

ACTION PLAN CONCERNING SPECIES INTRODUCTIONS AND INVASIVE SPECIES IN THE MEDITERRANEAN SEA



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For bibliographic purposes, this document may be cited as

UNEP/MAP - SPA/RAC, 2016. Action Plan concerning Species Introductions and Invasive Species in the Mediterranean Sea. Ed. SPA/RAC, Tunis: 16 pp + Annex

Cover photo

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This publication has been prepared with the financial support of the MAVA Foundation.

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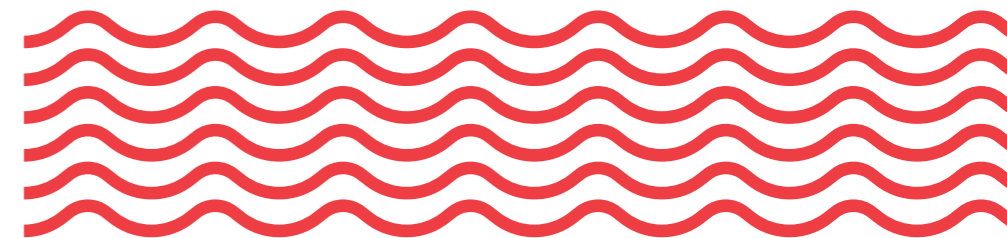




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1. INTRODUCTION

In 1975, 16 Mediterranean countries and the European Community adopted the Mediterranean Action Plan (MAP), the first-ever Regional Seas Programme under UN Environment's umbrella. In 1976 these Parties adopted the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention). Seven Protocols addressing specific aspects of Mediterranean environmental conservation complete the MAP legal framework.

In 1995, the Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean (MAP Phase II) was adopted by the Contracting Parties to replace the Mediterranean Action Plan of 1975. At the same time, the Contracting Parties adopted an amended version of the Barcelona Convention of 1976, renamed Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.

Currently, MAP has been adopted by 21 countries bordering the Mediterranean Sea, and the European Union. The 22 Contracting Parties to the Barcelona Convention give priority to the conservation of the marine environment and to the components of its biological diversity. This has been confirmed on several occasions, particularly by the adopting (Barcelona, 1995) of the new Protocol concerning specially protected areas and biological diversity in the Mediterranean (SPA/BD Protocol) and of its Annexes.

The SPA/BD Protocol invites the Contracting Parties to take "all appropriate measures to regulate the intentional or non-intentional introduction of non-indigenous or genetically modified species into the wild and prohibit those that may have harmful impacts on the ecosystems, habitats or species" (Article 13.1).

For established alien¹ species, the SPA/BD Protocol stipulates that "the Parties shall endeavour to implement all possible measures to eradicate species that have already been introduced when, after scientific assessment, it appears that such species cause or are likely to cause damage to ecosystems, habitats or species" (Article 13.2).

The Convention on Biological Diversity calls on in its Article 8 (h) each Contracting Party, as far as possible and as appropriate "to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species". In the tenth meeting of the Conference of the Parties, held from 18 to 29 October 2010, in Nagoya, Aichi Prefecture, Japan, a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period, was adopted. According to Aichi Target 9, "By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment."

Aichi Target 9 is reflected in Target 5 of the EU Biodiversity Strategy (European Commission COM/2011/244). Furthermore, the new EU Regulation (No 1143/2014) on the prevention and management of the introduction and spread of invasive alien species is a dedicated instrument to mitigate the impacts of biological invasions in Europe. The European Commission, European countries, and their relevant authorities will have, under the new EU legislative instrument, obligations and commitments in respect to invasive alien species

¹ Synonym of 'non-indigenous'. The term alien is adopted herein as it is the term currently mostly used by the scientific community and recent legislation (e.g. the new EU Regulation No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species)





(IAS). These include prioritising pathways for prevention, identifying the most harmful species for responses (list of species of EU concern), enforcing effective early warning and rapid response mechanisms for the IAS of EU concern, eradicating such species at an early stage of invasion, and taking management measures for IAS that are widely spread. In addition, the EU Marine Strategy Framework Directive (2008/56/EC) recognises alien marine species as a major threat to European biodiversity and ecosystem health, requiring Member States to consider them when developing strategies so that all European Seas reach Good Environmental Status by 2020. The European Alien Species Information Network (EASIN)² was launched in 2012 by the European Commission to facilitate the exploration of existing alien species information and to assist the implementation of the new Regulation and the other EU policies on biological invasions.

The trend of new introductions of alien species in the Mediterranean has been increasing. About 1000 marine alien species have been reported in the Mediterranean Sea up to now, of which more than half are considered established³. Many of these species have become invasive with serious negative impacts on biodiversity, human health, and ecosystem services.

There are many routes and mechanisms by which new alien species arrive in the Mediterranean Sea. Identification and assessment of the pathways of introduction is essential for predicting future trends of new introductions, identifying management options to mitigate invasions and to prevent new introductions, and communicating related risks and costs to policy makers and high level administration. Among the many important pathways by which human actions have introduced alien invasive species into the Mediterranean Sea are shipping (by means of ballast waters and hull fouling), corridors, maritime transport and water ways, aquaculture, trade in live marine organisms (aquarium trade and fishing bait) and others (e.g. fishing activities and aquarium exhibits). Other additional factors such as global warming may enhance alien species to spread in the Mediterranean.

In the Mediterranean Sea, despite the variability in monitoring and reporting effort among countries and the gap in our knowledge of alien species distribution, there is an enormous amount of information scattered in various databases, institutional repositories, and the literature. By harmonizing and integrating information that has often been collected based on different protocols and is distributed in various sources, the needed knowledge basis to assess the distribution and status of marine alien species can be built.

Elaborating and implementing action plans to confront the threats to biological diversity is an effective way of guiding, coordinating and stepping up the efforts made by the Mediterranean countries to safeguard the region's natural heritage. The invasive alien species, including as a side effect of climate change, are seen as being among the main threats to marine biodiversity in the Mediterranean. The adopted Ecosystem Approach (EcAp)⁴ to management of human activities with a view to conserve natural marine heritage and protecting vital ecosystem services recognises that to achieve good environmental status "non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem". It is imperative to take immediate steps to prevent the introduction of alien species, control the spread of those already introduced and endeavour to mitigate the damage they cause to the marine ecosystem including through national actions as well as regional and international

² <http://easin.jrc.ec.europa.eu/>.

³ Zenetos et al. (2012). Alien species in the Mediterranean Sea by 2012. A contribution to the application of European Union's Marine Strategy Framework Directive (MSFD). Part 2. Introduction trends and pathways. *Mediterranean Marine Science* 13(2): 328–352.

cooperation ensuring the availability of means of implementation inter alia capacity building, technology transfer, on mutually agreed terms and financing. The present Action Plan is being elaborated on the basis of the existing regional and international policies on invasive species data available; it will be adapted and updated, if necessary, to reflect the latest policies and new data available.

The actions advocated by the present Action Plan are to be carried out over a five year period, starting from when the Action Plan is adopted by the Contracting Parties. At the end of this period, SPA/RAC will prepare a report on the progress so far made in implementing the advocated actions, and will submit this to the National Focal Points for SPAs, who will make follow-up suggestions to the Parties.

Considering the world-wide scope of the issue of alien species introduction, it is important that the implementation of the present Action Plan be done in consultation and collaboration with the initiatives undertaken in this field in other regions and/or by other international organisations.

2. OBJECTIVES OF THE ACTION PLAN

The main objective of the present Action Plan is to promote the development of coordinated efforts and management measures throughout the Mediterranean region in order to prevent as appropriate, minimize and limit, monitor, and control marine biological invasions and their impacts on biodiversity, human health, and ecosystem services, particularly by:

- strengthening the capacity of the Mediterranean countries to deal with the issue of alien species, within the framework of the EcAp;
- supporting a regional information network for the efficient exploitation of alien species data and to support the regional policies on biological invasions;
- further developing MAMIAS, an online platform for the collection, exploitation, and dissemination of information on marine biological invasions in the Mediterranean Sea to support relevant regional and international policies;
- strengthening the institutional and legislative frameworks at the level of the countries of the region;
- conducting baseline studies and establishing monitoring programmes, within the framework of the EcAp Integrated Monitoring and Assessment Programme,

⁴ The 15th Meeting of the Contracting Parties to the Barcelona Convention (COP15) decided (through Decision IG.17/5) to progressively apply the ecosystem approach (EcAp) to the management of human activities that may affect the Mediterranean marine and coastal environment for the promotion of sustainable development. The 17th Meeting of the Contracting Parties to the Barcelona Convention (COP17) confirmed the importance given to the EcAp in the Mediterranean, and agreed (through⁵ Decision IG.20/4) on an overall vision and goals for EcAp, on 11 ecological objectives, operational objectives and indicators for the Mediterranean, adopted the timeline for implementing the ecosystem approach until 2019 and established a six-year cyclic review process of its implementation, with the next EcAp cycle to cover 2016-2021.

At the 18th Meeting of the Contracting Parties to the Barcelona Convention (COP18), targets for achieving Good Environmental Status of the Mediterranean Sea and its coastal zone by 2020 were adopted. In addition, through Decision IG. 21/3 (the so called "COP18 EcAp Decision"), the Contracting Parties agreed to design an Integrated Monitoring and Assessment Programme by the next Meeting of the Contracting Parties (COP19), and mandated the Secretariat to carry out an assessment of the state of the Mediterranean environment in 2017.



to collect reliable and pertinent scientific data that can be used for decision-making where necessary;

- setting up mechanisms for cooperation and the exchange of information among the Mediterranean countries;
- Elaborating guidelines and any other technical documentation.

3. PRIORITIES

3.1. At national level

Considering the lack of the data and knowledge necessary for impact and risk assessments, horizon scanning, and the implementation of management actions for prevention, control and eradication, priority at national level should be given to:

- encouraging all necessary actions (e.g. research work, data collection, monitoring, national impact assessments, horizon scanning etc.) aimed at improving the available knowledge;
- conducting baseline studies and establishing monitoring programmes to collect reliable and pertinent data on the distribution of alien species in the territorial waters;
- coordinating the actions that are necessary for the regular provision of essential information for the national and Mediterranean-wide reference lists of alien species;
- supporting, through the provision of essential information, the 'Marine Mediterranean Invasive Alien Species'(MAMIAS) database and online platform, which will include Mediterranean-wide national lists of alien species, including information on their taxonomic classification, ecology, biology, habitats, and impacts on biodiversity, human health, and ecosystem services;
- encouraging the implementation of scientifically-backed regionally-harmonised measures of prevention and control in particular for the high risk pathways of Non Indigenous Species (NIS);
- developing training and raising awareness programmes on risks, legal issues, best practices, and management actions for prevention and mitigation of impacts.

It is understood that the Parties will follow national procedures in implementing these priorities.

3.2. At regional level

Considering the breadth and complexity of the issue of alien species introduction, the large amount of relevant information that remains scattered in various databases and repositories, and the need for harmonization and integration of alien-species data, priority at regional level should be given to:

- coordinating, supporting, and updating the 'Marine Mediterranean Invasive Alien Species' (MAMIAS) database and online platform;
- creating an active network of partners within the framework of MAMIAS for the continuous updating of the database and the early warning in case of new records of invasive species;
- linking MAMIAS to other international networks, such as the European Alien Species Information Network (EASIN), increasing its visibility and use for the support of international policies on the management of alien invasive species;
- elaborating and adopting at regional level guidelines intended to assist the relevant national authorities;
- assisting national authorities to organise training on taxonomical issues, identification of target species, monitoring methods and reporting, and management practices;
- coordinating the actions taken by neighbouring Parties to prevent and control the introduction of alien species;
- supporting cooperation at international level.

4. ACTIONS REQUIRED TO ATTAIN THE OBJECTIVES OF THE ACTION PLAN

4.1. At national level

4.1.1. Data collection

The Contracting Parties are invited to assess the situation as regards the introduction of marine species and compile the available information to prepare updated national reports. The need to address the operational objectives 2.1, 2.2 and 2.3 for the implementation of the agreed EcAp should be reflected in the national reports. To this end, Contracting Parties will be assisted by SPA/RAC, if necessary. The national reports will particularly deal with:

- inventorying the alien marine species reported in the national territory, and providing the relevant documentation available;
- trends in abundance, temporal occurrence and spatial distribution in the wild of alien species, particularly invasive alien species, notably in risk areas, in relation to the main vectors and pathways of spreading of such species;
- ratio between invasive alien species and native species in some well-studied



taxonomic groups (e.g. fish, macroalgae, molluscs) that may provide a measure of change in species composition;

- impacts of alien species on biodiversity, human health, and ecosystem services at national level;
- steps taken at national level to prevent and control the introduction of marine species
- the national institutional framework that governs the controlling of species introduction
- horizon scanning to identify future threats from invasive species
- participation at pertinent international initiatives, including joining international agreements and bilateral cooperation.

The Parties are requested to design and implement programmes for data collection, monitoring and assessment, within the framework of the EcAp Integrated Monitoring and Assessment Programme⁵, particularly of:

- the presence of alien marine species, the pathways of their introduction, and the state of their population trends, including those used in aquaculture;
- the ratio between alien and native species in some well-studied taxonomic groups (e.g. fish, macroalgae, molluscs) to provide a measure of change in species composition;
- the impact of alien species on biodiversity, human health and ecosystem services, including both negative and positive impacts.

4.1.2. Supporting MAMIAS

Considering the need of a comprehensive and continuously updated information system to support coordinated efforts and management measures throughout the Mediterranean region in order to prevent, control and monitor marine biological invasions and their impacts on biodiversity, human health and ecosystem services, the Parties are requested to conduct a baseline study, reporting in particular:

- an inventory of all alien species in their territorial waters;
- for each species: the year of first record, the pathway of introduction (together with the level of certainty in assessing the pathway: direct evidence, most likely, possible), and the state of the population;
- georeferenced records of alien species presence and the date of each record;
- studies on the impact of the alien species at national level;
- any relevant documentation;

⁵UNEP(DEPI)/MED WG.411/3

It is understood that the Parties will follow national procedures in preparing these base line studies. The baseline study should be submitted to SPA/RAC to feed MAMIAS. Reporting should follow the forms provided by SPA/RAC.

The baseline study should be updated annually based on the outputs of the national monitoring programmes (paragraph 18) and any new information should be submitted to SPA/RAC and made available to MAMIAS.

4.1.3. Legislation

Those Contracting Parties which have not yet enacted national legislation for controlling the introduction of marine species must do so as quickly as possible. All the Contracting Parties are strongly recommended to take the necessary steps to express in their national laws the provisions of the pertinent international treaties, especially the IMO Convention on the management of ballast waters, and guidelines and codes adopted on the subject within the context of international organisations⁶

4.1.4. Institutional framework

A mechanism should be set up, if possible at the level of each country, to promote and coordinate the following actions:

- compiling an inventory of introduced species and assessing their pathways of introduction;
- cooperating with SPA/RAC and supporting regional initiatives, in particular supporting and updating MAMIAS;
- establishing a directory of relevant specialists and organisations;
- setting up a group of experts who will be responsible for assessing all relevant issues; regarding introduction, spatial distribution, pathways of introduction, and impacts of alien species, and analysing risks and possible consequences, in close consultation with the other Parties and relevant International Organisations;
- developing relevant training programmes;
- strengthening and where necessary setting up systems to control the intentional import and export of alien marine species;
- developing and implementing risk-assessment techniques;

⁶Many organisations have elaborated codes, guidelines or other tools providing technical and legal recommendations for the better control of species introductions and mitigation of their negative impacts. Those tools which are most pertinent for the Mediterranean region are:

- Guiding principles for the prevention, introduction and mitigation of impacts of alien species (elaborated within the framework of the Convention on Biological Diversity)
- Recommendation no. 57 on the Introduction of Organisms belonging to Non-Native Species into the Environment (adopted within the framework of the Bern Convention)
- The IUCN Guidelines for the prevention of biodiversity loss caused by alien invasive species
- The Code of Practice on the Introductions and Transfers of Marine Organisms (developed by the International Council for the Exploration of the Sea)
- Guidelines for preventing the introduction of unwanted aquatic organisms and pathogens from ships' ballast water and sediment discharges (adopted within the framework of the IMO)
- The precautionary approach concerning the introduction of species (developed by the FAO)



- promoting relevant scientific research;
- cooperating with the concerned authorities in neighbouring states regarding the detection of introduced species and risk assessment;
- participating in international initiatives on invasive species;
- promoting citizen science initiatives to support the monitoring of invasive species;
- developing programmes to raise the awareness of the general public and target groups, including decision-makers, concerning the risks associated with species introduction.

4.1.5. National Plans

To ensure more efficiency in the measures envisaged in the implementation of this Action Plan, Mediterranean countries are invited to establish National Plans to prevent the introduction of new alien marine species by controlling their pathways, and to mitigate their negative impact. Each National Plan, taking into account the concerned country's specific features, must suggest appropriate institutional and legislative measures. The National Plan shall be based on the available scientific data and will include programmes for

- ~~~~~ the collection and regular updating of data, especially for the support of EcAp;
- ~~~~~ the highest possible dissemination of data and relevant information, especially within the framework of MAMIAS;
- ~~~~~ training and refresher courses for specialists;
- ~~~~~ awareness-raising and education for the general public, actors and decision-makers; and
- ~~~~~ coordination and collaboration with other states. The national plans must be brought to the attention of all concerned actors and, when possible, coordinated on a regional basis.

4.2. At regional level

4.2.1. Development of the MAMIAS platform

Considering that sufficient high quality information on alien species ecology, distribution, pathways of introduction, impacts, and effective management strategies is a prerequisite for the efficient prevention, early detection, rapid response, and management of biological invasions, a regional mechanism for collecting, harmonizing, and integrating information on alien species should be set up as part of the present Action Plan. The MAMIAS online platform will be at the core of this mechanism, and will be further developed to include:

- a comprehensive basin-wide database on all alien species with information on their taxonomic classification, establishment success, year of first introduction in the Mediterranean, years of first record in each Mediterranean country, pathways of both primary and secondary introductions, impacts on biodiversity, human health, and ecosystem services, links to factsheets and other databases with relevant information;

- for the most invasive and high-impact species, factsheets with details on their biology and ecology, diagnostic characters and field identification signs, native range, distribution maps in the Mediterranean and globally, history of its introduction, population trends, impacts on biodiversity, human health, and ecosystem services, relevant links, and existing management measures for control or eradication;
- a user-friendly web site with online tools and web services for searching the database and extracting data;
- online mapping tools providing distribution maps of alien species in the Mediterranean Sea and possibilities to extract spatial data;
- an early warning system to issue notifications to the Parties, when there is an early new detection of invasive and high-impact species;
- online tools to produce statistics and indicators, such as trends in new introductions by pathway and trends in spatial distribution, especially to support the application of EcAp; these tools should be capable to assist the estimation of the common indicator 6 of the EcAp Integrated Monitoring and Assessment Programme⁷.

Considering that to effectively support international and regional policies and scientific research on biological invasions, and to efficiently use the already accumulated knowledge, there is a need for standardization, harmonization and integration of existing information systems, it is recommended that SPA/RAC will establish collaborations and close links between MAMIAS and other international information systems and organizations. An indicative list of collaborators includes:

4.2.2. Training

To support the implementation of the present Action Plan, a regional training session should be organised in collaboration with the concerned international organisations. In particular, it will deal with the main following themes:

- Methods and protocols for impact and risk assessments, and horizon scanning regarding new introductions of alien species
- Management measures for prevention, control and eradication of invasive alien species
- Taxonomic issues and identification of alien species
- Monitoring methods and protocols for marine alien species

4.2.3. Public education and awareness

With a view to promoting the Mediterranean countries' national programmes for raising the awareness of the general public and target groups, including decision-makers, about

⁷ Trends in abundance, temporal occurrence and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (E02, in relation to the main vectors and pathways of spreading of such species) UNEP(DEPI)/MED WG.411/3



the risks associated with introducing alien marine species into the Mediterranean and with bad practices that assist the secondary spread of already established alien species, it is recommended that SPA/RAC, in collaboration with the relevant national authorities and international organisations, prepare brochures, posters and other educational and awareness materials. These will be made available to the National Focal Points for SPAs, to be circulated in their respective countries.

5. REGIONAL COORDINATION

Regional coordination of the implementation of the present Action Plan will be guaranteed by the Mediterranean Action Plan's (MAP) Secretariat through the Regional Activity Centre for Specially Protected Areas. The main functions of the coordinating structure shall consist in:

- taking in hand the implementation of those actions required at regional level to attain the present Action Plan's objectives (Section C.2 above);
- insofar as its means permit, assisting the Contracting Parties in implementing the actions required at national level to attain the present Action Plan's objectives (Section C.1 above);
- regularly reporting to the National Focal Points for SPAs about the implementation of the present Action Plan, and preparing the report mentioned in paragraph 12 above;
- collaborating with the concerned organisations and endeavouring to ensure that the Mediterranean region is involved in the pertinent international and/or regional initiatives;
- promoting exchanges among Mediterranean specialists.

6. PARTICIPATION IN THE IMPLEMENTATION

Implementing the present Action Plan is the province of the national authorities of the Contracting Parties. The concerned international organisations and/or NGOs, laboratories and any organisation or body are invited to join in the work necessary for implementing the Action Plan. At their ordinary meetings, the Contracting Parties may, at the suggestion of the meeting of National Focal Points for SPAs, grant the status of «Action Plan Associate» to any organization or laboratory which so requests and which carries out, or supports (financially or otherwise) the carrying out of concrete actions (conservation, research, etc.) likely to facilitate the implementation of the present Action Plan, taking into account the priorities contained therein.

In addition to collaborating and coordinating with the Secretariats of the relevant Conventions, SPA/RAC should invite IMO and FAO/GFCM to join and contribute to the implementation of the present Action Plan. It will set up a mechanism for regular dialogue between the participating organisations and, where necessary, organise meetings to this effect.

ANNEX: IMPLEMENTATION TIMETABLE

Action	Deadline	Responsible
Preparation of national reports (paragraph 17)	2016	Contracting Parties
Set up a mechanism to promote and coordinate the actions listed in paragraph 22	2016	Contracting Parties
Launch MAMIAS (paragraph 24)	2016	SPA/RAC
Preparation of forms for reporting to MAMIAS (as provisioned in paragraph 19)	2017	SPA/RAC
Baseline study with information for MAMIAS (paragraph 19)	2017	Contracting Parties
Develop programmes for data collection and monitoring (paragraph 18)	2017	Contracting Parties
Launch the procedures for enacting or strengthening national legislation governing the control of alien species introduction (paragraph 21)	2017	Contracting Parties
Establish/update a directory of relevant specialists and organisations (paragraph 22)	2017	SPA/RAC Contracting Parties
Develop programmes to raise the awareness of the general public and target groups, including decision-makers, concerning the risks associated with species introduction (paragraph 22)	2017	Contracting Parties
Develop online tools and web services for searching the database and extracting data (paragraph 24)	2017	SPA/RAC
Annual updates of national data for MAMIAS (paragraph 20)	2019-2017 (annually)	Contracting Parties
Develop and implement risk-assessment techniques (paragraph 22)	2018	Contracting Parties
Develop online mapping tools (paragraph 24)	2018	SPA/RAC
Organise the regional training session (paragraph 26)	2018	SPA/RAC
Elaborate the National Plans (paragraph 23)	2019	Contracting Parties
Develop an early warning system in the framework of MAMIAS (paragraph 24)	2019	SPA/RAC
Establish collaborations and links between MAMIAS and other international systems and organizations (paragraph 25)	2019	SPA/RAC
Preparation of material for public education and awareness (paragraph 27)	2020	SPA/RAC, Contracting Parties
Develop online tools in MAMIAS for statistics and indicators, especially to support EcAp (paragraph 24)	2020	SPA/RAC
Organise a symposium every 3 years	From 2016	SPA/RAC

SPA/RAC WORKING AREAS

SPA/ RAC, the UNEP/ MAP **Specially Protected Areas Regional Activity Centre**, was created in 1985 to assist the Contracting Parties to the Barcelona Convention (21 Mediterranean countries and the European Union) in implementing the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol).



**Marine
turtles**



Cetaceans



**Mediterranean
Monk Seal**



**Cartilaginous
fishes**
(Chondrichthyans)



**Marine and coastal
bird species**

Listed in Annex II of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean



**Specially Protected
Areas**



Monitoring



**Coralligenous and other
calcareous
bio-concretions**



**Marine
vegetation**



Dark Habitats

Habitats and species associated with seamounts, underwater caves and canyons, aphotic hard beds and chemo-synthetic phenomena



**Species introduction
and invasive species**



Mediterranean
Action Plan
Barcelona
Convention



*The Mediterranean
Biodiversity
Centre*

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This publication has been prepared
with the financial support
of the MAVA foundation