



UNITED
NATIONS

EP

UNEP/MED WG.630/10



**Mediterranean
Action Plan**
Barcelona
Convention

24 July 2025
Original: English

12th Meeting of the Ecosystem Approach Coordination Group

Athens, Greece, 15 September 2025

Agenda Item 4: Revised Integrated Monitoring and Assessment Programme (IMAP) for the Mediterranean Sea and Coast

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

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Note by the Secretariat

The Integrated Monitoring and Assessment Programme (IMAP) for the Mediterranean Sea and Coast and Related Assessment Criteria was adopted by the Contracting Parties through Decision IG.22/7 during COP 19 (Athens, Greece, 2016). Since then, notable progress has been achieved in the implementation of IMAP, including the development of national and regional monitoring frameworks, technical guidance, methodologies, and the operationalization of the IMAP InfoSystem. These efforts have been further supported by successive regional assessments – notably the 2017 and 2023 Mediterranean Quality Status Reports (MED QSR) – and by the adoption of the IMAP Data Policy (Decision IG.25/10).

During COP 23 (Portorož, Slovenia, 5–8 December 2023), the Contracting Parties mandated the Secretariat, through Decision IG.26/3, to coordinate the development of a revised EcAp Policy and Roadmap (2026–2035), under the leadership of the Ecosystem Approach Coordination Group (EcAp CG), for consideration at COP 24 (Egypt, December 2025). As part of this process, the enhancement of IMAP and its related monitoring and assessment components was identified as a key priority.

In this context and building on the guidance received during the 11th Meeting of the EcAp CG (2 October 2024, online), the Secretariat has worked, in consultation with relevant CORMONs and Thematic Focal Points (SPA/RAC, MED POL, PAP/RAC), to consolidate all updated elements relevant to the monitoring and assessment of biodiversity and non-indigenous species (NIS).

The present document responds to the need to consolidate in a comprehensive manner all related information on assessment criteria (i.e., Reference List of Species and Habitats, Assessment Criteria and Scales, Threshold and Baseline Values) for the Biodiversity and Non-Indigenous Species (NIS) cluster. The elements presented and extracted in this document have been progressively developed with the collaboration of the Online Working Group (OWG) on Biodiversity and NIS. They have been reviewed by a series of Meetings (i.e., CORMON Biodiversity and Fisheries, SPA/BD Focal Points, and EcAp Coordination Group) during the 2018–2019, 2020–2021, 2022–2023, 2024–2025 biennia:

Ecological Objective 1 – Biodiversity:

- Benthic Habitats (CI1, CI2): [UNEP/MED WG.606/16](#) and [UNEP/MED WG.606/05](#) were reviewed during the Seventeenth Meeting of the SPA/BD Focal Points (Istanbul, Türkiye, 20–22 May 2025) and the Meeting of the Ecosystem Approach Correspondence Group on Monitoring (CORMON) Biodiversity and Fisheries (Athens, 7–8 April 2025).
- Marine Mammals (CI3, CI4, CI5): [UNEP/MED WG.514/Inf.11](#) was reviewed during the 8th Meeting of the EcAp Coordination Group (Videoconference, 9 September 2021), the Fifteenth Meeting of the SPA/BD Focal Points (Videoconference, 23–25 June 2021; [UNEP/MED WG.502/16.Appendix B](#)), and the CORMON Biodiversity and Fisheries Meeting (Videoconference, 10–11 June 2021; [UNEP/MED WG.500/4](#)).
- Marine Turtles (CI3, CI4, CI5): [UNEP/MED WG.514/Inf.12](#) was reviewed during the 8th EcAp CG Meeting (9 September 2021), the Fifteenth SPA/BD Focal Points Meeting (23–25 June 2021, [UNEP/MED WG.502/16 Rev.1.Appendix C. Rev.1](#)), and the CORMON Biodiversity and Fisheries Meeting (10–11 June 2021; [UNEP/MED WG.500/5](#)).
- Seabirds (CI3, CI4, CI5): [UNEP/MED WG.521/Inf.7](#) was reviewed during the 9th Meeting of the EcAp Coordination Group (Videoconference, 5 July 2022) and during the CORMON Biodiversity and Fisheries Meeting (Videoconference, 28–29 March 2022; [UNEP/MED WG.520/4](#)).

Ecological Objective 2 – Non-Indigenous Species (NIS):

- Non-Indigenous Species (CI6): [UNEP/MED WG.520/Inf.3](#), [UNEP/MED WG.500/7](#), and [UNEP/MED WG.502/16.Appendix E](#) were reviewed during the CORMON Biodiversity and Fisheries Meetings (10–11 June 2021 and 28–29 March 2022) and the Fifteenth SPA/BD Focal Points Meeting (23–25 June 2021).
- Baseline Values for NIS (CI6): [UNEP/MED WG.520/5](#), [UNEP/MED WG.500/8](#), [UNEP/MED WG.502/16.Appendix F](#), and [UNEP/MED WG.521/Inf.8](#) were reviewed during the CORMON Biodiversity and Fisheries Meetings (10–11 June 2021 and 28–29 March 2022), the Fifteenth SPA/BD Focal Points Meeting (23–25 June 2021), and the 9th Meeting of the EcAp CG (5 July 2022).

The current document is submitted to the 12th Meeting of the EcAp Coordination Group (EcAp) for approval, as well as for integration into the IMAP-section of the Draft Decision on EcAp Policy and Roadmap 2026–2035.

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Annex I: References

List of Abbreviations / Acronyms

ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area
ADRIA	Adriatic Sea sub-region
ASI	Aerial Survey Initiative
BD	Biological Diversity
BiPo	Biological Monitoring Tool for <i>Posidonia oceanica</i>
CBD	Convention on Biological Diversity
CHL	Chlorophyll a concentration
CI	Common Indicator
CLA	Catch Limit Approach
CMED	Central Mediterranean Sea sub-region
COP	Conference of the Parties
CORMON	Correspondence Group on Monitoring
EcAp CG	Ecosystem Approach Coordination Group
EBQI	Ecological Biodiversity Quality Index
EMED	Eastern Mediterranean
EO	Ecological Objective
GES	Good Environmental Status
GFCM	General Fisheries Commission for the Mediterranean
GSA	Geographical Sub-Area (<i>General Fisheries Commission for the Mediterranean</i>)
ICZM	Integrated Coastal Zone Management
IUCN	International Union for Conservation of Nature
IMAP	Integrated Monitoring and Assessment Programme
MACS	Mediterranean Assessment for Coralligenous System
MAP	Mediterranean Action Plan
MED POL	Mediterranean Pollution Assessment and Control Programme
MED QSR	Mediterranean Quality Status Report
MEOW	Marine Ecoregions of the World
MHW	Mean High Water
MRU	Marine Reporting Unit
MSFD	Marine Strategy Framework Directive
MPA	Marine Protected Area
MTSG	Marine Turtle Specialist Group
NIS	Non-Indigenous Species
OSPAR	Convention for the Protection of the Marine Environment for the North- East Atlantic
OWG	Online Working Group
PAP/RAC	Priority Actions Programme / Regional Activity Centre
PREI	<i>Posidonia oceanica</i> Rapid Easy Index
RAC	Regional Activity Centre
RLA	Replacement Level Approach
RMU	Regional Management Unit
SPA/BD	Specially Protected Areas / Biological Diversity
SPA/RAC	Specially Protected Areas / Regional Activity Centre
WFD	Water Framework Directive
WMED	Western Mediterranean

1. Introduction

1. The present document provides the elements related the monitoring and assessment of biodiversity and non-indigenous species (NIS) within the framework of the Integrated Monitoring and Assessment Programme (IMAP). It compiles the most recent versions of the Reference Lists of species and habitats, updated assessment criteria, spatial and temporal assessment scales, baseline and threshold values for several Common Indicators under Ecological Objectives 1 and 2 (Biodiversity and NIS). These elements have been developed through an extensive consultative process involving the Online Working Group on Biodiversity and NIS, and reviewed by the relevant CORMONs, SPA/BD Focal Points Meetings, and EcAp Coordination Group sessions.

2. The document also includes technical documents reviewed over the past years on benthic and pelagic habitats, marine mammals, marine turtles, seabirds, and NIS, reflecting the latest available scientific and technical consensus. While many of these elements have informed the 2023 Mediterranean Quality Status Report (MED QSR), they have not yet been formally endorsed.

3. This document consolidates them for formal consideration by the 12th Meeting of the EcAp Coordination Group and potential inclusion in the draft Decision on the revised EcAp Policy and Roadmap (2026–2035).

2. Reference List of Habitats

4. Contracting Parties are expected to monitor the distributional range and extent of key habitats (Common Indicator 1), as well as the condition of their typical species and communities (Common Indicator 2). This monitoring applies to both coastal and marine habitats, including pelagic habitats.

2.1 Marine Benthic Habitat Types

5. Marine Benthic habitat types in the Mediterranean region are listed in a *Reference List of Marine and Coastal Habitat Types in the Mediterranean* which was updated in 2019 (UNEP/MED WG.467/14, Decision IG.24/7 – Annex VI¹) and published as the habitat typology for the Barcelona Convention (UNEP/MAP SPA/RAC, 2019; Montefalcone et al. 2021). This list supports the coherent use of a standardized typology in national inventories and monitoring programmes, enabling a consistent and adequate assessment of Ecological Objective 1 (EO1) and its related Common Indicators across the entire Mediterranean region.

6. The present Benthic Habitat Monitoring under IMAP focuses on three habitat types that have received particular attention in the implementation of IMAP's Ecological Objective 1 (EO1). The three habitat types are:

- a. B1 Coralligenous
 - i. MB1.55 Coralligenous (enclave of circalittoral)
 - ii. MC1.51 Coralligenous cliffs (with 17 sub-types)
 - iii. MC1.52a Coralligenous outcrops (with 9 sub-types)
 - iv. MC1.52b Coralligenous outcrops covered by sediment (see MC1.52a for examples of facies)
 - v. MC1.52c Deep banks (with 3 sub-types)
 - vi. MC2.51 Coralligenous platforms (with 12 sub-types)
- b. B2 Maërl
 - i. MB3.511 Association with maërl or rhodoliths²
 - ii. MB3.521 Association with maërl or rhodoliths
 - iii. MC3.52 Coastal detritic bottoms with rhodoliths (with 9 sub-types)

¹ COP21, Naples, Italy, Decision IG.24/7, Annex VI “Updated Classification of Benthic Marine Habitat Types for the Mediterranean Region”

² MB3.511 and MB3.521 have the same habitat names but are listed under separate higher types (MB3.51 Infralittoral coarse sediment mixed by wave and MB3.52 Infralittoral coarse sediment under the influence of bottom currents).

- c. B3 *Posidonia*
 - i. *Posidonia oceanica* meadow (MB2.54 with 7 sub-types³)

7. Additional habitat types could be proposed by the Contracting party for EO1 monitoring and assessment.

2.2 Pelagic Habitat Types

8. Table 1 presents an updated reference list of pelagic habitat types in the Mediterranean Sea, as prepared by Multidisciplinary group of experts nominated by the Contracting Parties to define parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators, the Conclusion and Recommendations of which were adopted by Decision IG.26/5 – Annex VII⁴). This list is intended to serve, where appropriate, as a basis for the identification and selection of reference pelagic habitats to be monitored and assessed at the national level under the IMAP.

9. The classification is based on the modified typology of pelagic habitats in the epipelagic layer (0–200 m), as proposed in the UNEP/RAC/SPA (2013) document, and was confirmed as relevant for use under IMAP by experts during the meetings of the CORMON Biodiversity and Fisheries held in June 2024 (UNEP/MED WG.592/06) and April 2025 (UNEP/MED WG.606/06). Contracting Parties are encouraged to adapt and further develop this list to reflect national specificities and priorities.

Table 1: Reference list of pelagic Habitat Types for the epipelagic layer (0-200m) (Annex VII of Decision IG.26/5)

	Pelagic Habitat Types	Water mass	Comments*
A.1.	Reduced salinity water	coastal lagoons	WFD correspondence ⁵
A.2.	Variable salinity water – high surface or subsurface CHL (>3 mg/m ³)	estuaries, river plumes	Transitional waters with WFD correspondence ⁶ (Values should be revised)
A.3.	Marine water: neritic - medium surface or subsurface CHL (0.5-3 mg/m ³)	upwellings, re-suspension in shallow waters and outskirts of river plumes, winter mixing areas	WFD water type II, type III
A.4.a	Marine water: oceanic - medium surface or subsurface CHL (0.5-3 mg/m ³)	Upwellings, and winter mixing areas	WFD water type III
A.4.b	Marine water: oceanic - low to medium surface CHL (~0.1-1.0 mg/m ³)	Hydrological features (fronts and gyres)	WFD water type III
A.5.a.	Marine water: oceanic - very low surface CHL (<0.1 mg/m ³) with deep CHL maximum	euphotic depth > mixed layer depth	WFD water type III
A.5.b.	Marine water: oceanic - very low surface CHL (<0.2 mg/m ³) without deep CHL maximum	euphotic depth < mixed layer depth	WFD water type III

* Each country should specify the range of CHLa, Salinity, depth and if annual/seasonal values are used

³ Sub-types for a) *Posidonia* on artificial substrata and b) *Posidonia* association with *Zostera noltii* are not specifically defined in BC or EUNIS habitat classifications.

⁴ COP24, Portoroz, Slovenia, Decision IG.26/5, Annex VII “Conclusions and recommendations of the Multidisciplinary group of experts nominated by the Contracting Parties to define parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators and elaborate the List of Reference of Pelagic Habitat Types in the Mediterranean Sea”.

⁵ European Commission Decision 2018/229/EU establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, and repealing Commission Decision 2013/480/EU (notified under document C (2018) 696) <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018D0229&from=PL>

⁶ WFD Annex 2 part 1.2.3. defines Transitional waters. see also Guidance document n.o 5 , Transitional and Coastal Waters, Typology, Reference Conditions and Classification Systems and Water Framework Directive Intercalibration Technical Report - Part 3: Coastal and Transitional Waters

3. Reference List of Species

3.1 Marine Sea Birds

10. Eleven indicator species were selected from Annex II of the Barcelona Convention (UNEP/MED IG.26/22, Decision IG.26/4), 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>Ichthyaetus audouinii</i>
Inshore surface feeders:	<i>Croicocephalus genei</i> , <i>Thalasseus bengalensis</i>
<i>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>

3.2 Marine Mammals

Cetaceans:

11. All cetacean species occurring in the Mediterranean Sea are considered in the IMAP (UNEP/MED WG.514/Inf.1). 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*).

12. 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 (UNEP/MED WG.514/Inf.1):

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

Monk Seal:

13. Among the pinniped species worldwide, only the Mediterranean monk seal (*Monachus monachus*) is found in the Mediterranean Sea, where it maintains a small and vulnerable resident population that requires continuous monitoring and assessment.

3.3 Marine Turtles

14. 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 (UNEP/MED WG.514/Inf.12). These are the following:

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

4. Assessment methodologies, assessment criteria and thresholds for biodiversity and NIS common indicators

15. This section compiles the assessment methodologies, assessment criteria, baseline and threshold values developed for the Common Indicators under IMAP Ecological Objectives 1 (Biodiversity) and 2 (Non-Indigenous Species – NIS). The content reflects the outputs of several years of collaborative work within the Online Working Group on Biodiversity and NIS, including contributions from thematic experts and focal points. It covers methodological proposals and assessment scales for benthic habitats (CI1, CI2), marine mammals, turtles, and seabirds (CI3, CI4, CI5), as well as for non-indigenous species (CI6), and includes detailed references to the supporting technical documents. These elements aim to inform future national and regional assessments, strengthen consistency in reporting, and enhance comparability across Contracting Parties under the Barcelona Convention framework.

4.1 Assessment Criteria and Thresholds for Biodiversity Common Indicators 1 and 2

16. This section provides a summary of the key components of the proposed assessment methodologies, criteria, and thresholds for the Common Indicators 1 and 2 (i.e., CI1 and CI2) on benthic habitats. Developed by SPA/RAC with the support of the Biodiversity Online Working Group, this proposal focuses on three priority habitat types: *Posidonia oceanica* meadows, coralligenous assemblages, and maërl beds. It builds on the results of the 2022–2023 feasibility study (UNEP/MED WG.547/11) and includes elements reviewed by the CORMON Meeting on Biodiversity and Fisheries (Athens, Greece, 7–8 April 2025; UNEP/MED WG.606/05) and the 17th Meeting of the SPA/BD Focal Points (Istanbul, Türkiye, 20–22 May 2025; UNEP/MED WG.608/16).

17. The most relevant methodological approaches, assessment criteria, and proposed threshold values, are summarized in Tables 2 and 3.

Table 2: Proposed parameters, metrics and indices for assessing CI1 and CI2 for the three habitat types at monitoring sites.

Habitat/CI	Minimum protocol	Optimal protocol
B1 Coralligenous CI1	Habitat extent (km ²) Habitat loss (m ²) Extent (km ²) and proportion (%) of habitat loss across all monitored sites	Extent of habitat loss at assessment area/national level
B1 Coralligenous CI2	For MACS (Enrichetti et al., 2019): Extent of hard bottom (% rock and biogenic) Species richness of conspicuous megabenthic sessile and sedentary species Structuring species: count, height (cm) and density (no. of colonies/individuals m ⁻²) % sediment cover % of colonies with epibiosis, necrosis and entangled in lost fishing gears for all structuring anthozoans Marine litter (density m ⁻²)	For EBQI ⁷ and other indices (Di Camillo et al., 2023): Typical species composition Condition of key species/groups: • Filter- and suspension feeders (cover and diversity) • Detritivores abundance • Related fish assemblage biomass (distinguishing piscivores, carnivores of invertebrates, planktivores) Sensitivity level
B2 Maërl CI1	Analysis of existing knowledge (scientific and grey literature) on the presence of maërl/rhodolith beds Habitat extent (km ²) ⁸	Extent of habitat loss at assessment area/national level

⁷ FR: From Ruitton et al. 2014 updated by Astruch et al. (under review). See also: https://www.researchgate.net/publication/325607434_Guide_methodologique_pour_l%27evaluation_ecosystemique_des_habitats_marins.

⁸ ES: To estimate this parameter for RMBs, firstly it will be necessary to have the maps of the benthic biocenoses throughout the entire continental shelf. Currently, these maps are only available for certain (few) areas.

Habitat/CI	Minimum protocol	Optimal protocol
	Habitat loss (m ²) Extent (km ²) and proportion (%) of habitat loss across all monitored sites	
B2 Maërl CI2	Index to be defined. Rhodolith/maërl (% cover live and dead) Rhodolith/maërl density	Index to be defined. Species composition: abundance and diversity (filter-feeders, carnivores, detritivores, etc.) including echinoderms Particulate organic matter cover Detritic litter cover Rhodolith size and shape
B3 <i>Posidonia</i> CI1	Habitat extent (km ²) Habitat loss (m ²) Upper and lower depth limit of meadow (to nearest 0.1m) at monitored sites Extent (km ²) and proportion (%) of habitat loss across all monitored sites Change in vertical distribution of habitat (+ or – m) at monitored sites	Extent of habitat loss at assessment area/national level
B3 <i>Posidonia</i> CI2	For PREI (Gobert et al., 2009): Leaf surface Leaf biomass Shoot density Lower limit depth and type Leaf epiphytes biomass For BiPO (Lopez y Royo et al., 2010) (same parameters as PREI but without sampling living material): Leaf surface Shoot density Lower limit depth and type For functional assessment: Sea urchin density	For EBQI (Personnic et al., 2014): Growth rate of vertical rhizomes Meadow cover Biomass density and species diversity in all compartments: • Filter- and suspension feeder density • Sea urchin <i>Paracentrotus lividus</i> density • Related fish assemblage biomass (distinguishing piscivores, carnivores of invertebrates, planktivores) • <i>Pinna</i> spp. density (not only <i>Pinna nobilis</i> now that <i>P. rudis</i> occurrence is increasing)
All sites	Parameters related to water quality (sea temperature, salinity, turbidity, transparency)	

Table 3: Overview of the main aspects of monitoring and assessment elements for CI1 and CI2 for the three habitat types Posidonia, coralligenous and maërl.

Element	CI1 & CI2
Habitat types	Define more clearly each of the habitat types, including specification of which EUNIS/BC subtypes are to be considered, and the most important pressures they face
Monitoring scale: number of sites	A minimum of five sites per habitat type per assessment area (28 subdivisions of Mediterranean region) Sites to be distributed across countries within each assessment area, and represent a gradient of conditions from impacted to non-impacted locations Assess state of habitats (extent and condition) at monitoring sites as a proxy for their state across the wider assessment areas and region (to make monitoring and assessment process feasible for all Contracting Parties)
Monitoring methods: parameters	Refer to Table 2 for minimum and optimal set of parameters per habitat type.
State/impact monitoring in context of pressures	Sites selected for detailed monitoring should include a range of pressures or intensities of pressures, as well as sites which are 'unimpacted'. Pressures (and related activities) should be reported at monitoring sites and across each country (linked to EO6), assigning data to a standardised grid system.
Assessment scale	Use same set of assessment areas (28 subdivisions of the 4 Mediterranean subregions) as proposed for EO6.
Assessment methods	Use several indicators to represent differing aspects of habitat distribution and extent (CI1) and structure and function (CI2), as given in Table 2. The indicators need testing with data from multiple CPs to help define suitable thresholds and ensure comparability of results across the region.
Data standards	Simplify data standards to facilitate data submission and aggregation for analyses.
Baselines	Use unimpacted sites to establish the current extent and state of each habitat type in reference state (under prevailing physiographic, geographic, climatic and environmental conditions).
Quality threshold	Re-evaluate threshold once sufficient data are available to set fully meaningful threshold for the assessment area/subregion and habitat type. Ensure equivalent level of quality across assessment areas, habitats, indicators and pressures.
Extent thresholds	Set thresholds for the maximum extent of habitat loss (for CI1) and habitat which is adversely affected (for CI2) that is permitted per habitat in each assessment area.
Progress with monitoring and assessment processes	Contracting Parties should update their monitoring programmes, if necessary, based on general agreements for monitoring and assessment elements. SPA/RAC should evaluate progress in implementation of the monitoring programmes, say at a mid-point in the 6-year data collection phase. This evaluation should include the state of data submissions to the IMAP Info System and undertaking a trial region-wide assessment. Outcomes should guide further implementation of the programmes in the lead up to the next MedQSR assessment.

4.2 Assessment Criteria and Thresholds for Biodiversity Common Indicators 3, 4 and 5 related to Marine Mammals

18. This section summarizes the key elements proposed for the monitoring and assessment of IMAP Common Indicators 3, 4 and 5 (i.e., CI3, CI4, and CI5) related to marine mammals. to be note that the proposed assessment criteria takes into consideration the interlinkages with Common Indicator 12 (CI12: bycatch of vulnerable species).

19. The proposed approach, developed in collaboration with the Biodiversity Online Working Group on marine mammals and reviewed by CORMON, ACCOBAMS experts, and SPA/BD Focal Points, follows a stepwise process: refining monitoring and assessment scales, establishing criteria, and proposing threshold and baseline values. These elements were tested during the preparation of the 2023 Mediterranean Quality Status Report (MED QSR) and will continue to be improved within the framework of the third MED QSR cycle.

20. This approach and its technical components were reviewed during the following key meetings:

- 8th Meeting of the Ecosystem Approach Coordination Group (videoconference, 9 September 2021; [UNEP/MED WG.514/Inf.11](#))
- Fifteenth Meeting of the SPA/BD Focal Points (videoconference, 23–25 June 2021; [UNEP/MED WG.502/16.Appendix B](#))
- Meeting of the Ecosystem Approach Correspondence Group on Monitoring (CORMON), Biodiversity and Fisheries (videoconference, 10–11 June 2021; [UNEP/MED WG.500/4](#))

21. The refined scales of monitoring, suitable scales of assessment and assessment criteria (i.e., Threshold and Baseline Values) are summarized in Table 4.

Table 4: Biodiversity common indicators 3, 4 and 5 related to Marine Mammals (Ecological Objectives, GES Definitions and Targets, Monitoring and Assessment Scales, Assessment Criteria, Threshold and Baseline Values) (Extracted from UNEP/MED WG.514/Inf.11⁹)

Common Indicator 3 (CI3) ¹⁰					
Refining scales of monitoring , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		Developing scales of assessment (if different from those of monitoring) and assessment criteria		Develop threshold and baseline values	
Species/functional group	<i>Proposed changes</i> Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	<i>Existing context</i>	<i>Proposed changes</i>	<i>Existing context</i>	<i>Proposals</i>
Fin whale / Mysticetes	Primary monitoring • <i>Geographic scale:</i> Regional. • <i>Method:</i> standard & synchronised between all countries (i.e. ASI-like). • <i>Frequency:</i> at least once per reporting period. Secondary monitoring • <i>Geographic scale:</i> Sub-Regional / National. ◦ High Priority sub-regions (HP): in WM and I&CM key habitats for this species (i.e. feeding, corridor). ◦ Low priority sub-regions (LP) in A and A&LS. • Method: ◦ in HP: systematic regular monitoring (including photo-id). ◦ in LP complement systematic monitoring with other adequate and standard method (UNEP MAP 2019). • Frequency: ◦ in HP sub-regions the minimum requirement is: at least three times (better annually in selected places); ◦ in LP at least one time over the reporting period.	New proposal in UNEP/MED WG.450/3:	• Primary assessment/MRU: Regional. • Frequency: once every reporting period.	None	Reference values distributional range: • <i>Mediterranean cetaceans (all species):</i> map to be created based on Mannocci et al. 2018, Canadas et al. 2018 (<i>Ziphius</i>) • <i>Adriatic cetaceans:</i> Fortuna et al. 2018 (<i>Tusiops, Stenella</i>) • <i>Monk seals:</i> map to be created based all existing data. Thresholds for distributional range: • The extent of the distribution of each species remains stable or expanding compared to a reference map (see above). In particular, the Extent of occurrence (EOO) shows: 1) no decline (in all sub-regions where the species was regularly found since last assessment, 2) no decline of number of locations or local putative populations for the species within its distributional range. Given the difficulty to assess the distribution of cetacean species at a finer scale, both reference values and thresholds for this CI should be revised at each assessment cycle.
Sperm whale / Odontocete (deep feeder)	Primary monitoring • <i>Geographic scale:</i> Regional. • <i>Method:</i> As in previous cell. • <i>Frequency:</i> As in previous cell. Secondary monitoring • <i>Geographic scale:</i> Sub-Regional / National. ◦ High Priority (HP) in WM, I&CM and A&LS key habitats for this species (i.e. breeding, corridor). ◦ Low priority (LP) in A • <i>Method:</i> As in “Fin whale” cell. • <i>Frequency:</i> As in “Fin whale” cell.			None	
Cuvier's beaked whale (deep feeder)	Primary monitoring • <i>Geographic scale:</i> Regional. • <i>Method:</i> As in “Fin whale” cell. • <i>Frequency:</i> As in “Fin whale” cell. Secondary monitoring <i>Geographic scale:</i> Sub-Regional / National. ◦ High Priority (HP) in WM, I&CM and A&LS key habitats for this species (i.e. feeding). ◦ Low priority (LP) in A • <i>Method:</i> As in “Fin whale” cell. • <i>Frequency:</i> As in “Fin whale” cell.			None	

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

⁹ 8th Meeting of the Ecosystem Approach Coordination Group (EcAp CG), Videoconference, 9 September 2021.

¹⁰ <https://www.medqsr.org/common-indicator-3-species-distributional-range-marine-mammals>

Common Indicator 3 (CI3)					
Refining scales of monitoring , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		Developing scales of assessment and assessment criteria		Develop threshold and baseline values	
Species/ functional group	Proposed changes Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	Existing context	Proposed changes	Existing context	Proposals
Long finned pilot whale (epipelagic feeder)	Primary monitoring • Geographic scale: Regional. • Method: standard & synchronised between all countries (i.e. ASI-like). • Frequency: at least once per reporting period. Secondary monitoring • Geographic scale: Sub-Regional / National. ◦ High Priority sub-regions (HP) in WM key habitats for this species (i.e. feeding, corridor). ◦ Low priority (LP) in I&CM. • Method: ◦ in HP: systematic regular monitoring; ◦ in LP complement systematic monitoring with other adequate and standard method (UNEP MAP 2019). • Frequency: ◦ in HP sub-regions the minimum requirement is biannual; ◦ in LP at least one time over the reporting period.	New proposal in UNEP/MED WG.450/3: • Sub-regional: small cetaceans	• Primary assessment/MRU: Regional. • Frequency: once every reporting period.	None	See previous page.
Risso's dolphin (epipelagic feeder)	Primary monitoring • Geographic scale: Regional. • Method: As in previous cell. • Frequency: As in previous cell. Secondary monitoring • Geographic scale: Sub-Regional / National. ◦ High Priority sub-regions (HP) in WM & A key habitats for this species (i.e. feeding, corridor). ◦ Low priority (LP) in I&CM and A&LS. • Method: As in "Fin whale" cell. • Frequency: As in "Fin whale" cell.			None	
Bottlenose dolphin (epipelagic feeder)	Primary monitoring • Geographic scale: Regional. • Method: As in previous cell. • Frequency: As in previous cell. Secondary monitoring • Geographic scale: Sub-Regional / National. ◦ High Priority sub-regions (HP) in key habitats for this species in all sub-regions (i.e. feeding, corridor). ◦ Low priority (LP) in offshore areas. • Method: As in "Fin whale" cell. • Frequency: As in "Fin whale" cell.			None	
Common dolphin (epipelagic feeder)	Primary monitoring • Geographic scale: Regional. • Method: As in previous cell. • Frequency: As in previous cell. Secondary monitoring • Geographic scale: Sub-Regional / National. ◦ High Priority sub-regions (HP) in WM, A&LS key habitats for this species (i.e. feeding, corridor). ◦ Low priority (LP) in A, I&CM. • Method: As in "Fin whale" cell. • Frequency: As in "Fin whale" cell.			None	
Striped dolphin (epipelagic feeder)	Primary monitoring • Geographic scale: Regional. • Method: As in "Fin whale" cell (except for photo-id). • Frequency: As in "Fin whale" cell.			None	

Common Indicator 3 (CI3)					
Refining scales of <u>monitoring</u> , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		Developing scales of assessment and assessment criteria		Develop threshold and baseline values	
Species/ functional group	<i>Proposed changes</i> Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	<i>Existing context</i>	<i>Proposed changes</i>	<i>Existing context</i>	<i>Proposals</i>
Monk Seal	Primary monitoring • Geographic scale: Sub-regional ○ In Group A countries: ○ Specifically, monitor populations in sites consistent with the Regional Strategy for the conservation of Monk seal in the Mediterranean (RSMS). ○ In Group B and C countries: area with suitable habitat and/ historical presence. • Method: ○ In Group A countries: ▪ Registry on opportunistic sightings / citizen science ▪ Photo traps in selected caves ○ In Group B & C countries: ▪ Registry on opportunistic sightings (minimum requirement) ▪ Photo traps in selected caves of selected locations identified by the revised RSMS. • Frequency: Annual (minimum requirement) or all known locations in each Group A country covered at least three times (biannually) per reporting period.	None	• Primary assessment/MRU: Regional. • Frequency: once every reporting period.	None	Reference values distributional range: • <i>Monk seals:</i> map to be created based all existing data.

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

Common Indicator 4 (CI4)					
Refining scales of monitoring , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		Developing scales of assessment and assessment criteria		Develop threshold and baseline values	
Species/functional group	Proposed changes Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	Existing context	Proposals	Existing context	Proposals
Fin whale	Primary monitoring • Geographic scale: Regional. • Method: standard & synchronised between all countries (i.e. ASI-like). • Frequency: at least once per reporting period. Secondary monitoring • Geographic scale: Sub-Regional / National. ◦ High Priority sub-regions (HP): in WM and I&. ◦ Low priority (LP): in A and A&LS. • Method: ◦ in HP: systematic regular monitoring (including photo-id); ◦ in LP complement systematic monitoring with other adequate and standard method (UNEP MAP 2019). • Frequency: ◦ in HP sub-regions the minimum requirement is biennial. ◦ in LP at least one time over the reporting period.	IMAP Monitoring Protocols 2019	• Assessment / MRU: Regional. • Frequency: once every reporting period.	None	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of $\geq 20\%$ over 3 generations (1.5% within a 6-year reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
Sperm whale	Primary monitoring: As in “Fin whale” cell. Secondary monitoring: • Geographic scale: Sub-Regional / National. ◦ HP: in WM, I&CM and A&LS. ◦ LP: in A. • Method: As in “Fin whale” cell. • Frequency: As in “Fin whale” cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of $\geq 20\%$ over 3 generations (1.3% within a 6-year reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
Cuvier’s beaked whale	Primary monitoring: As in “Fin whale” cell. Secondary monitoring • Geographic scale: Sub-Regional / National. ◦ HP in WM, I&CM and A&. ◦ LP in A. • Method: As in “Fin whale” cell. • Frequency: As in “Fin whale” cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of $\geq 1.5\%$ within a 6-year reporting period. • Regional reference value: Canadas <i>et al.</i> 2018 & ASI 2018 DS design-based estimate (see Box 4 for details).
Long finned pilot whale	Primary monitoring: As in “Fin whale” cell. Secondary monitoring • Geographic scale: Sub-Regional / National. ◦ High Priority sub-regions (HP) in WM. ◦ Low priority (LP) in I&CM. • Method: As in “Fin whale” cell. • Frequency: As in “Fin whale” cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of $\geq 20\%$ over 3 generations (1.7% within a reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).

Risso's dolphin	Primary monitoring: As in "Fin whale" cell. Secondary monitoring • Geographic scale: Sub-Regional / National. ◦ High Priority sub-regions (HP) in WM & A. ◦ Low priority (LP) in I&CM and A&LS. • Method: As in "Fin whale" cell. • Frequency: As in "Fin whale" cell.	None.		None.	• Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. • When listed as LC, no decrease of $\geq 20\%$ over 3 generations (2.0% within a reporting period). • Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
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Key: MS=Monitoring Scale, AS=Assessment Scale, MRU=Marine Reporting Units

Common Indicator 4 (CI4)					
STEP 1 Refining scales of monitoring , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing scales of assessment and assessment criteria		STEP 3 Develop threshold and baseline values	
Species/functional group	Proposed changes Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	Existing context	Proposals	Existing context	Proposals
Bottlenose dolphin	Primary monitoring: As in "Fin whale" cell. Secondary monitoring • Geographic scale: Sub-Regional / National. ○ High Priority sub-regions (HP). ○ Low priority (LP) in offshore areas. • Method: As in "Fin whale" cell. • Frequency: As in "Fin whale" cell.	None.		None.	- Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. - No decrease of $\geq 20\%$ over 3 generations (1.9% within a reporting period). - Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details). - Adriatic: Reference value (2010: Fortuna et al. 2018)
Common dolphin	Primary monitoring: As in "Fin whale" cell. Secondary monitoring • Geographic scale: Sub-Regional / National. ○ High Priority sub-regions (HP) in WM, A&LS key habitats for this species (i.e. feeding, corridor). ○ Low priority (LP) in A, I&CM. • Method: As in "Fin whale" cell. • Frequency: As in "Fin whale" cell.	None.		None.	- Check IUCN Mediterranean Red Listing and if EN, CR, VU then maintain total abundance at or above reference levels. - When listed as LC, no decrease of $\geq 20\%$ over 3 generations (2.7% within a reporting period). - Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
Striped dolphin	Primary monitoring: As in "Fin whale" cell.	None.		None.	- Check IUCN status and if EN, CR, VU then > only. - Maintain total abundance at or above reference levels. - When listed as LC, no decrease of $\geq 20\%$ over 3 generations (1.8% within a reporting period). - Regional reference value: ASI 2018 DS design-based estimate (see Box 4 for details).
Monk Seal	Primary monitoring (pending definition of a single standardised method to avoid double counting and allow inter-regional comparison) • Geographic scale: Sub-regional • Method: ○ Group A countries: ▪ Individuals counts based on cave monitoring (minimum requirement) and/or mark-recapture based on photo-identified seals data in sites consistent with the revised Monk seal strategy. ○ Group B & C countries: ▪ Photo-identification of individuals based on images obtained from non-invasive monitoring of resting caves. Caves in sites that require monitoring should be decided based on evidence of recurrent sightings recorded through the results of the opportunistic sighting registry ○ Frequency: Annual.	None.	• Assessment/MRU: Regional	None.	- Increase on total population of 1% over six-year reporting period AND increase in number of pups compared to the last assessment. - Provisional reference value: to be estimated.

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

Common Indicator 5 (CI5)					
Refining scales of <u>monitoring</u> , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		Developing scales of assessment and assessment criteria		Develop threshold and baseline values	
Species/ functional group	<i>Proposed changes</i> Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	Existing context	Proposals	Existing context	Proposals
Cetaceans (<i>Stenella</i> , <i>Tursiops</i> and <i>Balaenoptera</i> as proxy for functional groups)	Primary monitoring • Geographic scale: Sub-regional / National. • Species: focus on <i>Stenella</i>, <i>Tursiops</i> and <i>Balaenoptera</i>. Parameters: ○ adult survival probability, juvenile survival probability; fecundity/breeding productivity/rate; age class distribution; sex ratio; population growth rate. • Method: ○ Stranding network collecting standard measures and biological material (e.g., teeth and reproductive organs) ○ Photo-ID network collecting standard pictures (list of parameters including calf) • Frequency: continuous for strandings, regularly and frequent for photo-ID. Secondary monitoring • Geographic scale: Sub-Regional. • Method: one dedicated concerted and cooperative campaign collecting biopsies (for sex ratio, and hormones rates). • Frequency: at least once per reporting period.		• Assessment/MRU: Sub-regional & all “local populations” (long-term studies). • Frequency: once per reporting period.		It is not possible to develop reference and threshold values at this point.
Monk seal	Primary monitoring • Geographic scale: Sub-regional in countries Group A. • Method: Pup counts in critical/selected breeding caves (minimum requirement). • Frequency: annual.		• Assessment/MRU: Sub-regional & all “colonies”. • Frequency: once per reporting period.		Reference values demography: • <u>Total annual national pup counts</u>: to be estimated. • <u>Annual birth rate</u>: define index areas and produce estimates. Threshold values: • Increase from last assessment.

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

CI12: Bycatch of vulnerable and non-target species (EO1 and EO3)					
Refining scales of monitoring , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		Developing scales of assessment and assessment criteria		Develop threshold and baseline values	
Species/ functional group	<i>Proposed changes</i> Key: WM=Western Mediterranean; I&CM=Ionian and Central Mediterranean; A=Adriatic; A&LS=Aegean and Levantine seas.	<i>Existing context</i>	<i>Proposals</i>	<i>Existing context</i>	<i>Proposals</i>
Marine mammals	• In each GFCM GSA, at least one year of cetacean bycatch rate monitoring per each high priority fishing métiers (to be defined), within each reporting cycle. • GFCM provides data on fishing effort during reference year for priority fishing métiers, for each GSA. • Annually: bycatch (onboard observations, questionnaires and strandings) and systemic pollution (strandings) • CPs monitor their fleets (at least one métier per sub-region per year, rotating). • National stranding network collect data on fishery-induced mortality and level of pollutants in marine mammal tissues. They provide biennial reports on these matters. • Each CP: national monitoring schemes to provide bycatch rates and annual fishing effort.		• Assessment /MRU: Regional & Sub-regional (or aggregated GFCM GSAs). • Frequency: annual or biennial.		• Regional: BRA on each species for the potentially most dangerous fishing gears. ◦ Threshold of the total estimated bycatch per all fishing gears: 1% of the total population. This triggers in-depth monitoring programmes. • Sub-regional: thresholds calculated with CLA or RLA on each species, based on actual observations on bycatch rates, total fishing effort, biological parameters and conservation objectives (CLA = 72% K; RLA = 80% K).

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

4.3 Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Marine Turtles

22. This section summarizes the key elements proposed for the monitoring and assessment of IMAP CI3, CI4, and CI5 related to marine turtles.

23. The proposed methodology, elaborated with the support of the Biodiversity Online Working Group on marine turtles, was reviewed and discussed during three key meetings:

- The Meeting of the Ecosystem Approach Correspondence Group on Monitoring (CORMON) Biodiversity and Fisheries (Videoconference, 10–11 June 2021; [UNEP/MED WG.500/5](#));
- The 15th Meeting of SPA/BD Focal Points (Videoconference, 23–25 June 2021; [UNEP/MED WG.502/16 Rev.1.Appendix C. Rev.1](#)); and
- The 8th Meeting of the Ecosystem Approach Coordination Group (EcAp CG) (Videoconference, 9 September 2021; UNEP/MED WG.514/Inf.12).

24. The refined scales of monitoring, suitable scales of assessment and assessment criteria (i.e., Threshold and Baseline Values) are summarized in Table 5.

Table 5. Summary Tables of the methodological approach and results of the analysis on monitoring and assessment scales, assessment criteria and thresholds and baseline values for the Common Indicators 3,4 and 5 related to sea turtles

Common Indicator 3 (CI3)							
STEP 1 Refining <u>scales of monitoring</u> , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing <u>scales of assessment</u>		STEP 3 Developing <u>assessment criteria</u>		STEP 4 Develop <u>threshold and baseline values</u>	
Existing context	Proposed changes	Existing context	Proposals	Existing context	Proposals	Existing context	Proposals
Species distribution ranges ¹¹ can be gauged at local (i.e., within a small area like a national park) or regional (i.e., across the entire Mediterranean basin) scales using a variety of approaches. Long-term monitoring of these areas provides information on the temporal evolution in species distributions.	Revise mapping requirements to two maps; one for <u>nesting areas</u> and one for <u>marine areas</u>. <u>Nesting areas monitoring</u> - Geographic scale: (sub-)National. Up to 7 established sites or 75% of national nesting activity (index areas) - Method: - standard nesting beach surveys. - Frequency: - Minimum = June/July annually for index areas. - six-yearly national scale. <u>Nearshore monitoring</u> - Geographic scale: (sub-)National. Up to 4 sites. - Method: - systematic regular monitoring index areas. - bycatch/stranding data. - Frequency: - biannual monitoring index areas. - year-round bycatch/stranding recording. - six-yearly national scale. <u>Offshore monitoring</u> - Geographic scale: (sub-)National/regional. - Method: - Aerial surveys - Boat surveys - Bycatch recording. - Opportunistic boat surveying. - Frequency: - Yearly for aerial and boat surveys - Year-round for bycatch records <i>Ad hoc</i> boat surveying. - six-yearly national scale.	The European (ETRS) 10x10km grid is used for mapping the distribution and range.... Three different maps (grids) are produced yearly for each species accounting for breeding sites, wintering sites and feeding/developmental sites. Number of 10x10 km cells (presence/absence) occupied for breeding or wintering or feeding/developmental areas along the Mediterranean (or subregional) coast and in all pelagic marine areas.	<u>Nesting areas</u> National and Subdivisional level GES assessments based on maintenance of distribution of all nesting sites. <u>Marine areas</u> Subregional GES assessments.	Turtles continue to nest in all known nesting sites. Turtle distribution is not significantly affected by human activities.	<u>Nesting areas</u> Turtles remain present in all parts of annually monitored nesting sites and at all established sites during periodic surveys. <u>Marine areas</u> Turtles remain present in all annually monitored, CP defined, hotspot areas and no evidence of definitive absences in any other area within the RMU distribution.	None	<u>Nesting areas</u> Baselines centred on 1992 to be used for established nesting sites. More recent data to be modelled to 1992 era levels for these sites. New and emerging sites to use maximum existing 6-year average as baseline. <u>Marine areas</u> All areas assumed to have turtle presence (in line with updated IUCN-MTSG RMU boundaries) unless proven otherwise.

¹¹ <https://www.medqsr.org/common-indicator-3-species-distributional-range-marine-turtles>

Common Indicator 4 (CI4)							
STEP 1 Refining <u>scales of monitoring</u> , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing <u>scales of assessment</u>		STEP 3 Developing <u>assessment criteria</u>		STEP 4 Develop <u>threshold and baseline values</u>	
Existing context	Proposed changes	Existing context	Proposals	Existing context	Proposals	Existing context	Proposals
For counts carried out on an annual basis, a number of sites should be selected that represent a sufficiently large proportion of the subregional or national population, with criteria being delineated by expert groups. of selected species ¹²	<u>Nesting areas monitoring</u> • Geographic scale: ○ (sub-)National. Up to 7 sites or 75% of national nesting activity (index areas) • Method: ○ standard nest count surveys. • Frequency: ○ Minimum = June/July annually for index areas. ○ six-yearly national scale. <u>Nearshore monitoring</u> • Geographic scale: ○ (sub-)National. Up to 4 sites. • Method: ○ systematic regular monitoring index areas. ○ bycatch/stranding data. • Frequency: ○ biannual monitoring index areas. ○ year-round bycatch/stranding recording.	For counts carried out on an annual basis, a number of sites should be selected that represent a sufficiently large proportion of the subregional or national population, with criteria being delineated by expert groups. The “Demography Working Group” suggests that comprehensive surveys should be carried out every 5 years, with the aim of covering all breeding, foraging, wintering and developmental sites. However, here, it is recommended that the whole coastal and marine area is covered on a national or subregional scale to take into account changes in population	<u>Nesting areas</u> National and Subdivisional level GES assessments based on maintenance of nesting abundance at all sites. <u>Marine areas</u> Subregional GES assessments based on relevant population segments present in each area.	<u>Nesting areas</u> The average breeding population size during at least a decade is suggested as the base level (based on International Union for Conservation of Nature Red List minimal criteria for sea turtles) <u>Marine areas</u> for non-breeding animals at wintering / foraging / developmental sites, number of individuals (n) with appropriate modelling to extrapolate population numbers	<u>Nesting areas</u> Rolling average of previous six years’ data to count in the annual assessment. To coincide with the six-yearly nationwide GES assessments. <u>Marine areas</u> Rolling average of previous six years’ data to count in the annual assessment. To coincide with the six-yearly nationwide GES assessments. Observations on numbers of turtles in different life-stages and sex ratios to be considered	None.	<u>Nesting areas</u> Baselines centred on 1992 to be used for established nesting sites. More recent data to be modelled to 1992 era levels for these sites. New and emerging sites to use maximum existing 6-year average as baseline. <u>Marine areas</u> GES baseline taken as annual abundance derived from existing modelled

¹² <https://www.medqsr.org/common-indicator-4-population-abundance-selected-species-marine-reptiles>

Cardona L, et al. (2015) Demography of marine turtles nesting in the Mediterranean Sea: a gap analysis and research priorities. Demography Working Group of the 5th Mediterranean Conference on Sea Turtles. 37pp. Bern Convention, T-PVS/Inf (2015) 1
4 Sparks LM & DiMatteo AD (2020) Loggerhead sea turtle density in the Mediterranean Sea. NUWC-NPT Tech Rep 12360. 77pp.

Common Indicator 5 (CI5)							
STEP 1 Refining <u>scales of monitoring</u> , by revising the existing IMAP proposals and identifying adequate scales for the most relevant species in the Mediterranean context.		STEP 2 Developing <u>scales of assessment</u>		STEP 3 Developing <u>assessment criteria</u>		STEP 4 Develop <u>threshold and baseline values</u>	
Existing context	Proposed changes	Existing context	Proposals	Existing context	Proposals	Existing context	Proposals
A number of sites should be selected that represent a sufficiently large proportion of the subregional or national population for demographic data to be collected (reflecting the breeding, wintering, foraging and developmental populations that are representative of the region) ¹³ . If possible, populations should be selected where animals have been tracked with a sufficient number of units (i.e., >50 individuals), from which the connectivity among these different habitat types can be established.	<u>Nesting areas monitoring</u> - Geographic scale: (sub-)National. Up to 7 established sites or 75% of national nesting levels - Methods: - Standard: hatchling emergence success (HES) and nest temperature data. - Additional: Sex ratio adults - Frequency: - Annually, Minimum: August/September for index area HES and May-September for temperature data. April-May for adult sex ratios. - six-yearly national scale. <u>Nearshore monitoring</u> - Geographic scale: (sub-)National. Up to 4 index hotspot sites. - Method: - systematic regular monitoring index areas. - bycatch/stranding data. - Frequency: - biannual monitoring index areas. - year-round bycatch/stranding recording. - six-yearly national scale. <u>Offshore monitoring</u> - Geographic scale: (sub-)National. - Method: - Bycatch recording. - Opportunistic boat surveying. - Frequency: - Year-round bycatch records - Ad hoc boat surveying. - six-yearly national scale.	The selected breeding sites should aim to be genetically diverse, so as this diversity can be detected at foraging/ wintering/ developmental grounds where different populations diverge. This will facilitate the selection of marine areas for protection that support the highest genetic diversity (i.e., the greatest accumulation of different breeding populations), as well as those that support single breeding populations, which may be of equal importance. Opportunistic data should be collected from all possible sources, wherever possible, and compiled into a single database, which might be used to provide an overview of the entire area. Knowledge about the sex, health and genetic structure of the different populations/subpopulations will be obtained, by Understanding recruitment and mortality within different parts of a population and across populations. This information is important to understand whether there are sex-specific mortality risks at different age/size classes, which is important towards aiding population recovery. Also, knowledge on the physical health and genetic health of populations will be obtained, which will indicate the capacity for resilience to human activities, including climate change.	<u>Nesting areas</u> National and Subdivisional level GES assessments. <u>Marine areas</u> Subregional GES assessments.	publication). Most studies that do exist are focused on the breeding areas; thus, greater focus is required at foraging, wintering and developmental areas, with in-water limitations needing to be accounted for in analyses. Therefore, set analyses need to be established that are applicable within and/or across the different habitat types to allow comparison at the Mediterranean level.	<u>Nesting areas</u> Maintenance of suitable hatchling sex ratios and high hatchling emergence success. <u>Marine areas</u> Quantification of bycatch and calculation of bycatch mortality rates. Observations on numbers of turtles in different life-stages and sex ratios to be considered for indications of perturbations in population structure.	No threshold and baseline values have been consistently defined and applied to date.	<u>Nesting Areas</u> 'Good' HES values can be taken from published literature and taken as thresholds with a buffer zone for improved conservation measures. Nest temperature records to be monitored with estimations of over 95% female production as an upper threshold. <u>Marine areas</u> Human-induced mortality as a component of longevity and survivorship is the one factor that can be measured and affected by conservation actions and hence can be considered as an actionable indicator for GES. Numbers of deaths should be used as the indicator with a stable or declining trend in numbers indicating GES

¹³ <https://www.medqsr.org/common-indicator-5-population-demographic-characteristics-marine-reptiles>

4.4 Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Sea Birds

25. This section presents the key elements developed for the monitoring and assessment of IMAP CI3, CI4 and CI5 related to seabirds in the Mediterranean. The proposed assessment elements, were prepared in coordination with the informal Online Working Group (OWG) on seabirds, and discussed during the Meeting of the Ecosystem Approach Correspondence Group on Monitoring (CORMON) Biodiversity and Fisheries (Videoconference, 28–29 March 2022; [UNEP/MED WG.520/4](#)). They were also presented during the 9th Meeting of the Ecosystem Approach Coordination Group (EcAp CG) (Videoconference, 5 July 2022) as information document ([UNEP/MED WG.521/Inf.7](#)).

26. The refined scales of monitoring, suitable scales of assessment and assessment criteria (i.e., Threshold and Baseline Values) are summarized in Table 6.

Table 6. Summary Tables of the methodological approach and results of the analysis on monitoring and assessment scales, assessment criteria and thresholds and baseline values for the Common Indicators 3,4 and 5 related to seabirds

	Species	Common Indicator	Assessment Criteria	Baseline	Threshold	Scales of Assessment	Scales of Monitoring
1	Osprey <i>Pandion haliaetus</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding birds. % Shift in occupancy	Reference-based baseline: pristine conditions baseline with widest known range in the last 100 years. Modern baseline: If no reliable historic data are available, modern baseline with widest known range in last 20 years	Not more than 10% deviation from baseline	Spatial: Regional and sub- regional Temporal: Annual, with reporting every six years	Spatial: National, surveys covering at least all known breeding areas Temporal: Annual where feasible and depending on scale, alternatively one time to two times within six years, linked to IMAP reporting cycles
		CI 4: Population abundance	Annual relative breeding bird abundance (annual abundance / baseline abundance)	Reference-based (modern) baseline: Abundance at the start of the implementation of BD (1981) Alternatively: highest breeding abundance estimate in the last 20 years Additionally: Highest abundance of entering population in the last 20 years	Deviation from baseline: annual relative breeding and wintering abundance > 0.7	Spatial: Regional and sub- regional (all sub-regions, but with main focus on Western Mediterranean Sea) Temporal: Aiming at annual assessment with reporting every six years	Spatial: National or sub- national (aiming at 100% of known nesting sites) Temporal: Annual
		CI5: Population Demographic Characteristics	Population growth rate: Reproductive success of monitored nests Survival rates of adult and young from capture-mark- resighting (colour- ringing of nestlings)	Model-based baseline: growth rates in the last assessment cycle Population	Deviation from growth rate of 1.0 or higher baseline: Population	Spatial: Regional, sub- regional Temporal: Annual breeding success and survival rates with reporting every 6 years regional and national	Spatial: National or sub-national, aiming at 100% assessment (all known nests) of reproductive success Representative subsample of accessible nests for colour- ringing of nestlings Temporal: Annual for breeding success and survival via reading of colour rings

2	Kentish Plover <i>Charadrius alexandrinus</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding and wintering populations % Shift in occupancy for breeding and wintering population	Reference-based baseline for breeding and wintering population separately: Widest known range in the last 20 years, except a major and reversible decline in the range is known to have taken place before	Not more than 10% deviation from baseline	Spatial: Sub-regional Temporal: Every six years	Spatial: National Temporal: Annual
		CI 4: Population abundance	For breeding birds: Annual relative breeding bird abundance For non-breeding birds Annual relative wintering bird abundance	Reference-based (modern) baseline: Highest breeding abundance estimates and wintering abundance estimates (separately) in the last 20 years	Deviation from baseline: annual relative breeding and wintering abundance > 0.7	Spatial: Sub-regional Temporal: Every 6 years, linked to IMAP reporting cycle, alternatively every 3 years linked to NE- Atlantic flyway count initiative	Spatial: Breeding population: National or sub-national (at least 40% of the national breeding population and certainly no less than 10% of the national population,) Non-breeding population: sub-national representative number of known sites
		CI5: Population Demographic Characteristics	Population growth rate Reproductive success of monitored nests reproductive success Adult survival rates from capture- mark- resighting of monitored nests (colour-ringing of breeding adults) Immature survival rates from capture- mark- resighting (via colour ringing of chicks directly after hatching	Model-based baseline: Population growth rates in the last 6 to 12 years where data is available	Population growth rate to be set close to 1.0 over a 6 years average as requirement to reach GES	Spatial: Sub-regional Temporal: Annual: breeding success from sub-samples Every six years: adult and immature survival	Temporal: Annual Spatial: National or sub-national Representative sample of colonies from high pressure vs protected areas Representative subsample of nests from these sample colonies Temporal: Annual: breeding success Every six years: adult and immature survival

3	Mediterranean Shag <i>Gulosus aristotelis desmarestii</i>	CI3: Species Distributional Range	Distribution of breeding colonies, and separately, distribution during non-breeding (July roosts)	Reference-based baseline for breeding and non-breeding population separately: Widest known range in the last 20 years, except a major and reversible decline in the range is known to have taken place before	Not more than 10% deviation from baseline, (potentially re- evaluated at higher threshold due to potentially strong fluctuations between years, alternatively: 10% deviation between averages)	Spatial: Regional and sub-regional Temporal: Every six years	Spatial: National Temporal: Annual where feasible and depending on scale, alternatively one time to two times within six years, linked to MSFD reporting cycle
		CI 4: Population abundance	For breeding birds: Annual relative breeding bird abundance For non-breeding birds: Annual relative non-breeding bird abundance	Reference-based (modern) baseline: Highest breeding and non-breeding abundance estimates in the last 20 years	Deviation from baseline: Annual relative breeding and non-breeding abundance > 0.7	Spatial: Regional and sub-regional Temporal: Every six-years	Spatial: Breeding population: National or sub-national (at least 40% of the national breeding population and certainly no less than 10% of the national population) Non-breeding population: sub-national: relevant, representative sites during mid-winter counts Temporal: Annual
		CI5: Population Demographic Characteristics	Population growth rate Reproductive success of monitored nests (alternatively count of fledglings pre- dispersal to reduce disturbance) Adult survival rates from capture-mark-resighting of monitored nests (colour-ringing of breeding adults) Immature survival rates from capture-mark-resighting (via colour ringing of chicks), additionally by ratio adult vs first year birds at roosts (July counts).	Model-based baseline: Population growth rates in the last assessment cycle	Deviation from baseline: Population growth rate of at least 1.0	Spatial: Regional and sub-regional Temporal: Every six year: adult and immature survival Annual: reproductive success	Spatial: National or sub-national Representative sample of colonies from high pressure vs protected areas Representative subsample of nests from these sample colonies Relevant, representative sites for mid-winter counts Temporal: Annual

4	Audouin's Gull <i>Ichthyaetus audouinii</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding birds. % Shift in occupancy	Maximum range of breeding colonies as measured in the last 20 years, alternatively since implementation of the BD (1981)	Not more than 10% deviation from baseline	Spatial: Regional and sub-regional Temporal: Every six years	Spatial: National, surveys covering all known (major) breeding colonies per country Temporal: Annual highly recommended! (where not feasible 1 to 2 times within a 6 years reporting cycle)
		CI 4: Population abundance	For breeding birds in colonies: Annual relative breeding bird abundance For non-breeding birds during coastal mid-winter roost counts and at bottleneck during post-breeding/ post fledging migration (Gibraltar Strait): Annual relative non-breeding bird abundance	Reference-based (modern) baseline: Highest breeding and non-breeding abundance estimates in the last 20 years	Deviation from baseline: annual relative breeding and non-breeding abundance > 0.7	Spatial: Regional and sub-regional Temporal: Annual with reporting every six-years	Spatial: Breeding population: National or sub-national, all (larger) colonies Non-breeding population: sub-national, all known roost sites during mid- winter, bottleneck during outbound migration Temporal: Annual
		CI5: Population Demographic Characteristics	Population growth rate Reproductive success of monitored colonies or subsamples Post-fledging, immature and adult survival rates modelled from capture-mark- resighting of birds colour-ringed as chicks in colonies Ratio of first winter versus adult birds from counts at bottleneck and mid-winter roosts for cross-assessment of reproductive output	Model-based population growth rate	Population growth rate 1.0 or higher	Spatial: Sub-regional Temporal: Annual: breeding success, immature and adult survival rates with reporting every six years	Spatial: National or sub-national Representative sample of colonies from high pressure vs protected areas Representative subsample of nests from these sample colonies All important mid-winter roosts per country for ratio of adult versus 1st winter birds and reading of colour ringed individuals bottleneck (Gibraltar Strait) for ratio of adult versus 1st year during outbound migration Temporal: Annual for breeding success, adult and immature survival

5	Slender-billed Gull <i>Chroicocephalus genei</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding birds. % Shift in occupancy	Average range of breeding colonies as measured in the last 20 years, alternatively since implementation of the BD (1980)	Not more than 10% deviation from baseline	Spatial: Regional and sub-regional Temporal: Every six years	Spatial: National, surveys covering all known (major) breeding colonies per country Temporal: Annual if feasible, alternatively 1 to 2 times within a 6 years reporting cycle
		CI 4: Population abundance	For breeding birds in colonies: Annual relative breeding bird abundance For non-breeding birds during coastal mid-winter roost counts and at roosting areas during post-breeding. Annual relative non-breeding bird abundance	Reference-based (modern) baseline: Average breeding and non-breeding abundance estimates in the last 20 years	Deviation from baseline: Annual relative breeding and non-breeding abundance > 0.7	Spatial: Regional and sub-regional Temporal: Annual with reporting every six-years	Spatial: Breeding population: National or sub-national, all (larger) colonies Non-breeding population: sub-national, all known roost sites during mid-winter Temporal: Annual
		CI5: Population Demographic Characteristics	Population growth rate Reproductive success of monitored colonies or subsamples Post-fledging, immature and adult survival rates modelled from capture-mark-resighting of birds colour-ringed as chicks in colonies Ratio of first winter versus adult birds from counts at bottleneck and mid-winter roosts for cross-assessment of reproductive output	Model-based population growth rate	Population growth rate 1.0 or higher	Spatial: Sub-regional Temporal: Annual: breeding success, immature and adult survival rates with reporting every six years	Spatial: National or sub-national Representative sample of colonies from high pressure vs protected areas Representative subsample of nests from these sample colonies All-important mid-winter roosts per country for ratio of adult versus 1st winter birds and reading of colour ringed individuals Temporal: Annual for breeding success, adult and immature survival

6	Lesser- crested Tern <i>Thalasseus bengalensis emigratus</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding birds. % Shift in occupancy	Maximum range of breeding colonies as measured in the last 20 years	Not more than 10% deviation from baseline, set as a preliminary value, potentially to be set lower due to restricted range	Spatial: Sub-regional Temporal: Every six years	Annual for breeding success, adult and immature survival
		CI 4: Population abundance	For breeding birds in colonies: Annual relative breeding bird abundance For non-breeding birds during coastal mid-winter roost counts and at bottleneck during post-breeding/ post fledging migration (Gibraltar Strait) Annual relative non-breeding bird abundance	Reference-based (modern) baseline: Highest breeding and non-breeding abundance estimates in the last 20 years	Deviation from baseline: annual relative breeding and non-breeding abundance > 0.7	Spatial: Regional and sub-regional Temporal: Annual with reporting every six-years	Spatial: Breeding population: National or sub-national, all (larger) colonies Non-breeding population: sub-national, all known roost sites during mid- winter, bottleneck during outbound migration Temporal: Annual
		CI5: Population Demographic Characteristics	Population growth rate Reproductive success of monitored colonies or subsamples Post-fledging, immature and adult survival rates modelled from capture-mark- resighting of birds colour-ringed as chicks in colonies Ratio of first winter versus adult birds from counts at bottleneck and mid-winter roosts for cross-assessment of reproductive output if feasible	Model-based population growth rate	Population growth rate 1.0 or higher	Spatial: Sub-regional, national (Libya) Temporal: Annual: breeding success, immature and adult survival rates with reporting every six years	Spatial: National or sub- national All colonies Representative subsample of nests/ chicks from these sample colonies All mid-winter aggregations per country for ratio of adult versus 1st winter birds and reading of colour ringed individuals bottleneck (Gibraltar Strait) for ratio of adult versus 1st year during outbound migration Temporal: Annual for breeding success, adult and immature survival, alternatively, breeding success every second year to reduce disturbance

7	Sandwich Tern <i>Thalasseus sandvicensis</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding and wintering birds % Shift in occupancy for breeding and wintering population	Maximum range of breeding colonies as measured in the last 20 years	Not more than 10% deviation from baseline	Spatial: Sub-regional Temporal: Every six years	Spatial: National Temporal: Annual where feasible and depending on scale, alternatively one time to two times within six years, linked to EcAp reporting cycles
		CI 4: Population abundance	Relative abundance for breeding and wintering birds	Reference-based (modern) baseline: Highest breeding and non-breeding abundance estimates in the last 20 years	Annual relative abundance > 0.7	Sub-regional Annual where feasible, with reporting every six- years	Sub-national: Breeding: high- and low-pressure areas > sample of nests Wintering: selection of high- and low-pressure areas or all known areas Temporal: annual
		CI5: Population Demographic Characteristics	Population growth rate ^{[1][2]} Reproductive success of monitored colonies or subsamples Post-fledging, immature and adult survival rates modelled from capture-mark-resighting of birds colour-ringed as chicks in colonies Ratio of first winter versus adult birds from counts at mid-winter roosts for cross-assessment of reproductive output if feasible	Model-based population growth rate	Population growth rate 1.0 or higher	Spatial: Regional, Sub-regional Temporal: Annual: breeding success, immature and adult survival rates with reporting every six years	Spatial: National or sub-national Temporal: Annual for breeding success, adult and immature survival, alternatively, breeding success every second year to reduce disturbance

8	Mediterranean Storm- petrel <i>Hydrobates pelagicus melitensis</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding birds. % Shift in occupancy	Reference-based baseline: Widest known range in the last 20 years, except a major and reversible decline in the range is known to have taken place before	Not more than 10% deviation from baseline	Spatial: Regional and sub-regional Temporal: Every six years	Spatial: National Temporal: Annual where feasible and depending on scale, alternatively one time to two times within six years, linked to EcAp reporting cycles
		CI 4: Population abundance	Annual relative breeding bird abundance	Reference-based (modern) baseline: Highest breeding abundance estimate in the last 20 years	Deviation from baseline: Relative annual abundance > 0.8	Spatial: Regional and sub-regional Temporal: Every six years	Spatial: National or sub-national (at least 40% of the national population and certainly no less than 10% of the national population, according to suggestions by UNEP/IMAP (2017)) Temporal: every 3 to 6 years
		CI5: Population Demographic Characteristics	Population growth rate: Adult survival rates from capture-mark-recapture of monitored colonies	Model-based baseline: Average population growth rates if available in the last 6 to 12 years	Average growth rate of at least 1.0	Spatial: Regional and sub-regional Temporal: Aiming at annual monitoring and assessment with reporting every six years	Spatial: National or sub-national, representative subsamples Representative sample of colonies from high pressure vs protected areas Representative subsample of nests from these sample colonies Temporal: Annual

9	Scopoli's Shearwater <i>Calonectris diomedea</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding birds. % Shift in occupancy	Reference-based baseline: Widest known range in the last 20 years, except a major and reversible decline in the range is known to have taken place before	Not more than 10% deviation from baseline	Spatial: Regional and sub-regional Temporal: Every six years	Spatial: National Temporal: Annual where feasible and depending on scale, alternatively one time to two times within six years, linked to EcAp reporting cycles
		CI 4: Population abundance	Annual relative breeding bird abundance supported by or substituted with raft counts where deemed suitable, following the confirmation of connectivity of rafts with certain colonies by means of GPS-tracking	Reference-based (modern) baseline: Abundance at the start of the implementation of BD (1980): needs to be discussed Highest breeding abundance estimate in the last 20 years	Deviation from baseline: Relative annual abundance > 0.8	Spatial: Regional or sub-regional Temporal: Aiming at annual monitoring and assessment with reporting every six	Spatial: National or sub-national (at least 40% of the national population and certainly no less than 10% of the national population, according to suggestions by UNEP/IMAP (2017)) Temporal: Annual
		CI5: Population Demographic Characteristics	Population growth rate Reproductive success of monitored nests Adult survival rates from capture-mark-recapture of monitored nests	Model-based approach: Population growth rates over one assessment and reporting cycle	Population growth rate of at least 1.0	Spatial: Regional Temporal: Annual	Spatial: National or sub-national Representative sample of colonies from high pressure vs protected areas Representative subsample of nests from these sample colonies Temporal: Annual

10	Yelkouan Shearwater <i>Puffinus yelkouan</i>	CI3: Species Distributional Range	% Change in occupancy in distribution range of breeding birds. % Shift in occupancy	Reference-based baseline: Widest known range in the last 20 years, except a major and reversible decline in the range is known to have taken place before	Not more than 10% deviation from baseline	Spatial: Regional and sub-regional Temporal: Every six years	Spatial: National Temporal: Annual where feasible and depending on scale, alternatively one time to two times within six years, linked to EcAp reporting cycles
		CI 4: Population abundance	Annual relative breeding bird abundance by combination of methods including CMR in colonies; supported by land-based passage counts in the evening, combined with telemetry were deemed suitable	Reference-based (modern) baseline: Highest breeding abundance estimate in the last 20 years	Deviation from baseline: annual relative breeding abundance > 0.9	Spatial: Regional and sub-regional Temporal: Every six years	Spatial: National Temporal: Annual where feasible and depending on scale, alternatively one time to two times within six years, linked to EcAp reporting cycles
		CI5: Population Demographic Characteristics	Population growth rate Reproductive success of monitored nests Adult survival rates from capture-mark-recapture of monitored nests	Model-based approach: Population growth rates over one assessment and reporting cycle	Population growth rate of at least 1.0	Spatial: Regional and sub-regional Temporal: Annual	Spatial: National or sub-national Representative sample of colonies from high pressure vs protected areas Representative subsample of nests from these sample colonies Temporal: Annual

11	Balearic Shearwater <i>Puffinus mauretanicus</i>	CI3: Species Distributional Range	Distributional pattern: % change in occupancy in distribution range of breeding birds Distributional pattern: % change in at-sea distribution (50% KDE), modelled from representative number of tracked individuals and/or transect line counts % Shift in occupancy	Reference-based 'modern' baseline: Due to unfavorable conservation status (CR): maximum ranges (at sea and regarding breeding colonies) e.g. since start of the implementation of BD (1980)	No negative deviation in range size between assessment cycles due to precarious conservation status. Maximum 10% in range shift between assessment cycles	Spatial: Sub-regional (Balearic islands for breeding, Western Mediterranean Sea (mainly) for at-sea distribution during breeding (relevant OSPAR sub-region during non-breeding) Temporal: Every six years	For breeding range: Balearic Islands, covering at least all known breeding areas Temporal: Annual
		CI 4: Population abundance	Annual relative breeding bird abundance Annual count net maxima of individuals passing bottleneck on migration	Reference-based (modern) baseline: Highest breeding abundance estimate in the last 20 years	Deviation from baseline: annual relative breeding abundance annual relative breeding abundance 1.0 or larger	Spatial: Regional (Western Mediterranean Sea) Temporal: Aiming at annual monitoring and assessment with reporting every six years	Spatial: Sub-national (ideally 100% but at least 90% of the population) Temporal: Annual
		CI5: Population Demographic Characteristics	Population growth rate Reproductive success Adult survival rates from capture-mark-recapture of monitored nests	Model-based approach: Population growth rates over one assessment and reporting cycle	Population growth rate 1.0 or higher	Spatial: sub-regional Temporal: Annual with reporting every six years	Spatial: Sub-national Representative sample of colonies from high pressure vs protected areas Representative subsample of nests from these sample colonies Temporal: Annual

4.5 Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 6 related to Non-Indigenous Species (NIS)

27. The NIS-related assessment criteria were developed with the support of the Biodiversity Online Working Group, was reviewed at multiple stages: Meeting of the Ecosystem Approach Correspondence Group on Monitoring (CORMON) for Biodiversity and Fisheries – Videoconference, 10–11 June 2021 ([UNEP/MED WG.500/7](#)); 15th Meeting of SPA/BD Focal Points – Videoconference, 23–25 June 2021 ([UNEP/MED WG.502/16.Appendix E](#)); CORMON Biodiversity and Fisheries Meeting – Videoconference, 28–29 March 2022 ([UNEP/MED WG.520/Inf.3](#)).

28. Although no Mediterranean-wide threshold values have yet been established for CI6, the document highlights the importance of setting them at the subregional level (e.g., WMED, CMED, Adriatic, Aegean-Levantine), taking into account recent data (from the 2000s onward), regional introduction pressures, and the level of monitoring effort. It proposes that thresholds could be expressed as a percentage reduction in new NIS introductions, with further input from regional experts in taxonomy, monitoring, ecology, and management. The latter was tested during the 2023 MED QSR preparation and will continue to be improved during the development of the third version of MED QSR.

Assessment Criteria:

29. Assessment criteria for preparing validated check lists of NIS to be used for assessing GES include a) taxa (all taxa or excluding phytoplankton, parasites); b) species to be considered in trends indicator (extinct species, cryptogenic species, crypto-expanding, questionable species); c) pathways to be considered (all pathways or excluding unaided expanding species, e.g. Lessepsian immigrants).

30. Partly native species, NIS introduced through natural dispersal, unicellular marine algae, parasites, extinct and freshwater species should be reported in NIS lists but considered in CI6 assessments on a case-by-case basis.

Spatial and Temporal Scales of Monitoring and Assessment:

31. Broad Geographic Units: Assessment of threshold values based on the trends indicator (CI6) calculated to date can be achieved at the basin and country level, although it is more meaningful to be assessed at the subregional level (i.e. EcAp subregional units) and, accordingly, at the national part of a subregion for each country, e.g. Greece: EMED, CMED, ADRIA; Italy: WMED, CMED, ADRIA, Tunisia: WMED, CMED.

32. Broad Temporal Scales: For consistency and harmonization reasons, it is recommended that the assessment period of CI6 should be the same across all Mediterranean countries and follow the assessment and reporting 6-year periods already established for EU countries under the MSFD.
Finer scales for NIS monitoring

33. At basin scale, there are no established standard protocols for the monitoring of NIS. However, guidelines for monitoring NIS in the Mediterranean were developed and endorsed by the CPs to the Barcelona Convention in 2019 under the framework of the EcAp/IMAP (UNEP/MED WG.467/16 (2019) “Monitoring Protocols for IMAP Common Indicators related to Biodiversity and Non-Indigenous species”).

34. The majority of countries do not have a dedicated strategy but have a monitoring strategy including marine NIS applied either at hot-spot areas of the country (i.e. ports, aquaculture units, marine protected areas) or in specific subregions through a related network of sampling stations. Targets of NIS monitoring include mainly the detection of new NIS and the measurement of abundance/coverage/biomass of established and/or invasive NIS, while only a small number of countries monitor the impact of established/invasive NIS on the native communities.

35. The IMAP Common Indicator Guidance propose more intense monitoring effort at “hot-spots” and “steppingstone areas” for non-indigenous species introductions, e.g. sampling at least once a year at ports and their wider area and once every two years in smaller harbours, marinas, and aquaculture sites. Importantly, the same sites should be surveyed each monitoring period, to avoid biases potentially caused by differences among sites.

Threshold Values

36. Currently, threshold values for the number of new introductions of non-indigenous species have not been set neither at the EU or the Mediterranean level. Ongoing work in the framework of the MSFD (Tsiamis et al., 2021b) has concluded that the most suitable approach for setting threshold values for D2C1 is to adopt the percentage reduction of new NIS and the exact value of percentage reduction should be decided at regional and/or subregional scale, based on the pathways pressure and level of monitoring coverage of each region/subregion.

37. Preliminary analysis of the available data for the Mediterranean between 1970-2017 for the purposes of this report demonstrated that there is a significant increase in the rate of new NIS entering all EcAp subregions after 2000 (presumably as a result of increased scientific effort) and that this parameter is significantly different between EcAp subregions. Consequently, the initial recommendations are that i) the threshold values for CI6 in the Mediterranean need to be set at subregional level and not at regional level and ii) we need to consider data only after 2000s in order to establish today's threshold values. Furthermore, for Mediterranean region/subregions that have not been efficiently monitored in terms of NIS during the previous decades, a shorter time span of 6-years cycle periods should be preferred, e.g. 3 years.

38. Conclusively, threshold values should be established separately for each of the Mediterranean subregions and should be sought by examining the data of the last two decades, if not an even more recent time period. At the same time, a consensus needs to be reached about which species groups will be included in the calculations and how their environmental impact will be taken into account. These are decisions that will determine the definition of GES for EO2 and will affect the management obligations of Contracting Parties to the Barcelona Convention. As such, it is proposed that further work takes into account the contribution of regional experts not only from the fields of taxonomy, monitoring and assessment but also conservation and management and last, but not least, ecologists with strong statistical/mathematical background

39. The baseline for IMAP Common Indicator 6 related to Non-Indigenous Species (NIS) has been reviewed through a series of regional consultation and review meetings:

- CORMON Biodiversity and Fisheries (Videoconference, 10–11 June 2021) [UNEP/MED WG.500/8](#)
- Fifteenth Meeting of SPA/BD Focal Points (Videoconference, 23–25 June 2021) [UNEP/MED WG.502/16.Appendix F](#)
- Follow-up CORMON Biodiversity and Fisheries Meeting (Videoconference, 28–29 March 2022) [UNEP/MED WG.520/5](#)
- 9th Meeting of the Ecosystem Approach Coordination Group (Videoconference, 5 July 2022) [UNEP/MED WG.521/Inf.8](#)

40. The progress achieved in the development of national and subregional NIS baselines has been acknowledged by the Ecosystem Approach Coordination Group (EcAp CG), which endorsed their use in the [2023 Mediterranean Quality Status Report \(Med QSR\)](#) and encouraged their further refinement during future IMAP implementation cycles.

41. The regional baseline includes only validated species records observed up to the end of 2020, harmonizing regional and subregional inventories and updating national lists (including the JRC baselines for EU Mediterranean countries).

42. A total of 1,011 non-indigenous species (NIS) have been recorded in Mediterranean marine waters, of which 748 are considered established—an overall establishment rate of nearly 74%, varying by subregion. These include 144 Macrophytes, 224 Mollusca, 188 Arthropoda, 203 Chordata, 83 Annelida, 33 Bryozoa, 42 Cnidaria, 47 Foraminifera, and 47 other taxa. Alien status and record validity have been clarified for most species. Where information was lacking, data-deficient and questionable records were compiled at regional and subregional levels.

References

- Cañadas, A., et al. (2018). Habitat modelling and density estimation of Cuvier's beaked whales. *Marine Ecology Progress Series*, 588, 213–228.
- Cardona, L., et al. (2015). Demography of marine turtles nesting in the Mediterranean Sea: a gap analysis and research priorities. Demography Working Group of the 5th Mediterranean Conference on Sea Turtles. Bern Convention, T-PVS/Inf (2015), 37 pp.
- Di Camillo, C., et al. (2023). Coralligenous habitats: Towards a regional ecological quality index. *Ecological Indicators*, 147, 109939.
- Enrichetti, F., et al. (2019). A new Mediterranean assessment tool for coralligenous assemblages. *Mediterranean Marine Science*, 20(1), 208–221.
- Fortuna, C. M., Cañadas, A., Holcer, D., Brecciaroli, B., Donovan, G.P., Lazar, B., Mo, G. et al. (2018). Distribution and abundance of bottlenose dolphins in the Adriatic Sea. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 28(1), 198–217.
- Gobert, S., et al. (2009). A preliminary assessment of seagrass indicators for the ecological status of coastal waters in the Mediterranean. *Marine Pollution Bulletin*, 58(11), 1727–1734.
- Lopez y Royo, C., et al. (2010). BiPo, a biological monitoring tool for *Posidonia oceanica* meadows. *Marine Ecology*, 31(3), 519–529.
- Mannocci, L., et al. (2018). Regional-scale modeling of cetacean distribution and abundance in the Mediterranean Sea. *Deep Sea Research Part II: Topical Studies in Oceanography*, 141, 70–85.
- Montefalcone, M., Tunesi, L., & Ouerghi, A. (2021). A review of the classification systems for marine benthic habitats and the new updated Barcelona Convention classification for the Mediterranean. *Marine Environmental Research*, 169, 105387. doi: 10.1016/j.marenvres.2021.105387
- Personnic, S., et al. (2014). An index based on taxonomic and functional diversity to assess seagrass community quality. *Ecological Indicators*, 43, 261–271.
- Sparks, L.M., and DiMatteo, A.D. (2020). Loggerhead sea turtle density in the Mediterranean Sea. NUWC-NPT Tech Rep 12360, 77 pp.
- Tsiamis, K., Palialexis, A., Connor, D., Antoniadis, S., Bartilotti, C., et al. (2021). Marine Strategy Framework Directive – Descriptor 2, Non-Indigenous Species. Delivering solid recommendations for setting threshold values for non-indigenous species pressure on European seas. EUR 30640 EN, Publications Office of the European Union, Luxembourg.
- UNEP (2024). Mediterranean Quality Status Report: The state of the Mediterranean Sea and Coast from 2018–2023. UNEP/MAP, Athens. <https://wedocs.unep.org/20.500.11822/46733>
- UNEP/MAP (2016). UNEP(DEPI)/MED IG.22/Inf.7. IMAP Common Indicator Guidance Facts Sheets (Biodiversity and Fisheries).
- UNEP/MAP (2019). UNEP(DEPI)/MED IG.24/7 – Annex VI. Updated Classification of Benthic Marine Habitat Types for the Mediterranean Region
- UNEP/MAP (2019). UNEP/MED WG.467/16. Monitoring Protocols for IMAP Common Indicators related to Biodiversity and Non-Indigenous species.
- UNEP/MAP (2021). UNEP/MED WG.500/5. Monitoring and assessment scales, assessment criteria, threshold and reference values for IMAP common indicators 3, 4 and 5 relating to marine turtles.
- UNEP/MAP (2021). UNEP/MED WG.500/7. Monitoring and assessment scales, assessment criteria and threshold values for IMAP common indicator 6 on non-native species.
- UNEP/MAP (2021). UNEP/MED WG.500/8. Progress in developing baseline values for common IMAP 6 indicator on non-native species.
- UNEP/MAP (2021). UNEP/MED WG.502/16. Implementation of the second phase (2019–2021) of the Integrated Monitoring and Assessment Program (IMAP - Biodiversity and non-native species) as part of the EcAp roadmap.
- UNEP/MAP (2021). UNEP/MED WG.514/Inf.11. Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Marine Mammals.
- UNEP/MAP (2021). UNEP/MED WG.514/Inf.12. Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Marine Turtles.

- UNEP/MAP (2022). UNEP/MED WG.520/4. Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Sea Birds.
- UNEP/MAP (2022). UNEP/MED WG.520/5. Guidelines for IMAP common indicator 6 on non-native species.
- UNEP/MAP (2022). UNEP/MED WG.520/Inf.3. Monitoring and assessment scales, assessment criteria and threshold values for IMAP common indicator 6 on non-native species.
- UNEP/MAP (2022). UNEP/MED WG.521/Inf.7. Monitoring and Assessment Scales, Assessment Criteria, Thresholds and Baseline Values for the IMAP Common Indicators 3, 4 and 5 related to Sea Birds.
- UNEP/MAP (2022). UNEP/MED WG.521/Inf.8. Baseline for the IMAP Common Indicator 6 related to Non-Indigenous Species.
- UNEP/MAP (2023). UNEP(DEPI)/MED IG.26/22. Amendments to Annexes II and III to the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean.
- UNEP/MAP (2023). UNEP(DEPI)/MED IG.26/5 – Annex VII. Conclusions and recommendations of the Multidisciplinary group of experts nominated by the Contracting Parties to define parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators and elaborate the List of Reference of Pelagic Habitat Types in the Mediterranean Sea
- UNEP/MAP (2023). UNEP/MED WG.547/11. Monitoring and assessment elements for the IMAP common indicators (CI1 and CI2) on benthic habitats.
- UNEP/MAP (2024). UNEP/MED WG.592/06. Way forward to develop common indicators using phytoplankton and zooplankton for Pelagic Habitat
- UNEP/MAP (2025). UNEP/MED WG.606/05. Assessment methodologies, evaluation criteria and thresholds for common biodiversity indicators IC1 and IC2.
- UNEP/MAP (2025). UNEP/MED WG.606/06. Assessment methodologies: assessment criteria and thresholds for biodiversity common indicators CI1 and CI2.
- UNEP/MAP (2025). UNEP/MED WG.608/16. Status of implementation of the Ecosystem Approach (EcAp) Roadmap.
- UNEP/RAC/SPA (2013). Towards the Identification and Reference List of Pelagic Habitat Types in the Mediterranean Sea.
- UNEP/MAP/SPA/RAC (2019). Updated classification of benthic marine habitat types for the Mediterranean region. Tunis, 23pp.