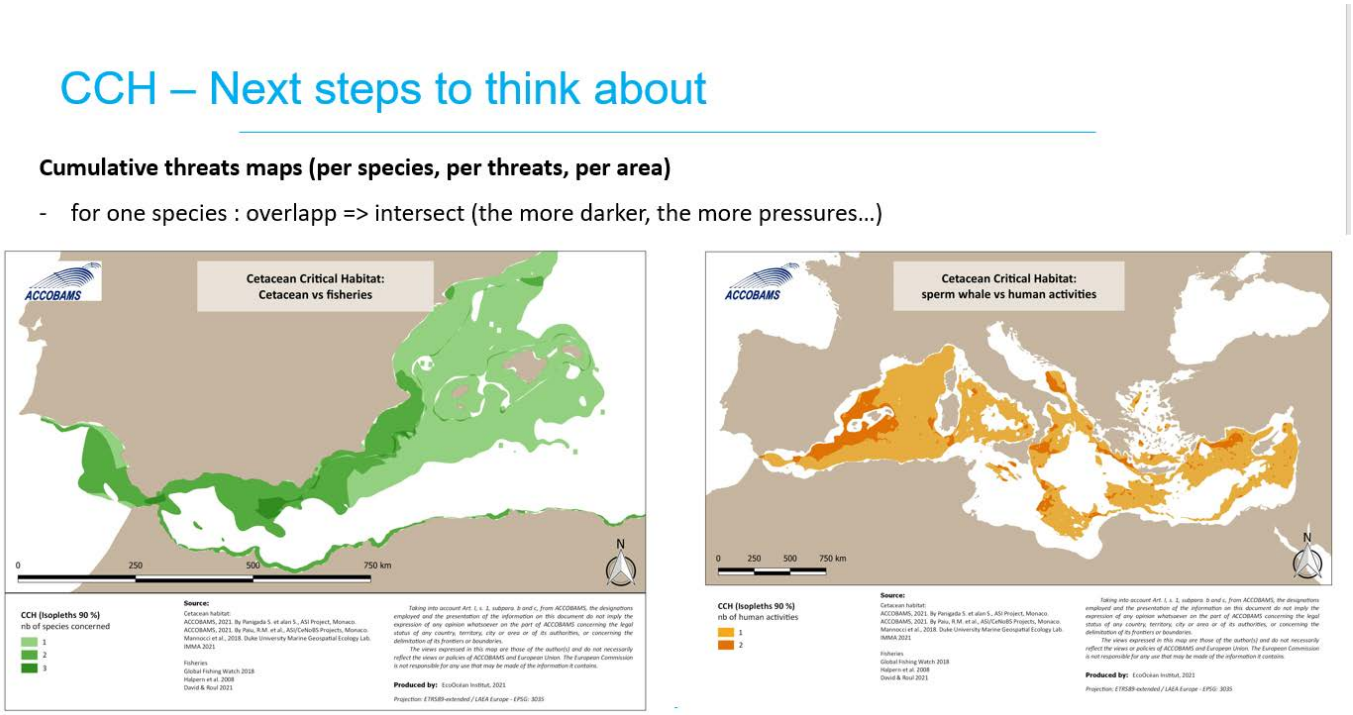


*Figure 20. Next steps for the analysis of Critical Cetacean Habitats. Source: ACCOBAMS.*QUESTIONS

QUESTIONS

There was no time for questions.

3.8. Recognition, integration and attribution: the importance of areas for environment and natural resources protection within the Italian MSP plan"– Fabio Carella & Daniele Brigolin (IUAV)

Fabio Carella and Daniele Brigolin, from the University of Venice (IUAV) shared the lasts updates regarding the Italian MSP plans. They focused their presentation on how different aspects concerning nature conservation were considered at the strategic level in the Italian MSP Plan. The Italian MSP plans were not finished, but public consultation and the Strategic Environmental Assessment (SEA) and the plans was occurring one month later. The two consultations were going to be carried out in parallel.

Daniele explained the organization of the process in Italy with IUAV, CNR and CORILA supporting the Ministry of Infrastructure and Sustainable Mobility, the Competent Authority (CA).

There are 3 maritime areas in the Italian MSP. The Western Mediterranean and the Tyrrhenian Areas are sub-divided in 11 sub-areas which can be categorized in coastal or offshore areas.

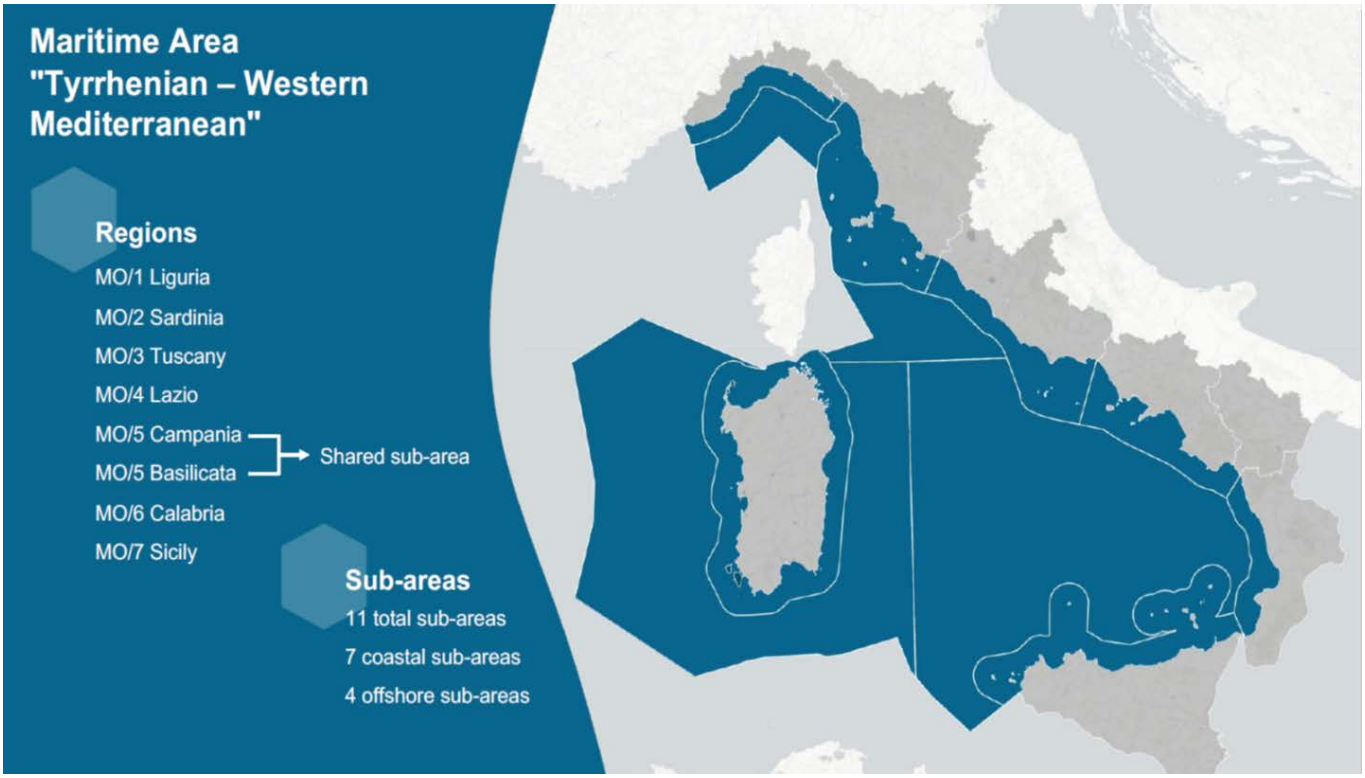


Figure 21. Tyrrhenian – Western Mediterranean maritime area for MSP Italian Plan. Source: IUAV.

The Plans are divided in 6 operational phases. The presentation was focused on Phase 4 (Strategic planning: vision, specific objectives, Planning Units and measures).

- Phase1- Initial status, current and expected trends
- Phase2 - Analysis of interaction between uses and impacts on environmental components
- Phase3 - Vision and strategic objectives
- Phase4 - Strategic planning: vision, specific objectives, Planning Units and measures
- Phase5 - Methodology and indicators for monitoring and adapting the Plan
- Phase6 - Activities to consolidate, implement and update the Plan

The workflow of the Italian MSP involves different levels of governance articulated and mediated by the Core Team of the Technical Committee, which results in several feedback loops thoroughgoing the different governance levels.

Regarding phase 1, the knowledge base, Daniele presented the main environmental features in the area (EBSAs, MPAs, Natura 2000 sites, Pelagos international sanctuary zone) and the main maritime transport routes referring the ones connecting the major islands and the main commercial and passengers' routes. He pointed out that the interaction between both aspects may present many different features in the area.

In relation to marine mammals, the plan identifies the areas with the principal interactions between maritime traffic and marine mammals. There were three hotspots for this interaction, the Bonifacio Strait, where a PSSA was constituted in 2011, the Toscana coasts and the Messina Strait area.

Fabio Carella presented the planning phase (phase 4). The outcome of three first operational phases brought them to define the Planning Units (PUs). Identified PUs were assigned to one of the following four categories, providing an increasing level of exclusive use of the area:

- **Generic (G) PU** areas where all maritime uses area allowed and equally considered, with specific regulation mechanisms aiming to guarantee safety, reduce and control environmental impacts and favour coexistence between uses.
- **Priority (P) PU**: areas for which the MSP plans identify priorities for existing or developing uses, also indicating the other uses to be guaranteed through specific regulation mechanisms.
- **Limited (L) PU**: areas where a prevalent use is indicated, with other uses that may be present, with or without specific limitations, if and as far as compatible with the prevalent use.
- **Reserved (R) PU**: areas reserved for a specific use. Other uses are permitted exclusively for the needs of reserved use or in case of specific concessions provided by the manager of the reserved use (i.e. for the Navy).

The set of criteria to identify these areas were:

- Intensity of **existing maritime uses** and on-going trends of their future evolution;

- Desired evolution of existing and **new uses** (e.g. offshore renewable energy, allocated zones for aquaculture); Distribution of **main environmental components,** as in particular key habitats (e.g. seagrass meadows, coral reefs, rocky outcrops), marine protected areas, Natura 2000 sites and other forms of nature and biodiversity protection (including OECMs, like fisheries restricted areas FRAs and Biological Protection Zones);

- Presence of **landscape and cultural heritage** of significant value, considering both the land and marine components of the coast, as well as major underwater cultural heritage sites;

- **Conflicts and synergies among different uses** and between uses and the environment and the landscape, detailing at the level of SA the analysis performed by Phase 2.

- Areas with intense land-sea interactions (so called **LSI hotspots,** e.g. major ports) emerged from the Phase 1 analysis.

Fabio showed the result of the application of these criteria in the Tuscany region and in Sardinia and detailed why and how each PU was identified.

The main criteria used for PU delimitation are based on the analysis of the interaction between “environmental protection and natural resources” and other activities occurring in the area. They are aware that in some PU there are activities that have conflicts with one another. That is the reason because they settled them together in order to try to mitigate this conflict and regulate them trying to find synergies and protecting biodiversity.

In total, for the Tyrrhenian there are 178 PUs, most of them nature-prioritized or reserved. And there are other 12 PUs in offshore areas to guarantee maritime transport and conservation. They also tried to give a continuity between offshore and coastal areas in order to keep the nature connectivity.

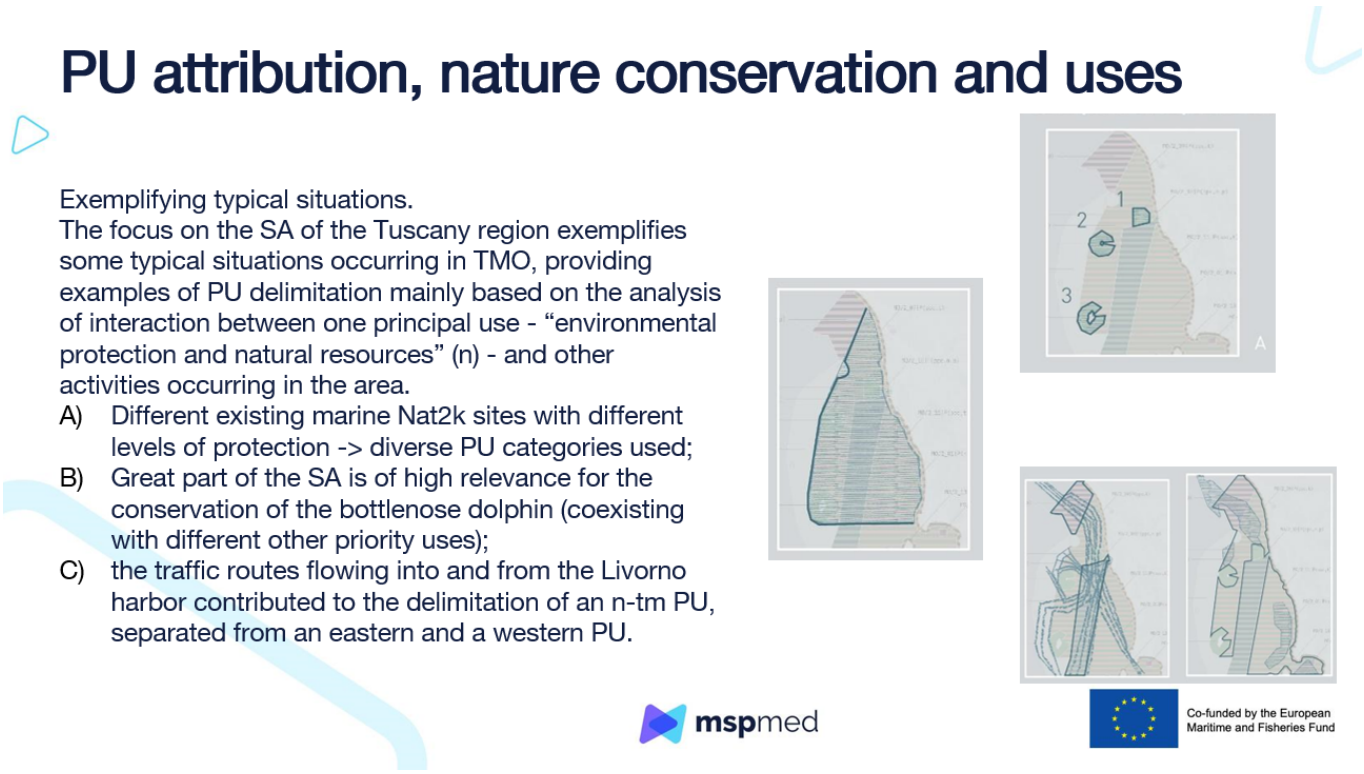


Figure 22. Nature conservation and maritime uses interaction in Tuscany region. Source: IUAV.

Regarding measures, Daniele explained how the identification of measures were conducted at a national level but in close collaboration with the Regions, addressing the strategic objectives of the plan. These measures taking into account the interaction between uses. Regions are designing measures at the scale of sub-area dealing with specific objectives. To illustrate and explain deeply the process of implementing the different measures through the strategic objectives, he showed different measures implemented through the distinct strategic objectives.

QUESTIONS

Cristina Cervera (IEO,CSIC) asked whether in the PUs where maritime transport and nature conservation coexist. They coexist because there is no alternative, if she understood well. She

understood that these areas are not catalogued as that because of the presence of cetaceans. Daniele Brigolin (IUAV) answered that it could happen, that there are areas where marine mammals can live (not coexist) with maritime transport, although they are not hot spot areas for cetaceans, they might have other features important for nature conservation.

4. PARTICIPATORY SESSION - Discussion on how presented works could contribute to each other

Cristina Cervera (IEO,CSIC) explained how the participative session was to be conducted. It started with a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the initiatives presented during both days (the underwater noise technical workshop and the Trilateral meeting between Italy, France and Spain dedicated to the "Underwater noise assessment for decision support in MSP and related policies") and it was followed by the answering of some key questions.

4.1. SWOT analysis

Examples of each feature of the SWOT analysis were provided to the participants in order to facilitate the analysis (Table 1) and a discussion was guided to identify more, either out loud, written in post-its or written in the chat of the videocall platform, for those in remote *(Image 23*).

Image 23. Cristina Cervera (IEO,CSIC) reading the results of the SWOT analysis. Source: IEO, CSIC

Table 1. SWOT analysis

STRENGTHS	WEAKNESSES
Example: Transboundary initiatives bring together resources and capabilities (i.e. human or economic) that separately would not achieve the same results. (1+1=3.). Contributions of the participants: • A strong and well-established network of experts exists on these topics. • Collaboration for scientific publications. • Collaboration in terms of standardization – using a common language. • Synoptic view/regional view/ "neighbouring" view/global view leads to "better" understandings and "better" measurements.	*Example: The no binding/ just informative character of transboundary projects.* Contributions of the participants: • PELAGOS – Not centralized govern body – countries responsibilities. • Related to AIS-based analyses – not considering small vessels without AIS. • Needs for studies regarding – what is worst – longer time with low noise intensity or shorter time but high intensity. • Lack of seasonal studies regarding cetacean's distribution. • Lack of standardization in the different studies and lack of expertise. The complexity of tackling many different impacts from many distinct activities, and the resources and temporal scope needed for the evaluation of this issue, makes it difficult to produce concrete and specific recommendations and guidance for competent authorities. In summary: data gaps and resources needed to fulfil them. • UWN is too specific for strategic plans (at least for the 1st implementation). • Knowledge gaps on impacts on different species. • Legal validity of the data? • Lack of understanding on the 3-dimensional effects of noise. • MSP gather too many sectors, interests and principles (nature, landscape) that it might be ineffective. • Lack of collaboration/exchange of information between all relevant entities / national policy matters. • Lack of knowledge about the adverse impact of noise over other kind of species, not only cetaceans. • Lack of standardization when evaluating adverse impact on the species attending to

	characteristics such as, sound sensitivity, mating species etc. • Uncertainty associated to data variability and threshold selection is still making it difficult to convert the analysis into simple policy indications.
OPPORTUNITIES	**THREATS**
Example: Transdisciplinary meetings, like this one, could help to stablish a dialogue to bring closer the science-to-policy interface, science-to-science approach, interdisciplinary (cross-cutting approach). *Example: Creation of permanent transboundary thematic working groups.* <u>Contributions of the participants</u>: • The creation of a database with the hydrophones' location (Passive Acoustic Monitoring-PAM) to collaborate and share data and platforms. More cost-effective. • To develop a "general" platform with all relevant info available. To take advantage of existing regional tools such as NETCCOBAMS. • Existing initiatives regarding evaluation of noise produced by vessels without AIS. • To address multiple pressures – i.e. collisions + underwater noise. • Seasonal scenarios- maybe we are making more noise during a period when there are no so many cetaceans. • Operationalizing methods. • Opportunity of joining the Spanish Cetacean Migration Corridor and the Pelagos Sanctuary. • The monitoring of noise due to the MSFD implementation brings the opportunity to obtain noise levels coming from different anthropic sound sources, together with the biological activities; this may facilitate to obtain the correlation between them. • Comparison/Calibration of shipping noise modelling. • Sharing processed data: o Ambient noise maps. o Marine mammals' detection (i.e. NETCCOBAMS).	*Example: The lack of support in the long term for transboundary projects. When a project ends, most times, the work performed does not continue.* <u>Contributions of the participants</u>: • Reduction speed measures – vessels spending more time in the area- more noise but less intense. • Derive the costs and benefits amongst regions (some may suffer the costs but others receive the benefits). • Egotic people might avoid or try to take the lead! Less work for some or works differently. • Making governance levels (regional and transnational) working together to solve transboundary issues is time consuming. • To generalise data: Work should be done with different scenarios, which means, with different species, speeds, vessels, etc.).

• Joint studies on impacts and cumulative impacts. • Acoustic-based monitoring tools and data for EBM in MSP. • Recommendation for EU projects: to have a first meeting with leaders of previous projects to share their knowledge (Success, etc) + data. • Collaborative people will be more necessary and validated. • Development and sharing of guidelines, recommendations and synthesis documents for policy makers based on the results of the projects/initiatives, thus allowing better informed decisions/planning. • Experts on MSP could join a Pelagos WG on impacts to present relevant (to Pelagos) preliminary results and analysis to explore if the Pelagos Agreement can facilitate technical discussions and exchange of data to improve the analysis. • Link of noise data with geographical and socioeconomic information so as to be able to assess the direct impacts of noise. • In situ data from one project can be used to validate a model from another project. • MSP and research studies (such as those on underwater noise) can help the implementation of the strategic plans at a regional level. • Is it possible to identify good practices for transferring the exercise made for the marine mammals/transport interactions to other uses? How to improve key reference scientific communities?	

The first **conclusion** that can be drawn from the contributions of the participants is that it seems to be **plenty of opportunities to capitalize on, while cons are mostly associated to internal characteristics of the** processes (weaknesses). **Strengths** refer mostly to the **added value of having multiple experts from different countries and institutions sharing data and expertise, common and multi perspective understanding**. **Weaknesses** are related mostly to **gaps of data and knowledge/methodologies and the complexity of managing the exchange of data among countries and the needed governance system efficiently**. The **science to policy interface** is also mentioned as a **challenge** it is difficult to “translate” outputs of these kind of analysis into decisions. **Opportunities**, as already mentioned, seem to be numerous, from the **creation of common platforms of data exchange, development of joint studies and collaboration among different initiatives**. Finally, **threats** are related to the **distribution of**

costs and benefits of measures, the loosing of information due to generalization (less detailed/broader analysis) and the **difficulty of coordinating different governance levels**.

Catarina Fortuna (ISPRA) wanted to specify an aspect that was written as a weakness: "*PELAGOS – Not centralized govern body – countries responsibilities*". She appraised that if you consider PELAGOS as a SPAMI or MPA that statement is totally true, but in relation to PELAGOS AGREEMENTs, it should be seen as a precursor of a regional MSP planning exercise. Each country would be responsible of applying the agreements.

She also wanted to make a comment about another weakness "*Related to AIS-based analyses – not considering small vessels without AIS data*". She said that in some regions, the signal of AIS is not equally distributed. This fact could lead to a BIAS. In some areas there are no signal receivers and it could be mistaken as areas with no maritime traffic, which has nothing to do with the reality.

There was also a general thought about the need for more collaboration between countries and sectors (active dialogue between experts working in maritime transport, biodiversity, fisheries, etc.). There is public data available in some platforms but there is a need for more cooperation between people working on different areas (e.g. MSP; biodiversity; fisheries, etc.). Each topic is complex and needs to be understood with a holistic and integrated perspective which is difficult. Cooperation is a cross-cutting approach to put the right people in the studies. This is seen, then as a strong weakness.

With respect to the threats, Benjamin Olivier (Shom) stated that traffic noise is sort of introducing pollution in the environment. Reducing the speed of vessels would contribute with less noise into the environment, although it cannot be quantified yet how much.

Léa Dávid (ACCOBAMS) added that this is in terms of the noise itself but we do not know if it is better for the animals. It is unknown if they prefer become less stressed with less noise more time or the other way around and it will probably depend on the species, the vessels, the frequency, etc. We still do not know the effect on the cetaceans, so this aspect should be included as an uncertainty.

4.2. Key questions

The last session consisted in answering two key questions prepared to foster the discussion.

1. How these initiatives could contribute to each other? (project-project/ project-D11 national implementation)

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- Corridors' design → experience dealing with connection of MPAs in Spanish waters and Pelagos, even though PSSA could provide useful insights for the design of corridors in other areas.
- Specific studies (such as underwater noise pollution) can help national plans and their related hotspots to get more in detail multiple impacts in a very specific area.
- Projects on Underwater Radiated Noise (Saturn) should contribute to shipping noise modelling, evaluation of vessels speed reduction, etc.
- In situ data from one project can help to validate the model of another project (ej. Chorus data to validate MSPMED model in the Gulf of Lions)
- The WestMED initiative could contribute to this noise assessment through specific projects that will be developed under its Sustainable Maritime Transport working group. Noise could also be studied under the WestMED Sustainable Aquaculture Group (AQUA WEST)
- All national, sub-regional or local studies could feed the regional view (better if same methodology is used)
- To carry out specialized and periodic practical workshops like this one (in the framework of European projects and beyond) in order to share information and experiences and to create an experts/planner's network interested in the matter.
- To create a partnership/propose a project to guide implementation of noise-related data into MSP

2. Main lessons Learnt from your initiatives that could be extrapolated to other processes (i.e. MSP processes; MPA designation, etc.)

- What we Learnt in MSP is the capacity and importance of sharing approaches among states.
- Methodology used for the identification of CCHs and associated uncertainty to be extended to other pressures
- Better three different studies (FR, SP, IT) showing similar results or one study done in cooperation in order to convince decision-makers?
- MSP and "maritime traffic" people can exchange/work with "cetaceans" people rather than doing twice the same exercise.

Léa David (ACCOBAMS) wanted to add that it is essential to set how results are legally validated or being used for decision making. Sometimes, there are a lot of projects done in a same area that it is not even necessary to give the information when it is the chance to have a dialogue between stakeholders.

5. Conclusions and farewell

To wrap up, it is important to highlight some aspects. To start, **collaboration could be seen as a cross-cutting issue included in the four categories of the SWOT analysis**. Firstly, it could be a **strength** because there is already a broad network on experts of MSP aspects, as a **weakness** when there is a lack of collaboration and exchange of information; joining studies and creating a general platform to share knowledge could be seen as an **opportunity** and would lead to cost-effective processes and projects and, finally, it could be seen as a **threat** because, on the one side, it could be truly difficult to coordinate with all the experts/countries of each sector.

An aspect that has been **highlighted is the need of using the results of the regional/national/transboundary projects for the following ones**. It is important that valuable methods, data, results and/or conclusions are not lost on the way. There should be a continuous feedback coming from different projects, institutions, experts, etc. that **feed on the new projects to increase efficiency and effectiveness**. About this aspect, a debate was generated because usually there is no time to read all the deliverables and reports from previous projects; therefore, **performing meetings** to share the most important information to be considered in the upcoming projects would be highly recommendable.

Some of the participants agreed on the **need of adding a new category to the SWOT** analysis for some aspects. For example, although this issue was labelled as a weakness there is an **uncertainty** associated to data variability and threshold selection that makes it difficult to convert the analysis into simple policy indications. Within this category it could be found the uncertainty about what it is better, a longer and less intense noise or a stronger but shorter one, in general terms and in relation to reduction speed measures and if these standards affect in the same way to all the species.

A relevant **recommendation** was received, that could be labelled as a threat as well. Work should be done with different scenarios, which means, with different species, speeds, vessels, etc.) because what it might be beneficial for one species under certain conditions, could not be for another one.

As additional relevant conclusion, the following aspects should be included: **It is necessary to include the impacts of small vessels in the different studies, to integrate continuous noises in the different projects; now the focus is on radiant noise**. **The importance of the transboundary collaboration in the scientific and policy making process is essential for establishing areas to protect cetaceans and other migrating or moving species** (that do not respect jurisdictional borders). In order to avoid the execution of the same works/projects, it is important to **share locations and objectives of the different research projects that are being carrying out and whose data could be used for other initiatives**. As the last aspect, it is essential to **create and promote a stakeholders' network**, including previous project proposals, future and ongoing initiatives, etc.

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To end up, Cristina Cervera (IEO,CSIC) thanked the assistance and contributions of every participant, both in presence and online and offered the availability of the MSP group in IEO (CSIC) to solve any doubt or receive any suggestion and to continue with the collaboration.

**In annex III there are the results of the satisfaction survey sent to the participants after the Underwater noise workshop and the Trilateral Meeting.*

Annex I- Agenda

11th May - Trilateral Meeting Italy-France-Spain	
9:30 – 10:00	**Welcome & round of introduction of participants**
PART 1 – INTRODUCTION AND WARM UP SESSION	
10:00 -10:20	**H2020- SATURN -** The integration of underwater noise in MSP – *Andrea Barbanti (CNR-ISMAR)*- ON LINE (15'+ 5' Q&A)
10:20 - 10:40	**MPA (SPAMI)- Cetacean Migration Corridor of the Mediterranean –** Roadmap towards the management plan and preventive measures – *Jorge Alonso / Elvira García (MITERD)*-ON LINE (15'+ 5' Q&A)
10:40 – 11:00	**PELAGOS SANCTUARY -** The importance of a transboundary approach for cetacean's protection - *Costanza Favilli* (15' + 5' Q&A) – ON LINE
11:00 - 11:30	**COFFEE -BREAK**
PART 2 – WORKING SESSION	
11:30 – 11:40	**MSPMED project and Gulf of Lions Case Study –** *Mónica Campillos (IEO, CSIC)* (5' + 5' Q&A)
11:40 – 12:15	**MSPMED Gulf of Lion case study - Underwater noise –** *Manuel Bou (IEO, CSIC)* (15' + 10' Q&A)
12:15 -13:15	**Issues of common concern: Practical examples and sharing of good practices.** - PSSA proposal in the North Western Mediterranean Sea – Elsa Jantet (15' + 5' Q&A) – ON LINE - ACCOBAMS - Designation of Critical Cetacean Habitats (CCH) – *Léa David & Maylis Salivas* (15' + 5' Q&A) - Recognition, integration and attribution: the importance of areas for environment and natural resources protection within the Italian MSP plan"– Fabio Carella/ Daniele Brigolin (15'+5' Q&A)
13:15 – 14:30	**LUNCH**
14:30 – 16:00	**PARTICIPATIVE SESSION** **Discussion on how presented works could contribute to each other** • *SWOT analysis* • Key questions: o *How these initiatives could contribute to each other? Looking for synergies*

	o *Main lessons Léarnt from your initiatives that could be extrapolated to other processes (i.e. MSP processes; MPA designation, etc.)*
16:00	**Conclusions and farewell**

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Annex II – List of participants

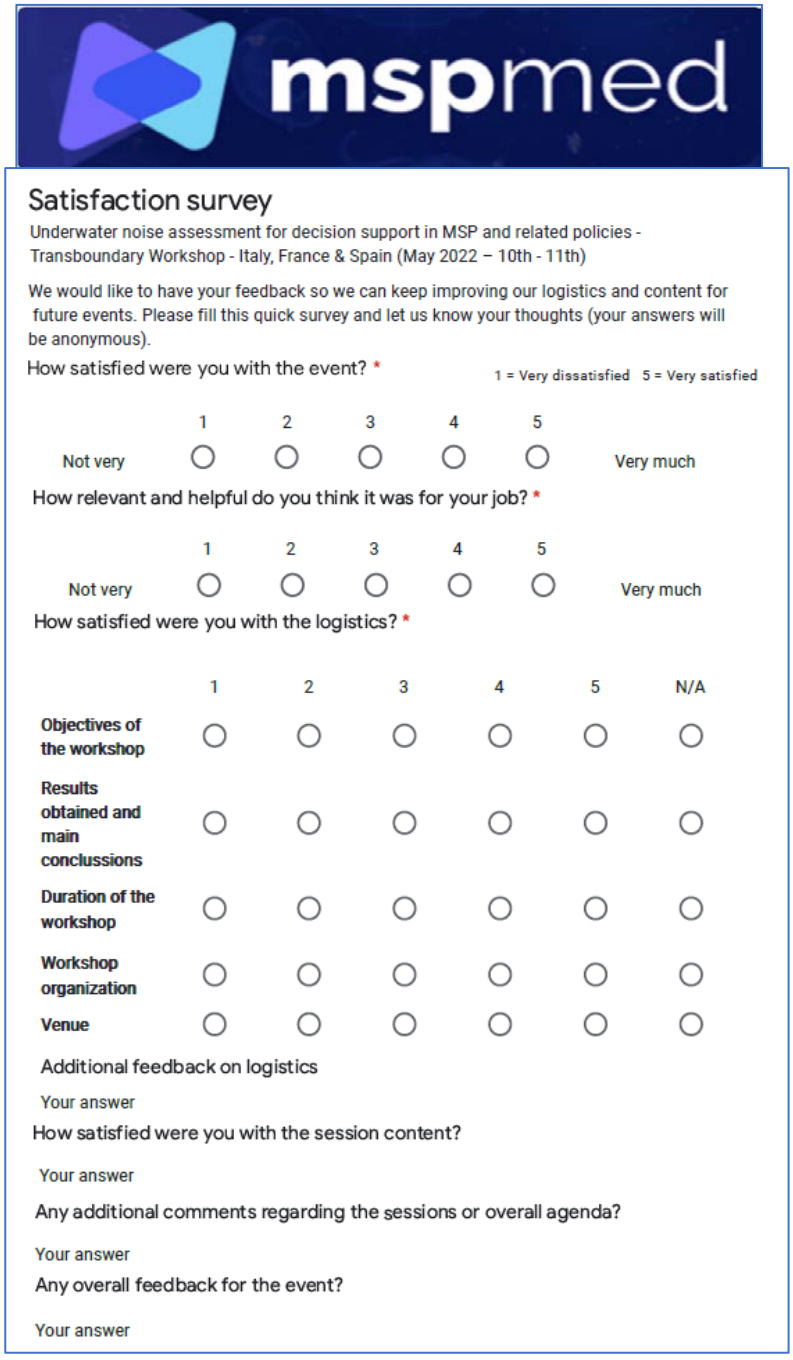
In presence	
Name and surname	**Institution**
Manuel Bou-Cabo*	IEO, CSIC
Elena Gutiérrez-Ruiz*	IEO, CSIC
Mónica Campillos-Llanos*	IEO, CSIC
María Gómez-Ballesteros*	IEO, CSIC
Cristina Cervera-Núñez*	IEO, CSIC
Daniele Brigolin	IUAV
Aurora Mesa	DGCM - MITERD
Maÿlis Salivas	ACCOBAMS
Armelle Sommier	Shom
Folco Soffietti	IUAV
Benjamin Olivier	Shom
Víctor Espinosa	UPV
Martina Bocci	IUAV
Fabio Carella	IUAV
Léa David	EcoOcéan Institute ACCOBAMS
On line	
Jorge Alonso	MITERD
Andrea Barbanti	CNR
Caterina Fortuna	CNR /Pelagos Sanctuary Agreement
Eduardo Belda	UPV
Federica Pace	-
Giulio Farella	CNR-ISMAR
Maite Hernández	MITERD
María Ceraulo	-
Marta Pascual	EU MSP Assistance Mechanism

Marta Picciulin	CNR
Noé Swynghedauw	-
Noemi Vidal	-
Noémie Duron	-
Thomas Folegot	Quiet-Oceans
Silvana Neves	-
Sofia Bosi	CNR-ISMAR
Soledad Manzanares	MITERD
Thanos Smanis	EU MSP Platform
Yves Henocque	EU MSP Platform
Guillermo Lara	IEO, CSIC

Annex III – Satisfaction survey

After the Underwater noise workshop and the Trilateral meeting between Spain, Italy and France, a satisfaction survey was sent to evaluate the degree of satisfaction of the events held.

The following are the questions asked to the participants:



Satisfaction survey

Underwater noise assessment for decision support in MSP and related policies - Transboundary Workshop - Italy, France & Spain (May 2022 – 10th - 11th)

We would like to have your feedback so we can keep improving our logistics and content for future events. Please fill this quick survey and let us know your thoughts (your answers will be anonymous).

How satisfied were you with the event? *

1 = Very dissatisfied 5 = Very satisfied

	1	2	3	4	5	
Not very	○	○	○	○	○	Very much

How relevant and helpful do you think it was for your job? *

	1	2	3	4	5	
Not very	○	○	○	○	○	Very much

How satisfied were you with the logistics? *

	1	2	3	4	5	N/A
Objectives of the workshop	○	○	○	○	○	○
Results obtained and main conclussions	○	○	○	○	○	○
Duration of the workshop	○	○	○	○	○	○
Workshop organization	○	○	○	○	○	○
Venue	○	○	○	○	○	○

Additional feedback on logistics

Your answer

How satisfied were you with the session content?

Your answer

Any additional comments regarding the sessions or overall agenda?

Your answer

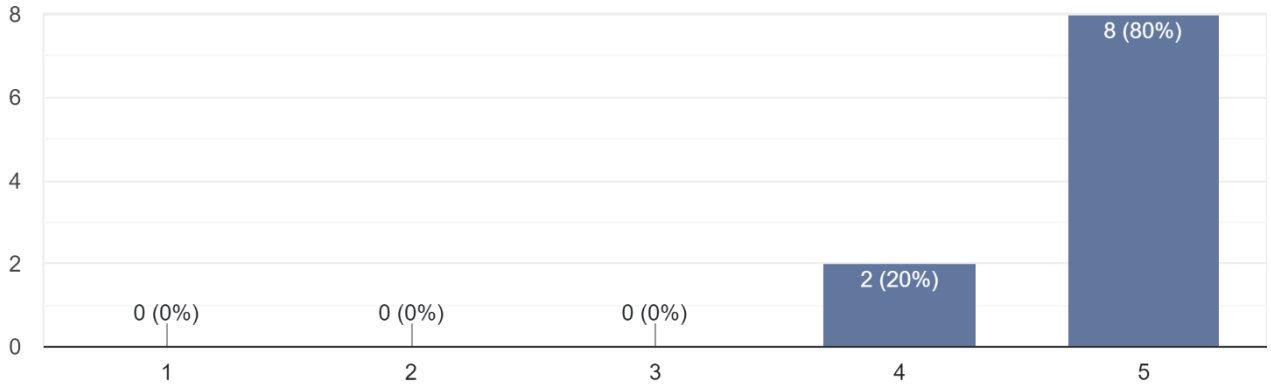
Any overall feedback for the event?

Your answer

In total, 10 responses were received:

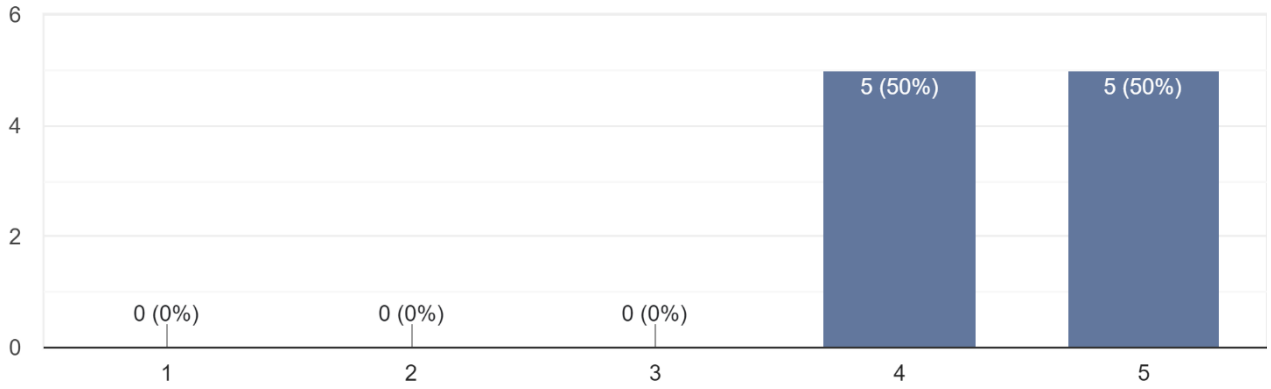
How satisfied were you with the event?

10 responses

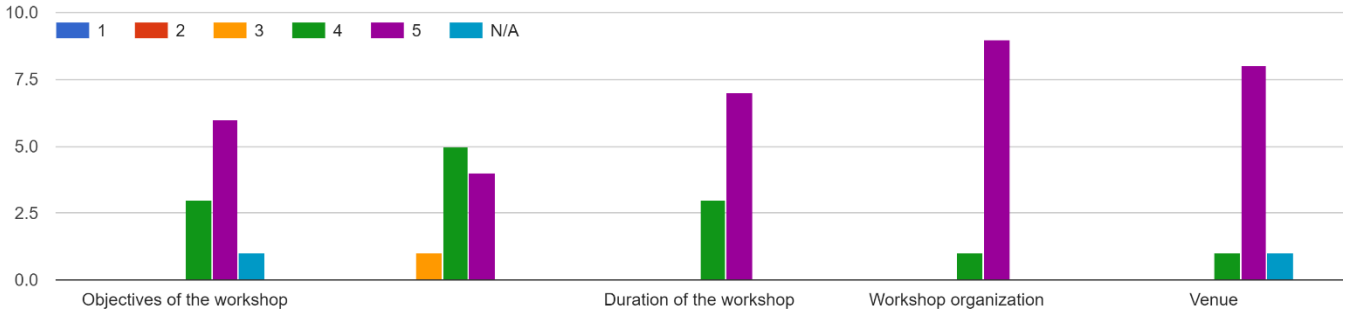


How relevant and helpful do you think it was for your job?

10 responses

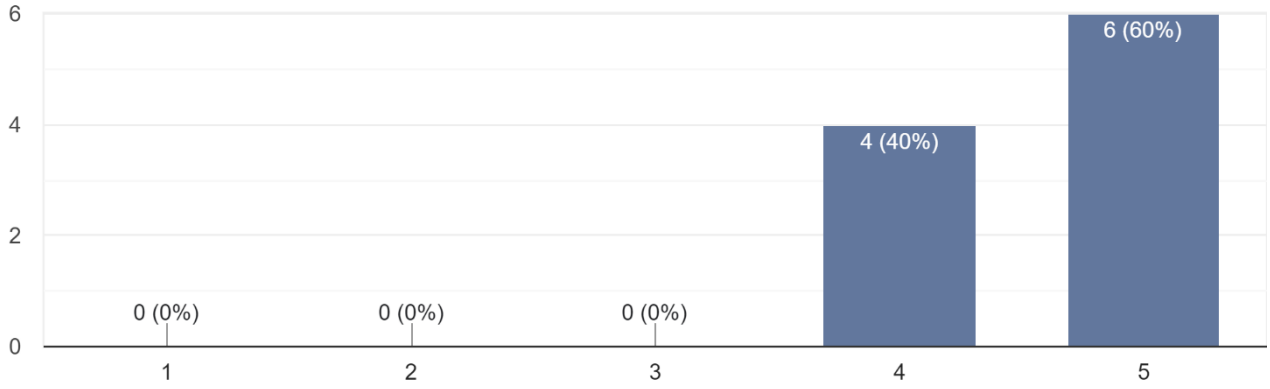


How satisfied were you with the logistics?



How satisfied were you with the session content?

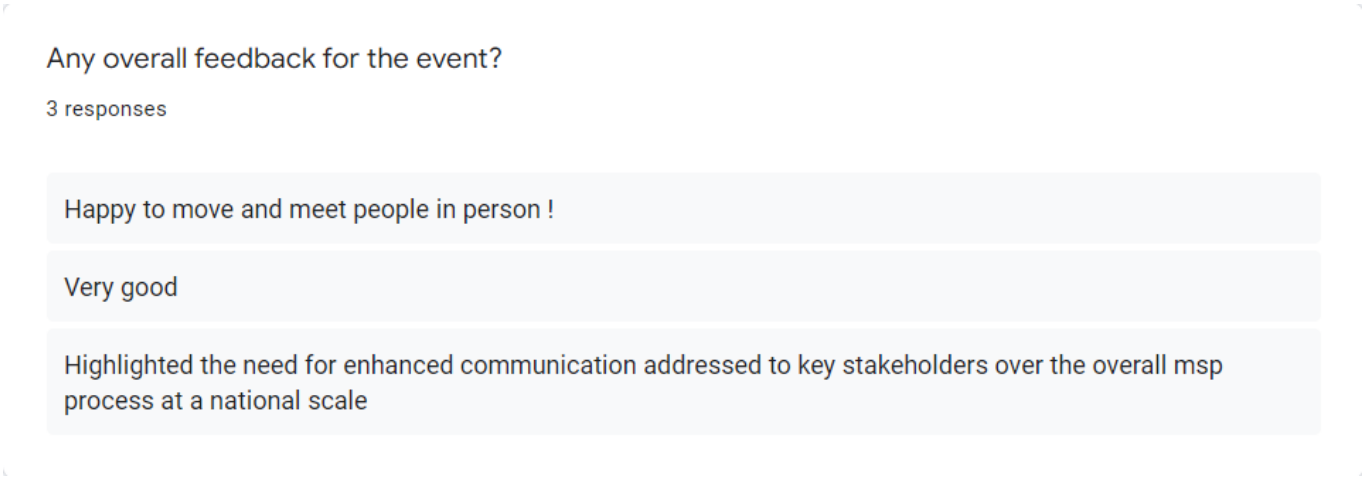
10 responses



Any additional comments regarding the sessions or overall agenda?

1 response

One thing I do for "my" workshop is that I send questions they have to think about before the workshop, even ask all people presenting their work to add a slide where they present some ideas on the subject (here it could have been : which synergy you imagine between your project and other existing project or new ones)....so they are more involve and already have thought on the main points...



IEO(CSIC) MSP team are taking into account this information obtained from the survey to improve future events.