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## MEDITERRANEAN ACTION PLAN

Integrated Correspondence Groups of GES and Targets Meeting

Athens (Greece), 17-19 February 2014

### Working document on Common Indicators for the Mediterranean



## **Working document on Common Indicators for the Mediterranean**

The current working document, revisiting the Information document on the EcAp process<sup>1</sup>, delivered to COP18, aims to build further on the process and definitions under EcAp described, while specifying further the concept of common indicators and guide discussions at the Integrated Correspondence Groups Meeting (**Integrated CORGEST**, 17-19 February) and clarify future proposed steps, in the EcAp Roadmap.

The Ecosystem Approach Roadmap (**EcAp Roadmap**), as agreed at the 18<sup>th</sup> Conference of the Parties, in Istanbul, 3-6 December, 2013 (COP18)<sup>2</sup> is following up on the hard work of colleagues in the three sub-clusters and as such, envisions the current biennium to focus on the development of an Integrated Monitoring and Assessment Programme.

Following other Regional Seas Conventions (**RSCs**) practices, the first step towards this, is the establishment of common indicators, to prepare and implement a cost effective integrated monitoring programme of marine quality environment with the view to assess if GES and respective targets have been achieved.

The monitoring experts (CORMON Groups, to start their work in April) will be able to proceed thanks to the agreement on these common indicators, focusing their work first on these core areas, identifying for these the specific monitoring parameters (specific purpose of the indicator for monitoring purposes, such as assess level of pressure or impact or state, specific elements to be monitored and parameters to be measured, scope of monitoring for the indicator, next to data processing methodologies).

As described in the COP18 Information Document on the EcAp process, this does not mean that any of the other agreed indicators or in some cases EOs will be left behind, but these will be gradually introduced for the experts, based on their further maturing.

As a first step towards this, during our Integrated CORGEST Meeting both GFCM and Accobams will present to the CORGEST experts relevant developments regarding EO3 and EO11 and the Secretariat will also present a specific proposal regarding EO8.

Based on the EcAp process COP18 Information Note, it is foreseen that the whole list of Indicators, GES and Targets will be revisited by COP19 and further adjusted, both based on the work of the CORMON groups, which will also provide important information on their feasibility, but also based on developments in science and work of other regional/international bodies regards the less matured indicators or EOs. This is the reason why it is important that both during this Integrated CORGEST meeting and during the upcoming CORMON meetings experts will have the opportunity to give recommendations towards these indicators/EOs, which will enable the EcAp Coordination Group to address them in line with the experts recommendations.

The aim of our Integrated CORGEST meeting today thus is (a) to agree on a list of common indicators, with which establish a solid basis for the work of the CORMON groups and (b) to give recommendations on those EOs/indicators, which are not mature enough yet, but scientific developments, work in other International Bodies would suggest to include them already in early discussions.

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<sup>1</sup> UNEP(DEPI)/MED IG.21/Inf.5

<sup>2</sup> UNEP(DEPI)/MED IG.21/9

The Secretariat proposed definition, in line with the above and relevant practices of other RSCs, for the **Common Indicator** is as follows: *In the context of the Barcelona Convention a common indicator is a measure that summarizes data into a simple, standardized and communicable figure and is ideally applicable in the whole Mediterranean basin, but at least on the level of sub-regions and shall be monitored by all contracting parties. A common indicator is able to give an indication of the degree of threat or change in the marine ecosystem and can deliver valuable information to decision-makers.*

The common indicators under have been proposed by the Secretariat taking into account practices of other RSCs and on the basis of experience already gained by the Contracting Parties through their regular MED POL monitoring activities as well as the experience gained by EU Mediterranean countries through their implementation of EU Directives such as the Marine Strategy Framework Directive, the Water Framework Directive and the “nature Directives” (Habitats and Birds Directives).

This experience is outlined under each of the proposed common indicators, as well as the possible methodologies, where available, that can be a basis for the future CORMON groups work, to address these indicators and determine reference conditions, baselines and thresholds and other specifics, that could be assessed in the process of developing methodological guidelines in the framework of the MAP ECAP process. Where possible, information on appropriate indicators developed or in the process of being developed by other Regional Seas Conventions is provided in the Information document UNEP(DEPI)/MED WG.390/Inf.3 which summarizes the analysis of the Secretariat on the topic.

**I. Secretariat’s Proposed List of Common Indicators (based on the Analysis below and also as described in the Table of Annex I of this document)**

**EO1:**

**Common Indicator 1: “Habitat distributional range”**

Scientific literature shows that this indicator has been assessed by some Mediterranean countries. The need for further development to specify spatial and temporal resolution has been underlined as well as the need for extensive mapping. The distribution of EUNIS habitat types (number, spatial limits, depth limits) has been considered.

EU guidelines<sup>3</sup> (Habitats Directive Guidelines) developed for the implementation of Article 17 of the EU Habitats Directive<sup>4</sup> provide guidance on how to estimate the habitat distributional range and favorable reference range of a habitat. This information may be useful as a basis to develop MAP guidelines for this indicator under ECAP.

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<sup>3</sup> European Commission, 2006. Assessment, monitoring and reporting under Article 17 of the Habitats Directive: Explanatory notes & guidelines. European Commission, Brussels. 64pp + 3 Appendices.  
[http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats\\_reporting/reporting\\_2001-2007/guidlines\\_reporting&vm=detailed&sb=Title](http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats_reporting/reporting_2001-2007/guidlines_reporting&vm=detailed&sb=Title)

<sup>4</sup> Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, available with its amendments, both in EN, FR, ES at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:01992L0043-20070101:EN:NOT>

### **Common Indicator 2: *Condition of the habitat's typical species and communities***

Scientific literature shows that this is one of the best analyzed indicators by several Mediterranean countries as it refers directly to species or communities. This indicator has been considered as highly pertinent for both pelagic and benthic habitats, though important methodological development may still be needed. The link with the Ecological Objectives/MSFD<sup>5</sup> Descriptors 6 and 4 is highlighted. It has been suggested that the following elements may need to be adapted to this indicator: the biotic index from the WFD<sup>6</sup>, the specific composition and the specific abundance parameters for benthic habitats. The other possible parameters could be biomass and specific trophic level. The spatio-temporal variation of structural descriptors of *Posidonia oceanica* meadows has been considered. Benthic macrofauna communities have been considered, with reference to the WFD methodologies for the classification of benthic communities, in relation with Ecological Objective/ MSFD Descriptor 6. The abundance of perennial seaweeds has also been considered.

Habitats Directive Guidelines provide guidance on how to define typical species and rough guidelines on how to monitor and assess their condition (e.g. best expert opinion, general national surveys, site-based sampling or reuse information from red data book work) for the Habitats Directive. It does not include any guidance on how to set favorable reference values for their condition. This information may be useful as a basis to develop MAP guidelines for this indicator under ECAP.

### **Common Indicator 3: *Species distributional range***

The scientific literature shows that several Mediterranean countries report a lack of data at the indicator level. The need for further development to specify spatial and temporal resolution has been underlined. The methodologies undertaken include using the spatial or spatio-temporal pattern of different diversity indices of macroalgae, benthic invertebrates and fish as a proxy for species distribution changes, the distribution size and the number of breeding colonies for seabirds, and the presence or absence trends for demersal species of fish.

Habitats Directive Guidelines provide guidance on how to estimate range of species and how to set favorable reference range. Although they are explicitly not limited to protected areas their applicability out of the protected areas and the specific species concerned needs to be evaluated and/or developed. Furthermore, the favorable reference range may not necessarily be the same with the one required to achieve good environmental status. The information may be useful however as a basis to develop MAP guidelines for this indicator under ECAP.

### **Common Indicator 4: *Population abundance of selected species (of marine mammals, seabirds, marine reptiles, marine macroalgae, zoobenthos, fish)***

This indicator is generally well developed by several Mediterranean countries. Detailed analyses by taxonomic structures have taken into consideration: species number, abundance, coverage, diversity index, density and biomass of the populations. This indicator has been considered as useful for mobile species, but further methodological development may be needed as the spatial and temporal resolution may still need to be specified. Marine

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<sup>5</sup> Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), available both in EN, FR, ES: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0056:EN:NOT>

<sup>6</sup> Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, available both in EN, FR, ES: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:EN:NOT>

mammals have been considered, including the population of the monk seal *Monachus monachus*, as well as seabirds (census of colonies), fecundity of the marine turtle *Caretta caretta*, demersal species of fish average abundance (number/biomass stratified indices), the abundance of macroalgae (% of coverage), and of zoobenthos (individuals per sample).

Habitats Directive Guidelines provide guidance on how to estimate the size (abundance) of a population and the favorable reference population. Although they are explicitly not limited to protected areas their applicability out of the protected areas and the specific species concerned needs to be evaluated and/or developed. Furthermore, the favorable reference population may not necessarily be the same with the one required to achieve good environmental status. A description of the methods that were included in the Commission Decision 2008/915/EC<sup>7</sup> can be found in the technical report of the WFD 1st intercalibration phase (Carletti & Heiskanen, 2009<sup>8</sup>). Such information may be useful as a basis to develop MAP guidelines for this indicator under ECAP.

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

This indicator has been considered as highly pertinent for mobile species. Information is available for a number of Mediterranean countries. This includes information on population size, age, fertility rates, mortality, the survival rate of *Posidonia oceanica* meadows, demographic characteristics of marine reptiles (length, spawning rate, mortality rate), marine mammals (social structure, reproduction, growth, diet, predators, migrations and acoustic behavior), seabirds (reproductive success, survival rate, introduced predators, capture in fishing gear, light disorientation) and fish.

**EO2:**

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

This indicator has been considered by several Mediterranean countries, more than any of the other indicators for this EO. This indicator is however still under methodological development as metrics, parameters, spatial and temporal resolution need to be specified. It has been suggested to follow the vectors of introduction instead of the NIS themselves, as it is easier from a methodological point of view. This would require a better knowledge of introduction vectors. A number of countries have chosen to focus on the identification of major vectors facilitating the spread of alien species, and proposed the development of a sampling network which would cover large spatial scales. The information provided concerns trends and ratios, some comprehensive spatial and temporal distribution for a limited number of species or the cumulative number of NIS, including date and location data. The need for further development of the GES status for this indicator has been underlined.

To the best of our knowledge there are no methods or guidelines currently available within the framework of European or international conventions.

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<sup>7</sup> Commission Decision of 30 October 2008 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, available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>

<sup>8</sup> Carletti A and Heiskanen A.S., 2009. Water Framework Directive intercalibration technical report - Part 3: Coastal and Transitional waters. EUR 23838 EN/3  
[http://publications.jrc.ec.europa.eu/repository/bitstream/11111111/10473/1/3010\\_08-volumecoast.pdf](http://publications.jrc.ec.europa.eu/repository/bitstream/11111111/10473/1/3010_08-volumecoast.pdf)

The scientific literature indicates that there is a database for marine non-indigenous species for the Mediterranean Sea managed by CIEM. Additionally, there are national marine databases as well as other national databases that include marine and non marine species. These databases may be useful for targeting monitoring and assessment activities.

#### **EO5:**

#### **Common Indicator 7: *Concentration of key nutrients in the water column***

This indicator has been considered by a good number of Mediterranean countries, and is well documented for nitrogen and phosphorus. Silicate concentrations are also mentioned. Reference has been made to the WFD parameters by EU Member States, which would however need to be adapted to offshore conditions. Data for this indicator have been generated by a number of Contracting Parties for the purpose of the MED POL Phase IV eutrophication monitoring programme. The parameters monitored include NO<sub>3</sub>, NO<sub>2</sub>, NH<sub>4</sub>, PO<sub>4</sub> (or Total N, Total P) and SiO<sub>4</sub> (occasionally). Additional data generation for MED POL in terms of additional parameters to address this indicator would not be required. However the existing geographical coverage in terms of contribution of monitoring data by Contracting Parties for this indicator would need to be improved.

Some reference points have already been suggested in the literature; however their seasonal and regional scales have not been specified. MED POL has already made some preparatory work to provide initial background information on methodologies for the establishment of threshold values for eutrophication (UNEP(DEPI)/MED WG.365/Inf.7). This work would need to be further discussed during national expert meetings organized by MAP MED POL during 2014-2015.

#### **Common Indicator 8: “*Chlorophyll-a concentration in the water column*”**

This indicator has been considered by a good number of Mediterranean countries. This includes inter alia the Chlorophyll-a concentration, measured in winter and in early spring (November–March) when phytoplankton bloom occurs following the deep winter mixing (<0.1 µg/l), data from a 25 meters top layer and /or surface data and satellite imagery to identify hotspots (different productivity areas). It has been mentioned that, for this indicator, the existing WFD parameters adopted by EU Mediterranean countries would need to be adapted to offshore conditions. Data for this indicator have been generated by a number of Contracting Parties for the purpose of the MED POL Phase IV eutrophication monitoring programme. The existing geographical coverage in terms of contribution of monitoring data by Contracting Parties for this indicator would need to be improved.

For a wider sub-regional and regional scale, it is possible to assess the actual condition for chl-a concentrations using satellite images. These values could then be used as reference conditions for any subsequent GES monitoring based on trends.

Some reference points have already been suggested in the literature; however their seasonal and regional scales have not been specified. MED POL has already made some preparatory work to provide initial background information on methodologies for the establishment of threshold values for eutrophication (UNEP(DEPI)/MED WG.365/Inf.7). This work would need to be further discussed during national expert meetings organized by MAP MED POL during 2014-2015.

**EO7:****Common Indicator 9: *Extent of area affected by permanent alterations***

In proposing this common indicator an important point to note that many countries, including those that have undertaken an assessment of this indicator do not have the same interpretation of the scope of the corresponding Ecological Objective/MSFD Descriptor and especially of the definition of “permanent alteration of hydrographical conditions”. By definition the term hydrography is meant to include depth, tidal current and wave characteristics of marine waters, including the topography and morphology of the seabed. This indicator is thus considered to correspond most closely to the definition of hydrographical conditions. However the features assessed by countries have varied from coastline artificialization and its impacts on the habitats, to hydrologic condition data (temperature, salinity, currents), hydrological modifications of coastal rivers inputs, the WFD quality descriptor “dissolved oxygen”, or other hydrological quality elements from the WFD as well as, and perhaps more pertinent to this Ecological Objective as a whole by definition, the physical pressures on the marine environment for example constructions, aquaculture cages or wind turbines.

This indicator is considered to be closely linked to the biodiversity indicators reflecting habitat condition in as much as it may bear a reference to the extent of area of habitat affected, as well as to the Ecological Objective on seafloor integrity to be developed at a later stage of the ECAP process.

**EO8:****Common Indicator 10: *Length of coastline subject to physical disturbance due to the influence of man- made structures***

It may be considered that this proposed common indicator also integrates features of the indicator related to coastal erosion occurring as a result of human interventions.

**EO9:****Common Indicator 11: *Concentration of key harmful contaminants measured in the relevant matrix (biota, sediment, seawater)***

This indicator corresponds to the traditional MED POL monitoring programme and to most of the available methodologies and data of any other indicator under the Ecological Objective 9, for a good number of Mediterranean countries. The information reported by countries for the assessment of this indicator ranges from heavy metals and petroleum hydrocarbons only, to 3 groups of contaminants in water, sediment and biota: Synthetic contaminants (PAHs, PCBs, DDTs and Drins), non -synthetic: pollutants (Cd, Pb, Cu, Zn, Hg) and petroleum hydrocarbons and radionuclides: (137 Cs), which allow comparability with the assessments under Directive 2000/60/EC, and contaminants included in the EU EQS Directive.

**Common Indicator 12: *Level of pollution effects of key contaminants where a cause and effect relationship has been established.***

Although there are many methods to measure pollution effects on organisms, there are not many contaminant-specific techniques that allow to measure responses within marine organisms to the exposure of specific contaminants. The most widely used specific technique is the measurement of TBT effects (imposex) on gastropods, where a cause and effect relationship has been established. Therefore, for the time being, it will not be possible to define thresholds in relation to effects, using a quantitative approach, for other



contaminants. There is a possibility to use available information for TBT thresholds from other regions in order to propose similar effects thresholds for the Mediterranean. And there is a need to develop and test more contaminant-specific techniques. Such work should be the objective of expert group meetings organized by MAP during 2014-2015.

Data for biological effects monitoring have been generated for the MED POL Phase IV contaminants monitoring programme, involving the biomarker "lysosomal membrane stability". Outside of the MED POL biological effects monitoring activities, ecotoxicological tests are performed by a small number of Mediterranean countries. Tested organisms include *Mullus barbatus* and *Mytilus edulis*. The methods consider the following biomarkers: EROD activity, lysosomal membrane stability, stress on stress, acetylcholinesterase activity, metallothionein content, frequency of micronuclei occurrence. It has been mentioned that the "imposex" indicator for the biological effect of TBT is not suitable for the French Mediterranean Sea, and is operational only in coastal areas.

**Common Indicator 13: 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)**

Acute pollution events (oil spills) are followed and recorded in the framework of the Prevention and Emergency Protocol, 2002 by the MAP Regional Marine Pollution Emergency Centre (REMPEC), which is also reviewing the maritime traffic in the Mediterranean providing information on routine operations. REMPEC has data on shipping accidents that caused oil or HNS pollution in the Mediterranean or were likely to cause it.

Moreover, in the field of scientific assistance for oil spill drift forecast, during the last few years, REMPEC developed a strong relationship with the Mediterranean Operational Oceanographic Network (MOON) with regard to operational use of forecasting and backtracking system for oil spills based on meteo oceanographic observations and models.

REMPEC and MOON have also signed a co-operation agreement to formalise their working relationship and define the type of common activities to be implemented.

**Common Indicator 14: Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood**

The literature shows that this indicator is considered by a good number of Mediterranean countries, although its coverage is subject to data availability. The information reported by countries for the assessment of this indicator includes concentrations of heavy metals (Pb, Cd and Hg) in fish tissues, heavy metals and different persistent organic pollutants according to EU regulations with partial availability of data for regulated substances, contaminants data on a wide variety of marine commercial species, and trends of bioaccumulation in the biota and functional groups used as bio-indicators (*Mytilus galloprovincialis* and *Mullus barbatus/Boops boops*, respectively). Some monitoring programmes still need improvements to provide an appropriate assessment. No corresponding data has been collected under MED POL Phase IV.

**Common Indicator 15: *Percentage of intestinal enterococci concentration measurements within established standards***

This indicator corresponds to traditional MED POL compliance monitoring for water quality in bathing waters, addressing operational objective 9.5 (Water quality in bathing waters and other recreational areas does not undermine human health). MED POL compliance monitoring also includes monitoring intestinal enterococci in shellfish growing waters. National legislation and regional agreements define the level of pathogenic microorganisms in bathing and shellfish growing waters, which is considered safe for bathing or for seafood production. The values agreed for the Mediterranean region in COP 17 (2012) (Decision IG.20/9 Criteria and Standards for bathing waters quality in the framework of the implementation of Article 7 of the LBS Protocol could be used for this indicator.

**EO10:**

**Common Indicator 16: *Trends in the amount of litter washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution and, where possible, source***

Marine litter monitoring has not been part of the MED POL monitoring programme, therefore there is no organized data submission from the Contracting Parties regarding this indicator. However a Regional Plan on Marine Litter has been adopted by the Contracting Parties. The literature shows that beach cleaning (and litter recording) campaigns are implemented in many EU Mediterranean countries on specific sites. Although this information is useful, it does not replace a well-coordinated monitoring programme.

Technical Recommendations for the Implementation of MSFD Requirements in order to address this indicator have been prepared by the MSFD WG GES subgroup on marine litter. This information may be useful as a basis to develop MAP guidance for this indicator under ECAP.

**Common Indicator 17: *Trends in the amount of litter in the water column including microplastics and on the seafloor***

Marine litter monitoring has not been part of the MED POL monitoring programme, therefore there is no organized data submission from the Contracting Parties regarding this indicator. However a Regional Plan on Marine Litter has been adopted by the Contracting Parties. The literature shows that data on the amount of marine litter in the water column and on the seafloor, when they are available, come from few monitoring programmes, from specific research projects, from programmes coordinated by NGOs, or from the MEDITS campaigns, which allow data collection on seafloor litter.

Technical Recommendations for the Implementation of MSFD Requirements in order to address this indicator have been prepared by the MSFD WG GES subgroup on marine litter. As regards microplastics, in the framework of the preparation of EU guidelines on the monitoring of marine litter, protocols and quantification methodologies are under development for sandy beaches and are already available for surface sampling. Such information may be useful as a basis to develop MAP guidance for this indicator under ECAP.