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Way forward to fine tune the Data Dictionaries and Data Standards related to Marine Litter IMAP Common Indicators

INFO/RAC
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The present document will be integrated and submitted to the next Joint Meeting of the Ecosystem Approach Correspondence Groups on Pollution and Marine Litter Monitoring (CORMON), Athens, 27-28 May 2025

Note by the Secretariat

The Contracting Parties (CP to the Barcelona Convention adopted (CoP 19, Athens 2016) the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP) (Decision IG.22/7) within the Ecosystem Approach (EcAp) process. The IMAP requirements focus on agreed Ecological Objectives (EOs) and their related common indicators.

In the framework of the UNEP/MAP Programme of Work and Budget for 2024–2025 and with the support of the EU funded EcAp-MED III Plus (2024-2026), INFO/RAC, leads the work on the development and completion of the "*Info/MAP platform and platform for the implementation of IMAP fully operative and further developed, connected to MAP components' information systems and other relevant regional knowledge platforms, to facilitate access to knowledge for managers and decision-makers, as well as stakeholders and the general public*" as provided for by Decision IG.22/7.

INFO/RAC has supported this output with the development of an IMAP Compatible Data and Information System (**IMAP Info System**), that has enabled the Contracting Parties to start reporting data as of mid-2020 for selected 11 IMAP Common Indicators.
At present IMAP Info System allows Contracting Parties to report data for **18 IMAP Common Indicators** trough **30 Information Standards** developed and implemented in the IMAP Info System, including for Candidate Common Indicator 24 (cCI24) "Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles". Relative data flows have been implemented, also for cCI 24 that can be reported on voluntary basis.

The IMAP Info System is now evolving towards the complete IMAP Info System and is able to receive and process data according to the proposed Data Standards and Data Dictionaries (DSs and DDs) that set the basic information on data reporting within IMAP.
This phase will be characterized by the completion of DSs and DDs for available and mature **new Common Indicators** that are going to be developed and **candidate ones** ready to be included as Common Indicators. At the same time new functionalities will be added to the IMAP Info System in order to improve the usability by IMAP Users and support UNEP/MAP in the data elaboration.

Way forward to fine tune the Data Dictionaries and Data Standards related to Marine Litter IMAP Common Indicators

1. Introduction

1.	IMAP Info System, developed by INFO/RAC during the second IMAP cycle, is fully operational and aims to collect, manage and share data from national monitoring programs developed under the framework of the UNEP/MAP Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP).

2.	The system allows Contracting Parties to report data for **18 IMAP Common Indicators** through 30 Information Standards developed and implemented in the IMAP Info System, including the one for Candidate Common Indicator 24 (cCI24) "Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles". Relative data flows have been implemented, also for cCI 24 that can be reported on voluntary basis.

3.	IMAP Info System web site is user friendly and accessible to the general public. Login is required only to access reserved sections. A specific guide has been developed to help users in browsing the web site: **IMAP Info System Technical Guide**

2. IMAP Info System Structure

4.	IMAP Info System has been recently enhanced with new features which make navigation, reporting, and access to information easier.

5.	The structure of IMAP Info System is user-friendly and allowing easy navigation with three main sections / menu options: (a) **Reporting**; (b) **Explore**; and (c) **Info**.

6.	**Reporting menu** includes 3 sections that allow to download, compile, verify, upload and update the Information Standards:

a)	**Standards:** this section includes all the Modules (Information Standards) related to the CIs implemented in the System. To access this section login is not required. Through the arrow symbol, it is possible to download a specific Module.
b)	**Conformity check:** this tool checks the compliance of the file before proceeding with the upload procedure. This section is open, login is not required.
c)	**Upload:** Upload section is restricted to registered users and login is required. In this section it is possible to upload and update compiled Information Standards, using the PLUS button at the bottom of the page. Each IMAP User could access and download the files uploaded by the Contracting Party (CP) they belong to. It is also possible to download the list of all the files uploaded by its own CP.

7.	**Explore menu** includes 4 sections that allow to access the published data, visualize its location in the map and consult graphical representation of IMAP data:

a) **Published Data:** in this section are available all the data published by CPs. This section is accessible to the general public.
b) **Geographical data:** it shows location of monitoring site per Standards. This section is open, login is not required
c) **Dashboard:** this is a tool that allows the user to have summarized, in a synthetic way and through graphical representation, different information coming from reported datasets. Graphs, tables and maps are interactive and automatically updated according to the data stored in the IMAP Info System DB.
d) **Utility tools:** Superset and Jupiter Lab are the tools available to all the RACs to explore and visualize data entered in the IMAP Info System.

8. **Info section** allows to access to these 2 sub-sections:

a) **Documents:** this section is accessible to the general public. In this section all the IMAP documents are available. For easier consultation, the IMAP documents are organized by cluster and typology.
b) **Guidelines and Tutorial:** in this section you can find all what can help users to navigate the IMAP Info System and in the reporting activities. Guidelines and Tutorial section includes an *User Guide* that explain step by step how to report data in the IMAP Info System, a *Technical Guide* to guide the user in browsing the website and *Video Tutorials*, the simplest way to understand how to navigate the website and report data in the IMAP Info System.

2.1 Data Standards (DSs) and Data Dictionaries (DDs)

9. The IMAP Info System allows reporting for 18 IMAP Common indicators and 30 modules as listed in Table 1 and 2.

10. 12 modules (Information Standards for 11 IMAP Common Indicators) have been developed during the first phase of the IMAP (Pilot) Info System (Table 1).

11. In the last two years, 18 new modules (Information Standards for 7 Common Indicators) - (**Error! Reference source not found.**) related to 7 Common Indicators have been further developed and implemented in the IMAP Info System.

Table 1: 12 modules (Information Standards for 11 IMAP Common Indicators) developed during the first phase in the IMAP Pilot Info System

Common Indicator(s)	Module name
CI 1: Habitat distributional range to also consider habitat extent as a relevant attribute CI 2: Condition of the habitat's typical species and communities	B1 - *Coralligenous Habitat*
	B2 - *Maerl/Rhodolith Habitat*
	B3 - *Posidonia oceanica Meadows Habitat*
CI 6: Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas	I1 - *Non Indigenous Species*
CI 13: Concentration of key nutrients in water column CI 14: Chlorophyll-a concentration in water column	E1 - *Nutrients & physical and chemical parameters*
CI 15: Location and extent of the habitats impacted directly by hydrographic alterations to also feed the assessment of EO1 on habitat extent	H1 - *Hydrography*
CI 16: Length of coastline subject to physical disturbance due to the influence of man-made structures	C1 – *Coastline*
CI 17: Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater)	P1 - *Contaminants in Seawater, Sediment and Biota*
CI 21: Percentage of intestinal enterococci concentration measurements within established standards	Q1 - *Bathing Water Quality*
CI 22: Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source)	M1 - *Beach litter*
CI 23: Trends in the amount of litter in the water column including microplastics and on the seafloor	M2 – *Seafloor litter*
	M3 - *Floating microplastics*

Table 2: 18 new modules (Information Standards for 7 Common Indicators) implemented in the IMAP Info System during the last biennium.

Common Indicators	N° of Information Standards
CI 3: Species distributional range (EO1)	14 new Information Standards on marine mammals (one specific on the monk seal), marine turtles, marine birds
CI 4: Population abundance of selected species (EO1)	
CI 5: Population demographic characteristics (EO1)	
CI 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established (EO9)	1 on level of pollution effects (PMO1)
CI 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9)	1 on level of acute pollution events (PAE1)
CI 20: Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood (EO9)	1 on levels of contaminants in seafood (PSF1)
CI 24: Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles (E10)	1 on ingestion and entanglement on marine turtles (MLT1)

2.2   IMAP Info System New features

12.   Specifically, the **Explore section** has 3 new functionalities available (the last two only for MAP Components):

a) **Dashboard**: a first tool allowing user to have summarized, in a synthetic way and through graphical representation, different information coming from different data sources. Graphs, tables and maps are interactive and automatically updated according to data stored in the IMAP Info System DB. To be upgraded and enriched.

b) **Superset**: it is a tool for business intelligence and data analysis. It allows users to easily explore and visualize data, from simple line graphs to geospatial graphs.

c) **Jupyter Lab**: it is a web-based interactive development environment (IDE) for data science and scientific computing. It provides a flexible and powerful interface for working with notebooks, code, and data.

13.   Moreover, the IMAP Info System has been updated to allow these operations:

- Access to **advanced research**, allowing the searching of data per cluster, module, status, sampling interval, Id;

- **Export all data** or just selection of them displayed in the Upload or in the Published Data sections;
- Download **zipped files** containing all selected files or all files listed in the Upload or in the Published Data sections;
- Access to **IMAP documents** grouped by cluster and typology for an easier consultation;
- Access to **guidelines and tutorials** for easier navigation and aiming to support reporting process.

Future developments:

14.   In the next two years (biennium 2026-27), IMAP Info System will be enhanced with the following features:

- Creation of connection/link with data held and managed by GFCM (General Fisheries Commission for the Mediterranean) on Ecological objective EO3;

- Development of new dashboard;

- Improvement of Jupiter Lab supporting RACs for the next QSR assessments;

- Development of four new video tutorials (in addition to the two already available) to support IMAP users in reporting data within the IMAP Info System.

Validation and quality control:

- Before submitting data to the IMAP Info System, the Conformity Check tool must be used by all IMAP Info Users to verify data compliance in-line with the rules specified in the DDs, aiming at having harmonized submission from all CPs.

- The conformity check procedures run control checks and verifications among all fields and contents, checking if data reported follow the rules defined into the DDs, specifically about data format and list of values. Furthermore, to avoid errors in filling in DS, new functionalities has been implemented (see paragraph before), like automatic filling, drop-down menu and introduction of range of values.

Assessment functionalities:

15.   IMAP Info System, reporting monitoring data, represents the main source of official and reliable information available to build the Mediterranean Quality Status Report as well as other assessment documents produced by UNEP/MAP. The new functionalities will also allow Contracting Parties to have partial assessment of data before, during and after a reporting cycle.

16.   On this basis INFO/RAC is exploring possible upgrading of the system to facilitate extraction, aggregation and elaboration of reported data in order to support the activity of Mediterranean. The functions will include:

- Creation of graphical representation and diagram, using business intelligence and data analysis tool like Superset and Jupyter Lab.
- Export of maps and geographical data
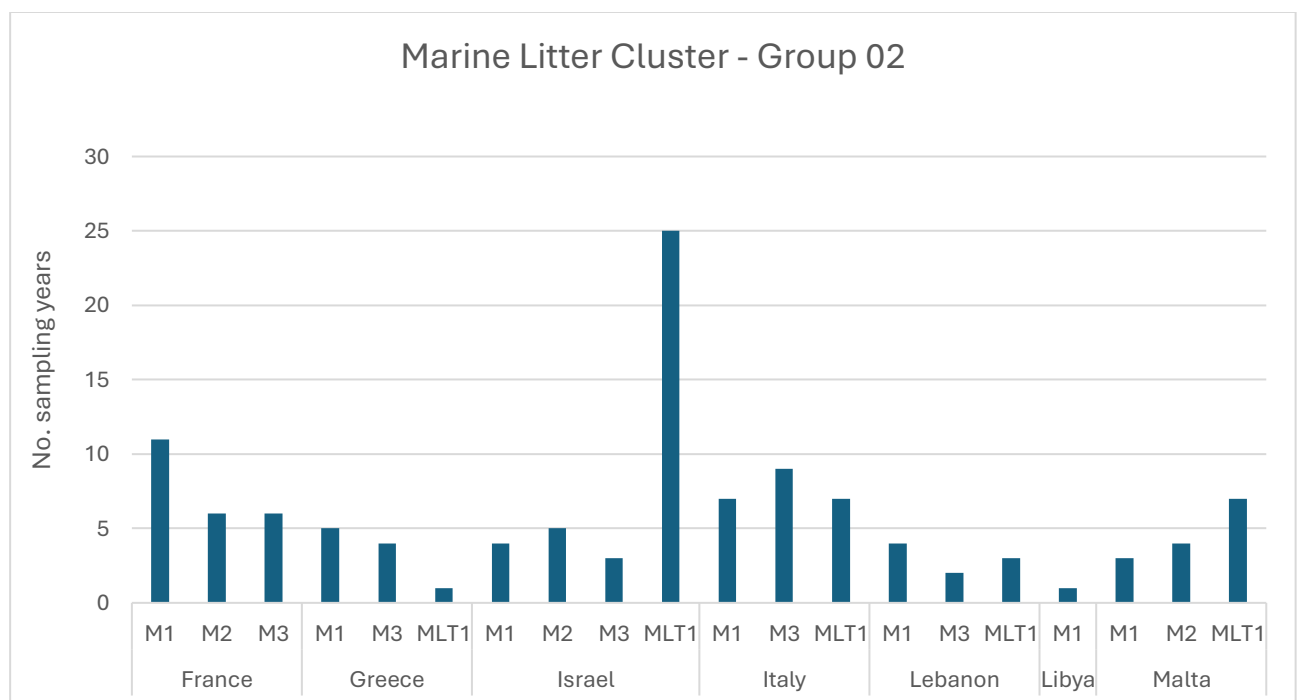- Creation of script and dashboard for data analysis

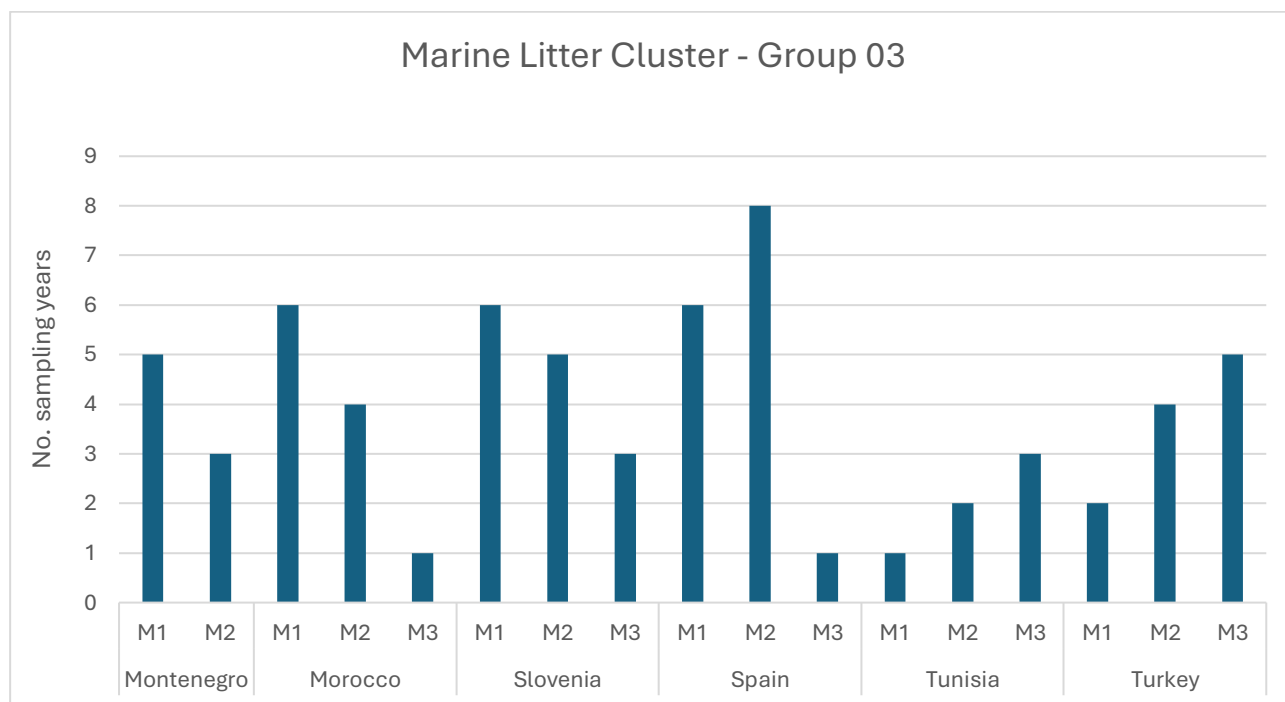**2.3   State of art of the IMAP reporting for Marine Litter**

17.   For Marine Litter cluster there are **4 Information standards** available on the IMAP Info system, related to Ecological Objective 10 and to the following Common Indicators (CIs):

- CI 22: Trends in the amount of litter washed ashore and/or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source)
- CI 23: Trends in the amount of litter in the water column including microplastics and on the seafloor
- CI 24: Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds, and marine turtles

Contracting Parties have reported monitoring data for the above IMAP Common Indicators as follows:

For Marine Litter cluster, 17 CPs (Albania, Bosnia and Herzegovina, Croatia, Cyprus, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Egypt, Malta, Montenegro, Morocco, Slovenia, Spain, Tunisia, Turkey) have uploaded **147 datasets** for **Ecological Objective 10**, of which 73 are compliant or valid.

It should be remarked that **only 6 dataset have been published** by Contracting Parties.

Marine Litter Cluster - Group 01

Marine Litter Cluster - Group 02

Marine Litter Cluster - Group 03

2.4 IMAP Data policy implementation and role of the Contracting Parties

18. The **IMAP User Network** is the network of IMAP Users responsible to **upload, validate, release and publish** monitoring data related to IMAP Common Indicators, following the workflow explained in Section A of this document.

19. IMAP user Network consists of Country representatives, **officially appointed by each Contracting Party** and coordinated by the INFO/RAC NFPs. The appointment, updating and integration of the IMAP User network is responsibility of the MAP Focal Points.

20. **INFO/RAC NFPs** act as facilitators among INFO/RAC and IMAP users, allowing the sharing and exchange of knowledge and information for data reporting purposes on IMAP Info System. As facilitators, INFO/RAC NFPs collaborate with INFO/RAC providing suggestion and observations to improve Information Standards. Furthermore, INFO/RAC NFPs encourage and facilitate all national IMAP Users participation into the Training/Assistance meeting organized by INFO/RAC.

21. A 3-level structure has been set up for IMAP User profiles, allowing CPs to differentiate the level of responsibility according to the internal national organization on data management.

- **Level I - Upload**: users uploading the monitoring data file and performing the compliance quality check - scientific institutions responsible for data production and elaboration (i.e. monitoring and research institutes).
- **Level II - Validation**: users performing the process of quality control of monitoring data – national institutions responsible for data collection and validation (i.e. Environmental National Agencies).
- **Level III - Official release & Publication**: users have the duty to confirm the official release and publish data (raw data will be visible to any anonymous user connected to the website and joined also through the geographical section directly by maps) - national entities responsible for the official release of the data (i.e. MAP Focal Points).

Publication function has been kept by INFO/RAC until now to avoid misunderstandings and accidental publishing of not open data from countries side. Due to the approved MAP Data Policy, the further clarification provided by IMAP Data Policy Annex and the support to data policy implementation provided by INFO/RAC to countries, time is ripe to give back to Contracting Parties the possibility to publish data by their own.

Please notice that, according to MAP Data Policy, all monitoring data reported into IMAP Info System must be considered quite open and should published by CPs, unless well motivated constraints are in place. Delay in the publishing not motivated according to the specific cases foreseen by MAP Data Policy, will generate a number of kind reminders and **finally the publication of data by UNEP/MAP**.

2.5   Fine tuning of Data Standards (DSs) and Data Dictionaries (DDs) for all the IMAP Common Indicators

22.   For all Data Standards and Data Dictionaries, a first fine-tuning exercise has been already carried out based on inputs and feedbacks collected from the Contracting Parties (CPs), aiming to improve and facilitate the reporting process. Feedback and comments, referred in particular to mismatch between all the available DSs/DDs and monitoring protocols, missing data and gaps, have been implemented after the respective CORMONs discussions and approvals.

23.   INFO/RAC's activity has focused on the most urgent and useful changes in order to support, enhance and simplify CPs reporting. Furthermore, new functionalities have been implemented in IMAP Info System in order to facilitate reporting phase:

- **Drop-down menu** for fields containing lists of values;
- **"Conditional" fields** (blue in the spreadsheets): these fields must be filled in only if a specific field has been previously compiled;
- **Automatic filling** of some fields according to what has been filled in other specific fields (i.e. units of measurements related to specific contaminants); and
- Introduction of **range of values**, under the guidance of MED POL experts, for numerical fields.

24.   In the current biennium (2024-2025) an **official systematic revision process** has been initiated for the IMAP Info System aiming to evaluate the feasibility all the possible/proposed changes being in pipeline for all the available information standards, and most importantly selecting those mandated by the IMAP Decisions and in-line with the reporting needs.

25.   In this regard, **Contracting Parties are kindly invited** to make an internal recognition based on data availability, compliance with monitoring plans, remarks collected by the respective national IMAP Users, and to provide written feedback to the Secretariat with a list of all possible improvements to be taken into consideration and to be discussed during the CORMON Meeting to be held during 2024-2025 and the following biennium.

26.   INFO/RAC has developed a form to facilitate feedback collection. The form will be distributed to IMAP Users as excel spreadsheet to easily individuate the correct parameter/section for which the amendment is proposed.

27.   INFO/RAC has partially collected feedbacks and errors from CPs in the past years, basically focused on units of measures, mandatory and not mandatory fields, limits and misalignment of monitoring protocols and other aspects.