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Videoconference, 28-29 March 2022

Agenda item 6: Data Dictionaries and Data Standards for the Common Indicators 3, 4 and 5 related to Species

6.2. Data Dictionaries and Data Standards related to Marine Turtles

Data Dictionaries and Data Standards for the Common Indicators 3, 4 and 5 related to Marine Reptiles

SPA/RAC
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In charge of the study at INFO/RAC

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Note by the Secretariat

In the framework of the UNEP/MAP Programme of Work and Budget for 2020–2021 (COP 21, Decision IG.24/14), 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*".

The **EU funded EcAp-MED II Project (2017-2019)** has supported this output with the development of a Pilot IMAP Compatible Data and Information System (IMAP (Pilot) Info System), that has enabled the Contracting Parties to start reporting data as of mid-2020 for selected **11 IMAP Common Indicators.** The IMAP (Pilot) Info System laid down the basis for building a fully operational IMAP Info System as provided for by Decision IG.22/7.

At present, the system supports the reporting data for 11 of the 27 IMAP Common Indicators, namely Common Indicators **1, 2, 6, 13, 14, 15, 16, 17, 21, 22, 23**. The criteria used for selecting the 11 Common Indicators as part of the IMAP (Pilot) Info System have been: a) maturity of Common Indicators as of 2017, in terms of monitoring experiences and best practices; b) existing data collection and availability representing all IMAP clusters; c) availability of Common Indicators Guidance Factsheets and/or metadata templates.

The draft **IMAP (Pilot) Info System** has been developed by INFO/RAC under the coordination of the Secretariat and in close consultation with all relevant MAP Components. The IMAP (Pilot) Info System is now evolving towards the complete **IMAP Info System** and is able to receive data according to the proposed Data Standards and Data Dictionaries (DSs and DDs) that set the basic information on data reporting within IMAP.

The ongoing process of evolution from the pilot to the final IMAP Info System is also supported by the EU funded project **EcAp MED III** project and include the implementation of Data Standards and Data Dictionaries and the related data flows for the whole set of modules for the IMAP Common Indicators (EO3 and candidate C.I.s currently excluded).

Introduction

Data Standards (DSs) are prepared in the form of Excel spreadsheets in which every column indicates a field to be filled by the data providers. **Data Dictionaries (DDs)** are prepared in the form of Excel spreadsheets in which every row contains information to guide the data provider. DSs & DDs are spreadsheets included in the **same Excel file**, downloadable from the IMAP (Pilot) info system. The data uploaded using the Data Standards will be suitable for the inclusion in the database.

The proposal of DSs and DDs provides broader data sets and associated dictionaries than requested as mandatory by the related IMAP Guidance Factsheets and Metadata Templates. In the Data Standards the mandatory data are represented in black and the **non-mandatory** ones in red. The possibility to fill in also **non-mandatory** fields is given to allow the Contracting Parties that already have monitoring systems in place and collect a wider set of data to report them as the additional data. Although it is at the discretion of the Contracting Parties to decide, reporting on non-mandatory data sets is **strongly encouraged** to avoid knowledge gaps between IMAP and other national data flows.

Following the outcome of CORMONs, the finalized DSs and DDs related to the 11 Common Indicators have been uploaded in the IMAP (Pilot) Info System and the consequent changes to the data base structure have been provided. Therefore, once all the parameters and measurement units have been defined, the correspondent data flow have been activated. Following a testing phase of the IMAP (Pilot) Info System realized with the voluntary participation of interested countries, the **phase I** of the system implementation is officially concluded in June 2020.

After the conclusion of the EcAp MED II Project, discussion about further modules has been started with the thematic MAP Components for each already selected Common Indicator and for the remaining ones in view of the completion of the IMAP Common Indicator set, according to the available resources specifically allocated.

The current document is a revised version of the "draft" DSs & DDs related to **Common Indicators 3, 4 & 5,** reflecting comments received during and after the CORMON Meetings on Biodiversity and Fisheries in 2020 and 2021. The document takes into account also discussion held during the following bilateral meetings with SPA/RAC and the Permanent Secretariat of ACCOBAMS. Inputs and comments collected from the Contracting Parties have been integrated to further elaborate the DSs & DDs and the updated version has been discussed and finalized with the support of the Mediterranean experts of the informal Online Working Group (OWG) on marine reptiles.

By reviewing this document, the present meeting is expected to provide the final **inputs and further reflections to tune** the standards to timely allow **the implementation of the correspondent data flows** to be ready by June in order to complete the Common Indicator set available for the IMAP call reporting**.**

Nevertheless, given that the development of indicators, monitoring methods and data standards are progressing in parallel, close and continuous dialogue and collaboration are needed among the bodies responsible for these developments to ensure their proper alignment and coherence.

Data Standards and Data Dictionaries for IMAP Biodiversity (EO1): Common Indicators (CIs) 3, 4 & 5 for Marine Turtles

1. Among five common indicators related to biodiversity (EO1) fixed by IMAP, three are about marine reptiles:

- **Common indicator 3**: Species distributional range;

- **Common indicator 4**: Population abundance of selected species;

- **Common indicator 5**: Population demographic characteristics (e.g., body size or age class structure, sex ratio, fecundity rates, survival/mortality rates)

2. The present document aims to present DSs & DDs related to a part of the available methods for monitoring turtle species as expressly reported in the IMAP guidance factsheets.

3. The reference documents for the species to be monitored are:

o IMAP Guidelines for monitoring marine turtles in the Mediterranean Sea (WG.461/21)

o Scales of monitoring & assessments, assessment criteria and baseline & threshold values for IMAP Common Indicators relating to Marine Turtles (UNEP/MED WG.514/Inf.12) .

o Sea turtles in the Mediterranean: Distribution, threats and conservation priorities

Marine turtles

1. Two species of sea turtles – the loggerhead turtle (*Caretta caretta*) and the green turtle (*Chelonia mydas*) – regularly occur and breed in the Mediterranean Sea. The breeding activities of both species are regularly monitored in the main nesting areas of ten countries; namely, Cyprus, Egypt, Greece, Israel, Italy, Lebanon, Libya, Syria, Turkey and Tunisia. Loggerhead turtles coming from the Atlantic deserve to be taken into account. In particular, the presence of the Atlantic loggerhead population is particularly important to consider in the Western Mediterranean.

The monitoring of sea turtles is currently performed using the following techniques: (i) **counting the number of nests** during the nesting period, (ii) **collecting data on stranded and by-caught turtles**, (iii) in-water **capture-mark-recapture** studies, (iv) **telemetry studies**, (v) **boat and aerial surveys,** including (vii) **genetic analysis**, getiing more and more important as new techniques in the future. Other methods as (vi) **stable isotope** analysis can also be considered.

2. Information about the main monitoring techniques listed above **are described in the document "***Guidelines for monitoring marine turtles in the Mediterranean Sea" (WG.461/21)"*.

3. However each Contracting Party will choose the methods to ensure the most appropriate turtles monitoring according to the country characteristics.

Module BA1 Line transect distance sampling - (CIs 3 & 4)

1. Estimation of the abundance and distribution of marine reptiles can be provided through the distance sampling methods. These methods consist in covering routes by boat or plane platform specially designed by specific software, in a defined study area. Distance sampling is especially **useful for turtles when applied by air** to estimate the abundance and distribution of aggregation areas at sea.

2. **Line transect distance sampling or strip transect** are both methods of the distance sampling family that allow defining the abundance estimation and distribution of specimens in a given space and in a given period of time.

3. **In line transect sampling as well as in the strip transect**, a study area is defined and surveyed along a sampling design of pre-determined transects ensuring equal coverage of the area.

4.   **Abundance** can be estimated by extrapolating calculated density in the covered area to the entire survey area. The output   is an uncorrected estimate (not corrected for availability bias) of abundance in a defined area at the time of the survey, estimate uncertainties are also provided.

5.   The **aerial-based method** can provide estimates of abundance, distribution and density of large-scale marine reptile species for all Mediterranean Sea. At the regional and local level, it appears useful to integrate aerial surveys, to obtain local indications of the conservation status and quality of the habitats through different methods. The choice of the monitoring approach will be made by the country on the basis of its national monitoring plan and the nature of the monitored area.

6.   The data reporting of distribution and abundance for marine reptiles will be carried out using the Data Standards and Data Dictionaries - Module **BA1** developed for **a large number of taxa** and already discussed in the document "**Data Dictionaries and Data Standards for the Common Indicators 3, 4 and 5 related to Marine Mammals**".

7.   The proposed module **BA1** is in line with the other standards developed for the IMAP Info System but also **compliant with ACCOBAMS metadata templates** used for the regional survey carried out in 2018 and the future ones to be planned, and already applied in the previous national activities of CPs; moreover, it includes the possibility to store data collected on marine reptiles.

8.   The module BA1 has been developed by INFO/RAC in close cooperation with ACCOBAMS and SPA/RAC and is proposed for the monitoring at the regional scale and also **for the Contracting Parties survey carried out at the national level**.

9.   The Module BA1 is reported in the document "Data Dictionaries and Data Standards for the Common Indicators 3, 4 and 5 related to Marine Mammals" as mainly used for cetaceans monitoring but also referring to a large number of taxa, including marine turtles.

10.   Here are reported the other modules developed according to the *IMAP Guidelines for monitoring marine turtles in the Mediterranean Sea (WG.461/21)* and to the assessment criteria for the IMAP CIs 3, 4 and 5 related to marine turtles, described in the document "*Scales of monitoring & assessments, assessment criteria and baseline & threshold values for IMAP Common Indicators relating to Marine Turtles* " (WG.514/Inf.12).

Module BT1 - Nesting Beach (CIs 3 & 4)
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1.   Estimation of the abundance and distribution of marine reptiles in **nesting beaches** is necessary to check that the turtles remain present in all parts of the environments monitored annually and in all the sites established during the periodic surveys. From the surveys on the count of the nests in each nesting beach, it is possible to determine the spatial distribution of the nesting per year. Existing and potential nesting beaches should be monitored during the nesting season.

2.   The data reporting of distribution and abundance of turtle nests will be carried out using the Data Standards and Data Dictionaries - Module BT1 developed on the basis of the *IMAP Guidelines for monitoring marine turtles in the Mediterranean Sea* and the document *Scales of monitoring & assessments, assessment criteria and baseline & threshold values for IMAP Common Indicators relating to Marine Turtles.*

3.   The structure of this module allows collecting the same data regardless of the monitoring methodology adopted (Foot patrols, Unmanned aerial vehicle (UAV), Plane surveys).

Module BT2 – Marine Habitat (Bycatch/Strandings) - (CIs 3 & 4)

1.   Three modules have been developed for monitoring the abundance and distribution of marine reptiles in **marine habitats**, depending on the survey method the Contracting Parties will adopt. In particular, the Module BT2 has been structured for **Bycatch** and **Stranding record** methods in which the information is recorded in reference to a monitoring area.

2.   Bycatch and stranding records should be analysed annually to identify any locations with increasing rate occurrence (bycatch values adjusted for fishing effort) which may mean increasing populations, or for areas where regular turtle reports are reducing or no longer occurring which may indicate a local reduction in population size. However, the main robust and defensible data to contribute to the abundance assessment should come from standardised repeated surveys in the hotspots. The neritic zone is also utilised by both species of the turtle as migratory thoroughfares at regular times of the year (pre- and post- breeding season) and this may affect abundance estimates determined during certain time periods, so monitoring and analysis need to account for this seasonality.

3.   Population monitoring in water with the Bycatch methodology can be used to estimate the abundance and distribution of a population in a particular area. Sea turtles are a migratory species, so study timing is important and should be carefully selected and a standardized methodology followed.

4.   Stranded turtles are a good source of data for collecting various data related to the space-time distribution of turtles. For stranded turtles it is necessary to obtain tissue samples for mixed stock analysis (MSA) which would identify the possible origin of stranding. This tissue sample could be further used in stable isotope analysis.

Module BT3 – Marine Habitat (Plane/Boat/UAV) (CIs 3 & 4)

1.   Abundance estimates at sea, where juveniles represent the majority of the population, can be conducted through a different method of surveys. Nevertheless, aerial surveys are the best method for determining the abundance of turtles at sea and detecting population changes, before they translate into changes in nest counts. The use of UAVs, for monitoring nesting activities and making individual counts of sea turtles swimming on the surface, is becoming more popular in recent years.

2.   BT3 Module has been structured for aerial, boat and UAV surveys. In these cases, the information is recorded along transects, each of which is identified with a unique code. The polylines representative of these transects must be reported in a GIS file with reference to each identification code. Although aerial surveys, albeit more expensive, allow for a more in-depth detection of emerging turtles for the benefit of better estimates of abundance compared to surveys with boats, it has been left to each CP to adopt either method or both. UAVs can be deployed from boats and determine turtle presence/abundance in offshore habitats. They are not an alternative to planes but complement these types of surveys.

Module BT4 – Marine Habitat (Telemetry) - (CIs 3 & 4)

1.   **Satellite tracking** (telemetry) is useful to characterize the movements of, and identify the habitats used (based on residency time) by tagged animals. Scientists generally attach **satellite transmitters** to the carapace of female sea turtles at nesting sites or animals caught at sea (during dedicated campaigns or incidentally caught by fishermen).

2.   The sex and size of tagged animals are generally recorded prior to their release, providing valuable information on their developmental stage.

3.   **Telemetry** is a good method to characterize the distributional range of the species (CI 3) considering different life stages and populations.

4.   Depending on the type of transmitter, it can also provide information on the environmental conditions of the habitats used by the species. Therefore, this method can lead to a better understanding of drivers of species distribution.

5.   Telemetry is also applied for abundance evaluation (CI 4) and a feasible method for demographic data collection in breeding areas (CI 5).

6.   Satellite telemetry of adult sea turtles is required for identifying the foraging grounds used by the adults of each population. This technique can also be used to assess the surface time of turtles at foraging grounds. A parameter is necessary to derive absolute population estimates for aerial surveys.

7.   Use of stable isotopes technique proved to be very useful to get indirect information about the life cycle of sea turtles.

Module BT5 - Nesting and Demography (CI 5)

1.   Population demographic parameters need to be collected from nests and nest environments and in-water observations.

2.   Understanding the demographics of sea turtle metapopulations helps identify which pressures may have the greatest impact on population stability and which conservation measures may greatly stabilize or recover population levels.

3.   The various elements that allow the reconstruction of the demographic characteristics of sea turtles have been considered. This module provides three Data Standards sheets, one dedicated to data collection in **nesting sites** (number of eggs per clutch, hatchling emergence success, etc.), the second to monitoring data in **marine habitat** referable to a specific time interval within the identified monitoring area (number of males/females adults per session, the mortality rate of individuals etc.) and a third developed for the collection of demographic characteristics related to each **individual** identified (gender, age, etc.).

Table 1: DSs & DDs Module BT1 (Nesting Beach) NestBeach for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code (e.g. "IT" for Italy).	
Sub-Region	Mediterranean Subregion. Enter one of the values from the list.	MWE = Western Mediterranean Sea MAD = Adriatic Sea MIC = Central and Ionian Seas MAL = Aegean and Levantine Seas
NestBeachID	Nesting beach identification code.	
NestBeachName	'Common' name for the monitored beach	
Latitude	Latitude of the mid-point of the beach in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the mid-point of the beach in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (e.g., 13.98078) for coordinates east of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (e.g., -2.6893).	
NestBeachLength	Total of monitored beach length in kilometers	
NestBeachCharacteristic	Indicate whether the monitored beach represents an active nesting site or is a potential nesting site. Enter one of the values from the list.	A = active nesting site P = potential nesting site
GISfile	Naming the GIS file that contains the polygon(s) of the survey area. In the attribute table of the GIS file, for each polygon of the survey area, the survey area code in the NestBeachID field must be	

| | reported. The file must be returned in a georeferenced shapefile format (WGS84) and compressed in a single .zip file that includes .zip, .prj, .dbf, etc. The filename must conform to the following Rule of composition: "ModuleBT1_GISfile_ <Sub-Region>_<NestBeachID>.zip", e.g., ModuleBT1_GISfile_MAD_N1.zip | |

Table 2: DSs & DDs Module BT1 (Nesting Beach) Species for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code(e.g. "IT" for Italy).	
NestBeachID	Nesting beach identification code.	
Year	Sampling year in YYYY format	
Species	Species name, enter one value from the list.	CC = *Caretta caretta* CM = *Chelonia mydas*
Method	Method for evaluating nesting distribution. Enter one of the values from the list.	FP = Foot patrols ATV = vehicles UAV = UAV surveys PS = Plane surveys MM = Mix Method
ActiveNestBeachLength	Active nesting beach length. If 'NestBeachCharacteristic' field has been compiled with 'P' enter '0' (zero) in this field.	
PotentialNestBeachLength	Potential nesting beach length. If 'NestBeachCharacteristic' field has been compiled with 'A' enter '0' (zero) in this field.	
NestNumber	Number of nests. If no nest has been found enter '0' (zero) in this field.	
TracksNumber	Number of non-nesting tracks. If non-nesting tracks have been found, enter '0' (zero) in this field.	
NumHathchedEggs	Number of eggs hatched (empty egg shells). If no hatched eggs have been found, enter '0' (zero) in this field.	
NumUnhathchedEggs	Number of integer eggs (unhathched with no embryos seen inside). If no intact eggs have been found, enter '0' (zero) in this field.	
NumDeadEmbryos	Number of dead embryos that have, at most, only pierced the egg	
NumDeadHatchling	Number of hatchlings completely hatched from the egg but were found dead	
HatchlingNumber	Number of live hatchlings. If no hatchling has been found, enter '0' (zero) in this field	
Remarks	Notes	

Table 3: DSs & DDs Module BT2 (Marine Habitat: Bycatch/Strandings) Area for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code(e.g. "IT" for Italy).	
Sub-Region	Mediterranean Subregion. Enter one of the values from the list.	MWE = Western Mediterranean Sea

		MAD = Adriatic Sea MIC = Central and Ionian Seas MAL = Aegean and Levantine Seas
AreaName	Survey Area name.	
AreaID	Survey Area code.	
Latitude	Latitude of the centroid of the distribution area of the species in the reference system in decimal degrees WGS84 with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the centroid of the distribution area of the species in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (e.g., 13.98078) for coordinates east of the of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (e.g., -2.68930).	
ExtensionArea	Total monitored area in square kilometers	
GISfile	Naming the GIS file that contains the polygon(s) of the survey area. In the attribute table of the GIS file, for each polygon of the survey area, the survey area code in the AreaID field must be reported. The file must be returned in a georeferenced shapefile format (WGS84) and compressed in a single .zip file that includes .zip, .prj, .dbf, etc. The filename must conform to the following Rule of composition: "ModuleBT2_GISfile_ <Sub-Region>_<AreaName>.zip", e.g., ModuleBT2_GISfile_MAD_GulfofTaranto.zip	
Remarks	Notes	

Table 4: DSs & DDs Module BT2 (Marine Habitat: Bycatch/Strandings) Marine Habitat for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code (e.g. "IT" for Italy).	
AreaID	Survey Area code.	
Species	Species name, enter one of the values from the list.	CC = *Caretta caretta* CM = *Chelonia mydas*
Year_start	Sampling start year in YYYY format	
Month_start	Sampling start month in 1-12 format	
Year_end	Sampling end year in YYYY format	
Month_end	Sampling end month in 1-12 format	
TissueID	Tissue for mixed stock analysis (MSA) or stable isotope analysis	
ForagingArea	Foraging area, enter one of the values from the list.	O = Oceanic foraging area N = Neritic foraging area
MigratoryPathways	Specify if is the foraging area in the reference period is utilized as migratory thoroughfares at regular times of the year (pre- and post- breeding season). This may affect abundance estimates determined during certain time periods, so monitoring and analysis need to account for this seasonality. Enter one of the values from the list.	Y = Yes N = No
Method	Survey methodology for gathering information. Enter one of the values from the list.	B = Bycatch S = Strandings

NumberTurtles	Number of turtles	
DensityTurtles	Number of turtles per square kilometer, calculated as the ratio between the 'NumberTurtles' and 'ExtensionArea' fields	
Remarks	Notes	

Table 5: DSs & DDs Module BT3 (Marine Habitat: Plane/Boat/UAV) Area for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code (e.g. "IT" for Italy).	
Sub-Region	Mediterranean Subregion. Enter one of the values from the list.	MWE = Western Mediterranean Sea MAD = Adriatic Sea MIC = Central and Ionian Seas MAL = Aegean and Levantine Seas
AreaName	Survey Area name.	
AreaID	Survey Area code.	
Latitude	Latitude of the centroid of the distribution area of the species in the reference system in decimal degrees WGS84 with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the centroid of the distribution area of the species in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (e.g., 13.98078) for coordinates east of the of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (e.g., -2.68930).	
ExtensionArea	Total monitored area in square kilometers	
GISfile	Naming the GIS file that contains the polygon(s) of the survey area. In the attribute table of the GIS file, for each polygon of the survey area, the survey area code in the AreaID field must be reported. The file must be returned in a georeferenced shapefile format (WGS84) and compressed in a single .zip file that includes .zip, .prj, .dbf, etc. The filename must conform to the following Rule of composition: "ModuleBT3_GISfile_<Sub-Region>_<AreaName>_<yyyy_mm_dd>.zip", e.g.,: ModuleBT3_GISfile_MAD_GulfofTaranto_2020_05_16.zip.	
Remarks	Notes	

Table 6: DSs & DDs Module BT3 (Marine Habitat: Plane/Boat/UAV) Transect for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code(e.g. "IT" for Italy).	
AreaID	Survey Area code.	
TransectID	Code of the transect	
TransectName	Transect name	

Year	Year of sampling in YYYY format	
Month	Month of sampling in 1-12 format	
Day	Day of sampling in 1-31 format	
Time	Hour-minutes-seconds of sampling in HH:MM:SS format	
LatitudeSTART	Latitude starting point of the transect in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx).	
LongitudeSTART	Longitude starting point of the transect in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use negative values for coordinates west of the Greenwich Meridian (0°).	
LatitudeEND	Latitude ending point of the transect in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx).	
LongitudeEND	Longitude ending point of the transect in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use negative values for coordinates west of the Greenwich Meridian (0°).	
GISfile	Name of the GIS file that contains the polyline related to each TransectID identifier. In the attributes table of the GIS file, for each polyline, the transect code must be reported. The file must be returned in a georeferenced shapefile format (WGS84) and compressed in a single .zip file that includes .zip, .prj, .dbf, etc. The name of the file must conform to the following composition rule: "ModuleBT3_GISfile_<TransectName>_<yyyy_mm_dd>.zip", e.g., ModuloBT3_GISfile_TransectTaranto1_2020_05_16.zip	
Remarks	Notes	

Table 7: DSs & DDs Module BT3 (Marine Habitat: Plane/Boat/UAV) Marine habitat for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code (e.g. "IT" for Italy).	
TransectID	Code of the transect	
ForagingArea	Foraging area, enter one of the values from the list.	O = Oceanic foraging area N = Neritic foraging area IA = Internesting areas
Species	Species name, enter one of the values from the list.	CC = *Caretta caretta* CM = *Chelonia mydas*
Method	Survey methodology for gathering information. Enter one of the values from the list.	PS = Plane survey BS = Boat survey UAV = UAV survey
Seastate	Intensity of the wind according to Beaufort scale (from 0 to 12 degrees)	
NumberTurtles	Number of turtles sighted	
Remarks	Notes	

Table 8: DSs & DDs Module BT4 (Marine Habitat: Telemetry) Area for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code (e.g. "IT" for Italy).	
Sub-Region	Mediterranean Subregion. Enter one of the values from the	MWE = Western

	list.	Mediterranean Sea MAD = Adriatic Sea MIC = Central and Ionian Seas MAL = Aegean and Levantine Seas
AreaName	Survey Area name.	
AreaID	Survey Area code.	
Latitude	Latitude of the centroid of the survey area in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the centroid of the survey area in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use negative values for coordinates west of the Greenwich Meridian (0°).	
ExtensionArea	Total monitored area in square kilometers	
Positions	Naming the GIS file that contains the positions of the monitored species. The file must be returned in a georeferenced shapefile format (WGS84) and compressed in a single .zip file that includes .zip, .prj, .dbf, etc ... files. The filename must conform to the following Rule of composition: "ModuleT1_GISfile_<Sub-Region> _ <AreaName> _ Telemetry_<gg_mm_aaaa> .zip", eg. ModuleT1_GISfile_Ionian_GulfofTaranto_Telemetry_05_2016.zip. If Region and / or AreaName contains spaces, replace these spaces with "_".	
Remarks	Notes	

Table 9: DSs & DDs Module BT4 (Marine Habitat: Telemetry) Telemetry for IMAP CIs 3 & 4 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code (e.g. "IT" for Italy).	
Sub-Region	Mediterranean Subregion. Enter one of the values from the list.	MWE = Western Mediterranean Sea MAD = Adriatic Sea MIC = Central and Ionian Seas MAL = Aegean and Levantine Seas
AreaID	Survey Area code.	
Year	Year of sampling in YYYY format	
Month	Month of sampling in 1-12 format	
Day	Day of sampling in 1-31 format	
Time	Hours-minutes-seconds of sampling in HH:MM:SS: format	
Tag	Provide information about the type of tag used.	
ArgosID	Argos identification number (PTT) associated with the tag used.	
Depth	Max depth (m) reached by the animal.	
L.C.	Argos location class (L.C.) attributed to the animal location. Enter one of the values from the list.	G A B Z 1

		2 3 0
Sensor	Other data recorded by the tag (e.g., temperature, salinity, etc.)	
Species	Species name, enter one value in the list	CC = *Caretta caretta* CM = *Chelonia mydas*
Size	Size (curved carapace length in m) of the tagged individual.	
Sex	Sex of the tagged individual. Enter one of the values from the list.	M=Male F=Female U=Unknown
Weight	Weight in kg of the specimen (2 decimal places)	
Remarks	Any notes or comments	

Table 10: DSs & DDs Module BT5 (Nesting and Demography) Area for IMAP CI 5 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code (e.g. "IT" for Italy).	
Sub-Region	Mediterranean Subregion. Enter one of the values from the list.	MWE = Western Mediterranean Sea MAD = Adriatic Sea MIC = Central and Ionian Seas MAL = Aegean and Levantine Seas
AreaName	Survey Area name.	
AreaID	Survey Area code.	
Latitude	Latitude of the centroid of the survey area of the species in the reference system in decimal degrees WGS84 with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of the centroid of the survey area of the species in the WGS84 decimal degrees reference system with at least 5 digits (xx.xxxxx). Use positive values without '+' before numbers (e.g., 13.98078) for coordinates east of the of the Greenwich Meridian (0°) and negative values with '-' for coordinates west of the Greenwich Meridian (0°) (e.g., -2.68930).	
Remarks	Notes	

Table 11: DSs & DDs Module BT5 (Nesting and Demography) Breeding areas for IMAP CI 5 - Marine Turtles

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code (e.g. "IT" for Italy).	
AreaID	Survey Area code.	
ClutchID	Clutch identification code	
Year	Sampling year in YYYY format	
Month_start	Sampling start month in 1-12 format	
Day_start	Sampling start day in 1-12 format	
Month_end	Sampling end month in 1-12 format	
Day_end	Sampling end day in 1-12 format	

Species	Species name, enter one of the values from the list.	CC = *Caretta caretta* CM = *Chelonia mydas*
ClutchSize	Total number of eggs per clutch	
LayingDates	First laying dates in YYYY/MM/DD HH:MM format	
HatchingDates	First hatching dates in YYYY/MM/DD HH:MM format	
IncubationDuration	Elapsed time between LayingDates and the first HatchingDates.	
IncubationTemperature	Mean middle third temperature of nest in °C degrees. Insert the value without the unit of measure (ex. if the nest temperature is 24°C, insert 24).	
HES	Hatchling Emergence Success (HES). Percentage (0-100) of eggs that produced a hatchling that escaped the nest (considering predation and inundation etc.). The evaluation of this index must be carried out considering all the nests of a beach as a single clutch	
NestCondition1	Specify whether the nest has been relocated or not. Enter one of the values from the list.	IS = In situ RN = Relocated nests
NestCondition2	Specify whether the nest has been inundated or not. Enter one of the values from the list.	I = Inundated NI = Non-inundated
NestCondition3	Specify whether the nest has been depredated or not. Enter one of the values from the list.	D = Depredated ND = Non-depredated
InternestingInterval	Elapsed time in days between clutch deposition and the next time the turtle emerges onto the beach to nest- whether successfully or not	
RemigrationInterval	Number of years between successive breeding seasons	
ClutchFrequency	Average number of clutches deposited by a turtle during a single breeding period	
InternestIntervalMethod	Method for evaluating InternestingInterval, RemigrationInterval and ClutchFrequency. Identification from movements (Telemetry), by observation of tagged turtle (Night patrols), by individual-specific DNA analysis (Genetics). Enter one of the values from the list.	T = Telemetry NP = Night patrols G = Genetics
SR-H	Sex ratio of hatchlings	
SR-HMethod	Method for evaluating SR-H: derived from laying and hatching dates (ID), from nest/beach temperatures (T) or assessed from blood sampling/hormone assay (BH). Enter one of the values from the list.	ID = Incubation Duration T = Nest/beach temperatures BH = Blood sampling/Hormone assay GH= Gonad histology
SR-BA	Sex Ratio of Breeding Adults. Ratio of the number of adult male and female turtles observed during the pre-nesting season gathering at sea near the nest site	
SR-BAMethod	Method for evaluating SR-BA. Enter one of the values from the list. Enter "G", in case SR-BA has been determined by identification of males from genetic characteristics and inferred from multi-paternity in clutches	UAV = UAV survey PS = Plane survey BS = Boat survey G = (Genetics - hatchlings)
Longevity	Reproductive longevity, determined with Capture-Mark-Recapture method (CMR), expressed in years.	
Remarks	Notes	

Table 13: DSs & DDs Module BT5 (Nesting and Demography) Marine habitat for IMAP CI 5 - Marine Turtles

Field	Description	List of value

CountryCode	Member country code as ISO two-letter country code(e.g. "IT" for Italy).	
AreaID	Survey Area code.	
Species	Species name, enter one of the values from the list.	CC = *Caretta caretta* CM = *Chelonia mydas*
Year_start	Sampling start year in YYYY format	
Month_start	Sampling start month in 1-12 format	
Day_start	Sampling start day in 1-31 format	
Year_end	Sampling end year in YYYY format	
Month_end	Sampling end month in 1-12 format	
Day_end	Sampling end day in 1-31 format	
Method	Survey methodology for gathering information. Enter one of the values from the list.	BS = Boat survey UAV = UAV/Plane survey BCS = Bycatch/Strandings
NumAdultMales	Number of males adults per session	
NumAdultFemales	Number of females adults per session	
NumAdultUndefined	Number of adults with undefined gender per session	
NumSubAdultMales	Number of subadults turtles males per session	
NumSubAdultFemales	Number of subadults turtles females per session	
NumSubAdultUndefined	Number of subadults turtles with undefined gender per session	
NumJuvenile	Number of juvenile turtles	
BycatchIncidence	Number of turtles captured bycatch	
MortalityBycatch	Mortality rate of individuals, resulting from the bycatch event, in percentage (0-100)	
MortalityTelemetry	Mortality rate of individuals identifiable by telemetry in percentage (0-100)	
MortalityCMR	Mortality rate of individuals identifiable by CMR (capture-mark-recapture) in percentage (0-100)	
StrandingIncidence	Number of turtles stranded	
MortalityStrandings	Percentage of dead stranded (0-100)	
Remarks	Notes	

Table 14: DSs & DDs Module BT5 (Nesting and Demography) Individual for IMAP CI 5 - Marine Turtles – The whole module has to be considered not mandatory but if filled in all the parameters are mandatory.

Field	Description	List of value
CountryCode	Member country code as ISO two-letter country code(e.g. "IT" for Italy).	
AreaID	Survey Area code.	
Species	Species name, enter one of the values from the list.	CC = *Caretta caretta* CM = *Chelonia mydas*
Year	Year of finding of the specimen in YYYY format	
Month	Month of finding of the specimen in 1-12 format	
Day	Day of finding of the specimen in 1-12 format	
ID_Specimen	Specimen identification code expressed as follows: CountryCode + Species + progressive number + year (e.g., ITCC012019 indicates the first turtle of the *Caretta caretta* species collected in Italy in 2019)	

Latitude	Latitude of finding of the specimen in the decimal degrees WGS84 reference system with at least 5 digits (xx.xxxxx).	
Longitude	Longitude of finding of the specimen in the decimal degrees WGS84 reference system with at least 5 digits (xx.xxxxx). Use negative values for coordinates west of the Greenwich Meridian (0°).	
Survey_type	Surveys typology to assess and sample sea turtles for health assessments. Enter one of the values from the list.	B = Bycatch C = CMR S = Stranding
CCL	Measure in cm of the Standard Curved Carapace Length (CCL) . CCL is the length measured from the notch at the anterior of the carapace to the tip of the last posterior marginal scute, usually measured to whichever scute is longer. (INDICIT – standard protocol Ingestion debris sea turtles – EN – Sept 2018; https://indicit-europa.eu/protocols/)	
Weight	Weight in kg of the specimen (2 decimal places)	
Gender	Specify the gender of the specimen if male female or Not determined. Insert one of the values of the list	M = Male F = Female ND = not detected or not determined
Maturation_stage	Maturation stage Insert one of the values of the list	A = Adult S = Subadult J = Juvenile
Injuries	Specify major injuries on the animal and/or any visible disease. Specify "None" if there are no injuries or are not visible. Enter one of the values from the list.	None Fracture Amputation Abrasion Disease Other
TissueID	Tissue for mixed stock analysis (MSA) or stable isotope analysis	
TAG_SatelliteID	Enter TAG or SatelliteID if exists	
Photo	Enter the name of the zip file containing all photos taken. The name of zip file is defined as follows ID_Specimen_<year>_<month>_<day>.zip.	
Remarks	Notes	