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Agenda Item 5: Enhancing the Integrated Monitoring and Assessment Programme for the Mediterranean Sea and Coast

Revised Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria

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UNEP/MAP
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Note by the Secretariat

The present document uses as basis Decision IG.22/7 of COP19 (2016) about the “Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP)”, and consists the first attempt of the Secretariat to present a preliminary proposal for updating IMAP.

The document reflects all the developments undertaken in the framework of IMAP implementation since 2016, as well as a first proposal pertinent to the inclusion of elements to facilitate and support IMAP third cycle implementation.

A number of new substantive elements are introduced for EOs 3, 4 and 6; no significant update is proposed for EOs 1, 2, 5, 9 and 11; whereas adjustments and additions are proposed for EOs 7, 8 and 10.

The approach used while developing this document, is that all existing text is presented as normal (un-bold) text, the proposal for deletion of text is presented with ~~striketrough~~ text, and the proposals for new text with **bold** text.

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1. Introduction

1. Monitoring and assessment, based on scientific knowledge, of the sea and coast is the indispensable basis for the management of human activities, in view of promoting sustainable use of the seas and coasts and conserving marine ecosystems and their sustainable development. The Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP) **adopted in 2016 (Decision IG.22/7 – COP19)** describes the strategy, themes, and products that the **Contracting Parties to the Barcelona Convention** ~~Contracting Parties~~ are aiming to deliver, through collaborative efforts ~~inside the UNEP/MAP Barcelona Convention~~, over the second cycle **(2016 – 2021)** of the implementation of the Ecosystem Approach **(EcAp) Process (EcAp process)**, i.e. ~~over 2016–2021, and the third cycle (2022 – 2028/2030) which is underway~~, in order to assess the status of the Mediterranean sea and coast, as a basis for further and/or strengthened measures.

Background:

2. IMAP builds on the monitoring and assessment related provisions of the Barcelona Convention and its Protocols, previous Decisions of the Contracting Parties related to monitoring and assessment, and ~~to the EcAp process, including on Decision IG. 21/3 and the expert level discussions mobilized based on this Decision, such as the ones taking place in the Correspondence Groups on Good Environmental Status (COR GEST) and Monitoring (CORMON), as well as the 4th and 5th EcAp Coordination Groups~~ **a number of Decisions related to the implementation of EcAp Roadmap.**

3. In addition, the development of IMAP ~~took~~ **has taken** due account of the Contracting Parties' ~~existing~~ monitoring and assessment programmes, **as well as** practices of other Regional Sea Conventions and other Regional bodies.

Timeline:

4. IMAP ~~is aiming to deliver over~~ **delivered during its second phase (2016-2021)** its **major** objectives as described above. ~~It is introduced first however in an initial phase (in line with Decision IG. 21/3, in between 2016–2019), during which the existing national monitoring and assessment programmes will be integrated, in line with the IMAP structure and principles and based on the agreed common indicators. This implies in practice that the existing national monitoring and assessment programmes will be~~ **reviewed and revised as appropriate so that national implementation of IMAP can be fulfilled in a sufficient and effective manner. The main outputs during the initial phase of IMAP will include the update of, including updated** GES definitions, further refinement **and establishment** of assessment criteria and development of national level integrated monitoring and assessment programmes.

5. Furthermore, the **2017 and 2023 Mediterranean Quality Status Reports in 2017 and (MED QSR) as well as the 2019 State of Environment and Development Report in 2019 will build (SoED) were built based** on the structure, objectives and data collected under IMAP. The validity of the IMAP should be reviewed once at the end of every EcAp ~~six-year~~ cycle, and in addition it should be updated and revised as necessary on a ~~biennial~~ **mid-term** basis, based on lessons learnt of the implementation of the IMAP and on new scientific and policy developments.

2. IMAP common principles and structure

2.1 Overarching principles¹ and the overall IMAP structure

6. **The key elements addressed through IMAP, in line with Decision IG.22/7 of COP19, are the Common Indicators, monitoring and assessment methodologies for all IMAP clusters (i.e., Biodiversity and Non-Indigenous Species, Pollution and Marine Litter, Coast and Hydrography), as**

¹ Clarification about the IMAP principles are provided in the Integrated Monitoring Guidance Document.

well as assessment criteria. On the other hand, the objectives, indicators, GES definitions and targets are part of the Ecosystem Approach (EcAp) Roadmap implementation.

7. The overarching principles guiding the development of, **implementation and revision** the IMAP include: (i) adequacy; (ii) coordination and coherence; (iii) data architecture and interoperability based on common parameters; (iv) concept of adaptive monitoring; (v) risk-based approach to monitoring and assessment; and (v) the precautionary principle in addition to the overall aim of integration. In line with the above overarching principles, data and information is gathered through integrated monitoring activities on the national level and shared in a manner that creates a compatible, shared regional pool of data, usable by each Contracting Party, ~~as described under at point 4.~~

8. The IMAP information system ~~will ensure~~ **(Info System) ensures** the establishment of ~~the~~ a regional pool of data **repository** based on SEIS principles that will allow the production of common indicator assessment reports in an integrated manner, following the monitoring ~~specifics~~ **specifications** and data provided, ~~which ensures~~ **thus ensuring** comparability across the Mediterranean region.

9. In line with the above, integration is achieved through IMAP ~~both~~ **implementation** at ~~monitoring level~~ **regional and national levels**, through an integrated monitoring system, following common principles and undertaken in a coordinated manner ~~and at assessment level~~, with the overall aim to assess the overall status of the marine and coastal environment.

2.2 IMAP integrated monitoring

10. The IMAP monitoring requirements focus on, based on agreed ~~common indicators~~, **Common Indicators and** parameters that are indicative of the state of the environment, the prevailing anthropogenic pressures and their impacts, and the progress towards the ~~good environmental status (ecological objectives and targets)~~. **Good Environmental Status (Ecological Objectives and Targets)**. The monitoring is carried out in such a way that an assessment with adequate confidence and precision is achieved.

11. IMAP sets out the basis ~~for on~~ how the Contracting Parties should design and carry out their national **IMAP-based** integrated monitoring programmes and work together in the framework of the UNEP/MAP Barcelona Convention to produce and update common indicator based regional assessments on the status of the Mediterranean Sea and Coast.

12. ~~During~~ **Since** 2016-2017, the Contracting Parties will, update their existing monitoring programmes in order to cover the IMAP areas, common indicators in line with the IMAP, and, based on the Integrated Monitoring and Assessment Guidance, Common Indicator Fact Sheets. It has to be noted that **went through** a number of ~~Contracting Parties have already developed integrated national monitoring programmes;~~ **important advancement pertinent to IMAP implementation:**

- **Development of IMAP-based national monitoring programmes;**
- **Data reporting and submission through the IMAP Info System** based on their existing national monitoring programmes ~~until they are updated into a national Integrated Monitoring Programme;~~ **Following the update of their existing monitoring programmes, report quality assured, including from additional data sources following a common regional monitoring reporting template (please see more on this under point 4);**
- **The 2017 and 2023 Mediterranean Quality Status Reports (MED QSR).**

13. During national implementation, the Contracting Parties ~~are~~ **have been** encouraged to coordinate within and between each other in order to use resources in an efficient way. Shared monitoring stations and activities, information, and data could be steps towards this direction.

2.3 IMAP integrated assessment

14. The IMAP assessment products, produced by the UNEP/MAP Secretariat, ~~including such as the Common Indicator Assessment Fact Sheets, MED QSR and the planned integrated assessments (2017 Status Quality Report, 2019 State of Environment and Development Report in the Mediterranean (SoED)),~~ should be mainly based on the common indicators and monitoring data provided by Contracting Parties **or based on data provided by remote sensing (such as satellites) for individual CP/groups or CPs and verified by the CPs.**

15. In areas of scientific and/or data gaps, the assessment products can also build on relevant scientific projects, pilot outcomes, and comparable data of other regional organizations and in case these are not available, on scientific literature. In addition, they will analyze trends, drivers and will build on available socio-economic data.

16. The common indicator assessment fact sheets provide information on the status of the environment and information needed to evaluate the severity of environmental problems and distance from EcAp targets, ecological objectives and Good Environmental Status (GES) description.

17. The common indicator assessment fact sheets are linked to specific Ecological Objectives (EOs) and together they indicate whether the GES related to the specific EO is met or not. Following the EO level assessment, the integrated assessment takes place on the state of the Mediterranean Sea and Coast.

18. ~~The 2017 recent 2023 Mediterranean Quality Status Report will be based on and was structured along the common indicators, and respective Ecological Objectives and Common Indicators, including the established and approved common indicator assessment fact sheets established for them, following a model to be developed by the Secretariat in cooperation with the Contracting Parties through CORMONs by the end of 2016, and will consider the data from the most recent national monitoring and relevant scientific projects and pilots undertaken relevant to the IMAP.~~

19. During the development of the above, an integrated approach for determining and assessing GES will be used, considering the Integrated Monitoring and Assessment Guidance, describing state-based common indicators and explicitly relating them to the pressure-based indicators.

20. **Some studies have been undertaken by UNEP/MAP to provide with practical solutions to structure, strengthen and sustain a "science-policy-interface" to support IMAP implementation, both for monitoring and assessment, at national level. These solutions touch upon evidence (science), outreach (policy) & engagement (human and financial means) and are valid for the 3 clusters of IMAP (Biodiversity and Non-Indigenous-Species, Pollution – Marine Litter, Coast and Hydrography).**

21. **As part of the EcAp governance structure, COR ESA meetings allow to work on the socio-economic characteristics of the Mediterranean Sea with information on demography, economy & employment and qualitative description of the links between human activities and the coastal and marine environment. To deeply assess the level of environmental and social sustainability of human activities that impact the coastal and marine environment, UNEP/MAP is measuring the sustainable blue economy based on a sustainability framework and associated core set of indicators.**

2.4 UNEP/MAP Strategy towards an Integrated Data and Information System

22. Assessments arising from monitoring data are critically dependent upon practical mechanisms for handling data from different activities that ensure that documents, data, and products are managed consistently and are easily available to users. This will support integrated assessments, for example from integrated biological and chemical programmes, or linking the observed changes in spatial distribution and temporal trends in substances or their effects to inputs into the UNEP/MAP Barcelona Convention maritime area.

23. Data storage and handling processes are therefore central, and it is important that the role of the various components in this is clear and continuously developed and strengthened.

24. IMAP thus requires an updated and integrated data and information system for UNEP/MAP Barcelona Convention with clear set roles for data handling and assessment for the various components and with a user-friendly reporting platform for Contracting Parties (**IMAP Info System**), based on the following strategic points:

- The UNEP/MAP Barcelona Convention data and information ~~activities~~ **are collected according to the official MAP data policy approved at COP22;**
- **The UNEP/MAP Barcelona Convention data and information system** aim to achieve a reliable, quantitative assessment of the status of the Mediterranean Sea and Coast;
- The UNEP/MAP Barcelona Convention data and information ~~activities~~ should facilitate access and knowledge of the general public to environmental information.

25. ~~Basic activities,~~ Core elements of the UNEP/MAP Barcelona Convention integrated data and information system should include:

- ~~Based on the structure of the Common Indicator Fact Sheets, develop region-wide, electronic, common indicator-based~~ **Data Standards (DSs) and Data Dictionaries (DDs)** monitoring reporting formats ~~and up-to-date~~ **based on IMAP Common Indicator fact sheets** and tools for data exchange;
- ~~implement~~ Relevant quality control and validation procedures, ~~as well as make~~ assessment products available in an integrated manner, on a common platform.

26. **Data** and information available using harmonized standards and practices, following the UNEP access-to-information policy (UNEP/EA. 1/INF/23).

27. **IMAP Info System, developed during the second IMAP cycle, is fully operational and allows Contracting Parties to report data for 18 IMAP Common Indicators (i.e. 1,2,3,4,5,6,13,14,15,1,6,17,18,19,20,21,22,23,24) and 30 Information Standards, including Candidate Indicator 24 “Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles” on voluntary basis.**

28. **IMAP Info System is accessible to the general public and login is required only to access reserved sections. An IMAP Info System Technical Guide is available to help users in browsing the web site.**

29. **The structure of IMAP Info System is user-friendly and allowing easy navigation with three main section:**

- **Reporting (Standards, Conformity check, Upload)**
- **Explore (Published data, Geographical data, Dashboard, Utility tools)**
- **Info (Documents, Guidelines and tutorials, Info and contact)**

2.5 Cooperation with other relevant regional bodies in the context of IMAP

30. The current IMAP covers with agreed common indicators the ~~ecological objectives~~ **Ecological Objectives (EOs)** related to biodiversity (EO1), non-indigenous species (EO2), **harvest of commercially exploited fish and shellfish (EO3), marine food webs (EO4²), eutrophication (EO5), sea-floor integrity**

² Not yet developed

(EO6³), hydrography (EO7), ~~east~~**coastal ecosystems and landscapes (EO8), contaminants pollution (EO9), and marine litter (EO10), and energy including underwater noise (EO11).**

31. In addition, ~~regarding marine noise (EO11), IMAP includes~~**a number of** candidate common indicators, **are included under EO8 (Coastal Ecosystems and Landscapes), EO10 (Marine Litter) and EO11 (Energy including Underwater Noise),** with the intention for these candidate common indicators to be further developed, based on pilot monitoring activities, additional expert knowledge, and scientific developments, ~~during the initial phase of IMAP.~~

32. While some of the elements of fisheries (EO3) and marine food webs (EO4) are partly covered by the monitoring and assessment of EO1 and EO2 ~~and the Contracting Parties have agreed on the GFCM developed list of common indicators. In this regard, the monitoring and assessment specifics of EO3 are still being developed by the GFCM, in close cooperation with UNEP/MAP. During the initial phase of IMAP implementation, a clear roadmap will be developed by the Secretariat in collaboration with GFCM and other relevant partners on the monitoring programme and assessment for EO4 and EO6.~~

33. In light of the above, ~~it is an absolute necessity for UNEP/MAP to strengthen~~**has strengthened** its cooperation with the relevant regional bodies, especially in relation to:

- EO1, both with the General Fisheries Commission for the Mediterranean (GFCM) for commercial species of fish and shellfish and 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, ~~to be undertaken during 2016–2019, will provide~~**was conducted (2018 – 2019) and provided** important inputs (in terms of monitoring methodologies, capacity building and reliable data on abundance and distribution of cetaceans); **but also on other marine megafauna species such as turtles and elasmobranchs, as well as on human activities and respective impacts, like floating litter and underwater noise);**
- EO3, with the GFCM, noting that the EO3 related common indicators ~~will be further~~**are being** developed and assessed by GFCM (with assessment results provided to UNEP/MAP in order to undertake the 2017 and following integrated assessments);
- 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.

34. In addition, cooperation with other regional and international bodies will be key for the successful implementation of IMAP, to ensure that no double obligation is created for those Contracting Parties, which are Parties to various Regional Seas Conventions and/or members of the European Union and undertake monitoring activities under other specific frames.

35. Cooperation with other regional and international bodies can also strengthen the cost- efficiency and scientific adequacy of IMAP. Exchange of best practices and information is encouraged during the IMAP implementation, both in between Contracting Parties participating in various monitoring programmes and in between UNEP/MAP and other relevant regional, international bodies.

³ Under development

3. Key elements of IMAP

3.1 Common Indicators

36. The common indicators are the backbone of IMAP.

37. In the context of the Barcelona Convention, a common indicator is an indicator that summarizes data into a simple, standardized, and communicable figure and is ideally applicable in the whole Mediterranean basin, or at least on the level of sub-regions, and is monitored by all Contracting Parties. A common indicator is able to give an indication of the degree of threat or change in the marine ecosystem and can deliver valuable information to decision makers.

38. Candidate indicators are indicators which still have many outstanding issues regarding their monitoring and assessment and therefore are recommended to be monitored in the initial phase of IMAP on a pilot and voluntary basis.

39. The Common and candidate indicators **currently** agreed-upon, which are at the core of IMAP, include:

- 1) Habitat distributional range (EO1) to also consider habitat extent as a relevant attribute;
- 2) Condition of the habitat's typical species and communities (EO1);
- 3) Species distributional range (EO1 related to marine mammals, seabirds, marine reptiles);
- 4) Population abundance of selected species (EO1, related to marine mammals, seabirds, marine reptiles);
- 5) Population demographic characteristics (EO1, e.g. body size or age class structure, sex ratio, fecundity rates, survival/mortality rates related to marine mammals, seabirds, marine reptiles);
- 6) Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such species);
- 7) Spawning stock Biomass (EO3);
- 8) Total landings (EO3);
- 9) Fishing Mortality (EO3);
- 10) Fishing effort (EO3);
- 11) Catch per unit of effort (CPUE) or Landing per unit of effort (LPUE) as a proxy (EO3);
- 12) Bycatch of vulnerable and non-target species (EO1 and EO3)
- 13) Concentration of key nutrients in water column (EO5);
- 14) Chlorophyll-a concentration in water column (EO5);
- 15) Location and extent of the habitats **potentially** impacted ~~directly~~ by hydrographic alterations (EO7) ~~to also feed the assessment of EO1 on habitat extent⁴;~~
- 16) Length of coastline subject to physical disturbance due to the influence of ~~man~~human⁵-made structures (EO8) ~~to also feed the assessment of EO1 on habitat extent;~~
- 17) Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater);
- 18) Level of pollution effects of key contaminants where a cause-and-effect relationship has been established (EO9);
- 19) Occurrence, origin (where possible), and extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9);

⁴ Several CORMON meetings agreed to simplify the original Guidance Factsheet in order to allow for monitoring of this indicator due to its complexity, requirements for historic data, significant human and financial resources required and alike. Some simplification has been already proposed however further steps are needed and agreed (for the last time at CORMON meeting in Marseille 28-29 March 2023). Title to be changed accordingly.

⁵ Change of the term "man-made" to "human-made" in the title of the indicator due to gender equality reasons, further to the proposal that has been requested by the EU and several CPs.

- 20) Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood (EO9);
- 21) Percentage of intestinal enterococci concentration measurements within established standards (EO9);
- 22) Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source.) (EO10);
- 23) Trends in the amount of litter in the water column including microplastics and on the seafloor (EO10);

23bis) Trends in the amount of litter coming from riverine sources (EO10).

- 24) ~~Candidate~~ **Common** Indicator: Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds and marine turtles (EO10);
- 25) ~~Candidate~~ **Common** Indicator: Land ~~use~~ **cover** change (EO8)⁶;
- 26) Candidate indicator: 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 (EO11);
- 27) Candidate Indicator: Levels of continuous low frequency sounds with the use of models as appropriate (EO11).

40. During the implementation of ~~the initial phase of~~ **IMAP since 2016**, the CORMONs ~~will have~~ **played an instrumental role in** further developing the candidate **common** indicators towards common indicators as well as to further refine the specifics~~of~~, **including a number of technical element, for the** agreed common indicators, in particular on geographical scale, in light of the ongoing implementation experience of IMAP.

Note on geographic reporting scales:

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

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

- a) Whole region (i.e. Mediterranean Sea **and Coastal Regions as defined by the Convention and its Protocols**);
- b) Mediterranean sub-regions, as presented in the Initial Assessment of the Mediterranean Sea, UNEP(DEPI)/MED IG.20/Inf.8;
- c) Coastal waters and other marine waters; and
- d) Subdivisions of coastal waters provided by Contracting Parties.

43. The work shall be undertaken to further develop reporting geographical scales of the nested approach.

⁶ The CORMON Coast and Hydrography (Marseille, 28-29 March 2023) agreed to put this indicator to the list of Common indicators. The title should be "Land cover change". Testing has been done with several projects (SIDA, EcAp MED II and III, GEF MedProgramme) and results for the Adriatic sub-region were included in the 2023 MED QSR, training sessions have been completed or are in progress for all GEF MedProgramme countries. The COP23 Decision on 2023 QSR proposes some technical elements for the Guiding Factsheet that will be inserted to the method.

3.2 Monitoring and assessment of biodiversity and NIS related common indicators

Biodiversity (EO1):

44. Biological diversity is the “variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”.

45. The common indicators to be monitored and assessed in relation to biodiversity are as following:

- | | |
|---------------------|---|
| Common Indicator 1: | Habitat distributional range (EO1) to also consider habitat extent as a relevant attribute; |
| Common Indicator 2: | Condition of the habitat’s typical species and communities (EO1); |
| Common Indicator 3: | Species distributional range (EO1 related to marine mammals, seabirds, marine reptiles); |
| Common Indicator 4: | Population abundance of selected species (EO1, related to marine mammals, seabirds, marine reptiles); |
| Common indicator 5: | Population demographic characteristics (EO1, e.g. body size or age class structure, sex ratio, fecundity rates, survival/mortality rates related to marine mammals, seabirds, marine reptiles). |

46. Climate change is indeed one of the most significant threats to biodiversity in the Mediterranean Sea. In this regard, further clarifications need to be considered on the Guidance Factsheets and GES definitions, and the effects of climate change should be integrated into the existing indicators and methodologies, including for establishing baseline and threshold values.

47. As it is not possible or even necessary to monitor all attributes and components of biological diversity throughout the region, IMAP monitoring is focusing, in line with the risk-based approach, on ~~some~~**the most** representative sites and species, which can showcase the relationship between environmental pressures and their main impacts on the marine environment. In light of the above, **an updated** reference list of species and habitats **with a good representativity of Mediterranean marine biodiversity** to be monitored is presented in ~~Appendix~~**Annex I**, noting that those Contracting Parties who have the necessary means and are willing to do so can go beyond the monitoring requirements of this reference list.

48. The Contracting Parties while updating their national monitoring programmes, **for the new six-year cycle**, need to **take in consideration the results of the 2023 MED QSR and to** include at least the monitoring of the **updated** reference list species and habitats with at least two monitoring areas, one in a low-pressure area (e.g. marine protected area/ Specially Protected Area of Mediterranean Importance (SPAMI) and one in a high-pressure area from human activity.

49. To achieve a comprehensive assessment of the state of the Mediterranean Sea, it is essential to expand the monitoring protocols for EO1 CI1 and CI2, to include pelagic habitats. Currently, The Contracting Parties focus on Benthic habitats and specific types such as well illuminated infralittoral rock, algal-dominated infralittoral rock, *Posidonia oceanica* meadows, coralligenous, and circalittoral rhodolith beds provides valuable information about the benthic zone. However, to gain a full understanding of the ecosystem, it is crucial to also consider both the benthic and pelagic zones, taking into account the anthropogenic pressures.

50. For EO1 CI1 and CI2, given the importance and vulnerability of *Posidonia oceanica* meadows in the context of climate change, the Contracting Parties shall make every effort to review the monitored parameters of these meadows to ensure better protection of this essential habitat, which serves a functional role for many species, limits coastal erosion, and contributes to climate change mitigation. Additionally, parameters that could provide insights into their resilience to climate change impacts should also be studied.

51. The Mediterranean Sea harbours 25 cetaceans' species, which are subjects to various human pressures, which reflects on their conservation status. The few species of cetaceans regularly present in the Mediterranean Sea should all be considered when developing updating the national monitoring programmes for the new six-year cycle. The Contracting Parties shall make every effort to identify a minimum of two species to be included in their national monitoring programme, based on the specificity of their marine environment and biodiversity, and taking account that these species should belong to at least two different functional groups, where possible (Baleen whales / Deep-diving toothed whales / Shallow-diving toothed whales). As far as possible the choice of monitored species should be coordinated at sub regional scale to ensure coherence with cetacean population distribution in the Mediterranean Sea , as proposed in the Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to marine mammals.

52. Seabirds sensu lato form a crucial component of the region's marine biodiversity and ecosystem, with many of the relevant taxa being endemic or near-endemic to the Mediterranean. A list of priority species, which includes 11 representative species from a range of functional groups that can showcase the relationship between environmental pressures and their main impacts on the marine environment, was selected from Annex II of the Barcelona Convention. This list will be utilized for the assessment of the three relevant IMAP Common Indicators (CIs) related to seabirds according to the Monitoring and Assessment Scales, Assessment Criteria, Thresholds, and Baseline Values for the IMAP Common Indicators 3, 4, and 5 related to seabirds. As far as possible, the Contracting Parties should implement coordinated monitoring efforts within subdivisions or subregions to improve the representativeness of monitoring samples.

53. Monitoring and Assessment Scales, Assessment Criteria, Thresholds, and Baseline Values have been developed and region-wide agreed for the Mediterranean with regards to Common Indicators 3,4 and 5 for related to sea birds, Marine Mammals, Marine Turtles (Annex I to the present document). The Contracting Parties are encouraged to use those elements while developing national assessments

54. The methodologies and quality control and quality assurance measures have been made available for Contracting Parties to consider during the update of and have been considered in their IMAP-based national monitoring programmes are described, in line with the Integrated Monitoring and Assessment Guidance as well as the numerous technical guidelines prepared by SPA/RAC.

55. Regarding the assessment of biodiversity, it has to be noted that the quantitative definition of GES is difficult, considering the variety of assessment elements and the effects of climate change. The conceptual approach for a quantitative GES setting can be framed in a way that the resilience of the ecosystem is suited to accommodate the quantified biodiversity, or, in other words, it will be accounted in the determination of the GES boundaries as the "acceptable deviation from a reference state which reflects conditions largely free from anthropogenic pressures.

56. The scale of monitoring is of specific importance for biodiversity, due to the nature of the biodiversity related common indicators.

57. For the high quality of assessment, baselines and thresholds will need to be agreed on in line with the possible methods for this set out in the Integrated Monitoring and Assessment Guidance document, following the agreed scales of assessment, during the initial phase of IMAP implementation.

58. Furthermore, Data Standards (DSs) and Data Dictionaries (DDs) have been developed for the OE1 common Indicators (i.e., coralligenous, Maerl/Rhodolith and *Posidonia oceanica* meadow's habitat, Marine Mammals, Marine Turtles and Marine Birds).

Non-Indigenous Species (EO2):

59. Non-indigenous species (NIS; synonyms: alien, exotic, non-native, allochthonous) are species, subspecies, or lower taxa introduced outside of their natural range (past or present) and outside of their natural dispersal potential.

60. Invasive alien species (IAS) are a subset of established NIS which have spread, are spreading, or have demonstrated their potential to spread elsewhere, and which have an effect on biological diversity and ecosystem functioning (by competing with and on some occasions replacing native species), socio-economic values, and/or human health in invaded regions.

61. The common indicator in relation to NIS is:

Common Indicator 6: Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such species in the water column and seabed, as appropriate);

62. Non-indigenous species monitoring in the Mediterranean is a trend monitoring, where it is key to establish reliable, **standardized monitoring and** long-term data-sets as a first step of monitoring.

63. In addition, monitoring of non-indigenous species (NIS), following the risk-based approach, needs to be focused on the invasive alien species (IAS) in IAS introduction “hot spots” (e.g. ports and their surrounding areas, docks, marinas, aquaculture installations, heated power plant effluents sites, offshore structures). In addition, areas of special interest such as marine protected areas or lagoons may be selected on a case-by-case basis, as appropriate, depending on the proximity to alien species introduction hot spots.

64. With the application of the risk-based approach as stated above, it is possible to obtain an overview of the non-indigenous species present at a large spatial scope while only monitoring a relatively small number of locations.

65. Based on existing regional databases, such as the Marine Mediterranean Invasive Alien Species database, (MAMIAS), the “Andromeda” invasive species database for the Mediterranean and Black Sea, and the European Alien Species Information Network (EASIN), each Contracting Party will determine the list of IAS to be monitored in its national monitoring programme during the initial phase of the IMAP and start collecting data regarding these species. Guidance on developing IAS national lists and a regional and or sub regional reference list will be developed by 2017.

66. Key next steps for GES assessment of NIS involve elaborating on CI6 aspects related to impacts by developing criteria and targets for vulnerable species and habitats. This should be coordinated with EO1 CI1 and CI2 and EO6 on seafloor integrity. It is also crucial to assess the impact of Invasive Alien Species on habitat conditions within EO1-CI2 and to include NIS impacts on seabed habitats in EO6, which is currently missing from IMAP.

67. The methodologies and quality control and quality assurance measures **have been made** available for Contracting Parties ~~to consider during the update of~~ **and have been considered** in their **IMAP-based** national monitoring programmes, ~~is described in line with~~ the Integrated Monitoring and Assessment Guidance **as well as the numerous technical guidelines prepared by SPA/RAC (reference to documents).**

68. As the most effective monitoring method a Rapid Assessment Survey (RAS) will be carried out, at least yearly by the Contracting Parties in hot-spot areas (e.g. ports and their surrounding areas, docks, marinas, aquaculture installations, heated power plant effluents sites, offshore structures). **Contracting Parties with the necessary resources are encouraged to use Environmental DNA (eDNA) surveys.**

69. In addition, UNEP/MAP will develop during the ~~initial~~^{next} phase of IMAP citizen survey guidance for NIS, to enable Contracting Parties to use this additional cost-efficient methodology, which also strengthens public awareness and participation.

70. ~~Regarding the~~ **Guidance on monitoring non-indigenous species, monitoring and assessment of EO2, to be able to specify further GES, it is important to understand which NIS are present within the marine Scales, Assessment Criteria, Thresholds, and Baseline Values have been developed and region and sub-regions. A baseline assessment of the extant NIS would provide a reference point against which the success of future actions could be measured. After this baseline data has been gathered during the initial phase of IMAP, it will be possible to set reference levels-wide agreed for the Mediterranean with regards to Common Indicators 6. The Contracting Parties are encouraged to use those elements while developing national assessments, following the assessment criteria set out in the Integrated Monitoring and Assessment Guidance.**

Harvest of commercially exploited fish and shellfish (EO 3):

71. **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**

72. **The Fisheries related Common Indicators are the following:**

Common Indicator 7: Spawning stock Biomass (EO3);

Common Indicator 8: Total landings (EO3);

Common Indicator 9: Fishing Mortality (EO3);

Common Indicator 10: Fishing effort (EO3);

Common Indicator 11: Catch per unit of effort (CPUE) or Landing per unit of effort (LPUE) as a proxy (EO3);

Common Indicator 12: Bycatch of vulnerable and non-target species (EO1 and EO3).

73. **The definition of the common indicator, GES definition, operational objectives, and proposed targets for most of the common indicators, as well as the common indicator factsheets, have been developed by the GFCM.**

Marine Food Webs (EO4)⁷:

74. **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.**

⁷ The development of Common/Candidate Indicators for EO4 is ongoing from GFCM, and additional update should be expected by GFCM during the Meeting.

Sea-floor integrity EO 6:

75. Sea-floor integrity is maintained, especially in priority benthic habitats

76. EO6 on sea-floor integrity has been developed and agreed by the CORMON biodiversity and fisheries meeting held in June 2024. It includes proposals for GES descriptions, related targets, and indicators for EO6 (Sea-floor integrity). It also includes proposals regarding broad benthic habitats, the sources of pressures to be considered in the determination of GES regarding this EO, and the linkages with other EOs.

77. The Contracting Parties recommended maintaining EO1 (biodiversity) and EO6 (sea-floor integrity) as distinct ecological objectives, while optimizing and integrating their monitoring and data collection processes.

78. The EO6 has been undertaken in coherence with the EU MSFD Descriptor 6 and, in particular, the work of the Technical Group on seabed habitats and sea-floor integrity (TG Seabed). It also takes into account recent policy developments, with a view to ensuring EO6 is relevant in the context of Mediterranean, European, and global policies on environmental protection and climate change

3.3 Monitoring and assessment of pollution and marine litter related common indicators

Eutrophication (EO5):

79. Eutrophication is a process driven by enrichment of water by nutrients, especially compounds of nitrogen and/or phosphorus, leading to: increased growth, primary production and biomass of algae; changes in the balance of nutrients causing changes to the balance of organisms; and water quality degradation.

80. Eutrophication related Common Indicators:

Common Indicator 13: Concentration of key nutrients in water column (EO5);

Common Indicator 14: Chlorophyll-a concentration in water column (EO5).

81. The monitoring of eutrophication under IMAP builds on the existing monitoring system of UNEP/MAP MED POL Monitoring programme and ~~most of the Contracting Parties already have~~ monitoring programmes in place for eutrophication all over the Mediterranean basin, which **however** constitutes a ~~greater~~ **particular** concern for the Adriatic ~~than for the rest of sub-region.~~

82. The Contracting Parties, building on their existing national monitoring programmes and previous MED POL experience on eutrophication, ~~will update these~~ **updated the IMAP-based national monitoring programmes during the initial phase of IMAP since 2016**, with the overall aim to establish coherent datasets at the entire regional sea level.

83. The methodologies and quality control and quality assurance measures **have been made** available for Contracting Parties ~~to consider during the update of~~ **and have been considered in their IMAP-based national monitoring programmes** ~~are described, in line with the Integrated Monitoring and Assessment Guidance, noting the differences of needed techniques based on the level of the eutrophication problem in different sub-regions and countries as well as the numerous technical guidelines prepared by MED POL.~~

84. The geographical scale of monitoring for the assessment of GES for eutrophication ~~will depends on~~ the hydrological and morphological conditions of an area, particularly the freshwater inputs from rivers, the salinity, the general circulation, upwelling, and stratification.

85. The spatial distribution of the monitoring stations should thus, prior to the establishment of the eutrophication status of the marine sub-region/area, be risk-based and proportionate to the anticipated extent of eutrophication in the sub-region under consideration as well as its hydrographic characteristics aiming for the determination of spatially homogeneous areas. Consequently, each Contracting Party ~~would be required to determine~~**has determined** the optimum frequency per year and optimum locations for their monitoring/sampling stations.

~~7. — It is recommended that the Contracting Parties rely on the classification scheme on chl-a concentration ($\mu\text{g/l}$) developed by MEDGIG as an assessment method that is easily applicable by all Mediterranean countries, based on the indicative thresholds and reference values adopted therein (see Table 2, Appendix 2). In this context, water typology is a very important factor for the further development of classification schemes in a certain area regarding the definition of sub-regional thresholds for chlorophyll-a.~~

86. Assessment criteria have been developed and region-wide agreed for the Mediterranean with regards to Common Indicators 13 and 14 (Decision IG.26/3 and Annex II to the present document), based on 5 major water typologies. The Contracting Parties are encouraged to use those assessment criteria while developing national assessments

87. In addition, countries, where **needed and** appropriate, may continue using ~~the alternative/~~ existing different eutrophication assessment methods such as (e.g., TRIX, Eutrophication scale, EI, HEAT, etc. at sub-regional or national levels), **to complement the those developed under UNEP/MAP**, for assessing eutrophication trends.

~~88. The assessment methodology is well described in the Integrated Monitoring and Assessment Guidance for eutrophication. The final report of the Informal Online working group on eutrophication (UNEP((DEPI)/MED WG.420/Inf.11) contains assessment criteria regarding eutrophication which are presented in Appendix 2 of this document.~~

~~89. During the initial phase of IMAP implementation, work will be undertaken to develop GES thresholds and reference conditions for nutrients, transparency, and oxygen, using an adequate geographical scale as well as harmonize existing assessment tools through workshops, dialogue, comparative exercises at regional/sub-regional/subdivision levels.~~

~~90. In addition, taking into account sub-regional differences, work will be also undertaken to develop assessment fact sheets for eutrophication common indicator based on specifics described in the Integrated Monitoring and Assessment Guidance.~~

91. Moreover, IMAP Guidance Factsheets have been developed in 2019 for Common Indicators 13 and 14 (UNEP/MED WG.467/5), and Contracting Parties are encouraged to use them while implementing the IMAP-based national monitoring programmes.

Contaminants (EO9):

92. The monitoring of concentrations of a range of chemical contaminants in water, sediments and biota has a long-standing history in the Mediterranean, under the auspices of the UNEP/MAP Barcelona Convention, its Land-Based Protocol, and UNEP/MAP MED POL monitoring programmes. ~~The IMAP builds on these existing legislative bases, programmes.~~

Contaminants related Common Indicators:

Common Indicator 17:	Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater);
Common Indicator 18:	Level of pollution effects of key contaminants where a cause-and-effect relationship has been established (EO9);
Common Indicator 19:	Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9);
Common Indicator 20:	Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood (EO9);
Common Indicator 21:	Percentage of intestinal enterococci concentration measurements within established standards (EO9).

93. All Mediterranean countries have ~~programmes already in place in relation to~~ **IMAP-based national monitoring programmes for** contaminants monitoring, ~~however the, with varying scope and scale of this monitoring varies between the countries.~~ The IMAP thus aims to ~~build more~~ **builds in developing** harmony ~~and coherence~~ between the various ~~existing~~ **national** monitoring programmes, based on the agreed common indicators.

94. Biological effects monitoring **has been progressively integrated and** is ~~generally less widely established in both part of the IMAP-based national and international monitoring programmes, and the number of countries undertaking such studies (and the intensity of the coverage) is much smaller.~~ Therefore, it will be essential ~~during the initial phase of IMAP~~ to further expand and develop the use of biological effects methods to cover properly the EO9.

95. In addition, important ~~development areas during the initial phase of IMAP will include~~ **harmonisation of steps have been undertaken to further harmonize** monitoring targets (determinants and matrices) within assessment sub-regions, development of suites of assessment criteria, integrated chemical and biological assessment methods, ~~and review of the scope of the monitoring programmes to ensure that those contaminants which are considered to be important within each assessment area are included in monitoring programmes.~~

96. ~~Noting the above, the Contracting Parties will update their existing contaminants-related monitoring programmes by building on their existing sampling station networks, existing methodologies and statistical tools, existing data sets, and existing time series as the basis of monitoring against a “no deterioration” objective, aiming to cover the monitoring of all contaminants related common indicators.~~

97. While ~~most~~ monitoring stations ~~already exists~~ **are well defined in the IMAP-based national monitoring programmes**, there is also a need for Contracting Parties to ~~include in their monitoring programme~~ **consider** areas beyond the coastal areas in a representative and efficient way, where risks warrant coverage, in line with the Integrated Monitoring and Assessment Guidance **and stations towards**

offshore areas.

98. The methodologies, quality control and quality assurance measures, and reference methods available for Contracting Parties to consider during the update of their national monitoring programmes, are described in the Integrated Monitoring and Assessment Guidance **as well as the numerous technical guidelines.**

99. ~~Regarding assessment, the Report UNEP(DEPI)/MED WG.394/Inf.3 on the development of assessment criteria for hazardous substances and the final report of the Informal Online working group on contaminants (UNEP(DEPI)/MED WG.420/Inf.12) present key recommendations which will be followed to establish a forward procedure for monitoring the achievement of GES for contaminants during the initial phase of IMAP (Appendix 2 of this Annex).~~

100. ~~Until EACs are defined under this follow up, a two fold approach could be adopted to support monitoring for the assessment of GES:~~

- ~~a) a threshold value for GES(BAC), to be set using concentrations from relatively unpolluted areas on a sub-regional level and~~
- ~~b) a decreasing trend should be observed from baseline values representing the actual level of contaminants concentrations.~~

101. ~~Thus, GES can be defined for toxic metals (Hg, Cd, Pb), chlorinated organic compounds, and PAHs, for which monitoring data exist as a result of running monitoring programmes, already during the initial phase of IMAP, and UNEP/MAP will conclude its relevant common indicator based assessment in light with the above.~~

102. ~~In addition, during the initial phase of IMAP, UNEP/MAP will also prepare an adapted manual establishing the BAC and, when possible, the formulation of EAC for selected biomarkers in Mediterranean species.~~

103. **Assessment criteria have been developed and region-wide agreed for the Mediterranean with regards to Common Indicators 17, 18 and 20 (Decision IG.26/3 and Annex II to the present document). The Contracting Parties are encouraged to use those assessment criteria while developing national assessments.**

104. Regarding acute pollution events, while Contracting Parties already have an existing monitoring obligations under Article 9 of the Prevention and Emergency Protocol, the efforts of which need to be strengthened, it is also foreseen that further analysis of the links between acute pollution events and effect on biota ~~and the development of specific assessment criteria for this latter should occur~~ **be further strengthened.**

105. ~~Monitoring of contaminants in biota used for human consumption also builds on existing monitoring requirements and only measures contaminants in fish and other seafood for which regulatory limits have been set in national and international regulations for public health reasons.~~

106. ~~National monitoring Programmes in this regard should at least consider the following contaminants for which regulatory levels have been laid down: Heavy metals (lead, cadmium, and mercury), polycyclic aromatic hydrocarbons, and dioxins (including dioxin-like PCBs), also considered in line with the species selection considerations described in the Integrated Monitoring and Assessment Guidance.~~

107. ~~Regarding percentage of intestinal enterococci concentration measurements within established standards), the Revised Mediterranean guidelines for bathing waters of 2007 based on the WHO guidelines for “Safe Recreational Water Environments” and on the EC Directive for “Bathing Waters” serve as a basis for monitoring~~ **assessment criteria developed and region-wide values agreed for the Mediterranean region in COP 17 (Decision IG.20/9 Criteria and Standards for bathing waters quality in the framework of the**

~~implementation of Article 7 of the LBS Protocol, (UNEP/MAP, 2012) will be built on 26/3 and Annex II to further define GES for the indicator on pathogens in bathing waters during the initial phase of IMAP.~~
present document).

Marine litter (EO10):

108. Marine litter monitoring of IMAP is based on the **updated** Regional Plan on Marine Litter Management in the Mediterranean (Decision IG. ~~20/10, the MLRP~~**25/9, COP 22**) and on the following agreed common and candidate indicators:

Common Indicator 22: Trends in the amount of litter washed ashore and/or deposited on coastlines (EO10);

Common Indicator 23: Trends in the amount of litter in the water column including microplastics and on the seafloor (EO10);

Common Indicator 23 (bis)⁸: Trends in the amount of litter coming from riverine sources (EO10)

~~Candidate~~**Common** Indicator 24: Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles (EO10).

~~109. In addition, as marine litter monitoring is a new area for the Mediterranean, IMAP greatly builds on the UNEP Guidelines for Comprehensive Beach Litter Assessment and on the Guidance on Monitoring of Marine Litter in European Seas.~~

110. Contracting Parties ~~will establish~~**have established** national **IMAP-based** monitoring programmes ~~during the initial phase of IMAP~~ in relation to the two common indicators **(in particular on beach macro-litter, seafloor macro-litter, and floating microplastics)**, and ~~are~~**have been** encouraged to also consider in their monitoring programmes the candidate indicator related to ~~ingested~~**ingestion and entanglement of marine litter from sea turtles** and to undertake pilot monitoring activities on the latter. **In this regard, a number of countries (e.g., Tunisia, Lebanon, Morocco etc.) have piloted the establishment of IMAP-based national monitoring programmes also for IMAP Candidate Indicator 24.**

~~111. Furthermore, is strongly recommended that Contracting Parties, which currently have plans to monitor only in a subset of environmental compartments, start with small pilot research or development projects in other compartments. This would provide baseline data to make an informed decision about future, full-scale monitoring programmes. Without information on trends and amounts in all the marine compartments, a risk-based approach to litter monitoring and measures is not possible.~~

112. Furthermore, Data Standards (DS) and Data Dictionaries (DD) have been developed and agreed region-wide for the 2 common indicators (i.e., beach macro-litter, seafloor macro-litter, and floating microplastics), including the establishment of Threshold Values (TV) and updated Baseline Values (BV).

113. A considerable number of citizens, communities (NGOs, civil society initiatives), and environmental protection associations and institutes across the Mediterranean are already taking part in activities to tackle marine litter. Contracting Parties are encouraged to ~~enable~~**further engage** them in the implementation of IMAP and empower them to help improve the evidence base needed for marine litter monitoring.

⁸ Proposal for inclusion of a new common indicators.

114. Regarding beach litter, cost-efficient and easy to follow monitoring and sampling methodologies and techniques are well established, as described in the Integrated Monitoring and Assessment Guidance, with at least two surveys per year in spring and autumn recommended and ideally 4 surveys per year in spring, summer, autumn and winter.

115. ~~A reduced master~~**An updated** list of litter categories and items ~~is~~**has been** also included in the Integrated Monitoring and Assessment Guidance **and also integrated into the respective DS-DD**, with the most frequent items found in Mediterranean beaches.

116. ~~The Contracting Parties can build on this reduced~~ **Further alignment with the EU/MSFD joint list as a reference approach which is compatible with other lists, in relation to marine litter monitoring, and it can be used also as a practical guide for the field work, enabling a coordinated**~~considered once this list is finalized and harmonized monitoring (including when operated by NGOs, as appropriate) its ongoing update is completed.~~

117. Regarding monitoring **of marine** litter at the sea (Common Indicator ~~17~~**23**), due to the low occurrence of litter in midwater, the common indicator focuses on ~~surface~~**floating** and seafloor litter. ~~Due to the observation methodology (observation from ships), the type of marine litter objects can only be noted during very short visual observation. Therefore, in contrast to beach litter, only rough litter categories can be determined, even though monitoring size categories should also include relevant small items, in line with the Integrated Monitoring and Assessment Guidance, including microplastics.~~

118. ~~During~~**Regional guidelines detailing the initial phase**~~monitoring of IMAP, floating microplastics have been developed by UNEP/MAP will develop a specific Monitoring of floating litter protocol, on a~~ **MED POL and agreed at regional level.**

119. Regarding seafloor macro-litter (Common Indicator ~~17~~**23**), opportunistic monitoring is the most cost-efficient method for sea-floor monitoring, ~~building on being jointly implementation with national/regional fish-stock assessment survey programmes (e.g., the Mediterranean International Bottom Trawl Surveys (MEDITS) and), with the use of compatible professional trawling operations to couple monitoring efforts may be the best approach to monitor litter on the sea floor.~~ There may be other opportunities to couple marine litter surveys with other regular surveys (**e.g., monitoring in marine reserves, offshore platforms, passenger ships for visual monitoring, etc.**) or programmes on biodiversity, with methodologies and technical requirements prescribed in the Integrated Monitoring and Assessment Guidance **Document**.

120. ~~Regarding ingested litter (Candidate Indicator 18), due to the limited availability of protocols and the state of knowledge, the candidate indicator's focus during the initial phase of IMAP is on sea turtle Caretta caretta. UNEP/MAP thus will develop during the initial phase of IMAP a monitoring protocol for marine litter in sea turtles with focus on relevant parameters for application in the Mediterranean.~~

121. Regarding ingestion and entanglement of marine litter from biota, in particular from sea turtles (Candidate Indicator 24), a number of actions have been undertaken by UNEP/MAP, which have been reviewed and endorsed by the CPs, and subsequently have substantially improved the level of knowledge and information for this candidate indicator, including the following: (a) development of a report with the most representative species to be used for this indicator, including a short-listing; (b) region-wide protocols for monitoring interactions between marine litter and marine turtles (ingestion and entangling) with a view to harmonizing methods of data collection for monitoring and assessment; (c) assessment of the available data to propose GES targets; (d) assessment reports from the testing of the harmonized protocols (Algeria, Tunisia, Lebanon); (e) operational strategy for monitoring IMAP Candidate Indicator 24; (f) guidelines for the design of a regional network for monitoring & assessment of IMAP Candidate Indicator 24 in the Mediterranean; (g) data standards and data dictionaries and related data flow implemented; (h) pilot IMAP-based national monitoring programmes (Tunisia, Lebanon, Morocco).

122. ~~Further to the above-stated information, the Secretariat feel that there is sufficient ground to have this ingested litter is a candidate common indicator, being transformed into a common indicator and a relevant request from the Contracting Parties are not obliged to include its monitoring in their national integrated monitoring programmes during the initial phase of IMAP, but they are encouraged however to undertake pilots, further research on this indicators should be initiated.~~

123. Furthermore, it is important to note that while micro-litter ~~is~~ **and in particular microplastics are** considered ~~to be part of~~ **from IMAP-EO10**, further work is **still** necessary ~~hereat~~ at regional level, recognizing that our understanding of the potential impacts of microplastic on organisms and the environment is still ~~limited~~ **under development**. Contracting Parties are thus encouraged also to undertake pilots, further research work in this area (**e.g., microplastics on beaches, microplastics on sediment, etc.**).

124. The Integrated Monitoring and Assessment Guidance ~~includes~~ **Document, and the Guidance Factsheets include** further specific **details and specifications on** methodologies, scales, ~~and of~~ **assessment, as well as** technical considerations, which can guide the Contracting Parties during the development of their ~~integrated IMAP-based national monitoring programme's programmes for~~ marine litter component. The report of the Informal Online working group on Marine Litter (UNEP((DEPI)/MED WG.420/Inf.13) present recommendations related to baselines (Appendix 2) **(IMAP – EO10)**.

3.4 Monitoring and assessment of coastal ecosystems and landscapes and hydrography related common indicators

Hydrography:

125. ~~Monitoring of hydrographic alterations aim to address developments large enough to have the potential to alter hydrographical conditions, either at broad scale or through acting cumulatively with other developments.~~

126. ~~As mentioned above,~~ Monitoring under this ecological objective aims to address new developments of permanent alterations (constructions lasting for more than 10 years) **that can potentially impact marine habitats. It is therefore closely related to CI 1 (EO1).**

127. Hydrography related common indicator:

128. ~~Contracting Parties thus when developing their national integrated monitoring programme's hydrography component, need to first agree on a common baseline year in the (very) near future from which monitoring for good status can be based upon. Furthermore, the Contracting Parties are strongly encouraged to list their available records the licensing applications for any proposed developments that would be considered large enough to have the potential to alter hydrographical conditions (constructions lasting for more than 10 years). The monitoring following this approach, will confirm whether there is need for any additional licensing, monitoring or assessment requirements for Government, marine licensing authorities or developers.~~

Common Indicator 15: Location and extent of the habitats **potentially** impacted by hydrographic alterations (EO7)

129. Taking into considerations the difficulty in monitoring this indicator; due to its complexity, requirements for historic data, significant human and financial resources required and alike, several CORMON meetings agreed to simplify the original Guidance Factsheet in order to allow its implementation. Some simplification has been already proposed, however further steps are needed and agreed (for the last time at CORMON meeting in Marseille 28-29 March 2023).

130. In line with the above, the monitoring under this EO could focus on basic hydrographic indicators, necessary for the overall IMAP implementation and monitoring under other EOs, such

as: bathymetry, salinity of the sea; sea temperature; transparency, areas of high waves etc.

Coastal ecosystems and landscapes:

131. One particularity of the IMAP (compared to other regional/RSC monitoring and assessment programmes) is the inclusion of an Ecological Objective focusing on the terrestrial part of the coastal zone. This reflects that the Barcelona Convention also covers coastal areas in its work, in line with the ICZM Protocol.

132. The coast related common indicator and candidate common indicator are as follows:

Common Indicator 16: Length of coastline subject to physical disturbance due to the influence of ~~man~~human-made structures (EO8);

133. Based on 2023 MED QSR and experience from the first monitoring cycle, the CoP Decision on 2023 QSR Measures and Actions proposed several technical improvements in the Guiding Factsheet including to redefine the reference coastline so to harmonize the approach, as well as to have a clear link (starting line) for the calculation of the CI 25 Land cover change.

134. During the development of the national integrated monitoring programmes' coastal component, the Contracting Parties, in line with the above, first need **to** assess the length of coastline affected by ~~man~~human-made structures in the current state, in line with the ~~Integrated Monitoring and Assessment Guidance Factsheet~~, noting that the length of coastline subject to physical disturbance due to the influence of ~~man~~madehuman-made structures is an impact indicator, which assumes that the coastlines occupied by ~~man~~madehuman-made structures are potentially impacted areas.

135. For assessment of indicator on length of coastline influenced by ~~man~~human-made structures, **(CI16)**, definition of thresholds as % and / or m, to be developed, during the initial phase of IMAP, should be based on expert assisted procedure to take into account the typology of the coast including its ecosystem goods and services related to social and economic benefits. The assessment should also include disturbance that comes from such structures. **The Guiding document “Assessment criteria and the Guiding document for application of assessment criteria for the IMAP Common Indicator 16” was endorsed by the CORMON meeting (Marseille, 28-29 March 2023), tested in Morocco and already applied in Montenegro and Türkiye should be used to define GES in other countries. CPs were invited to do so by the COP 23 Decision on 2023 MED QSR.**

136. In line with the above, the monitoring under this Ecological Objective is meant to address human activities causing coastal artificialization by sealing the coast with the implementation of coastal structures and therefore impacting the coastal ecosystems and landscapes.

137. The term ‘human-made structures’ typically refers to different types of coastal defenses (such as seawalls, breakwaters, dykes etc.), ports/marinas, as well as to structures built on land, either on the coastline or in its vicinity landward.

Common Indicator 25: Land ~~use~~ cover change (EO8)

138. Based on the agreement by CPs representatives in CORMON Coast and Hydrography meetings (Marseille, 28-29 March 2023 being the latest) there is a sufficient ground for this candidate common indicator to become a common indicator, with the title “Land cover change”. Testing of this indicator has been carried out within several projects (SIDA, EcAp MED II and III, GEF MedProgramme); results for the Adriatic sub-region were included in the 2023 MED QSR; training sessions have been completed or are in progress for all GEF MedProgramme countries. The COP23 Decision on 2023 QSR proposes some technical elements for the Guiding Factsheet that will be inserted to the method and presented at the CORMON C&H in October 2024.

139. In relation to candidate indicator on land ~~use~~**cover** change, Contracting Parties are encouraged to develop monitoring programmes and undertake monitoring activities in line with the outcomes of the EcAp-MED pilot ~~project~~**projects**, undertaken in the Adriatic- **and presented in the 2023 MED QSR, as well as the training /capacity building activities and pilot projects implemented in GEF MedProgramme eligible countries.** This indicator is very important for the analysis of processes, including land-sea interaction, **and climate change impact** in coastal areas and ~~as it is a simple tool it should be promoted and developed during the initial phase of IMAP. This will allow~~ **allows** countries to propose adequate measures to achieve GES (to be specified by the countries themselves taking into account their local specificities-) **and mitigate Climate Change impacts.** It will bring more objectivity into reporting on the state and evolution of their coastal zones and implementation of the ecosystem approach in coastal zones. ~~During the initial phase of IMAP implementation further work will be undertaken to provide support to the Contracting parties through training, capacity building activities, exchange of experience including as appropriate consultations at sub-regional level.~~

140. Certain other indicators related to land cover change but also strongly influenced by climate change could be developed (as highlighted in the COP23 Decision on 2023 MED QSR), such as those related to flooding due to sea level rise and storm surges; heat stress/droughts and related forest fires, etc. Potential consideration of such indicators will be discussed in future CORMON C&H meetings.

3.5 Monitoring Ecological Objective 11: Energy including underwater noise

141. This part of IMAP has been prepared, thanks to the support of experts from the Joint ACCOBAMS/ASCOBANS/CMS Working Group on Noise

142. The two candidate common indicators related to energy including underwater noise are:

- | | |
|-------------------------|--|
| Candidate Indicator 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 animals; |
| Candidate Indicator 27: | Levels of continuous low frequency sounds with the use of models as appropriate. |

143. 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 proposed monitoring strategy of these two candidate indicators, as spelled out in the Integrated Monitoring and Assessment Guidance, represents a basis for further work during the initial stage of IMAP towards an effective and widely agreed monitoring of underwater noise at a regional scale.

144. In line with the above, Contracting Parties are encouraged to develop monitoring programmes and undertake activities on the two common indicators on a pilot basis during the initial phase of IMAP.

145. UNEP/MAP and ACCOBAMS, together with other interested partners, will continue during the initial phase of IMAP to further develop these candidate indicators towards common indicators.

146. For GES assessment related to EO11, three thresholds need to be established: a spatial and a temporal threshold concerning candidate indicator 26 and a noise threshold concerning candidate indicator 27.

147. During the initial phase of IMAP, the ACCOBAMS Secretariat in coordination with the competent MAP components will carry out the following tasks with a view to further develop technical aspects of the candidate indicators in particular:

- a) Reviewing what spatial and temporal thresholds have been selected by European Member States for implementing impulsive noise indicator of D11
- b) Fulfilling action CA 2b1 of the 2014-2016 Work Plan (“Identifying Noise Hotspots for cetaceans in the ACCOBAMS area which is relevant to the Mediterranean Sea Area as provided for in the Barcelona Convention”), in order to provide the necessary baseline information on space-time distribution of impulsive noise sources across the Mediterranean
- c) Reviewing ambient noise data available for the Mediterranean Sea as a follow up of the present work in order to identify the threshold for continuous noise indicator 11.1.2.
- d)

Annex I⁹

**Updated Reference List of Species and Habitats, Assessment Criteria and Scales,
Thresholds, Baseline Values for Biodiversity and Non-Indigenous Species**

⁹ Annex I updated in its entity. The 11th EcAp CG Meeting to discuss and take a decision regarding the approach that will be followed for the presentation of the content of Annex I (e.g., hyperlinks or table approach), as well as the need to submit the aforementioned values to the upcoming COP24 for endorsement.

Annex I: Updated Reference List of Species and Habitats, Assessment Criteria and Scales, Thresholds, Baseline Values for Biodiversity and Non-Indigenous Species

A. Reference list of habitats:

Benthic Habitat: [Updated Reference List of Marine Habitat Types](#) (UNEP/MED WG.467/14)

Pelagic Habitat: [Reference list of pelagic Habitat Types for the epipelagic layer \(0-200m\)](#) (UNEP/MED WG.548/7)

B. Reference list of species:

Marine sea birds:

Eleven indicator species were selected from Annex II of the Barcelona Convention, representing six functional groups, to be used for the assessment of the three relevant IMAP Common Indicators related to seabirds:

Coastal top predators:	<i>Pandion haliaetus</i>
Intertidal benthic-feeders:	<i>Charadrius alexandrinus</i>
Inshore benthic feeders:	<i>Gulosus aristotelis desmarestii</i>
Offshore surface-feeders:	<i>Ichthyiaetus audouinii</i>
Inshore surface feeders:	<i>Croicocephalus genei</i> , <i>Thalasseus bengalensis emigrates</i> , <i>Thalasseus sandvicensis</i>
Offshore (surface or pelagic) feeders:	<i>Hydrobates pelagicus melitensis</i> , <i>Calonectris diomedea</i> , <i>Puffinus yelkouan</i> , <i>Puffinus mauretanicus</i>

Marine Mammals:

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:

- a) Baleen whales: fin whale (*Balaenoptera physalus*).
- b) 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*).
- c) Other toothed species: short-beaked common dolphin (*Delphinus delphis*), striped dolphin (*Stenella coeruleoalba*), common bottlenose dolphin (*Tursiops truncatus*).

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:

- a) Harbour porpoise (*Phocoena phocoena*)
- b) Rough-toothed dolphin (*Steno bredanensis*)
- c) False killer whale (*Pseudorca crassidens*)
- d) Killer whale (*Orcinus orca*).

Marine Turtles:

Of the seven species of marine turtle that inhabit the world's oceans only two have established resident breeding populations in the Mediterranean and require assessment. These are the:

- a) Loggerhead turtle (*Caretta caretta*; IUCN (regionally) Least Concern).
- b) Green turtle (*Chelonia mydas*; IUCN (globally) Endangered).

C. Assessment Criteria and Scales, Thresholds, Baseline Values

- a) [Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Marine Mammals](#) (UNEP/MED WG.514/Inf.11)¹⁰.
- b) [Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Marine Turtles](#) (UNEP/MED WG.514/Inf.12)¹¹.
- c) [Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to sea birds](#) (UNEP/MED WG.521/Inf.7)¹².
- d) [Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicator 6 related to non-indigenous species](#) (UNEP/MED WG.520/Inf.3)¹³.
- e) [Baseline for the IMAP Common Indicator 6 related to Non-Indigenous Species](#) (UNEP/MED WG.521/Inf.8)¹⁴.

¹⁰ Presented during the 8th Meeting of the Ecosystem Approach Coordination Group, (9 September 2021).

¹¹ Presented during the 8th Meeting of the Ecosystem Approach Coordination Group, (9 September 2021).

¹² Presented during the 9th Meeting of the Ecosystem Approach Coordination Group, (5 July 2022).

¹³ Presented during the Meeting of the Ecosystem Approach Correspondence Groups on Monitoring (CORMON), Biodiversity and Fisheries (10-11 June 2021).

¹⁴ Presented during the 9th Meeting of the Ecosystem Approach Coordination Group, (5 July 2022).

Annex II

IMAP Updated Assessment Criteria for Nutrients, Contaminants and Biomarkers Marine Litter¹⁵

¹⁵ Annex II updated in its entity. The Assessment Criteria for Nutrients, Contaminants and Marine Litter have been approved by COP23 ([Decision IG.23/3, Annex II](#))

Annex II: IMAP Assessment Criteria for Nutrients, Contaminants and Marine Litter

PART I: Pollution (IMAP EO5 and EO9)

1. The assessment criteria for Common Indicators 13 and 14¹⁶

Table 1. Major coastal water types in the Mediterranean

	Type I	Type II-A, II-A Adriatic	Type III-W	Type III-E	Type Island-W
σ _t (density)	<25	25<d<27	>27	>27	All ranges
S (salinity)	<34.5	34.5<S<37.5	>37.5	>37.5	All ranges

Note: With the view to assess eutrophication, the classification scheme on Chl *a* concentration (in µg/l) is optimal in coastal waters as a parameter easily applicable by all Mediterranean countries based on the indicative thresholds and reference values presented in Table 3.

Note: The major coastal water types are also indicative of the part of offshore waters next to coastal waters; however, it should be used with caution in the offshore (open) areas.

Table 2. Coastal water types reference conditions and boundary values in the Mediterranean, along with the new and updated values for coastal and open (offshore) waters in the Adriatic Sea Sub-region¹⁷.

(Reference conditions and boundary (Good/Moderate status) values, expressed as *G_mean* annual values, are based on long time series (>5 years) of monthly sampling at least, which differ from type to type on the sub-regional scale, and therefore, were built with different strategies).

Water Typology	Coastal waters					
	Reference conditions of c(Chla) (µg/L)		Boundaries of c(Chla) (µg/L) for G/M status		Reference conditions of c(TP) (µmol/L)	Boundaries of c(TP) (µmol/L) for G/M status
	<i>G_mean</i>	90% percentile	<i>G_mean</i>	90% percentile		
Type I	1,4	3,33 ^b	6,3	10		
Type I Adriatic	1,4	3,94	5,0 ^a	14,1	0,19 ^a	0,55 ^a
Type II-A-FR-SP ^d	-	1,9	-	3,58	-	-
Type II-A Adriatic	0,33	0,87	1,5	4,0	0,16 ^a	0,48 ^a
Type II-A ^e Tyrrhenian	0,32	0,77	1,2	2,9	-	-
Type III-W Adriatic ^c	-	-	0,64 ^f	1,7 ^f	-	0,26
Type III-W Tyrrhenian	-	-	0,48	1,17	-	-
Type III-W-FR-SP		0,9		1,80	-	-
Type III-E		0,1		0,4		
Type Island-W		0,6		1,2-1,22		

Water Typology	Open (offshore) waters in the Adriatic Sea Sub-region					
	Reference conditions of c(Chla) (µg/L)		Boundaries of c(Chla) (µg/L) for G/M status		Reference conditions of c(DIN) (µmol/L)	Boundaries of c(DIN) (µmol/L) for G/M status
	<i>G_mean</i>	90 % percentile	<i>G_mean</i>	90 % percentile		
Type I Adriatic	0,15 ^g ; 0,29 ^h	0,42 ^f ; 0,81 ^g	3,1	8,7	0,21 ^g ; 0,66 ^h	22.3
Type II-A Adriatic	0.11	0.29	-	-	-	-
Type III-W Adriatic ^c	-	-	0.64	1.7	-	-

^a From Giovanardi et al, 2018

^b Applicable to Gulf of Lion Type I coastal waters

¹⁶ For ease of reference, the Secretariat included the values as approved by Decisions IG.22/7 (COP 19) and IG. 23/6 (COP 20) which are shown in shaded cells.

¹⁷ The new values are calculated based on data as available by December 2022.

^c The ecological classification scheme would not be suitable for proper and safe classification, and therefore the boundary values for WT III-W Adriatic waters are based on the H/G values for WT II-A Adriatic in coastal waters i.e. 0.64 µg/L for Chla and 0,26 µmol/L for TP

^d Correction of error included to ensure consistency with the classification as provided in Commission Decision 2013/480/EU i.e. Type II -FR-SP, as included in Decision IG.22/7, replaced with Type II -A-FR-SP

^e Correction of error included to ensure consistency with the classification as provided in Commission Decision 2013/480/EU i.e., Type II-A Tyrrhenian replaced Type II-B Tyrrhenian, as included in Decision IG.22/7, since the latter does not exist in the Tyrrhenian Sea

^f values based on the H/G values for WT II-A^c The ecological classification scheme would not be suitable for proper and safe classification, and therefore the boundary values for WT III-W Adriatic waters are based on the H/G values for WT II-A Adriatic in coastal waters i.e. 0.64 µg/L for Chla and 0,26 µmol/L for TP

^g for ME; ^h for HR, IT

^h No pressure – effect relationship was found, and therefore RC for DIN and boundary G/M values for Chla and DIN could not be proposed.

2. The assessment criteria for IMAP Common Indicator 17¹⁸¹⁹

2.1 The BC and BAC values for IMAP Common Indicator 17

Table 3. The BC and BAC values for trace metals in sediments. The units of concentration are given in µg/kg dry wt, as requested by IMAP.

The BC and BAC values for trace metals in sediments					
The BC values in sediments, µg/kg dry wt					
TM	MED	WMS	ADR	CEN	AEL
Cd	107	140	120	#	78.9
Hg	50.0	90.0	50.0	#	31.5
Pb	15000	16000	15700	1805	15674
The BAC values in sediments, (µg/kg dry wt)					
	Med	WMS	ADR	CEN	AEL
Cd	161	210	180	#	118
Hg	75.0	135	75.0	#	47.3
Pb	22500	24000	23550	2708	23511

#All data points for Cd are BDL as well as 72% of the Hg data points.

Table 4. The BC and BAC values for Polycyclic Aromatic Hydrocarbons (PAHs) in sediments. The units of concentration are given in µg/kg dry wt, as requested by IMAP.

The BC and BAC values for Polycyclic Aromatic Hydrocarbons (PAHs) in sediments					
PAH compounds	The BC values in sediments, µg/kg dry wt				
	MED	WMS	ADR	CEN	AEL
Naphthalene	2.00	8.0	2.0	#	2.3
Acenaphthylene	(1.0) [#]	#	#	0.4	#
Acenaphthene	(2.0) [#]	#	#	*	#
Fluorene	(2.0) [#]	#	#	0.4	#
Phenanthrene	3.10	14.9	3.5	0.8	3.1
Anthracene	(2.2) [#]	#	#	#	#
Fluoranthene	5.00	#	7.0	0.1	2.7
Pyrene	6.20	24.8	8.0	0.4	3.0
Benzo[a]anthracene	3.38	19.7	4.1	*	1.8
Chrysene	2.70	35.9	4.6	1.6	1.6
Benzo(b)fluoranthene	5.00	8.7	15.0	*	2.6
Benzo(k)fluoranthene	4.00	#	3.0	*	#
Benzo[a]pyrene	(4.0) [#]	#	4.0	#	1.0
Benzo[g,h,i]perylene	(4.2) [#]	#	5.7	*	1.8
Dibenz[a,h]anthracene	(1.0) [#]	7.0	#	*	#
Indeno[1,2,3-c,d]pyrene	(4.0) [#]	#	4.4	*	2.1
Sum PAHs	27.4	160	41.0	6.3	21.4
PAH compounds	The BAC values in sediments, µg/kg dry wt				
	MED	WMS	ADR	CEN	AEL

¹⁸ For ease of reference, the Secretariat included the values as approved by Decisions IG.22/7 OF (COP 19) and IG. 23/6 (COP 20) which are shown in shaded cells.

¹⁹ The new values are calculated based on data as available by December 2022

The BC and BAC values for Polycyclic Aromatic Hydrocarbons (PAHs) in sediments					
Naphthalene	3.0	12.0	3.0	#	3.5
Acenaphthylene	(1.5) [#]	#	#	0.6	#
Acenaphthene	(3.0) [#]	#	#	*	#
Fluorene	(3.0) [#]	#	#	0.5	#
Phenanthrene	4.7	22.4	5.3	1.2	4.7
Anthracene	(3.3) [#]	#	#	#	#
Fluoranthene	7.5	#	10.5	0.2	4.1
Pyrene	9.3	37.1	12.0	0.6	4.5
Benzo[a]anthracene	5.1	29.6	6.2	*	2.7
Chrysene	4.0	53.9	6.9	2.4	2.4
Benzo(b)fluoranthene	7.5	13.0	22.5	*	3.8
Benzo(k)fluoranthene	6.0	#	4.5	*	#
Benzo[a]pyrene	(6.0) [#]	#	6.0	#	1.5
Benzo[g,h,i]perylene	(6.3) [#]	#	8.6	*	2.7
Dibenz [a,h]anthracene	(1.5) [#]	10.5	#	*	#
Indeno[1,2,3-c,d]pyrene	(6.0) [#]	15.0	6.5	*	3.2
Sum PAHs	41.0	240	61.5	9.5	32.0

#most data (>50%) below detection limit, * no data reported

Table 5. The BC and BAC values for trace metals in mussel (*M. galloprovincialis*) and fish (*M. barbatus*) . The units of concentration are given as requested by IMAP.

The BC and BAC values for trace metals in mussel soft tissue (<i>M. galloprovincialis</i>), µg /kg dry wt					
The BC values					
TM	MED	WMS	ADR	CEN	AEL
Cd	710	1030	629	*	942 ^{>}
Hg	77.9	85.0	75.4	*	110 ^{>}
Pb	1100	1260	1000	*	2300 ^{>}
The BAC values					
TM	MED	WMS	ADR	CEN	AEL
Cd	1065	1545	944	*	1413 ^{>}
Hg	117	128	113	*	165 ^{>}
Pb	1650	1890	1500	*	3450 ^{>}

* Only a few data points were available for the CEN. The calculated BCs were lower than in other sub-regions, however, the few data are not representative of the CEN.

> Since new data were not available in the AEL to update BC/BAC values for *M. galloprovincialis*, it was approved to use the values calculated in 2019.

The BC and BAC values for trace metals in fish muscle (<i>Mullus barbatus</i>), µg/kg wet wt					
The BC values					
TM	MED	WMS	ADR	CEN	AEL
Cd	3.9	*	5.3	*	3.6
Hg	40.6	*	120	*	33.7
Pb	18.3	*	40.8	*	13.5
BAC values					
	MED	WMS	ADR	CEN	AEL
Cd	7.8	*	10.6	*	7.2
Hg	81.2	*	240	*	67.4
Pb	36.6	*	81.6	*	27.0

* Given the lack of data, it was not possible to propose values for BC in these sub-regions, therefore it was approved to use the regional MED BC values for the GES assessment

Table 6. The BC and BAC values for Polycyclic Aromatic Hydrocarbons (PAHs) in mussel (*M. galloprovincialis*) . The unit of concentration is given in µg/kg dry wt, as requested by IMAP. No data were available for the CEN and the AEL Sub-regions.

The BC and BAC values for Polycyclic Aromatic Hydrocarbons (PAHs) in mussel (<i>M. galloprovincialis</i>), µg/kg dry wt			
BC values			
	MED	WMS	ADR
Naphthalene	0.56	0.52	#
Acenaphthylene	(0.05) [#]	#	#
Acenaphthene	(0.50) [#]	#	#
Fluorene	2.50	7.87	#
Phenanthrene	5.35	19.9	2.25
Anthracene	1.12	0.94	#
Fluoranthene	4.83	10.0	#
Pyrene	2.50	5.54	#
Benzo[a]anthracene	0.60	0.69	#
Chrysene	2.54	2.98	#
Benzo(b)fluoranthene	1.00	1.36	#
Benzo(k)fluoranthene	1.00	0.73	#
Benzo[a]pyrene	(1.00) [#]	0.94	#
Benzo[g,h,i]perylene	1.00	0.67	#
Dibenz[a,h]anthracene	(0.10) [#]	#	#
Indeno[1,2,3-c,d]pyrene	(0.63) [#]	0.29	#
Sum 16 PAHs ²⁰	5.80	5.60	6.60
The BAC values			
	MED	WMS	ADR
Naphthalene	0.84	0.79	#
Acenaphthylene	(0.08) [#]	#	#
Acenaphthene	(0.75) [#]	#	#
Fluorene	3.75	11.8	#
Phenanthrene	8.03	29.8	3.38
Anthracene	1.68	1.40	#
Fluoranthene	7.25	15.0	#
Pyrene	3.75	8.31	#
Benzo[a]anthracene	0.90	1.04	#
Chrysene	3.81	4.46	#
Benzo(b)fluoranthene	1.50	2.04	#
Benzo(k)fluoranthene	1.50	1.09	#
Benzo[a]pyrene	(1.50) [#]	1.42	#
Benzo[g,h,i]perylene	1.50	1.01	#
Dibenz[a,h]anthracene	(0.14) [#]	#	#
Indeno[1,2,3-c,d]pyrene	(0.94) [#]	0.43	#
Sum 16 PAHs	8.70	8.40	9.90

[#]most data (>50%) below detection limit;

²⁰ Data dictionary gives 2 additional categories: Sum 4 PAHs Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene) and Sum 5 PAHs (Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)perylene, Indeno(1,2,3-cd)pyrene). It is suggested that they be considered for use in the future data reporting.

Table 7. The BAC values for organochlorinated contaminants (PCBs and pesticides) in sediments and mussel (*M. galloprovincialis*). The unit of concentrations is given in µg/kg dry wt, as requested by IMAP. For sediments, very limited data were available for the CEN sub-region, while for biota no data were available for the CEN and AEL sub-regions. When most (>50%) of the data points were below the detection limit for the sub-regions, BACs were not calculated.

The BAC values for organochlorinated contaminants (PCBs and pesticides) in sediments and mussel (<i>M. galloprovincialis</i>)					
SEDIMENTS, µg/kg dry wt	MED	WMS	ADR	CEN	AEL
PCBs					
PCB28	0.10	#	#	#	0.09
PCB52	0.07	0.10	0.09	#	0.04
PCB101	0.10	0.16	0.16	*	#
PCB118	0.10	0.46	0.18	#	0.01
PCB138	0.11	0.26	0.24	#	#
PCB153	0.14	0.40	0.28	#	0.02
PCB180	0.09	0.13	0.13	#	#
Sum 7 PCBs	0.40	1.60	0.21	#	0.19
Pesticides					
γ-HCH (Lindane)	(0.1) [#]	#	#	*	0.02
DDE(p,p')	(0.1) [#]	0.23	#	#	*
Hexachlorobenzene	(0.1) [#]	#	#	#	*
Dieldrin	(0) [#]		#	#	#
BIOTA – MG, µg/kg dry wt	MED	WMS	ADR	CEN	AEL
PCBs					
PCB28	0.20	0.07	1.38	*	*
PCB52	0.38	0.3	0.5	*	*
PCB101	1.20	1.1	1.4	*	*
PCB118	1.23	1.5	1.4	*	*
PCB138	2.31	2.4	3.3	*	*
PCB153	3.45	4.6	4.6	*	*
PCB180	0.50	0.3	0.5	*	*
Sum 7 PCBs	18.4	28.6	17.3	*	*
Pesticides					
γ-HCH (Lindane)	(1.0) [#]	#	#	*	*
DDE(p,p')	3.05	3.05	*	*	*
Hexachlorobenzene	(0.5) [#]	#	#	*	*
Dieldrin	(1.0) [#]	#	*	*	*

most data (>50%) below detection limit. * no data reported

2.2 The Environmental Assessment Criteria (EAC) values for IMAP CI 17

Table 8. The Mediterranean EAC values for trace metals in sediments and biota, as endorsed by Decision IG.23/6

The Mediterranean EAC values for trace metals in sediments and biota			
TM	MedEAC*	#MedEAC	#MedEAC
	Sediments, µg/kg dry wt	<i>M. galloprovincialis</i> , µg/kg dry wt	<i>Mullus barbatus</i> , µg/kg wet wt
	IG.23/6	IG.23/6	IG.23/6
Cd	1200	5000	50
Hg	150	2500&	1000
Pb	46700	7500	300

* Med EAC values equal to ERL (Effects Range Low, Long et al. 1995, idem OSPAR values). # Med EAC values equal to the maximum regulatory levels for contaminants in foodstuffs as provided in EC/EU 1881/2006 and 629/2008 Directives
& Not included in EU directives, but adopted by OSPAR

Table 9. The Mediterranean EAC values for Polycyclic Aromatic Hydrocarbons (PAHs) in sediments and biota, as endorsed by Decisions IG.23/6 and IG.22/7, along with a few updated values to ensure consistency with ERL Long et al., and OSPAR EAC values

The Mediterranean EAC values for Polycyclic Aromatic Hydrocarbons (PAHs) in sediments and biota				
PAH compounds	Sediments, µg/kg dw		Biota Mussels, µg/kg dw	
	EAC* IG.22/7 and IG.23/6 - OSPAR and ERLs	ERL Long et al, 1995 [#]	EAC** IG.22/7 and IG.23/6 - OSPAR	OSPAR [#]
Naphthalene		160		340
Acenaphthylene		44		
Acenaphthene		16		
Fluorene		19		
Phenanthrene	240		1700	
Anthracene	85		290	
Fluoranthene	600		110	
Pyrene	660		100	
Benzo[a]anthracene	261		80	
Chrysene	384			
Benzo(b)fluoranthene				
Benzo(k)fluoranthene			260	
Benzo[a]pyrene	430		600	
Benzo[g,h,i]perylene	85		110	
Dibenz[a,h]anthracene		63.4		
Indeno[1,2,3-c,d]pyrene	240			
Sum 16 PAHs		4022		

* Med EAC values equal to ERL (Effects Range Low, Long et al. 1995, idem OSPAR values)

** Med EAC values equal to OSPAR values

Med EAC values equal to ERL (Effects Range Low, Long et al., 1995) which were not included in Decisions IG.22/7 and IG.23/6.

Table 10. The Mediterranean EAC values for for organochlorinated contaminants (PCBs and pesticides) in sediments and biota, as endorsed by Decisions IG.23/6 and IG.22/7 along with the one updated value.

The Mediterranean EAC values for for organochlorinated contaminants (PCBs and pesticides) in sediments and biota					
PCBs	Sediments			Mussel	Fish
	EAC [#] IG.22/7 (µg/kg dry wt) – updated	EAC* IG.22/7 (µg/kg dry wt)	EAC** IG.23/6 (µg/kg dry wt)	EAC** IG.22/7 and IG.23/6 (µg/kg dry wt)	EAC** IG.22/7 and IG.23/6 (µg/kg lipid)
CB28			1.7	3.2	64
CB52			2.7	5.4	108
CB101			3	6	120
CB118			0.6	1.2	24
CB138			7.9	15.8	316
CB153			40	80	1600
CB180			12	24	480
Sum 7 PCBs	67,9				
Pesticides					
γ-HCH (Lindane)		3		1.45	11 µg/kg ww
DDE(p,p')		2.2		5-50	
Hexachlorobenzene		20			
Dieldrin		2		5-50	

* ERL (Effects Range Low, (Long et al., 1995) or used by OSPAR (2009)

** From OSPAR (2009)

[#]The EAC value of 11.5 µg/kg dry wt in Decision IG 22/7 originated probably from Long et al, 1995 as explained in document UNEP/MED 427/Inf.3. However, Long et al.,1995 present the ERL value of 22.7 µg/kg dry wt for Total PCBs in sediments but do not specify which congeners were considered. Moreover, OSPAR has not adopted an EAC value for the sum of 7 PCBs in sediments. Therefore, further to experience related to the preparation of the assessments within the 2023 MED QSR, the EAC value of 67,9 is included to present the sum of 7 individual IMAP PCB congeners.

3. The Environmental Assessment Criteria (EAC) related to IMAP Common Indicator 20

Table 11. The Mediterranean EACs values for CI 20 related to trace metals based on the maximum regulatory levels for trace metals in foodstuffs for the protection of human health, as provided in EC/EU Directives 1881/2006 and its amendments 488/2014 and 1005/2015. The concentrations are presented in mg/kg wet wt.

The EAC CI 20 for trace metals- EU 1881/2006 directive and its amendments 488/2014 and 1005/2015			
matrix	TM, mg/kg wet wt		
	Cd	Hg	Pb
fish muscle	0.05-0.25	0.5-1	0.3
cephalopods	1		1
crustaceans	0.5	0.5	0.5
bivalve mollusc	1		1.5

Table 12. The Mediterranean EAC values for IMAP CI 20 related to Benzo(a)pyrene and sum of four PAHs based on the maximum regulatory levels for these contaminants in foodstuffs for the protection of human health, as provided in EC/EU EC Regulations 835/2011 and 1259/2011 amending Regulation (EC) 1881/2006. The concentrations are presented in µg/kg wet wt.

The EACs values for CI 20 related to Benzo(a)pyrene and sum of four PAHs (benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and chrysene) - EC Regulation (EC) 1881/2006 and amendments 835/2011 and 1259/2011		
Matrix	Maximum levels (µg kg ⁻¹ wet wt)	
	Benzo(a) pyrene	Sum of Benzo(a) pyrene, Benzo(a) anthracene, Benzo(a) fluoranthene and chrysene
Smoked fish muscle	2-5	12-30
Smoked bivalve mollusc	6	35
Bivalve mollusk (fresh, chilled or frozen)	5	30

Table 13. The Mediterranean EAC values for CI 20 related to Dioxins and PCBs based on the maximum regulatory levels for these contaminants in foodstuffs for the protection of human health, as provided in EC/EU EC Regulation 1259/2011 amending EC Regulation 1881/2006. The concentrations are presented in wet wt.

The EACs values for CI 20 related to Dioxins and PCBs – EC Regulation 1259/2011 amending EC Regulation 1881/2006			
Foodstuffs	Maximum levels		
	Sum of dioxins (WHO-PCDD/F-TEQ) ⁽¹⁾ pg g ⁻¹ ww	Sum of dioxins and dioxin-like PCBs (WHO-PCDD/F-PCB-TEQ) ⁽¹⁾ pg g ⁻¹ ww	Sum of PCB28, PCB52, PCB101, PCB138, PCB153 and PCB180 (ICES 6) ng g ⁻¹ ww
Fish muscle	3.5	6.5	75
Fish liver	3.5	20	200
Eel muscle	3.5	10	300

(1) Dioxins (sum of polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), expressed as World Health Organisation (WHO) toxic equivalent using the WHO-toxic equivalency factors (WHO-TEFs)) and sum of dioxins and dioxin-like PCBs (sum of PCDDs, PCDFs and polychlorinated biphenyls (PCBs), expressed as WHO toxic equivalent using the WHO-TEFs). WHO-TEFs for human risk assessment based on the conclusions of the World Health Organization (WHO) (For TEF values see note 31, (EC) Regulation 1259/2011 – Annex 1.1.9.). Where fish are intended to be eaten whole, the maximum level shall apply to the whole fish.

4. The Environmental Assessment Criteria (EAC) values for IMAP CI 18²¹

Table 14. The Mediterranean BACs and EACs for biomarkers in mussel (*M. galloprovincialis*) as endorsed by Decisions IG.22/7 and IG.23/6.

The Mediterranean BACs and EACs for biomarkers in mussel (<i>M. galloprovincialis</i>)				
Biomarkers/Bioassays and units	BACs IG.23/6 in Mussels (<i>Mytilus galloprovincialis</i>)	EACs IG.23/6 in Mussels (<i>Mytilus galloprovincialis</i>)	BACs IG.22/7 in Mussels (<i>Mytilus galloprovincialis</i>)	EACs IG.22/7 in Mussels (<i>Mytilus galloprovincialis</i>)
Lysosomal membrane stability Neutral Red Retention Assay (minutes)			120 ^{a*}	50 ^{a*}
Lysosomal membrane stability Cytochemical method (minutes)			20 ^{a*}	10 ^{a*}
AChE activity (nmol min ⁻¹ mg ⁻¹ protein) in gills (French Mediterranean waters)			29	20
AChE activity (nmol min ⁻¹ mg ⁻¹ protein) in gills (Spanish Mediterranean waters)			15	10
Stress on Stress (days)	11	5		
Metallothioneins (µg/g digestive gland)	247			
Micronuclei frequency (number of cases /1000 cells) in haemocytes)	1			

^aTechnical annex: assessment criteria for biological effects measurements. Integrated monitoring of chemicals and their effects. ICES Cooperative Research Report No. 315. Davies, I.M. and Vethaak, A.D. Eds.

*Moore et al., 2006 (Standard values adopted by ICES)

²¹ For ease of reference, the Secretariat included the values as approved by Decisions IG.22/7 0F (COP 19) and IG.23/6 (COP 20) which are shown in shaded cells.

PART II: Marine Litter (IMAP – EO10)

5. Updated Baseline Values (BV) and Threshold Values (TV) for IMAP Common Indicator 22

Table 15: Updated Baseline Values and Threshold Values for IMAP Common Indicator 22 (i.e., beach macrolitter).

IMAP Indicator	Categories of Marine Litter	Baseline Values (BV – 2021)	Threshold Value (TV – 2021)
Common Indicator 22	Beach Macro-litter	369 items/100m	130 items/100m

6. Updated Baseline Values (BV) and Threshold Values (TV) for IMAP Common Indicator 23

Table 16: Updated Baseline Values and Threshold Values for IMAP Common Indicator 23 (i.e., seafloor macrolitter, floating microplastic).

IMAP Indicator	Categories of Marine Litter	Baseline Values (BV – 2023)	Threshold Value (TV – 2023)
Common Indicator 23	Seafloor Macro-litter	135 items/km ²	38 items/km ²
Common Indicator 23	Floating Microplastics	0.044338 items/m ²	0.000845 items/m ²

Annex III²²

IMAP Data Policy

²² New Annex III, containing the approved text from Decision IG.25/10 (IMAP Data Policy), COP22. The 11th EcAp CG Meeting to discuss and take a decision regarding the approach that will be followed for the presentation of the content of Annex III (e.g., hyperlinks or text approach).

Annex III: IMAP Data Policy

Decision IG.25/10 sets out the IMAP Data Policy as adopted by COP22 in 2021:

https://wedocs.unep.org/bitstream/handle/20.500.11822/37132/21ig25_27_2510_eng.pdf