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23rd Meeting of the Contracting Parties to the
Convention for the Protection of the Marine Environment
and the Coastal Region of the Mediterranean and its Protocols

Portorož, Slovenia, 5-8 December 2023

Agenda Item 3: Thematic Decisions

Draft Decision 26/5: Specially Protected Areas (SPAs), Specially Protected Areas of Mediterranean Importance (SPAMIs) and Ecosystem Restoration

UNEP/MAP
Athens, 2023

Note by the Secretariat

Mid-term assessment of the implementation of the Post-2020 SAPBIO

1. At their COP 22 (Antalya, Türkiye, 7-10 December 2021), the Contracting Parties to the Barcelona Convention and its Protocols adopted the Post-2020 Strategic Action Programme for the Conservation of Biodiversity and Sustainable Management of Natural Resources in the Mediterranean Region (Post-2020 SAPBIO) and urged the Contracting Parties to take the necessary measures for its effective implementation.

2. By 2025, the Secretariat is expected to conduct the mid-term assessment of the implementation of the Post-2020 SAPBIO by 2025 in cooperation with the Contracting Parties and the relevant regional and international organization.

Development of the Draft Evaluation and Monitoring Framework for the Post-2020 Regional Strategy for MCPAs and OECMs in the Mediterranean

3. The Contracting Parties to the Barcelona Convention and its Protocols, at their COP 22 (Antalya, Türkiye, 7-10 December 2021):

- Adopted the Post-2020 Regional Strategy for marine and coastal protected areas (MCPAs) and other effective area-based conservation measures (OECMs) in the Mediterranean (Post-2020 Strategy for MCPAs and OECMs); and
- Requested SPA/RAC to develop an evaluation and monitoring framework (EMF) for the strategy, with the technical support of the Ad hoc Group of Experts for Marine Protected Areas in the Mediterranean (AGEM), using to the extent possible existing monitoring tools in the region, in particular those established under UNEP/MAP-Barcelona Convention as well as in the framework of Sustainable Development Goals (SDGs), Post-2020 Biodiversity framework and related target monitoring.

4. SPA/RAC launched, since early March 2023, the elaboration of the evaluation and monitoring framework for the Post-2020 Regional Strategy (EMF) as requested by COP22 (Decision IG.25/12), with the valorous support of the Ad hoc Group of Experts for Marine Protected Areas in the Mediterranean (AGEM), in alignment to the Kunming-Montreal Global Biodiversity Framework as well as its Monitoring framework as adopted by the CBD COP 15 (Montreal, Canada, 7-19 December 2022),

5. A specific working group (WG-E&M) composed by volunteer members of the AGEM has been set-up and prepared a first version of the EMF that has been reviewed and endorsed by the AGEM members and then discussed and revised through an informal consultation with the SPA/BD Focal Points (teleconference, 18 April 2023).

6. The resulting draft Evaluation and Monitoring Framework for the Post-2020 Regional Strategy for MCPAs and OECMs in the Mediterranean (EMF) was reviewed and endorsed by the 16th Meeting of SPA/BD Focal Points, which agreed on its submission to the MAP Focal Points meeting and COP 23 for adoption.

7. The draft Evaluation and Monitoring Framework has the format of an Appendix II to be appended to the Post-2020 Regional Strategy for MCPAs and OECMs, adopted by COP 22.

Outcomes of the ordinary periodic review of SPAMIs of 2022-2023

8. By their Decision IG.25/12 (COP 22), the Contracting Parties requested SPA/RAC to work with the relevant designated national authorities in Albania, Algeria, France and Italy to carry out the ordinary periodic review for the five SPAMIs listed below, and bring the outcome of that review process to the attention of the Contracting Parties at their COP 23:

- Karaburun Sazan National Marine Park (Albania) in 2022;
- Banc des Kabyles Marine Reserve (Algeria) in 2023;
- Habibas Islands (Algeria) in 2023;
- Les Calanques National Park (France) in 2023; and
- Portofino Marine Protected Area (Italy) in 2023.

9. The 2022-2023 SPAMI ordinary periodic reviews were all conducted, except the review of the Karaburun Sazan National Marine Park (Albania). The Karaburun Sazan National Marine Park was expected to undergo its first ordinary review. Despite repeated calls by SPA/RAC and the UNEP/MAP Secretariat, Albanian authorities were not able to plan and conduct the SPAMI review before the 16th Meeting of SPA/BD Focal Points.

10. The results and recommendations of the four realised ordinary reviews were approved by the 16th Meeting of SPA/BD Focal Points (Malta, 22-24 May 2023). The meeting thus recommended maintaining the Banc des Kabyles (Algeria), Les Calanques National Park (France) and the Portofino Marine Protected Area (Italy) in the ordinary review process and including the Habibas Islands (Algeria) in a period of provisional nature of 6 years maximum.

11. In view of that decision, Algeria should inform the seventeenth meeting of SPA/BD Focal Points in 2025 about identifying and launching adequate corrective measures for the Habibas Islands.

12. The 16th Meeting of SPA/BD Focal Points (Malta, 22-24 May 2023) agreed to exceptionally allow postponing the ordinary review of the Karaburun Sazan National Marine Park (Albania) to 2024.

Format for the periodic review of SPAMIs

13. The 2022-2023 SPAMI ordinary periodic reviews were made using the updated format for the periodic review of SPAMIs adopted by COP 21 Decision IG.24/6. This updated format was developed into a web application: the "SPAMI Evaluation System" (https://eval.medchm.net/) that is linked to the SPAMI Collaborative Platform.

14. Based on feedback from the concerned SPA/BD Focal Points, the meeting requested SPA/RAC to do a few adjustments on the Format for the periodic review of SPAMIs adopted in 2019 concerning the scoring system under sections 4.1 and 4.2 to propose it in due course for adoption by COP 23.

15. In June 2023, SPA/RAC prepared a revised format and proposed it for electronic review by the SPA/BD Focal Points and the independent experts involved in the 2022-2023 SPAMI evaluations. The resulting format was submitted to the MAP Focal Points meeting and now to COP 23 for adoption.

Ordinary and extraordinary reviews of SPAMIs expected in 2024-2025

16. Beside the ordinary reviews of 6 SPAMIs in 2024 and 14 SPAMIs in 2025, extraordinary reviews for the 5 SPAMIs that were included in a period of provisional nature in 2019 (COP 21) should take place in 2025 at the latest.

17. Taking into account the high number of SPAMIs to be evaluated in 2024-2025, the importance to start the process of the SPAMI evaluation well in advance was highlighted by the 16th Meeting of SPA/BD Focal Points, in order to allow the Technical Advisory Commissions to plan their missions and organize their visits.

Updating of the Regional Action Plans

18. The Contracting Parties to the Barcelona Convention, at their COP 22 (Antalya, Türkiye, 7-10 December 2021), requested the Secretariat (SPA/RAC) to update:

- the Action Plan for the conservation of bird species listed in Annex II of the SPA/BD Protocol in the Mediterranean based on its implementation progress at national and regional levels, and to suggest adjustments to its implementation timetable to maintain them in favourable status of conservation,
- the Action Plan concerning species introduction and invasive species in the Mediterranean Sea to address the impact, on biodiversity and ecosystem integrity, of non-indigenous species and invasive non-indigenous species,

19. An assessment of the implementation of their previous calendars has been done at national and regional levels. The assessment has considered the SPA/RAC Progress activities achieved during the last biennia (since 2018) and the activities realized by Contracting Parties as requested by the adopted timetables. Multilateral Environment Agreements, regional organizations, and institutions as well as Partners to these Action Plans were also invited to report on their related achievements.

20. The steps taken for updating the Bird Species Action Plan included checking to which extent each action/activity is achieved and identifying potential mitigation measures for its further implementation if necessary. Concerning the Non-Indigenous Species Action Plan, the updating took into consideration the national, sub-regional and regional Non-Indigenous Species baselines and the Ballast water management strategy for the Mediterranean Sea (2022-2027).

Restoration of Pinna nobilis

21. Due to the mass mortality event affecting *Pinna nobilis* populations, the Contracting Parties to the Barcelona Convention and its Protocols, at their COP 22 (Antalya, Türkiye, 7-10 December 2021), requested the Secretariat (SPA/RAC) to take restoration measures related to the conservation of *Pinna nobilis* species of the Annex II "List of endangered or threatened species" of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean of the Barcelona Convention in the Mediterranean to respond to their mass mortality.

22. In this context, SPA/RAC, implemented a project funded by the UNEP Regional Seas Programme - 2021 and the Swedish International Development Cooperation Agency (SIDA) allocation in the Mediterranean sub-basin, where the first major action is related to the elaboration of a draft restoration programme for *Pinna nobilis* and its discussion and validation during a two-day regional workshop (Tunisia, 20-21 June 2022).

23. Due to the alarming situation of *Pinna nobilis*, participants thoroughly discussed the proposed draft *Pinna nobilis* restoration programme, main objectives, national and regional priority actions as well as implementation timetable and have agreed/recommend submitting the amended version to the Barcelona convention Contracting Parties for consideration. The draft restoration programme was reviewed and endorsed by the 16th Meeting of Specially Protected Areas and Biological Diversity Focal Points (Malta, 22-24 May 2023).

Parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators and elaborate the List of Reference of Pelagic Habitat Types in the Mediterranean Sea

24. The Contracting Parties to the Barcelona Convention and its Protocols, at their COP 22 (Antalya, Türkiye, 7-10 December 2021), requested SPA/RAC to establish a multidisciplinary group of experts nominated by the Contracting Parties to define parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators and elaborate the List of Reference of Pelagic Habitat Types in the Mediterranean Sea so that it can be used, where necessary, as a basis for identifying reference pelagic habitats to be monitored and assessed at the national level under the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria for consideration of COP 23.

25. In this context, following an invitation sent by SPA//RAC, the Contracting Parties nominated national experts with expertise in field related to the typology of pelagic habitats and monitoring using

phytoplankton and zooplankton. The group met online on 5 April 2023, and produced the conclusions and recommendations, endorsed by the 16th Meeting of SPA/BD Focal Points (Malta, 22-24 May 2023).

26. This draft decision and its Annexes were submitted to and reviewed by the Meeting of the Mediterranean Action Plan (MAP) Focal Points (Istanbul, Türkiye 12-15 September 2023) which decided its transmission as presented in this document to the 23rd Meeting of the Contracting Parties (COP 23) (Portorož, Slovenia, 5-8 December 2023).

[Decision IG.26/5

Specially Protected Areas (SPAs), Specially Protected Areas of Mediterranean Importance (SPAMIs) and Ecosystem Restoration

The Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols at their 23rd Meeting,

Recalling General Assembly resolution 70/1 of 25 September 2015, entitled "Transforming our world: the 2030 Agenda for Sustainable Development",

Recalling also, General Assembly resolution A/RES/73/284 of 1 March 2019, entitled "United Nations Decade on Ecosystem Restoration (2021–2030)",

Recalling further the United Nations Environment Assembly resolution UNEP/EA.5/Res.5 of 7 March 2022, entitled "Nature-based solutions for supporting sustainable development",

Recalling the United Nations General Assembly resolution 76/296 of 21 July 2022, entitled "Our ocean, our future, our responsibility",

Recalling the Kunming-Montreal Global Biodiversity Framework (GBF), its goals A and B and targets 1,2,3,4, 5,6,8,9 and 11 and other important decisions underpinning its implementation adopted by 15th Conference of the Parties (COP-15) to the Convention on Biological Diversity (CBD) (Montreal, Canada 7 - 19 December 2022),

Having regard to Article 10 of the Barcelona Convention, the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, and in particular Articles 4, 5, 6, 8, 9, 11 and 12, thereof, whereby Contracting Parties shall, individually or jointly, take all appropriate measures to protect and preserve biological diversity, rare or fragile ecosystems, as well as species of wild fauna and flora which are rare, depleted, threatened or endangered and their habitats, in the Mediterranean Sea Area,

Having also regard to Decision IG.25/11 on the Post-2020 Strategic Action Programme for the Conservation of Biodiversity and Sustainable Management of Natural Resources in the Mediterranean Region (Post-2020 SAPBIO) and its goals aiming to reduce the threats to biodiversity and ensure that biodiversity is preserved and maintained or enhanced in order to meet people's needs, targets and actions, adopted by the Contracting Parties at their 22nd Meeting (COP 22) (Antalya, Türkiye,7-10 December 2021),

Noting Decision IG.17/12 on the Procedure for the Revision of the Areas included in the Specially Protected Areas of Mediterranean Importance (SPAMI) List, adopted by the Contracting Parties at their 15th Meeting (COP 15) (Almeria, Spain, 15-18 January 2008),

Having regard to Decision IG.24/6 on the Identification and Conservation of Sites of Particular Ecological Interest in the Mediterranean, including Specially Protected Areas of Mediterranean Importance, adopted by the Contracting Parties at their 21st Meeting (COP 21) (Naples, Italy, 2-5 December 2019),

Having also regard to Decision IG.25/12 on Protecting and conserving the Mediterranean through well connected and effective systems of marine and coastal protected areas and other effective area-based conservation measures, including Specially Protected Areas and Specially Protected Areas of Mediterranean Importance, adopted by the Contracting Parties at their 22nd Meeting (COP 22) (Antalya, Türkiye,7-10 December 2021),

Appreciating the support provided by the Ad hoc group of Experts for Marine Protected Areas in the Mediterranean to the Secretariat and the Contracting Parties during the current biennium,

Recalling Decision IG.22/7, on the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria, adopted by the Contracting Parties at their 19th Meeting (COP 19) (Athens, Greece, 9-12 February 2016),

Recalling also Decision IG.25/13, on Action Plans for the conservation of species and habitats under the Protocol concerning Specially Protected Areas and Biological Diversity in the

Mediterranean, adopted by the Contracting Parties at their 22nd Meeting (COP 22) (Antalya, Türkiye,7-10 December 2021),

Taking into account the results of the assessments of the status of implementation of the Action Plan for the conservation of bird species listed in Annex II to the SPA/BD Protocol and the Action Plan concerning species introductions and invasive species in the Mediterranean Sea, as well as the Report of the multidisciplinary group of experts nominated by the Contracting Parties to define parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators and elaborate the List of Reference of Pelagic Habitat Types in the Mediterranean Sea,

Taking also into account the alarming situation of the population of *Pinna nobilis* in the Mediterranean, and the need and urgency of action in terms of monitoring, studying and restoring the species as soon as possible, in a coordinated manner and with a proven scientific approach,

Committed to further streamlining the Mediterranean Action Plan Ecological Objectives and associated Good Environmental Status and Targets, as well as the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria into the Regional Action Plans for the conservation of endangered and threatened species and key habitats adopted within the framework of the SPA/BD Protocol,

Recalling the mandate of the Regional Activity Centre for Specially Protected Areas (SPA/RAC), as laid down in Decision IG.19/5 on the Mandates of the Components of MAP, adopted by the Contracting Parties at their 16th Meeting (COP 16) (Marrakesh, Morocco, 3-5 November 2009), and its relevance to the implementation of this Decision,

Having considered the report of the 16th Meeting of Specially Protected Areas and Biological Diversity Focal Points (Malta, 22-24 May 2023),

1. *Invite* the Secretariat, to conduct a mid-term assessment of the collective implementation of the Post-2020 Strategic Action Programme for the Conservation of Biodiversity and Sustainable Management of Natural Resources in the Mediterranean Region (Post-2020 SAPBIO) by 2025, and the Contracting Parties to review their National Biodiversity Strategies and Action Plans accordingly to ensure the achievement of the Post-2020 SAPBIO objectives by 2030;

2. *Adopt* the Evaluation and Monitoring Framework for the Post-2020 Regional Strategy for Marine and Coastal Protected Areas and Other Effective Area-based Conservation Measures in the Mediterranean, set out in Annex I to this Decision, on the basis of which the Secretariat (SPA/RAC) shall undertake its mid-term and final evaluations, in 2026 and 2030 respectively;

3. *Decide* to include the Specially Protected Area of Mediterranean Importance of the Habibas Islands (Algeria) in a period of provisional nature of a maximum of six years and request Algeria to launch the necessary and adequate corrective measures and report on the progress made to the 17th Meeting of SPA/BD Focal Points.

4. *Request* the Secretariat (SPA/RAC) to support as a matter of priority Algeria in identifying and launching the necessary corrective measures and encourage other Contracting Parties, other SPAMIs and appropriate funding mechanisms to contribute to their implementation;

5. *Adopt* the Format for the periodic review of Specially Protected Areas of Mediterranean Importance, set out in Annex II to this Decision, and request the Secretariat (SPA/RAC) to reflect it accordingly in the online Evaluation System of the Specially Protected Areas of Mediterranean Importance;

6. *Request* the Secretariat (SPA/RAC) to work with the relevant designated national authorities in Albania, Cyprus, France, Italy, Lebanon, Monaco, Slovenia, Spain and Tunisia to carry out ordinary and extraordinary reviews for the 25 Specially Protected Areas of Mediterranean Importance listed below, and bring the outcome of these reviews to the attention of the Contracting Parties at their 24th Meeting (COP 24):

7. The Karaburun Sazan National Marine Park (Albania) is to be subject to an ordinary review that was expected to take place in 2022 and that was exceptionally postponed to 2024 at the latest;

8. The following five Specially Protected Areas of Mediterranean Importance are to be subject to an ordinary review in 2024:

- La Côte Bleue Marine Park (France),
- Les Embiez Archipelago - Six Fours (France),
- Capo Carbonara Marine Protected Area (Italy),
- Penisola del Sinis - Isola di Mal di Ventre Marine Protected Area (Italy), and
- Porto Cesareo Marine Protected Area (Italy);

9. The following fourteen SPAMIs are to be subject to an ordinary review in 2025:

- Lara-Toxeftra Turtle Reserve (Cyprus),
- Port-Cros National Park (France),
- Cerbère-Banyuls Marine Nature Reserve (France),
- Pelagos Sanctuary for the Conservation of Marine Mammals (France, Italy and Monaco),
- Egadi Islands Marine Protected Area (Italy),
- Landscape Park Strunjan (Slovenia),
- Alboran Island (Spain),
- Cabo de Gata-Nijar Natural Park (Spain),
- Cap de Creus Natural Park (Spain),
- Columbretes Islands (Spain),
- Mar Menor and Oriental Mediterranean zone of the Region of Murcia coast (Spain),
- Medes Islands (Spain),
- Sea Bottom of the Levante of Almeria (Spain), and
- Cetaceans Migration Corridor in the Mediterranean (Spain);

10. The following five SPAMIs are to be subject to an extraordinary review in 2025 at the latest:

- Palm Islands Nature Reserve (Lebanon),
- Tyre Coast Nature Reserve (Lebanon),
- La Galite Archipelago (Tunisia),
- Kneiss Islands (Tunisia), and
- Zembra and Zembretta National Park (Tunisia);

11. *Adopt* the Action Plan for the Conservation of Marine and Coastal Bird Species listed in Annex II to the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, set out in Annex III to this Decision;

12. *Adopt* the Action Plan concerning Species Introductions and Invasive Species in the Mediterranean Sea, set out in Annex IV to this Decision;

13. *Adopt* the Restoration Programme of *Pinna nobilis*, set out in Annex V to this Decision;

14. *Urge* the Contracting Parties to take the necessary measures for the effective implementation of the Action Plans and Programme and to report on their implementation, using the online Barcelona Convention Reporting System;

15. *Request* the Secretariat (SPA/RAC), in coordination with other relevant regional and international organizations, where appropriate, to continue to provide technical support to the Contracting Parties for the effective implementation of the Action Plans and Programme, through technical cooperation and capacity-building activities, including resource mobilization activities;

16. *Request* the Secretariat (SPA/RAC) to update (i) the Action Plan for the Conservation of the Coralligenous and Other Calcareous Bio-concretions in the Mediterranean Sea, (ii) the Action Plan for the Conservation of Mediterranean Marine Turtles, (iii) the Action Plan for the Conservation of Cartilaginous Fishes (Chondrichthyans) in the Mediterranean Sea, and (iv) the Regional Strategy for the Conservation of Monk Seal in the Mediterranean Sea, and submit them for consideration of COP 24;

17. *Adopt* the Conditions and criteria for the award of the title of Regional Action Plan Partner, set out in Annex VI to this Decision;

18. *Request* the Secretariat (SPA/RAC) to draw up a list of the Regional Action Plans' Partners and update it for each meeting of SPA/BD Focal Points;

19. *Adopt* the Conclusions and recommendations of the Multidisciplinary group of experts nominated by the Contracting Parties to define parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators and elaborate the List of Reference of Pelagic Habitat Types in the Mediterranean Sea, set out in Annex VII to this Decision, so that they can be used, where necessary, as a basis for identifying reference pelagic habitats to be monitored and assessed at the national level under the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria;

20. *Request*, the Secretariat (SPA/RAC) to continue the work of the Multidisciplinary group of experts to advance in the development of the indicator using phytoplankton and zooplankton for relevant IMAP biodiversity indicators, based on the outcomes of relevant ongoing projects in the region and in collaboration with relevant regional research centres.

Annex I

Evaluation and Monitoring Framework for the Post-2020 Regional Strategy for Marine and Coastal Protected Areas and Other Effective Area-based Conservation Measures in the Mediterranean

Evaluation and Monitoring Framework for the Post-2020 Regional Strategy for Marine and Coastal Protected Areas and Other Effective Area-based Conservation Measures in the Mediterranean

Appendix II –Evaluation and Monitoring Framework for the Post-2020 Regional Strategy for MCPAs and OECMs in the Mediterranean, including indicators, mid-term and final targets.

Output	Indicator	Mid-term target 2026	Final target 2030	Means of verification
The Strategy overall target: By 2030, at least 30 per cent of the Mediterranean Sea is protected and conserved through well connected, ecologically representative and effective systems of marine and coastal protected areas and other effective area-based conservation measures, ensuring adequate geographical balance, with the focus on areas particularly important for biodiversity				
--	% coverage of MCPAs and OECMs in the Mediterranean Sea	15% of the Mediterranean Sea	30% of the Mediterranean Sea	MAPAMED database[1]
Strategic Outcome 1: Governance arrangements for MCPAs and OECMs are inclusive and effective in delivering conservation and livelihood outcomes				
Output 1.1: Legal frameworks and institutional arrangements of MCPAs and OECMs allow for opportunities for participatory management	Number of Contracting Parties with legal frameworks and institutional arrangements of MCPAs allowing for opportunities for participatory management. Number of Contracting Parties with legal frameworks and institutional arrangements of OECMs allowing for opportunities for participatory management, considering the objectives of such OECMs.	11 States Contracting Parties to the Barcelona Convention 11 States Contracting Parties to the Barcelona Convention	All States Contracting Parties to the Barcelona Convention All States Contracting Parties to the Barcelona Convention	National reports Official data provided by the Contracting Parties
Output 1.2: Governance arrangements for MCPAs and OECMs are inclusive and equitable	Number of Contracting Parties with governance structures and mechanisms (e.g., a national commission or other) for MCPAs established and functional, that facilitates inclusive and equitable governance.	11 States Contracting Parties to the Barcelona Convention	All States Contracting Parties to the Barcelona Convention	National reports Official data provided by the Contracting Parties

[1] SPA/RAC should ensure that the MAPAMED database is expanded to cover all the indicators agreed upon under this Evaluation and Monitoring Framework, and includes coastal protected areas, provided that relevant data and information are shared by the Contracting Parties to inform the MAPAMED database for these indicators.

	Number of Contracting Parties with appropriate procedures and mechanisms for the effective participation of and/or coordination with other stakeholders in OECM processes.	11 States Contracting Parties to the Barcelona Convention	All States Contracting Parties to the Barcelona Convention	
Output 1.3: National, regional, transboundary and cross sectoral co-operation for the establishment and management of MCPAs and OECMs are strengthened	Number of Contracting Parties with multi-sectoral cooperation tools (e.g., committees, consultations, agreements, etc.) for MCPAs or OECMs established. Number of transboundary co-operation agreements for MCPAs or OECMs.	11 States Contracting Parties to the Barcelona Convention 3 Agreements	All States Contracting Parties to the Barcelona Convention 5 Agreements	National reports Official data provided by the Contracting Parties
Output 1.4: Adaptive planning and management frameworks of MCPAs and OECMs that anticipate, learn from and respond to changes in decision-making are strengthened	Number of MCPAs that have management plans. % of MCPAs applying adaptive management. % of OECMs that have flexible procedures in place to ensure that results from monitoring, evaluation, consultation, and multiple knowledge sources are used to inform management and planning processes.	50% of MCPAs 50% of MCPAs 50% of OECMs	100% of MCPAs 100% of MCPAs 100% of OECMs	MAPAMED database
Strategic Outcome 2: MCPA coverage increased through the expansion of soundly-designed, ecologically representative and well-connected systems of MCPAs				
Output 2.1: Areas of importance for biodiversity and ecosystem services are identified	Number of Contracting Parties that have identified areas of importance for biodiversity and ecosystem services, serving to inform MCPAs establishment process.	11 States Contracting Parties to the Barcelona Convention	All States Contracting Parties to the Barcelona Convention	National reports Official data provided by the Contracting Parties
Output 2.2: Distribution of MCPA systems across the Mediterranean Sea is balanced	The unbalanced MCPA distribution between the 4 Mediterranean sub-regions (Adriatic Sea; Aegean - Levantine Sea; Ionian Sea and Central Mediterranean Sea; and Western Mediterranean Sea) is reduced.	The unbalanced distribution is reduced by 50%	The distribution is balanced	MAPAMED database

	Baseline: % coverage of MPAs per Mediterranean sub-region[2]: Adriatic Sea: 4.8% Aegean - Levantine Sea: 2.1% Ionian Sea and Central Mediterranean Sea: 1.8% Western Mediterranean Sea: 20.4%			
Output 2.3: MCPA coverage in areas beyond national jurisdiction is increased	The coverage of MPAs in ABNJ[3] is increased. *Baseline:* % coverage of MPAs in ABNJ: [less than 1.85%][4]	The coverage of MPAs in ABNJ is increased by 50%	The coverage of MPAs in ABNJ is increased by 100%	MAPAMED database
Output 2.4: The number and coverage of MCPAs with enhanced protection levels is increased	% coverage of NTZs[5] within MCPAs/OECMs. *Baseline:* % cumulative surface of no-go, no-take or no-fishing area[6]: 0.04%	2% of the Mediterranean Sea	5% of the Mediterranean Sea	MAPAMED database National reports
Strategic Outcome 3: Marine and coastal OECMs in the Mediterranean are identified, recognized and reported towards post-2020 global and regional targets				
Output 3.1: Awareness in Contracting Parties and stakeholders on OECMs enhanced and guidance for the application of OECM criteria provided	Number of Contracting Parties that established processes to evaluate the application and identification of OECMs, applying the guidance for application of OECM criteria.	50% of the States Contracting Parties to the Barcelona Convention	100% of the States Contracting Parties to the Barcelona Convention	National reports Official data provided by the Contracting Parties
Output 3.2: OECMs identified, recognized and reported to regional and global databases by Contracting Parties and regional organizations	Surface of OECMs recognized and reported.	OECM surface complementing MPA surface to 15%	OECM surface complementing MPA surface to 30%	MAPAMED database

[2] Source: SPA/RAC and MedPAN, MAPAMED 2019 edition.
[3] The extent of ABNJ in the Mediterranean depends on the number of EEZs declared by coastal States. If all the coastal States declare their EEZ, there will be no more ABNJ.
[4] Figure to be updated by SPA/RAC on the following versions of the draft document (information requested from the Pelagos Agreement Permanent Secretariat).
[5] No-Take Zones are geographically defined zones within marine protected areas that do not allow any fishing, mining, drilling, or other extractive activities.
[6] Source: MedPAN: The Mediterranean MPA management database, 2021.

Output 3.3: Effectiveness of identified OECMs is enhanced, including through prioritization in cross-sectoral marine spatial planning	Number of OECMs included within MSP measures adopted by the Contracting Parties using OECMs to contribute to the 30% target for the Mediterranean. Number of projects to evaluate the effectiveness of OECMs.	3 OECMs 3 projects	6 OECMs 6 projects	National reports Official data provided by the Contracting Parties
Output 3.4: New OECMs are established and recognized OECMs expanded	Guidance document on future OECM designation, recognition and reporting Number of new OECMs established at Mediterranean level contributing to the 30% collective target on protected areas and OECMs.	1 10 OECMs	-- 20 OECMs	Guidance document MAPAMED database
Strategic Outcome 4: MCPAs are effectively managed and their conservation outcomes successfully delivered				
Output 4.1: All MCPAs have adaptive management plans adopted, effectively implemented and periodically reviewed	MCPAs have adaptive management plans adopted, effectively implemented and periodically reviewed.	50% of MCPAs	100% of MCPAs	MAPAMED database
Output 4.2: Sufficient and sustainable resources for the establishment and management of MCPAs in the Mediterranean are mobilized	% of MCPAs where financial constraints are not threatening the capacity of management to achieve the site's objectives.	50% of MCPAs	100% of MCPAs	MAPAMED database
Output 4.3: Individual and institutional capacity for MCPA management is enhanced	% of MPCAs with adequate numbers of appropriately trained staff provided by the responsible entity. Number of Contracting Parties with MCPA institutions in place.	50% of MCPAs 11 States Contracting Parties to the Barcelona Convention	100% of MCPAs All States Contracting Parties to the Barcelona Convention	MAPAMED database National reports Official data provided by the Contracting Parties

Output 4.4: Surveillance and enforcement in MCPAs are strengthened and ensured, and user compliance is promoted	% MCPAs having regular surveillance.	50% of MCPAs	100% of MCPAs	National reports MAPAMED database
Output 4.5: Monitoring of conservation outcomes and evaluation of management effectiveness are strengthened across the MCPA system	% MCPAs with regular monitoring identifying biological threat and socio-economic indicators % MCPAs carrying out regular site-level management effectiveness evaluations	50% of MCPAs 50% of MCPAs	100% of MCPAs 100% of MCPAs	MAPAMED database
Strategic Outcome 5: Actions and support for MCPAs and OECMs are mobilized				
Output 5.1: Awareness, understanding and appreciation of the values of, and threats to, MCPAs and OECMs across government and non-government stakeholders, the private sector, the youth and wider society	Number of Contracting Parties with targeted communication and awareness strategies as standalone or as part of other national activities. Number of CPs having education programmes including MCPAs and OECMs. % of positive attitudes towards MCPAs/OECMs across wide stakeholder groups.	11 States Contracting Parties to the Barcelona Convention 11 States Contracting Parties to the Barcelona Convention 30% positive attitudes towards MCPAs/OECMs	All States Contracting Parties to the Barcelona Convention All States Contracting Parties to the Barcelona Convention 60% positive attitudes towards MCPAs/OECMs	National reports Official data provided by the Contracting Parties Stakeholder survey
Output 5.2: Political support for the establishment and management of MCPAs and biodiversity conservation is increased	% of MCPAs receiving regular adequate funds from government budgets for management. Number of Contracting Parties that consider MCPAs in Environmental Impact Assessments (EIAs) and Spatial Planning processes.	50% of MCPAs 11 States Contracting Parties to the Barcelona Convention	100% of MCPAs All States Contracting Parties to the Barcelona Convention	National reports Official data provided by the Contracting Parties
Output 5.3: The contribution of MPCAs and OECMs to sustainable development goals, the blue economy, climate change mitigation and adaptation, and the wider	Number of Contracting Parties with MCPA/OECM considerations included into national plans and policies for climate change mitigation and adaptation.	11 States Contracting Parties to the Barcelona Convention	All States Contracting Parties to the Barcelona Convention	National reports Official data provided by the Contracting Parties

society are recognized and accounted for	Number of Contracting Parties with MCPA/OECM considerations included into national plans and policies for sustainable blue economy growth. Number of national Public Relation (PR) and awareness initiatives in relation with MCPA/OECM targeting the wider society	11 States Contracting Parties to the Barcelona Convention 1 per Contracting Party	All States Contracting Parties to the Barcelona Convention 2 per Contracting Party	Media produced (social media platforms, videos, etc.)

Annex II

Format for the periodic review of Specially Protected Areas of Mediterranean Importance

Format for the periodic review of Specially Protected Areas of Mediterranean Importance

SPAMI Name:	

SECTION I: CRITERIA WHICH ARE MANDATORY FOR THE INCLUSION OF AN AREA IN THE SPAMI LIST

1. MEDITERRANEAN VALUE OF THE SPAMI

	Score
1.1. The SPAMI still fulfils at least one of the criteria related to the regional Mediterranean value as presented in the SPA/BD Protocol's Annex I. Assessment scale: 0 = No 1 = Yes	**?**
Score justification:	

	Score
1.2. Level of adverse changes occurred during the evaluation period for the habitats and species considered as natural features in the SPAMI presentation report submitted for the inclusion of the area in the SPAMI List. Assessment scale: 0 = Significant changes 1 = Moderate changes 2 = Slight changes 3 = No adverse change	**?**
Score justification:	

	Score
1.3. Are the objectives, set out in the original SPAMI application for designation, actively pursued? Assessment scale: 0 = No 1 = Only some of them 2 = Yes for most of them 3 = Yes for all of them	**?**
Score justification:	

2. LEGAL AND INSTITUTIONAL ARRANGEMENTS

	Score
2.1. The legal status of the SPAMI (with reference to its legal status at the date of the previous evaluation report). Assessment scale: 0 = Significant negative change in the legal status of the SPAMI 1 = Slight negative change in the legal status of the SPAMI 2 = The SPAMI has maintained or improved its legal status	**?**
Score justification:	

	Score
2.2. Are competencies and responsibilities clearly defined in the texts governing the area? Assessment scale: 0 = competencies and responsibilities are not clearly defined 1 = The definition of competencies and responsibilities needs slight improvements 2 = The SPAMI has clearly defined competencies and responsibilities	**?**
Score justification:	

	Score
2.3. Does the area have a management body, endowed with sufficient powers? ***(Not applicable for multilateral (transboundary high sea) SPAMIs)*** Assessment scale: 0 = No management body, or the management body is not endowed with sufficient powers 1 = The management body is not fully dedicated to the SPAMI 2 = The SPAMI has a fully dedicated management body and sufficient powers to implement the conservation measures	**?**
Score justification:	

In the case of multilateral (transboundary high sea) SPAMIs:

	Score
2.3. Does the area have governance bodies in line with the original application for inclusion in the SPAMI List? Assessment scale: 0 = No governance bodies 1 = Only some governance bodies are in place 2 = The governance bodies are in place, but they are not functioning on a regular basis (e.g.: no regular meetings or works) 3 = The SPAMI has fully dedicated governance bodies and sufficient powers to address the conservation challenges	**?**
Score justification:	

3. MANAGEMENT AND AVAILABILITY OF RESOURCES

	Score
3.1. Does the SPAMI have a management plan? Assessment scale: 0 = No management plan 1 = The level of implementation of the management plan is assessed as “insufficient” 2 = The management plan is not officially adopted but its implementation is assessed as “adequate” 3 = The management plan is officially adopted and adequately	**?**

implemented	
Score justification:	

	Score
3.2. Assess the adequacy of the management plan taking into account the SPAMI objectives and the requirements set out in article 7 of the Protocol and Section 8.2.3 of the Annotated Format (AF[7]). Assessment scale: 0 = Low 1 = Medium 2 = Good 3 = Excellent	**?**
Score justification:	

	Score
3.3. Assess the adequacy of the human resources available to the SPAMI. Assessment scale: 0 = Very low/Insufficient 1 = Low 2 = Adequate 3 = Excellent	**?**
Score justification:	

	Score
3.4. Assess the adequacy of the financial and material means available to the SPAMI *(Not applicable for multilateral (transboundary high sea) SPAMIs)* Assessment scale: 0 = Very low 1 = Low 2 = Adequate 3 = Excellent	**?**
Score justification:	

In the case of multilateral (transboundary high sea) SPAMIs:

	Score
3.4.1. Assess the adequacy of the financial and material means available for the implementation of the SPAMI conservation/management measures at national level. Assessment scale: 0 = Low 1 = Medium 2 = Good 3 = Excellent	**?**
Score justification:	

[7] Annotated format for the presentation reports for the areas proposed for inclusion in the SPAMI List.

In the case of multilateral (transboundary high sea) SPAMIs:

	Score
3.4.2. Assess the adequacy of the financial and material means available to the multilateral governance bodies of the SPAMI. Assessment scale: 0 = Low 1 = Medium 2 = Good 3 = Excellent	**?**
Score justification:	

	Score
3.5. Does the area have a monitoring programme? Assessment scale: 0 = No monitoring programme 1 = The level of implementation of the monitoring programme is assessed as "insufficient" 2 = The monitoring programme needs improvement to cover other parameters that are significant for the SPAMI 3 = The monitoring programme is adequately implemented and allows the assessment of the state and evolution of the area, as well as the effectiveness of protection and management measures	**?**
Score justification: *If the TAC identified important parameters that are not covered by the monitoring programme of the SPAMI, these should be listed here with the related rationale.*	

	Score
3.6. Is there a feedback mechanism that establishes an explicit link between the monitoring results and the management objectives, and which allows adaptation of protection and management measures? Assessment scale: 0 = Low 1 = Medium 2 = Good 3 = Excellent	**?**
Score justification:	

	Score
3.7. Is the management plan effectively implemented? Assessment scale: 0 = Low 1 = Medium 2 = Good 3 = Excellent	**?**
Score justification:	

	Score

3.8. Have any concrete conservation measures, activities and actions been implemented? Assessment scale: 0 = Low 1 = Medium 2 = Good 3 = Excellent	**?**
Score justification:	

SECTION II: FEATURES PROVIDING A VALUE-ADDED TO THE AREA
(Section B4 of the Annex I, and other obligatory for a SPAMI, and Art. 6 and 7 of the Protocol))

4. THREATS AND SURROUNDING CONTEXT

4.1. Assess the level of threats within the site to the ecological, biological, aesthetic and cultural values of the area *(B4.a Annex I)*.

Under section 4.1, questions are asked in two parts: part a) enquiring on the existence of threats within the site, and part b) asking about the response made to mitigate such threats. If the answer to part a) is "no threats", part b) is not applicable. Whereas, when threats are reported under part a), part b) should be answered. The score achieved in response to part b) is considered as a bonus and has no impact on the score evaluation and consequently the result of the review.

In particular:

	Score
4.1.1. a) Unregulated exploitation of natural resources (e.g., sand mining, water, timber, living resources) ***See 5.1.1. in AF*** Score: 0, 1, 2 or 3 0 means "very serious threats" ; 3 means "no threats" *(If the answer is "no threats", pass directly to question 4.1.2. a).)*	**?**
Score justification:	

	Score (bonus)
4.1.1. b) Efforts (actions) undertaken during the evaluation period to address/mitigate the unregulated exploitation of natural resources (e.g., sand mining, water, timber, living resources) ***See 5.1.1. in AF*** Score: 0, 1, 2 or 3 0 means "no effort"; 3 means "significant effort" *(If applicable: Not applicable if the answer to question 4.1.1. a) is "no threats".)*	**?**
Score justification:	

	Score
4.1.2. a) Threats to habitats and species (e.g., disturbance, desiccation, pollution, poaching, introduced alien species) ***See 5.1.2. in AF*** Score: 0, 1, 2 or 3 0 means "very serious threats"; 3 means "no threats"	**?**

(If the answer is "no threats", pass directly to question 4.1.3. a).)	
Score justification:	

	Score (bonus)
4.1.2. b) Efforts (actions) undertaken during the evaluation period to address/mitigate the threats to habitats and species (e.g., disturbance, desiccation, pollution, poaching, introduced alien species) ***See 5.1.2. in AF*** Score: 0, 1, 2 or 3 0 means "no effort"; 3 means "significant effort" *(If applicable: Not applicable if the answer to question 4.1.2. a) is "no threats".)*	**?**
Score justification:	

	Score
4.1.3. a) Increase of human impact (e.g., tourism, boats, building, immigration...) ***See 5.1.3. in AF*** Score: 0, 1, 2 or 3 0 means "very serious threats"; 3 means "no threats" *(If the answer is "no threats", pass directly to question 4.1.4. a).)*	**?**
Score justification:	

	Score (bonus)
4.1.3. b) Efforts (actions) undertaken during the evaluation period to address/mitigate the increase of human impact (e.g., tourism, boats, building, immigration…) ***See 5.1.3. in AF*** Score: 0, 1, 2 or 3 0 means "no effort"; 3 means "significant effort" *(If applicable: Not applicable if the answer to question 4.1.3. a) is "no threats".)*	**?**
Score justification:	

	Score
4.1.4. a) Conflicts between users or user groups. ***See 5.1.4. and 6.2. in AF*** Score: 0, 1, 2 or 3 0 means "very serious threats"; 3 means "no threats" *(If the answer is "no threats", pass directly to question 4.1.5.)*	**?**
Score justification:	

	Score (bonus)
4.1.4. b) Efforts (actions) undertaken during the evaluation period to address/mitigate the conflicts between users or user groups. *See 5.1.4. and 6.2. in AF* Score: 0, 1, 2 or 3 0 means "no effort"; 3 means "significant effort" *(If applicable: Not applicable if the answer to question 4.1.4. a) is "no threats".)*	**?**
Score justification:	

4.1.5. Please include here a prescriptive list of threats (not evaluated or mentioned above) that are of concern and are evaluated individually:

4.2. Assess the level of external threats to the ecological, biological, aesthetic and cultural values of the area *(B4.a of the Annex I)* and the efforts made to address/mitigate them. *See 5.2. in the AF*

Under section 4.2, questions are asked in two parts: part a) enquiring on the existence of external threats, and part b) asking about the response made to mitigate such threats. If the answer to part a) is "no threats", part b) is not applicable. Whereas, when threats are reported under part a), part b) should be answered. The score achieved in response to part b) is considered a bonus and has no impact on the score evaluation and consequently the result of the review.

In particular:

	Score
4.2.1. a) Pollution problems from external sources including solid waste and those affecting waters up-current. *See 5.2.1. in the AF*. Score: 0, 1, 2 or 3 0 means "very serious threats"; 3 means "no threats" *(If the answer is "no threats", pass directly to question 4.2.2. a).)*	**?**
Score justification:	

	Score (bonus)
4.2.1. b) Efforts (actions) undertaken during the evaluation period to address/mitigate the pollution problems from external sources including solid waste and those affecting waters up-current. *See 5.2.1. in the AF*. Score: 0, 1, 2 or 3 0 means "no effort"; 3 means "significant effort" *(If applicable: Not applicable if the answer to question 4.2.1. a) is "no threats".)*	**?**
Score justification:	

	Score
4.2.2. a) Significant impacts on landscapes and on cultural values. *See 5.2.2 in AF*. Score: 0, 1, 2 or 3 0 means "very serious threats"; 3 means "no threats" *(If the answer is "no threats", pass directly to question 4.2.3. a).)*	**?**
Score justification:	

	Score (bonus)
4.2.2. b) Efforts (actions) undertaken during the evaluation period to address/mitigate the significant impacts on landscapes and on cultural values. *See 5.2.2 in AF*. Score: 0, 1, 2 or 3 0 means "no effort"; 3 means "significant effort" *(If applicable: Not applicable if the answer to question 4.2.2. a) is "no threats".)*	**?**
Score justification:	

	Score
4.2.3. a) Expected development of threats upon the surrounding area. *See 6.1. in AF*. Score: 0, 1, 2 or 3 0 means "very serious threats"; 3 means "no threats" *(If the answer is "no threats", pass directly to question 4.2.4.)*	**?**
Score justification:	

	Score (bonus)
4.2.3. b) Efforts (actions) undertaken during the evaluation period to address/mitigate the expected development of threats upon the surrounding area. *See 6.1. in AF*. Score: 0, 1, 2 or 3 0 means "no effort"; 3 means "significant effort" *(If applicable: Not applicable if the answer to question 4.2.3. a) is "no threats".)*	**?**
Score justification:	

4.2.4. Please include here a prescriptive list of threats (not evaluated or mentioned above) that are of concern and are evaluated individually:

4.2.5. Please include the list of threats (not evaluated or mentioned above) that were of concern

and were eliminated or solved:

4.3. Is there an integrated coastal management plan or land-use laws in the area bordering or surrounding the SPAMI? ***(B4.e Annex I). See 5.2.3. in AF***

	Score
Score: 0 = No 1 = Yes	**?**
Score justification:	

4.4. Does the management plan for the SPAMI have influence over the governance of the surrounding area? (D5.d Annex I). ***See 7.4.4. in the AF***

	Score
Score: 0 = No 1 = Yes	**?**
Score justification:	

5. ENFORCEMENT OF PROTECTION MEASURES

5.1. Assess the degree of enforcement of the protection measures

In particular:

	Score
5.1.1. Are the area boundaries adequately marked on land and, if applicable, adequately marked at sea? ***See 8.3.1. in AF (Not applicable for multilateral (transboundary high sea) SPAMIs)*** Score: 0 = No 1 = Yes	**?**
Score justification:	

In the case of multilateral (transboundary high sea) SPAMI:

	Score
5.1.1. a) Is the area officially depicted on international marine / terrestrial maps? Score: 0 = No 1 = Yes	**?**
Score justification:	

In the case of multilateral (transboundary high sea) SPAMI:

	Score
5.1.1. b) Is the area officially reported on the marine / terrestrial maps of	**?**

each SPAMI Member State? Score: 0 = No 1 = Yes	
Score justification:	

In the case of multilateral (transboundary high sea) SPAMI:

	Score
5.1.1. c) Are the coordinates of the area easily accessible (maps, internet, etc.)? Score: 0 = No 1 = Yes	**?**
Score justification:	

	Score
5.1.2. Is there any collaboration from other authorities in the protection and surveillance of the area and, if applicable, is there a coastguard service contributing to the marine protection? ***See 8.3.2. and 8.3.3. in AF*** Score: 0 = No 1 = Yes	**?**
Score justification:	

	Score
5.1.3. Are third party agencies also empowered to enforce regulations relating to the SPAMI protective measures? ***(Not applicable for multilateral (transboundary high sea) SPAMIs)*** Score: 0 = No 1 = Yes	**?**
Score justification:	

	Score
5.1.4. Are there adequate penalties and powers for effective enforcement? ***See 8.3.4. in AF*** Score: 0 = No 1 = Yes	**?**
Score justification:	

	Score
5.1.5. Is the field staff empowered to impose sanctions? ***See 8.3.4. in AF*** Score: 0 = No 1 = Yes	**?**
Score justification:	

	Score
5.1.6. Has the area established a contingency plan to face accidental pollution or other serious emergencies? ***(Art. 7.3. in the Protocol, Recommendation of the 13th Meeting of Contracting Parties)*** Score: 0 = No 1 = Yes	**?**
Score justification:	

6. COOPERATION AND NETWORKING

	Score
6.1. Are other national or international organizations collaborating to provide human or financial resources? (e.g. researchers, experts, volunteers...). ***See 9.1.3. in the AF*** Score: 0 = No 1 = Weakly 2 = Fairly 3 = Excellent	**?**
Score justification:	

	Score
6.2. Assess the level of cooperation and exchange with other SPAMIs (especially in other nations) ***(Art. 8, Art. 21.1, Art. 22.1., Art. 22.3 of the Protocol, A.d in Annex I)*** Score: 0 = No 1 = Insufficient 2 = Fairly 3 = Excellent	**?**
Score justification:	

SECTION III: FOLLOW-UP OF THE RECOMMENDATIONS MADE BY THE PREVIOUS EVALUATION(S)

(If applicable: Not applicable for SPAMIs undergoing their first ordinary periodic review)

7. IMPLEMENTATION OF THE RECOMMENDATIONS MADE BY THE PREVIOUS EVALUATIONS

7.1. Assess to what extent the recommendations possibly made by the previous evaluations were implemented: Recommendations made by the TAC(s) and/or approved by the Focal points for SPAs <u>regarding Section I</u>

	Score
Assessment scale: 0 = 'No' for all of them 1 = 'Yes' for some of them 2 = 'Yes' for most of them 3 = 'Yes' for all of them	**?**

Score justification:	

7.2. Assess to what extent the recommendations possibly made by the previous valuations were implemented: Recommendations made by the TAC(s) and/or approved by the Focal points for SPAs <u>regarding Section II</u>

	Score
Assessment scale: 0 = 'No' for all of them 1 = 'Yes' for some of them 2 = 'Yes' for most of them 3 = 'Yes' for all of them	**?**
Score justification:	

CONCLUSIONS AND RECOMMENDATIONS

SECTION I: CRITERIA WHICH ARE MANDATORY FOR THE INCLUSION OF AN AREA IN THE SPAMI LIST	
1. MEDITERRANEAN VALUE OF THE SPAMI	
Total Score: Coastal national SPAMI - max: 7 Multilateral (transboundary high sea) SPAMI - max: 7	**?**
2. LEGAL AND INSTITUTIONAL ARRANGEMENTS	
Total Score: Coastal national SPAMI - max: 6 Multilateral (transboundary high sea) SPAMI - max: 7	**?**
3. MANAGEMENT AND AVAILABILITY OF RESOURCES	
Total Score: Coastal national SPAMI - max: 24 Multilateral (transboundary high sea) SPAMI - max: 27	**?**
SECTION II: FEATURES PROVIDING A VALUE-ADDED TO THE AREA	
4. THREATS AND SURROUNDING CONTEXT	
Total Score: Coastal national SPAMI - max: 37 Multilateral (transboundary high sea) SPAMI - max: 37	**?**
5. ENFORCEMENT OF PROTECTION MEASURES	
Total Score: Coastal national SPAMI - max: 6 Multilateral (transboundary high sea) SPAMI - max: 8	**?**
6. COOPERATION AND NETWORKING	
Total Score: Coastal national SPAMI - max: 6 Multilateral (transboundary high sea) SPAMI - max: 6	**?**
SECTION III: FOLLOW-UP OF THE RECOMMENDATIONS MADE BY THE PREVIOUS EVALUATION(S)	
7. IMPLEMENTATION OF THE RECOMMENDATIONS MADE BY THE PREVIOUS EVALUATIONS (Not applicable for SPAMIs undergoing their first ordinary periodic review)	
Total Score: National SPAMI - max: 6 Multilateral (transboundary high sea) SPAMI - max: 6	**?**
GRAND TOTAL SCORE: **Coastal national SPAMI - max: 78 without bonus *(92 with bonus)*** Coastal national SPAMI subject to its first ordinary periodic review - max: **72 without bonus *(86 with bonus)*** **Multilateral (transboundary high sea) SPAMI - max: 84 without bonus *(98 with bonus)*** **Multilateral (transboundary high sea) SPAMI subject to its first ordinary periodic review - max: 78 without bonus *(92 with bonus)***	**?**

Score evaluation:

The TAC will propose to include the SPAMI in a period of provisional nature (in accordance with paragraph 6 of the Procedure for the revision of the areas included in the SPAMI List) if the SPAMI has:

- a score **< 1** in one or more of the following questions: **1.1**, **2.1**, **2.2**, **2.3**, **3.1**, **3.2**, **3.3**, **3.4**, **3.5** and **3.6**;
- a score **< 2** in one or more of the following questions: **1.2**, **1.3**, **7.1** and **7.2**.

Furthermore, considering that the sites included in the SPAMI List are intended to have a value of example and model for the protection of the natural heritage of the region (Paragraph A.e of Annex 1 to the SPA/BD Protocol), the TAC shall also propose to include the SPAMI in a period of provisional nature if:

- the total score of the evaluation is less than **54** for a **coastal national SPAMI** *(= 70% of the maximum total score without bonus: 78)*;
- the total score of the evaluation is less than **50** for a **coastal national SPAMI subject to its first ordinary periodic review** *(= 70% of the maximum total score without bonus: 72)*;
- the total score of the evaluation is less than **58** for a **multilateral (transboundary high sea) SPAMI** *(= 70% of the maximum total score without bonus: 84)*;
- the total score of the evaluation is less than **54** for a **multilateral (transboundary high sea) SPAMI subject to its first ordinary periodic review** *(=70% of the maximum total score without bonus: 78)*.

The bonus will count only in the case where the SPAMI has not reached the minimum score without the bonus. Then, the bonus will be added to the total score achieved by the SPAMI.

CONCLUSION (BASED ON THE SCORE EVALUATION) BY THE TAC FOR THE PRESENT EVALUATION:

RECOMMENDATIONS BY THE TAC FOR THE FUTURE EVALUATION:

Recommendation 1:

Recommendation 2:

etc.

SIGNATURES:

National Focal Point:	**Independent Experts:**
SPAMI Manager(s):	**National Expert:**

Annex III

Action Plan for the Conservation of Marine and Coastal Bird Species listed in Annex II to the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean

Action Plan for the Conservation of Marine and Coastal Bird Species listed in Annex II to the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean

Foreword

In 1995, the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) adopted a new Protocol concerning Specially Protected Areas and Biological Diversity (SPA/BD Protocol) in the Mediterranean. Annex II of this new protocol lists endangered or threatened species found in the Mediterranean.

Subsequently a series of nine Action Plans were also adopted by the Parties to the Barcelona Convention. They also urge and encourage co-ordination and co-operation amongst Mediterranean states towards the achievement of conservation of a species or a group of species within this region.

During their meeting in Monaco in November 2001 the Contracting Parties had asked SPA/RAC to draw up a draft action plan for the bird species appearing in Annex II, which listed 15 endangered or threatened bird species.[8] Consequently, in 2003, the Parties to the Barcelona Convention adopted an Action Plan for the conservation of the bird species listedin Annex II. The main purpose of the Action Plan was to maintain and/or restore their population levels to a favourable conservation status and to ensure their long-term conservation. The Action Plan also aimed to contribute to the sharing of knowledge and expertise between the Mediterranean countries and to co-ordinate efforts among the countries and other relevant initiatives and agreements. It also inspired a synergic approach among the Mediterranean countries in the protection of these bird species and their habitats and encouraged research to fill the many gaps in our knowledge concerning coastal and pelagic birds in the Mediterranean, particularly seabirds' distribution and their movements, as well astheir feeding, moulting and wintering areas at sea.

The development of the Action Plan for the conservation of these species followed various initiatives taken by other organisations, such as BirdLife International partners in Mediterranean countries, WWF, IUCN, Medmaravis, and Tour du Valat, on the conservation of birds and their important sites and habitats. Various actions have been taken at national level by the competent authorities and at species level by several non-governmental organisations (particularly BirdLife International partners) in their respective countries, to counteract some of the threats, which were being faced by several species covered by the Action Plan.

In 2005, the first Mediterranean Symposium on the ecology and conservation of the bird species listed in Annex II, was held in Villanova I la Geltrú (Spain) with the participation of 31 ornithologists and experts from 16 Mediterranean countries. The participants made several recommendations to SPA/RAC, including the addition of 10 new marine and coastal bird species to the list of Annex II[9]. In November 2009, the 16th Ordinary Meeting of the Contracting Parties to the Barcelona Convention, held in Marrakech (Morocco), adopted the addition of the 10 species of marine and coastal birds in Annex II, bringing up the total number of bird species to 25. Ten years after the Villanova Mediterranean Symposium it was appropriate to hold another symposium; SPA/RAC, in partnership with the Tunisian NGO Les Amis des Oiseaux (AAO/BirdLife Tunisia), Medmaravis, Tour du Valat Biological Station and the Conservatoire du Littoral, organised the 2nd Symposium on Marine and Coastal Birds in the Mediterranean in Hammamet, Tunisia, in February 2015[10] (a) to update the knowledge on the status of

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[8] The original number of species was 15, but two subspecies (*Puffinus yelkouan yelkouan* and *Puffinus yelkouan mauretanicus*) of one of the species (Mediterranean Shearwater *Puffinus yelkouan),* were given species status by taxonomists, namely Yelkouan Shearwater *Puffinus yelkouan* and Balearic Shearwater *Puffinus mauretanicus.* The latter is one of the 10 added bird species to Annex II in 2009

[9] UNEP/MAP- SPA/RAC. 2006. *Proceedings of the first symposium on the Mediterranean action plan for the conservation of marine and coastal birds.* Vilanova i la Geltrú, (Spain), 17-19 November 2005, (Ed. Aransay, N.) SPA/RAC, Tunis.

[10] Yesou,P., Sultana, J., Walmsley, J. & Azafzaf, H. (Eds.) 2016. *Conservation of Marine and Coastal Birds in the Mediterranean*. Proceedings of the UNEP-MAP-SPA/RAC Symposium, Hammamat 20-22 February 2015, Tunisia.

marine and coastal birds; (b) to assess the effect of new regulations, conventions and research tools; and (c) to call for a closer cooperation among the countries that adopted the list of 25 bird species of Annex II of the SPA/BD Protocol. Subsequently, the Action Plan for the Conservation of Bird Species listed in Annex II to the SPA/BD Protocol has been updated to include the new added species (COP19, Decision IG22/12) and adopted by the 20th Conference of the Parties to the Barcelona Convention, held in Albania in December 2017.Decision IG.23/08) After more than five years from this update, a second update has been requested by the COP 21 (Decision IG.25/13) to review the results of the activities undertaken between 2018-2022 to ensure the effective implementation of the Action Plan.

Following the request made for SPA/RAC during the 22nd Meeting of the Contracting Parties to the Barcelona Convention (Decision IG.25/13), the Action Plan for the conservation of bird species drafted in 2003, revised in 2013, is updated during the biennium 2022-2023

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7.25 Eleonora's Falcon (*Falco eleonorae)* 69

INTRODUCTION

1. Birds have captivated humans for millennia due to their beauty, song, flight, and ecological roles. Despite their significance, human activities have threatened many bird species in the Mediterranean and beyond. The Mediterranean region is home to several hundred bird species, some of which are exclusive to this climatic zone. Pelagic bird species are limited, but breeding colonies of Scopoli's Shearwater (*Calonectris diomedea*), Yelkouan Shearwater (Puffinus yelkouan), and the subspecies of the European Storm-petrel (*Hydrobates pelagicus melitensis*) may be found along sea-cliffs or on small isolated rocky islands and islets.

2. Coastal seabirds, including the subspecies emigratus of the Lesser Crested Tern (Sterna bengalensis), whose breeding area is restricted to Libya, are found in river deltas and inland saltwater lagoons. Many other coastal species, however, are found breeding in sub-optimal and man-modified habitats such as salinas, while others rely on municipal waste dumps and discards from fishing boats for their food.

3. Ten new bird species have been added to Annex II, including the critically endangered Balearic Shearwater (*Puffinus mauretanicus*), and the near-threatened Armenian Gull (*Larus armenicus*), whose population trend has been assessed by the IUCN as decreasing. Although the rest of the new species are regarded globally as least concern (LC), their breeding range in the Mediterranean is restricted to a few countries, particularly eastern ones. Furthermore, the population trend of some of them, such as Kentish Plover (*Charadrius alexandrinus*), Greater Sand Plover (*Charadrius leschenaultii*), Mediterranean Gull (*Larus melanocephalus*), and Common Gull-billed Tern (*Gelochelidon nilotica*) has also been assessed as decreasing globally.

4. The ornithological calendar of the Mediterranean is dominated by the seasonal migrations of birds from Europe to Africa in autumn and vice versa in spring, and several species which breed in Europe over-winter in the Mediterranean basin. Nonetheless, the Mediterranean is the home of several hundred bird species, some of which occur exclusively in this climatic zone. The seabirds found along the crowded coastal zone and the islands of this almost land-locked sea are quite resilient, including the comparatively rare and localised Audouin’s Gull *Larus audouinii*.

PRESENT STATUS OF MARINE AND COASTAL BIRDS LISTED IN ANNEX II TO THE SPA/BD PROTOCOL

1.1. Bird Species listed in Annex II to the SPA/BD Protocol: List of Endangered or Threatened Species

5. The sequence and nomenclature follow del Hoyo, J. & Collar, N.J. (2014). HBW and BirdLife International Illustrated Checklist of the Birds of the World. Volume 1: Non- passerines. Lynx Edicions, Barcellona.

English Name	French Name	Scientific Name
Greater Flamingo	Flamant rose	*Phoenicopterus roseus*
European Storm-petrel	Océanite tempête	*Hydrobates pelagicus* ssp. *melitensis*
Scopoli's Shearwater	Puffin de Scopoli	*Calonectris diomedea*
Yelkouan Shearwater	Puffin yelkouan	*Puffinus yelkouan*
Balearic Shearwater	Puffin des Baléares	*Puffinus mauretanicus*
Pygmy Cormorant	Cormoran pygmée	*Microcarbo pygmaeus*
European Shag	Cormoran huppé	*Gulosus aristotelis* ssp.*desmarestii*
Dalmatian Pelican	Pélican frisé	*Pelecanus crispus*
Great White Pelican	Pélican blanc	*Pelecanus onocrotalus*
Kentish Plover	Pluvier à collier interrompu	*Charadrius alexandrinus*
Greater Sandplover	Pluvier de Leschenault	*Charadrius leschenaultii* ssp. *columbinus*
Slender-billed Curlew	Courlis à bec grêle	*Numenius tenuirostris*
Slender-billed Gull	Goéland railleur	*Larus genei*
Mediterranean Gull	Mouette mélanocéphale	*Larus melanocephalus*
Audouin's Gull	Goéland d'Audouin	*Larus audouinii*
Armenian Gull	Goéland d'Arménie	*Larus armenicus*
Little Tern	Sterne naine	*Sternula albifrons*
Common Gull-billed Tern	Sterne hansel	*Gelochelidon nilotica*
Caspian Tern	Sterne caspienne	*Hydroprogne caspia*
Lesser Crested Tern	Sterne voyageuse	*Thalasseus bengalensis*
Sandwich Tern	Sterne caugek	*Thalasseus sandvicensis*
Osprey	Balbuzard pêcheur	*Pandion haliaetus*
Pied Kingfisher	Martin-pêcheur pie	*Ceryle rudis*
White-breasted Kingfisher	Martin-chasseur de Smyrne	*Halcyon smyrnensis*
Eleonora's Falcon	Facoun d'Éléonore	*Falco eleonorae*

1.2. Overview of threats

6. In general birds are threatened by habitat loss and disturbance and also from contamination by oil pollutants. Fish farms and wind farms close to seabird colonies, as well as intensive deep-water fishing may constitute serious threats to some bird species.

7. Among the 25 species listed in Annex II as endangered or threatened one finds those:

- which are globally threatened;
- which are endemic to the region and have an unfavourable conservation status;
- whose populations are not concentrated in the Mediterranean, but which have an unfavourable conservation status and/or a restricted range in the region;
- whose populations are not concentrated in the Mediterranean, have a healthy conservation status but are regarded as flagship species.

8. However, they all have something in common. They are all endangered by a number of threats, including:

- Contamination by oil pollutants
- Direct and indirect depletion of food resources
- Non-sustainable forms of tourism
- Disturbance
- Direct persecution including illegal hunting and the use of poison
- Mortality from bycatch
- Wind farms
- Loss of habitats
- Degradation of habitat, particularly wetlands and small islands of high biological importance
- Introduction of and predation by alien species
- Climate change
- Marine litter (plastics)

1.3. Ecology and status of the species

9. The biology, ecology, distribution and conservation status of the fifteen bird species in the original Action Plan (2003) had been presented in an information document entitled “List of Threatened Bird Species as Adopted by the Barcelona Convention”. It was composed of an annotated List compiled by Medmaravis and edited by J. Criado, J. Walmsley and R. Zotier (April 1996) and gave the status, population size and trends, ecology, threats and conservation measures for each species. This was complemented by other national, regional and global contributions, particularly by BirdLife International.

10. The additional 10 species, which were originally proposed in 2005 during the first Mediterranean Symposium on the ecology and conservation of the bird species listed in Annex II, held in Villanova I la Geltrú (Spain), were presented by Xavier Monbailliu on behalf of Medmaravis, using a scientific criterion to screen possible candidate species. They are species of particular importance for coastal habitats in the Mediterranean. Their biology, ecology, distribution and conservation status were based on BirdLife International’s publication Birds in Europe: Population estimates, Trends and Conservation status (2004).

11. Several ornithological studies have been carried out in the Mediterranean in the last twenty to thirty years, as can be noted particularly in the proceedings of various symposia including those organised by SPA/RAC, Medmaravis, Conservatoire du Littoral, Tour du Valat, and national NGOs in the Mediterranean countries. Despite all these studies, there are still many gaps in the knowledge of coastal and pelagic birds and their habitats in the Mediterranean, particularly seabird movements and their distribution at sea. There is an urgent need for mapping of breeding, feeding, moulting and wintering areas of pelagic birds in the whole region.

1.4. Geographical scope of the Action Plan

12.The geographical scope of the action plan is the entire semi-closed sea and the Mediterranean bio-climate parts of its bordering countries. Some of the species, such as Balearic Shearwater *Puffinus mauretanicus* and Yelkouan Shearwater *Puffinus yelkouan*, have a restricted breeding range in the Mediterranean. Others, such as Eleonora's Falcon *Falco eleonorae*, have migration routes and/or wintering areas outside the Mediterranean. Other species, such as White Pelican *Pelecanus onocrotalus*, Greater Flamingo *Phoenicopterus ruber*, Osprey *Pandion haliaetus*, Sandwich Tern *Sterna sandvicensis* and Little Tern *Sterna albifrons*, are widespread elsewhere, but have a limited range and/or a small population in the Mediterranean. For Slender-billed Curlew *Numenius tenuirostris*, which is a globally Critically Endangered species, the Mediterranean used to be part of its wintering range, but now its population is estimated less than 50 according to BirdLife International species factsheet (2016) and there have been no recent confirmed records in the Mediterranean. Apart from the Armenian Gull *Larus armenicus*, which is Near Threatened, and the Balearic Shearwater, which is Critically Endangered, the other newly added species to Annex II are of Least Concern, according to BirdLife International. However, their breeding population and/or range in the Mediterranean are quite restricted.

ACTION PLAN OBJECTIVES AND TARGETS

1.5. The main objective

13.The main purpose of the Action Plan is to maintain and/or restore the population levels of bird species listed in the Annex II of SPA/BD Protocol to a favourable conservation status and to ensure their long-term conservation.

1.6. Other objectives

- To share information, knowledge and expertise between Mediterranean countries and organisations dealing with the bird species listed in Annex II.
- To co-ordinate efforts among Mediterranean countries and other relevant orgaisations, initiatives and agreements, so as to ensure the implementation of this Action Plan.
- To encourage a synergetic approach among Mediterranean countries in the protection of the 25 listed bird species and their habitats.
- To encourage research to fill the many gaps which still exist in knowledge of coastal and pelagic birds in the Mediterranean, particularly of seabird distribution and movements, and of their feeding, moulting and wintering areas at sea.

STRATEGIC APPROACH

14.In the implementation of this Action Plan there are three levels of priority:

At Species level

- To implement this Action Plan for all species in Annex II of the SPA/BD Protocol.
- To consider the conservation of globally threatened species as one of the mainpriorities of the present Action Plan.
- To give priority to the conservation of other species, which have an unfavorable conservation status at regional level.

At National level

- To map the distribution of the species on land as well as at sea.
- To identify sea and coastal important bird areas, particularly for feeding and breeding.
- To identify and control threats for birds and their habitats.
- To protect and monitor Important Bird Areas (IBAs).
- To carry out proper Environment Impact Assessments for all proposed development where any of the species occur.
- To develop and implement appropriate legislation for the protection of birds and their

habitats.

- To pursue the principles and adhere to the requirements of Agreements and Conventions related to bird conservation.

At Mediterranean level

- To strengthen co-operation and exchange of information and experience in research.
- To disseminate information.
- To promote and support the identification of coastal and sea areas which areimportant for birds.
- To promote the creation and monitoring of protected areas of coastal and marine important birds areas.
- To prevent and/or control the expansion of invasive species, particularly on small islands of high biological importance for birds.
- To identify and monitor migratory hotspots.
- To seek, whenever appropriate, collaboration at a broader international level with relevant Conventions/Agreements such as the Berne Convention, the Bonn Convention, and in particular with the Afro-Eurasian Waterbird Agreement (AEWA).

ACTIONS TO ACHIEVE THE OBJECTIVES OF THE ACTION PLAN

1.7. Protected areas

- Important bird marine areas should be identified and given legal protection status.
- Breeding sites of all threatened species should be legally established as protectedareas with an adequate management plan.
- Coastal and marine protected important bird areas should be continuously monitoredand properly managed.

1.8. Legislation

- Throughout the Mediterranean, species should be afforded legal protection by the Contracting Parties in countries where they breed, winter or occur during migration, as per the guidelines provided by SPA/RAC (see para. 5).
- Legislation should include dissuasive penalties.
- Assessment of environmental impact on these species and their habitats by any type of development should be legally obligatory.

1.9. Research

- In view of the existing gaps in knowledge of coastal and pelagic birds and their habitats in the Mediterranean, especially of their movements and distribution at sea, priority must be given to the mapping of breeding, feeding, moulting and wintering areas of the species concerned.
- Resources should be made available for researchers to fill the gaps in knowledge, such as for the establishment of a Mediterranean seabirds' atlas, and for monitoring population size and breeding success of less well-known species.
- In relation to the threats facing bird species, such as marine litter and climate change. It would also be good to carry out regular gap analyses to understand what research is needed and to prioritise research efforts.

1.10. Monitoring Activities

15.A major component of the Ecosystem Approach implementation in the Mediterranean is related

to the monitoring and assessment of the status of the marine and coastal environment. In view of establishing a coherent region-wide framework, the Contracting Parties adopted in 2016 the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP) (COP 19 Decision IG.22/7). IMAP sets out all the required elements to cover in an integrated manner monitoring and assessment of biodiversity and fisheries, pollution and marine litter, and coast and hydrography.

16.In relation to seabirds, IMAP proposes to monitor and assess the following common indicators (CIs):

- CI 3: Species distributional range (EO1);
- CI 4: Population abundance of selected species (EO1);
- CI 5: Population demographic characteristics (EO1, e.g. body size, age class structure, sex ratio, fecundity rates, survival/mortality rates).

17.IMAP recommends monitoring and assessing those common indicators for a selection of 11 representative species from the List of endangered and threatened species (annex II of the SPA/BD Protocol) and organised into 5 functional groups.

18.In this context, Contracting Parties to the Barcelona Convention should

- with the support of the SPA/RAC, update their national monitoring programmes for biodiversity and or develop one in line with IMAP and report regularly quality assured data.
- with the help of national, regional or international organisations, undertake, when appropriate, joint monitoring initiatives on a pilot basis, with the aim to share and exchange best practices, using harmonized methodologies, and ensuring cost efficiency.
- support and take part in regional initiatives and projects ledby competent partner organizations that will contribute to the implementation of the of the IMAP in order to strengthen strategic and operational regional synergies.

19.The SPA/RAC should work further and create more opportunities with relevant partner organizations, in order to strengthen technical support that countries might need to implement the IMAP at national level.

20.Moreover, The MSFD requires EU Member States to monitor the state of their marine waters and to take measures to achieve Good Environmental Status (GES). This includes monitoring of bird populations and their habitats, according to the criteria designed to allow assessment of the conservation status of seabird populations at the EU level.

21.Therefore, it is strongly recommended to harmonize, as appropriate, the ongoing monitoring work within the framework of the IMAP/EcAp Process and MSFD with regard to monitoring guidelines and protocols as well as the bird species list to be monitored.

1.11. Awareness, Education & Training

- Contracting Parties should promulgate legislation concerning endangered bird species.
- Contracting Parties should seek and/or provide the training of personnel for monitoring, conserving and managing protected important bird areas.
- The organisation of ornithological training courses *in situ* for trainers, important bird areas staff and relevant personnel should be supported by SPA/RAC and the partners of the Action Plan.
- Public awareness and education programmes and campaigns highlighting the vulnerability of threatened species, directed particularly at stakeholders and decision makers, should be

planned and implemented in co-operation with non-governmental organisations.
- Conduct regular capacity building needs assessments to identify the skills required in each country, divided by target group.

1.12. National Action Plans

- Contracting Parties should formulate National Action Plans for the conservation of endangered and threatened bird species in the Mediterranean.
- National Action Plans should take into consideration the implementation of the specific actions relevant to the particular countries proposed in this Action Plan.
- New and updated National Action Plans should address the current factors causing loss or decline of the bird species in Annex II; suggest appropriate subjects for legislation; give priority to the protection and management of sites; and ensure continued research and monitoring of populations and sites.
- Contracting Parties should apply and implement their Action Plans.

IMPLEMENTATION

1.13. Regional co-ordination structure

22. Regional co-ordination of the implementation of the present Action Plan will be guaranteed by the Mediterranean Action Plan's (MAP) secretariat through the Specially Protected Areas Regional Activity Centre (SPA/RAC).

23. The main functions of the co-ordinating structure shall consist in:
- Promoting co-operation among Contracting Parties in those actions executed in trans-boundary areas and at sea in national waters and beyond.
- Promoting the development of a regional network for monitoring populations and distribution of threatened Mediterranean bird species, in co-ordination with other organisations.
- Supporting and collaborating with Contracting Parties in the establishment of important bird areas at sea.
- Providing detailed guidelines to assist countries in their efforts to afford adequate legislative protection to endangered species.
- Elaborating guidelines for monitoring and management plans in collaboration with experts and other interested organisations.
- Urging and supporting the Contracting Parties to create and/or update their national monitoring programmes in line with the guidelines and protocols elaborated within the IMAP/ EcAp process (Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and RelatedAssessment Criteria) and report regularly quality assured data.
- Supporting actions toward the harmonization as appropriate, of the Monitoring guidelines and protocols developed in the framework of the IMAP/EcAp Process and the MSFD
- Assisting countries in the monitoring and conservation of the species listed in AnnexII according to the proposed actions by this Action Plan.
- Organising meetings of experts on specific subjects relating to the ecology and conservation of the bird species found in Annex II.
- Preparing progress reports on the implementation of this Action Plan.
- Encouraging complementary work, done by other international organisations with thesame objectives, and promoting co-ordination to avoid possible duplication of effort.

1.14. Participation

24. Any interested international, regional and/or national organisation is invited to participate in

actions necessary for the implementation of this Action Plan, while links with other bodies responsible for Action Plans dealing with one or more bird species listed in Annex II should be made, to strengthen co-operation and avoid duplication of work.

1.15. "Action Plan Partners"

25.To encourage and reward contributions to the work of applying the Action Plan, the Contracting Parties may at their ordinary meetings grant the title of "Action Plan Partner" to any organisation (governmental, nongovernmental, economic, etc.) that has to its credit concrete actions likely to help the conservation of birds in Annex II of the Protocol. Conditions for the awarding of the Partner title shall be adopted by the Contracting Parties following advice given by the meeting of National Focal Points for SPAs. The co-ordination structure shall set up a mechanism for regular dialogue between the participating organisations and where necessary, organise meetings to this effect. However, any dialogue could also be done by mail/email and webinars (online conferences).

1.16. Assessment and revision

26.National Focal Points for SPAs, in collaboration with national experts, will be expected to:

- Assess progress in implementing the Action Plan during their meetings.
- Suggest recommendations to be submitted to the Contracting Parties.
- Suggest adjustments to the implementation timetable.

1.17. Timing

27.The actions advocated by the present Action Plan have 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 made so far in implementing the advocated actions
- Suggest adjustments to action and its implementation timetable, if appropriate
- Submit the updated action plan to the national focal points for spa, who will make follow-up suggestions to the parties.

1.18. Timetable

Action	Deadline	By whom
1. Organisation of the fourth Mediterranean Symposium on ecology and conservation of the bird species in Annex II.	By end of 2029	SPA/RAC & Partners
2. Protect legally all bird species in Annex II	1 year after adoption	Contracting Parties
3. Establish/support research and monitoring programmes to track changes in the trends and to fill gaps in knowledge of threatened species in partnership with other organizations	From 2024 to 2029	Contracting Parties, SPA/RAC, AP, Partners, AEWA, BirdLife International
4. Revision of the directory of organisations andexperts concerned with the threatened and endangered bird species in the Mediterranean.	By end of year 2029	SPA/RAC
5. Creation and implementation of National Action Plans for the conservation of endangered and threatened bird species in the Mediterranean; and update them every 5 years from the date of their creation.	From 2024 to 2029	Contracting Parties & SPA/RAC
6. Application and implementation of any Action Plans/monitoring Programmes of the bird species listed in Annex II.	From 2024 to 2029	SPA/RAC & Contracting Parties
7. Participation in promotion of a regional network for monitoring populations and distribution of Mediterranean threatened bird species, in co-ordination with other organisations.	From 2024 to 2029	SPA/RAC , AP Partners, AEWA, BirdLife International
8. Legal establishment of protected areas important for bird species listed in the Annex II of the SPA/BD Protocol, with adequate management plans at breeding sites	By end of year 2029	Contracting Parties
9. Support Contracting Parties and Partners to produce and publish relevant scientific documentation contributing to update knowledge and enhance conservation action taken on the Annex II species.	From 2024 to 2029	SPA/RAC, AP Partners, AEWA, BirdLife International,ICCAT, GFCM
10. Identification of areas important for the birds listed in the Annex II of the SPA/BD Protocol, on land and at sea (mapping of breeding, feeding, roosting, resting, molting and wintering areas).	From 2024 to 2029	Contracting Parties, AP Partners, AEWA, Birdlife International
11. Mapping of breeding, feeding, moulting andwintering areas of pelagic species.	From 2024 to 2029	Contracting Parties
12. Produce progress reports in theimplementation of the Action Plan.	By end of year 2029	SPA/RAC
13. Assess capacity building needs, organize trainings, and report results of specific training courses and workshops in coordination/synergy with international and/or national NGOs	From 2024 to 2029	SPA/RAC, Partners & Contracting Parties
14. Optimize synergies with international agreements and organisations dedicated to bird conservation	From 2024 to 2029	Contracting Parties
15. Raise public awareness, provide educational programmes, and advocate for policy changes to stimulate the implementation of the Action Plan	From 2024 to 2029	Contracting Parties, SPA/RAC, AP Partner, ICCAT, GFCM

PROPOSED SPECIFIC PLANS

28.The hereafter listed Specific Action Plans for the 25 bird species listed in the Annex II of the SPA/BD Protocol should be implemented in all Mediterranean states where the species breed, winter or occur on migration. They should be reviewed and updated every three years. If sudden major environmental changes happen which may affect any of the species' populations in the Mediterraneanan, an emergency review should be immediately undertaken. The current status given below covers the countries that have a Mediterranean coast. Proposed actions, which apply to all species, should include inter alia the initiation of public awareness campaigns on the status of these species and the preparation of National Action Plans. Other on-going Action Plans, which have been developed by other institutions, and which cover some of the species, are listed below, and should be taken in consideration and implemented where these species occur.

1.19. Greater Flamingo (*Phoenicopterus roseus*)

Current status

29. In the Mediterranean, it breeds in localised sites in suitable wetlands, mainly in Spain, FranceTurkey, Italy as well as in Algeria. Breeding colonies are established at sites free from humandisturbance and secure from terrestrial predators. Breeding is irregular with numbers fluctuating from one season to another. Substantial numbers also occur in Tunisia, Greeceand Cyprus but breed rarely. Mediterranean population seems to be separated from Asiatic populations, with minimal exchange and overlap in Libya and Egypt.

Current factors causing loss or decline

30. Urban development; habitat loss for tourism development; disturbance; and illegal killing.

Status under international instruments

- Class A - African Convention on the Conservation and Natural Resources (1968).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - Convention on the Conservation of Migratory Species of Wild Animals (1979).
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean (1626/94 (EC) 1994).
- Listed in the AEWA Action Plan (Column B Category 2a)

Current Action Plans

None

Action Plan objectives and target

31. To maintain healthy breeding populations and maintain wetlands where the species overwinter.

Proposed action

- Confer strictly protected status on the species.
- Prohibit all types of disturbance to breeding colonies.
- Monitor and warden breeding colonies.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.
- Restore wetlands where the species used to breed.
- Maintain wetlands where the species overwinter.

1.20. European Storm-petrel (*Hydrobates pelagicus ssp. Melitensis*)

Current status

32. This pelagic colonial species breeds in small to very large colonies mainly on islets and in caves along the coast. Subspecies *melitensis* is endemic to the Mediterranean. Important breeding colonies are found in Malta, Sardinia and Sicily. Breeding surveys are totally lacking for the Adriatic and eastern Mediterranean. A general decline has been recorded.

Current factors causing loss or decline

33. Loss of habitat; disturbance; predation by *Rattus* sp. and Yellow-legged Gull *Larus cachinnans*; possibly contamination by oil pollutants of the sea.

Status under international instruments

- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Annex I - European Union Directive on the conservation of wild birds (79/409/EEC/1979).
- European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean (1626/94 (EC) 1994).

Current Action Plans

None

Action Plan objectives and target

34. To halt the decline and maintain healthy breeding colonies.

Proposed action

- Compile an inventory of breeding sites and map critical habitats supporting the colonies,particularly in the eastern part of the Mediterranean.
- Confer strictly protected status on the species.
- Prohibit all types of disturbance to the breeding colonies.
- Monitor and warden colonies under threat.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes, which may result in loss of habitat and the introduction and/or spread of invasive species, particularly mammals (*Rattus* sp.) and Yellow- legged Gull *Larus michahellis*.
- Control and/or eradicate rats at all breeding colonies.
- Prevent the introduction of alien predatory species.
- Prevent oil spills and chemical pollution of the sea.
- Identify areas at sea important for the species.

1.21. Scopoli's Shearwater (*Calonectris diomedea*)

Current status

35. This pelagic, colonial species is restricted to the Mediterranean, nesting in sea-cliffs, on rockyislands and islets. Breeds in Algeria**,** Croatia**,** France**,** Greece**,** Italy**,** Malta**,** Spain**,** Turkey and Tunisia where the breeding population has been recently estimated at 140,000 pairs. The majority of the population spends the non-breeding season in the Atlantic**.** Its recent conservation status according to IUCN is of Least Concern (LC) but its population is thought to be in slow decline overall, although more research is required particularly in the eastern part of the Mediterranean and in the Adriatic.

Current factors causing loss or decline

36. Introduced mammals, such as *Rattus* sp., which affect breeding success; illegal hunting; taking of eggs and/or chicks; mortality from bycatch (longlines); development close to colonies and disturbance, and possibly oil spills and chemical pollution of the sea.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean (1626/94 (EC) 1994).

Current Action Plans

None

Action Plan objectives and target

37. To halt the decline of the population and maintain healthy colonies.

Proposed action

- Compile an inventory of breeding sites and map critical habitats supporting the colonies, particularly in the eastern part of the Mediterranean. Confer strictly protected status on the species.
- Prohibit all types of disturbance to breeding colonies, including the taking of eggs and young.
- Monitor and warden colonies under threat of disturbance.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.
- Prevent oil spills and chemical pollution of the sea.
- Monitor levels of mercury and chlorinated hydrocarbons in populations.
- Develop and implement management projects targeting the conservation of the breeding habitat and strict control of introduced mammals, as well as preventing the introduction of alien predatory species.
- Identify important bird areas at sea for the species.
- Develop an Action Plan to reduce mortality at sea especially from bycatch (longlines, gear nets).
- Reduce fishing harvest (small pelagic fishes)

1.22. Yelkouan Shearwater (*Puffinus yelkouan)*

Current status

38. This pelagic colonial species breeds on rocky islands and islets. Population estimated at less than 33,000 pairs, with 95% of the population breeding along the Mediterranean shores of South European countries, with main breeding colonies in Greece Italy and Malta. Somepairs breed along the North African coast. Breeding surveys in the eastern Mediterranean are lacking and for a number of countries the population is very poorly known.

Current factors causing loss or decline

39. Lack of food resources; lack of protection of breeding colonies; predation by Rats *Rattus* sp, Yellow-legged Gulls *Larus michahellis*, and locally by feral cats and dogs; disturbance and illegal hunting; some mortality from bycatch (longlines, gear nets); and possibly contamination by oil pollutants at sea.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- EU European Union Regulation laying down certain technical measures for the conservationof fishery resources in the Mediterranean (1626/94 (EC) 1994).

Current Action Plans

40. National action plan is in place and is being implemented in France. BirdLife International partners are currently working on a LIFE project to produce an action plan.

Action Plan objectives and target

41. To halt the decline of the species, to restore its numbers to former status and to increase theknowledge about its biology.

Proposed action

- Compile an inventory of breeding sites and map critical habitats supporting the colonies.
- Confer strictly protected status on the species.
- Prohibit all types of disturbance to the breeding colonies.
- Monitor the population dynamics of the species and warden colonies.
- Control and if possible, eradicate rats in breeding colonies.
- Prevent the introduction of alien predatory species.
- Ensure the protection of the breeding habitat and create SPAs where breeding colonies exist. Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.
- Promote adequate fishing practices, which take into account the conservation of the species.
- Reduce fishing harvest (small pelagic fishes)
- Prevent oil spills and chemical pollution of the sea.
- Undertake surveys of colonies and research on the conservation biology of the species.
- Identify areas at sea important for the species.
- Develop an Action Plan to reduce mortality at sea especially from bycatch.

1.23. Balearic Shearwater (*Puffinus mauretanicus*)

Current status

42. This pelagic, colonial species is restricted to the Balearic Islands; breeding on rocky islands and islets. It is the most threatened species in Europe. Current official population is estimated at 1989-2883 breeding pairs, but recent research at sea shows a much larger population of individual birds.

Current factors causing loss or decline

43. Predation by introduced carnivores (Genet, Pine Marten and feral cats); bycatch; and possiblyoil spills and chemical pollution of the sea.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- European Union Regulation laying down certain technical measures for the conservation of fishery resources in the Mediterranean (1626/94 (EC) 1994).

Current Action Plans

44. A national Action Plan is in place and is being implemented in Spain

A National Action Plan (PNA) was launched in 2021 by the Ministry of Ecology (MTE) for a period of 5 years. It is led by the French Office for Biodiversity. (Website: https://oiseaux-marins.org/accueil/projets/pna-puffin)

Action Plan objectives and target

45. To halt the decline of the species and restore its numbers to former status.

Proposed action

- Compile an inventory of breeding sites and map critical habitats supporting the colonies.
- Confer strictly protected status on the species.
- Prohibit all types of disturbance to the breeding colonies.
- Monitor the population dynamics of the species and warden colonies.
- Control and if possible, eradicate rats and predators in the colonies and prevent any introduction of terrestrial mammals in breeding colonies.
- Ensure the protection of the breeding habitat and create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.
- Promote adequate fishing practices, which take into account the conservation of the species.
- Prevent oil spills and chemical pollution of the sea.
- Undertake surveys of colonies and research on the conservation biology of the species.
- Identify the marine important areas for the species.
- Reduce fishing harvest (small pelagic fishes)
- Develop an Action Plan to reduce mortality at sea especially from bycatch.

1.24. Pygmy Cormorant (*Microcarbo pygmaeus*)

Current status

46. The main breeding populations in the Mediterranean of this globally threatened species are found in Montenegro, Serbia, Greece, and Turkey, with some pairs in Albania, Bosnia and Herzegovina, Israel and Italy. It is restricted to lowland freshwater and brackish habitats, and in winter frequents coastal lagoons, deltas, rivers and riparian forests. The whole population of the Mediterranean countries probably numbers 11,000-13,000 breeding pairs.

Current factors causing loss or decline

47. Degradation and loss of wetland habitat; disturbance and illegal hunting; destruction of breeding colonies and bycatch with abandoned fish nets.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - Convention on the Conservation of Migratory Species of Wild Animals (1979).
- European Union Regulation laying down certain technical measures for the conservation of fishery resources in the Mediterranean (1626/94 (EC) 1994).
- Listed in the AEWA Action Plan (Column B Category 1)

Current Action Plans

– Action Plan for the Pygmy Cormorant *Phalacrocorax pygmeus* in Europe prepared by BirdLife International on behalf of the European Commission (February 1996).
– Globally threatened birds in Europe Action Plans. Council of Europe – BirdLife International EU Life-Nature (1996).
– Italy has a national Action Plan.

Action Plan objectives and target

48. To maintain the recent increase of the species' population size and distribution.

Proposed action

- Afford strict protection to the species and its habitat, particularly from hunting, disturbance and development.
- Manage wintering and breeding sites in order to meet the species' requirements.
- Monitor breeding and wintering populations.
- Monitor water levels and quality at breeding sites.
- Create SPAs where breeding colonies exist.
- Research its feeding and dispersal ecology.
- Develop education campaigns for hunters.
- Restore degraded wetlands used by the species.

1.25. European Shag (*Gulosus aristotelis ssp.desmarestii*)

Current status

49. This Mediterranean endemic subspecies of the European Shag *Phalacrocorax aristotelisdesmarestii* is present in the western Mediterranean (Balearic Islands, Corsica and Sardinia), and the Adriatic, Aegean and Black Seas, breeding along the coast on rocky islands andislets. The Mediterranean population numbers less than 9,000 pairs.

Current factors causing loss or decline.

50. Human disturbance; oil pollution; habitat loss; mortality from bycatch; Seine net fishing andlong-line hauling close to colonies and moulting areas.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979) (79/409/EEC/1979).
- European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean (1626/94 (EC) 1994).

Current Action Plans

No national action plans, but a Species Action Plan for the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* in Europe was prepared by BirdLife International on behalf of the European Commission (final draft December 1999).

Action Plan objectives and target

51. To ensure the survival of Mediterranean populations.

Proposed action

- Compile an inventory of breeding sites and map critical habitats.
- Confer strictly protected status on the species.
- Prohibit all types of disturbances to the breeding colonies.
- Carry out rat-eradication programmes at breeding colonies.
- Monitor populations.
- Create SPAs where the species breeds, and encourage buffer zones surrounding breeding areas including adjacent sea area.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to breeding sites.
- Take measures to influence fishing policies in order to avoid negative effects on food stocks and food availability, and to avoid mortality from bycatch.
- Prevent oil spills and chemical pollution of the sea.
- Identify important bird areas at sea for the species.

1.26. Dalmatian Pelican (*Pelecanus crispus*)

Current status

52. This species is vulnerable and globally threatened. In the Mediterranean, small populations (totalling 2500-2700 breeding pairs) are found mainly in Albania, Montenegro, Greece and Turkey. Breeds on inland and coastal wetlands and nests on floating islands of reeds and on bare ground on islands, isolated from mainland to be safe from mammalian predators. Up to about 3000 birds winter in Albania, Greece, Syria and Turkey.

Current factors causing loss or decline

53. Wetland drainage resulting in a sharp decline of available breeding sites; collisions with electric wires; persecution due to competition with commercial fisheries; illegal hunting and disturbance.

Status under international instruments

- Class A - African Convention on Conservation and Natural Resources (1968).
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix I & II - Convention on the Conservation of Migratory Species of Wild Animals(1979).
- Appendix I - Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973).
- European Union Regulation laying down certain technical measures for the conservation of fishery resources in the Mediterranean (1626/94 (EC) 1994).
- Listed in the AEWA Action Plan (Column A Category 1a/1c).

Current action plans

Action Plan for the Dalmatian Pelican *Pelecanus crispus* prepared by BirdLife Internationalon behalf of the European Commission (April 1996).
Globally threatened birds in Europe Action Plans. Council of Europe – BirdLife International – EU Life-Nature (1996).
A new Species Action Plan is under development through EU funded LIFE Euro SAP Project 2014-2018.
Albania has a NAP, but it is only partly implemented, while a NAP is in preparation inTurkey.

Action plan objectives and target

54. To prevent any declines and to increase the population size to a level at which it can be regarded as safe.

Proposed action

- Confer strictly protected status on the species and its habitats during breeding and wintering periods in all range states.
- Establish supervised buffer zones around breeding colonies.
- Prohibit all types of disturbance to the breeding colonies.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.

- Manage in a sustainable way or restore where necessary all wetlands where the species occurs.
- Replace overhead electricity wires by thick cables or lay them underground.
- Monitor continually the breeding and wintering populations.
- Develop education campaigns for local fishermen and hunters, and decision-makers.

1.27. Great White Pelican (*Pelecanus onocrotalus*)

Current status

55. In the Mediterranean this species breeds in Turkey and Greece. Numbers have declined in thelast thirty years, and now the breeding population in the Mediterranean is down to less than 1000 pairs (810-940bp). It nests on the ground in large reedbeds, bare earth or rocky islands, in isolation from the mainland to be safe from mammalian predators.

Current factors causing loss or decline

56. Habitat loss and destruction; depletion of fish stocks; persecution and disturbance; pollution;flooding; disease; illegal killing, and collision with electric power lines.

Status under international instruments

- Class A - African Convention on Conservation and Natural Resources.
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979). Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix I (Pal.) II (Western Pal.) - Convention on the Conservation of Migratory Species ofWild Animals (1979).
- European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean Current Action Plans (1626/94 (EC) 1994).
- Listed in the AEWA Action Plan (Column A Category 1a/3c).

Current Action Plans

57. National action plan is in place and is being implemented in Israel.

Action Plan objectives and target

58. To reverse the decline of the breeding populations in the Mediterranean.

Proposed action

- Confer strictly protected status on the species.
- Prohibit all types of disturbance to breeding colonies and their habitat.
- Monitor and supervise breeding colonies.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of (a) coastal development and infrastructure that impacts and/or fragments habitats; (b) pollution; and (c) overexploitation of fish stocks.
- Develop education campaigns aimed at local fishermen.
- Restore degraded wetlands used by the species.
- Create artificial nesting sites close to foraging sites.

1.28. Kentish Plover (*Charadrius alexandrines*)

Current status

59. This predominantly coastal small wader species has an extremely large global range and hence is evaluated by IUCN as of Least Concern. However the overall population trend is decreasing. It prefers sparsely vegetated, sandy or dry mud areas when breeding. While some populations of this species are sedentary or only disperse short distances, most inland and northern coastal populations have distinct separate breeding and wintering ranges. Small breeding populations breed in most Mediterranean countries with some 5000 pairs in Tunisia,up to nearly 2000 pairs in Spain, Greece, and Italy, and 'several thousands' in Morocco.

Current factors causing loss or decline

60. Disturbance of coastal habitats; degradation and loss of wetland habitat; land reclamation; declining river flows; urbanisation and predation by foxes, feral cats and dogs.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - Convention on the Conservation of Migratory Species of Wild Animals (1979).

Current Action Plans

61. National action plan is in place and is being implemented in Slovenia.

Action Plan objectives and target

62. To reverse the decline of the breeding populations and of the number of migrant birds in theMediterranean.

Proposed action

- Control of recreation activities and human disturbance at breeding sites.
- Reduce/ban debris removal from beaches during the breeding season (February-July)
- Reverse the abandonment of salt pans.
- Promote the traditional management of saltpans (as opposed to industrial management), including the permanence of stable water levels and of small sand banks in parts of salt pans suitable for breeding
- Stop pollution of wetland habitats, land reclamation, and infrastructure development at breeding sites.

1.29. Greater SandPlover (*Charadrius leschenaultii ssp. Columbinus*)

Current status

63. This species has an extremely large global range and population size. According to IUCN criteria it is of Least Concern. However, in the Mediterranean the subspecies *columbinus* is known to breed only in Turkey (probably 800-1200bp) and Syria (400-1000bp). As a migrantit is fairly common in Israel, and very scarce or vagrant in some other eastern Mediterranean countries. During the breeding season this species is predominantly found in open, dry, treeless areas and rocky plains. In Turkey the species frequents heavily grazed saline steppe and usually breeds near water but exceptionally also some kilometres away from it.

Current factors causing loss or decline

64. Hunting & disturbance.

Status under international instruments

- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - Convention on the Conservation of Migratory Species of Wild Animals (1979).

Current Action Plans

None

Action Plan objectives and target

65. To ensure the safeguarding and to prompt an increase of the present few breeding populationsin the Mediterranean, as well as to provide it with safe passage and wintering grounds where it occurs in other Mediterranean countries.

Proposed action

- Confer strictly protected status on the species and on its “lookalike” species, where it occurs on passage and during winter.
- Prohibit all types of disturbance to breeding areas and their surroundings.
- Monitor, warden and afford appropriate protection and management of all breeding, passage and wintering grounds.
- Train wardens, unexperienced ornithologists and hunters in the identification of the species to assist in recording it.
- Increase public awareness of the species’ rare status in the Mediterranean.

1.30. Slender-billed Curlew (*Numenius tenuirostris*)

Current status

66. This is a globally threatened species, which is possibly extinct. Once described as common inthe Mediterranean region, it is now one of the rarest and least known species in the Western Palearctic. Used to migrate from Siberia across eastern and southern Europe to winter in North Africa. On passage, occurs in a wide range of habitats: salt marshes, saltpans, brackish lagoons, dry fishponds, steppe and freshwater marshes. Last confirmed documented record in the Mediterranean was in Greece in 1999

Current factors causing loss or decline

67. Habitat loss at migrating and wintering areas. Other factors unknown.

Status under international instruments

- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats (1979).
- Appendix I - Convention on the Conservation of Migratory Species of Wild Animals (1979).
- Appendix I - Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973).
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- European Union Regulation laying down certain technical measures for the conservation of fishery resources in the Mediterranean (1626/94 (EC) 1994).
- Memorandum of Understanding concerning Conservation Measures for the Slender-billed Curlew under the Bonn Convention (CMS) (1994).
- Listed in the AEWA Action Plan (Column B Category 1a/1b/1c).

Current Action Plans

International Action Plan for the Slender-billed Curlew prepared by BirdLife International onbehalf of the European Commission (February 1996).
Globally threatened birds in Europe Action Plans. Council of Europe – BirdLife International – EU Life-Nature (1996).
Italy has a national action plan.

Action Plan objectives and target

68. To provide safe passage and wintering grounds in the Mediterranean.

Proposed action

- Confer strictly protected status on the species and on its “lookalike” species, where it occurs on passage and during winter.
- Monitor and warden wintering sites
- Afford appropriate protection and management of all passage and wintering grounds.
- Plan, regulate and/or manage activities and processes of development near wintering sites.
- Train wardens, unexperienced ornithologists and hunters in the identification of the species to assist in recording it.
- Increase public awareness of the species’ critically threatened status amongst politicians, decision-makers and hunters.
- Ratify the AEWA Agreement by those countries which have not yet done so.

1.31. Slender-billed Gull (*Larus genei)*

Current status

69. This gull is both resident and/or migratory in the Mediterranean. It breeds colonially on sandyislands in saltpans at the coastal zone but also (as in Tunisia) in inland wetlands including saltlakes. It is found breeding at widely isolated scattered localities in some countries. It is presently known to breed in Spain (1650-1950bp), France (ca.1000bp), Italy (3000-5000bp), Greece (100-130bp) and Turkey (2000-3000bp). In Tunisia, up to 4000bp have been recorded breeding in Thyna salt-pans, and 10,560bp have been recorded breeding in the Golfe of Bou Grara, apart from other scattered s ites. It also breeds in Egypt but numbers are unknown; formerly bred in Morocco; and there is no evidence of breeding in Algeria. The European population seems to be decreasing.

Current factors causing loss or decline

70. Disturbance of coastal habitats; degradation and loss of wetland habitats; human disturbance and illegal hunting; predation by feral dogs; eggs and chicks of this species are preyed upon by other gull species especially where colonies are frequently disturbed by humans; subsistence egg collecting by local people; pollution and flooding.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979). Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II of the Convention on Migratory Species and listed under the African EurasianWaterbird Agreement.

Current Action Plans

None. Regional management plans for seabirds including this species are in place and implemented in Spain.

Action Plan objectives and target

71. To maintain and increase a healthy breeding population and increase the number of its colonies.

Proposed action

- Compile an inventory of breeding sites and map critical habitats supporting the colonies, particularly in the North African Mediterranean countries.
- Increase management in breeding areas.
- Prevent disturbance from tourism and recreational activities.
- Develop education campaigns for decision makers.
- Confer strictly protected status on the species.
- Prohibit all types of disturbance to breeding colonies, including the taking of eggs and young.
- Monitor and supervise colonies under threat.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.

- Control or eradicate invasive competitive species and terrestrial mammals at colonies.
- Prevent oil spills and chemical pollution of the sea.
- Identify marine important areas for the species.
- Develop an Action Plan to reduce mortality at sea especially from bycatch.

1.32. Mediterranean Gull (*Larus melanocephalus*)

Current status

72. This gull breeds in dense colonies at lagoons, estuaries, coastal as well as inland saltmarshes, and on large steppe lakes and marshes in open lowland areas. It breeds mainly on the Black Sea coast of Ukraine and at scattered localities throughout Europe. In the Mediterranean it breeds in Spain, southern France, Italy, Greece, and Turkey. The Mediterranean also hosts in winter a substantial number of the European population. The Mediterranean breeding population is estimated to be 9400-15,700 pairs

Current factors causing loss or decline

73. Tourist disturbance at breeding colonies; habitat loss resulting from development; possibly contamination by oil spill and chemical discharges at sea; bycatch from long-line fishing; andthe taking of adults and eggs by fishermen.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979). Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II of the Convention on Migratory Species and listed under the African EurasianWaterbird Agreement.

Current Action Plans

None

Action Plan objectives and target

74. To maintain and increase a healthy breeding population; increase the number of its colonies; and give total protection to the wintering population

Proposed action

- Compile an inventory of breeding sites and map critical habitats supporting the colonies.
- Identify site-based threats and necessary management actions of protected areas.
- Increase existing management in breeding areas.
- Prevent disturbance from tourism and recreational activities.
- Confer strictly protected status on the species.
- Prohibit all types of disturbance to breeding colonies, including the taking of eggs and young.
- Monitor and supervise colonies under threat.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.
- Create where possible artificially constructed nesting sites in coastal locations.

1.33. Audouin's Gull (Larus audouinii)

Current status

75. This is an endemic Mediterranean species, with its main breeding populations occurring in the western Mediterranean in coastal and island sites; an average of 16,800 breeding birds in Spain in the years 2004-2016 being the largest. Other colonies occur in other parts of the Mediterranean including Greece, Turkey, Tunisia and Sardinia. It was close to extinction in the 1970s, but better enforcement of protection measures has resulted in an increase in the breeding population. In 2020, this species relapsed and was moved by Birdlife from LC to NT, based on information that it had a sharp decline in Spain.

Current factors causing loss or decline

76. Habitat alterations at breeding sites; changes in fishing practices in reference to fishing waste management policies; bycatch from fishing gear; competition with theYellow-legged Gull *Larus michahellis*; egg collection; rat predation; human persecution and disturbance; and possibly depletion of food resources and contamination by oil pollutants.

Status under international instruments

- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix I & II -Convention on the Conservation of Migratory Species of Wild Animals (1979).
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979). European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean (1626/94 (EC) 1994).
- Listed in the AEWA Action Plan (Column A Category 1a/3a).

Current Action Plans

International Action Plan for Audouin's Gull *Larus audouinii* prepared by BirdLife International on behalf of the European Commission (March 1996).
Globally threatened birds in Europe Action Plans. Council of Europe – BirdLife International –EU Life-Nature (1996).
Action Plan to restore the Audouin's Gull *Larus audouinii* by Government Committee of Palm Islands Nature Reserve in Lebanon.
Official Working Group in Spain (Ministry of Environment) to review status and propose conservation actions for *Larus audouinii*.
A national action plan is in place and implemented in Italy; another is in preparation in Turkey and regional implemented management plans are on-going for a number of coloniesin Spain.

Action Plan objectives and target

77. To halt the decline of the spieces and maintain a healthy breeding population and increase the number of colonies.

Proposed action

- Conduct research to understand the reason for the recent sharp decline in population.
- Compile an inventory of breeding sites and map critical habitats supporting the colonies, particularly in the eastern part of the Mediterranean.
- Confer strictly protected status on the species.

- Prohibit all types of disturbance to breeding colonies, particularly the taking of eggs and young.
- Monitor and supervise colonies under threat.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.
- Set an Action plan to reduce the dominance of the Yellow-legged Gull over the Audouin's Gull to restore the latter.
- Control or eradicate invasive competitive species and terrestrial mammals at colonies.
- Prevent oil spills and chemical pollution of the sea.
- Identify marine important areas for the species.
- Reduce fishing harvest (small pelagic fishes)
- Develop an Action Plan to reduce mortality at sea especially from bycatch and the illegal use of poison for fishing by fishermen.

1.34. Armenian Gull (*Larus armenicus*)

Current status

78. This species nests colonially in huge aggregations. Its European population has declined rapidly and it was listed by IUCN as Near Threatened. In 2021, the BirdLife International changed the rank of the species from NT to LC following a genuine increase in numbers of individuals of the Armenian Gull (BirdLife International, 2023). In the Mediterranean it breeds in western Turkey where it is resident, with a breeding population of 8000-10,000 pairs. In the Mediterranean it winters in the eastern part but numbers are not known. It is a common winter visitor and passage migrant to Israel where numbers have also decreased drastically. The species inhabits both coastal and inland waters, frequenting lakes, reservoirs, ponds and rivers. It breeds along the stony and grassy shores of mountain lakes, nesting and foraging in reed-beds and on beaches. In its winter range the species may also forage in agricultural fields and on fish-ponds.

Current factors causing loss or decline

79. Persecution (due to the damage it inflicted to fisheries); egg harvesting; and loss of habitat quality.

Status under international instruments

- Appendix II of the Convention on Migratory Species and is covered by the African Eurasian Waterbird Agreement.

Current Action Plans

None

Action Plan objectives and target

80. To maintain the conservation status of the species and maintain a healthy breeding population.

Proposed action

- Identification and designation of important sites for this species.
- Education programmes to fishers to reduce persecution.
- Carry out studies to understand its ecology, including its diet and population trends.
- Compile an inventory of breeding sites and map critical habitats supporting the colonies, in the eastern part of the Mediterranean.
- Confer strictly protected status on the species.
- Prohibit all types of disturbance to breeding colonies, including the taking of eggs and young.
- Monitor and supervise colonies under threat.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.
- Develop an Action Plan to halt the decline of the species and maintain a healthy breeding population.

1.35. Little Tern (Sternula albifrons)

Current status

81. This coastal seabird is a strongly migratory species which usually fishes in very shallow water. It has the most inshore distribution of all terns. It breeds in solitary pairs or in very small groups sometimes amidst colonies of other terns. Its European breeding population is estimated at 36,000-53,000 pairs. However the breeding population in all the Mediterranean countries is estimated at 11,000-14,500 breeding pairs with the highest populations in Turkey (3000-5000bp), Spain 2641-2691bp), Italy (2000-3500bp), Greece (1500-2000bp), France (700bp), Albania (200-500bp), and Israel (300bp). The overall global population trend is decreasing.

Current factors causing loss or decline

82. Habitat loss and destruction of breeding sites; human disturbance; and predation (feral cats and dogs and foxes).

Status under international instruments

- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - Convention on the Conservation of Migratory Species of Wild Animals (1979).
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean (1626/94 (EC) 1994).
- Listed in the AEWA Action Plan (Column A Category 3/a).

Current Action Plans

None; but national implemented action plans exist in Israel & Slovenia.

Action Plan objectives and target

83. To maintain healthy breeding colonies and to fill the gaps of knowledge in quantitative dataof breeding populations in a number of countries.

Proposed action

- Compile an inventory and map critical habitats supporting the colonies, particularly in the eastern Adriatic and eastern Mediterranean countries where quantitative data are lacking.
- Confer strictly protected status on the species.
- Prohibit all types of disturbance to the breeding colonies.
- Eliminate predation.
- Monitor and warden colonies under threat of disturbance.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known colonies.
- Establish population size and trends.
- Restore wetlands where the species is known to breed.

1.36. Common Gull-billed Tern (*Gelochelidon nilotica)*

Current status

84. This species has an extremely large global range, but its breeding population in the Mediterranean is only 5800-7150 pairs: Spain (3185-3435bp), Turkey (1000-2000bp), France (873bp), Italy (550bp), Greece (180-280bp), Tunisia (150-350bp) and Libya (12bp). It breedsin a variety of locations not only in coastal areas, but also at inland lakes, rivers, marshes and swamps.

Current factors causing loss or decline

85. Deterioration and loss of habitat, e.g. through wetland drainage, agricultural intensification, pesticide pollution and fluctuating water levels; Development close to breeding and/or at foraging sites; and human disturbance at breeding colonies.

Status under international instruments

- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II -Convention on the Conservation of Migratory Species of Wild Animals (1979).

Current Action Plans

None

Action Plan objectives and target

86. To safeguard the breeding areas; maintain a healthy breeding population and possibly increase it.

Proposed action

- Compile an inventory and map critical habitats supporting the colonies.
- Ensure breeding sites protection from disturbance, development and modification.
- Confer strictly protected status on the species.
- Eliminate predation.
- Monitor and warden colonies under threat of disturbance.
- Prevent erosion of islet complexes,
- Create SPAs where breeding colonies exist.

1.37. Caspian Tern (*Hydroprogne caspia*)

Current status

87. This species has an extremely large cosmopolitan but scattered distribution. Some populations are sedentary while others are strongly migratory. It prefers nesting on sandy, shell-strewn or shingle beaches, sand-dunes, flat rock-surfaces, sheltered reefs or islands. In the Mediterranean the breeding population is less than 500 breeding pairs, and is restricted toa few countries in the eastern part: Turkey (150-300bp), Syria (100-200bp), Greece (up to 10bp). It is said that it breeds in Egypt, but no numbers are given.

Current factors causing loss or decline

88. Loss and deterioration of breeding habitat, human disturbance at nesting colonies, contamination by oil spills and marine pollution and bycatch in fishing gears.

Status under international instruments

- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats (1979).
- Appendix II -Convention on the Conservation of Migratory Species of Wild Animals (1979).
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).

Current Action Plans

None, but it is listed in the AEWA Action Plan (Column A Category 1a/3a).

Action Plan objectives and target

89. To strictly protect the small breeding population and possibly to increase it.

Proposed action

- Compile an inventory and map critical habitats supporting the colonies.
- Ensure breeding sites protection from disturbance, development and modification.
- Confer strictly protected status on the species.
- Eliminate predation.
- Monitor and warden colonies under threat of disturbance.
- Prevent erosion of islet complexes,
- Create SPAs where breeding colonies exist.

1.38. Lesser Crested Tern (*Thalasseus bengalensis ssp. Emigratus*)

Current status

90. This Mediterranean endemic subspecies is currently confined to Libya, at 4 colonies: Garah Island (2000 pairs), Ftiha Island (12 pairs) Ulbah Island (16 pairs) and Sabkhat Julyanah (70 pairs). Ocassional breeding was recorded in former years in France, Greece, Italy and Spain.

Current factors causing loss or decline

91. Occasional disturbance by fishermen; probably predation by Yellow-legged Gull *Larus cachinnans*; and possibly contamination by oil pollutants and toxic chemicals.

Status under international instruments

- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - (African pops.) Convention on the Conservation of Migratory Species of WildAnimals (1979).
- European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean (1626/94 (EC) 1994).
- Listed in the AEWA Action Plan (Column A Category 1/c).

Current Action Plans

None. However, a national action plan is in place in Libya but it is not yet implemented.

Action Plan objectives and target

92. To safeguard the breeding areas; maintain a healthy population; and possibly increase itspopulation.

Proposed action

- Confer strictly protected status on the species.
- Prohibit all types of disturbance to breeding colonies, including the taking of eggs and young.
- Monitor and supervise colonies regularly.
- Create SPAs where the species' breeding colonies exist and prohibit access to known sites except for scientific purposes.
- Investigate whether local fisheries impact on breeding success.
- Prevent oil spills and chemical pollution of the sea.
- Establish population size and trends.
- Provide small artificial islands at Sabkhat Julyanah to encourage an increase of the colony size in the lake.

1.39. Sandwich Tern (*Thalasseus sandvicensis*)

Current status

93. This species can be found in Europe, Africa, western Asia, and the southern Americas. Whilstthe European population is estimated at 79,900-148,000 pairs, the breeding population in the Mediterranean is estimated to be 6300-8800 pairs, nesting in colonies mainly in river deltas, on sandbanks and in salinas. Also migrates from elsewhere into the Mediterranean for wintering.

Current factors causing loss or decline

94. Degradation and loss of habitat mainly due to coastal development; disturbance by humans, animals predation and hunting; and possibly reduction of small pelagic fish abundance.

Status under international instruments

- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - Convention on the Conservation of Migratory Species of Wild Animals (1979).
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- Listed in the AEWA Action Plan (Column A Category 3a/3c).

Current Action Plans

None

Action Plan objectives and target

95. To maintain healthy breeding colonies and stop the loss of habitat.

Proposed action

- Compile an inventory and map critical habitats supporting the colonies, particularly in the eastern part of the Mediterranean, where breeding surveys are lacking.
- Confer strictly protected status on the species.
- Prohibit all types of disturbance to the breeding colonies.
- Monitor and supervise colonies under threat of disturbance.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development that impact on wetlands and other breeding habitats.
- Restore wetlands where the species breeds.

1.40. Osprey (*Pandion haliaetus*)

Current status

96. This is a cosmopolitan species, which is vulnerable in several regions. Whilst the European population is estimated at 8,400-12,300 pairs, less than 120 pairs breed in the Mediterranean (mainly Balearic Islands, Corsica, Morocco and Algeria). Some local small populations have disappeared from other islands (e.g. Ibiza, Sicily & Sardinia). The newly established Italian population (<10 pairs) originates from Corsican individuals released in 2006-2010.

Current factors causing loss or decline

97. Habitat destruction and disturbance at breeding sites related to tourism. Mortality occurs mainly from illegal poaching, electrocution and collisions.

Status under international instruments

- Class B - African Convention on Conservation and Natural Resources (1968).
- Appendix II -Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - Convention on the Conservation of Migratory Species of Wild Animals (1979).
- Annex I - European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).
- European Union Regulation laying down certain technical measures for the conservation offishery resources in the Mediterranean (1626/94 (EC) 1994).

Current Action Plans

None; but a regional species action plan is in place in Spain. France submitted to CMS a National Action Plan for Osprey as an instrument on 30 October 2019.

Action Plan objectives and target

98. Reverse the decline of the breeding population in the Mediterranean.

Proposed action

- Make an inventory and map critical habitats supporting the remaining breeding pairs.
- Confer strictly protected status on the species.
- Prohibit the destruction of its habitat, disturbance, and the taking or trade of the species.
- Use area-based measures to protect and restore its habitats.
- Create SPAs where it breeds.
- Plan, regulate and/or manage activities and processes of coastal and infrastructure development near to known breeding sites.
- Research the causes of the decline of the species.

1.41. Pied Kingfisher (*Ceryle rudis)*

Current status

99. This species has an extremely large range. However in the Mediterranean it is restricted to a few countries and is only known to breed in Israel (2500bp), Turkey (100-200bp) and in Syria and Egypt where breeding numbers are unknown. Decreases in populations have been noted in Syria, Israel, and Egypt. It inhabits small and large lakes, large rivers, estuaries, coastal lagoons and sandy and rocky coasts, dams and reservoirs with either fresh or brackish water with available waterside perches. It is generally sedentary with some local movements due to changes in the supply of food.

Current factors causing loss or decline

100. Use of poisons and pesticides; water storage developments; and bioaccumulation of pollutionand toxins in the fish they eat.

Status under international instruments

- Appendix II -Convention on the Conservation of European Wildlife and Natural Habitats(1979).

Current Action Plans

None

Action Plan objectives and target

101. Reverse the decline and maintain a healthy breeding population in the Mediterranean.

Proposed action

- Compile an inventory of the breeding areas and populations.
- Protect legally the species and all its key breeding sites.
- Carry out research on the species' range, ecology, habitat requirements and movements, to be used for the necessary conservation measures.
- Assess the potential threats and their impacts in order to develop appropriate response.
- Develop Regional Action Plans for the protection and management of the species' key sites.

1.42. White-breasted Kingfisher (*Halcyon smyrnensis)*

Current status

102. This kingfisher has a very large global range. However, in the Mediterranean it is restricted toa few countries, and is only known to breed in Israel (15,000bp), Turkey (170-250bp) and Egypt (> 10,000bp, but no proper estimates). It inhabits various habitats ranging from water bodies to farmland and palm plantations.

Current factors causing loss or decline

103. Use of pesticides; habitat degradation from various factors; gaps in knowledge of the species'ecology and behaviour and of the threats facing this species.

Status under international instruments

- Appendix II -Convention on the Conservation of European Wildlife and Natural Habitats (1979).

Current Action Plans

None

Action Plan objectives and target

104. Reverse the decline and maintain a healthy breeding population in the Mediterranean.

Proposed action

- Compile an inventory of breeding areas and populations.
- All breeding sites should be strictly protected and supervised.
- Prohibit any development that would degrade the species' breeding sites.
- Carry out research on species ecology and habitat needs for future conservation measures.
- Assess the potential threats and their impacts in order to develop appropriate responses.
- Develop Regional Action Plans for the protection and management of the species' key sites.

1.43. Eleonora's Falcon (*Falco eleonorae)*

Current status

105. This falcon breeds in colonies along the coast of the mainland or on rocky islands, which are often uninhabited. In Europe, which covers >95% of the breeding range, the population has been estimated recently at 14,300-14,500 pairs – the largest number of breeding pairs are found in Greece (12,360), followed by Italy (638-704), Spain (655), Cyprus (90-145) and Turkey (35-50). The North African population has been estimated at approximately 250 pairs (ca.72% of which are found in Tunisia). The current population trend is increasing. Almostall the entire population breeds on rocky Mediterranean islands.

Current factors causing loss or decline

106. Predation by cats and rats; human disturbance in colonies; habitat degradation; taking of eggsand young; hunting; and accidental poisoning from pest control methods.

Status under international instruments

- Class B - African Convention on Conservation and Natural Resources (1968).
- Appendix II - Convention on the Conservation of European Wildlife and Natural Habitats(1979).
- Appendix II - Convention on International Trade in Endangered Species of Wild Fauna andFlora (1973).
- Annex I European Union Directive on the Conservation of Wild Birds (79/409/EEC/1979).

Current Action Plans

International Species Action Plan Eleonora's Falcon *Falco eleonorae* prepared by BirdLife International on behalf of the European Commission (final draft December 1999).
A regional implemented species action plan for the Balearics, which host most of thebreeding population in Spain, is in place.

Action Plan objectives and target

107. To safeguard the present colonies and encourage the increasing trend, through preserving the breeding sites particularly the uninhabited islands and eliminating any negative impacts on the species.

Proposed action

- Confer strictly protected status on the species.
- Prohibit all types of disturbance to the breeding colonies, including the taking of eggs and young.
- Monitor and warden colonies under threat.
- Create SPAs where breeding colonies exist.
- Plan, regulate and/or manage activities and processes, which may result in loss of habitat and the introduction/spread of invasive species.
- Control and/or eradicate species that have become invasive.
- Carry out breeding surveys in eastern Mediterranean countries. Prevent poisoning through awareness campaigns and cooperation with farmer.

Annex IV

Updated Action Plan concerning Species Introductions and Invasive Species in the Mediterranean Sea

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Updated Action Plan concerning Species Introductions and Invasive Species in the Mediterranean Sea

1. Introduction

1. 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.

2. Currently, MAP has been adopted by 21 countries bordering the Mediterranean Sea, and the European Union. The 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 alien 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).

3. To that effect, the Contracting Parties adopted in 2003 the first Regional Action Plan concerning species introductions and invasive species in the Mediterranean Sea, which was further updated in 2017. The main objective of the 2017 NIS Action Plan was to promote the development of coordinated efforts and management measures throughout the Mediterranean region in order to prevent as appropriate, minimise and limit, monitor, and control marine biological invasions and their impacts on biodiversity, human health, and ecosystem services, through a series of actions to be carried out between 2017 and 2020. Coinciding with the adoption of the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP), which aims to assess the status of the Mediterranean sea and coast as a basis for enhanced action, the focus of the 2017 Action Plan was to strengthen the capacity, and the institutional and legislative framework of Mediterranean countries so that they can deal with issues of alien species, conduct baseline studies and establish monitoring programmes, foster regional co-operation and data sharing infrastructure and produce guidelines and other necessary technical documentation; goals which have been achieved to a large extent.

4. As our baseline knowledge and understanding of marine boinvasions has been increasing and the regulatory and institutional framework to combat NIS are continuously developing, the post-2020 international and regional policy framework is moving towards more concrete actions for the management of pathways and the drastic reduction in invasive alien species populations and their impacts.

5. The first draft of the Post-2020 Global Biodiversity Framework (GBF) addresses alien species with Target 6: Manage pathways for the introduction of invasive alien species, preventing, or reducing their rate of introduction and establishment by at least 50 per cent, and control or eradicate invasive alien species to eliminate or reduce their impacts, focusing on priority species and priority sites.

6. Similar stipulations are reflected in the Draft Post-2020 Strategic Action Programme for the Conservation of Biodiversity and Sustainable Management of Natural Resources in the Mediterranean Region" (Post-2020 SAPBIO), which aims to reduce the threats to biodiversity by alien species with its Target 1.2 on alien invasive species, by sharing databases and controlling introduction pathways and impacts in the most vulnerable areas. Furthermore, it stipulates that "Invasive alien species and pathways must be regularly identified in all countries, listing priority species to be controlled or eradicated".

7. The EU Biodiversity Strategy for 2030, calls for an enhanced implementation of NIS-relevant legislation aiming to minimise, and where possible eliminate, the introduction and establishment of alien species in the EU environment. One of the Strategy's key commitments is the management of established invasive alien species and a 50% reduction in the number of Red List species they threaten (EC, 2020)

8. The Mediterranean Sea, with about 1000 alien species reported in its waters up to now, is one of the most invaded ecosystems in the world. The trend of new introductions of alien species, which exhibited a steep increase after the mid-1990s, shows no sign of decline and is moreover accompanied by an accelerating rate of spread and establishment in the last decade, with almost seventy percent of the species being considered established (Zenetos & Galanidi, 2020; Zenetos et al., 2022a). Some of these species have become invasive with serious negative impacts on biodiversity, human health, and ecosystem services. The main 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, aquaculture, trade in live marine organisms (aquarium trade and live food trade) and others (e.g. fishing activities and aquarium exhibits).

9. 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. In the 2022-2027 period, significant actions for the management of shipping vectors are planned within the framework of the Ballast Water Management Strategy for the Mediterranean Sea and its Action Plan. The present NIS Action Plan takes this into consideration with complementary actions addressing the remaining important pathways, as well as a focus on the impacts of priority invasive species on priority native species and habitats, in line with existing regional and international policies; it will be adapted and updated, if necessary, to reflect the latest policies on invasive species and new data available.

10. 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 it to the National Focal Points for SPAs, who will make follow-up suggestions to the Parties.

11. 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

12. 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 make progress towards Good Environmental Status in relation to non-indigenous species. These efforts can be organized along two main axes corresponding to the two main operational objectives of the Ecosystem Approach (EcAp) and IMAP with respect to Ecological Objective 2 (EO2) and Common Indicator 6 (CI6).

13. Operational objective 2.1 requires that "Introduction and spread of NIS linked to human activities are minimised, in particular for potential IAS" and addresses trends in temporal occurrence, spatial distribution, and abundance of NIS, as well as preventative measures for introduction and spread. Here, the main goals of the Action Plan for the next five years should be:

- Continuing to support the implementation of IMAP and the operationalization of its indicators
- Developing a regional early-warning system within the framework of MAMIAS
- Continuing to elaborate guidelines and technical documentation
- Strengthening the institutional and legislative framework for pathway management, allowing for synergies with the Mediterranean BWM Strategy (2022-2027)
- Supporting the implementation of the Mediterranean BWM Strategy (2022-2027), through technical cooperation and capacity building activities
- Promoting voluntary codes of conduct for pathways where a mandatory legal framework is not yet in place

Operational objective 2.2 states that "The impact of non-indigenous, particularly invasive species, on ecosystems is limited" and requires prioritization and impact quantification that can be achieved in a three-step process of:

- Risk assessment and prioritization with an emphasis on prevention and mitigation.
- Identification of invasive population levels that elicit unacceptable effects
- Elaborating and executing rapid response plans and management plans for the most invasive NIS

3. Priorities

1. At National level

14. 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:

- Conducting regular NIS monitoring as specified in their monitoring programmes
- Supporting the regional Digital Data infrastructure by providing updated baselines and any other new information to MAMIAS and by submitting yearly monitoring data to the IMAP Info System
- Focusing on invasive species impacts through systematic prioritization, risk assessment and targeted species impact research
- Performing data-based assessments of the NIS introduction and spread risks associated with the aquaculture, ornamental trade and live food trade sectors
- Elaborating an early warning system and rapid response plans
- Developing training and raising awareness programmes on risks, legal issues, best practices, and management actions for prevention and mitigation of impacts.
- Ratify and implement the BMW convention and enact the BMW strategy for the Mediterranean and its Action Plan

2. At Regional level

15. Considering the existing progress in monitoring and baseline information and the activities planned under the BWM Action Plan concerning ballast water and fouling management, priority at the regional level should be given to:

- Further develop criteria for the identification and prioritization of pathways based on international standards and assess their economic impact
- Further refinement of IMAP targets and development of impact related aspects of CI6 indicator
- Supporting cooperation at international level and ensuring harmonization with related policies
- Activating the updated version of MAMIAS and developing an early warning system
- Co-ordinating the application of risk assessment methodologies for priority species
- Training and capacity building for status assessments of the aquaculture, ornamental trade and live food trade sectors
- Training as needed and co-ordination of targeted NIS impact studies
- Support the implementation of the Ballast Water Management Strategy for the Mediterranean and its Action Plan, in cooperation with REMPEC

4. Actions required to attain the objectives of the Action Plan

1. At National level

a). IMAP implementation

- Consolidate/implement IMAP compliant monitoring programmes (if not already in place) and adapt as necessary as new data emerges and IMAP refinement progresses;
- Regularly update the national baselines, informed by national monitoring, research projects and the literature.
- Endeavour to increase the level of confidence in pathways and vectors of introduction and spread and refine relevant baseline information to support the BWM Action Plan.

b). Prioritisation and planning

- Conduct Horizon Scanning for existing NIS and potential future introductions at the national level in order to compile priority lists of high-risk species and to inform an early warning system. High-risk species should be prioritized for spatial distribution and abundance monitoring.
- Perform risk assessments of priority species following well established protocols and taking into account the potential for management
- Quantify and map impacts of priority species at the national level by employing CIMPAL. Such analysis allows the identification of hotspots of highly impacted areas, and augments the prioritization of sites, pathways and species for management actions.
- Perform risk analysis and status assessments of sectors (aquaculture operations, ornamental trade and live food trade)
- Conduct Environmental Impact Assessments before actions on pathways that could increase NIS

c). Initiate and support research on NIS impacts

- Focused impact studies (field and laboratory experiments, modelling studies) for priority species to identify acceptable abundance levels

d). Support the regional Digital Data Infrastructure

- Regularly submit monitoring data to the IMAP Info System, following the designated procedures and Data Standards
- Support MAMIAS with updated baselines, pathway information, results of impact studies an any other new information.

e). Legislation

16. 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 organisations.

f). Institutional framework

- Set up reporting mechanisms for NIS sightings, especially among actors and stakeholder groups most likely to first notice new species introductions (e.g. fishers, divers, aquaculture operators, border officials, etc.). Disseminate information about species anticipated to arrive in the near future. Provide links of this early warning system to the regional MAMIAS system and cooperate with the concerned authorities in neighbouring states regarding new NIS detections;
- Elaborate rapid response and management plans for invasive NIS, including eradication or population control measures as appropriate; it is important that such plans are specific with clear procedures, jurisdictions and resource allocation;
- Conduct research on methods to mitigate invasions through existing pathways.
- Develop and disseminate best practice guidelines and codes of conduct for pathways not already covered by the BWM Action Plan
- Strengthen and where necessary set up systems to control the intentional import and export of alien marine species;
- Promote citizen science programmes for data collection;
- Undertake awareness raising activities for targeted stakeholder groups and the general public.

2. At Regional level

a). IMAP implementation/refinement and operationalization of its indicators

17. Evaluation of CI6 is currently based on operational objective 2.1 (“Invasive non-indigenous species introductions are minimized”), addressing trends in abundance, temporal occurrence and spatial distribution of NIS, notably in risk areas; however due to the lack of suitable data, significant progress has only been made in assessing trends in temporal occurrence. With national monitoring programmes being increasing implemented and making data available, further elaboration of CI6 elements will be possible, more specifically:

- Setting reference conditions and threshold values for trends in temporal occurrence, in collaboration with other Regional Seas Conventions and the EU
- Elaborating methodologies and quantitative targets for trends in spatial distribution
- Elaborate quantitative targets for trends in abundance, in conjunction with operational objective 2.2 (“The impact of non-indigenous, particularly invasive species on ecosystems is limited) and its state target “Abundance of NIS introduced by human activities reduced to levels giving no detectable impact.
- Elaborate scales of aggregation for CI6 assessment and integration with other Ecological Objectives and Common Indicators
- Furthermore, develop an early warning system within MAMIAS and link with national early warning systems.

Finally, liaise with REMPEC on monitoring and data collection in ports and baseline surveys in ports to ensure integration with IMAP monitoring programs.

b). Implementation of the BWM Strategy (2022-2027)

18. SPA/RAC is already committed in its PoW for 2024-2025 to provide assistance to Contracting Parties to implement target measures to control and manage ships' ballast water and biofouling in order to minimize

the transfer of invasive aquatic species, as an active participant in the implementation of the BWM Strategy. This can be achieved through:

- Participation in the regional online BWM Working Group, established and coordinated in cooperation with REMPEC, to drive the process towards harmonization of BWM measures in the region;
- Liaising with REMPEC regarding monitoring and data collection at ports and port baseline surveys to ensure integration with IMAP monitoring programmes.
- Assisting, with data and methodological approaches, in developing and implementing port risk assessments and a comprehensive Regional Procedure for the Granting of Exemptions under the BWM Convention as stipulated in the BWM Action Plan;
- Co-ordinating, together with REMPEC, the preliminary activities to address the threat of biofouling on ships and provide assistance to Contracting Parties in implementing them, as stipulated in the BWM Action Plan (i.e., organize a regional workshop, conduct National Status Assessments and national strategies and action plans to manage biofouling)

c). Training and Capacity Building

- Produce an updated guide for risk analysis to assess NIS impacts. Organise a training session focusing on the application of risk analysis, risk assessment for priority species and for pathways and environmental impact assessments and co-ordinate the systematic application of region-wide agreed methodologies. Considering that a regional risk assessment of key ports in the Mediterranean Sea as well as National Status Assessments for biofouling are planned to be undertaken within the framework of the BWM Action plan, the focus should be on species, as well as risk analyses of other contributing pathways, most notably corridors, aquaculture, the ornamental trade and live food trade. Collaborate with Contracting Parties on data requirements and availability and with REMPEC to support ballast and biofouling management with NIS related data.
- Provide guidance and training as needed for experimental field studies and modelling studies and translating results into policy targets, co-ordinate pilot studies for specific NIS in order to elucidate their density-impact relationships.

d). Public education and awareness

19. With particular focus on stakeholders and decision-makers, prepare and circulate guidelines with best practices for activities and sectors that exert strong pressure as vectors of introduction and particularly spread of NIS

5. Regional Coordination

20. 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 a report on the progress made in reaching its objectives at the end of the 5-year implementation period;

- 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

21. 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 Partner» 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.

22. In addition to collaborating and coordinating with the Secretariats of the relevant Conventions, SPA/RAC should invite other MAP components and RACs to join and contribute to the implementation of the present Action Plan, in particular REMPEC and INFO/RAC. It will set up a mechanism for regular dialogue between the participating organisations and, where necessary, organise meetings to this effect.

7. Implementation timetable

Action (* in tandem with the BWM Action Plan)	Deadline	Responsible
1. establish a working group nominated by Contracting Parties to Further develop criteria for the identification and prioritization of pathways based on international standards and assess their economic impact	2024	SPA/RAC & Contracting Parties
2. Consolidate/implement IMAP compliant monitoring programmes	2024	Contracting Parties
3. Increase the level of confidence in pathways and vectors of introduction and spread	2024	Contracting Parties
4. Prepare and circulate guidelines with best practices for activities and sectors that exert strong pressure as vectors of introduction	2024	SPA/RAC
5. Produce an updated guide for risk analysis to assess NIS impacts	2024	SPA/RAC
6. Organise a training session for risk assessment of species and pathways	2024	SPA/RAC
7. Develop and adopt a regional protocol for sampling of ballast water for purposes of Port State Control*	2024	REMPEC & SPA/RAC
8. Develop a regional protocol for port baseline surveys *	2024	REMPEC & SPA/RAC
9. Review and adapt the IMAP Guidance Fact Sheet for CI 6 under EO 2 to ensure integration of data in the IMAP Info System*	2024	REMPEC & SPA/RAC
10. Develop and adopt a regional protocol for port risk assessment *	2024	REMPEC & SPA/RAC
11. Undertake a regional risk assessment of key ports in the Mediterranean Sea *	2025	REMPEC & SPA/RAC
12. Develop, adopt, and implement a comprehensive Regional Procedure for the Granting of Exemptions under the BWM Convention *	2025-2028	REMPEC & SPA/RAC
13. Develop an early warning system in the framework of MAMIAS	2025	SPA/RAC
14. Conduct Horizon Scanning for existing NIS and potential future introductions taking into consideration the increased risk of establishment of IAS due to climate change	2025	Contracting Parties
15. Perform risk assessments of priority species	2025	Contracting Parties
16. Map impacts of priority species with CIMPAL	2025	SPA/RAC, Contracting Parties
17. Workshop to initiate biofouling-related activities in the region *	2024	REMPEC & SPA/RAC
18. Undertake National Status Assessments of Biofouling *	2025	Contracting Parties
19. Develop national strategies and action plans to manage biofouling *	2025-2028	Contracting Parties
20. Perform risk analysis and status assessment of aquaculture, ornamental trade and live food trade sectors	2026	Contracting Parties
21. Set up a mechanism to promote and coordinate the actions listed in section C.1.6. (Institutional framework)	2025	Contracting Parties
22. Launch the procedures for enacting or strengthening national legislation governing the control of alien species introduction	2026	Contracting Parties
23. Develop national early warning and reporting systems	2026	Contracting Parties
24. Elaborate rapid response and management plans for invasive NIS	2026	Contracting Parties
25. Preparation of material for public education and awareness	2025-2028	SPA/RAC, Contracting Parties

26. Develop programmes to raise the awareness of the general public and target groups, including decision-makers, concerning the risks associated with species introduction and disseminate best practice guidelines	2028	Contracting Parties
27. Strengthen and where necessary set up systems to control the intentional import and export of alien marine species	2027	Contracting Parties
28. Support the regional Digital Data Infrastructure as set out in section C.1.4	2024-2028 (annually)	Contracting Parties
29. IMAP CI6 target refinement, setting of thresholds, further indicator development regarding impacts	2024-2028	SPA/RAC
30. Organise a symposium every 3 years	From 2024	SPA/RAC

Annex V

Restoration Programme of *Pinna nobilis*

Restoration Programme of *Pinna nobilis*

FOREWORD

1. Elaborating and implementing action plans to conserve one species or group of species and or restoration programme is an effective way of guiding, coordinating and strengthening the efforts that the Mediterranean countries are making to safeguard the natural heritage of the region and fulfil their obligation under the new 1995 Barcelona Convention Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol).

2. *Pinna nobilis* is a long-lived Mediterranean endemic species, considered one of the biggest bivalve molluscs in the Mediterranean Sea. It has a wide distribution across coastal areas, occurring mainly in seagrass meadows, but also present in other habitats such as rocky bottoms, coarse sand or rhodoliths beds.

3. A mass mortality event affecting *Pinna nobilis* populations was first detected in 2016 along the Spanish coast. The still ongoing mortality outbreak has been found to be caused by a pathogen, which rapidly spread throughout the Mediterranean Sea causing mortality rates of 80-100% across many regions.

4. In 2018, a First online meeting of 33 researchers and representatives from the public administrations from 13 Mediterranean countries to coordinate a response to *Pinna nobilis* crisis, facilitated by IUCN-Med, to present the latest mortality data and progress to recover the Critically Endangered (CR) populations of *Pinna nobilis*, now included on the IUCN Red List of Threatened Species. The role of unaffected populations for a potential recovery, established with a network of larval collector stations to enhance larval dispersal from unaffected sites and potential recolonization through recruitment of resistant juveniles was also discussed.

5. In this context, the Specially Protected Areas Regional Activity Centre (SPA/RAC) of the United Nations Environment Programme / Mediterranean Action (UNEP/MAP) Barcelona Convention, implemented a project funded by the UNEP Regional Seas Programme - 2021 Swedish International Development Cooperation Agency (SIDA) allocation in the Mediterranean sub-basin, to contribute to the restoration of *Pinna nobilis* a species of the Annex II “List of endangered or threatened species” of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean of the Barcelona Convention.

6. This project had two major actions. The first was related to the elaboration of draft restoration programme for *Pinna nobilis* and its discussion and validation during a two-day regional workshop (Tunisia, 20-21 June 2022). The second action was related to the organisation of a regional hands-on training on juveniles’ collection from identified sites and their transportation in rearing sites (Kerkennah Islands, Tunisia, 28-30 June 2022).

7. In the implementation of its project, SPA/RAC in partnership with the Life Pinna Project consortium “Conservation and re-stocking of the *Pinna nobilis* in the western Mediterranean and Adriatic Sea” coordinated by the regional agency for the protection of the Ligurian environment (Italy) and supported by the European Union (EU) Life Programme, drafted a proposal for a restoration programme for *Pinna nobilis*, which was discussed during the regional workshop, held in Tunis, Tunisia from 20 to 21 of June 2022.

8. During the two-day regional workshop, the participants made an overview of the situation of *Pinna nobilis* in their respective countries and shared information on some restoration activities implemented in few countries confirming the regional alarming situation and the need and urgency to act for

monitoring, studying and the restoration of the species as soon as possible in a coordinated manner with proven scientific approach.

9. The workshop urged the establishment of the Pan-Mediterranean task force to implement, propose and assess the translocation of potentially resistant individuals and any other matters in relation with the restoration of *Pinna nobilis*.

10. Due the alarming situation of *Pinna nobilis*, the participants recommend that SPA/RAC, the Contracting Parties, and relevant partners such as IUCN, research institutions and NGOs contribute to the implementation of the draft restoration programme as appropriate.

11. The Participants also call upon the relevant donors and national and international funding agencies to support the restoration programme of *Pinna nobilis* due to the urgency of its situation.

12. Participants thoroughly discussed the proposed draft *Pinna nobilis* restoration programme, main objectives, national and regional priority actions as well as timetable implementation. A final version has been validated, and participants have agreed/recommend submitting the amended version to the Barcelona convention Contracting Parties for consideration.

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INTRODUCTION

1. The fan mussel *Pinna nobilis* (Linnaeus, 1758) is the largest endemic bivalve of the Mediterranean Sea. *P. nobilis* occurs in soft-bottom habitats of transitional water ecosystems and in marine coastal zones at depths between 0.5 and 60 m, mostly in seagrass meadows of *Posidonia oceanica* or *Cymodocea nodosa* (Zavodnik et al. 1991, Richardson et al. 1999, García March et al. 2007, Orfanidis et al. 2007, Coppa et al. 2010; 2013, Prado et al. 2014), but also in bare sandy bottoms (Katsanevakis 2005). This species is an important benthic filter feeder contributing to water clarity, and a "conservation species", playing the roles of flagship, key and umbrella species.

2. The *Pinna nobilis* facies that could characterize the infralittoral sands or muddy sands is part of the reference list of species and habitats to be monitored in the framework of the Barcelona Convention's Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (Decision IG.22/7).

3. Due to its ecological relevance, *P. nobilis* has recently been suggested as being a reliable bioindicator for benthic coastal ecosystems according to the Descriptor 1 "Biological diversity" and 4 "Status of the single structural components of ecosystems" of the EU Marine Strategy Framework Directive (MSFD 2008/56/EC).

4. In addition, the fan mussel represents the host for two crustacean symbionts (i.e., *Pontonia pinnophylax* and *Nepinnotheres pinnotheres*) (Rabaoui et al. 2008) and it is also predated by other species, such as for instance *Octopus vulgaris* and or other small molluscs (e.g., *Hexaples trunculus*), playing a key role in the trophic web.

5. During the 80s, populations of *P. nobilis* greatly declined due to several human activities (i.e., fishing, ornamental harvesting, anchoring, and trawl nets). Therefore, *P. nobilis* is nowadays a protected species under Annex II "List of endangered or threatened species" to the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean of the Barcelona Convention and. the Annex IV of the EU Habitats Directive 92/43/EEC (EEC 1992).

6. In a few decades, this full regime protection led to a complete recovery of the species in the whole Mediterranean, as it was also evidenced by molecular analyses (Sanna et al. 2013; 2014). Unfortunately, in early autumn 2016 a mass mortality event (MME) impacted *P. nobilis* populations in the south-western Mediterranean Sea (Vázquez-Luis et al. 2017). Since then, the situation has worsened, gradually affecting the coasts of many Mediterranean countries. In Italy for example, from Sardinia to Sicily, from Apulia to Tuscany, fan mussels are dying. The protozoan *Haplosporidium pinnae*, a pathogenic micro-organism that affects the digestive system of the mollusk progressively reducing the feeding of the animal and causing its death, was initially imputed as the main cause of this mass mortality (Catanese et al. 2018, Panarese et al. 2019). However, recently several bacteria species have been also invoked as pathogens involved in the mass mortality of this species (Carella et al. 2019, Prado et al. 2020, Scarpa & Sanna et al. submitted) suggesting that the real causes of the mortality are not completely understood and that a multifactorial disease may be the most probable responsible factor.

RESTORATION PROGRAMME

7. The restoration programme aims to establish the main steps to be followed to start a recovery process for the pen shell. The difficulties of operating with distances that are too great for actions such as transporting individuals make it necessary for the programme to have focal points that can carry out the main actions in each of the regions where it is intended to operate. The technical-scientific expertise also required for some of the proposed analyses makes it appropriate to identify one or more competent structures that can carry out this task for the benefit of the peripheral locations and stand in for the lacking these skills. For all actions also, it will be necessary to initiate training, perhaps available online on a shared e-learning platform, to school the personnel who will be dedicated to operations such as the setup of the collectors, their placement, and the sorting of the collected material, as well as the collection and translocation of individuals in a practical and safe way that could meet the criteria required for authorization under each state's implementation of the 92/43/CEE directive.

8. Considering the analysis of all the projects (see annexe I: case studies & state of the art**)** and the preliminary results of some of the most recent research, it is not possible to indicate a unique solution to facilitate the restoration of *Pinna nobilis.* The experimental trials conducted so far, as well as the evolving knowledge on the causes of mass mortality, warn us against illusory solutions and suggest going step by step on a precautionary approach under continuous monitoring and assessment.

9. The actions implemented by the different projects have some shared points that deserve to be considered as priorities in the *Pinna nobilis* Restoration programme; in particular, these are actions concerning the setup of collectors for collecting larvae, environmental assessments of the health conditions of sites with live Pinna, monitoring of implanted juveniles (when replanting from the project is envisaged), continuous updating of all the methodologies used, growth of juveniles in aquaria and/or in facilities also at sea, transport of individuals to 'safe' sites and extensive monitoring actions also through Citizen Science. On some actions to be taken, on the other hand, there does not seem to be total agreement; however, these are choices determined by whether or not to have provided for translocating individuals between different sites: in fact, where it has been decided to implement only collector collection practices, replanting has been favoured in places such as lagoons where individuals, not necessarily resistant, nevertheless seem to survive because of unfavourable conditions for pathogens. In these places, it would not make sense to implement monitoring techniques with environmental sentinels as envisaged when individuals are to be transferred between even very distant sites whose suitability must be evaluated in advance to avoid wasting valuable time and biological resources.

10. The proposed programme is based on what was developed under the LIFE Pinna project and supplemented with the support of documentation collected from the other existing projects.

Objectives:

11. The main objective aimed at by the present Restoration programme are to reduce threats and promote the conservation and restoration of *Pinna nobilis* populations particularly by:

- Reducing the threats impacting this species through the implementation of sustainable fishing practices, reduce pollution and protect its habitat
- The conservation of the seagrass meadows, and of other vegetal assemblages of importance for the marine environment, as marine habitats that are essential to the survival of many Mediterranean species and in particular *Pinna nobilis*, and keeping them in favourable conservation status;
- Improving the knowledge on the status of *Pinna nobilis*
- Ensuring conservation of genetic diversity of Mediterranean populations of *Pinna nobilis* as the primary source for the species' resilience

- The recovery of *Pinna nobilis* according to their specificities and best available science and by addressing the identified threats
- The restocking is a possible solution only when ensuring at the same time good environmental condition of the receiving sites as well as genetic diversity of the reintroduced individuals. This implies ensuring that the habitat and ecological processes necessary for the species' survival are present and properly functioning, as well as minimizing or eliminating threats.

Priorities and action required to attain the objective of the restoration programme:

12. At National Level:

- Continuous mapping and monitoring of the situation to determine the population's status and whether any recruitment is taking place even after mortality has occurred.
- Precise mapping of existing populations, implementation of systematic monitoring with sampling campaigns for diseases detection, genetic studies, systematic marking campaigns for fan mussels in shallow areas and establishment of protective cages around the most exposed individuals
- Establish maps/catalogue of hotspots and sites with favourable environmental conditions for repopulation and assess their sustainability.
- Promote localised translocation of individual from sites of low survival probability to more protected sites in line with most recent and approved procedures.
- Identification and mitigation of anthropic pressures experienced by existing populations.
- Establish of marine protected areas or expansion of existing ones with effective management and enforcement of measures to aid in the preservation of new *Pinna nobi*lis individuals that appear to be resistant to the parasite's impact if certain protective measures are applied.
- Update the management Plan of existing MPA where *Pinna nobilis* is present by taking into consideration specific management measures for the species.
- Exclude boating or establish ecological mooring systems in areas frequented by boaters to limit the impact of anchors on fan mussel populations and seagrass beds, where juveniles and sub-adults settle.
- Elaboration and implementation of appropriate legislation
- Develop public and professional awareness actions on the status of the species and promote citizen science
- Establish national network of all relevant actors including national task force with legal expertise to establish procedure for captive breeding and other restoration activities
- Creation a directory of institutions working on captive breeding to promote implementing project
- Establish national DNA bank and database

13. At Regional Level:

- Establish a Pan-Mediterranean task force coordinated by SPA/RAC to implement the present restoration programme (focal point for *Pinna nobilis*/by theme who will establish the national network, propose, and assess the translocation of resistant individuals)
- make sure updated information on the status of populations is well circulated at real-time
- Elaborate guidelines, recommendations and standardised Protocol to monitor, study populations, for translocation and/or rescue ex-situ and captive breeding.
- setting up reproductive broodstocks for captive breeding, and take register with genetic record (DNA fingerprinting)
- Promote the installation of larval collectors in strategic locations.
- Organise regional/national training and exchange visit as appropriate.
- Strengthening cooperation and exchange of cooperation between Contracting Parties, concerned actors and project.

- Establish a new pan-Mediterranean type of protection called “important area for *Pinna nobilis*” and create a coordinated network of these sanctuaries for the species.
- Invite countries to include *Pinna nobilis* in the implementation of national monitoring programme of habitat component of their national IMAP (Integrated monitoring and assessment Programme)
- Assist Mediterranean countries to establish national DNA bank/database and promote sharing of information.
- Establish a regional directory of Experts/institutions working on *Pinna nobilis* to promote networking.

14. At population level:

- The programme envisages development in phases and has two main targets for action: *Pinna nobilis* adult individuals and juveniles obtained by collectors or through searching actions in places such as marinas or transition water, zones where the chance of finding them seems to be greater. For each of the actions to be taken, it is considered appropriate to evaluate carefully and always whether it is preferable to leave the individuals in place or to relocate them based always on scientific analysis that justifies the move for safety reasons (the place for example might be subject to hazards such as mechanical threats due to anchoring) or for the improvement of the individual's health status: the individual is in a place that still has a high presence of pathogens and therefore would benefit from being moved to a place that is pathogen-free. This type of action must be carried out with great care as it may accidentally introduce the parasite into healthy areas and encourage its spread. Especially since it is not possible to decontaminate an area or to ensure with certainty the absence of the parasite in the environment.
- A priority should be given to study the pathogens responsible of the mass mortality, their life cycles, propagation and possible treatments for the diseases.
- Study in deep the resistance of the individuals to pathogens and the natural hybridization between *Pinna rudis* and *Pinna nobilis*[11] and promoting the establishment of genetic diversity database of resistant individuals.

Target ONE - juveniles

The main strategy and efforts of the restoration programme should be devoted to identifying locations free of the pathogens identified so far as causes of the mass mortality and collecting juvenile individuals and larvae also in order to increase the chances of restoration.

The actions to be taken, after checking that you are following the latest protocols[12], are as listed below:

1. **Search for juveniles**
   - Extensive action to search for juveniles; this involves initiating, also with the help of citizen science, an effective and extensive search for juvenile individuals that might be found in estuarine areas but also in places such as marinas and harbors where calm sea conditions seem to be favorable for settlement.
2. **Collectors**
   - Recruitment and collection of fan mussel juveniles using artificial devices following the methodologies from Kersting & Hendriks (2019) or new published protocols.
   - After the collection of juveniles there is two ways forward, the first is transport and rearing if facilities are available and the second one is directly put into water after assessment of the juveniles conditions with use of cages of exclusions of predators and mechanical damages
3. **Transport and rearing if needed and facilities are available**

[11] M. Vázquez-Luis, E. Nebot-Colomer, S. Deudero, S. Planes, et E. Boissin, « Natural hybridization between pen shell species: Pinna rudis and the critically endangered Pinna nobilis may explain parasite resistance in P. nobilis », Mol. Biol. Rep., vol. 48, no 1, p. 997-1004, 2021.

[12] If more updated protocols will be available in the future, or more relevant ones, Parties should follow,

- Once juvenile individuals have been collected, they must be immediately placed in a box filled with seawater to be conducted, in the safest way, to the location prepared for their growing and rearing. Before moving juveniles in tanks, operators will check the integrity of the shell and byssus. Whether byssus can regrow, big damages on the shell will affect P. nobilis ability to close itself. This is important in the next phases, where fan mussel specimens will have to be transferred to other sites and they'll need to close their valves to avoid stress and the loss of inner water. Checked P. nobilis individuals will be set in aquarium tanks, where they will spend the initial period of growth. Due to the stressful condition individuals may be in, they will be kept under observation for a first period (about 1 month). This is necessary to restore organism optimal conditions and to rebuild the byssus. It is necessary to proceed very carefully during the insertion of the juvenile specimens in the aquarium, paying attention to the physical and chemical conditions of the water in which specimens will be placed (acclimation phase). According to dimension and conditions, individuals can be placed directly in sediment-free support, in the soft bottom or in small support such as Petri dishes filled with coarse sediment or on small, open jute bags. Once ready, the organisms can be placed in baskets attached to the mussel farm's longline and will thus remain suspended in the aquatic medium for a period necessary for the growth and rear of fan mussel specimens. Operators will conduct periodic monitoring (twice a month) to check the state of health of individuals. Also, the correct location of the lantern-nets will be checked, since some extreme marine phenomena could affect the right attachment of the basket to the longline rope. At the end, P. nobilis specimens will be transported to the restocking sites, after having reached the escape size (6, 12 and 18 months).

4. Identification of receiving sites[13]

- Priority receiving sites should be the sites that are naturally healthy due to environmental conditions that are unfavourable for the parasite [temperature and Salinity]
- Additional receiving sites will be identified after a careful analysis of the environmental characteristics of the receiving areas that display suitable environmental conditions for the survival of restocked individuals and where the pressure regime (both natural and human-induced) is as low as possible and with low hydrodynamics. The receiving pilot sites must be selected, where possible, in the habitat of *Posidonia oceanica* seagrass meadows or *Cymodocea nodosa/Zostera spp*. beds. Prior an action for monitoring the presence of pathogens also will have to be conducted through one of the most recent, scientifically proved analysis to verify presence of parasites in the donor and receiving sites. Genetic characterisations must be conducted in each donor and receiving site to avoid/exclude genetic erosion. As probably there are no more individuals in the receiving site, assessment should be based to the closer geographical population and/or on past sampling, retrievable from the DNA banks and database. To assess the best sites where fan mussels can be restocked within the seagrass meadows or on coarse sandy bottoms, field activities through underwater scuba diving must be performed by scientific divers. The best areas of the meadows, or of the sandy bottom, that will be likely to support a successful restoration will be chosen according to the occurrence of a matte substrate or a proper substrate, according to the ecological condition of the meadow, which must show high ecological quality (assessed through the adoption of ecological indices as requested by the D.Lgs. 152/2006 that has received the European Directive 2000/60/EC), high coverage of the bottom and high shoot density. According to MERCES results the presence of seagrass meadows and density of *Pinna nobilis* specimens will cooperate in best results. The sites need to meet the characteristics of safety from physical damage (anchoring extreme weather conditions etc), and absence of pathogens. Therefore, sites such as protected areas that guarantee through their prohibitions the highest degree of safety at least for mechanical hazards will be preferred.

[13] the deliverable A2 of PINNARCA project compiled the criteria of optimal receiving sites.

5. **Translocation of juveniles**
   - Once at the destination sites, *P. nobilis* specimens will be placed into the marine environment. The most critical phase, after the transport is the transplantation in the aquatic environment characterized by different water values of salinity and temperature, respect of those one occurs in the transport (and even earlier, with respect to biophysical and chemical parameters in the growth and reproduction tanks). Particular attention must be paid to the handling of specimens. It's very important to not damage the byssus and to not break the shell of the specimens. In fact, P. nobilis needs byssus to anchor itself to the seabed, while the intact shell permits the tightly closing of the organism and preserves the internal water, held between the valves, during the installation operations. Before any transplanting operations, between the transport and the installation, there will be an intermediate phase, to avoid as much stress as possible to the organisms and to facilitate their acclimation to the new site. This adaptive step involves the storage of the organisms in specific tanks that reproduce the chemical and biophysical conditions of the transplant site. With the aim of transplanting as many juveniles as possible and keeping them alive during installation operations, the group of juveniles to translocate will be splitted in different sub-groups. In this way, different sessions of acclimation will be carried out. Therefore, it is of fundamental importance to be able to transplant as many juveniles as possible in at least one protected area, to support the division of the group to be transplanted into different sub-groups and then into different receiving sites. After the acclimation phase, the organisms will be placed by experienced dive operators in the receiving sites placing them in the different types of substrates, either Posidonia matte, Cymodocea meadows or coarse sand. The specimens of P. nobilis will be placed at a certain distance from each other, to avoid external criticalities that could ruin the transplantation experiment, such as abusive nets, emergency anchoring, presence of pelagic large animals etc. Cages/devices for the exclusion of predators and damages must be set up. Each transplanted organism will be tagged in order to ensure monitoring operations and the geographical location (geographic coordinates) will be recorded via GPS.

Target TWO - Adults

The search for adults is aimed at finding spawners and verifying their health conditions to ensure that they are not in potentially dangerous and pathogen-free locations. Mapping and a geographic analysis of the data may also provide insight into whether or not they should be transplanted or not to a single location at a distance that facilitates fertilization. The actions to be pursued will therefore be aimed at finding and protecting live individuals and assessing their health conditions. This will require:

1. **Search for adults**
   - Extensive action to search for live adults; The research activities of adult individuals conducted in many places in recent years have proven how effective citizen science actions are that succeed in guaranteeing a large number of observers who, if properly trained, can provide very precise indications, greatly reducing the effort of researchers engaged therefore in the sole actions of verification of the species and monitoring of health conditions.

2. **Molecular characterization of surviving individuals of *Pinna nobilis***

Molecular analysis of surviving individuals of *Pinna nobilis* are carried out in order to:

i. Acquire the proper knowledge of the genetic make-up of the species and their possible correlation with diseases resistance.
ii. Assess their population genetics parameters and compare them with the already existing data on scientific literature also to help in the choice of the most compatible receiving site from genetical point of view
iii. Search for possible etiological agents in the fan mussel analysed

This last step represents a crucial point, since the introduction of "pathogens-free" recruited specimens is the critical condition that allows to increase the chances of success for restocking activities and avoid any

unintentional spread of pathogens as explicitly recommended by the IUCN conservation measures for the species[14].

3. Mapping of surviving individuals of *Pinna nobilis*

- Mapping is a crucial aspect in order to be able to properly assess the appropriateness of moving the specimens; a comparative analysis of the distances between individuals, possible risks from mechanical damage, and the main oceanographic features of the sites will in fact be able to provide the best guidance on how to proceed. If the condition of the individuals is sufficiently safe and the site conditions good one can simply mark the individuals and maintain their monitoring over time. If, on the other hand, it is appropriate to move the individuals, it will be necessary to proceed with the steps of receiving site identification and transplantation.

4. Identification of receiving sites

- Priority receiving sites should be the sites that are naturally healthy due to environmental conditions that are unfavourable for the parasite [temperature and Salinity]
- Additional receiving sites will be identified after a careful analysis of the environmental characteristics of the receiving areas that display suitable environmental conditions for the survival of restocked individuals and where the pressure regime (both natural and human-induced) is as low as possible. The receiving pilot sites must be selected considering previous information on the occurrences of *Pinna nobilis*, where possible, in the habitat of *Posidonia oceanica* seagrass meadows or *Cymodocea nodosa/Zostera spp*. beds. To assess the best sites where fan mussels can be restocked within the seagrass meadows or on coarse sandy bottoms, field activities through underwater scuba diving have to be performed by scientific divers. The best areas of the meadows, or of the sandy bottom, that will be likely to support a successful restoration will be chosen according to the occurrence of a matte substrate or a proper substrate, according to the ecological condition of the meadow, which must show high ecological quality (assessed through the adoption of ecological indices as requested by the D.Lgs. 152/2006 that has received the European Directive 2000/60/EC), high coverage of the bottom and high shoot density. According to MERCES results the presence of Seagrass meadows and density of *Pinna nobilis* specimens will cooperate in best results. The sites need to meet the characteristics of safety from physical damage (anchoring, extreme weather conditions etc) and absence of pathogens. Therefore, sites such as protected areas that guarantee through their prohibitions the highest degree of safety at least for mechanical hazards will be preferred. An action for monitoring the presence of pathogens also will have to be conducted through one of the most recent, scientifically proved analysis to verify presence of parasites in the donor and receiving sites. Genetic characterisations have to be conducted in each donor and receiving site to avoid/exclude genetic erosion. As probably there are no more individuals in the receiving site, assessment should be based to the closer geographical population and/or on past sampling, retrievable from the DNA banks and database.

5. Transport and transplantation of adults[15]

- Collected individuals have to be immediately placed in a box filled with seawater in order to be conducted, in the safest way, to the destination site. Before moving, operators will check the integrity of the shell and byssus. Any storage phase between adult collection and transfer should be of short duration and carried out in such a way as not to expose the animals to stressful conditions and should be carried out by keeping the removed organisms in a water environment with sufficient exchange of

[14] Kersting, D., Benabdi, M., Čižmek, H., Grau, A., Jimenez, C., Katsanevakis, S., Öztürk, B., Tuncer, S., Tunesi, L., Vázquez-Luis, M., Vicente, N. & Otero Villanueva, M. 2019. Pinna nobilis. The IUCN Red List of Threatened Species 2019: e.T160075998A160081499. http://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T160075998A160081499.en

[15] Several protocols for transplantation of adults Pinna nobilis already exists, also knowledge on surviving percentage of translocated individuals

water. Replanting should take place within two days of harvesting the animals and in the shortest possible time. Once at the destination sites, P. nobilis specimens will be placed into the marine environment. The most critical phase, after the transport, is the transplantation in the aquatic environment characterized by different water values of salinity and temperature, respect of those that occur in the transport (and even earlier, with respect to biophysical and chemical parameters in the growth and reproduction tanks). Particular attention must be paid to the handling of specimens. It's very important to not damage the byssus and to not break the shell of the specimens. In fact, P. nobilis needs byssus to anchor itself to the seabed, while the intact shell permits the tightly closing of the organism and preserves the internal water, held between the valves, during the installation operations. Before any transplanting operations[16], between the transport and the installation, there will be an intermediate phase, in order to avoid as much stress as possible to the organisms and to facilitate their acclimation to the new site. This adaptive step involves the storage of the organisms in specific tanks that reproduce the chemical and biophysical conditions of the transplant site. With the aim of transplanting as many individuals as possible and keeping them alive during installation operations, the group of individuals to transplant will be splitted in different sub-groups. In this way, different sessions of acclimation will be carried out. Therefore, it is of fundamental importance to be able to transplant as many individuals as possible in at least one protected area, to support the division of the group to be transplanted into different sub-groups and then into different receiving sites. After the acclimation phase, the organisms will be placed by experienced dive operators in the receiving sites placing them in the different types of substrates, either Posidonia matte, Cymodocea meadows or coarse sand. The specimens of P. nobilis will be placed according to MERCES outcomes with density of maximum 1ind/m2. Each transplanted organism will be tagged in order to ensure monitoring operations and the geographical location (geographic coordinates) will be recorded via GPS.

[16] Pilot study case of translocation of resistant individuals performed in Spain, 2018: https://www.youtube.com/watch?v=hQbIYak1gQk&t=6s

WORK PROGRAMME AND TIMETABLE FOR 2023-2028

Action	Deadline	To be implemented by
Elaboration and implementation of appropriate legislation	First year	Contracting Parties & SPA/RAC
Continuous mapping and monitoring of the situation to determine the population's status and whether any recruitment is taking place even after mortality has occurred.	Continuous	SPA/RAC, Contracting Parties, research institutions, NGOs,
Develop a publicly available repository of all relevant documents regarding *Pinna nobilis*	Continuous	SPA/RAC & Pan-Mediterranean Task force
Establish national/regional network and a mailing list of all relevant actors including national task force with legal expertise to establish procedure for captive breeding and other restoration activities and create a directory of institutions/researchers working on captive breeding to promote implementing project	First Year	Contracting Parties, research institutions & SPA/RAC
Precise mapping of existing populations, implementation of systematic monitoring with sampling campaigns for diseases detection, genetic studies, systematic marking campaigns for fan mussels in shallow areas and establishment of protective cages around the most exposed individuals	Continuous	Contracting Parties, research institutions and NGOs
Define criteria to assess populations and sites with favourable conditions and identify the sites which shelter high population numbers of the species	First Year	SPA/RCA, relevant Partners and research institutions
Establish maps/catalogue of hotspots and sites with favourable environmental conditions for repopulation and assess their sustainability	First year Establishment and updated yearly	Contracting Parties, research institutions and SPA/RCA
Promote localised translocation of individual from sites of low survival probability to more protected sites in line with most recent and approved procedures.	Continuous with the establishment of the procedure the first year	Contracting Parties, research institutions & SPA/RAC
Establish of marine protected areas or expansion of existing ones with effective management and enforcement of measures to aid in the preservation of new *Pinna nobilis* individuals that appear to be resistant to the parasite's impact if certain protective measures are applied and update the management Plan and regulations of existing MPA where *Pinna nobilis* is present by taking into consideration specific management measures for the species in line with the relevant strategies (Post 2020 SAPBIO, 2030 European Strategy etc…)	Continuous	Contracting Parties,
Avoid any disturbance and establish ecological systems (ie mooring etc.) in areas frequented by boaters to limit the human impact on fan mussel populations and seagrass beds, where juveniles and sub-adults settle;	Continuous	Contracting Parties and NGOs
Develop public and professional awareness actions and advocacy on the status of the species and promote citizen science	Continuous	Contracting Parties, research institutions & NGOs

Establish a Pan-Mediterranean task force coordinated by SPA/RAC to implement and assess the implementation/update of the present restoration programme, propose, and assess the translocation of resistant individuals (Genetic, translocation, ecotoxicology, parasitology, benthic and Ecology, MPA management, captive breeding)	First year	SPA/RAC & Contracting Parties
Organise a special session for *Pinna nobilis* during the Mediterranean Key habitats and NIS symposia	Each 3 years	SPA/RAC & Pan-Mediterranean Task force
Elaborate guidelines, recommendations, and standardised Protocol to monitor, study populations, for translocation and/or rescue ex-situ and captive breeding.	First year - Continuous	SPA/RAC, Pan-Mediterranean Task force & research institutions
Promote the installation of larval collectors in strategic locations	Continuous	SPA/RAC, Pan-Mediterranean Task force & research institutions
Organise regional/national training and exchange visit as appropriate	Continuous	SPA/RAC & Contracting Parties
Organise and promote academic studies for students through master type courses, encouraging post graduate studies on *Pinna nobilis* biology and restoration	Continuous	Contracting Parties and academic institutions
Invite countries to include *Pinna nobilis* in the implementation of national monitoring programme of habitat component of their national IMAP (Integrated monitoring and assessment Programme) and in projects relevant to the species or habitats related to *Pinna nobilis*	First Years	SPA/RAC & Contracting Parties
Invest in studies of the Pathogens responsible of the Mass mortality, its life cycle and propagation as priority	First year and Continuous	Pan-Mediterranean Task force & Research institutions
Study in deep the resistance of the individuals to pathogens and using of innovative approach such as modelling	Continuous	Research Institutions
Promoting the establishment of genetic diversity database of *Pinna nobilis* populations including resistant individuals	First year – continuous	SPA/RAC, Pan-Mediterranean Task force & research institutions
Actions devoted to *Pinna nobilis* restoration at “population level” both for juveniles and adults. Some actions focused on assessing connectivity and identifying sink/source area is very important.	Continuous	SPA/RAC, Pan-Mediterranean Task force & research institutions, MPA and NGOs

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ANNEX I - CASE STUDIES & STATE OF THE ART

MERCES project – Croatia, Italy, Turkey

1. MERCES project "Marine Ecosystem Restoration in Changing European Seas", coordinated by the Università Politecnica delle Marche (Italy), has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No-689518. The project was focused on the restoration of different degraded marine habitats, with the aim of 1) assessing the potential of different technologies and approaches; 2) quantifying the returns in terms of ecosystems services and their socio-economic impacts; 3) defining the legal-policy and governance frameworks needed to optimize the effectiveness of the different restoration approaches. Specific aims include a) improving existing, and developing new, restoration actions of degraded marine habitats; b) increasing the adaptation of EU degraded marine habitats to global change; c) enhancing marine ecosystem resilience and services; d) conducting cost-benefit analyses for marine restoration measures; e) creating new industrial targets and opportunities. To achieve these objectives, MERCES created a multi-disciplinary consortium with skills in marine ecology, restoration, law, policy and governance, socioeconomics, knowledge transfer, dissemination and communication. MERCES started from the inventory of EU degraded marine habitats (WP1), conducted pilot restoration experiments (WP2, WP3, WP4), and assessed the effects of restoration on ecosystem services (WP5).

2. MERCES Work Package 2 (WP2) focuses on shallow soft-bottom habitats, especially seagrass meadows and bivalve reefs. Using a combination of field surveys, aquarium and field experiments, and case studies, WP2 aimed to:
   (a) determine the factors affecting seagrass restoration success,
   (b) test whether integrating feedbacks and interactions in restoration increases success rates, and
   (c) provide recommendations for managers and policymakers.

3. MERCES WP2 included 9 research groups in 7 countries (Croatia, Estonia, Finland, Italy, Netherlands, Norway, Turkey). In Northern European seas (Baltic Sea, North Sea, Wadden Sea), test species include eelgrass (*Zostera marina*), dwarf eelgrass (*Z. noltii*), blue mussels (*Mytilus edulis*) and Baltic clams (*Macoma balthica*). In Southern Europe (Adriatic Sea, Eastern Mediterranean), researchers are restoring the seagrasses *Cymodocea nodosa* and *Posidonia oceanica* and the endangered noble pen shell *Pinna nobilis*.

4. Considering the Southern Europe pilot actions several activities have been conducted. Among them very interesting was the Seagrass-bivalve co-restoration using *Pinna nobilis*, *Cymodocea* and *Zostera*. The main question was if planting seagrass and *P. nobilis* together could increase the survival and growth of either or both species? Can transplantation of *P. nobilis* in existing meadows increase the growth/survival of the seagrasses? The experiments were conducted in two different sites (Italy and Croatia).

5. In Italy, *P. nobilis* transplanting was performed using U-shaped stainless-steel rods. First of all, a housing for the transplanting bivalve was prepared in the seabed using a corer. After that, the hole was partially filled with pebbles and the bivalve was anchored with the steel rod. Nine P. nobilis specimens have been transplanted in three experimental plots (1x1m): three specimens in bare sediments, three specimens in natural seagrass meadows and three specimens in transplanted seagrasses. P. nobilis abundance: 1 ind./m2 per each experimental plot. Seagrass transplantation using biodegradable bags. The experimental treatments included transplanting seagrass, transplanting seagrass and P. nobilis and existing seagrass as a control. Each experimental plot (1x1 m, n=3). The presence of seagrass favoured the survival of P. nobilis specimens while the severe hydrodynamic conditions occurred immediately after the beginning of the experiment have limited the success of the seagrass transplanting. The proposed method of anchorage for P. nobilis specimens resulted to be efficient. Plots with P. nobilis into existing seagrass meadows showed higher organic matter concentrations immediately after the translocation of bivalves. No differences among experimental plots in

terms of meiofaunal abundance and diversity were observed immediately after the beginning of the experiment. Environmental conditions immediately after translocation play a key role in the survival of P. nobilis and transplanted seagrasses. The presence of natural seagrass acts as a barrier for P. nobilis reducing the severe hydrodynamic conditions and avoiding possible burial effects. The presence of *P. nobilis* may increase the availability of food for benthic fauna associated with seagrasses meadows. Considering the results of Croatian site transplanting *P. nobilis* within seagrass meadow enhances its survival in exposed areas, given that transplantation is (ideally) carried out during early summer, thus providing enough time for pen shells to regenerate byssus and anchor well, prior to winter storms. Furthermore, transplanting pen shells in high density (e.g., 5 ind./m2) may enhance C. nodosa growth through a putative fertilization effect.

6. A further question was addressed by the project: Can covering with cage help Pinna establish after translocation? For the experiment conducted in Turkey, *P. nobilis* translocation was done by collecting small individuals from the vicinity and digging out with 50 cm radius and 50-60 cm deep sediment to protect the byssus as much as possible. All individuals were then transferred by covering the attached sediment with a plastic bag and carried underwater. They were placed and covered with their original sediment, and no support was used. After 1x1x0.5 m cages were used to cover the individuals. Transplanted P. nobilis individuals were alive and healthy after the winter and spring periods. Some new individuals were observed in spring on both cage covered and uncovered plots and few on the frame of the cages. However, in July 2018, due to parasite infection all individuals were either looking unhealthy (slowly closing their shell) or even dead. It was observed that cages help pen shells to anchor after translocations and promote recruitment of new individuals, but a solid conclusion cannot be made due to disease outbreak that wiped out a large portion of the Mediterranean P. nobilis population.

7. Main conclusion for MERCES (Manual of restoration measures in soft bottoms based on surveys and experiments WP2 Deliverable 2.1) was that in southern European habitats (Mediterranean), mutual facilitation of P. nobilis and a seagrass was observed and transplanting P. nobilis within seagrass meadow enhances seagrass survival, especially in exposed areas. Furthermore, transplanting P. nobilis at a density of 5 ind./m2 may enhance C. nodosa growth through fertilization. The presence of natural seagrass acts as a barrier reducing the severe hydrodynamic stress for P. nobilis and avoiding possible burial effects. Conversely, the presence of P. nobilis may increase the availability of food for benthic fauna associated with seagrasses meadows. In other words, bivalve facilitation may not only enhance seagrass restoration, but the interactions between bivalves and seagrass proved positive for both species.

RESTORFAN project – Italy

8. Thanks to the MedPAN Small Projects financial contribution, in 2019 the RESTORFAN project was carried out within the Miramare Marine Protected Area (MPA), in Italy. All the specific objectives of the project were based on the currently available information and the experts knowledge gathered during several meetings; the proposal aimed to satisfy all the IUCN recommendations and results of the first meeting of Mediterranean partners to coordinate a response to Pinna nobilis crisis (online, Fabruary 2021), as the Northern Adriatic Sea and particularly the Gulf of Trieste (Italy) represent key areas for early action and rapid implementation of conservation measures.

9. The specific objectives were:
    1. Increasing international scientific knowledge (by means of new research and papers) on the species.
    2. Test of an experimental hatchery/culture, with specimens coming from mussel farms, finalized to the organization of a Rescue Programme as requested by IUCN Guidelines. Indeed, according to IUCN guidelines, the development of a rescue programme close to the affected areas is paramount and it should be developed as soon as possible in areas where there is an important density of Pinna nobilis and the parasite has confirmed not arrived.

3. According to the goal - “raise the issue at national level and advocate for the development of a rescue programme”, Miramare MPA was proponent of several meetings among all the local main actors, to promote the development of a rescue programme. Within this context RESTORFAN developed a protocol, in compliance with IUCN guidelines, for the local/basin rescue programme for Pinna nobilis.
4. “Collaborate in the identification of *Pinna nobilis* hotspots” in the entire region. A density map has been prepared to represent the most relevant hotspots at Friuli Venezia Giulia scale to support the future evaluations. A proposal of a monitoring programme for these “hot sites” has been produced and delivered to regional authorities (Friuli Venezia Giulia, Italy).

10. Among the main results of the project is certainly the development of the protocol for the recovery and transplantation of the juvenile specimens collected in the mussel farmers' longlines. The arrival of mass mortality during the project strongly influenced the actions by pushing for a strong action of awareness raising and search for survivors. The data collected were used for the realization of thematic maps of the gulf of Trieste. A further result of the project was the network of relationships with researchers and MPAs that led to the preparation of the LIFE Pinna project, which was then financed by the LIFE programme.

LIFE IP INTEMARES project

11. LIFE IP INTEMARES project, coordinated by the Biodiversity Foundation of the Ministry for the Ecological Transition and the Demographic Challenge. It receives financial support from the European Union's LIFE programme (LIFE15 IPE ES 012).

12. In this project the Spanish Ministry has been involved through RESCUE actions and elaborating the Conservation Strategy of Pinna nobilis. Moreover, the research institution IEO has developed several actions in the sanctuary populations of Pinna nobilis in the Mar Menor lagoon.

LIFE PINNA project – Italy, Slovenia

13. Funded by the contribution of the LIFE programme, the European Union’s financial instrument supporting environmental, nature conservation and climate action projects. The aim of the LIFE PINNA 17project is to repopulate the areas identified in the project with healthy individuals, survivors of the mass die-off that started in 2016. In particular, the areas involved are the Gulf of Trieste, as a donor site, the MPA of Bergeggi (Liguria, Italy) and the MPA of Asinara (Sardinia, Italy) as recipient sites. Survivors are likely to be characterized by natural resistance to the pathogens responsible for the disease outbreak. Some analysis of the level of pathogenic infection in the tissues of surviving or dying individuals will be conducted to identify microorganisms that are involved in the disease. In addition, considering that proper identification of the pathogens causing mass mortality is a crucial point in setting up adequate recovery plans for this species, it is also important to assess the level of contamination/infection occurring where the mussels died and where they survived. Repopulation actions will be carried out with transplantation of juvenile organisms, and in parallel protocols for captive breeding of adult organisms will be developed. The organisms derived from this artificial insemination will be used to repopulate the affected areas.

14. The specific objectives include:
    - Analysis and selection of marine or transitional areas appropriate for restocking.
    - Molecular characterisation of surviving specimens and selection of the best candidates to be reproduced.

[17] website: http://lifepinna.eu/

- Development and implementation of the most suitable repopulation techniques, through translocation of self-recruited juveniles and captive breeding of *P. nobilis* in order to release a large number of specimens into the wild in a few years;
- Maintenance of a good level of genetic variation among the individuals used for restocking in order to obtain offspring that will be the founders of new future populations with good fitness in the long term;
- Monitoring of donor sites to evaluate the status of *P. nobilis* (including citizen science actions);
- Monitoring of "sentinel" organisms for the infection level of pathogens responsible for mass mortality of *P. nobilis*, to quickly detect anomalous values that are potentially dangerous for the species' survival.
- Public engagement to increase awareness on P. nobilis and influence sea users' behavior; and
- Transfer and replication of skills and methodologies to areas where the fan mussel is decreasing.

LIFE PINNARCA project – France, Greece, Italy, Spain

15. LIFE PINNARCA[18] is a European project devoted to the protection and restoration of the fan mussel Pinna nobilis populations in the Mediterranean Sea. It has been conducted with the contribution of the LIFE programme, the European Union's financial instrument supporting environmental, nature conservation and climate action projects.

16. To project team focus on three main objectives:
    1) Increasing awareness on a global scale, to reduce the possibility of vandalism and illegal collection of the remaining fan mussels, but also to call for broad public collaboration. Actions will be oriented at schools and the general public, including the production of a video, international workshops and volunteering actions.
    2) Gathering all existing information on the remaining populations and resistant individuals into a database integrated within the project's website, to provide information to other countries planning mitigation and recovery actions. This objective will be achieved by implementing a comprehensive census of areas where resistant individuals or unaffected populations are found, as well as installing larvae collectors to assist successful recruitment.
    3) Developing active recovery actions, focused both on resistant individuals and the remaining non-resistant populations, to increase the probabilities of recovery of the species. This objective involves efforts to aggregate resistant individuals, translocate vulnerable individuals to safer areas, exchange genetic information among remaining populations, identify locations with optimal conditions to repopulate with healthy fan mussels, maintain individuals in indoor facilities, and develop active measures to improve the environments where healthy non-resistant individuals are still found.

17. All project selected areas host habitats appropriate for Pinna nobilis populations, including from healthy Posidonia oceanica meadows (in all of them except the Columbretes Islands, Spain) to enclosed bays with gentle hydrodynamic conditions or deeper maërl beds, with optimum substrate and conditions for maintaining fan mussels. These areas also hosted dense fan mussel populations before the mass mortality event (MME) and had some permanent monitoring stations that were periodically surveyed. Therefore, a priori information about the distribution of fan mussels is available and the probability of finding resistant fan mussels in these areas is higher than in other sites not considered Special Areas of Conservation (SAC).

The "Conservation of *P. nobilis* in the Adriatic Sea" – A Croatian national project

18. Nowadays, in the Mediterranean the most far-reaching national project is the one currently being carried out in Croatia: "Conservation of *Pinna nobilis* in the southern part of the Adriatic Sea". The project was

[18] website: https://www.lifepinnarca.com/

launched in late 2020 harmonizing actions carried out by institutions involved in the protection of the mollusc along the Croatian Adriatic. The project is implemented within the framework of the national programme for the conservation of Pinna nobilis in the Adriatic Sea, coordinated by the Institute for Environmental and Nature Protection of the Ministry of Economy and Sustainable Development of the Republic of Croatia. The total value of the project is HRK 335325,00 €, of which the Fund for Environmental Protection and Energy Efficiency co-finances 80%, while 20% of funding is provided by project partners. Main partners are public institution "National Park Brijuni", Public institution "Nature Park Telašćica" and public institution for the management of protected parts of nature in the Split-Dalmatia County "Sea and Karst"). The estimated duration of the project was until 2022 when it was extended until 2025. Total value of the new upcoming period of this project is 368,000 €.

19. The funds of past and upcoming period are intended for the implementation of in situ activities, such as setting up larvae collectors, protection of larvae and adult living individuals from predators and anthropogenic impact, marking sites for protection, monitoring of survivors' positions, maintenance of adult individuals and larvae in controlled conditions (ex-situ) and raising public awareness through various educational activities. Activites in the upcoming period also include: Control of the marine environment of *Pinna nobilis* habitat, scientific research and activities for the recovery of the Pinna nobilis population; reintroduction/repopulation of the *Pinna nobilis*

20. The coordinator Institute for Environmental and Nature Protection of the Ministry of Economy and Sustainable Development of the Republic of Croatia. Project is implemented through three subprojects, coordinated by three main partners: Public institution "National Park Brijuni", Public institution "Nature Park Telašćica" and Public institution for the management of protected parts of nature in the Split-Dalmatia County "Sea and Karst". Project partners are Croatian Veterinary Institute, Institute of Oceanography and Fisheries, Public Institution for the Management of Protected Areas of Nature of the Dubrovnik-Neretva County, Public Institution "Lastovo Islands Nature Park", Public Institution "National Park Mljet", Public institution Lokrum Reserve, Natural History Museum and Zoo of the City of Split, University of Dubrovnik. Public institution "Natura Histrica", Public institution for protected area management "Natura" of Primorje-Gorski Kotar County, Public institution "Kamenjak", Ruđer Bošković Institute, CROREEF Marine Aquaristic, University of Zadar, University of Zagreb Faculty of Science, Public institution "Natura" of Šibenik-Knin County, "20000 Leagues" Marine Explorers Society, Public institution "Natura Jadera", Public Institution "National Park Kornati". All partners signed cooperation agreement, Aquarium of Pula officially became a partner of the project, as the main institution in Croatia in charge of maintaining juvenile and adult Pinna nobilis under controlled (ex-situ) conditions.

Other relevant or recent activities/studies – Malta, Spain, Turkey

21. The following other relevant or recent activities/studies are to be mentioned:

Country	**Year**	**Activity / Title**	**Reference**
Malta	2022	Ocean literacy and scientific data acquisition through citizen science campaigns: a mixed approach in the Maltese Islands to collect information on *Pinna nobilis* and *Pinna rudis*.	https://ejournals.epublishing.ekt.gr/index.php/hcmr-med-mar-sc/article/view/26623

Spain	2015	Embryological Development of *Pinna nobilis* in Controlled Conditions	https://link.springer.com/chapter/10.1007/978-3-319-13878-7_42
Spain	2021	Breeding, planktonic and settlement factors shape recruitment patterns of one of the last remaining major population of *Pinna nobilis* within Spanish waters	https://link.springer.com/article/10.1007/s10750-019-04137-5
Spain	2021	Natural hybridization between pen shell species: Pinna rudis and the critically endangered Pinna nobilis may explain parasite resistance in P. nobilis	https://pubmed.ncbi.nlm.nih.gov/33394229/
Greece	2021	Population, aquaculture and transplantation applications of critically endangered species P. nobilis (Linnaeus 1758) in the Mediterranean Sea	https://doi.org/10.33714/masteb.627562
Turkey	2011	Culture of fan mussel (*Pinna nobilis*, Linnaeus 1758) in relation to size on suspended culture system in Izmir Bay, Aegean Sea, Turkey	https://vetdergikafkas.org/uploads/pdf/pdf_KVFD_1032.pdf
Turkey	2021	Population, Aquaculture and Transplantation Applications of Critically Endangered Species *Pinna nobilis* (Linnaeus 1758) in the Mediterranean Sea	https://dergipark.org.tr/en/pub/masteb/issue/64818/627562

STATE OF THE ART

22. The table below shows the main actions undertaken in the different projects in order to better evaluate in a comparative way which strategy is the most shared and therefore what should be focused on in order to propose common actions not only on a national scale but also on a Mediterranean scale.

ACTION	MERCES	RESTORFAN	LIFE PINNA	PINNARCA LIFE	HR Project
Environmental status assessment of seagrass meadows and *Pinna nobilis* populations in donor and receiving areas	X	X	X	X	X
Molecular characterization of sentinel species in the putative pilot sites of restocking			X		
Molecular characterization of surviving individuals of *Pinna nobilis*		X	X	X	
Monitoring of pathogens in restocking sites by using sentinel species			X		X

Monitoring of implanted juveniles	X	X	X		
Monitoring of the project's impact on the *P. nobilis* status	X	X	X	X	X
Report with suggested correction measures that could be implemented	X	X	X	X	X
Location of optimum sites				X	
Collection and growth of *Pinna nobilis* self-recruited, collectors-recruited individuals		X	X	X	X
Adaptation, breeding and where possible reproduction for active restocking			X		X
Collection and transport (translocation) of specimens from self-capture to receptor sites	X	X	X	X	X
Installation of the specimens of *Pinna nobilis* at the pilot areas	X		X		
Exhaustive shallow and deep census		X	X	X	X
Actions for environmental improvement in fan mussel sanctuary areas				X	
Treatment assays and analysis				X	

23. The actions implemented by the different projects have some shared points that deserve to be considered as priorities in the *Pinna nobilis* Restoration programme; in particular, these are actions concerning the setup of collectors for collecting larvae, environmental assessments of the health conditions of sites with live Pinna, monitoring of implanted juveniles (when replanting from the project is envisaged), continuous updating of all the methodologies used, growth of juveniles in aquaria and/or in facilities also at sea, transport of individuals to 'safe' sites and extensive monitoring actions also through Citizen Science. On some actions to be taken, on the other hand, there does not seem to be total agreement; however, these are choices determined by whether or not to have provided for transplanting individuals between different sites: in fact, where it has been decided to implement only collector collection practices, replanting has been favoured in places such as lagoons where individuals, not necessarily resistant, nevertheless seem to survive because of unfavourable conditions for pathogens. In these places, it would not make sense to implement monitoring techniques with environmental sentinels as envisaged when individuals are to be transferred between even very distant sites whose suitability must be evaluated in advance to avoid wasting valuable time and biological resources.

24. However, many things in common can be found in the harvesting, translocation and replanting protocols that are the result of the many completed or ongoing projects. Here are some of them that may be useful in the operational implementation phase of the Restoration Programme:

RESTORFAN protocol

25. A protocol for the handling, capture, and restoration of *Pinna nobilis* was developed during the project. The protocol is attached to this document (Annex 1). Specifically, the protocol is divided into 4 parts that deal respectively for uptake (1), for collection and extraction from sediment (2), for the housing and growth of organisms (3) and for the re-implantation of organisms (4). During the project larval collectors have been successfully realized and tested according to IUCN Protocol.

A proposed protocol for larval collection (Kersting & Hendriks 2019)

26. Larval collectors consisted of a series of plastic mesh bags containing entangled nylon filament or onion bags (see De Gaulejac et al., 2003; Cabanellas-Reboredo et al., 2009; Kersting and García-March, 2017; Vicente, 2020, for more details). Thus, covering the main reproduction and settlement period of the species (Cabanellas- Reboredo et al., 2009; Deudero et al., 2017; Kersting and García- March, 2017). Observation of *P. nobilis* recruits was undertaken with the naked eye, allowing the detection of recruits of sizes down to 0.3 cm antero-posterior length. Recruits extracted from the collectors were either installed in aquaria (García-March et al., 2020; Vicente, 2020) or in growth cages in the field following Kersting and García-March (2017). The complete protocol is attached to this document (Annex 2).

Paper on state of art in Greece, "Population, aquaculture and transplantation applications of critically endangered species P. nobilis (Linnaeus 1758) in the Mediterranean Sea"Acarli 2021

27. The population of fan mussel, *Pinna nobilis* across the Mediterranean Sea has been affected by factors such as overfishing, fisheries processes, environmental pollution, destruction of habitat, tourism, etc. Therefore, the species *P. nobilis* was taken under protection by the Decisions of the Council of Europe and the Barcelona Convention. However, its mortality rates of 100% have been reported to be due to *Haplosporidium pinnae*, a parasite in different Mediterranean regions. The status of *P. nobilis* has thus been revised to increase its category of risk from "Vulnerable" to "Critically Endangered" and the importance of all the studies on the species further increased. The aim of the study is to present the current status of *P. nobilis,* the native to the Mediterranean, by combining the relevant studies on ecology, aquacultural process (larvae, spat settlement and rearing), culture methods and transplantation. The study has provided comprehensive knowledge on the current status of the P. nobilis population, aquaculture and transplantation activities. Except for studies to determine stocks, in particular, those on collecting young individuals from nature and planting and growing them in predetermined sites as well as their production through various cultures from their larval phase onwards are of great importance in terms of rehabilitation and sustenance of the damaged *P. nobilis* population. Therefore, alternative, and potential habitats should be created thanks to transplantation and aquaculture. Marine protected areas should be determined to enable a healthy P. nobilis population to be sustained.

ANNEX 2 – The RESTORFAN Protocol

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Pinna nobilis, Protocols for manipulation, captation and restoration (2019)

1. Protocol for uptake

2. Protocol for collection and extraction from sediment

3. Protocol for the housing and growth of organisms

4. Protocol for the re-implantation of organisms

1. PROTOCOL FOR *PINNA NOBILIS* JUVENILE COLLECTION

The populations of *Pinna nobilis* in the Gulf of Trieste reach a gonadal maturity in the period between August and November. During this period it is possible to observe the fans emitting gametes into the water column.

The operations of captation must be conducted during this period.

We then proceed with the preparation of the captation structure (Figure 1) consisting of 1 ballast, a rope with a maximum length of 2 meters, a float and the collector. Among the 2 collection systems tested (vertical and horizontal) the horizontal system was preferred. A circular lanter-net (plastic devices used in ostrey maricoltures) is therefore used on which it is possible to fix various types of textile material to increase the efficiency of collection. Simplest method is put inside the lanternet some textile material like potato-bag, jute bag, ropes etc. This method help juveniles to attached helding larvas.

Figure 1Horizontal collector

2. PROTOCOL FOR THE COLLECTION OF JUVENILES OF *PINNA NOBILIS* ORGANISMS

The juvenile organism is harvested as soon as it reaches a height of 1-2 cm (Figure 2) as it is slightly more resistant during the diver's harvesting operations.

Once collected, the organism is transported in a box paying particular attention to not stress it.

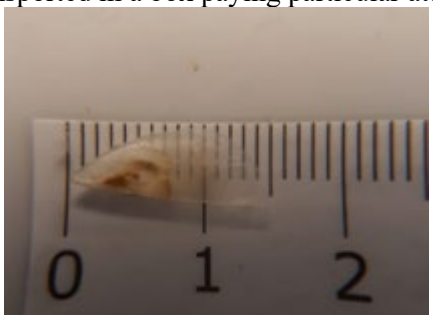

Figure 2 Juvenile Pinna nobilis

Harvesting operations are carried out in the same way on the longlines of mussel farms (Figure 3). After a careful analysis of the longline by the diver, once the individual is identified, the collection is carried out. Often the operation is not easy because the organisms are found among other specimens of *Mytilus galloprovincialis* or sponges and ascidians. In this case we try to remove first the organisms around the *Pinna nobilis* and then we try to cut the byssus without damaging the gland responsible for the production of byssus. Once collected the specimens should be placed in a closed rigid container (Figure 4) paying attention to not stress it.

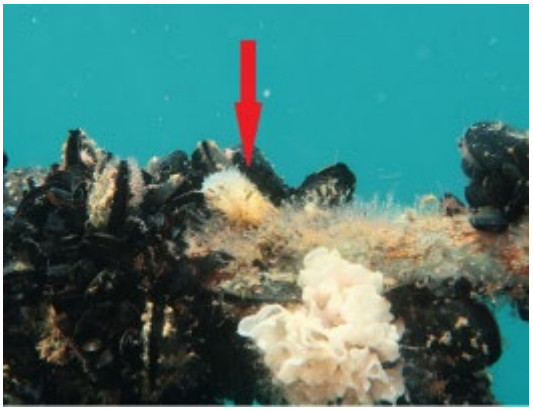

Figure 3 Pinna nobilis on longline

Figure 4 Plastic-box for collected organism

IMP: Temperature and salinity data must be collected on site to reproduce them in laboratory.

In case of extraction of organisms from the sediment, a small sorbonne is used (Figure 5), i.e., an instrument that is operated with air coming from a compressor or a scuba bottle allows to remove the sediment around the fin without damaging the organism. After removing most of the sediment around the organism you should see the byssus attached to the solid substrate. Usually, the fin sticks to a few little solid bodies, which can be a rock or a very large rock. In case the byssus is attached to a removable stone

we proceed with the extraction of the fin with the whole stone. If the fin is attached to a rock, then proceed by cutting the byssus in the proximity of the rock without damaging the byssus gland.

Figure 5 Sorbonne

3. PROTOCOL FOR BREEDING AND GROWTH OF *PINNA NOBILIS*

Once reached the laboratory in the shortest possible time, we proceed with the insertion of juvenile organisms in the enclosures.

First of all it is important to verify that the chemical-physical properties of the tanks-enclosure are equal to the conditions of the sampling area. Good practice for the insertion of organisms in the tanks is however to proceed gradually, inserting small amounts of water from the aquariums into the boxes with the collected organisms. This operation can be completed within half an hour.

Once you have inserted the organisms in the tanks you can choose whether to insert them in the free sediment or put some gross sediment inside a petri dish and then insert the organism (it is valid for very small ones), otherwise you can also use small open bags made with jute, inserting first the sediment and then the organism (Figure 6).

It is good practice together with the sediment to also insert a stone on which the juvenile of Pinna nobilis is able to fix the byssus. This practice helps the Pinna nobilis in a subsequent transplant operation as it would avoid a second splitting of the byssus. It should be remembered that the cutting of the byssus cloth brings anyway a stress to the organisms, debilitating it and reducing the chances of survival.

Figure 6 Juta bag and Petri dish

For stabling and growth operations, attention must be given above all to maintaining the optimal chemical-physical conditions. Although the Pinna nobilis is a very resistant and adaptable bivalve mollusc (it survives even for short periods out of the water) we try not to produce large fluctuations in the tanks during normal maintenance operations. The photoperiod should be adjusted according to the seasonality of collection and gradually varied according to the progress of the seasons. As far as the growth is concerned, it is possible to proceed with the insertion of nutrients or, if the tank already has a started ecosystem (at least 5 cm of sediment, different stones, vegetable and animal organisms present) then it is also possible not to insert nutrients for the fans. If the tanks instead are only filled with water without any kind of ecosystem started, then it is recommended to insert once a week a microalgal culture concentrate in the tank.

To choose the most suitable algal culture for feeding *P.nobilis* you can proceed with monocultures (i.e *Dunaliella tertiolecta*) or mix of algae monocultures available on the market. Usually available algae cultures are used because they are selected and free of other organisms. It is also possible to proceed with the culture starting from a sampling in seawater in the juvenile organisms sampling area, but this method does not guarantee the purity of the final result. Inside the taken water there are many predatory organisms of the seaweed and maybe even pathogenic organism for the fin, which in culture could even increase their population.

4. PROTOCOL FOR THE RESTORATION OF THE *PINNA NOBILIS*

The organisms, once they reach 10 cm in size inside the tanks, can be re-implanted in the final site. For the re-implantation of both juveniles and transplanted adult organism, it is sufficient to proceed with the choice of a suitable site for the transplantation of the organisms. In particular, it is important to make sure that the turbulence is not excessive in case of sea storms, as it could undermine the newly planted organisms.

We proceed with the excavation of a hole in the sediment either with sorbonne or by hand that is at least 1/3 of the total length of the organism. If, on the other hand, the organism has passed the "growth phase" in a yute bag, you can proceed with the insertion of the whole bag in the sediment. Within a few weeks the yute degrades.

5. PROTOCOL FOR THE COLLECTION OF MATERIAL FOR THE GENETIC ANALYSIS

This kind of protocol is intended for the detection of *Haplosporidium pinnae* infection. The material detected for genetic analysis is the faeces and pseudofaeces of the organisms. A diver dives into the site where the organisms to be monitored are located, equipped with 60 mL syringes and tubes for the collected material (10 mL tubes are sufficient) (Figure 7). The diver moves slowly to the living organism so as not to provoke a reaction in the body and thus miss the opportunity to collect the material. Once the syringe and tube are prepared, the syringe can be brought closer to the body and the pseudo-faeces present on the edge of the valve opening opposite the hinge can be aspirated. At that point the gills secret this mucus which serves as protection against excessive sedimentation. If you want to take the fecal pellets you will have to pay attention to the exit of the cloacal channel of the organism that is more or less near them. If the organism does not emit, you can try knocking on a valve, in this way the organism will close and emit fecal

pellets. After sampling, biological material are conserved in alcool (90°) and put in freezer at -80°C, ready for the genetic analysis.

Figure 7 Underwater operations

ANNEX 3 – SHORT GUIDANCE FOR THE CONSTRUCTION, INSTALLATION AND REMOVAL OF *PINNA NOBILIS* LARVAL COLLECTORS

SHORT GUIDANCE FOR THE CONSTRUCTION, INSTALLATION AND REMOVAL OF *PINNA NOBILIS* LARVAL COLLECTORS

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CONTEXT

An unprecedented mass mortality event is impacting *Pinna nobilis* populations throughout the Mediterranean Sea[19] (Vázquez-Luis et al. 2017). The eventual recovery of impacted populations will depend mainly on the existence of unimpacted populations, resistant individuals and recruitment. Therefore, it is extremely important to assess larval recruitment to evaluate if larvae coming from unaffected sites or resistant individuals are reaching the impacted areas, thus potentially contributing to eventual recoveries.

Larval collectors have been successfully used to assess *P. nobilis* recruitment in different contexts and areas (Cabanellas-Reboredo et al. 2009, Kersting & García-March 2017, Wesselmann et al. 2018). Additionally, if needed, this methodology might eventually be used to provide juveniles to restock populations (Kersting & García-March 2017).

Here we describe how to construct, install and remove larval collectors in order to assess larval settlement in *P. nobilis*.

CONSTRUCTION

Collector bags

The collector bags consist of entangled nylon filament, onion bags or any similar material composed of fine filaments that endure underwater, placed inside polyethylene (or similar plastic) mesh bags (Fig. 1). Different designs can be applied here, the important thing is to have entangled filaments (settlement substratum for larvae) and a plastic mesh bag containing that substratum that acts as a protection against predators (but allows larvae to access the inner filaments). The outer plastic mesh bag must be securely closed using cord or nylon cable ties. At one of the ends the same cord used to close the bag can be used to anchor the bag to the main rope (see next step).

Entangled nylon can be obtained by recycling old trammel nets (or similar); usually fishermen throw them away when old or broken. This material can be reused many times if rinsed in water and dried after each use as larval collector. Onion or vegetable nets/bags can be obtained by recycling used ones or can be bought in gardening or agriculture shops (as well in internet shops).

[19] https://www.iucn.org/news/mediterranean/201907/mediterranean-noble-pen-shell- crisis-pinna-nobilis-june-2019-update

Fig. 1. Two different bag designs. Left. Entangled nylon (trammel net) inside plastic mesh bags. Right. A similar outer plastic bag but using onion nets as substrata inside. Photographs: D. K. Kersting, I. Hendriks.

Main rope

The bags are attached to a main rope (Fig. 2). The whole system is fixed to a small concrete mooring (or similar, but it must be heavy enough to prevent dislocation by waves and currents) and the rope is kept vertical by a submerged buoy. Submerged buoys (depth > 3m) prevent the whole system to be seen from the surface and potential entanglements with boats.

Fig. 2. Collectors' bags attached to the main rope and buoy ready to be deployed. Photograph: D. K. Kersting.

There are several ways to distribute the bags along the rope. In deeper sites the bags can be attached in approx. 1,5 m intervals throughout the rope (Fig. 3), thus covering a wider depth range. In shallow sites the bags can be attached in a single point (Fig. 3). It has been observed that *P. nobilis* larvae settle in collectors in a wide depth range, so both deeper (for example 15 m) and shallower (for example 5 m) collector installations are possible.

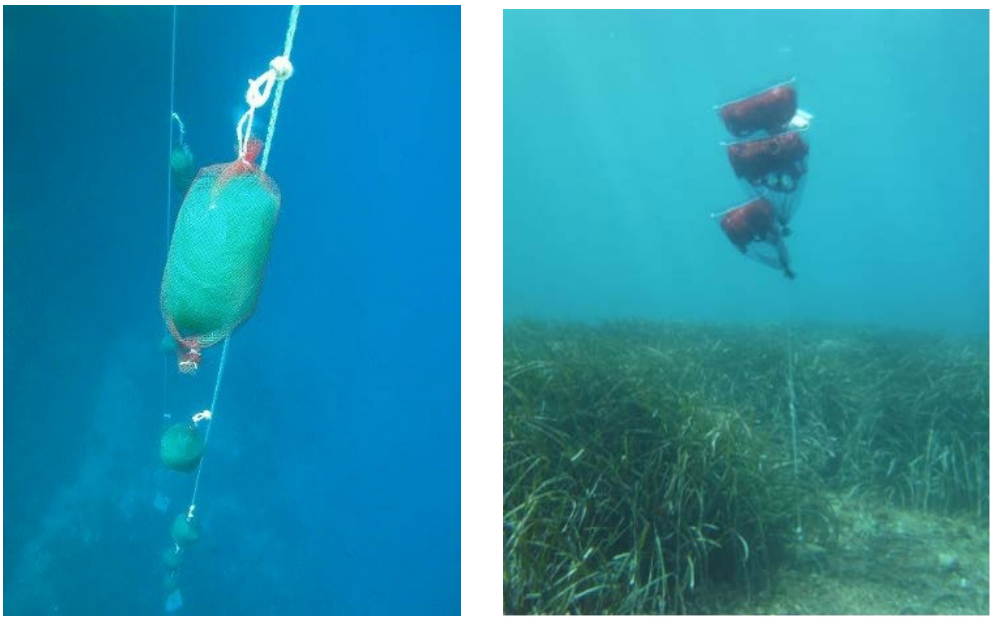

Fig. 3. Larval collector bags attached in 1,5 m intervals in a deep site (left) and a shallow site installation (righty). Photographs: D. K. Kersting, I. E. Hendriks.

INSTALLATION AND REMOVAL

Where?

The collectors should be preferably placed in a location exposed to open waters, as *P. nobilis* larvae are transported by currents. Of course, they can be installed as well in other sites if needed, for example to check for potential recruitment in semi-enclosed lagoons.
The presence of adult *P. nobilis* populations is not a prerequisite to install the collectors. They can be installed in locations where the species is not present or in areas where the ongoing mass mortality event has killed all individuals. *Pinna nobilis* larvae can travel long distances transported by currents, therefore the larvae arriving to a certain site may come from distant areas.

When?

The main reproduction period of *P. nobilis* is from May to August and the main settlement period is estimated to occur between July and September (in the W Mediterranean). These periods could change depending on environmental conditions (for example water temperature) in the different Mediterranean regions. We suggest installing the collectors in June and remove them in October-November. While this would be the ideal installation and removal period, later installations and removals are possible. It must be taken into account that later installations will lower the possibility of covering the whole main larval settlement period. While the main problem of a later removal of the collectors is a higher exposure to storms in some regions and the fact that at some point juveniles might not have enough room between the filaments to keep growing.

How to remove settled juveniles?

The collectors should be carefully removed, avoiding crushing the bags. The bags should be preferably maintained underwater until the removal of the juveniles.

At the end of the installation period juveniles' sizes (antero-posterior length) may range approx. from 0,5 – 9 cm. In general, they can be seen by the naked eye inside the tangled fibers (Fig. 4). They have to be removed carefully in order not to break the fragile valves. Juveniles should be immediately placed in seawater after their extraction from the collector bag (Fig. 4).

Fig. 4. *Pinna nobilis* juveniles settled inside the collectors. Notice different morphologies and sizes. Juveniles have to be kept in seawater immediately after extraction from the bags. Photographs: D. K. Kersting.

What to do with the juveniles?

Juveniles can be placed in protection cages in the field where they will continue growing, giving the possibility of re-implanting them in suitable substrata when a certain size is reached (Fig. 5). See Kersting & García-March (2017) for further information.

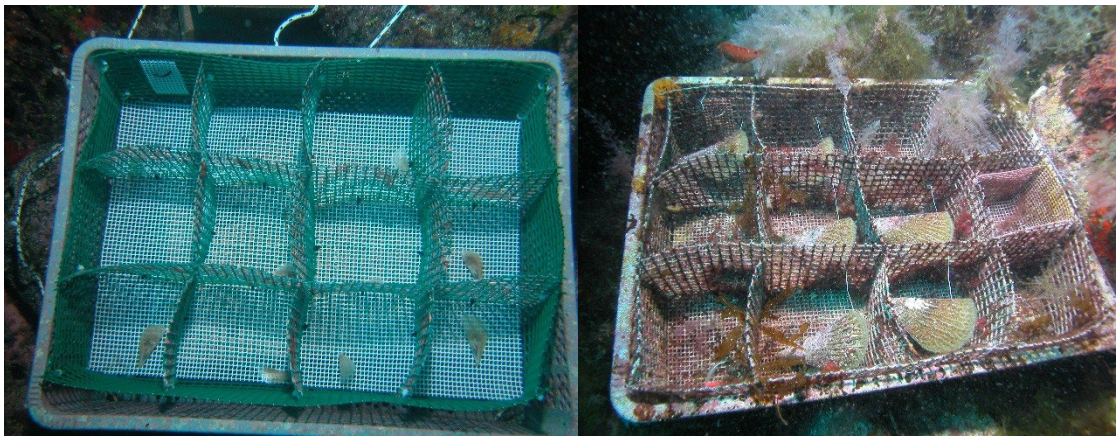

Fig. 5. Left. Juveniles just extracted from the collectors and placed in the protection cage (in the field). Right. *Pinna nobilis* individuals of approx. 2-3 years of age in the protection cage. Notice the photographs have been taken without the mesh protection covering the cages. Photographs: D. K. Kersting.

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Citation: Kersting D. K., Hendriks I. E. (2019) Short guidance for the construction, installation and removal of *Pinna nobilis* larval collectors. IUCN. 6pp.

Annex VI

Conditions and criteria for the award of the title of Regional Action Plan Partner

Conditions and criteria for the award of the title of Regional Action Plan Partner

BACKGROUND

1. In accordance with its mission, the Specially Protected Areas Regional Activity Centre (SPA/RAC) of the Mediterranean Action Plan (UNEP/MAP) is assisting the Contracting Parties to the Barcelona Convention in fulfilling their obligations under the SPA/BD Protocol, the Post-2020 Strategic Action Programme for the Conservation of Biological Diversity and Sustainable Management of Natural Resources in the Mediterranean Region (Post-200 SAPBIO) and the regional Action Plans and strategies to protect vulnerable habitats, endangered species, and areas of conservation interest.

2. Elaborating and implementing regional action plans to address threats to biological diversity within a common framework, namely the Barcelona Convention, is an effective way to step up efforts by the Mediterranean countries to safeguard the region's natural heritage. Although they do not have a binding legal character, these action plans set out the priorities and activities to be undertaken as defined and agreed with the Contracting Parties.

3. In all the action plans, coordination of efforts, cooperation and solidarity are a fundamental point. This approach has indeed proved necessary to ensure the conservation and sustainable management of biodiversity in the Mediterranean as a whole.

4. The Contracting to Barcelona Convention adopted the following Regional Action Plans:
   - Action Plan for the management of the Monk Seal
   - Action Plan for the conservation of marine turtles
   - Action Plan for the conservation of cetaceans
   - Action Plan for the conservation of marine vegetation
   - Action Plan for the conservation of bird species registered in Annex II of the SPA/BD Protocol
   - Action Plan for the conservation of cartilaginous fishes (Chondrichthyans) in the Mediterranean Sea
   - Action Plan concerning species introduction and invasive species
   - Action Plan for the conservation of the coralligenous and other calcareous bio-concretions in the Mediterranean Sea
   - Action Plan for the conservation of habitats and species associated with seamounts, underwater caves and canyons, aphotic hard beds and chemo-synthetic phenomena in the Mediterranean Sea

5. To encourage and reward contributions to the work of applying the Action Plans, the Contracting Parties may at their ordinary meetings grant the title of "Action Plan Partner" to any organization (governmental, NGO, economic, etc.) that has to its credit concrete actions likely to help the conservation and the protection of the species/group of species in question.

6. Within the PoW 2022-2023, SPA/RAC is requested to develop conditions and criteria for the award of the title of Regional Action Plan Partner (Activity 5.4.4.a). These Conditions and criteria for the awarding of the Partner title are submitted for review by the sixteenth SPA/BD Focal Points meetings, the MAP Focal Points and adoption by the 23rd Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols (COP 23).

7. The following draft criteria take into consideration the decision on MAP/Civil society cooperation and Partnership (UNEP(DEPI)/MED WG 337/8) adopted by 16th meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols (COP 16).

CONDITIONS AND CRITERIA FOR THE AWARD OF THE TITLE OF REGIONAL ACTION PLAN PARTNER

The present conditions and criteria will apply to the evaluation of proposals for the awarding and the renewal of the awarding of the title of Regional Action Plan Partner.

No limit is set on the total number of the Partner to the Regional Action Plan. However, Parties agree that the awarding will be based the following criteria. Any Organization can request the title of Partner for more than one Action Plan.

1. General conditions and criteria

1.1. Types of organizations eligible for the title of Regional Action Plan Partner:

- International and regional organizations
- International and regional NGOs
- National organisations
- National and local NGOs from Mediterranean riparian states.
- Research institutions/Laboratories
- Private organizations/ companies (environmental responsibility)
- Any other organization 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 concerned Action Plan, taking into account the objectives and priorities contained therein.

1.2. General conditions of candidate partners:

a) be representative in the field(s) of their competence and fields of action related to the concerned Action Plan(s)
b) be able, through their work and specific project or programme, to support the achievement of the objectives and the implementation of the concerned Action Plan(s)
c) be able to make known the concerned Action Plan(s) in the region and/or their respective countries and to contribute, through a specific event or manifestation linked to public awareness-raising.
d) be able to provide, through their specific activity or experience, expert advice and/or best practices on the definition of objectives, priorities and actions for the concerned Action Plan(s)
e) be able to provide information or views related to their own area(s) of expertise, either on their own initiative or at the SPA/RAC request.

2. Specific conditions and criteria

2.1. Awarding criteria:

Candidate partners at the time of submitting request to become an action plan partner should fulfil the following criteria:

1. to have legal status; terms of reference, objectives and scope of activities related to one or more SPA/RAC areas of activity and objectives and the scope genuinely related to the concerned Action Plan(s)

2. to have existed for at least 5 years.
3. to submit financial and activity reports from the last two years.
4. to have their regional office or headquarters in a Mediterranean country.
5. to demonstrate proof of general or specialized, technical or scientific competence on issues related to the activities of SPA/RAC and the concerned Action Plan(s)
6. to demonstrate what contributions the partner could make the concerned Action Plan(s).

2.2. Awarding procedure:

a) The concerned organization should send a request to SPA/RAC, using the form in Annex 1, at least 90 days before the Meeting of SPA/BD Focal Points. The proposal must be submitted either in English or in French.

b) SPA/RAC will consult with the concerned focal point about the received request of National organisations, National and local NGOs and research institutions/laboratories

c) SPA/RAC will then forward a copy of the proposal in its original version with the recommendation of the concerned focal Point, to the MAP Coordinator.

d) SPA/RAC will proceed to the translation of the original version so that the proposal may be submitted in English and French at least a month before the Focal Points meeting, which will proceed to evaluate it in the light of the above agreed criteria using the table in annex II.

e) The meeting of SPA/BD Focal Points will examine the request accompanied by the evaluation by the Centre and will decide where to award or not the Regional Action Plans Partner title.

f) Once approved by meeting of SPA/BD Focal Points, the candidate partner will be notified by official communication from SPA/RAC, including duration of the award and a request to nominate a contact person to ease coordination with the Centre.

2.3. Renewal of awarding:

a) Award will be renewed every five years, when the implementation of the concerned Action Plan (s) is assessed and the Action Plan updated, the partner organisation should request the Centre to renew their awarding of the Regional Action Plan Partner title.

b) The request should show what contribution the partner organisation has made to the implementation of the concerned Action Plan (s)

2.4. Awarding Renewal procedure:

The same procedure as the initial awarding applies.

2.5. Effects of awarding

a) SPA/RAC shall draw up a list of Action Plan's partners and update it for each meeting of SPA/BD Focal Points, drawing a distinction between the category of the organisation.
b) SPA/RAC shall set up a mechanism for regular dialogue between the Partners and, where necessary, organize meetings to this effect. Dialogue should be made mainly by email and tele-conference.

c) Selected partners can be invited to attend expert meetings to update an action plan, and/ or invited to the meetings of SPA/BD Focal Points to provide expert inputs with status of observers in the meeting.

2.6. Partner title award levels

a) **Bronze partner**: A partner of regional action plan, during the first 5 years of partnership,

b) **Silver partner**: A partner who completed the bronze partner period, for the implementation of respective Action Plan. The silver badge should be granted for 5 years.

c) **Golden partner**: A partner who completed the silver partner period for the implementation of respective Action Plan. The Golden badge should be granted for 10 years, with progress assessment at the 5th year.

d) **Associate/Affiliate partner**: is the final level that granted to a Golden Action Plan partner, who successfully maintained a continuous commitment in action plan implementation for 10 consecutive years.

2.7. Withdrawal of awarding

A Total lack of participation in the implementation of the concerned Action Plan (s) over a period of 5 years will lead to the awarding being automatically cancelled following a hearing with the concerned Partner.

Following a formal request from the partner organisation in question if it deems that the partner organisation is no longer meets the accreditation criteria or has shown no further interest in Action Plan implementation related activities, the meeting of SPA/BD Focal may withdraw the awarding of title. The concerned organization should send the request to SPA/RAC, at least 90 days before the Meeting of SPA/BD Focal Points

1. Annex I : Application form for the Action Plan Partner title

Part A	**Select an Action Plan**	
☐ Action Plan for the management of the Monk Seal		☐ Action Plan for the conservation of marine turtles
☐ Action Plan for the conservation of bird species registered in Annex II of the SPA/BD Protocol		☐ Action Plan for the conservation of marine vegetation
☐ Action Plan concerning species introduction and invasive species		☐ Action Plan for the Conservation of the Coralligenous and Other Calcareous Bio-concretions in the Mediterranean Sea
☐ Action Plan for the conservation of habitats and species associated with seamounts, underwater caves and canyons, aphotic hard beds and chemo-synthetic phenomena in the Mediterranean Sea (Dark Habitats Action Plan)		☐ Action Plan for the conservation of cartilaginous fishes (Chondrichthyans) in the Mediterranean Sea
		☐ Action Plan for the conservation of cetaceans
Part B	**General Information**	
1.	**Name and acronym of the organization (in English and French)**	
2.	**Organization HQ address**	
	Street	
	City & Zip Code	
	Country	
	Tel	
	Email	
	Web site	
3.	**Year of foundation**	
4.	**Type of organization (Association; federation, foundation, professional organization, umbrella organization)**	
5.	**Organizational status**	
	President of the organization Name: Surname: Address: Tel: Email:	
	Secretary General of the organization Name: Surname: Address: Tel: Email:	
	Structure and functioning of directing bodies	
	Staff	

	Number of members	
6.	**Funding**	
a)	Membership fees	
b)	Public funding	
c)	Private donations	
d)	Other, please specify	
7.	**Purpose** *Please describe briefly the goals, mandate or mission of your organization*	
8.	**Activities of your organization** *Please describe activities of your organization*	
9.	**Constituency** *Please describe briefly the support base (members/supporters/donors) of your organization*	
10.	**Accreditations** *Accreditation with other international intergovernmental organizations*	
11.	**Publications**	
	Titles/Numbers	
	Does your organization publish an annual report?	☐ Yes ☐ No
	Does your organization produce a list of available publications and or educational matters?	☐ Yes ☐ No
Part C	**Areas of possible cooperation with SPA/RAC**	
	Please indicate the areas of your organization's activities which correspond to the SPA/RAC programme of activities and Action Plans	
	☐ Governance for environment and development	
	☐ Integrating environment in development	

	☐ Legal aspects of implementation of the Barcelona Convention and its Protocols	
	☐ Pollution control and prevention	
	☐ Biodiversity conservation	
	☐ Integrated coastal zone management/Ecosystem management	
	☐ Scientific Research	
	☐ Sustainable management of natural recourses and efficient use of resources	
	☐ Public participation and awareness	
Part D	**Modalities of Cooperation with SPA/RAC**	
1.	In what ways does your organization think it can support SPA/RAC activities and the objectives of the selected Action Plan? (*Please describe: Studies, reports, previous work in the field concerned, expertise of its members, etc*)	
2.	What practical cooperation has already been established with SPA/RAC and/or other RACs? (*Please describe joint activities, comments on draft documents, exchange of information, participation as experts, participation at SPA/RAC meeting and events, etc*)	
3.	In what ways and audiences will your organization promote the work and development of the SPA/RAC?	

Name: ……..
Position in the Organization: ……..
Date: ……
Stamp & Signature: ……

****

Please send your completed form and required documents by email to: car-asp@spa-rac.org

Please enclose all the documents required to support your application for action plan partner title:

Submission checklist:
☐ Cover letter addressed to the SPA/RAC Director
☐ Read and endorsed the action plan partner conditions and criteria
☐ Completed application form
☐ Copy of the statute
☐ Financial reports of the past two years
☐ Annual reports of the past two years, highlighting the activities
☐ Copies of the organization's publications

2. Annex II: Evaluation table for applications to Action Plan partner title status

	Requirement	Check
Part A	**One Action Plan is selected**	☐
Part B	**General Information**	
1.	**Name and acronym of the organization (in English and French)**	☐
		☐
2.	**Organization HQ address**	☐
3.	**Year of foundation**	☐
4.	**Type of organization (Association; federation, foundation, professional organization, umbrella organization)**	☐
5.	**Organizational status**	☐
	President of the organization details provided	☐
	Secretary General of the organization details provided	☐
	Structure and functioning of directing bodies	☐
	Staff details provided	☐
6.	**Funding details provided**	☐
8.	**Activities of your organization provided**	☐
9.	**Constituency information provided**	☐
10.	**Proof of other Accreditations provided**	☐
11.	**Publication's list provided**	☐
	Copies of the organization's annual reports provided?	☐ Yes ☐ No
	Copies of the organization's publications provided?	☐ Yes ☐ No
Part C	**The organization provided enough information on areas of possible cooperation with SPA/RAC**	☐ Yes ☐ No
Part D	**The organization provided enough information modalities of Cooperation with SPA/RAC**	☐ Yes ☐ No

Annex VII

Conclusions and recommendations of the Multidisciplinary group of experts nominated by the Contracting Parties to define parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators and elaborate the List of Reference of Pelagic Habitat Types in the Mediterranean Sea

Conclusions and recommendations of the Multidisciplinary group of experts nominated by the Contracting Parties to define parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators and elaborate the List of Reference of Pelagic Habitat Types in the Mediterranean Sea

Definition of parameters allowing to use phytoplankton and zooplankton for relevant IMAP biodiversity indicators

1. Overall, while there has been progress in developing indicators based on phytoplankton and zooplankton, continued research and development are needed to define these indicators and improve their usefulness for assessing and managing pelagic habitats.

2. First, the relationships between changes in these organisms and broader ecosystem health can be complex and variable depending on the pressure and the considered spatial and temporal scales. For example, in some cases, high phytoplankton abundance may be indicative of eutrophication and poor water quality, while in other cases, it may simply reflect natural seasonal variability and associated processes (e.g., winter convection in the north-western Mediterranean Sea). Therefore, more research is needed to define specific indicators that are the most informative for different types of pressures, to better understand and study how these indicators reflect to different pressures (at different spatio-temporal scales) and how they should be interpreted. In addition, there is a strong need for collaboration among experts from different scientific fields and marine regions to define common indicators and thresholds and, finally, to investigate the links between indicators, environmental variables, and anthropogenic pressures.

3. The main pressures identified so far on pelagic habitats are:

- hydroclimatic conditions and shifts that should be considered in light of climate change;
- Eutrophication;
- Biological invasions;
- Contaminants (chemicals and marine litter);
- Overfishing;
- Aquaculture;
- Physical disturbance due to the influence of man-made structure (wind farms, desalination plants, hydrocarbon drilling, marinas etc.);
- Acidification;
- Maritime traffic.

4. As pelagic habitats are closely linked to several Ecological Objectives of the EcAp like EO5 Eutrophication and EO9 Pollution, it is important to enhance synergy and better integration among Ecological objectives (by improving data collection and sharing, data harmonization and interoperability, etc.)

5. Monitoring and assessing phytoplankton and zooplankton communities can be logistically challenging. Therefore, there is a need to develop efficient, harmonised and cost-effective monitoring methods that can be applied across the region. Specific workshops should be organised for harmonizing sampling strategies and protocols. Ensuring parameter comparability is also crucial and can be achieved through the use of comparable acquisition methods and/or intercomparison/intercalibration exercises. This is necessary to evaluate whether and how the results obtained are influenced by the acquisition methods used.

6. Long-term series of data are critical for using indicators based on phytoplankton and zooplankton effectively. Without sufficient long-term data, it is impossible to distinguish between natural variability and anthropogenic impacts, making it challenging to identify trends or changes. It is also critical to provide associated metadata wherever available in to ensure the quality and comparability of the data collected over time to validate whether observed changes are not explainable

by changes in acquisition techniques (e.g., to verify whether observed changes are not explainable by changes in methodologies (sampling techniques, sample processing, different analysts)).

7. ABIOMMED project, and in particular the Activity 2, is related to pelagic habitat and the use of the plankton communities to properly address the status of pelagic habitat and relevant spatio-temporal scales and pressures. Under this concept, ABIOMMED is expected to provide a comprehensive input and the essential resources to contribute to the development of relevant IMAP biodiversity indicators based on phytoplankton and zooplankton.

8. The following parameters can be used to effectively use these organisms as indicators:

- Biomass [Chla, Carbon]
- Abundance (per species/genius or groups)
- Size and biovolume

9. Setting thresholds is a difficult task and could be challenging (Varkitzi et al. 2018[20]). Using trends, i.e., considering plankton indicators as surveillance indicator (e.g., Shephard et al. 2015[21] ; Bedford et al. 2018 [22]) with the addition of expert knowledge following indicator computation, could be a reasonable alternative and was recently proposed by McQuatters-Gollop et al. (2022)[23] for biodiversity assessment.

10. Monitoring frequency should be adapted to integrate Seasonal and long-term temporal variability and rely on existing data.

11. Abiotic parameters could be measured at the relevant space and time to interpret the changes in plankton communities:

- Water Temperature
- Salinity
- Transparency
- Oxygen
- Turbidity
- pH
- Nutrients concentration
- Meteorological data (air temperature, precipitation, wind intensity and direction, etc.)

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[21] Samuel Shephard, Simon P. R. Greenstreet, GerJan J. Piet, Anna Rindorf, Mark Dickey-Collas, Surveillance indicators and their use in implementation of the Marine Strategy Framework Directive, ICES Journal of Marine Science, Volume 72, Issue 8, September/October 2015, Pages 2269–2277, https://doi.org/10.1093/icesjms/fsv131

[22] Jacob Bedford, David Johns, Simon Greenstreet, Abigail McQuatters-Gollop,Plankton as prevailing conditions: A surveillance role for plankton indicators within the Marine Strategy Framework Directive,Marine Policy,Volume 89, 2018,Pages 109-115,ISSN 0308-597X,https://doi.org/10.1016/j.marpol.2017.12.021.

[23] A. McQuatters-Gollop, L. Guérin, N.L. Arroyo, A. Aubert, L.F. Artigas, J. Bedford, E. Corcoran, V. Dierschke, S.A.M. Elliott, S.C.V. Geelhoed, A. Gilles, J.M. González-Irusta, J. Haelters, M. Johansen, F. Le Loc'h, C.P. Lynam, N. Niquil, B. Meakins, I. Mitchell, B. Padegimas, R. Pesch, I. Preciado, I. Rombouts, G. Safi, P. Schmitt, U. Schückel, A. Serrano, P. Stebbing, A. De la Torriente, C. Vina-Herbon, Assessing the state of marine biodiversity in the Northeast Atlantic, Ecological Indicators, Volume 141, 2022, 109148, ISSN 1470-160X, https://doi.org/10.1016/j.ecolind.2022.109148.

The measurement of weather conditions cannot be considered only on the day of collection of the plankton community. Conditions that prevailed prior to data collection (t-1) can explain the structure and dynamics of the communities at time t.

Elaboration of the List of Reference of Pelagic Habitat Types in the Mediterranean Sea

12. The meeting confirmed that the modified classification of pelagic habitat types in the epipelagic layer (0-200 m) proposed in UNEP/RAC/SPA (2013)24, can be used, where necessary, as a basis for identifying reference pelagic habitats to be monitored and assessed at the national level under IMAP. This reference list could be further developed at national level to consider national features and specificities.

13. The group of experts did not reach a conclusion concerning whether the typology defined for pelagic habitats will be computed at seasonal scale or more frequently over a given period (i.e., 6-year cycle) and recommended that the point be discussed in the future.

14. It will be necessary to phase the typology definition for pelagic habitats with the areas of assessment defined for other Ecological Objectives (EO 5 Eutrophication – EO 9 Pollution) given eutrophication and pollution can act as pressures that should be considered in coherent spatial scales.

15. Frequency of the sampling depends on the proposed typology, on the resources available and on plankton dynamics and should be adapted at a minimum to the temporal scale of the typologies used.

16. Satellite-derived products for chlorophyll-a are valuable tools for acquiring data offshore because they are regularly validated and calibrated with in-situ data and account for reprocessing phases undertaken by NASA and ESA. These products rely on look-up tables to convert satellite measurements into estimates of chlorophyll-a concentrations, making them an effective way to complement in-situ data collection. However, it is important to note that satellite-derived products have limitations, such as limited spatial and temporal resolution, and should be used in combination with in-situ data to provide a more comprehensive understanding of pelagic habitats. Different products developed for Eutrophication (Common Indicator 14) were provided for the QSR Med Assessment 2023. They concern distinct contracting parties and rely on CMEMS product, French products developed by Argans and Spanish products (for the Alboran Sea). Ongoing works aim to compare the results given by these different products on eutrophication assessment (Chl a – Common Indicator 14).

17. The Draft reference list of pelagic Habitat Types for the epipelagic layer (0-200m) is as follows:

Draft reference list of pelagic Habitat Types for the epipelagic layer (0-200m) *

	Pelagic Habitat Types	Water mass	Comments**
A.1.	Reduced salinity water	coastal lagoons	WFD correspondence [25]
A.2.	Variable salinity water – high surface or subsurface CHL (>3 mg/m^3)	estuaries, river plumes	Transitional waters with

[24] UNEP/RAC/SPA, 2013: http://www.rac-spa.org/nfp11/nfpdocs/working/WG_382_11_ENG_1706.pdf

[25] European Commission Decision 2018/229/EU 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, and repealing Commission Decision 2013/480/EU (notified under document C (2018) 696) https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018D0229&from=PL

			WFD correspondence [26] (Values should be revised)
A.3.	Marine water: neritic - medium surface or subsurface CHL (0.5-3 mg/m^3)	upwellings, re-suspension in shallow waters and outskirts of river plumes, winter mixing areas	WFD water type II, type III
A.4.a	Marine water: oceanic - medium surface or subsurface CHL (0.5-3 mg/m^3)	Upwellings, and winter mixing areas	WFD water type III
A.4.b	Marine water: oceanic - low to medium surface CHL (~0.1-1.0 mg/m^3)	Hydrological features (fronts and gyres)	WFD water type III
A.5.a.	Marine water: oceanic - very low surface CHL (<0.1 mg/m^3) with deep CHL maximum	euphotic depth > mixed layer depth	WFD water type III
A.5.b.	Marine water: oceanic - very low surface CHL (<0.2 mg/m^3) without deep CHL maximum	euphotic depth < mixed layer depth	WFD water type III

* This list can be used, where necessary, as a basis for identifying reference pelagic habitats to be monitored and assessed at the national level under IMAP. This reference list could be further developed at national level to consider national features and specificities.

**Each country should specify the range of CHLa, Salinity, depth and if annual/seasonal values are used]

[26] WFD Annex 2 part 1.2.3. defines Transitional waters. see also Guidance document n.o 5 , Transitional and Coastal Waters, Typology, Reference Conditions and Classification Systems and Water Framework Directive Intercalibration Technical Report - Part 3: Coastal and Transitional Waters