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Agenda Item 7: Status of implementation of the Ecosystem Approach (EcAp) Roadmap

7.1. Implementation of the second phase (2019-2021) of the Integrated Monitoring and Assessment Programme (IMAP - Biodiversity and non-indigenous species) in the framework of the EcAp Roadmap

Implementation of the second phase (2019-2021) of the Integrated Monitoring and Assessment Programme (IMAP - Biodiversity and non-indigenous species) in the framework of the EcAp Roadmap

Appendix B: Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Marine Mammals

UNEP/MAP
SPA/RAC-Tunis, 2021

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LEXICON

1. Definitions used in Summary Tables

Primary monitoring tool or scale: "Primary" here means the necessary (mandatory) monitoring tool and scale to assess EcAp/IMAP GES Common Indicators for marine mammals as approved by the Parties. Establishing primary monitoring tools does not impede contracting parties to use additional methods ("secondary" or new tools), knowing that those will answer other questions than those related to EcAp and IMAP reporting.
Secondary monitoring tool or scale: "Secondary" does not mean the "second-best" method or monitoring scale, but it indicates a method that applied to a different scale allows gathering complementary data that helps filling knowledge gaps, which will help correcting adaptive processes as, in this case, EcAp and MSFD. These "secondary" methods and scales are important in the long-term, but do not allow to assess EcAp/IMAP GES Common Indicators for marine mammals.
Voluntary monitoring tool: These are other data collection tools that can be used for marine mammals, better if applying existing guidelines (UNEP MAP 2019) and in an international cooperation programme. Even though they will not produce useful information to assess the GES in the short-, medium- or long-term, they can produce useful information to manage human-uses of the sea at a national or smaller scale.

2. Acronyms

A: Adriatic sub-region.
ACCOBAMS: Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area.
AL: Aegean-Levantine sub-region.
BC: Barcelona Convention.
CCI: Candidate Common Indicator.
CI: Common Indicator.
CORMONs: Correspondence Groups on Monitoring.
EcAp: Barcelona Convention Ecosystem Approach policy.
EO: EcAp/IMAP Ecological Objective.
EU: European Union.
FAO: Food and Agriculture Organization of the United Nations.
GFCM: General Fisheries Commission for the Mediterranean.
GSA: Geographical Subareas.
HD: Habitats Directive.
HELCOM: Convention on the Protection of the Marine Environment of the Baltic Sea Area - Helsinki Convention.
ICES: International Council for the Exploration of the Sea.
ICM: Ionian and Central Mediterranean sub-region.
IMAP: Barcelona Convention Integrated Monitoring and Assessment Programme.
IWC: International Whaling Commission.
MEDPOL: Programme for the Assessment and Control of Marine Pollution in the Mediterranean.
MAP: Mediterranean Action Plan.
MSFD: Marine Strategy Framework Directive.
OSPAR: Convention for the Protection of the Marine Environment of the North-East Atlantic.
PAP/RAC: Priority Actions Programme Regional Activity Centre.
RSMS: Regional Strategy for the conservation of Monk Seal in the Mediterranean.
SAP BIO: Strategic Action Programme for the conservation of Biological Diversity.
SPA/RAC: Regional Activity Centre for Specially Protected Areas Special.
STECF: Scientific, Technical and Economic Committee for Fisheries.
UNEP/MAP: United Nations Environment Programme /Mediterranean Action Plan.
WGBYC: Working Group on Bycatch of Protected Species.
WM: Western Mediterranean sub-region.

EXECUTIVE SUMMARY

This document was prepared in the framework of the EcAp process to propose refinement to the monitoring and assessment scales and propose reference and thresholds values for the IMAP Common Indicator (CI) 3 (*Species distributional range*), CI 4 (*Population abundance of selected species abundance*) and CI 5 (*Population demographic characteristics*) for marine mammal species, it also considers CI 12 (*Bycatch of vulnerable and non-target species*) because of its strong connection with CI 3, CI 4 and CI5.

This document summarizes background information on these CIs, including material on reference values, thresholds and targets, monitoring and assessment scales and GES definitions contained in the Barcelona Convention Decisions, and the necessary explanatory material. It also includes relevant material discussed and/or approved in the context of the EU Habitats Directive (HD) and Marine Strategy Framework Directive (MSFD), OSPAR, HELCOM and even some EU Mediterranean National prospective.

Early drafts were thoroughly discussed with a pool of Mediterranean experts composed by Rimel Ben Messaoud, Ali Cemal Gucu, Arda Tonay, Souad Lamouti, Giulia Mo, Vincent Ridoux, Aviad Scheinin, José Antonio Vázquez Bonales and revised accordingly. The final draft of this document benefited from revisions suggested by members of the ACCOBAMS Scientific Committee (particularly, Simone Panigada, Ayaka Amaha Ozturk and Joan Gonzalvo) and the Biodiversity Online Working Group (OWG) on Marine mammals.

The main products of this work are: (a) the Summary Tables (pages 32-38), (b) a list of recommended revisions to Appendix 1 of the Annex to the Decision IG.22/7 on '*Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria*' (Annex 1 to this document) and (c) a list of recommendations on future work to be carried out within the EcAp/IMAP revision and implementation.

Particularly, the **Summary Tables** summarize the current state of play and contain our proposals in regard to IMAP CI 3, 4, 5 and 12, GES objectives and targets for marine mammals. In particular, they provide background information on agreed EcAp Common Indicators, Ecological Objectives (EO), GES definitions and GES target and few proposals for changes and/or updates. They also include proposal on refining scales of monitoring for marine mammals and identify adequate scales for the most relevant species in the Mediterranean context. Finally, they contain proposals on assessment scales and criteria, including methods to set threshold and potential reference values.

The "**Recommendations for future work**", to be addressed in the context of the IMAP revision process, focus on the following issues:

- To ensure consistency or, at least, to ensure complementarity of EcAp/IMAP GES definitions, targets and IMAP monitoring and assessment scales with SAP BIO (Decision IG.24/7).
- To coordinate technical work on several aspects needing streamlining and regional agreement among experts, including:
  - The definition of specific aspects of CIs of reference values and parameters for the assessment for marine mammals, prior the next assessment (2023).
  - The appropriate level of significance for thresholds and reference values before the next assessment (2023).
  - The consideration of the potential impact of constantly changing baselines and on allowing the use of constantly decreasing trends within a specific time-window for CI3, CI4 and CI5.
  - The elaboration of initial reference maps for C3 and estimates of C4 and C5 for all possible species.
- To develop the Common Indicator 12 (bycatch) under EO1 rather than EO3, in cooperation with relevant agreements and organisations (e.g., for marine mammals: ACCOBAMS and Pelagos Agreement), in line with the MSFD D1C1 approach.

1. INTRODUCTION

1.1 Working methods to compile this report

1. Even though the priority of this report is to refine monitoring and assessment scales and define reference values and thresholds for EcAp/IMAP Common Indicator (CI) 3 (*Species distributional range*), CI4 (*Population abundance of selected species abundance*) and CI5 (*Population demographic characteristics*) for marine mammal species, it also considers CI12 (*Bycatch of vulnerable and non-target species*) because its strong connection with CI3, CI4 and CI5. It summarizes background information on these CIs, including material on reference values, thresholds and targets, monitoring and assessment scales and GES definitions contained in the Barcelona Convention Decisions, and the necessary explanatory material. It also includes relevant material discussed and/or approved in the context of the EU Habitats Directive (HD) and Marine Strategy Framework Directive (MSFD), OSPAR, HELCOM and even some EU Mediterranean National prospective. Finally, it contains some information on Candidate CIs (CCI), namely CCI24 (*Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles*), CCI26 (*Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animal*) and 27 (*Levels of continuous low frequency sounds with the use of models as appropriate*), which are relevant to marine mammals (e.g., on marine litter and acoustic pollution).

2. There are also pieces of preliminary boxed text identified as "***Recommendation for future work***". These highlight preliminary ideas on actions that must be taken immediately after having agreed the Assessment framework for marine mammals, possibly before the next assessment (2023).

3. The draft report has been prepared by Caterina Fortuna and Léa David. The first draft of each section has been then circulated to a group of Mediterranean experts acting as external reviewers. These experts are: Rimel Ben Messaoud, Ali Cemal Gucu, Souad Lamouti, Giulia Mo, Vincent Ridoux, Aviad Scheinin, Arda Tonay, José Antonio Vázquez Bonales.

4. A consolidated draft was shared with the ACCOBAMS Scientific Committee. Then, the revised draft was further discussed by the Biodiversity Online Working Group (OWG) on marine mammals before its finalization and submission to the CORMON meeting on Biodiversity and Fisheries.

1.2 Background material on relevant aspects of the EcAp/IMAP discussion in the European context

5. In the following sections, you find a compilation of material regarding definitions, reference values, thresholds for marine mammals mostly in the context of the HD and MSFD discussions. This material (which might disappear or become an appendix) is meant to inform the selection of proposed options on equivalent topics in the context of EcAp and IMAP discussions.

6. The **Summary Tables** (in A3 format, see pages 32-38) at the end of these introductory material are the main output of this report, as they summarize the current state of the play and contain our proposals.

1.2.1 EU MSFD AND BARCELONA CONVENTION ECAP/IMAP MEDITERRANEAN SUB-REGIONS

1. EcAp sub-regions are the same as European Union (EU) Marine Strategy Framework Directive (MSFD) Mediterranean sub-regions: Western Mediterranean (WM), Ionian and Central Mediterranean (ICM), Adriatic (A) and Aegean-Levantine (AL). See the map below.

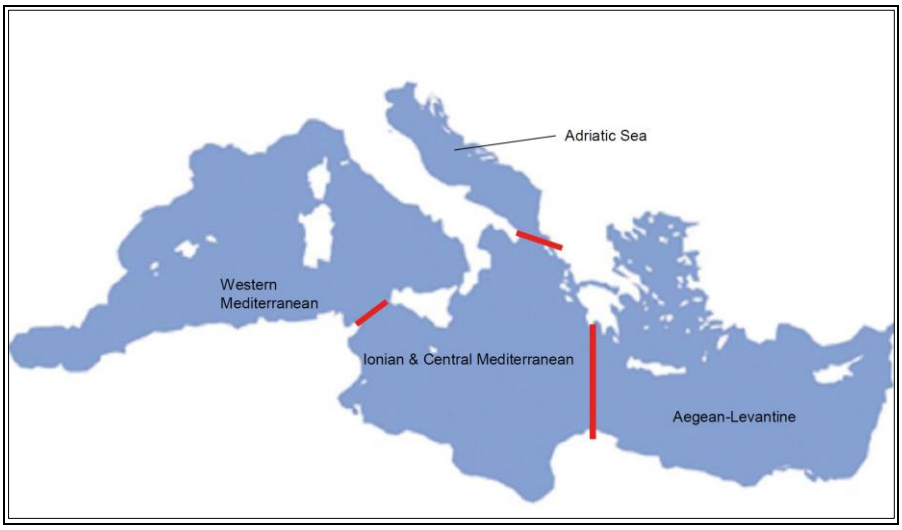
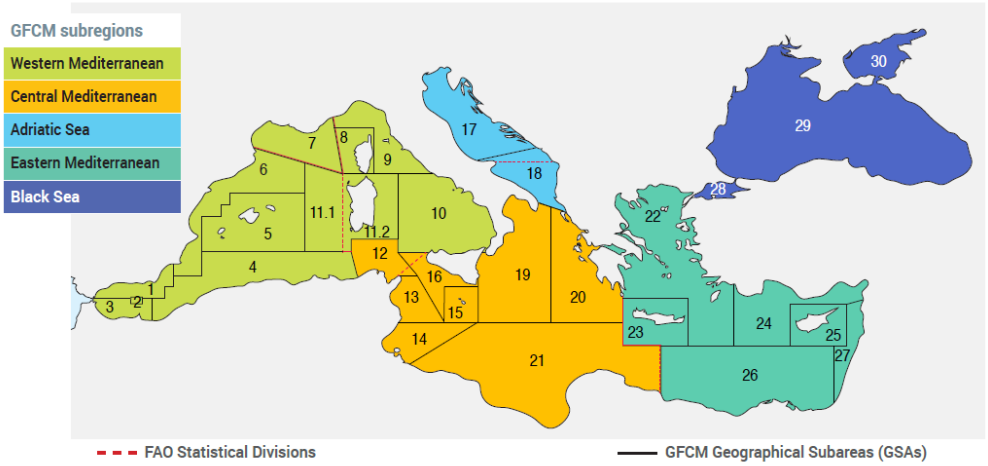


Figure 1: EcAp subregions

2. Sub-divisions are not yet defined; although some countries (e.g., Spain) have subdivisions and management units used within the MSFD.

3. In terms of sub-areas/management units already identified by other relevant organization (i.e. organizations dealing with pressures that might affect marine mammal species), the General Fisheries Commission for the Mediterranean (GFCM) Geographical Subareas (GSAs) exist and are relevant for the EcAp/IMAP assessment when considering Common Indicator 12 on bycatch mortality and its impact on species and their populations. Therefore, **the GFCM GSAs should be taken into due consideration** when designing substrata for the ACCOBAMS Survey Initiative (ASI)-like surveys, so that species abundance estimates can be provided in relation to these GSAs to assess bycatch mortality of marine mammals and other species of conservation concern.



GFCM GSAs

01 - Northern Alboran Sea	07 - Gulf of Lion	13 - Gulf of Hammamet	19 - Western Ionian Sea	25 - Cyprus
02 - Alboran Island	08 - Corsica	14 - Gulf of Gabes	20 - Eastern Ionian Sea	26 - South Levant
03 - Southern Alboran Sea	09 - Ligurian Sea and Northern Tyrrhenian Sea	15 - Malta	21 - Southern Ionian Sea	27 - Eastern Levant Sea
04 - Algeria	10 - South and Central Tyrrhenian Sea	16 - South of Sicily	22 - Aegean Sea	28 - Marmara Sea
05 - Balearic Islands	11.1 - Sardinia (west) 11.2 - Sardinia (east)	17 - Northern Adriatic Sea	23 - Crete	29 - Black Sea
06 - Northern Spain	12 - Northern Tunisia	18 - Southern Adriatic Sea	24 - North Levant Sea	30 - Azov Sea

Figure 2: General Fisheries Commission for the Mediterranean (GFCM) Geographical Subareas (GSA) *(Source: http://www.fao.org/gfcm/about/area-of-application/en/)*

1.2.2 GES DEFINITIONS AND GES TARGET IN THE HD, MSFD AND ECAP

4. Table 1 shows a comparison of definitions of conservation status/GES (state) and targets in the EU HD, MSFD and EcAp/IMAP contexts. It is worth noting that the HD focuses on habitats and species, whereas the MSFD focuses on the whole marine ecosystem.

Table 1 - Comparison of definitions of conservation status/GES (state) and targets in the EU HD, MSFD and BC EcAp/IMAP contexts

Conservation status in the EU HD: "state" definition	**Conservation status of a species in the EU HD: "state" targets**
The '*conservation status of a species*' is taken as '*favourable*' when (Article 1i): • population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, **and** • the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, **and** • there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis. Conservation Status is defined as: • **Favourable** (FV) describes the situation where species can be expected to prosper without any change to existing management or policies. FV is coded as GREEN. • **Unfavourable-Inadequate** (U1): describes situations where a change in management or policy is required to return the species to FV status, but there is no danger of extinction in the foreseeable future. U1 is coded as AMBER. • **Unfavourable-Bad** (U2): is for species in serious danger of becoming extinct (at least regionally). U2 is coded as RED. • **Unknown** (XX) class which can be used where there is insufficient information available to allow an assessment. XX is coded as GREY.	• **Favourable Reference Range (FRR)**: **Range** within which all significant ecological variations of species are included for a given biogeographical region and which is **sufficiently large to allow the long term survival** of the species. • **Favourable Reference value (FRV)** must be **at least the range (in size and configuration)** when the Directive **came into force**; if the range was insufficient to support a favourable status, the reference for favourable range should take account of that and should be larger (in such a case information on historic distribution may be found useful when defining the favourable reference range); 'best expert judgement' may be used to define it in absence of data. **Favourable Reference Population (FRP):** Population in a given biogeographical region considered the minimum necessary to ensure the long-term viability of the species; favourable reference value must be at least the size of the population when the Directive came into force; information on historic distribution/population may be found useful when defining the favourable reference population; 'best expert judgement' may be used to define it in absence of other data.
Good Environmental Status in the EU MSFD: "state" definition	**Good Environmental Status in the EU MSFD: "state" targets**
Art, 3.5 states that "*'good environmental status'* [GES] *means the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and* ***the use of the marine environment is at a level that is sustainable****, thus* ***safeguarding the potential for uses and activities*** *by current and future generations, i.e.:* *(a) the structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors,* ***allow those ecosystems to function fully and to maintain their resilience to human-induced environmental change****.* ***Marine species and habitats are protected****,* ***human-induced decline of biodiversity is prevented,*** *and diverse biological components function in balance;* *(b) hydro-morphological, physical and chemical properties of the ecosystems, including those properties which result from human activities in the area concerned, support the ecosystems as described above. Anthropogenic inputs of substances and energy, including noise, into the marine environment do not cause pollution effects*".	Relevant **qualitative descriptors** for determining GES (MSFD Annex I): *(1) Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.* ***[D1]*** *(4) All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.* ***[D4]*** *(8) Concentrations of contaminants are at levels not giving rise to pollution effects.* ***[D8]*** *(10) Properties and quantities of marine litter do not cause harm to the coastal and marine environment.* ***[D10]*** *(11) Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.* ***[D11]*** In MSFD Annex III, among listed characteristics, pressures and impacts there are the following relevant definitions: ***Characteristics***: "*a description of the population dynamics, natural and actual range and status of species of marine*

Art. 10: "*[…] When devising those targets and indicators, Member States shall take into account the continuing application of relevant existing environmental targets laid down at national, Community or international level in respect of the same waters, ensuring that these targets are mutually compatible and that relevant transboundary impacts and transboundary features are also taken into account, to the extent possible*	*mammals and reptiles occurring in the marine region or subregion"*. ***Pressures and impacts***: "*Biological disturbance:* […] *selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing*)".
Good Environmental Status in the Barcelona Convention EcAp: "state" definition	**Good Environmental Status in the Barcelona Convention EcAp: "state" targets**
EcAp aim to "A healthy Mediterranean with marine and coastal ecosystems that are productive and biologically diverse for the benefit of present and future generations". The EcAp ecological vision: • To protect, allow recovery and, where practicable, restore the structure and function of marine and coastal ecosystems thus also protecting biodiversity, in order to achieve and maintain good ecological status and allow for their sustainable use. • To reduce pollution in the marine and coastal environment so as to minimize impacts on and risks to human and/or ecosystem health and/or uses of the sea and the coasts. • To prevent, reduce and manage the vulnerability of the sea and the coasts to risks induced by human activities and natural events.	**Ecological Objective 1 - Biological diversity (EO1):** "*Biological diversity is maintained or enhanced. The quality and occurrence of coastal and marine habitats and the distribution and abundance of coastal and marine species are in line with prevailing physiographic, hydrographic, geographic, and climatic conditions*". The term '*maintained*' is key and its condition is determined by three factors: i. No further loss of the diversity within species, between species and of habitats/communities and ecosystems at ecologically relevant scales. ii. Any deteriorated attributes of biological diversity are restored to and maintained at or above target levels, where intrinsic conditions allow. iii. Where the use of the marine environment is sustainable. **Ecological Objective 3 (EO3) - Harvest of commercially exploited fish and shellfish** ("*Populations of selected commercially exploited fish and shellfish are within biologically safe limits, exhibiting a population age and size distribution that is indicative of a healthy stock*") is relevant for marine mammals because of Common Indicator 12: Bycatch of vulnerable and non-target species (EO1 and EO3). **Ecological Objective 4 (EO4) - Marine food webs:** "*Alterations to components of marine food webs caused by resource extraction or human-induced environmental changes do not have long-term adverse effects on food web dynamics and related viability*". In this EO marine mammals are considered under various functional groups. **Ecological Objective 9 (EO9) - Pollution:** "*Contaminants cause no significant impact on coastal and marine ecosystems and human health*" **Ecological Objective 10 (EO10) - Marine litter** is relevant for marine mammals because of Candidate Indicator 24 (Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles). **Ecological Objective 11 (EO11) - Energy including underwater noise** is relevant for some cetacean species because of two Candidate Indicators 26 (Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animal) and 27 (Levels of continuous low frequency sounds with the use of models as appropriate).

Key: EU HD= European Habitats Directive (Council *Directive* 92/43/EEC). **Sources:** Habitats Directive (Council *Directive* 92/43/EEC); Evans & Arvela (2011); Commission Decision (EU) 2017/848 of 17 May 2017 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardized methods for monitoring and assessment and repealing Decision 2010/477/EU.

1.2.3 CONSERVATION STATUS, REFERENCE VALUES, THRESHOLDS AND TARGETS DEFINITIONS IN THE HD AND MSFD

5. In the context of the MSFD discussions, there is an ongoing effort to streamline definitions and approaches when setting **reference points** and **thresholds,** within and across descriptors. In practice, this means efforts to maintaining consistency in approaches by setting clear definitions. It has been concluded that this can be achieved only with a strong engagement in coordinating efforts at regional level (*see, for example, discussion at the MSFD workshop on cross-cutting issues on 30 September 2020*) and spelling out more clearly the official terminology.

1.2.3.1 Habitats Directive context

6. Under the EU HD, each Member State can set its own definitions of favourable status of conservation, reference points and thresholds, which then apply within its territorial waters. Definitions can change over time if an appropriate rationale is provided.

7. Concerning the distribution of species, HD art. 17 guidelines suggest that when estimating what they call **Favourable Reference Range** (FRR) for a species, the following factors should be considered:

- Current range.
- Potential extent of range taking into account physical and ecological conditions (such as climate, geology, soil, altitude).
- Historic range and causes of change.
- Area required for viability of habitat type/species, including consideration of connectivity and migration issues.
- Variability including genetics.

8. Concerning the species abundance, when setting the **Favourable Reference Population** (FRP) it is suggested to keep in mind the following background information and parameters:

- Historic distribution and abundances.
- Potential range.
- Biological and ecological conditions.
- Migration routes and dispersal ways.
- Gene flow or genetic variation including clines.
- Population should be sufficiently large to accommodate natural fluctuations and allow a healthy population structure.

9. Palialexis and colleagues observe that there are two approaches to set FRP (DG Environment, 2017):

- Model-based methods are built on biological considerations, such as those used in Population Viability Analysis (PVA) or on other estimates of Minimum Viable Population (MVP) size.
- Reference-based approaches that are founded on an indicative historical baseline corresponding to a documented (or perceived by conservation scientists) good condition of a particular species or restoring a proportion of estimated historical losses.

10. Data availability and quality determines the selection of the proper approach between reference-based and model-based (DG Environment, 2017).

11. The data used to estimate population size can be grouped in the following categories in the HD reporting (DG Environment, 2017):

- Complete survey or a statistically robust estimate
- Estimate based on partial data with some extrapolation and/or modelling
- Estimate based on expert opinion with no or minimal sampling
- Absent data
- Minimum viability population < FRP < potential population.

1.2.3.1.1 TRENDS

12. Under the HD, the period for **short-term trend** is recommended to be 12 years (two reporting cycles). The short-term trend should be used for the status assessment. The direction of the short- term trend can be: i) stable; ii) increasing; iii) decreasing; or iv) unknown. The percentage change over the period reported, if it can be quantified should be given as a precise figure (e.g., 27 %) or a banded range (e.g. 20-30 %) (ETC/BD, 2011; DG Environment, 2017). The **long-term trend** is recommended to be evaluated over a period of 24 years (four reporting cycles).

1.2.3.1.2 MAPPING

13. For mapping purposes, it is advised to use the ETC/BD to 10 x 10 km for visualisation, ETRS 89 LAEA grid; allowing to submit maps of 50 x 50 km for exceptional cases such as, for example, widely ranging but data poor cetaceans. In this sense, it is advisable to keep this in mind when defining the monitoring scales, to avoid in the medium-term too many empty cells.

1.2.3.1.2 ASSESSMENT MATRIX AND DEFINITION OF CONSERVATION OBJECTIVES

14. Table 2 (**HD evaluation matrix**) is a modified version of table 3 in Palialexis *et al*. 2019. It summaries all relevant definitions of HD Conservation Status reference thresholds.

Table 2 - HD evaluation matrix of Conservation Status of species *(modified)*

Species **Parameter**	**Favourable** ('green')	**Unfavourable - Inadequate** ('amber')	**Unfavourable - Bad** ('red')	**Unknown**
Range (within the concerned biogeographical region)	**Stable** (loss and expansion in balance) or increasing **AND not < 'favourable reference range'.**	Any other combination.	**Large decline**: **=** to a loss of > 1% per year within period specified by MS **OR** > 10% < favourable reference range.	No or insufficient reliable information available to assess it.
Population	Population(s) **not < 'favourable reference population'** **AND** reproduction, mortality and age structure **not deviating from normal** (if data available).	[**Moderate decline** = to a loss of less than 1 % per year and ≤ 'favourable reference population'; **OR** a **large decline** = to a loss of > than 1 % per year and ≥ 'favourable reference population'; **OR** population size is < than 25 % below favourable reference population; **OR** age structure somehow different from a natural, self-sustaining population].	**Large decline**: **=** to a loss of > 1% per year (**indicative value MS may deviate from if duly justified**) within period specified by MS **AND** < 'favourable reference population' **OR** > 25% < favourable reference population **OR** reproduction, mortality and age structure strongly deviating from normal.	No or insufficient reliable information available to assess it.
Habitat for the species	Area of habitat is sufficiently large (and stable or increasing) **AND** habitat quality is suitable for the long-term survival of the species.	Any other combination.	Area of habitat is clearly not sufficiently large to ensure the long-term survival of the species **OR** Habitat quality is bad, clearly not allowing long term survival of the species.	No or insufficient reliable information available to assess it.
Future prospects (as regards to	**Main pressures and threats** to the species	Any other combination.	Severe influence of pressures and threats to	No or insufficient reliable information

population, range & habitat availability)	**not significant**; **species** will remain **viable on the long-term.**		the species; very bad prospects for its future, long-term viability at risk.	available to assess it.
Overall CS assessment	All 'green' **OR** three 'green' **AND** one 'unknown'.	**One or more** 'amber' **but no** 'red'.	**One or more** 'red'.	**Two or more** 'unknown' combined with green **OR** all "unknown".
Source: Modified from Table 3 in Palialexis *et al*. 2019 on definitions of HD parameters and list the threshold values set for the identification of the Conservation Status of each parameter.				

15. When discussing **reference values**, we should consider:
- using reference conditions/reference state (based on current conditions of sites considered to be in reference state, historical data or modelling);
- using a baseline condition set at a specified date in the past (i.e. the entering into force of HD);
- using a baseline condition set as 'current' state.

16. For **targets**:
- use of directional/trend-based targets (either purely a direction of change or incorporating a rate of desired change from a baseline);
- use of baseline value as the target;
- use of deviation (in absolute value terms or percentage change terms) from a specified given baseline;
- use of limits or thresholds (in relation to a specified baseline).

17. There are various ways to set conservation targets that are under discussion/consideration. For example, modelling carrying capacity, based on parameters of life history, and setting a target as a deviation from this total carrying capacity to allow for "sustainability" (e.g., 80%). IWC is using this method to manage aboriginal whaling sustainably or setting levels of pressure in line with agreed deviations from modelled carrying capacity (e.g., the Harbour porpoise EcoQO which sets a 1.7% limit for anthropogenic removal (including bycatch) so that a target population of at least 80% of carrying capacity is maintained).

1.2.3.2 Relevant indicators (i.e. criteria) in the MSFD context

18. In Table 3 are shown extracts of text on relevant criteria for marine mammals from "*Criteria and methodological standards, specifications and standardised methods for monitoring and assessment of essential features and characteristics and current environmental status of marine waters under point (a) of Article 8(1) of Directive 2008/56/EC"* (Commission Decision (EU) 2017/84).

Table 3 - Extract on relevant criteria for marine mammals from Commission Decision (EU) 2017/848

Criteria elements	Criteria	Methodological standards
Species of mammals, which are at risk from incidental by-catch in the region or subregion. *Member States shall establish that list of species through regional or subregional cooperation.*	**D1C1 - Primary**: The **mortality rate per species from incidental by-catch** is below levels which threaten the species, such that its long- term viability is ensured. *Member States shall establish the threshold values for the mortality rate from incidental by-catch per species, through regional or subregional cooperation.* Note: For D1C1, data shall be provided per species per fishing metier for each ICES area or GFCM Geographical Sub-Area or FAO fishing areas for the Macaronesian biogeographic region, to enable its aggregation to the relevant scale for the species concerned, and to identify the particular fisheries and fishing gear most contributing to incidental catches for each species. References to: • Article 25(5) of Regulation (EU) No 1380/2013	*Scale of assessment:* As used for assessment of the corresponding species or species groups under criteria D1C2-D1C5. *Use of criteria:* The extent to which good environmental status has been achieved shall be expressed for each area assessed as follows: • the mortality rate per species and whether this has achieved the threshold value set. This criterion shall contribute to assessment of the corresponding species under criterion D1C2.

	• Table 1D of the Annex to Commission Implementing Decision (EU) 2016/1251. • Regulation (EC) No 199/2008	
Species groups, as listed under Table 1 and if present in the region or subregion. *Member States shall establish a **set of species representative of each species group**, selected according to the criteria laid down under 'specifications for the selection of species and habitats', **through regional or subregional cooperation**. These shall include the mammals and reptiles listed in Annex II to Directive 92/43/EEC and may include any other species, such as those listed under Union legislation (other Annexes to Directive 92/43/EEC, Directive 2009/147/EC or through Regulation (EU) No 1380/2013) and international agreements such as Regional Sea Conventions.*	**D1C2 - Primary**: • The **population abundance** of the species is not adversely affected due to anthropogenic pressures, such that its long-term viability is ensured. *Member States shall establish threshold values for each species through regional or subregional cooperation, taking account of natural variation in population size and the mortality rates derived from **D1C1**, **D8C4** and **D10C4 and other relevant pressures**.* *For species covered by Directive 92/43/EEC, these values shall be consistent with the Favourable Reference Population values established by the relevant Member States under Directive 92/43/EEC.* **D1C3 - Secondary** for marine mammals: • The **population demographic characteristics** (e.g. body size or age class structure, sex ratio, fecundity, and survival rates) of the species are indicative of a healthy population which is not adversely affected due to anthropogenic pressures. *Member States shall establish threshold values for specified characteristics of each species through regional or sub-regional cooperation, taking account of adverse effects on their health derived from **D8C2**, **D8C4 and other relevant pressures**.* **D1C4 - Primary for** species covered by Annexes II *[i.e. **bottlenose dolphins**, **harbor porpoise**, **monk seal]*, IV *[**all cetaceans**]* or V to Directive 92/43/EEC and **secondary for other species**: • The **species distributional range and**, where relevant, **pattern** is in line with prevailing physiographic, geographic and climatic conditions. *Member States shall establish threshold values for each species through regional or sub-regional cooperation. For species covered by Directive 92/43/EEC, these shall be consistent with the Favourable Reference Range values established by the relevant Member States under Directive 92/43/EEC.* **D1C5 - Primary for** species covered by Annexes II *[i.e. **bottlenose dolphins**, **harbor porpoise**, **monk seal]*, IV and V to Directive 92/43/EEC and **secondary for other species**: • The habitat for the species has the necessary extent and condition to support the different stages in the life history of the species.	*Scale of assessment:* Ecologically-relevant scales for each species group shall be used, as follows: • for deep-diving toothed cetaceans, baleen whales: region, • for small toothed cetaceans: subregion for Mediterranean Sea, • for seals: subregion Mediterranean Sea. *Use of criteria:* The status of each species shall be assessed individually, on the basis of the criteria selected for use, and these shall be used to express the extent to which good environmental status has been achieved for each species group for each area assessed, as follows: (a) the assessments shall express the value(s) for each criterion used per species and whether these achieve the threshold values set; (b) the overall status of species covered by Directive 92/43/EEC shall be derived using the method provided under that Directive. The overall status for commercially-exploited species shall be as assessed under Descriptor 3. For other species, the overall status shall be de- rived using a method agreed at Union level, taking into account regional or subregional specificities; (c) the overall status of the species group, using a method agreed at Union level, taking into account regional or subregional specificities.
Criteria elements	**Criteria**	**Methodological standards**
Litter and micro-litter classified in the categories 'artificial polymer materials' and 'other', assessed in any species from the following groups: birds, mammals, reptiles, fish or invertebrates.	**D10C3 - Secondary**: • The amount of litter and micro-litter ingested by marine animals is at a level that does not adversely affect the health of the species concerned. *Member States shall establish threshold values for these levels through regional or subregional cooperation.*	The use of criteria D10C1, D10C2 and D10C3 in the overall assessment of good environmental status for Descriptor 10 shall be agreed at Union level. The outcomes of criterion D10C3 shall also contribute to assessments under Descriptor 1, where appropriate.

Member States shall establish that list of species to be assessed through regional or subregional cooperation.		
Criteria elements	**Criteria**	**Methodological standards**
Species of birds, mammals, reptiles, fish or invertebrates which are at risk from litter. *Member States shall establish that list of species to be assessed through regional or subregional cooperation.*	**D10C4 - Secondary**: • The number of individuals of each species which are adversely affected due to litter, such as by entanglement, other types of injury or mortality, or health effects. *Member States shall establish threshold values for the adverse effects of litter, through regional or subregional cooperation.*	*Scale of assessment:* As used for assessment of the species group under Descriptor 1. *Use of criteria:* The extent to which good environmental status has been achieved shall be expressed for each area assessed as follows: — for each species assessed under criterion D10C4, an estimate of the number of individuals in the assessment area that have been adversely affected. The use of criterion D10C4 in the overall assessment of good environmental status for Descriptor 10 shall be agreed at Union level. The outcomes of this criterion shall also contribute to assessments under Descriptor 1, where appropriate.
Anthropogenic impulsive sound in water.	**D11C1 — Primary:** • The spatial distribution, temporal extent, and levels of anthropogenic impulsive sound sources do not exceed levels that adversely affect populations of marine animals. *Member States shall establish threshold values for these levels through cooperation at Union level, taking into account regional or subregional specificities.*	*Scale of assessment*: Region, subregion or subdivisions. *Use of criteria*: The extent to which good environmental status has been achieved shall be expressed for each area assessed as follows: (a) for D11C1, the duration per calendar year of impulsive sound sources, their distribution within the year and spatially within the assessment area, and whether the threshold values set have been achieved; (b) for D11C2, the annual average of the sound level, or other suitable temporal metric agreed at regional or subregional level, per unit area and its spatial distribution within the assessment area, and the extent (%, km^2) of the assessment area over which the threshold values set have been achieved. The use of criteria D11C1 and D11C2 in the assessment of good environmental status for Descriptor 11 shall be agreed at Union level. The outcomes of these criteria shall also contribute to assessments under Descriptor 1.
Anthropogenic continuous low-frequency sound in water.	**D11C2 — Primary:** • The spatial distribution, temporal extent and levels of anthropogenic continuous low-frequency sound do not exceed levels that adversely affect populations of marine animals. *Member States shall establish threshold values for these levels through cooperation at Union level, taking into account regional or subregional specificities.*	

Species groups	
Ecosystem component	*Species groups*
Mammals	Small-toothed cetaceans Deep-diving toothed cetaceans Baleen whales Seals
Specifications and standardised methods for monitoring and assessment relating to theme 'Species groups of marine birds, mammals, reptiles, fish and cephalopods'	
1. Species may be assessed at population level, where appropriate.	
2. Wherever possible, the assessments under Directive 92/43/EEC, Directive 2009/147/EC and Regulation (EU) No 1380/2013 shall be used for the purposes of this Decision: […] (b) for mammals, reptiles and non-commercial fish, the criteria are equivalent to those used under Directive 92/43/EEC as follows: D1C2 and D1C3 equate to 'population', D1C4 equates to 'range' and D1C5 equates to 'habitat for the species';	
3. Assessments of the adverse effects from pressures under criteria D1C1, D2C3, D3C1, D8C2, D8C4 and D10C4, as well as the assessments of pressures under criteria D9C1, D10C3, D11C1 and D11C2, shall be taken into account in the assessments of species under Descriptor 1.	
Units of measurement for the criteria: - D1C2: abundance (number of individuals or biomass in tonnes (t)) per species.	

1.2.3.3 Definitions of reference points and thresholds in the context of regional discussions (i.e. OSPAR, HELCOM, HD) and national implementation

19. The following tables (Table 4, 5 and 6) summarise relevant information on definitions of criteria reference points and thresholds in the context of regional discussions (i.e. OSPAR and HELCOM), the HD and national implementation. In particular, they provide an overview of different approaches taken in different contexts. The national prospective is presented for some of the EU Mediterranean countries and represents examples of decisions taken by those countries only.

Table 4 - Definitions of criteria reference points and thresholds in the context of regional discussions (i.e. OSPAR, HELCOM, HD)

Criterion	Reference/baseline values	Thresholds
HELCOM C2.1 Population trends and abundance of seals (haul-out areas)	**Limit Reference Level** (LRL): at least 10,000 individuals.	GES is achieved for each species, when: i) the abundance of seals in each management unit is has attained a LRL of at least 10,000 individuals to ensure long-term viability; and ii) the species-specific growth rate is achieved indicating that abundance is not affected by severe anthropogenic pressures (HELCOM, 2018b). The growth rate aspect of the threshold value is assessed separately for populations at and below the **Target Reference Level** (TRL; which is population close to carrying capacity) (HELCOM, 2018b): - For populations at TRL, good status is defined as 'No decline in population size or pup production exceeding 10% occurred over a period up to 10 years'. - For populations below TRL, good status is defined as 3% below the maximum rate of increase for seal species, i.e. 7% annual rate of increase for grey seals and ringed seals and 9% for harbour seals. For good status, 80 % statistical support for a value at or above the threshold is needed.
HELCOM C4.1 Distribution of Baltic seals		GES is achieved when the threshold values for all considered parameters are achieved (HELCOM, 2018g): 1) the distributions of seals are close to pristine conditions (e.g. 100 years ago); 2) or where appropriate when all currently available haul-out sites are occupied (modern baseline); and 3) when no decrease in area of occupation occurs.

OSPAR C2.2 Harbour Seal and Grey Seal Abundance	**Rolling baseline** (current six-year assessment population size vs previous six-year assessment) and an historical fixed baseline. **Historical baseline** in 1992 or the closest value => year of HD entry into force.	***Assessment Value 1***: No decline in seal abundance of > 1% per year in the previous six-year period (a decline of approximately 6% over six years). ***Assessment Value 2***: No decline in seal abundance of >25% since the fixed baseline in 1992 (or closest value). The 25% chosen for the second assessment value currently approximates to 1% a year since 1992. Seal long-term trend in abundance ($\Delta baseline$) calculated via generalised linear models (GLMs) or generalised additive models (GAMs). $\Delta abundance=(B-A/A)\times 100$; where A is the count fitted by the model in the baseline year and B is the count fitted by the model in the most recent survey year (OSPAR, 2018b). 80% confidence intervals.
HD Distributional Range and pattern of seals	**Favourable Reference Range** (ETC/BD, 2011): Range within which all significant ecological variations of the habitat/species are included for a given biogeographical region and which is sufficiently large to allow the long-term survival of the habitat/species.	**Favourable reference value**: at least the range (in size and configuration) when the Directive came into force (1992). If range insufficient to support a favourable status: larger (in such a case information on historic distribution may be found useful when defining the favourable reference range). **Changes in distributional pattern** are percentage change in occupancy between two periods for a given spatial unit: $\Delta\boldsymbol{distribution} = ((\boldsymbol{B}/\boldsymbol{N}) - (\boldsymbol{A}/\boldsymbol{N})) \times \mathbf{100}$; where A is the number of spatial units (e.g., sub-areas, grid cells) in an assessment unit (AU) occupied by seals during reference period A; B is the number of units occupied in a subsequent period B, and N is the total number of spatial units within the AU. For the present assessment, period A is 2003–2008 and period B is 2009–2014. The **Index of shift in occupancy** describes the overall shift in the seasonal distribution of seals between sub-areas or grid cells over time: $Shift = 2(A\&B)/(A+B)$; where A is the number of spatial units (e.g., sub-areas, grid cells) occupied by seals during reference period A; B is the number of units occupied in a subsequent period; A&B is the number of identical units occupied in both periods. For the present assessment, period A is 2003–2008 and period B is 2009–2014. The shift index value is between 0 and 1: a value of 0 indicates that there has been a complete shift in the spatial units occupied; a value of 1 indicates there has been no shift.
Criterion	**Reference/baseline values**	**Thresholds**
OSPAR Grey Seal Pup Production	**Baselines** (OSPAR, 2018d): A fixed-baseline year (1992) is used. A short-term rate-based assessment value was also adopted that uses a **rolling baseline** (Method 1; OSPAR, 2012).	Use of the two types of baseline and associated assessment values seeks to provide an indicator that would warn against both a slow, but long-term steady decline (the problem of 'shifting baselines' associated with only having a rolling baseline) and against a recovery followed by a subsequent decline (potentially missed with a fixed baseline set below reference conditions) (OSPAR, 2018d). **Indicator assessment** values were set as a **percentage deviation** from the **baseline value** (Method 3; OSPAR, 2012). Associated with these baselines, two **assessment values** were used to assess grey seal pup production in each AU: • ***Assessment value 1***: **No decline** in grey **seal pup production of >1% per year in the previous six-year period** (a decline of approximately 6% over six years). • ***Assessment value 2***: **No decline** in grey seal pup production of **>25% since the fixed baseline in 1992** (or closest year). The percentage change in pup numbers since the baseline year (Equation 2; $\Delta abundance$) and 80% confidence intervals is calculated from fitted values. Although no formal hypothesis testing was conducted, 80% confidence intervals were calculated to reflect the choice to set the significance level, α, equal to 0.20 or 20%. Calculation of **long-term trend in abundance**: $\Delta abundance=(B-A/A)\times 100$

OSPAR Abundance and Distribution of Coastal Bottlenose Dolphins		**Declining**: a decreasing trend of ≥5% over ten years (significance level p<0.05). Increasing is defined as an increasing trend of ≥5% over ten years (significance level p<0.05). **Stable**: population changes of <5% over ten years. 5% is derived from IUCN criterion to detect a 30% decline over three generations for a species (**Vulnerable**).
OSPAR Abundance and Distribution of Cetaceans	**Species Distribution**: • Density surface models if sufficient data are available from large-scale purpose-designed surveys. • Maps of observed sightings provide information on distribution as alternative.	**Declining**: decreasing trend of ≥5% over ten years (significance level p<0.05). **Increasing**: increasing trend of ≥5% over ten years (significance level p<0.05). **Stable**: population changes of <5% over ten years. **Power Analysis**: on at least three data points. Data have 80% power (the conventional acceptable level) to detect an annual rate of change, at a significance level (p value) of 0.05, of 1.5% for harbour porpoise, 2.5% for white-beaked dolphin, and 0.5% for minke whale. The power to detect trends could be improved by increasing the frequency of the large-scale surveys.
HELCOM Reproductive status of seals		Good status is achieved when the annual reproductive rate (i.e. the proportion of females pregnant/showing postpartum pregnancy signs per year) is at least 90% for harbour seals of five years and older, and grey and ringed seals of six years and older (HELCOM 2018f). A reproductive rate of **90%** is defined as the threshold for each of these parameters as this is **indicative of increasing populations**.

Source: Palialexis et al. 2019.

Table 5 - OSPAR Intermediate Assessment (2017) on cetaceans

Assessment scale	*Monitoring methods*	*Thresholds*	*Pressures/thresholds*
NE Atlantic (encompassing the North Sea/OSPAR Area II and Celtic Seas/OSPAR Area III)	Regular surveillance of abundance and distribution.	• 'increasing' means an increasing trend of ≥5% over 10 years (significance levels, p value, of 0.05) • 'stable' means population changes of < 5% over 10 years, and • 'decline' means a decreasing trend of ≥5% over 10 years (significance levels, p value, of 0.05).	• The main human induced cause of mortality is bycatch. • Bycatch of harbour porpoise: data from the ICES assessments of bycatch in the North Sea and Celtic Seas *vs*. best population estimate for the areas using two thresholds: 1% and 1.7%. (ASCOBANS agreed on 1 % bycatch mortality and 1.7 % total anthropogenic mortality).

Source: ICES WKDIVAGG REPORT 2018, ICES CM 2018/ACOM:47, Report of the Workshop on MSFD biodiversity of species D1 aggregation.

Table 6 - Extract from Table 3. Cetacean indicators currently employed by Contracting Parties in the OSPAR region as of August 2019. *In ACCOBAMS-MOP7/2019/Inf 47. 2019. REPORT FROM THE JOINT ACCOBAMS/ASCOBANS WORKING GROUP ON THE MARINE STRATEGY FRAMEWORK DIRECTIVE (MSFD).*

France[1]			
MSFD Criteria	**Proposed Indicators**	**Species**	**Assessment value/threshold value/target**
D1C1	*OSPAR Common Indicator M6:* Incidental mortality rate (bycatch observer data)	Harbour porpoise	This common indicator currently does not have an assessment value. It will be decided upon by OSPAR in 2019/2020.
	National Indicator: Bycatch mortality rate (strandings data)	Common dolphin Harbour porpoise	
D1C2	*OSPAR Common Indicator M4:* Abundance of Cetaceans	Harbour porpoise Bottlenose dolphin White-beaked dolphin Minke whale	No assessment value has been applied in this assessment. For a trends' assessment: a significant decline means a decreasing trend of ≥5%

			over 10 years (significance level p<0.05); a significant increase means an increasing trend of ≥5% over 10 years (significance level p<0.05); stable means population changes of <5% over 10 years.
	National Indicator: Trend in the relative abundance of Cetaceans	Common dolphin Striped dolphin Bottlenose dolphin Pilot whale Risso's dolphin Minke whale	
D1C3	*National indicator:* Recurrence of unusual mortality events	Common dolphin Harbour porpoise Striped dolphin	
D1C4	*National indicator:* Trends in occupancy of cetaceans	Common dolphin Striped dolphin Bottlenose dolphin Pilot whale Risso's dolphin Minke whale Fin whale	
Spain[6]			
MSFD Criteria	**Proposed Indicators**	**Species**	**Assessment value/threshold value/target**
MT-tam D1.2.1	*National indicator:* Population size (Abundance, no. Individuals)	Harbour porpoise Common dolphin Bottlenose dolphin Atlantic fin whale	Maintain or restore the natural balance of the populations of key species for the ecosystem.
MT-dist D1.1.1 D1.1.2	*National indicator:* Range and pattern of distribution of the populations	Harbour porpoise Common dolphin Bottlenose dolphin Atlantic fin whale	The species distributional range and, where relevant, pattern is in line with prevailing physiographic, geographic and climatic conditions.
MT-dem D1.3.1	*National indicator*: Demographic characteristics of the population (mortality rate) (Parameters required for analysis- population size, mortality caused by these pressures. Others (birth rate, survival / mortality rate, etc.))	All species of cetaceans	Reduce the main causes of mortality and decrease of populations of groups of non-commercial species in the top of the food chain (marine mammals, reptiles, birds, marine, pelagic and demersal elasmobranchs), such as accidental catches, boat collisions, ingestion of marine litter, introduced land predators, pollution, destruction of habitats and overfishing.

20. France has more recently agreed to the following descriptions in relation to criterion D1C1 (Spitz et al. 2018). For each species they use two approaches (as in previous tables):

1. Estimation of the number of individuals who died by accidental capture using a drift model applied to stranded individuals.
2. Estimation of the annual incidental capture rate (total number of individuals incidentally captured divided by total abundance of the species) through a Bycatch Risk Assessment (see below).

21. Threshold reference values are set as follow:

- By-catch mortality rate less than 1.7% of the abundance with a probability> 80% ; and
- 80% confidence interval of the mean by-catch mortality rate less than 1.7%.

1.2.3.3.1 CRITERION D1C1 ON BYCATCH AND AVAILABLE METHODS TO ESTIMATE MAXIMUM BYCATCH THRESHOLDS FOR BYCAUGHT CETACEAN SPECIES

22. The MSFD Criterion D1C1, assessing that '*the mortality rate per species from incidental by-catch is below levels which threaten the species, such that its long-term viability is ensured*', is well developed, at least

for cetacean species. For these species, a widely recommended framework exists, and it is well defined also for data-poor situations (e.g., FAO 2018 and STEFC 2019). This approach covers monitoring, assessment and mitigation aspects and it is based on direct data (independent observer data), not on interviews or self-assessment (indirect data). The latter **will never be able to assess the actual impact** of fishery-induced mortality at a population level.

23. In data poor context, a basic **Bycatch Risk Assessment (BRA)** can be applied to evaluate the impact of bycatch on relevant species. This is an approach proposed by the International Council for the Exploitation of the Sea (ICES)'s Working Group on Bycatch of Protected Species (WGBYC) and developed during the Workshop on Bycatch of Cetaceans and other Protected Species (WKRev812; ICES 2013). The essential idea of a BRA is to use an estimate of total fishing effort for the fisheries of concern in a specific region, in combination with some estimate of likely or possible bycatch rates that apply for the species of concern. This allows to evaluate whether the estimated total bycatch in that given region might be a conservation issue by threatening the survival of a given population, generating subsequent actions. The BRA is a better approach compared to that of applying discretionary flat percentages of "sustainable mortality" to the whole population of a given species (e.g., Rule of Thumb of 1% or the ASCOBANS 1.7 % when extended to all cetacean species; see Table 7) or establish a generic percentual decrease of total bycatch mortality in a fleet without taking into consideration the actual effect of such percentual decrease at population level.

Table 7 - Methods to assess the impact of fisheries on species of conservation concern (STECF 2019)

Method	Algorithm/concept	Key/Notes/Reference paper
ASCOBANS "rule of thumb"	To reduce bycatches to less than 1 % of the best available population estimate.	ASCOBANS 2000
ASCOBANS 1.7 %	1.7 % of best population estimate for harbour porpoises.	This was based on a simple deterministic population dynamics model with assumed maximum net productivity rate of 4 %, which found that 1.7 % total annual removal would allow a population to achieve 80 % of its carrying capacity over a very long time horizon (over un "infinite" period of time or until stabilisation). Extended to all species as total human-induced mortality.

24. When more data are available, particularly from observer programmes, more quantitatively accurate and conservative methods (i.e. in terms of total number of animal taken relative to the total population) can be applied to assess the impact of fisheries on species of conservation concern. These methods allow to incorporate into the assessment quantitative measures of conservation objectives. The most used and robust methods are the Potential Biological Removal (PBR), the Catch Limit Algorithm (CLA) and/or Removal Limit Algorithm (RLA) (STECF 2019). Specifics on these are given in Table 8.

Table 8 - Methods to assess the impact of fisheries on species of conservation concern (STECF 2019)

Method	Algorithm/concept	Key/Notes/Reference paper
U.S. Potential Biological Removal (PBR)	$Removal \quad limit = N_{min} \times \frac{1}{2} R_{max} \times F_R$	$\mathbf{N_{min}}$=20th percentile of a log-normal distribution surrounding the abundance estimate (N) equivalent to the lower limit of a 60 % 2-tailed confidence interval). $\mathbf{R_{max}}$=maximum population growth rate, $\mathbf{F_R}$=tuning factor related to conservation objectives (assumed value for cetaceans of 0.04). U.S. **target** in cetacean PBRs is 50 % of carrying capacity within a 100-year period. Wade et al. 1998
Catch Limit Algorithm (CLA)	$CLA = \alpha \times R_{max} \times (D_T - \beta) \times N_T$	$\mathbf{D_T}$ =current population status $\mathbf{N_T}$ = current population size

Removal Limit Algorithm (RLA)		**α** and **β** = tuning factors related to conservation objectives. **IWC CLA conservation objective** = 72 % K within a 100-year period. **North Sea harbour porpoise RLA conservation objective** = 80% K within a 100-year period. **CLA:** Cooke 1999 **RLA:** Hammond *et al.* 2019

25. This general approach (i.e. carry out a BRA for data-poorer situations and use more accurate algorithms for data from fishery observer programmes) is similar to that discussed in other regional contexts (e.g., OSPAR, ASCOBANS) in the context of the MSFD implementation strategy.

In addition, the OSPAR Marine Mammal Expert Group (OMMEG) is currently discussing a new update for indicator M6 (Marine Mammal Bycatch).

2. RELEVANT ASPECTS OF THE ECAP/IMAP DISCUSSION

26. The overall discussion on the EcAp/IMAP process happens in the context of the UNEP/MAP Programme of Work (PoW) and is coordinated by the regional Activity Centres, mainly SPA/RAC for the biodiversity cluster, MEDPOL for pollution and marine litter cluster, and PAP/RAC for coast and hydrography. Documents prepared by experts are discussed by relevant Correspondence Groups on Monitoring CORMONs and subsequently submitted to the relevant Focal Points meetings, the EcAp Coordination Group (CG), the MAP Focal meeting and then the BC COP.

2.1 IMAP Common Indicators

27. Specific guidelines on Common Indicators, including their development, are contained in BC decisions regarding different taxa. For example, Decision IG.22/7 specifically stated that: "*it is an absolute necessity for UNEP/MAP to strengthen its cooperation with the relevant regional bodies, especially in relation to:*

- *EO1 […] with […] the Secretariat of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS), noting that the ACCOBAMS Survey Initiative […] will provide important inputs (in terms of monitoring methodologies, capacity building and reliable data on abundance and distribution of cetaceans).*
- *EO11, with ACCOBAMS, noting that further development of the candidate common indicators will need to be carried out in a close cooperation between UNEP/MAP and ACCOBAMS in light of pilot monitoring activities, additional expert knowledge, and scientific developments, during the initial phase of IMAP, and considering that ACCOBAMS is undertaking an identification of noise hot spots in the Mediterranean*".

28. Table 9 offers a comparison between MSFD criteria and EcAp/IMAP Common Indicators.

Table 9 - Comparison between MSFD Criteria and EcAp/IMAP Common Indicators for marine mammals

MSFD Criteria	EcAp/IMAP Common Indicators (CI) and Candidate Common Indicators (CCI)
D1C1 - PRIMARY: The **mortality rate per species from incidental by-catch** is below levels which threaten the species, such that its long- term viability is ensured.	**CI12 - Bycatch of vulnerable and non-target species (EO1 and EO3)** • No definitions of targets/of methods.
D1C2 - PRIMARY: • The **population abundance** of the species is not adversely affected due to anthropogenic pressures, such that its long-term viability is ensured.	**CI4 - Population abundance of selected species** • Population size of selected species is maintained: ○ Cetaceans: The species population has abundance levels allowing to qualify to Least Concern Category of IUCN. ○ Monk seal: Number of individuals by colony allows to achieve and maintain a favourable conservation status.

D1C3 - **SECONDARY** for marine mammals: • The **population demographic characteristics** (e.g. body size or age class structure, sex ratio, fecundity, and survival rates) of the species are indicative of a healthy population which is not adversely affected due to anthropogenic pressures.	**CI5 - Population demographic characteristics** • Population condition of selected species is maintained: o Cetaceans: ▪ *State* - Decreasing trends in human induced mortality ▪ *Pressure* - Appropriate measure implemented to mitigate incidental catch, prey depletion and other human induced mortality. o Monk seal: ▪ *Pressure* - Appropriate measures implemented to mitigate direct killing and incidental catches and to preclude habitat destruction.
D1C4 - **PRIMARY for** species covered by Annexes II *[i.e. **bottlenose dolphins**, **harbour porpoise**, **monk seal]***, IV or V to Directive 92/43/EEC and **secondary for other species**: • The **species distributional range and**, where relevant, **pattern** is in line with pre- vailing physiographic, geographic and climatic conditions.	**CI3 - Species distributional range** • Species distribution is maintained: o No definition for cetaceans. o The Monk Seal is present along recorded Mediterranean coasts with suitable habitats for the species
D1C5 - **PRIMARY for** species covered by Annexes II *[i.e. **bottlenose dolphins**, **harbour porpoise**, **monk seal]***, IV and V to Directive 92/43/EEC and **secondary for other species**: • The habitat for the species has the necessary extent and condition to support the different stages in the life history of the species.	Partially related to CI5
D10C3 - **SECONDARY**: • The amount of litter and micro-litter ingested by marine animals is at a level that does not adversely affect the health of the species concerned. Member States shall establish threshold values for these levels through regional or subregional cooperation.	**CCI24 - Trends in the amount of litter ingested by or entangling marine organisms, especially mammals, marine birds and turtles.** • Decreasing trend in the cases of entanglement or/and a decreasing trend in the stomach content of the sentinel species. *Threshold and reference values* • Baseline Values for Ingested Marine Litter (gr)[1]: o *Minimum value*: 0 gr o *Maximum value*: 14 gr o *Mean value*: 1.37 gr o *Proposed Baseline*: 1-3 gr • Environmental Targets for Ingested Marine Litter (gr): o *Types of Target*: % decrease in quantity of ingested weight (gr) o *Minimum*: - o *Maximum*: - o *Reduction Targets*: Statistically Significant
D10C4 - **SECONDARY**: • The number of individuals of each species which are adversely affected due to litter, such as by entanglement, other types of injury or mortality, or health effects. Member States shall establish threshold values for the adverse effects of litter, through regional or subregional cooperation.	
D11C1 - **PRIMARY:** • The spatial distribution, temporal extent, and levels of anthropogenic impulsive sound sources do not exceed levels that adversely affect populations of marine animals. Member States shall establish threshold values for these levels through cooperation at Union level, taking into account regional or subregional specificities.	**CCI26: Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animals**

[1] Appendix 1 to Annex to Decision IG.22/7 on Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria.

D11C2 - PRIMARY: • The spatial distribution, temporal extent and levels of anthropogenic continuous low-frequency sound do not exceed levels that adversely affect populations of marine animals. Member States shall establish threshold values for these levels through cooperation at Union level, taking into account regional or subregional specificities.	**CCI27: Levels of continuous low frequency sounds with the use of models as appropriate**

29. From Table 9, it is apparent that there is not always an equivalence between MSFD criteria and EcAp/IMAP Common Indicators. Moreover, some agreed definition for EcAp/IMAP Common Indicators somehow overlap topics that should be separated to allow a correct assessment (e.g., CI5 and CI12).

30. See also document UNEP/MED WG.482/25 (2020) that contains a comparative analysis of IMAP Indicators with those in the Commission Decision (EU) 2017/848.

31. Decision IG.22/7 also pointed out the necessity to set up a structured cooperation with GFCM, to develop EO3 (fisheries), that includes CI 12 (Bycatch of vulnerable and non-target species), which is common to EO1 and EO3 and fundamental for marine mammals. However, it is more relevant to EO1 as it constitutes a direct pressure on CI3, CI4 and CI5. The cooperation between BC and GFCM will help developing also elements of EO4 (food webs).

32. In addition, Decision IG.22/7 states that '*compared to Descriptor 11 related indicators (MSFD), candidate indicators 26 and 27 are more closely related to the acoustic biology of key marine mammal species of the Mediterranean which are known to be sensitive to noise, i.e. the fin whale, the sperm whale and the Cuvier's beaked whale*'. The discussion on the development of these CCIs is happening in the context of the collaboration between UNEP/MAP-SPA/RAC and ACCOBAMS, and thanks to the financial and organisational support from EU funded projects (i.e. QuietMed; see Table 9). Therefore, these are not considered in this document, except in relation to monitoring activities under CI3 (Species distributional range), particularly for *Ziphius* (a species for which impulsive noise of certain types represents a deadly threat).

33. The discussion on Candidate Common Indicator 24 (Trends in the amount of litter ingested by or entangling marine organisms, especially mammals, marine birds and turtles) already happened in the context of the work coordinated by UNEP/MAP-MED POL. In Decision IG.22/7, Contracting Parties agreed definitions and targets for marine litter ingested by marine mammals. Therefore, these are not considered in this document (see Table 9).

2.2 IMAP species of interest

34. IMAP fixes a reference list of species and habitats to be monitored. All cetacean species occurring in the Mediterranean Sea are considered in the IMAP. Particular attention is given to the eight resident cetacean species, divided into three different functional groups:

- Baleen whales: fin whale (*Balaenoptera physalus*)
- Deep-diving cetaceans: sperm whale (*Physeter macrocephalus*), Cuvier's beaked whale (*Ziphius cavirostris*), long-finned pilot whale (*Globicephala melas*) and Risso's dolphin (*Grampus griseus*).
- Other toothed species: short-beaked common dolphin (*Delphinus delphis*), striped dolphin (*Stenella coeruleoalba*), common bottlenose dolphin (*Tursiops truncatus*).

35. IMAP recommends monitoring and assessing common indicators for this selection of representative species for cetacean. However, four other rare species of cetaceans occur also in the Mediterranean Sea: harbour porpoise (*Phocoena phocoena*), rough-toothed dolphin (*Steno bredanensis*), false killer whale (*Pseudorca crassidens*) and killer whale (*Orcinus orca*).

2.3 IMAP assessment, monitoring scales and geographic reporting scales

36. On assessment, monitoring scales and geographic reporting scales, Annex to Decision IG.22/7 states the following:

'*A scale of reporting units' needs to be defined during the initial phase of IMAP taking into account both ecological considerations and management purposes, following a nested approach.*

The nested approach aims to accommodate the needs of the above is to take into account 4 main reporting scales:

(1) Whole region (i.e. Mediterranean Sea);
(2) Mediterranean sub-regions, as presented in the Initial Assessment of the Mediterranean Sea, UNEP(DEPI)/MED IG.20/Inf.8;
(3) Coastal waters and other marine waters;
(4) *Subdivisions of coastal waters provided by Contracting Parties'*.

37. For marine mammals, this nesting approach it is not necessary or, in some case, might even be not applicable, as for most CIs the monitoring and assessment must happen at regional level and a lower-level monitoring would not help assessing the GES. The only exceptions are the CI5 and CI12 which could be also assessed at lower scales (e.g., GFCM GSAs or new subdivisions given by the aggregation of some GSAs, in relation to each species' population structure).

3. PROPOSED REVISIONS AND/OR UPDATES TO AGREED OFFICIAL EcAp/IMAP DOCUMENTS

38. The reading of all relevant EcAp/IMAP materials on marine mammals has generated few proposals not only on EcAp/IMAP elements that need to be completed or created (e.g., assessment scales, reference values and thresholds, which were the main objective of this report), but also on necessary updates of some agreed aspects of EcAp/IMAP processes, which are no longer in line with the current situations (particularly because of new species' knowledge and progress made in discussions about those two processes). In the following paragraphs these are briefly presented.

39. The EcAp/IMAP framework, as well as the MSFD, is an adaptive process that should be re-evaluated regularly every six-year and retuned if necessary.

40. In the following sections we propose a set of revisions in documents attached to EcAp/IMAP decisions. For example, Appendix 1 to Annex to Decision IG.22/7 on IMAP, assigns a lower priority to *Ziphius*, *Stenella*, *Globicephala* and *Grampus* compared to the other species, based on some unclear/inexistent evidence on threats and population status. Based on robust knowledge on threats on some of these species, we propose that *Ziphius* becomes a priority species. This request is based on known and measured threats (underwater mid-frequency sounds, e.g., Frantzis *et al*. 1998) and the relatively limited availability of preferred habitat within the Mediterranean Sea (Cañadas *et al*. 2018).

3.1 Revisions to Appendix 1 of Annex to Decision Ig.22/7 on Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and related Assessment Criteria

41. Proposed revisions to Appendix 1 of Annex to Decision Ig.22/7 on Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria are shown in Annex 1 to this report.

3.2 Proposed updates of definitions for some Common Indicator

42. In Decision IG.21/3, Common Indicator 5 (demography) GES definition includes a reference to human-induced mortality, for both cetaceans and the monk seal and to habitat destruction for the monk seal. However, human-induced mortality, when it is relative to accidental capture in fishing gear, should be addressed for coherence in separate Common Indicator, such as, for example Common Indicator 12 (Bycatch of vulnerable and non-target species (EO1 and EO3). This is consistent with the MSFD primary criterion D1C1.

43. Moreover, the text of the CI5's definition refers to the assessment of the measures taken to reduce the different pressures (i.e. appropriate measures taken to reduce direct killing/by-catch/habitat destruction) rather than the assessment of the different parameters that should describe population demographic characteristics,

as the title of the indicator would suggest. The text of the CI5 title should, therefore, be reformulated so that it either refers to an indicator of measures to contrast the main pressures or the definition of the indicator should be modified so that it coherently reflects the assessment of specific demographic parameters (i.e. the mortality rate due to direct killing is such that it does not negatively influence the viability of the species, or the pupping rate/reproductive rate is within the range of increasing population levels etc). See Summary Tables for proposed text (see pages 32-38).

44. **Summary Tables** (see pages 32-38) also offer how to tackle the full development of Common Indicator 12 for marine mammal species, in line with what has been proposed by experts of several regional organisations, including FAO. So far, little progress has been made on the development of monitoring CI12 (GFCM 2019) and no progress on the methodological development of assessment methods and targets. However, given the good progress made within the FAO and EU context (FAO 2018, STEFC 2019; see section 1.2.3.3.1), we believe that the proposed solutions can be agreed by Barcelona Convention's Parties, at least for marine mammal species.

3.3 Streamlining definitions of Monk seal conservation status in SAP BIO

45. Barcelona Convention Decision IG.24/7 - *on Strategies and Action Plans under the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, including the SAP BIO, the Strategy on Monk Seal, and the Action Plans concerning Marine Turtles, Cartilaginous Fishes and Marine Vegetation; Classification of Benthic Marine Habitat Types for the Mediterranean Region, and Reference List of Marine and Coastal Habitat Types in the Mediterranean* – contains several recommendations on monitoring different species, including the Monk Seal. The same applies to other agreed Regional Action Plans (RAP), including the one on Cetacean species (UNEP/MAP 2017). In this RAP, there is a proposed definition of "favourable conservation status"[2] that does not seem to be fully in line with the GES target as defined in the Decision IG.22/7 and should be reconsidered. In **Summary Tables** (see pages 32-38) take these recommendations into consideration, as much as possible. However, everything has been retuned in relation to the relevant agreed GES definitions.

Recommendation for future work: Within the ongoing process launched by SPA/RAC to elaborate the post 2020 SAP BIO, it would be beneficial to ensure the consistency of EcAp/IMAP GES definitions, targets and IMAP monitoring and assessment scales with SAP BIO (Decision IG.24/7) or at least, to ensure complementarity. In fact, any environmental management framework must be necessarily adaptive given the expected endless improvement on knowledge regarding habitats, species and threats, and constantly shifting baselines.

3.4 Monitoring and assessment methods and scales for cetacean species

46. It is fundamental to keep in mind that appropriate geographic scales must be consistent with the ecology of different marine mammal species and the geographic extent of their major threats/pressures, which need to be assessed. Therefore, ASI-like basin-wide data collection projects on distribution and abundance are the only means that will allow to populate the CI 3 and 4 and to provide key information for CI 12. This makes these means the highest priority for IMAP.

47. It is also very important that the Mediterranean basin-wide data collection is designed taking into consideration, as much as possible, all existing relevant sub-strata, including the EcAp/IMAP sub-regions, GFCM Geographical Sub Areas, National sub-division (if any) and other relevant descriptors sub-divisions (if any) related to pressures on these species.

48. Systematic surveys carried out at sub-regional level or smaller scale (e.g., national level), can only complement but not substitute data obtained through basin-wide surveys. Also, given the nature of these species (wide-ranging marine mammals), any sub-regional monitoring effort must be synchronised and designed to appropriately complement existing knowledge and fill gaps between ASI or similar campaigns.

[2] '*The conservation status will be taken as «favourable» when: i) population dynamic data indicate that cetaceans in the Mediterranean Sea Area are maintaining themselves on a long- term basis as a viable component of the ecosystem; ii) the range of cetaceans in the Mediterranean Sea Area is neither currently being reduced, nor is likely to be reduced on a long-term basis; iii) there is, and will be in the foreseeable future, sufficient habitats in the Mediterranean Sea Area to maintain cetaceans on a long-term basis'*.

49. In addition, it is important to focus Contracting Parties' resources on data collection that allow them to assess the status of these species at the required geographical scale. Thus, the proposed order of priority for monitoring scales of species and pressures is given in relation to species assessment scales. In this sense, the endorsed key message in the Annex I of Decision IG.23/6 ('more effort should be devoted in poorly monitored areas') it may become detrimental unless understood as complementary national data collection, to fill sub-regional gaps, only.

50. Sub-stratification within the Mediterranean region is a key aspect that must be considered at various levels:

1. during the design of monitoring surveys;
2. during the data analysis;
3. during the species' and overall GES assessments.

51. Conclusions on the best solutions are guided by considerations on the following aspects:

1. species' ecology;
2. existing geographical management units of human pressures (e.g., GFCM Sub-Areas);
3. administrative constraints on logistics (this becomes preponderant for the fieldwork phase);
4. administrative requirements for reporting under various international policies (e.g., MSFD, HD, EcAp, IMAP, etc.).

52. In regard to administrative constraints on logistics, during the early phases of the design of monitoring surveys, support from Contracting Parties is critical to identify the limitations due to air traffic regulation and to facilitate the delivery of appropriate permissions for aerial and ship surveys and allow the coverage of ecologically and administratively appropriate regions.

53. In regard to existing geographical management units of human pressures and to Contracting Parties' needs to report under various international policies (e.g., EcAp, IMAP, Habitat Directive and MSFD), consideration of different strata can be done as post-stratification while analysing data and carrying out assessments. However, all the relevant sub-divisions need to be considered, at least theoretically, during design to inform the best options, for example, on the most appropriate coverage.

Recommendations for future work: Concerning Common Indicator 3 (species distributional range), a better definition of specific High Priority (HP) and Low Priority (LP) sub-regional units, to be monitored in relation to important habitats for certain species (e.g., fin whales feeding grounds, *Ziphius* preferred habitats, sperm whales breeding grounds), needs to be refined based on ASI data, latest IUCN species Red List assessments, etc., prior the next assessment (2023).

Recommendation for future work: Concerning Common Indicator 12 (bycatch) for cetaceans and other protected species, since it is a shared indicator that requires the combination of data under EO1 and EO3, this should not be developed and regularly re-evaluated in isolation by the GFCM (as per approach suggested in Decision XXX), but it should be retuned through a specific work involving experts that developed CI3, CI4 and CI5 descriptions for the species of concern, ensuring the full cooperation with other relevant agreements (i.e. ACCOBAMS, Pelagos Agreement) and integration with other policies relevant at regional level (e.g., the MSFD D1C1). The assessment of CI12 should also be made by the same pool of experts.

54. Box 1 summarises details of the potential minimum requirements for a cetacean monitoring framework on Common Indicators 3, 4, 5 and 12 to enable Contracting Parties to meet their commitments in the EcAp framework. Full details are given in the **Summary Tables** (see pages 32-38).

Box 1 – Summary of monitoring framework for EcAp/IMAP Common Indicators for cetaceans		
CI3 – Distributional range **CI4 - Abundance**	**Regional monitoring**	**Sub-regional monitoring**
Frequency of data collection	• At least every 6 years (as per reporting cycle).	• Optimal: annually. • Minimum: biennially (3 comparable datasets/estimates). • Seasonal: fin whale, pilot whale*(?)*

Monitoring method	• Basin-wide line transect distance sampling surveys (see ASI standard protocols): shipboard and aerial (both visual and acoustic).	• Line-transect distance sampling methods: shipboard or aerial. • Mark-recapture Photo-ID (on selected species). • Passive acoustic monitoring (PAM) for selected species. • Multidisciplinary surveys.
Authority responsible for monitoring	• ACCOBAMS, UNEP/MAP/ SPA/RAC, EU, CPs periodic concerted action.	• Each CP: national monitoring schemes. • CPs of sub-regions when cooperation needed.
Frequency of Common Indicators update	*6 years (as per reporting cycle).*	
Frequency of assessment update	*6 years (as per reporting cycle).*	
Minimal amount of monitoring locations	• Mediterranean region (all four sub-regions must be covered with equal effort).	• Monitoring must cover representative parts of in sub-regions waters (at least three locations per sub-region to be identified through sub-regional workshops). • Photo-ID for relevant putative local populations or management units (e.g., bottlenose dolphins, common dolphins, fin whales, Cuvier's beaked whales; Risso's dolphins; sperm whales). • PAM stations dependent in potential corridors and important habitats for deep diving species.
CI5 - Demography	**Regional monitoring**	**Sub-regional monitoring**
Frequency of data collection	• Not applicable.	• Systematic.
Monitoring method	• Not applicable.	• Photo-id. • Strandings.
Authority responsible for monitoring	• None.	• Each CP: national monitoring schemes. • CPs of sub-regions when cooperation needed (matching photo-id catalogues).
Frequency of Common Indicators update	*6 years (as per reporting cycle).*	
Frequency of assessment update	*6 years (as per reporting cycle).*	
Minimal amount of monitoring locations	• Not applicable.	• Demographic parameters should be obtained from long-term studies in more than two locations per sub-region per species. • Strandings: whenever they occur on *Stenella* (pelagic delphinids) and *Tursiops* (coastal delphinids) or any other most frequent stranded species.
CI12 - Bycatch	**Regional monitoring**	**Sub-regional monitoring**
Frequency of data collection	• At least once per high priority fishing métiers within a reporting period.	• At least one year per high priority fishing métiers/gears to obtain bycatch rates, within each reporting cycle. • GFCM provides data on fishing effort for priority fishing gears and per fleet segment during a reference year, for each GSA and produce a risk analysis on the Mediterranean region, based on available bycatch rates per species.
Monitoring method	• Fishing effort per GSA per métier/gear.	• Annually: bycatch (onboard observations, at port questionnaires and strandings; FAO 2019 protocol may be used). • CPs monitor their fleets (at least one métier/gear per sub-region per year, rotating, starting from the most impacting ones). • National stranding networks collect data on fishery-induced mortality in marine mammal tissues. They provide biennial reports on these matters.
Authority responsible for monitoring	• GFCM, Contracting Parties (relevant authorities)	• Each CP: national monitoring schemes to provide bycatch rates and annual fishing effort.

Frequency of Common Indicators update	*6 years (as per reporting cycle)*
Frequency of assessment update	*6 years (as per reporting cycle)*

3.5 Monitoring and assessment methods and scales for the Mediterranean Monk seal

55. Box 3 describes the minimum requirements for a monitoring framework on monk seals for CIs 3, 4 and 5, organised mostly according to Group A and Group B countries (*sensu* revised Mediterranean monk seal conservation Strategy 2020-2026), as defined in Decision 24/7 (i.e. Group A countries are those that '*host monk seal resident breeding populations and the majority of the species population*'; Group B countries '*are important, because current monk seal sighting records suggest the potential for the species' survival and expansion in areas beyond Group A country borders*' and which '*may contain* […] *critical coastal habitat, which is likely to be re-colonised*''.

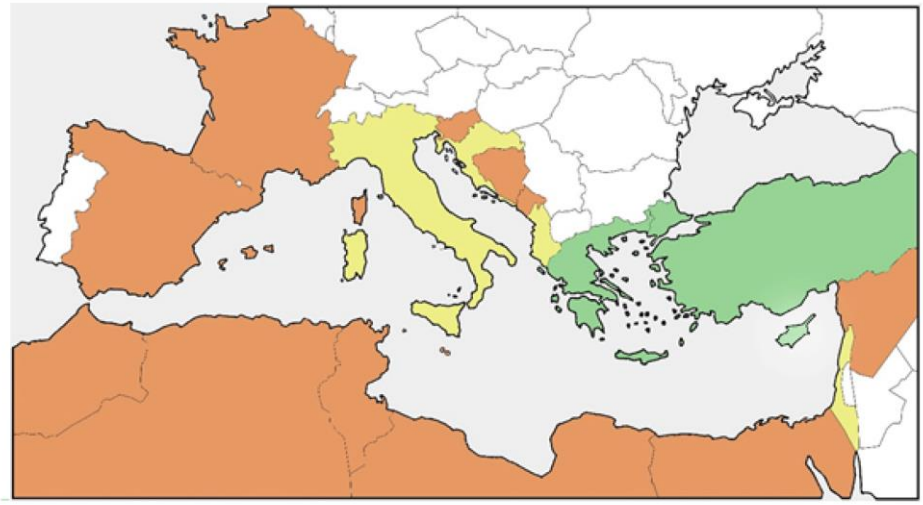


Figure 3: Monk seal conservation status by country (updated at 31.04.2019). *Key: Green: "Group A" countries (where monk seal breeding has been reported after year 2010). Yellow: "Group B" countries (where no monk seal breeding is reported, but where repeated sightings of monk seals (>3) were reported since 2010). Tan: "Group C" countries (where no monk seal breeding is reported, and where very rare or no sightings of monk seals (≤3) were reported since 2010), source: Decision.IG24/7.*

Box 2 – Summary of monitoring framework for EcAp/ IMAP Common Indicators 3 and 4 for the monk seal		
	Group A countries	**Group B and C countries**
Frequency of data collection	• Biennial (minimum requirement) • Annual (optimal)	• Continuous.
Monitoring method	• Pup counts based on cave inspections allow interpolation of population estimate (=> CI4) through conversion formula and allow pupping rate estimate (=> CI5) (minimum requirement). • Population estimate based on mark-recapture of photo-identified individuals based on camera trap monitoring (optimal) => CI4&5 • Opportunistic sightings and cave monitoring => CI3	• Recording opportunistic sightings (minimum requirement) => CI3 • Counts of photo-identified individuals based on camera trap monitoring in caves (optimal) => CI4 and CI5
Authority responsible for monitoring	• Each CP: national monitoring schemes	• Each CP: national monitoring schemes
Frequency of Common Indicators update	6 years (as per reporting cycle)	

Frequency of assessment update	6 years (as per reporting cycle)	
Minimal amount of monitoring locations	• All known locations in each Group A country covered at least once per reporting period.	• selected locations identified in Decision IG24/7 or in areas with high reported sighting frequency and habitat suitability

56. However, it is important to note that the country category subdivisions in the Strategy were revised in 2019, based on the availability of knowledge on monk seal presence in Mediterranean countries, with the objective of defining priority actions to be carried out in 2020-2026 in light of the regional Action Plan non-implementation. According to the strategy, Group C countries are "*also important because, although they are characterized by rare monk seal occurrence, they contain historical monk seal critical habitat.* […] *In the absence of sighting data collection mechanisms, some countries, known to host seals and suitable environmental conditions in the recent past, may currently qualify as Group C*". Some level of monitoring should therefore be carried out also in Group C countries, which hosted seals and suitable environmental conditions in the recent past. In fact, some of the priority actions foreseen for some Group C countries are defined with the intent of soliciting data collection frameworks designed at assessing monk seal presence in specific sectors of coastline (the ones with historical and currently more pristine suitable geomorphological habitat and seal presence).

3.6 Recommended monitoring, assessment, and reporting scales

57. Box 3 presents and additional summary of the proposed approach for marine mammal species in terms of monitoring methods and scales (MS), assessments scales (AS) and reporting scales (MRU) for considered Common Indicators and Candidate Common Indicators.

58. For mapping purposes, it is recommended to adopt the ETC/BD 10x10km for visualisation, ETRS 89 LAEA grid and the 50x50km for wide-ranging, relatively low-density species.

Box 3 - Proposed for marine mammal species primary monitoring methods and assessment & monitoring scales

Taxa	Common Indicators	Region	Sub-region	Sub-division (e.g., GFCM GSA)	National jurisdiction
Cetaceans	CI 3 Species distributional range	• **MS, AS, MRU** • **Distance sampling** for all species ○ **Acoustic and visual methods** for *Ziphius & Physeter*			• **MS** • **Acoustic and visual methods in** important habitats for *Ziphius, Physeter & Balaenoptera*
	CI 4 Population abundance	• **MS, AS, MRU** • **Distance sampling** for all species ○ **Acoustic and visual methods** for *Ziphius & Physeter*		• **MS** • **Distance sampling** for all species	
	CI 5 Population demography		• **MS, AS, MRU** • **Photo-id:** *Tursiops, Balaenoptera* • **Strandings**: *Stenella, Tursiops.*		• **MS** • **Photo-id:** *Tursiops, Balaenoptera* • **Strandings**: *Stenella, Tursiops.*
	CI 12 By-catch	• **MS, AS, MRU** • **Bycatch Risk Analysis** for all species		• **MS** • **On-board observers** for all species	

	CCI 26 Impulsive noise				• **MS** • **Acoustic buoys**: in *Ziphius* important habitats
Monk Seal	CI 3 Species distributional range	• **AS, MRU**			• **MS** • **Cave monitoring** in Country Group A • **Registry** of **opportunistic sighting** in Country Group B and C
	CI 4 Population abundance				• **MS** • **Pup counts in caves** in Country Group A and/or mark –recapture based on **Photo-id** through **caves' monitoring**
	CI 5 Population demography				

Key: MS=Monitoring Scale, AS=Assessment Scale, MRU=Marine Reporting Units.

3.7 Proposed reference values and thresholds for marine mammal species

3.7.1 THE IUCN LEAST CONCERN GUIDING PRINCIPLE FOR CETACEAN SPECIES, REFERENCE VALUES AND THRESHOLDS

59. The development of thresholds for the Common Indicator 4 (Species abundance) of cetacean species followed the guiding principle contained in a decision of the Parties (Decision IG.21/3) to use the IUCN "*Least Concern*" (LC) concept. Hence, all proposals are consistent with the MSFD process, but not necessarily identical.

60. Box 4 summaries proposed assessment reference values, thresholds, and assessment units for the Common Indicator 4 (Species abundance) of cetacean species. Summaries of our proposals on potential reference values and thresholds for these species on Common Indicators (3, 5 and 12) are contained in "*STEP 3*" (light red section) of the **Summary Tables** (see pages 32-38).

Box 4 - Proposed assessment reference values, thresholds, and assessment units for the Common Indicator 4 (Species abundance) related to the 8 species commonly encountered in the Mediterranean

Note: this table needs to be updated with the outcome of the ongoing IUCN Red List Assessment on Mediterranean cetaceans

Species	Proposed assessment units/MRUs	Reference value	Proposed 'state' assessment definition	If 'Least Concern'
Striped dolphin (*Stenella coeruleoalba*) • Regularly present in all sub-regions • IUCN Mediterranean listing: VU • Generation length=22.5 (3-gen period=67.5 years)	Regional	ASI 2018 DS design-based estimate. *Corrected and uncorrected for availability bias.* Every time that historical abundance values are revised, a new assessment of the species is necessary.	Maintain total abundance at or above reference levels.	*Stable or no decrease of ≥20% over 3 generations (1.8% within a reporting period).*
Common dolphin (*Delphinus delphis*) • Regularly present in all sub-regions • IUCN Mediterranean listing: EN • Generation length=14.8 (3-gen period=44.4 years)	Regional		Maintain total abundance at or above reference levels.	*No decrease of ≥20% over 3 generations (2.7% within a reporting period).*
Coastal bottlenose dolphins (*Tursiops truncatus*) • Regularly present in all sub-regions ○ Preferred habitat <100 m ○ Common over the continental shelf (<200m) ○ Present offshore • IUCN Mediterranean listing: LC • Generation length=21.1 (3-gen period=63.3 years)	Regional		Not applicable	*No decrease of ≥20% over 3 generations (1.9% within a reporting period).*

• Threats *to assess:* ○ bycatch ○ *food chain* pollution *(PCBs, heavy metals, etc.)*				
Risso's dolphin (*Grampus griseus*) • Regularly present in all sub-regions • IUCN Mediterranean listing: DD • Generation length=19.6 (3-gen period=58.8 years)	Regional		Maintain total abundance at or above reference levels.	*No decrease of ≥20% over 3 generations (2.0% within a reporting period).*
Long finned pilot whale (*Globicephala melas*) • Regularly present in the Western Mediterranean • IUCN Mediterranean listing: EN • Generation length=24 (3-gen period=72 years)	Regional		Maintain total abundance at or above reference levels.	*No decrease of ≥20% over 3 generations (1.7% within a reporting period).*
Cuvier's beaked whale (*Ziphius cavirostris*) • Regularly present in all sub-regions ○ Deep-*waters'* canyons, slope. • IUCN Mediterranean listing: VU • Generation length= Unknown • Threats *to assess:* ○ bycatch ○ *mid-frequency impulsive noise in* important *habitats*	Regional	ASI 2018 DS design-based estimate. *Corrected and uncorrected for availability bias.* Every time that historical abundance values are revised, a new assessment of the species is necessary.	Maintain total abundance at or above reference levels.	*No decrease of ≥ 1.5% within a reporting period.*
Sperm whale (*Physeter macrocephalus*) • Regularly present in all sub-regions, but the Adriatic. • IUCN Mediterranean listing: EN • Generation length=31.9 (3-gen period=95.7 years)	Regional		Maintain total abundance at or above reference levels.	*No decrease of ≥20% over 3 generations (1.3% within a reporting period).*
Fin whale (*Balaenoptera physalus*) • Regularly present in all sub-regions • IUCN Mediterranean listing: EN • Generation length=25.9 (3-gen period=77.7 years)	Regional		Maintain total abundance at or above reference levels.	*No decrease of ≥20% over 3 generations (1.5% within a reporting period).*

Source: estimated generation lengths are from Taylor et al. 2007.

61. In terms of existing GES definitions for cetacean species CI4 (*Abundance*), it is important to notice that IUCN categories do not evaluate the current status of a species in relation to a "pristine" condition, nor the MSFD or HD. There is a general agreement on the fact that it is impossible to establish what "natural levels" means in quantitative terms, because of a combination of lack of historical data and series and demographic and ecological complexity of many species, including marine mammals. This explains the reason why we do not use the terminology "baseline values", which could be misleading, but rather "reference values". Initial reference values for cetacean species can be based on the results of the data analyses from the 2018 ASI project; although some subregions (i.e. Adriatic) can have abundance values collected earlier on at the correct scale and through "primary methods" (see **Summary Tables**, pages 32-38), which can allow moving the first reference value at an earlier date with respect back in the years (i.e. 2010; Fortuna et al. 2018).

62. The transposition of the quantitative meaning of IUCN Criterion A to define the condition of "Least Concern" over a "3-generation time" window was made in relation to the EcAp/IMAP reporting period (6-year). In simple words, this means that a decrease of less than 20% over a "3-generation" period is acceptable. Anything between 20% and 29% would qualify a species for the category "Near Threatened". Potential "acceptable" decreases vary among species because generation-time varies, sometimes considerably.

63. The IUCN definition of "generation length" is "*the average age of parents of the current cohort (i.e. newborn individuals in the population). Generation length therefore reflects the turnover rate of breeding*

individuals in a population. Generation length is greater than the age at first breeding and less than the age of the oldest breeding individual, except in taxa that breed only once. Where generation length varies under threat, the more natural, i.e. pre-disturbance, generation length should be used" (Taylor *et al*. 2007). The Generation length include the Inter-breeding interval (IBI) parameter.

64. Proposed thresholds consider what to do in case of LC species and what for all other species that are listed into threaten categories (i.e. Critically Endangered, Endangered and Vulnerable). In terms of monitoring routine, the Category "Near threaten" should be considered a "buffer" zone in which countries should engage in *ad hoc* monitoring cycles, possibly focusing on parameters that can help to best understand the real situation for a given species.

Recommendation for future work: The appropriate level of significance for thresholds and reference values needs to be discussed and agreed before the next assessment (2023).

Recommendation for future work: Some additional work needs to be done before the next assessment on the evaluation of the potential impact of constantly changing baselines and on allowing the use of constantly decreasing trends within a specific time-window for CI3, CI4 and CI5. See, for example, the solutions adopted by OSPAR on Grey Seal Pup Production.

65. For Common Indicator 5 (demographic parameters), reference and threshold values will need to be defined, as soon as sufficient information will become available on demographic characteristics and will be sufficiently robust to provide average values for sub-regional reference populations. In fact, in order to develop appropriate reference values for those species for which is possible (i.e. those for which data on mark-recapture, gender and reproductive history can be acquired), long-term datasets are necessary (usually of a few decades). In addition, given the high variability within species, this indicator might be particularly challenging for cetacean species.

3.7.2 PROPOSED REFERENCE VALUES AND THRESHOLDS FOR THE MONK SEAL

66. Summaries of our proposals on Potential reference values and thresholds for the Monk seal for all Common Indicators (3, 4, 5 and 12) are contained in "*STEP 3*" (light red section) of the **Summary Tables** (see pages 32-38).

67. Unfortunately, there is no reference map for the species range at Mediterranean level, with sufficient detail that allows to measure shifts in range across 6-year reporting periods. At present the only available data is contained in the IUCN 2015 red listing and the 2019 monk seal strategy subdivision of monk seal areas hosting resident (and therefore known reproductive nuclei) seals, as opposed to areas with monk seal sightings but no formal map exists.

Recommendation for future work: Concerning CI 3, the existing range maps constructed for Habitats Directive reporting, which should be the same as those for MSFD, should be merged into one, with the addition of other data from non-EU and EU countries (e.g., citizen-science, IMAP monitoring, field-work and strandings, etc.). This should be the current baseline against which to measure changes. This work should be finalised before the next reporting period (2023).

68. Similar issues apply to the estimated abundance: at present the IUCN estimate, while based on the best available evidence, is still far from describing the actual population estimate that should be based on homogeneous methodologies. In fact, methods used in the region to estimate abundance are extremely different (e.g., Greek population is estimated through pup counts converted into number of total individuals based on a multiplier obtained from various monk seal populations; whereas the south-eastern Turkish coast population is estimated using mark-recapture methods).

Recommendation for future work: In regard to CI 4, Mediterranean experts need to cooperate to establish a standard method to estimate abundance that takes into account individual displacement across whole range, which will allow to inform and compare temporal and sub-regional trends, before 2023 assessment. This initiative should be organised in the context of the IMAP revision process.

69. The monitoring and assessment of this endangered species (Karamanlidis and Dendrinos 2015) would highly benefit from concerted programmes carefully analysing trends in distributional range, total abundance and reproductive rates.

70. In regard to demographic parameters, pup production (pup counts) is an important parameter to be used to assess the Mediterranean population. Considering the difficulty in doing wide ranging monitoring it could be reasonable to elect "index areas" (e.g., Levantine basin, Ionian islands, North Aegean, etc.) in which to do a more in depth analysis to identify other parameters. These could be: (a) the annual birth rate in "index areas" (reproductive females/number of pups); (b) age class structure (long term); (c) age at maturity, etc.

Recommendation for future work: In regard to CI 5, Mediterranean experts need to cooperate to elaborate a more structured approach on how to explore and identify the best demographic parameters for the medium-long term monitoring, before 2023 assessment. This initiative should be organised in the context of the IMAP revision process.

3.8 New IMAP Candidate Common Indicators (CCI) relevant to marine mammals

71. In terms of assessing the impact of a polluted ecosystem at population level (EO9), the creation of a Candidate Common Indicator that represents a proxy for "population health condition of cetacean species" is proposed. This CCI would assess the level of pollutants' concentration in tissues of free-ranging and stranded specimens, in particular, of compounds such as polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), hexachlorobenzene (HCB) and dichlorodiphenyltrichloroethane and its main metabolites (DDTs), heavy metals and new emerging pollutants. This new CCI could be monitored at sub-regional level and it would necessitate concerted/coordinated programmes. It would be analysed in blubber, liver, kidney and skin samples (ideally bone, spleen and lung should also be considered) from stranded animals and on free-ranging specimens (through blubber-skin biopsies sampling conducted within national jurisdictions and by researchers with contrasted expertise on remote biopsy sampling). These data should be considered at sub-regional level for the assessment.

72. The definitions of the Candidate Common Indicator could be similar to those of Criterion D8C2 (Species and habitats which are at risk from contaminants) of the MSFD, as in the table below:

Criteria elements	Criteria	Methodological standards
Species and habitats which are at risk from contaminants. Member States shall establish **that list of species**, and **relevant tissues to be assessed**, and habitats, through regional or subregional cooperation.	**D8C2** — Secondary: The **health of species** and the condition of habitats (such as their species composition and relative abundance at locations of chronic pollution) are **not adversely affected due to contaminants including cumulative and synergetic effects**. Member States shall establish those adverse effects and their threshold values through regional or subregional cooperation.	*Use of criteria:* The extent to which good environmental status has been *achieved* shall be expressed for each area assessed as follows: […] for each species assessed under criterion D8C2, an estimate of the abundance of its population in the assessment area that is adversely affected; […]. The use of criterion D8C2 in the overall assessment of good environmental status for Descriptor 8 shall be agreed at regional or subregional level. The *outcomes* of the assessment of criterion D8C2 shall contribute to assessments under Descriptors 1 and 6, where appropriate.

4. SUGGESTIONS POTENTIALLY RELEVANT TO THE DISCUSSION ON DECISIONS REGARDING AGREED GES AND OF THE ONGOING OVERALL INTEGRATION PROCESS

73. While considering current ongoing process at the European level on the MSFD and regionally on EcAp and IMAP, the authors identified few topics that might be of interest for future consideration. These are:

1) The following species have a limited geographical distribution in the Mediterranean. Some consideration should be given on whether to consider them at some stage, in relation to their importance within a sub-region prospective.

Species with limited sub-regional geographical distribution			
Species	**Present**	**Reference value**	**Additional information**
Harbour porpoise (*Phocoena phocoena relicta*)	Eastern Mediterranean: North Aegean Sea	Not Available	• *Phocoena phocoena* is a Priority species under the EU HD. This sub-species is endemic of the Black Sea. • Generation length=11.9 (for *Phocoena phocoena*)
Killer whale (*Orcinus orca*)	Gibraltar Strait (Western Mediterranean)	Check the ongoing IUCN Assessment	• Generation length=25.7
Rough-toothed dolphin (*Steno bredanensis*)	Eastern Mediterranean	Check the ongoing IUCN Assessment	• Generation length= Not available
False Killer Whale (*Pseudorca crassidens*)	Eastern Mediterranean (in proximity of Suez Canal)	Not Available	• Species frequently encountered in the Suez Canal adjacent area. Recent observations and strandings (2019-2020) were reported in Tunisia and Libya.

2) Common Indicators could be prioritised. For example, in order to assess the status of a given cetacean species it is sufficient to collect regularly information on abundance (CI4) and human-induced mortality (e.g., CI12). This is true also in the context of IUCN Red listing, under Criterion A.

74. In addition to these considerations, knowing that the discussion on the overall integration of GES of all Common Indicators (topic outside the scope of this report) is ongoing, it is important to highlight that this process should duly consider issues related to transboundary species and pressures and their connectivity, since GES achievement by one Contracting Party may be dependent on actions taken by other Contracting Parties within the region or any sub-regions, given various interactions, among these elements especially regarding anthropogenic pressures that may have transboundary effects.

75. To achieve the ultimate objective (i.e.: assess the overall Mediterranean GES), a strategy on how to integrate pressures, impacts and state elements and their interrelation to the extent possible among different relevant Ecological Objectives (EO) needs to be defined (2018 UNEP/MED WG.450/3; 2019 UNEP/MED WG.467/7; 2020 UNEP/MED WG.482/Inf.13).

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SUMMARY TABLES - IMAP COMMON INDICATORS (CI), GES OBJECTIVES AND TARGETS RELATED TO MARINE MAMMALS

Agreed EcAp Common Indicators, Ecological Objectives, GES definitions and GES target						STEP 1 Refining scales of monitoring, by revising the existing IMAP/EcAp proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing scales of assessment (if different from those of monitoring) and assessment criteria		STEP 3 Develop threshold and reference values	
Common Indicator	**Ecological Objective**	**Operational Objective**	**GES definition**	**GES target**	***Comments, suggestions***	***Existing context*** Species/functional group	***Proposed changes*** Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	***Existing context***	***Proposed changes***	***Existing context***	***Proposals***
CI3: Species distributional range[3]	Eo1 - Biological diversity is maintained or enhanced. The quality and occurrence of coastal[4] and marine habitats and the distribution and abundance of coastal and marine species[5] are in line with prevailing physiographic, hydrographic, geographic and climatic conditions.	1.1 Species distribution is maintained	None in Decision IG.21/3. ***2017 Proposal***: The species are present in all their **natural** distributional range.	***State***: none in Decision IG.21/3. ***2017 Proposal***[6]: The distribution of marine mammals remains stable or expanding and the species that experienced reduced distribution in the past are in favourable status of conservation and can recolonise areas with suitable habitats. ***Pressure/Response***[7]: Human activities having the potential to exclude marine mammals from their natural habitat within their range area or to damage their habitat are regulated and controlled. Conservation measures implemented for the zones of importance for cetaceans. Fisheries management measures that strongly mitigate the risk of incidental taking of monk seals and cetaceans during fishing operations are implemented.		Fin whale / Mysticetes	**<u>Primary monitoring</u>** • *Geographic scale*: Regional. • *Method*: standard & synchronised between all countries (i.e. ASI-like). • *Frequency*: at least once per reporting period. **<u>Secondary monitoring</u>** • *Geographic scale*: Sub-Regional / National. ○ **High Priority sub-regions** (HP): in WM and I&CM key habitats for this species (i.e. feeding, corridor). ○ **Low priority sub-regions** (LP) in A and A&LS. • **Method**: ○ in **HP**: systematic regular monitoring (including photo-id). ○ in **LP** complement systematic monitoring with other adequate and standard method (UNEP MAP 2019). • **Frequency**: ○ in **HP** sub-regions the minimum requirement is: at least three times (better annually in selected places); ○ in **LP** at least one time over the reporting period.	New proposal in UNEP/MED WG.450/3: • Regional: large cetaceans	• Primary assessment/MRU: Regional. • Frequency: once every reporting period.	None	**Reference values distributional range**: • <u>*Mediterranean cetaceans*</u> (**<u>all species</u>**): map to be created based on Mannocci et al. 2018, Canadas et al. 2018 (*Ziphius*) • <u>*Adriatic cetaceans*</u>: Fortuna et al. 2018 (*Tusiops*, *Stenella*) • <u>*Monk seals*</u>: map to be created based all existing data. **Thresholds for distributional range**: • The extent of the distribution of each species remains stable or expanding compared to a **reference map** (see above). In particular, the Extent of occurrence (EOO) shows: 1) no decline (in all sub-regions where the species was regularly found since last assessment, 2) no decline of number of locations or local putative populations for the species within its distributional range. Given the difficulty to assess the distribution of cetacean species at a finer scale, both reference values and thresholds for this CI should be revised at each assessment cycle.
						Sperm whale / Odontocete (deep feeder)	**<u>Primary monitoring</u>** • **Geographic scale**: Regional. • **Method**: As in previous cell. • **Frequency**: As in previous cell. **<u>Secondary monitoring</u>** • **Geographic scale**: Sub-Regional / National. ○ **High Priority** (HP) in WM, I&CM and A&LS key habitats for this species (i.e. breeding, corridor). ○ **Low priority** (LP) in A • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell.			None	
						Cuvier's beaked whale (deep feeder)	**<u>Primary monitoring</u>** • **Geographic scale**: Regional. • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell. **<u>Secondary monitoring</u>** **Geographic scale**: Sub-Regional / National. ○ **High Priority** (HP) in WM, I&CM and A&LS key habitats for this species (i.e. feeding). ○ **Low priority** (LP) in A • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell.			None	

[3] https://www.medqsr.org/common-indicator-3-species-distributional-range-marine-mammals
[4] By coastal it is understood both the emerged and submerged areas of the coastal zone as considered in the SPA/BD Protocol as well as in the definition of coastal zone in accordance with Article 2e and the geographical coverage of Article 3 of the ICZM Protocol.
[5] On the basis of Annex II and III of the SPA and Biodiversity Protocol of the Barcelona Convention.
[6] UNEP(DEPI)/MED WG.444/6/Rev.1. IMAP Common Indicator Guidance Facts Sheets (Biodiversity and Fisheries). 6th Meeting of the Ecosystem Approach Coordination Group, Athens, Greece, 11 September 2017.
[7] Decision IG.21/3 on the Ecosystems Approach including adopting definitions of Good Environmental Status (GES) and targets.

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Agreed EcAp Common Indicators, Ecological Objectives, GES definitions and GES target						STEP 1 Refining scales of monitoring, by revising the existing IMAP/EcAp proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing scales of assessment and assessment criteria		STEP 3 Develop threshold and reference values	
Common Indicator	**Ecological Objective**	**Operational Objective**	**GES definition**	**GES target**	***Comments, suggestions***	***Existing context*** Species/functional group	***Proposed changes*** Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	***Existing context***	***Proposed changes***	***Existing context***	***Proposals***
CI3: Species distributional range[8] *continue*	Eo1 - Biological diversity is maintained or enhanced. The quality and occurrence of coastal[9] and marine habitats and the distribution and abundance of coastal and marine species[10] are in line with prevailing physiographic, hydrographic, geographic and climatic conditions.	1.1 Species distribution is maintained	None in Decision IG.21/3. ***2017 Proposal***: The species are present in all their **natural** distributional range.	***State***: none in Decision IG.21/3. ***2017 Proposal***[11]: The distribution of marine mammals remains stable or expanding and the species that experienced reduced distribution in the past are in favourable status of conservation and can recolonise areas with suitable habitats. ***Pressure/Response***[12]: Human activities having the potential to exclude marine mammals from their natural habitat within their range area or to damage their habitat are regulated and controlled. Conservation measures implemented for the zones of importance for cetaceans. Fisheries management measures that strongly mitigate the risk of incidental taking of monk seals and cetaceans during fishing operations are implemented.		Long finned pilot whale (epipelagic feeder)	**Primary monitoring** • **Geographic scale**: Regional. • **Method**: standard & synchronised between all countries (i.e. ASI-like). • **Frequency**: at least once per reporting period. **Secondary monitoring** • **Geographic scale**: Sub-Regional / National. ○ **High Priority sub-regions** (HP) in WM key habitats for this species (i.e. feeding, corridor). ○ **Low priority** (LP) in I&CM. • **Method**: ○ in **HP**: systematic regular monitoring; ○ in **LP** complement systematic monitoring with other adequate and standard method (UNEP MAP 2019). • **Frequency**: ○ in **HP** sub-regions the minimum requirement is biannual; ○ in **LP** at least one time over the reporting period.	New proposal in UNEP/MED WG.450/3: • Sub-regional: small cetaceans	• **Primary assessment/MRU**: Regional. • **Frequency**: once every reporting period.	None	*See previous page.*
						Risso's dolphin (epipelagic feeder)	**Primary monitoring** • **Geographic scale**: Regional. • **Method**: As in previous cell. • **Frequency**: As in previous cell. **Secondary monitoring** • **Geographic scale**: Sub-Regional / National. ○ **High Priority sub-regions** (HP) in WM & A key habitats for this species (i.e. feeding, corridor). ○ **Low priority** (LP) in I&CM and A&LS. • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell.			None	
						Bottlenose dolphin (epipelagic feeder)	**Primary monitoring** • **Geographic scale**: Regional. • **Method**: As in previous cell. • **Frequency**: As in previous cell. **Secondary monitoring** • **Geographic scale**: Sub-Regional / National. ○ **High Priority sub-regions** (HP) in key habitats for this species in all sub-regions (i.e. feeding, corridor). ○ **Low priority** (LP) in offshore areas. • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell.			None	
						Common dolphin (epipelagic feeder)	**Primary monitoring** • **Geographic scale**: Regional. • **Method**: As in previous cell. • **Frequency**: As in previous cell. **Secondary monitoring** • **Geographic scale**: Sub-Regional / National. ○ **High Priority sub-regions** (HP) in WM, A&LS key habitats for this species (i.e. feeding, corridor). ○ **Low priority** (LP) in A, I&CM. • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell.			None	
						Striped dolphin (epipelagic feeder)	**Primary monitoring** • **Geographic scale**: Regional. • **Method**: As in "Fin whale" cell (except for photo-id).			None	

[8] https://www.medqsr.org/common-indicator-3-species-distributional-range-marine-mammals
[9] By coastal it is understood both the emerged and submerged areas of the coastal zone as considered in the SPA/BD Protocol as well as in the definition of coastal zone in accordance with Article 2e and the geographical coverage of Article 3 of the ICZM Protocol.
[10] On the basis of Annex II and III of the SPA and Biodiversity Protocol of the Barcelona Convention.
[11] UNEP(DEPI)/MED WG.444/6/Rev.1. IMAP Common Indicator Guidance Facts Sheets (Biodiversity and Fisheries). 6th Meeting of the Ecosystem Approach Coordination Group, Athens, Greece, 11 September 2017.
[12] Decision IG.21/3 on the Ecosystems Approach including adopting definitions of Good Environmental Status (GES) and targets.

							• **Frequency**: As in "Fin whale" cell.					

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Common Indicator	**Ecological Objective**	**Operational Objective**	**GES definition**	**GES target**	***Comments, suggestions***	***Existing context*** Species/functional group	***Proposed changes*** Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	***Existing context***	***Proposed changes***	***Existing context***	***Proposals***
CI3: Species distributional range *continue*	EO1 - Biological diversity is maintained or enhanced. The quality and occurrence of coastal and marine habitats and the distribution and abundance of coastal and marine species are in line with prevailing physiographic, hydrographic, geographic and climatic conditions.	1.1 Species distribution is maintained	The **Monk Seal** is present along recorded Mediterranean coasts with suitable habitats for the species[6].	***State***[7]: The distribution of Monk Seal remains stable or expanding and the species is recolonizing areas with suitable habitats. ***Pressure***[7]: Human activities having the potential to exclude marine mammals from their natural habitat within their range area or to damage their habitat are regulated and controlled. Fisheries management measures that strongly mitigate the risk of incidental taking of monk seals and cetaceans during fishing operations are implemented.		Monk Seal	**<u>Primary monitoring</u>** • **Geographic scale**: Sub-regional o In Group A countries: o Specifically, monitor populations in sites consistent with the Regional Strategy for the conservation of Monk seal in the Mediterranean (RSMS). o In Group B and C countries: area with suitable habitat and/ historical presence. • **Method**: o In Group A countries: ▪ Registry on opportunistic sightings / citizen science ▪ Photo traps in selected caves o In Group B & C countries: ▪ Registry on opportunistic sightings (minimum requirement) ▪ Photo traps in selected caves of selected locations identified by the revised RSMS. • **Frequency**: Annual (minimum requirement) or all known locations in each Group A country covered at least three times (biannually) per reporting period.	None	• **Primary assessment/MRU**: Regional. • **Frequency**: once every reporting period.	None	**Reference values distributional range**: • *<u>Monk seals</u>*: map to be created based all existing data.

SUMMARY TABLES - IMAP COMMON INDICATORS (CI), GES OBJECTIVES AND TARGETS RELATED TO MARINE MAMMALS

Agreed EcAp Common Indicators, Ecological Objectives, GES definitions and GES target						STEP 1 Refining scales of monitoring, by revising the existing IMAP/EcAp proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing scales of assessment and assessment criteria		STEP 3 Develop threshold and reference values	
Common Indicator	**Ecological Objective**	**Operational Objective**	**GES definition**	**GES target**	***Comments, suggestions***	***Existing context*** Species/functional group	***Proposed changes*** Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	***Existing context***	***Proposals***	***Existing context***	***Proposals***
CI4: Population abundance of selected species[13]	EO1- Biological diversity is maintained or enhanced. The quality and occurrence of coastal and marine habitats and the distribution and abundance of coastal and marine species are in line with prevailing physiographic, hydrographic, geographic and climatic conditions.	1.2 Population size of selected species is maintained	The species population has abundance levels allowing to qualify to Least Concern Category of IUCN.	***State***[6]: Populations recover towards natural levels. ***2017 Proposal***: No human-induced mortality is causing a decrease in breeding population size or density. Populations recover towards natural levels.		Fin whale	**Primary monitoring** • *Geographic scale*: Regional. • *Method*: standard & synchronised between all countries (i.e. ASI-like). • *Frequency*: at least once per reporting period. **Secondary monitoring** • *Geographic scale*: Sub-Regional / National. ○ *High Priority sub-regions* (HP): in WM and I&. ○ *Low priority* (LP):in A and A&LS. • **Method**: ○ in HP: systematic regular monitoring (including photo-id); ○ in LP complement systematic monitoring with other adequate and standard method (UNEP MAP 2019). • **Frequency**: ○ in HP sub-regions the minimum requirement is biennial. ○ in LP at least one time over the reporting period.	IMAP Monitoring Protocols 2019	• **Assessment / MRU**: Regional. • **Frequency**: once every reporting period.	None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of ≥20% over 3 generations (1.5% within a 6-year reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
						Sperm whale	**Primary monitoring**: As in "Fin whale" cell. **Secondary monitoring**: • *Geographic scale*: Sub-Regional / National. ○ HP: in WM, I&CM and A&LS. ○ LP: in A. • *Method*: As in "Fin whale" cell. • *Frequency*: As in "Fin whale" cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of ≥20% over 3 generations (1.3% within a 6-year reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
						Cuvier's beaked whale	**Primary monitoring**: As in "Fin whale" cell. **Secondary monitoring** • *Geographic scale*: Sub-Regional / National. ○ HP in WM, I&CM and A&. ○ LP in A. • *Method*: As in "Fin whale" cell. • *Frequency*: As in "Fin whale" cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of ≥ 1.5% within a 6-year reporting period. • Regional reference value: Canadas *et al.* 2018 & ASI 2018 DS design-based estimate (see Box 4 for details).
						Long finned pilot whale	**Primary monitoring**: As in "Fin whale" cell. **Secondary monitoring** • *Geographic scale*: Sub-Regional / National. ○ **High Priority sub-regions** (HP) in WM. ○ **Low priority** (LP) in I&CM. • **Method**: As in "Fin whale" cell. ○ **Frequency**: As in "Fin whale" cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of ≥20% over 3 generations (1.7% within a reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
						Risso's dolphin	**Primary monitoring**: As in "Fin whale" cell. **Secondary monitoring** • **Geographic scale**: Sub-Regional / National. ○ **High Priority sub-regions** (HP) in WM & A. ○ **Low priority** (LP) in I&CM and A&LS. • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of ≥20% over 3 generations (2.0% within a reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).

[13] https://www.medqsr.org/common-indicator-4-population-abundance-selected-species-marine-mammals

SUMMARY TABLES - IMAP COMMON INDICATORS (CI), GES OBJECTIVES AND TARGETS RELATED TO MARINE MAMMALS

Agreed EcAp Common Indicators, Ecological Objectives, GES definitions and GES target						STEP 1 Refining scales of monitoring, by revising the existing IMAP/EcAp proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing scales of assessment and assessment criteria		STEP 3 Develop threshold and reference values	
Common Indicator	**Ecological Objective**	**Operational Objective**	**GES definition**	**GES target**	***Comments, suggestions***	***Existing context*** Species/functional group	***Proposed changes*** Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	***Existing context***	***Proposals***	***Existing context***	***Proposals***
CI4: Population abundance of selected species[14] *continue*	EO1- Biological diversity is maintained or enhanced. The quality and occurrence of coastal and marine habitats and the distribution and abundance of coastal and marine species are in line with prevailing physiographic, hydrographic, geographic and climatic conditions.	1.2 Population size of selected species is maintained	The species population has abundance levels allowing to qualify to Least Concern Category of IUCN.	***State***[6]: Populations recover towards natural levels. ***2017 Proposal***: No human-induced mortality is causing a decrease in breeding population size or density. Populations recover towards natural levels.		Bottlenose dolphin	**<u>Primary monitoring</u>**: As in "Fin whale" cell. **<u>Secondary monitoring</u>** • **Geographic scale**: Sub-Regional / National. ○ **High Priority sub-regions** (HP). ○ **Low priority** (LP) in offshore areas. • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • No decrease of ≥20% over 3 generations (1.9% within a reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details). ○ Adriatic: Reference value (2010: Fortuna et al. 2018)
						Common dolphin	**<u>Primary monitoring</u>**: As in "Fin whale" cell. **<u>Secondary monitoring</u>** • **Geographic scale**: Sub-Regional / National. ○ **High Priority sub-regions** (HP) in WM, A&LS key habitats for this species (i.e. feeding, corridor). ○ **Low priority** (LP) in A, I&CM. • **Method**: As in "Fin whale" cell. • **Frequency**: As in "Fin whale" cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of ≥20% over 3 generations (2.7% within a reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
						Striped dolphin	**<u>Primary monitoring</u>**: As in "Fin whale" cell.	None.		None.	• Check IUCN status and if EN, CR, VU then > only. • Maintain total abundance at or above reference levels. • When listed as LC, no decrease of ≥20% over 3 generations (1.8% within a reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
			Number of individuals by colony allows to achieve and maintain a favourable conservation status.	***State***[7]: Continual recovery of population density.		Monk Seal	**<u>Primary monitoring (pending definition of a single standardised method to avoid double counting and allow inter-regional comparison)</u>** • **Geographic scale**: Sub-regional • **Method**: ○ Group A countries: ▪ Individuals counts based on cave monitoring (minimum requirement) and/or mark-recapture based on photo-identified seals data in sites consistent with the revised Monk seal strategy. ○ Group B & C countries: ▪ Photo-identification of individuals based on images obtained from non-invasive monitoring of resting caves. Caves in sites that require monitoring should be decided based on evidence of recurrent sightings recorded through the results of the opportunistic sighting registry ○ **Frequency**: Annual.	None.	• **Assessment/ MRU**: Regional	None.	• Increase on total population of 1% over six-year reporting period AND increase in number of pups compared to the last assessment. • Provisional reference value: to be estimated.

[14] https://www.medqsr.org/common-indicator-4-population-abundance-selected-species-marine-mammals

SUMMARY TABLES - IMAP COMMON INDICATORS (CI), GES OBJECTIVES AND TARGETS RELATED TO MARINE MAMMALS

Agreed EcAp Common Indicators, Ecological Objectives, GES definitions and GES target						STEP 1 Refining scales of monitoring, by revising the existing IMAP/EcAp proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing scales of assessment and assessment criteria		STEP 3 Develop threshold and reference values	
Common Indicator	**Ecological Objective**	**Operational Objective**	**GES definition**	**GES target**	***Comments, suggestions***	***Existing context*** Species/functional group	***Proposed changes*** Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	***Existing context***	***Proposals***	***Existing context***	***Proposals***
CI5: Population demographic characteristics[15]	EO1 - Biological diversity is maintained or enhanced. The quality and occurrence of coastal and marine habitats and the distribution and abundance of coastal and marine species are in line with prevailing physiographic, hydrographic, geographic and climatic conditions.	1.3 Population condition of selected species is maintained	***State***[7]: Decreasing trends in human induced mortality. ***Pressure***[7]: Appropriate measure implemented to mitigate incidental catch, prey depletion and other human induced mortality.	Species populations are in good condition: Low human induced mortality, balanced sex ratio and no decline in calf production[7]. ***2017 Proposal***: preliminary assessment of incidental catch, prey depletion and other human induced mortality followed by implementation of appropriate measures to mitigate these threats.	Move GES definitions for state and pressure to CI12 and reformulate GES definitions for CI5	Cetaceans (*Stenella, Tursiops* and *Balaenoptera* as proxy for functional groups)	**Primary monitoring** • **Geographic scale**: Sub-regional / National. • **Species**: focus on *Stenella, Tursiops* and *Balaenoptera*. **Parameters**: o adult survival probability, juvenile survival probability; fecundity/breeding productivity/rate; age class distribution; sex ratio; population growth rate. • **Method**: o **Stranding network** collecting standard measures and biological material (e.g., teeth and reproductive organs) o **Photo-ID network** collecting standard pictures (list of parameters including calf) • **Frequency**: continuous for strandings, regularly and frequent for photo-ID. **Secondary monitoring** • **Geographic scale**: Sub-Regional. • **Method**: one dedicated concerted and cooperative campaign collecting biopsies (for sex ratio, and hormones rates). • **Frequency**: at least once per reporting period.		• **Assessment/ MRU**: Sub-regional & all "local populations" (long-term studies). • **Frequency**: once per reporting period.		It is not possible to develop reference and threshold values at this point.
			Pressure[7]: Appropriate measures implemented to mitigate direct killing and incidental catches and to preclude habitat destruction and disturbance.	Species populations are in good condition: Low human induced mortality, appropriate pupping seasonality, high annual pup production, balanced reproductive rate and sex ratio[6]. ***2017 Proposal***: decreasing trends in human induced mortality (e.g., direct killings, pupping/resting habitat /disturbance/occupation)	Move GES definitions for state and pressure to CI12 and reformulate GES definitions for CI5. Add "Habitat disturbance" to the definition of Pressure in GES.	Monk seal	**Primary monitoring** • **Geographic scale**: Sub-regional in countries Group A. • **Method**: Pup counts in critical/selected breeding caves (minimum requirement). • **Frequency**: annual.		• **Assessment/MRU**: Sub-regional & all "colonies". • **Frequency**: once per reporting period.		**Reference values demography**: • *Total annual national pup counts*: to be estimated. • *Annual birth rate*: define index areas and produce estimates. **Threshold values**: • Increase from last assessment.

[15] https://www.medqsr.org/common-indicator-5-population-demographic-characteristics-marine-mammals

SUMMARY TABLES - IMAP COMMON INDICATORS (CI), GES OBJECTIVES AND TARGETS RELATED TO MARINE MAMMALS

Agreed EcAp Common Indicators, Ecological Objectives, GES definitions and GES target						STEP 1 Refining scales of monitoring, by revising the existing IMAP/EcAp proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing scales of assessment and assessment criteria		STEP 3 Develop threshold and reference values	
Common Indicator	**Ecological Objective**	**Operational Objective**	**GES definition**	**GES target**	***Comments, suggestions***	***Existing context*** Species/functional group	***Proposed changes*** Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	***Existing context***	***Proposals***	***Existing context***	***Proposals***
CI12: Bycatch of vulnerable and non-target species (EO1 and EO3)	EO3-EO1 - Populations of selected commercially exploited fish and shellfish are within biologically safe limits, exhibiting a population age and size distribution that is indicative of a healthy stock	***2017 Proposal***: Incidental catch of vulnerable species (i.e. sharks, marine mammals, seabirds and turtles) are minimized.		***2017 Proposal***: The abundance / trends of populations of seabirds, marine mammals, sea turtles and sharks key species (selected according to their actual and total dependence on the marine environment, and to their ecological representativeness) is stable or not reducing in a statistically significant way taking into account the natural variability compared to the current situation.	***Cetaceans*** ***State***[7]: **No unsustainable impact at population level**. Decreasing trends in human induced mortality. ***Pressure***[7]: Appropriate measure implemented to mitigate incidental catch, prey depletion and other human induced mortality. ***Monk seal*** ***Pressure***[7]: Appropriate measures implemented to mitigate direct killing and incidental catches and to preclude habitat destruction.	Marine mammals	• In each GFCM GSA, at least one year of cetacean bycatch rate monitoring per each high priority fishing métiers (to be defined), within each reporting cycle. • GFCM provides data on fishing effort during reference year for priority fishing métiers, for each GSA. • **Annually**: bycatch (onboard observations, questionnaires and strandings) and systemic pollution (strandings) • CPs monitor their fleets (**at least one métier per sub-region per year, rotating**). • National stranding network collect data on fishery-induced mortality and level of pollutants in marine mammal tissues. They provide biennial reports on these matters. • Each CP: national monitoring schemes to provide bycatch rates and annual fishing effort.		• **Assessment/MRU**: Regional & Sub-regional (or aggregated GFCM GSAs). • **Frequency**: annual or biennial.		• **Regional**: BRA on each species for the potentially most dangerous fishing gears. o Threshold of the total estimated bycatch per all fishing gears: **1% of the total population**. This triggers in-depth monitoring programmes. • **Sub-regional**: ***thresholds*** calculated with CLA or RLA on each species, based on actual observations on bycatch rates, total fishing effort, biological parameters and conservation objectives (CLA = 72% K; RLA = 80% K).

UNEP/MED WG.502/16
Appendix B

ANNEX 1 - PROPOSED REVISIONS TO APPENDIX 1 OF ANNEX TO DECISION IG.22/7 ON INTEGRATED MONITORING AND ASSESSMENT PROGRAMME OF THE MEDITERRANEAN SEA AND COAST AND RELATED ASSESSMENT CRITERIA

Proposed revisions to Appendix 1 of Annex to Decision Ig.22/7 on Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria are all in red. Added text is in **bold**, proposed deletions are ~~strikethrough~~.

Revisions are proposed for the next three tables.

Proposed revisions to Annex to Decision IG.22/7 on Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria

Species class	**Species functional groups**	
	~~CEEC~~**/OSPAR**	~~FR experts proposal~~ **EcAp/IMAP** ~~(subdivision of toothed whales)~~
Marine mammals	Baleen whales	~~baleines à fanons (Mysticètes)~~ **Baleen whales (Mysticetes)**
	Toothed wales	~~Odontocètes épipélagiques stricts (alimentation entre 0 à -200 m)~~ **Strictly epipelagic Odontocetes (feeding between 0 and -200m)**
		~~Odontocètes épi- et méso-bathy-pélagiques (alimentation de 0 à >-200 m)~~ **Epi-, mesopelagic Odontocetes (feeding > -200m)**
	Seals	~~Phoques (pinnipèdes)~~ **Seals (pinnipeds)**

<u>Proposed revisions</u> to Appendix 1 to Annex to Decision IG.22/7 on Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria

Corrections in red, **added text** in **bold**, proposed deletions are ~~strikethrough~~ and ~~red~~.

Minimum list			**Texel-Faial Criteria**								**Typology/listed**	
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Predominant habitat or "Functional" group of species	**Specific habitat type or species to be monitored**	**ADDITIONAL INFORMATION (to be further discussed): specific representatives species or habitats (Invertebrates associated with habitats)**	**(sub)regional importance**	**Rarity**	**Key functional role**	**Declining or threatened**	**Sensitivity / Vulnerability (exposure to pressures): cf. column N to V**	**feasibility (for monitoring): cf. column W to AG**	**Priority (estimated from column D to I)**	**Assessment monitoring scale**	**EUNIS 2015**	**Habitats Directive**
Mammals - baleen whales	*Balaenoptera physalus* (Linnaeus, 1758)		subregional			**T**		**yes**	**1**	~~subregional~~ **regional**		
Mammals - toothed whales (deep feeder)	*Physeter macrocephalus* (Linnaeus, 1758)		subregional			**T**	**High**	**yes**	**1**	subregional		
Mammals - toothed whales (deep feeder)	*Ziphius cavirostris* (Cuvier G., 1832)		subregional			**T**	**High**	**yes**	~~2~~ **1**	subregional		
Mammals - toothed whales (epipelagic feeder)	*Delphinus delphis* ~~(~~Linnaeus, 1758~~)~~		subregional					**yes**	**1**	subregional		
Mammals - toothed whales (epipelagic feeder)	*Tursiops truncatus* (Montagu, 1821)		~~regional~~ **subregional**				**Moderate**	**yes**	**1**	~~regional~~ **subregional**		priority species
Mammals - toothed whales (epipelagic feeder)	*Stenella coeruleoalba* (Meyen, 1833)		regional					**yes**	**2**	regional		
Mammals - toothed whales (epipelagic feeder)	*Globicephala melas* (Traill, 1809)		subregional					**yes**	**2**	subregional		
Mammals - toothed whales (epipelagic feeder)	*Grampus griseus* (Cuvier G., 1812)		subregional				**Moderate**	**yes**	**2**	subregional		
Mammals - seals	*Monachus monachus* (Hermann, 1779)		subregional			T	**High**		**1**	subregional		priority species

Proposed revisions to Appendix 1 to Annex to Decision IG.22/7 on Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria *[continuing from previous table]*
Corrections in red, **added text** in **bold**, proposed deletions are ~~strikethrough~~ and ~~red~~.

Minimum list		Main pressures (binary=occuring or not: to be prioritized (ranked) for each specific representatives species or									Feasibility										
		N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
Predominant habitat or "Functional" group of species	Specific habitat type or species to be monitored	Physical loss of habitat (construction ports, marinas)	Physical damage to habitat	Nutrient enrichment	Contaminants	Removal by fishing (target, non-target)	Hydrological changes (thermal, salinity regime)	Other disturbances to species (e.g. litter, visual disturbance)	UW noise	NIS	Vessel	Lab facilities, equipment, consumables	Taxonomic expertise (technicians, scientists)	Monitoring techniques developed	Aerial	Land-based	In-water	Indicators established	Existing observatory stations / long term monitoring programmes	Satellite / Remote Sensing / aerial platforms	Oceanographic platforms
Mammals - seals	*Monachus monachus* (Hermann, 1779)										Yes	Yes	~~Moderate~~	**Non invasive monitoring of selected resting/breeding caves to allow photoidentification for mark-recapture and pup counts**				Yes	Yes	~~Teledection Tracking~~	
Mammals – baleen whales	*Balaenoptera physalus* (Linnaeus 1758)										Yes	Yes	Moderate	Shipboard, acoustic or aerial **strip line** transects	**Yes, line transect**	**Only used in the Strait of Gibraltar**		Yes	Yes	~~Teledection Tracking~~ **Yes**	
Mammals - toothed whales (deep feeder)	*Physeter macrocephalus* (Linnaeus, 1758)					***					Yes	Yes	Moderate	Shipboard surveys; Acoustic surveys; Aerial surveys (but not optimum due to long dives, **photo-ID**			**Yes, acoustic**	Yes	Yes	~~Teledection Tracking~~ **Yes**	
Mammals - toothed whales (deep feeder)	*Ziphius cavirostris* (Cuvier G., 1832)										Yes	Yes	Moderate	Shipboard surveys, Acoustic surveys (but not easy to detect), Aerial surveys (but not optimum due to long dives)			***Fix acoustic***	Yes	Yes	~~Teledection Tracking~~ **Yes**	
Mammals - toothed whales (epipelagic feeder)	*Delphinus delphis* (~~L~~Linnaeus, 1758~~)~~										Yes	Yes	Moderate	Shipboard or aerial ~~strip~~ **line** transects	**Yes, line transect**			Yes	Yes	~~Teledection Tracking~~ **No**	
Mammals - toothed whales (epipelagic feeder)	*Tursiops truncatus* (Montagu, 1821)										Yes	Yes	Moderate	Shipboard, acoustic or aerial ~~strip~~ **line** transects, **photo-ID**	**Yes, line transect**			Yes	Yes	~~Teledection Tracking~~ **No**	
Mammals - toothed whales (epipelagic feeder)	*Stenella coeruleoalba* (Meyen, 1833)										Yes	Yes	Moderate	Shipboard or aerial ~~strip~~ **line** transects	**Yes, line transect**			Yes	Yes	~~Teledection Tracking~~ **No**	
Mammals - toothed whales (epipelagic feeder)	*Globicephala melas* (Traill, 1809)										Yes	Yes	Moderate	Shipboard, acoustic or aerial ~~strip~~ **line** transects	**Yes, line transect**			Yes	Yes	~~Teledection Tracking~~ **No**	
Mammals - toothed whales (epipelagic feeder)	*Grampus griseus* (Cuvier G., 1812)										Yes	Yes	Moderate	Shipboard, acoustic or aerial ~~strip~~ **line** transects, **photo-ID**	**Yes, line transect**			Yes	Yes	~~Teledection Tracking~~ **No**	

Notes on proposed revisions: ***Marine mammals are dramatically impacted by IUU driftnets. In case of Sperm whales, even few animals per year taken at regional level are to be considered a serious threat.