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Final Report of the Informal Online Working Group on Biodiversity and Non-Indigenous Species

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Athens, 2015

In accordance with the decision taken at the 4th EcAp Coordination Group meeting held in Athens in October 2014, an informal on line expert group on Biodiversity and Non-Indigenous Species (Biodiversity Working Group) was established by the contracting parties with the volunteer leadership of Greece, with support from the Secretariat.

Based on the specific recommendations of the ECAP Correspondence Group on Monitoring (**CORMON**) Biodiversity and Non-Indigenous Species (NIS), on Ecological Objectives 1 and 2 UNEP(DEPI)/MED WG.411/Inf.5), and on the specific Terms of References of the Biodiversity Working Group, the experts aimed to:

- address key outstanding issues which are necessary to start a quantitative monitoring of biodiversity in the region, noting the “de minimis” principle- ie the aim is to set the minimum common ground, which is applicable regionally and feasible to follow all over the region;
- deliver environmental and background assessment criteria based on data availability for some common indicators related to Ecological Objective 1 and 2;
- address sub-regional specifics and raise attention to data gaps, research needs and look at alternative, cost effective monitoring methodologies related to biodiversity and NIS monitoring

Following consultations and joint work, the on line group delivered the first report represented under. The report addresses the following issues:

- review the draft species and habitats lists;
- review the available data and other challenges in relation to biodiversity and NIS monitoring,
- address key outstanding issues which are necessary to start a quantitative monitoring of biodiversity in the region, noting the “de minimis” principle- i.e. the aim is to set the minimum common ground, which is applicable regionally and feasible to follow all over the region;
- address sub-regional specifics and raise attention to data gaps, research needs and look at alternative, cost effective monitoring methodologies related to biodiversity and NIS monitoring

The following points are reflecting the key discussions and recommendations formed by the Biodiversity Working Group.

Recommendations on the listed species / habitats

The Biodiversity Working Group discussed that there is the need of a common and short list of species and habitats for monitoring, along with their associated protocols, to ensure consistency in the biodiversity assessment in order to be applicable regionally and feasible to follow all over the region.

The Annex I (see excel file) includes the habitats and species lists proposed for biodiversity monitoring in the Mediterranean. These have been listed according to the following criteria:

- (a) Predominant habitat types covering both the seabed and water column habitats and including their associated biological communities (i.e. predominant habitats with a functional role such as habitat forming species; high representation in terms of abundance or covered area enabling the comparability between Contracting Parties)
- (b) Functional groups of species covering the birds, mammals, reptiles, and fish representing the main functional groups of highly mobile and regionally dispersed taxa;
- (c) EU - Habitats and Birds Directive lists and International Convention lists (Barcelona Convention, and ACCOBAMS relevant provisions, etc)
- (d) Commercial fish (GFCM relevant provisions)
- (e) Indicators that reflect the impact of human activities to the environment / sensitivity to human pressures;
- (f) Habitats or species already included in existing operational monitoring programmes (i.e. Water Framework Directive of the EU)

While the Integrated CORMON has agreed that there is already a scientifically valid list for biodiversity and NIS monitoring and assessment in the Mediterranean, it also recommended this list would need to be minimized, noting that in the Initial Phase of the Integrated Monitoring and Assessment Programme implementation. A de minimis approach was applied prioritising the monitoring to address the most significant risks and enable a cost-effective implementation all over the Mediterranean basin.

The Biodiversity Working Group, in line with the above, focused its work on developing a basis for a proposal on a minimum list of species and habitats to be monitored in the Initial Phase of the Integrated Monitoring and Assessment Programme (Initial Phase of IMAP).

The Biodiversity Working Group, while aiming to develop a minimum list of species and habitats for the Initial Phase of IMAP, took into account the specific recommendation of the Integrated CORMON to undertake the assessment of the most important pressures and the cost efficiency of monitoring.

The following analysis of potential list of habitats and species to monitor in the Initial Phase of the Integrated Monitoring and Assessment Programme” aims to lay down the foundations for this minimum list and as such is the main outcome of the Biodiversity Working Group’s April-July 2015 work, also in line with discussions during the SPA Focal Points Meeting in May 2015.

Rationale to the Analysis

In a major review work Coll et al., 2010 assessed overall spatial and temporal patterns of species diversity and identified major changes and threats of biodiversity in Mediterranean Sea. Habitat loss and degradation, followed by fishing impacts, pollution, climate change, eutrophication, and the establishment of alien species were shown as the most important threats and affect the greatest number of taxonomic groups.

Building on the above, a **pressure analysis** is performed (Annex I) aiming to identify the priority pressures list for each functional group and predominant habitat type, and thus to provide a mean to confirm which specific species and habitats to monitor within these broader groups which can best 'represent' both the broader group and the pressure. The most important pressures are listed for each biodiversity element. For example multiple stressors affect benthic habitats however some of them e.g. physical damage, eutrophication, etc. are listed as major stressors. The pressures which had the greatest overall impact on each of the habitat types and species were highlighted and this was based on the expert judgement of the relative importance of each pressure for each individual broad scale habitat type and species.

The **Texel-Faial** criteria are applied focusing on the major pressures caused by human activities and the most vulnerable ecosystem components (Annex I).

The **feasibility analysis** of monitoring for each element is also investigated, in order to further assist the development of the monitoring programme, which is cost effective. The table summarises monitoring requirements, approaches and techniques, existing indicators, and availability of long term data.

The rationale for prioritizing the biodiversity elements for the initial phase of monitoring considered the Texel-Faial criteria the Pressure Exposure and the Feasibility for monitoring. If the above conditions are met then = High priority = scoring as “1”. Otherwise the element is scored as 2 (lower priority for the initial monitoring phase). The results contributed to prioritise the assessment of a minimum list of biodiversity elements and finalise the list of specific species and habitats to monitor within broader groups, along a gradient of risk, which can best represent both the broader group and the pressure.

It is recommended the pressures to be further assessed and refined on specific species and habitats. Where there are several pressures per species and habitats it is also advised to have assessments against each pressure, possibly using different monitoring techniques in order to assess the different impacts. On this basis, the assessment focuses on a specific habitat/pressure or specific species/pressure interaction, in order to assess the scale of impact (spatial extent and intensity). This in turn led to the identification of the most appropriate monitoring technique in each case.

Climate change pressures were not considered, and further work is needed to revise the climate change categories (e.g. temperature changes, pH changes etc) during the Initial Phase of IMAP.

Specific recommendations

Remarkably dynamic species of NIS altering biodiversity and ecosystem functioning are recommended to be monitored. E.g. the Lionfish *Pterois miles* etc; and other key habitats modifying biodiversity i.e. *Caulerpa cylindracea*, *Lophocladia lallemandii*, and *Fistularia comersonii*.

It is also recommended to monitor fish biodiversity on the coastal fish assemblages (visual census was suggested), since these areas are beyond the data collecting area obtained from fisheries and to work further on this topic, in cooperation with GFCM, during the initial phase of IMAP. The proposed families for coastal fish are listed below:

| | |
|--------------|-------------------------|
| Coastal fish | Blenniidae |
| Coastal fish | <i>Epinephelus</i> spp. |
| Coastal fish | Gobiidae |
| Coastal fish | Labridae |
| Coastal fish | Serranidae |
| Coastal fish | Sparidae |

Specific recommendations on biodiversity assessment areas

It is recommended to focus monitoring and assessment activities on pressured areas and the marine protected areas, especially the SPAMIs – considered as the most well managed MPAs in the Mediterranean- in order to identify reference conditions and assess the management efficiency of the protected areas.

Specific recommendations regarding monitoring capacity

Regarding the monitoring data compilation from countries answers to UNEP/MAP request, the information extracted is too general, no geo-referenced, providing limited information on the existing operational or institutional monitoring in the Mediterranean (see excel file monitoring capacity).

Experts noted that more detailed information on the monitoring capacity can be found in the European projects DEVOTES and IRIS-SES. It has been also recommended to reform the questionnaires related to the monitoring capacity of biodiversity elements of the project IRIS-SES and send to the CPs.

Some recommendations, taking in account the inventory of IRIS-SES project on the monitoring capacity, highlighted that coastal areas in EU countries are better covered mainly for the WFD biological elements, while many other of the components commonly associated with marine biodiversity assessment and monitoring are not covered by operational monitoring systems (e.g. coastal fish, mammals etc). The offshore/open sea is poorly sampled as also the MPAs.

The PERSEUS project outcomes on the spatial coverage of oceanographic platforms (drifters, floats, gliders etc) and the under-sampled southern areas of the Mediterranean Sea were discussed.

Specific recommendations regarding indicators

A set of biotic and multimetric indices for benthic macroinvertebrates (zoobenthos), angiosperms and macroalgae, already used in the implementation of WFD, tested and validated to discriminate the GES/ no GES in the MED GIG exercise have been proposed. The benthic biotic indices can be applicable in a wider scale and type of habitats, and are sensitive to changes due to anthropogenic pressures, such as eutrophication and dredging/dumping. Indices based on coralligenous assemblages are also developed in the framework of CIGESMED project.

Most current advances on methods for an integrative biodiversity assessment have been mentioned, such as the Baltic Sea-HELCOM Indicator based Tool for the assessment of Biodiversity Status (BEAT-2) developed under DEVOTES and HARMONY projects (Andersen et al., 2014) or the Marmoni Biodiversity Assessment Tool (<http://www.sea.ee/marmoni/index.php>). However a large set of methods for Biodiversity Integrated assessment are compiled within SCALES & DEVOTES projects (Borja et al., 2014).

Specific recommendations regarding data availability

The lack of appropriate broad Mediterranean spatial datasets for most species and habitats has been stressed.

It was recommended to further build on data of the:

- EU SeaMap which recently produced seabed habitat mapping of European seabed including the western part of the Mediterranean and EUSeaMap2 that has the objective of updating the western Med map and producing the modelled benthic habitat for all the Mediterranean and the Black Sea and that is expected to be completed in 2016.
- The products of the EmodNet MedSea Checkpoint map key biodiversity elements in MPAs in the Mediterranean (also expected to be completed in 2016).
- The LifeWatch biodiversity database is now fast evolving in support of the research infrastructure needed for biodiversity assessment and monitoring in Europe.

Specific recommendations and discussion on the need for a Coordinating Body for Biodiversity research, consultancy and sustainable use in the Mediterranean Sea

The seascape of the important players on the sustainable use and exploitation in the Mediterranean seems to be fragmented across many levels of the geopolitical administration: from local and national to international bodies, among which there exists only little coordination and collaborative effort. Local, regional (within countries) and national authorities in the northern countries deal with the implementation of the EU Directives, relevant to the biodiversity sustainable exploitation whereas in the southern ones the same authorities deal with the state's Acts and Laws.

At the international levels, EU authorities and the UNEP/MAP Barcelona Convention Secretariat take the lead, with many organizations to be kept involved in synergies on the field of the sustainable use of the marine biodiversity such as CIESM (<http://www.ciesm.org/about/index.htm>), FAO (<http://www.fao.org/home/en/>), GFCM (<http://www.gfcm.org/gfcm/about/en>), next to UNEP (and UNEP/MAP) (<http://www.unep.org/> and <http://www.unepmap.org>), and other relevant organizations, such as IUCN, ACCOBAMS and MedPan. Each of these international, regional organizations have their own mission and mandate and defines the field of its action, accordingly.

Between the various bodies, who deal with marine biodiversity, action on the implementation of the international, regional and national legislation and planning is not easy to be coordinated and successfully implemented.

The Biodiversity Working Group experts suggested that there is a key need for one regional organization with clear specific mission on the coordination of the scientific knowledge, to support through its consultancy the implementation of the relevant legislation on marine biodiversity use to the Mediterranean Sea.

From a scientific point of view, an ideal model for such an organization would be that of the ICES (<http://www.ices.dk/explore-us/who-we-are/Pages/Who-we-are.aspx>), with a clear vision and implementation plan on the field, backed up by the Convention on the Biological Diversity and the Barcelona Convention, and with signatory countries to shoulder responsibility for its development, functioning and performance, including funding.

One can propose many ways to reach to this point: (a) the Mediterranean countries individually joining ICES as full members thus to collaboratively establish MICES (the Mediterranean node of ICES, following the model of PICES in the Pacific); (b) establishing a new organization, which can undertake this huge task to coordinate effort made by all international and national organizations and develop collaborative plan of work, funded by the signatory countries, (c) choose one of the existing international/regional organizations listed above, to play this role (possibly CIESM); noting that this would imply profound changes in the organization's current mission and mandate.

In line with the above, the Biodiversity Working Group recommends that the UNEP/MAP Barcelona Convention Secretariat explores further the possibilities on how to strengthen biodiversity related research and scientific knowledge in the Mediterranean, in close cooperation with other relevant regional and international bodies, during the Initial Phase of IMAP.

Key topics of discussion

The Working Group laid down the basis of the minimum list with the attached Analysis and aimed to address the following key questions:

- a. Where there are several pressures per species/habitat (e.g. Seagrass meadows, *Sterna* spp.), would the Focal Points advise having assessments against each pressure (possibly using different monitoring techniques/data needs to assess the different impacts) or are some more important than others?
- b. Can the pressures to be assessed be further refined on one or two example habitats (e.g. one for seabed, one for water column)? Similarly for fishing.

- c. Does the bottom fishing (removal by fishing) pressure lead to physical damage to the seabed and should be removed from the assessment for benthic habitats and addressed by physical damage category?
- d. Can this prioritisation lead to a more specific monitoring technique to be used?
- e. Is this list feasible to prioritise for monitoring?
- f. Are the proposed monitoring elements sufficient to guide progress towards the achievement of the EOs?

Annex I: Analysis of priority list of habitats and species to monitor in the Initial Phase of the Integrated Monitoring and Assessment Programme

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