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5.2. Updating of the Action Plan concerning species introductions and invasive species in the Mediterranean Sea

Final draft regional harmonised procedures for the uniform implementation of the Ballast Water Management Convention in the Mediterranean Sea

MEDITERRANEAN ACTION PLAN (MAP)
REGIONAL MARINE POLLUTION EMERGENCY RESPONSE CENTRE FOR THE MEDITERRANEAN SEA (REMPEC)

Final draft regional harmonised procedures for the uniform implementation of the Ballast Water Management Convention in the Mediterranean Sea

This activity was financed by the Integrated Technical Cooperation Programme (ITCP) of the International Maritime Organization (IMO) as well as the Mediterranean Trust Fund (MTF) and was implemented by the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC), in cooperation with the Specially Protected Areas Regional Activity Centre (SPA/RAC).

Definitions

Barcelona Convention means the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean

Black Sea area means the Black Sea proper with the boundary between the Mediterranean and the Black Sea constituted by the parallel 41°

BWM Convention means the International Convention for the Control and Management of Ships' Ballast Water and Sediments

Helsinki Convention means the Convention on the Protection of the Marine Environment of the Baltic Sea

Mediterranean Sea area means the Mediterranean Sea proper including the Gulfs and seas therein with the boundary between the Mediterranean and the Black Sea constituted by the 41° N parallel and bounded to the west by the Straits of Gibraltar at the meridian of 005°36' W.

OSPAR Convention means the Convention for the Protection of the Marine Environment of the North-East Atlantic

Precautionary principle means the principle as taken from the Convention on Biological Diversity, which reads: '*where there is a threat to significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat'.*

Red Sea area means the Red Sea proper including the Gulfs of Suez and Aqaba bounded at the south by the rhumb line between Ras si Ane (12°28'.5 N, 043°19'.6 E) and Husn Murad (12°40'.4 N, 043°30'.2 E).

Acronyms

BWE:	Ballast water exchange
BWM:	Ballast water management
BWM Convention:	International Convention for the Control and Management of Ships' Ballast Water and Sediments
IBWMC:	International Ballast Water Management Certificate
BWMP:	Ballast Water Management Plan
BWMS:	Ballast water management system
BWRB:	Ballast Water Record Book
EASIN:	European Alien Species Information Network
GISIS:	Global Integrated Shipping Information System
HAOP:	Harmful aquatic organisms and pathogens
HELCOM:	Baltic Marine Environment Protection Commission or Helsinki Commission
IAS:	Invasive aquatic species
IMO:	International Maritime Organization
MEPC:	Marine Environment Protection Committee
PSU:	Practical salinity units
REMPEC:	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea
ROPME:	Regional Organization for the Protection of the Marine Environment
SRA:	Same risk area
SPA/RAC:	Specially Protected Areas Regional Activity Centre

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Preamble

Nothing in these final draft regional harmonised procedures for the uniform implementation of the Ballast Water Management Convention in the Mediterranean Sea, hereinafter referred to as the regional harmonised procedures, shall prejudice the principles of Sovereignty of the States, principles of Freedom, rights of Navigation, and principles of Innocent Passage in the Territorial Sea.

1 Introduction

The Mediterranean Sea comprises less than 1% of global oceans but, because of its strategic location, has a significant volume of shipping traffic. Passenger and merchant ships making port calls, together with ships transiting the area, represent just over 24% of global shipping. In 2019, this included 27% of the global fleet of oil and chemical tankers and 17.3% of worldwide cruises, with 453,000 port calls made by 14,403 ships. The majority of commercial maritime traffic is intra-Mediterranean[1].

Harmful aquatic organisms and pathogens (HAOP) are recognised as one of the main threats to the marine and coastal biodiversity of the Mediterranean. To date, nearly 1,000 marine species have been recognised as non-indigenous to the Mediterranean Sea. The take up in one location, and release in another location, of unmanaged ballast water by ships is a known vector of HAOP worldwide.

Recognising concern over the introduction of harmful aquatic organisms and pathogens (HAOP) via ballast water, the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) was adopted by the International Maritime Organization (IMO) in 2004.

The BWM Convention entered into force on 8 September 2017. As of 23 March 2023, the BWM Convention has 95 Contracting Parties, the combined merchant fleets of which constitute approximately 92.41% of the gross tonnage of the world's merchant fleet, including 13 of the Mediterranean coastal States that are Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention)[2].

The BWM Convention requires ships to manage their ballast water so that aquatic organisms and pathogens are removed or rendered harmless before ballast water is released into a new location, with the purpose of preventing the spread of HAOP.

The BWM Convention applies to all ships registered under Parties to the BWM Convention, which take up and use ballast water during international voyages. Ships registered to a flag that hasn't ratified the BWM Convention may not be issued relevant certificates under the Convention, however port States that are a Party to the Convention do expect ships to comply with the requirements of the Convention, to ensure no more favourable treatment is given.

Article 13(3) of the BWM Convention includes that Parties with common interests to protect the environment, human health, property, and resources in a given geographical area, in particular, those Parties bordering enclosed and semi-enclosed seas, shall endeavour, taking into account characteristic regional features, to enhance regional co-operation.

Reflecting on the threat of introduction of HAOP through ballast water in the Mediterranean Sea area, the Contracting Parties to the Barcelona Convention adopted at their 22nd meeting the Ballast Water Management Strategy for the Mediterranean Sea (2022-2027) (hereinafter referred to as the Mediterranean BWM Strategy (2022-2027)). This built on previous actions by the Contracting Parties

[1] UNEP/MED, 2022.

[2] The Contracting Parties to the Barcelona Convention are Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Montenegro, Morocco, Slovenia, Spain, Syrian Arab Republic, Tunisia, Türkiye, and the European Union.

to the Barcelona Convention, including the adoption of the 2012 Ballast Water Management Strategy for the Mediterranean Sea.

The overall objectives of the Mediterranean BWM Strategy (2022-2027) are to:

- Establish a framework for a regional harmonised approach in the Mediterranean on ships' ballast water control and management that is consistent with the requirements and standards of the BWM Convention, as outlined in Article 13(3),
- Initiate some preliminary activities related to the management of ships' biofouling in the Mediterranean region, and
- Contribute to the achievement of Good Environmental Status with respect to "non-indigenous species" as defined in the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria.

The Mediterranean BWM Strategy (2022-2027) comprises six (6) Strategic Priorities, each of which is supported by a number of actions and activities that are described in more detail in the Action Plan (Section 4 thereof). Appendix 1 thereto sets out a work plan and implementation timetable while Appendix 2 thereto outlines supplementary information for regional harmonisation of BWM measures.

Strategic Priority 1 (Support ratification and implementation of the BWM Convention) of the Mediterranean BWM Strategy (2022-2027) stipulates that "*The Contracting Parties to the Barcelona Convention support the work for the minimisation of the introduction of invasive aquatic species carried out by the relevant organisations and fora, particularly the work of the IMO, and are committed to take all appropriate actions towards the ratification and implementation of the BWM Convention in the Mediterranean*".

The Actions associated with Strategic Priority 1 include:

- Action 1: Ratification of the BWM Convention,
- Action 2: Harmonisation of BWM measures in the Mediterranean region,
- Action 3: Development, adoption, and implementation of a regional protocol for port baseline surveys and biological monitoring in Mediterranean ports
- Action 4: Promotion of the use of risk assessment as a tool to assist in ballast water (and, more generally, invasive aquatic species) management and decision-making, and
- Action 5: Alignment of BWM measures with neighbouring regions.

The regional harmonised procedures address aspects of the uniform implementation of the BWM Convention for which regional harmonisation in the Mediterranean region is essential, and contribute to Actions 2, 3, 4 and 5.

The regional harmonised procedures consist of six (6) parts, as follows:

- **Harmonised Procedure: Ballast Water Exchange Areas** (Section 2)
- **Harmonised Procedure: Regulation A-4 Exemptions** (Section 3)
- **Harmonised Procedure: Sediment Reception Facilities** (Section 4)
- **Harmonised Procedure: Contingency Measures** (Section 5)
- **Harmonised Procedure: Additional Measures** (Section 6)
- **Harmonised Procedure: Warnings** (Section 7).

2 Harmonised Procedure: Ballast Water Exchange Areas

2.1 Mediterranean Sea Context

The Contracting Parties to the Barcelona Convention communicated a harmonised, voluntary, interim ballast water exchange regime to the IMO in 2011 by means of BWM.2/Circ.35[3] (Harmonized voluntary arrangements for ballast water management in the Mediterranean Region). The regime was intended for implementation prior to the entry into force of the BWM Convention.

This regime was also set out in Annex 2 of the 2012 Mediterranean BWM Strategy "*Harmonised voluntary arrangements for ballast water management in the Mediterranean region".*

The regime identified the areas in the Mediterranean Sea that meet the 50/200 BWM Convention requirement, noting there are no areas in the Mediterranean Sea that meet the 200/200 requirement.

The Mediterranean BWM Strategy (2022-2027) includes proposed arrangements for regulation of ballast water exchange in the Mediterranean. The proposed arrangements are in line with those communicated in BWM.2/Circ.35 and the 2012 Mediterranean BWM Strategy.

The Mediterranean BWM Strategy (2022-2027) includes a map (Figure 1) of areas that meet the 50/200 BWM Convention requirement for ballast water exchange in the Mediterranean, and notes that at least one of these areas is actually unfit for ballast water exchange due to its size.

Shipping traffic routes recorded in the Mediterranean Sea (Figure 2) indicate that many ships traverse waters that do not meet the 50/200 BWM Convention requirement for BWE.

This harmonised approach to designate ballast water exchange areas in the Mediterranean Sea beyond the 200/200 and 50/200 BWM Convention requirements aims to provide a consistent approach to identification and designation of BWE areas, which may be used both as an interim solution until the regulation D-2 standard must be met, and to address longer term contingency measure needs, if considered necessary.

[3] IMO, 2011.

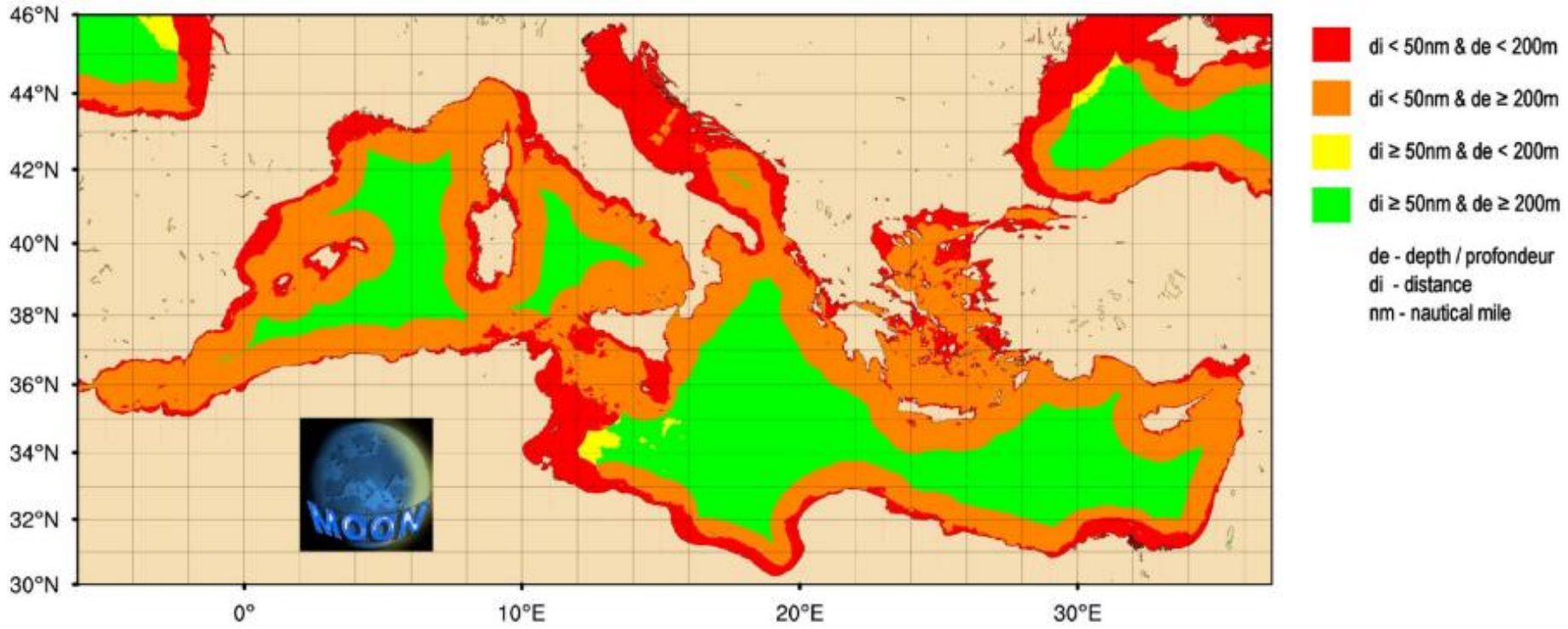

Figure 1: The Mediterranean Sea showing depth and distance from nearest land combinations, from the Mediterranean BWM Strategy (2022-2027).

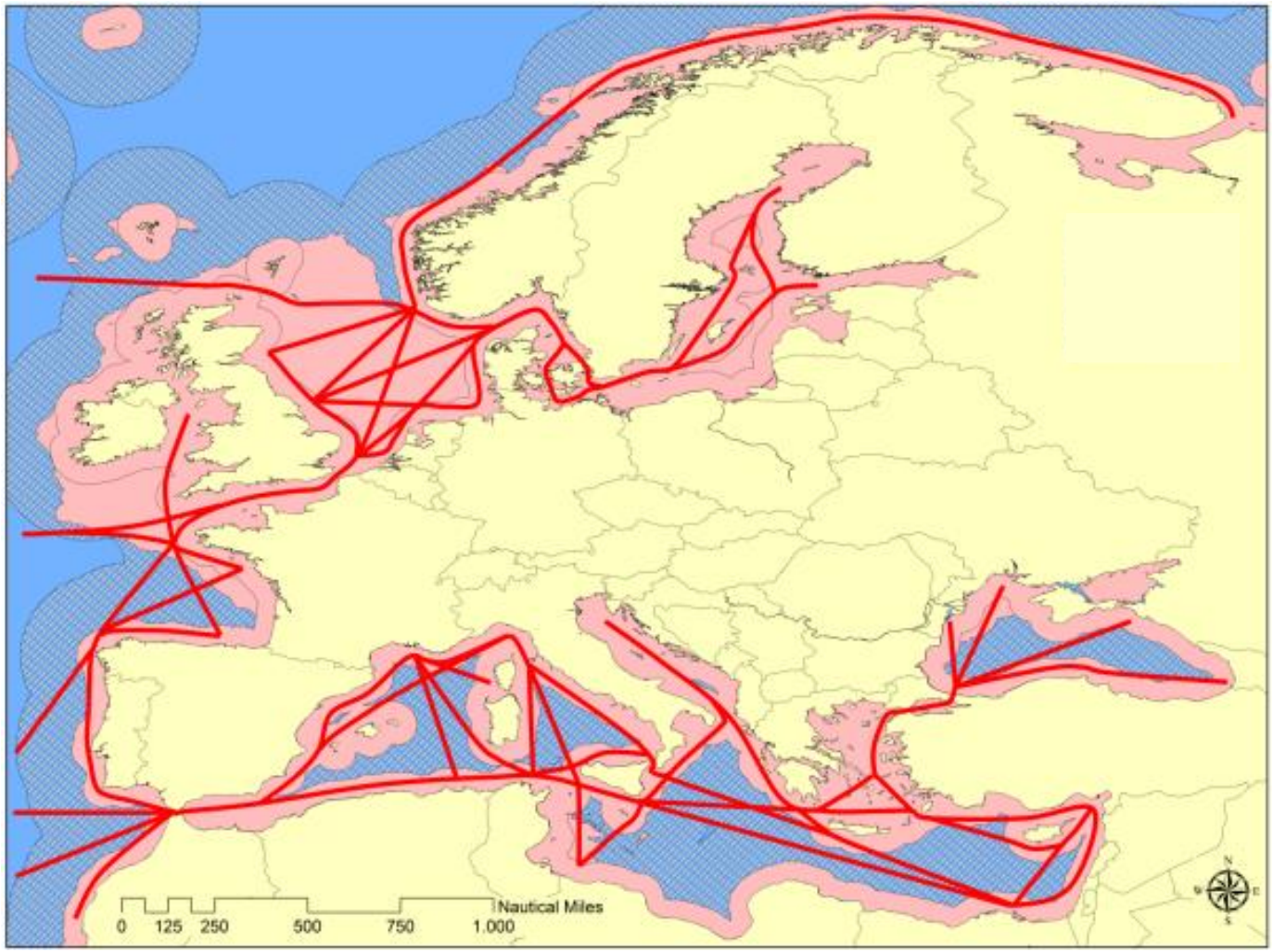

Figure 2: The seas surrounding Europe with red lines showing the main shipping routes, from David, M. and Gollasch, S. 2016. The pink areas are less than 50 nautical miles from nearest land and/or in waters less than 200m deep, and the pink shaded areas are more than 200 nautical miles from the nearest land.

2.2 Ballast water exchange areas in the Mediterranean Sea

As detailed in the Mediterranean BWM Strategy (2022-2027), and consistent with regulation B-4 of the BWM Convention, the requirements for ballast water exchange in the Mediterranean Sea area include:

Ships entering the waters of the Mediterranean Sea area from the Atlantic Ocean (Straits of Gibraltar), or from the Indian Ocean through the Red Sea (Suez Canal) or leaving the waters of the Mediterranean Sea area to the Atlantic Ocean (Strait of Gibraltar) or to the Indian Ocean through the Red Sea (Suez Canal), should:

(a) Undertake ballast water exchange before entering the Mediterranean Sea area, or after leaving the Mediterranean Sea area, as applicable, according to the standard set out in regulation D-1 of the BWM Convention, and at least 200 nautical miles from the nearest land and in waters at least 200 meters in depth,

(b) In situations where this is not possible, either due to deviating the ship from its intended voyage or delaying the ship, or for safety reasons, such exchange should be undertaken before entering the Mediterranean Sea area, or after leaving the Mediterranean Sea area, as applicable, in accordance with the standard set out in regulation D-1 of the BWM Convention, as far from the nearest land as possible, and in all cases in waters at least 50 nautical miles from the nearest land and in waters of at least 200 meters depth.

Ships should, when engaged in traffic between:

I. ports located within the Mediterranean Sea area; or
II. a port located in the Black Sea area and a port located in the Red Sea area; or
III. a port located in the Black Sea and a port located in the Mediterranean Sea area; or
IV. a port located in the Red Sea area and a port located in the Mediterranean Sea area.

a) Undertake ballast water exchange as far from the nearest land as possible, and in all cases in waters at least 50 nautical miles from the nearest land and in waters of at least 200 meters depth. The areas where such requirements are met in the Mediterranean Sea area, appear in Figure 1;

b) In situations where this is not possible either due to deviating the ship from its intended voyage or delaying the ship, or for safety reasons, exchange of ballast water should be undertaken in areas designated by the port State for that purpose, and, if a port State decides to designate a ballast water exchange area,

c) Such areas shall be assessed in accordance with the Guidelines on designation of areas for ballast water exchange (G14) and in consultation with adjacent States and all interested States.

As per regulation B-4 of the Ballast Water Management Convention, if the safety or stability of the ship is threatened by a BWE operation, this operation should not be undertaken. The reasons should be entered in the Ballast Water Record Book and a report should be submitted to the maritime authorities of the port of destination.

Each ship calling at a port within the Mediterranean Sea area is required to have on board a Ballast Water Management Plan complying with requirements of the Guidelines for ballast water management and development of Ballast Water Management Plans (G4)[4] and to keep a record of all ballast water operations carried out.

[4] MEPC.127(53) amended by MEPC.306(73); IMO, 2005 and 2019.

For ships travelling between the Mediterranean area and the North Sea, in line with the General guidance on the voluntary interim application of the D-1 ballast water exchange standard by vessels operating between the Mediterranean Sea and the North-East Atlantic and/or the Baltic Sea (BWM.2/Circ.39[5]), the ballast water exchange requirements include that:

- Ships leaving the Mediterranean Sea and proceeding to destinations in the North-East Atlantic or the Baltic Sea should exchange all their ballast tanks to the regulation D-1 standard at least 200nm from nearest land and in water at least 200m deep as soon as they enter the North-East Atlantic. It should be noted that the best place to do this is in waters that meet these criteria to the west of Portugal, Spain and France, as most of the waters of the English Channel and its approaches, the North Sea and the Baltic Sea are less than 200m deep,
- Ships entering the Mediterranean Sea from the North-East Atlantic or the Baltic Sea and proceeding to destinations in the Mediterranean Sea, the Black Sea or elsewhere should exchange all their ballast tanks to the regulation D-1 standard at least 200nm from nearest land and in water at least 200m deep before they leave the North-East Atlantic, and
- If it is not possible to meet the BWM Convention's 200/200 requirement for ballast water exchange, exchange should be undertaken as far from land as possible outside the Mediterranean Sea and in all cases in waters at least 50nm from nearest land and in waters 200m deep.

2.3 Designating ballast water exchange areas

To designate ballast water exchange areas beyond those identified by BWM Convention regulation B-4 (the 200/200 and 50/200 requirements), the Guidelines (G14) requires three steps to be undertaken – identification, assessment, and designation.

Several countries, such as Australia and Norway, and regions, for example the North Sea and Baltic Sea, have assessed and/or designated areas for BWE in line with the Guidelines (G14).

2.3.1 Harmonised procedure to designate ballast water exchange areas in the Mediterranean Sea

To designate BWE areas in the Mediterranean Sea, the three steps – *identification*, *assessment*, and *designation*, as outlined in the Guidelines (G14), should be followed. To ensure the process is streamlined and efficient, three additional steps are included in this procedure to set up governance arrangements for the designation process and ensure an appropriate level of consultation occurs.

[5] IMO, 2012.

The six steps recommended for designating BWE areas in the Mediterranean Sea include:

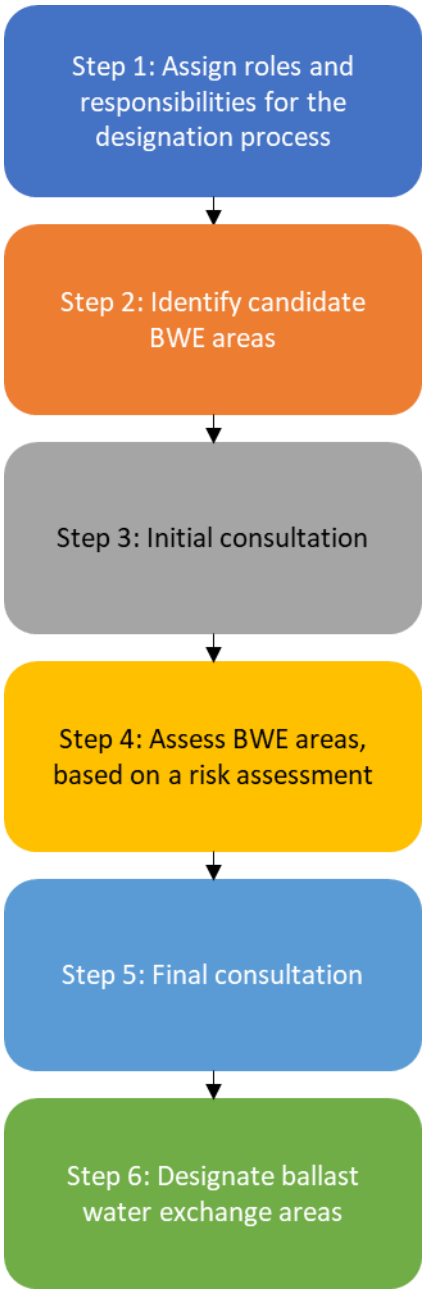

Figure 3: Steps for designating BWE areas in the Mediterranean Sea.

2.3.1.1 Step 1: Assign roles and responsiblities for designation process

Successfully navigating the designation process will require ensuring there are clear roles and responsibilities allocated at the outset. The government policy agency in the port State that has the lead responsibility to ensure that ballast water is managed correctly should nominate an officer for the role of managing the designation process. It may be necessary to outsource phases of the process, such as the risk assessment, however a government officer should have responsibility for overall management.

If more than one port State is involved in the BWE area designation process, equivalent government agencies in the relevant port States should be engaged at the earliest possible time, and similar roles and responsibilities assigned in each relevant port State Authority. If more than one port State is involved in the designation process, an expert consultative group should be established, incorporating experts from all relevant port States, to review and assess all information gathered and assessed, and provide recommendations to the decision maker(s).

The designation manager should report to an overall decision maker - a senior manager appointed by the government agency in each port State Authority - to be accountable for the designation process and to approve and progress the designation for government and/or bilateral or regional endorsement.

2.3.1.2 Step 2: Identify appropriate ballast water exchange areas

There are three considerations essential to identifying appropriate BWE areas, in accordance with the Guidelines (G14). These include legal aspects, important resources (e.g. fisheries, tourism, aquaculture) and protected areas, and navigational constraints.

Legal Aspects

The jurisdiction of the designating body (or port State) is an important consideration. If a designated BWE area is being considered because there is insufficient sea area on ships' routes that meets the BWM Convention 200/200 or 50/200 requirements, then the port State(s) or regional body proposing to designate the BWE area must have jurisdiction over the proposed BWE area. That may mean that the area of the proposed BWE area is in the Exclusive Economic Zone of a port State, or several port States.

If a port State has also incorporated the provisions of the BWM Convention into its national law, the port State must also have included the ability to designate ballast water exchange areas in their national law. In addition, the port State must ensure that the requirements regarding BWE are tiered in accordance with regulation B-4. This means that ships must still undertake BWE:

- as far from land as possible, and at least 200 nautical miles from nearest land and in water 200 metres in depth (the 200/200 requirement),
- if this is not possible, at least 50 nautical miles from nearest land and in water 200 metres in depth (the 50/200 requirement),
- if this is not possible, in the designated BWE area.

If a port State has not incorporated the provisions of the BWM Convention into its national law, it should assign, in its national law, the authority to designate ballast water exchange areas.

Important Resources and Protected Areas

The location of proposed BWE areas should be carefully considered. Adverse impacts in aquatic areas protected under national or international law and other important aquatic resources, including those of economic and ecological importance, should be avoided.

The implementation of the BWM Convention in the Mediterranean region should take into account the potential impact of ballast water discharge on important resources, such as fisheries, marine biodiversity, and protected areas. It is important to ensure that the implementation of the convention is done in a manner that is consistent with the region's sustainability goals and objectives.

The establishment and management of marine and coastal protected areas in the Mediterranean represent a critical measure to address the pressures and protect the Mediterranean Sea and Coast, in alignment with the Barcelona Convention and its Protocol concerning Specially Protected Areas and Biological

Diversity in the Mediterranean (SPA/BD Protocol). The Convention recognizes the importance of marine protected areas (MPAs) and Specially Protected Areas of Mediterranean Importance (SPAMIs) as effective tools for conserving marine biodiversity and ecosystem services.

In 2020, 8.3 % of the Mediterranean Sea is benefiting of a protection status (including MPAs with a national statute, SPAMIs, marine Natura 2000 sites, and the Pelagos Sanctuary), covering a total surface area of 209,303 km²[6] (Figure 5).

The post-2020 targets taken at regional and global levels, through the Post-2020 Regional Strategy for Marine and Coastal Protected Areas (MCPAs) and Other Effective Area-based Conservation Measures (OECMs) in the Mediterranean, and the Kunming-Montreal Global Biodiversity Framework, respectively, ambition 30% of protection of the Mediterranean Sea by 2030.

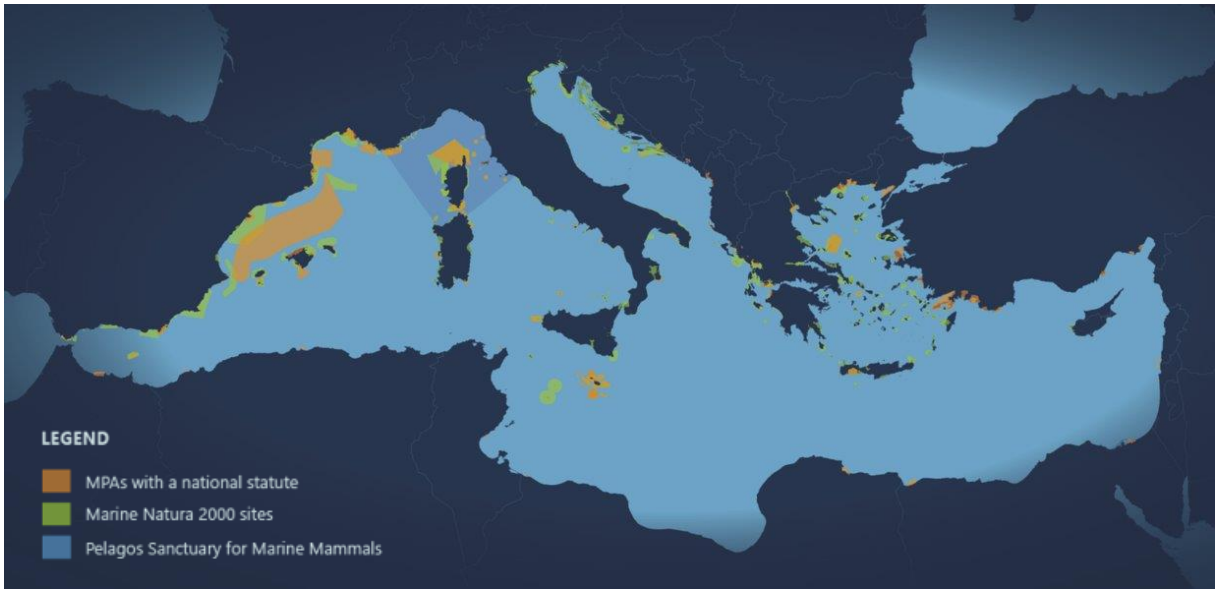

Figure 4: The system of Marine Protected Areas in the Mediterranean in 2020 (Source: SPA/RAC and MedPAN, MAPAMED 2019 edition)

The List of Specially Protected Areas of Mediterranean Importance (SPAMI List) was established by virtue of Article 8 of the SPA/BD Protocol and aims at promoting cooperation in the management and conservation of natural areas, as well as in the protection of threatened species and their habitats. 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.

To date, the SPAMI List counts 39 SPAMIs (38 national SPAMIs and the Pelagos Sanctuary declared following an agreement between France, Italy and Monaco). SPAMIs cover a total surface area of 138,464 km² representing 5.5 % of the Mediterranean Sea area (Figure 5).

[6] MAPAMED, the database of MArine Protected Areas in the MEDiterranean. 2019 edition, version 2. © 2022 by SPA/RAC and MedPAN. Licensed under CC BY-NC-SA 4.0.: https://www.mapamed.org/

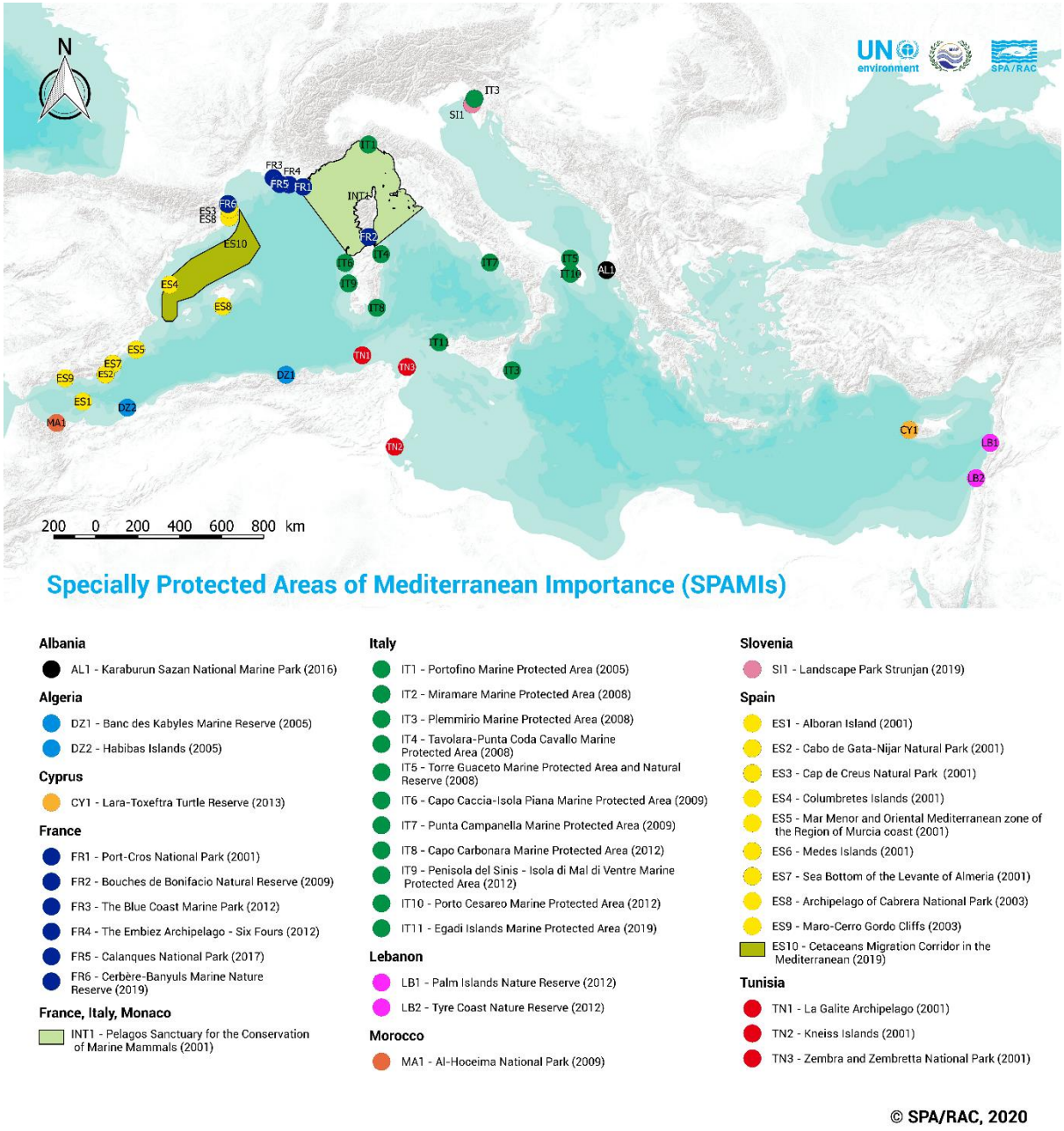

Figure 5: Specially Protected Areas of Mediterranean Importance (SPAMIs): Names, location and year of inclusion on the List

These protected areas are critical for the conservation of biodiversity and the protection of natural resources, including native habitats and species that may be vulnerable to the introduction of alien invasive species. The implementation of the BWM Convention should ensure that ballast water discharge does not harm these protected areas or their ecological values. Ballast water discharge from ships can introduce invasive species into the marine environment, which can have a negative impact on biodiversity and ecosystem functioning. Consequently, adequate measures should be put in place in order to prevent the introduction of invasive species through the regulation of ballast water discharge.

The implementation of the BWM Convention should take into account the potential impact of ballast water discharge on MPAs and SPAMIs and the species and habitats they protect. Ships entering MPAs or SPAMIs may need to undergo additional ballast water management measures to ensure that invasive aquatic species are not introduced into these protected areas. In this way, the designation of MPAs and

SPAMIs and the implementation of the BWM Convention can work synergically to protect the marine environment of the Mediterranean Sea and promote sustainable development.

Navigational Constraints

The purpose of designating a BWE area is to provide a practical option for BWM management that effectively manages the risk of ballast water, either prior to a ship being required to meet the D-2 standard or as a contingency measure. Therefore, an important consideration when identifying a potential BWE area is navigation aspects such as existing shipping routes and navigational safety, in accordance with the Guidelines (G14). The impact on shipping should be minimised.

2.3.1.3 Step 3: Initial consultation

The purpose of the initial consultation is to seek feedback from potentially affected stakeholders on BWE area(s) to identify:

- if areas will be suitable for ships to undertake BWE, and
- any reasons why a full assessment should not be undertaken,

prior to undertaking an extensive and potentially expensive risk assessment.

After potential BWE area(s) have been identified, and before a risk assessment is undertaken, relevant stakeholders should be consulted. If the proposed BWE areas extend into other port State jurisdiction(s), consultation should begin at the earliest stage possible in the designation process.

The first stage consultation should include as many relevant stakeholder groups as possible. These may include: shipping industry, ports, local governments, neighbouring port States, regional bodies and authorities, scientific experts, and affected industries such as fisheries, tourism, and aquaculture. The Contracting Parties to the Barcelona Convention should also be consulted.

The information provided to stakeholders should include the details of the potential areas, making it clear that these are not the final areas, and that an extensive risk assessment should still be undertaken prior to designating any ballast water exchange area.

2.3.1.4 Step 4: Assess ballast water exchange areas

The assessment of a proposed BWE area should be based on a risk assessment in accordance with the Guidelines (G14).

The risk assessment criteria include: oceanographic, physico-chemical, biological, environmental, important resources and ballast water operations.

Data for the risk assessment can be gathered from various sources. Questions that need to be addressed in the assessment, and examples of data sources, include (but are not limited to):

Is the area big enough for ships to undertake a full BWE? [7]

- Industry data on ballast water exchange rates and quantities,
- Shipping route data,

[7] Regulation D-1 of the BWM Convention requires at least 95% volumetric exchange of ballast water. For ships exchanging ballast water by the flow-through or dilution methods, pumping through three times the volume of each ballast water tank is required to meet the standard in regulation D-1.

- Industry data on the location of ballast water uptake (donor port) and quantity of ballast water taken up,
- Industry data on current exchange locations, quantities, and ship speed,
- Industry data on the location of ballast water discharge (recipient port) and quantity of ballast water discharged.

Are there any sea areas that should be avoided?

- Locations of special protected areas or areas of high environmental significance,
- Locations of other industries and activities for example aquaculture, fishing, boating, and tourism.

Where would the exchanged ballast water go?

- Oceanographic data to understand currents, upwellings and other oceanographic features of the proposed ballast water exchange area to determine where ballast water exchanged in the proposed BWE area may flow to.

What harmful aquatic organisms and pathogens might be in the ballast water?

- Data on the presence of known harmful aquatic organisms and pathogens (HAOP) in the region, particularly in donor ports related to the potential ballast water exchange area. This information can be obtained either through port surveys (using traditional taxonomic approaches or modern e-DNA surveys, as agreed by the port States) or expert knowledge.
- Biological data on each of the known HAOP to understanding the length and tolerances (depth, water quality) of each lifecycle stage. Species that can be transported via ballast water should be focused on.

Will the potential HAOP survive in the areas where the ballast water is exchanged or flows to?

- Hydrological data to understand the water depths in and surrounding the proposed ballast water exchange area.

The designated ballast water exchange area should provide the least risk to the aquatic environment, human health, property, or resources. The results of the risk assessment should be used to define the spatial limits of the BWE area, which should also be aligned with national and international law.

2.3.1.5 Step 5: Final Consultation

Once the risk assessment is complete, a final consultation should be undertaken with the same stakeholders as the initial consultation. The final consultation should provide the outcomes of the risk assessment, and whether the potential BWE area has been found suitable for designation by the decision maker(s). If the results of the risk assessment suggest that use of the BWE area would result in unacceptable risk (noting that zero risk is not possible) then this should be explained to stakeholders in the final consultation.

Input from stakeholders should be sought on the final details of the proposed BWE area, and any comments addressed, prior to finalising the area.

Prior to designating the area, endorsement for the BWE area should be sought from the relevant port State Authority(ies) and the Contracting Parties to the Barcelona Convention.

2.3.1.6 Step 6: Designation

To designate the BWE area, three actions should occur:

- The area should be included or referred to in the national circulars or notices to mariners
- Stakeholders should be notified, and
- The IMO should be notified.

Ballast water exchange areas designated by a port State Authority must be communicated to the IMO prior to implementation.

Effectively communicating the dimensions and use of the BWE area to industry stakeholders is essential. Communications should:

- Include guidance if a full exchange in the designated BWE area is not possible, in line with the Guidelines (G6) (i.e. that no exchange should be undertaken if a full exchange is not possible), and
- Reaffirm the tiered requirements for BWE in line with regulation B-4 (i.e. BWE should be undertaken to meet the 200/200 requirement first, if that cannot be met, the 50/200 requirement, and only if that cannot be met, the designated BWE area should be used).

The length of time that the BWE area will be designated for use should also be clearly communicated.

In most cases, this should be that the BWE area should be regarded as temporary and for use by ships only until they are required to meet regulation D-2. After that time, the BWE area should only be used in the event that BWE is utilised as a contingency measure, in accordance with the ship's BWMP, if the port State Authority considers it appropriate and there are not alternative options for ballast water management (e.g. a ballast water reception facility). This should be considered in line with the Guidance on contingency measures under the BWM Convention (BWM.2/Circ.62) [8].

[8] IMO, 2017g.

3 Harmonised Procedure: Regulation A-4 Exemptions

3.1 Mediterranean Sea context

In the Mediterranean BWM Strategy (2022-2027)[9], the Contracting Parties to the Barcelona Convention agreed to develop, adopt, and implement a comprehensive Regional Procedure for the Granting of Exemptions under the BWM Convention.

The 2012 Mediterranean BWM Strategy (BWM.2/Circ.35[10]) included that exemptions can be granted to a ship on a voyage between specified ports or locations within the Mediterranean Sea or to a ship operating exclusively between specified ports or locations within the Mediterranean Sea area, in accordance with regulation A-4 and the Guidelines (G7).

According to the IMO's Global Integrated Shipping Information System, Spain has issued three A-4 exemptions. Two of these exemptions were granted to the same ship for short periods (three months) to allow travel between two ports for the purpose of dry dock repairs. A third exemption was issued to a ship, also for a three-month period, to operate only in Algeciras Bay.

The Mediterranean Sea is a biodiversity hotspot that is heavily impacted by the introductions of HAOP. To date, nearly 1,000 marine species have been recognised as non-indigenous to the Mediterranean Sea. The Suez Canal was expanded in 2015, enabling larger ships to pass through and serving as a channel for species to spread. In this case, unmanaged ballast water enables secondary transfer of species. Recent research found that the highest species spread risk to the Mediterranean is from inside the Mediterranean itself, identifying a number of ports in the Mediterranean Sea that are high-risk for HAOP, including Gibraltar, Suez, Istanbul and Algeciras[11].

According to the Mediterranean BWM Strategy (2022-2027) the most up to date data available through the Marine Mediterranean Invasive Alien Species Database (MAMIAS[12]) suggests that, for the Mediterranean as a whole, introductions of species linked to shipping make up 70% of recorded non-indigenous species.

The Marine Ecoregions of the World project identified seven bioregions in the Mediterranean Sea[13]:

- Adriatic Sea;
- Aegean Sea;
- Levantine Sea;
- Tunisian Plateau/Gulf of Sidra;
- Ionian Sea;
- Western Mediterranean; and
- Alboran Sea.

There has been variability in the monitoring and reporting of HAOP in the Mediterranean Sea, with information scattered in various databases, institutional repositories and literature and surveys undertaken with differing approaches, such as traditional taxonomy and eDNA analysis. The European Alien Species Information Network (EASIN) increased accessibility to HAOP spatial information and

[9] UNEP/MED, 2022.
[10] IMO, 2011.
[11] Wang *et al*. 2022.
[12] Available at: http://dev.mamias.org/services/dash/med
[13] Spalding *et.al*., 2007.

has been used to identify that the composition of HAOP in the Mediterranean differs among Mediterranean bioregions[14].

Average Mediterranean surface temperature and salinity also show variability across bioregions. The Mediterranean Sea is generally significantly warmer in the east, and there is about a 10°C range between winter and summer highs and lows. Variation in salinity can reflect a few very large freshwater inputs, like those from the Atlantic Ocean flowing through the Strait of Gibraltar into the Mediterranean Sea, as shown in Figure 6, and from the Rhone River, which can create relatively fresh/brackish water layers in some regions.

Risk assessments to contribute to decision making on applications for regulation A-4 exemptions in the Mediterranean Sea should take into account this variability.

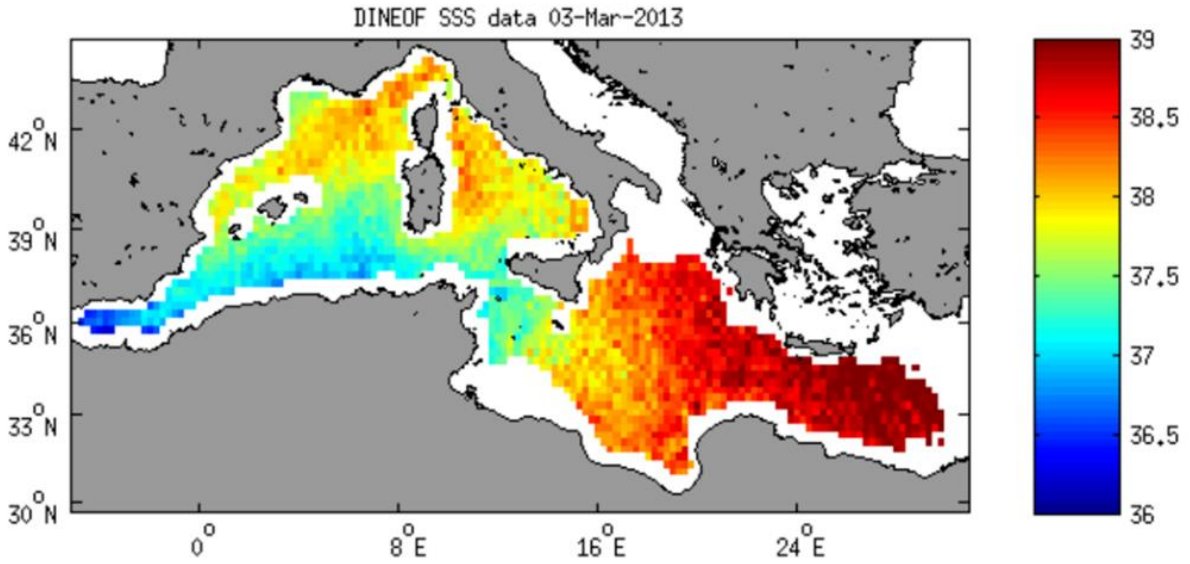

Figure 6: Salinity in the Mediterranean Sea on 3 March 2013, using information from the European Space Agency's (ESA) SMOS mission, from ESA - Mediterranean Sea salinity

3.2 Harmonised procedure for granting regulation A-4 exemptions in the Mediterranean Sea

This harmonised procedure aims to ensure that exemptions are assessed and granted in a consistent manner in the Mediterranean Sea, and that any exemption issued does not impair or damage the environment, human health, property, or resources.

3.2.1 Establishing roles and responsibilities

Roles and responsibilities must be clear from the outset. The roles and responsibilities for this harmonised exemption procedure are included in

[14] Katsanevakis, S. and others. 2014.

Table 1.

The port State Authority(ies) directly relevant to the exemption application should nominate officers for the role of managing the exemption process. The exemption manager should report to an overall decision maker – a senior manager appointed by the port State Authority to be accountable for the exemption process and progress the exemption for the port State Authority and/or bilateral or regional approval.

More than one port State Authority will be involved in the exemption process, so equivalent government agencies in the relevant port States should be engaged at the earliest possible time, and similar roles and responsibilities assigned in each relevant port State Authorities. An expert consultative group should be established, incorporating experts from all relevant port States and international experts as needed, to review and assess all information gathered and assessed, and provide recommendations to the decision maker(s).

Table 1. A-4 exemptions: responsibilities of port State Authorities and applicants.

APPLICANT	PORT STATE AUTHORITY(IES)
Consult with relevant port State Authorities as soon as possible	Inform applicant about the procedure and any associated conditions for exemptions
Collect data in accordance with this harmonised procedure, taking into account any guidance or directions from the port State Authorities	Target species selection
Pay for data collection as necessary	Consult with other port State Authorities as necessary.
Submit raw data to the port State Authorities	Guide and advise applicant(s) on the procedure requirements
Undertake risk assessment in line with this procedure, taking into account any guidance or directions from the port State Authorities	Share raw data for inclusion in regional databases
Submit application, including all information and data required along with the risk assessment report	Review applications, submitted data and the risk assessment report
	Make a decision on whether or not to issue an exemption
	Issue exemption (if relevant)
	Clearly communicate exemption decision to applicants and the IMO (if relevant)
Undertake intermediate review and provide report to port State Authorities	Notify applicant when intermediate review of exemption is required (if relevant)
	Review intermediate review and make a decision on whether or not to withdraw, or continue, the exemption (if relevant)
	Clearly communicate intermediate review decision to applicant and IMO (if relevant)

3.2.2 Application process

A flow chart of the application process is shown in Figure 8.

It is the responsibility of a ship owner/operator to apply to the port State Authorities for a regulation A-4 exemption. The ship's flag State should also be advised of the application.

A-4 Exemptions are granted jointly by the involved port State Authorities, in other words where the ship is operating. It is important that the flag State is included in the consultations, but it should be noted that the flag State does not take the ultimate decision. The ultimate decision is to be taken by the port State Authorities, who have the right to protect their environment from ships operating in their territories.

Expressions of interest should be made as early as possible, noting that the application process, including collection of data, may take several months (or years) to conclude. An expression of interest should include the proposed route that an exemption will be applied for and why an exemption is sought.

Exemptions may be viewed by the shipping industry as a means to avoid the requirement to meet the regulation D-2 standard in accordance with BWM Convention implementation schedule. (Figure 7)As

a result, approval of an exemption could result in a ship owner/operator choosing to delay installation of a suitable ballast water management system on the ship.

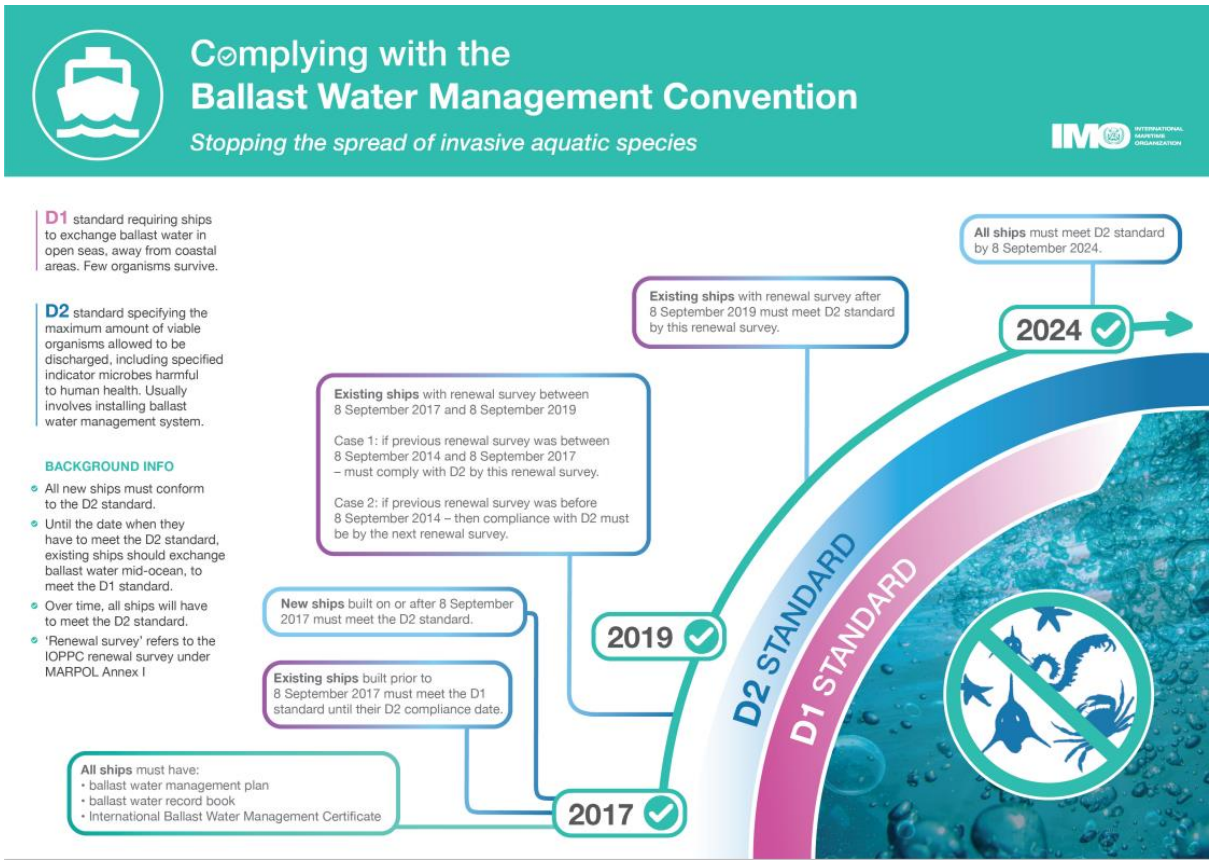

Figure 7: Infographic "Complying with the Ballast Water Management Convention", from the IMO Website.

If this is the intent of the applicant, this should be communicated to the port State Authorities. It is also the responsibility of the port State Authorities to advise the applicant that the exemption, if approved, may only be effective for up to 5 years, and is subject to immediate review should information become available that would indicate the risk had increased (for example, if any of the factors taken into account in the risk assessment change).

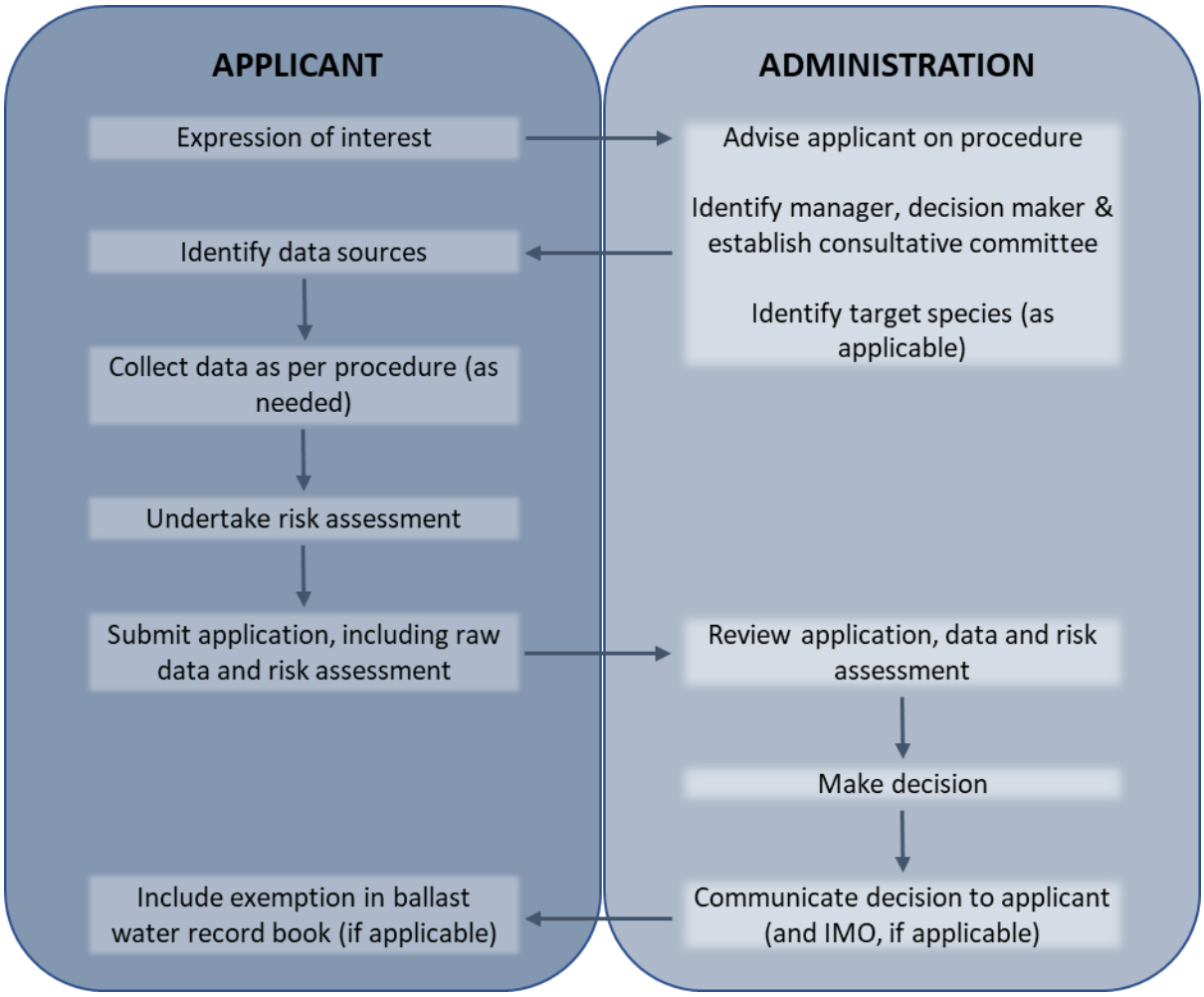

Figure 8: Assessment process in accordance with this procedure.

Upon receipt of an expression of interest, the port State authority should advise the applicant of the requirements in accordance with this procedure, and any costs that will be charged to the applicant, for example for time taken by the port State authority to review the application.

The port State Authority should also review the expression of interest to determine the target species relevant to the application and provide this list to the applicant. Guidance on target species identification can be found in Appendix A – Protocol for Identifying Target Species. To provide a list of target species to applicants in a timely manner, it is recommended that a regional target species list be prepared that can be applied to all regulation A-4 exemption applications.

The risk assessment process should be undertaken by the applicant. The risk assessment process is described in more detail in Section 3.2.3.

Detailed applications should be prepared once the full risk assessment process is complete. Applications should include:

- *General information*
  - Period for which an application is sought (mm:yy to mm:yy)
  - Why an exemption under regulation A-4 is sought
- *Ship's information*
    - Ship name
    - IMO number

- Port of registry
- Gross tonnage
- Owner
- Call sign
- Ballast water management option usually undertaken by ship, including ballast water treatment technology, if installed
- A copy of the Ship's Ballast Water Management Plan should be submitted
- The port State Authority may also require ballast water and sediment management history for a determined period

- *Route information*
  - Route of application, given as donor port(s) and recipient port(s) for ballast water discharge or as defined area of operation.
  - If single voyage: Date and time of departure and arrival.
  - If multiple voyages: Voyage frequency, regularity and estimated amount of ballast water discharged during the exemption period. Estimated time and dates for departures and arrivals.
  - Any voyages the ship plans to take to ports other than the specified ports during the duration of the exemption.
  - If multiple voyages, the estimated total number of voyages and the amount of ballast water discharged under the duration of the exemption.

- Environmental information: all data on temperature and salinity (and other environmental factors, if relevant) collected for use in the risk assessment must be provided to the port State Authorities. This information should be in line with the requirements outlined in Section 3.2.3.

- Biological information: all data on species in the relevant ports or areas collected for use in the risk assessment must be provided to the port State authority(ies). This information should be in line with the requirements outlined in Section 3.2.3 and be provided in the format specified by the Marine Mediterranean non-indigenous and Invasive Species Database (MAMIAS[15])

- Full risk assessment report, in accordance with Section 3.2.3 of this procedure.

Applications should be sent to the relevant contact point in each port State Authority.

3.2.3 Risk assessment and data needs

The eight key principles of risk assessment in the Guidelines (G7) are:

- **Effectiveness** - that risk assessments accurately measures the risks to the extent necessary to achieve an appropriate level of protection,
- **Transparency** - that the reasoning and evidence supporting the action recommended by risk assessments, and areas of uncertainty (and their possible consequences to those recommendations), are clearly documented and made available to decision-makers,
- **Consistency** - that risk assessments achieve a uniform high level of performance, using a common process and methodology,
- **Comprehensiveness** - that the full range of values, including economic, environmental, social and cultural, are considered when assessing risks and making recommendations,

[15] Available at: https://dev.mamias.org/page/contribution.

- **Risk management** - that low-risk scenarios may exist, but zero risk is not obtainable, and as such risk should be managed by determining the acceptable level of risk in each instance,
- **Precautionary** - that risk assessments incorporate a level of precaution when making assumptions, and making recommendations, to account for uncertainty, unreliability, and inadequacy of information. The absence of, or uncertainty in, any information should therefore be considered an indicator of potential risk,
- **Science based** - that risk assessments are based on the best available information that has been collected and analysed using scientific methods, and
- **Continuous improvement** - any risk model should be periodically reviewed and updated to account for improved understanding.

The risk assessment must be undertaken in accordance with these principles and the Guidelines (G7).

A two-step risk assessment, with the first step based on salinity and target species to give an early indication of the risk assessment outcome, should be undertaken.

The two-step risk assessment provides for a combination of environmental matching and species-specific risk assessment, supported by information on shipping activities.

Step One: Risk Assessment Algorithm

Two key risk criteria to distinguish between unacceptable (high) risk and acceptable (low) risk are:

a) Difference in water salinity between the donor and recipient ports, and
b) Presence of target species in donor and recipient ports.

In step one, the most recent existing data should be used if available.

For water salinity, data might include port collected salinity records, or data from remote sensing. If existing water salinity data is not comprehensive, port surveys can be conducted at both the donor and recipient ports (see port survey protocol in Appendix B – Port Survey Protocol).

For target species presence/absence, existing databases and literature should be used to determine presence or absence in the relevant ports, if available. Data sources may include port or national monitoring (using traditional taxonomy or new methods such as eDNA analysis), the Marine Mediterranean Invasive Alien Species Database (MAMIAS) or the European Alien Species Information Network (EASIN). Where existing data is used, it should be verified and validated, and have been collected no longer than three years prior to the date of the risk assessment.

If existing data on target species is not comprehensive, and information on some target species is not available, either a precautionary approach can be taken, whereby the target species is assumed to be present in the donor port but absent from the recipient port, or port surveys can be conducted at both the donor and recipient ports (see port survey protocol in Appendix B – Port Survey Protocol.

The step one risk assessment algorithm (Figure 8) has only two possible outcomes – low or high risk - as there are only two possible next steps, which are to proceed to step two, or consider withdrawing the application. The outcome of step one provides an indication of the final decision and may assist the applicant to decide whether to proceed with step two (the detailed and more expensive element) of the risk assessment.

A low-risk outcome in step one suggests that the risk of transfer of HAOP in ballast water on the proposed route may be acceptable, subject to further detailed analysis in step two of the risk assessment.

A high-risk outcome in step one indicates that the risk of transfer of HAOP in ballast water on the proposed route may be unacceptable (that is, that there is a high risk of survival of HAOP transferred

via ballast water), in which case an exemption cannot be granted. It is still possible that step two of the risk assessment may provide contradictory advice, for example that the target species already exist in both donor and recipient ports, however applicants should consider whether to proceed to step two if step one indicates high risk.

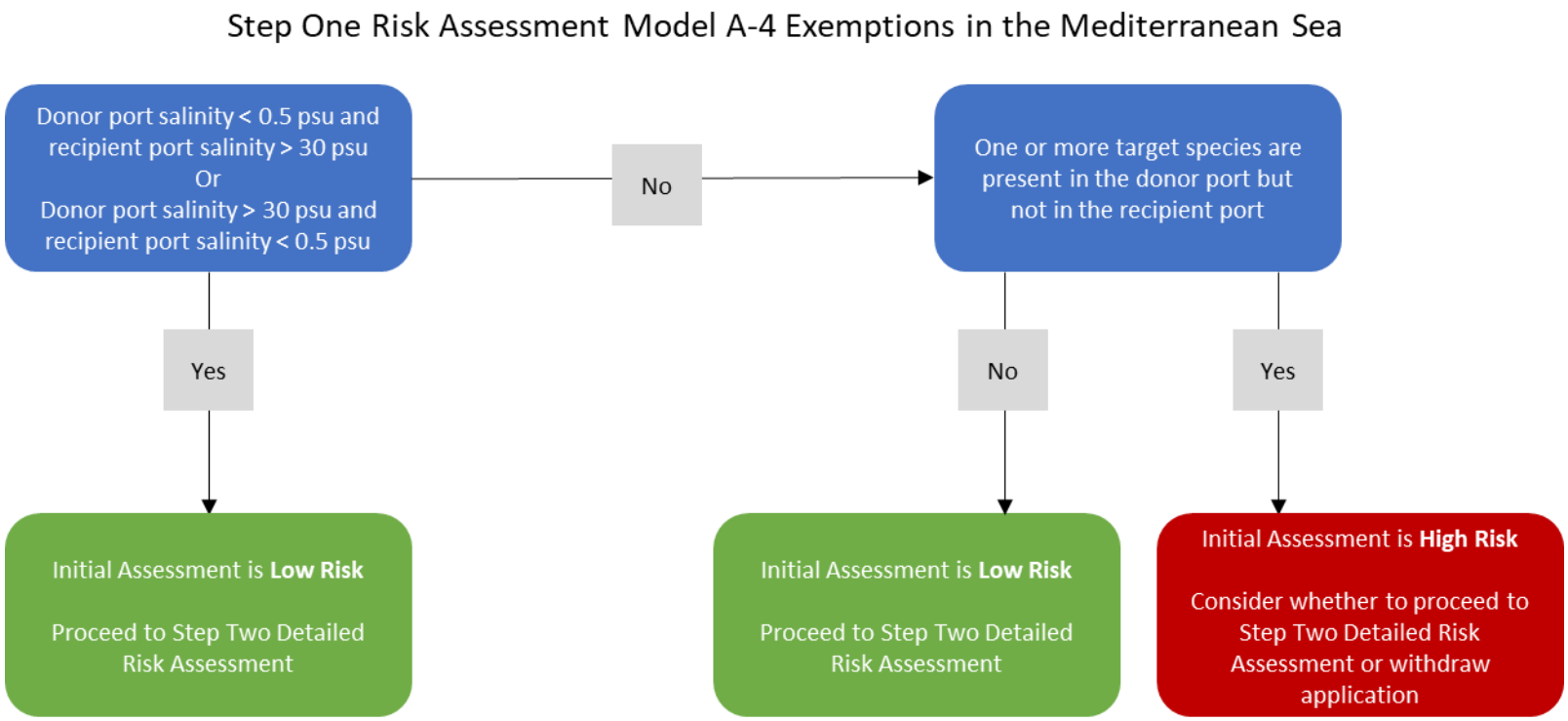

Figure 9: Risk assessment model for exemptions (step one).

Step Two: Detailed Risk Assessment

The detailed risk assessment in step two should take into account additional information on target species, species-specifics (e.g., dispersal capacity), natural dispersal, and mitigation measures (e.g., volume of ballast water, location of discharge and uptake). The step two risk assessment should be based only on verified data. Applicants should present the analysis of all data in a risk assessment report as part of the application for an exemption.

Additional aspects to consider in the step two detailed risk assessment include (but are not limited to):

- Port information

Port environmental information (depth, salinity, temperature, turbidity) at the point of uptake and discharge of ballast water should be considered. This may require a port survey, which should follow the protocol in Appendix B – Port Survey Protocol and/or obtaining data from existing sources, such as port monitoring or remote sensing.

- Additional species data

Additional species data should be assessed including presence and abundance of target species in the donor and recipient ports and surrounding areas. This may require a port survey, which should follow the protocol in Appendix B – Port Survey Protocol, and/or obtaining data from existing sources, such as port or national monitoring, the Marine Mediterranean Invasive Alien Species Database (MAMIAS), developed by the Specially Protected Areas Regional Activity Centre (SPA/RAC). The biological information needed for A-4 Exemptions should take this database into account, possibly as a baseline. Another existing source is EASIN.

All data should be verified and validated. It should be noted that, if target species are present in both the donor and recipient ports, and control measures are being implemented in the recipient port for that target species, the species presence in both ports should not be used as a basis considering the ballast water as low risk. In this case additional introductions will negatively impact on the effectiveness of the control measures. In line with regulation C-2 of the BWM Convention, port State Authorities should notify ships of areas under their jurisdiction where ships should not take up ballast water due to known conditions.

- Natural dispersal

Natural dispersal can be assessed for target species that were identified as high risk in step one. The extent and directionality of natural dispersal of target species should be modelled in line with the Guidelines (G7). Recent research using natural dispersal modelling for assessing same risk areas[16] should be considered. If this assessment in step two shows a high probability for natural dispersal, this may be used to counter a high-risk rating from step one based on presence/absence.

- Human pathogens

Information on pathogens in the donor port and the risk to human health should be considered as far as possible, including notifications under regulation C-2 regarding HAOP and sewage outfalls.

- Mitigation and control measures

If high risk scenarios are identified, there may be actions that the applicant can take to mitigate the risk. Mitigation measures might include, for example, restrictions in relation to the volume, location or timing of uptake and discharge of ballast water, undertaking regular port monitoring, reducing the duration of the exemption, or adding specific terms for intermediate review of the exemption, or terms for the withdrawal of the exemption.

[16] Hansen, F. T., & Christensen, A. 2018; Stuar-Lauridsen, F. *et al.*, 2018; HELCOM-OSPAR, 2020b.

Risk Assessment Report

The risk assessment report, to be submitted to the port State Authorities together with the A-4 exemption application, should clearly set out the considerations, any weighting applied to aspects of the assessment, and the reasoning behind the risk assessment outcome.

The report should include detailed descriptions of both the step one risk assessment algorithm and the step two detailed risk assessment.

At a minimum, the report should include:

- Non-technical summary with a high-level explanation of the purpose, methodology and risk assessment outcome,
- Table of contents,
- Description of methodology, including collection of data and risk assessment,
- All data used in the risk assessment (as an appendix),
- Description of the outcomes of the risk assessment, and
- References for all information sources used.

The risk assessment report should be assessed by the relevant port State authorities and the expert consultative group. Review of the report should ensure data used has been validated and verified.

It should be noted that the outcome of the risk assessment as analysed by the applicant does not necessarily guarantee the outcome of the exemption decision making process.

3.2.4 Decision making

The expert consultative group should review and assess the exemption application, including the step one risk assessment algorithm and step two risk assessment report, and provide recommendations to the decision maker(s).

Careful consideration should be given to the validity of the data used in the risk assessment, and any weightings applied by the applicant.

In accordance with the Guidelines (G7), any lack of full scientific certainty should be carefully considered in the decision-making process, as any decision to grant an exemption will allow for the discharge of ballast water that does not meet the regulation D-1 or D-2 standards.

If a 5-year exemption is being considered, an intermediate review, after 2.5 years, should be included as a condition of the exemption. The review should include an update of the data used in the risk assessment, including any port surveys to ensure the port survey data is up to date, and a re-do of the risk assessment. The conditions of the exemption should allow for withdrawal of the exemption if the intermediate review identifies that the risk is now unacceptable.

3.2.5 Records and communication

All data collected in the course of the exemption application process should be provided by the applicant to the port State Authorities in raw format. This data should be stored centrally and be publicly available, for example through the Marine Mediterranean Invasive Alien Species Database (MAMIAS).

The exemption decision should be clearly communicated to the applicant. If the decision is to grant the exemption, the decision should also be communicated to the IMO through the Global Integrated Shipping Information System (GISIS), and included in the ships' Ballast Water Management Plan and Record Book.

- The information included in the Ballast Water Record Book should include: Details of the exemption route and ports, identifying the donor and recipient ports, or SRA,
    - If for a single voyage – date and time of departure and arrival
    - If same risk area – the detailed coordinates of the boundary of the SRA
- Details of conditions associated with the exemption, including for example:
    - Requirement to undertake an intermediate review of the exemption, what the intermediate review should include and the due date for the intermediate review report
    - Ability to withdraw the exemption based on the outcomes of the intermediate review
    - Any mitigating measures the ship will take to minimise risks
    - The ship should not mix ballast water or sediments other than between the ports or locations specified in the exemption, which should be documented in the Ballast Water Management Plan and Record Book
- Duration of the exemption (no more than five years)
- Information and conditions for withdrawal of the exemption.

3.2.6 Implementing this harmonised procedure

In accordance with the 'continuous improvement' principle of the Guidelines (G7), this procedure should be kept under continuous review by the relevant port State Authorities.

4 Harmonised Procedure: Sediment Reception Facilities

4.1 Mediterranean Sea context

BWM.2/Circ.35[17] and the Mediterranean BWM Strategy (2022 – 2027)[18] include that sediments collected during the cleaning or repairing operations of ballast tanks should be delivered to sediment reception facilities in ports and terminals, in accordance with Article 5 of the BWM Convention, or, if the ship is not yet required to meet the regulation D-2 standard in accordance with the BWM Convention implementation schedule (regulation B-3), be discharged beyond 200 nautical miles from the nearest land of the coastline when the ship is sailing in the Mediterranean Sea area.

Further, BWM.2/Circ.39[19] includes that the release of sediments during the cleaning of ballast tanks should not take place within the Baltic Sea, or, if the ship is not yet required to meet the regulation D-2 standard according the BWM Convention implementation schedule (regulation B-3), within 200nm of the coastline of the North-East Atlantic or the Mediterranean Sea.

The voluntary regime set out in both BWM.2/Circ.35 and BWM.2/Circ.39 no longer applies when a ship meets the regulation D-2 performance standard in accordance with the BWM Convention implementation schedule.

4.2 Harmonised procedure for sediment reception facilities in the Mediterranean Sea

In accordance with Article 5 of the BWM Convention, in designated ports and terminals where cleaning or repair of ballast tanks occurs, adequate facilities should be provided for the reception of sediments.

Consideration should be given of the availability of sediment reception facilities in the Mediterranean Sea. When considering the establishment of a sediment reception facility in the Mediterranean Sea, the relevant port State Authorities should consider:

- Whether the cleaning or repair of ballast tanks occurs in ports or terminals within their jurisdiction,
- Whether sediment reception facilities are available at those ports or terminals,
- Whether sediment reception facilities are available within the local region, so that disposal of sediments can be undertaken by ships without undue delay, and
- Whether sediment reception facilities are registered on GISIS.

Coordination between port State Authorities may be required to ensure adequate access to facilities in the Mediterranean Sea.

The best management practices identified in the Guidelines (G1), and expanded on in GloBallast Monograph 23, should be followed when developing sediment reception facilities.

[17] IMO, 2011.
[18] UNEP/MED, 2022.
[19] IMO, 2012.

5 Harmonised Procedure: Contingency Measures

5.1 Harmonised procedure for contingency measures in the Mediterranean Sea

In the case of potentially non-compliant ballast water in ships trading with Contracting Parties to the Barcelona Convention, and in line with the Guidance on contingency measures under the BWM Convention (BWM.2/Circ.62), communication between the ship and the port State Authority should occur. This should include:

- The ship's responsible officer should report the potentially non-compliant ballast water, and the cause for this to the company.
- The company should report the cause of the potentially non-compliant ballast water to the flag State and, if relevant due to issues with the ship's BWMS, the classification society.
- Based on feedback from the flag State (and classification society where relevant), the company should agree on a plan to resolve the cause of the potentially non-compliant ballast water including, if needed, a BWMS repair plan. The repair plan should include all relevant supporting information, including historical failure and a schedule with a specific timeline for the repair to be completed.
- The company should submit a request to utilise a contingency measure to the port State Authority where the ballast water is intended to be discharged, in the form of a 'Ballast Water Contingency Measure Request Form' (Section 5.1.1). This should include a copy of the report on the cause of the potentially non-compliant ballast water and the plan to resolve the cause of the potentially non-compliant ballast water.
- The company should confirm to the ship which contingency measure is to be undertaken and provide any additional guidance or instructions necessary to fulfil the requirements of the port State, flag State or classification society, as necessary.

One of the approaches to manage non-compliant waters listed in the BWM.2/Circ.62 is the use of a ballast water exchange as a way to manage the water instead of treatment approved for the ship and as stated in its International Ballast Water Management Certificate (IBWMC). Such exchange may be acceptable by the port State authority if the risk for the environment is considered low. Such ballast water exchanges shall be carried out in areas designated for such activities and according to the Harmonised Procedure: Ballast Water Exchange Areas (Section 2). It should also be noted that the suggested Ballast Water Contingency Measure Request Form (Section 5.1.1) may be updated at a later stage following agreement on its use by the port State Authority(ies) as may be agreed by the Contracting Parties to the Barcelona Convention. Ballast water reporting forms in such case would be used not only for potentially targeting ship for PSC inspection but also could be used to carry out biological risk assessment prior to granting a right to discharge; in line with the Action 4 of the Mediterranean BWM Strategy (2022-2027).

It is expected that:

- The **company** should coordinate the necessary response between the port State, flag State, and classification society,
- The **port State** should communicate its consent for the contingency measure to be used OR discuss alternatives together with clear guidance on how the measure is to be undertaken and any additional reporting requirements,
- The **flag State** should acknowledge receipt of the ballast water non-compliance notice and, in the case of BWMS failure, accept this as notification of the failure.
- The **classification society** should undertake additional surveys, as necessary.

Resolution MEPC.290(71)[20] on the experience-building phase associated with the BWM Convention should be taken into account, noting that during the ballast water experience-building phase a ship should not be penalised solely due to an exceedance of the ballast water performance standard described in regulation D-2 of the Convention following use of a ballast water management system (BWMS), provided that:

1. The BWMS is approved in accordance with regulation D-3.1,
2. The BWMS has been installed correctly,
3. The BWMS has been maintained in accordance with the manufacturer's instructions,
4. The Ballast Water Management Plan, approved in accordance with regulation B-1 of the BWM Convention, has been followed, including the operational instructions and the manufacturer's specifications for the BWMS, and
5. Either the self-monitoring system of the BWMS indicates that the treatment process is working properly, or the port State has been advised that the BWMS is defective prior to the discharge of any ballast water.

5.1.1 Example Ballast Water Contingency Measure Request Form

(*Adapted from INTERTANKO's Ballast Water Contingency Measures for Tankers – IMO, 2019*)

Request to undertake contingency measure.

1 COMPANY REQUESTING TO UNDERTAKE CONTINGENCY MEASURE

1.1 Company name: _____

1.2 Designated officer: _____

1.3 Email: _____ 1.4 Tel. _____

2 SHIP'S PARTICULARS

2.1 Name of ship: _____

2.2 IMO number: _____

2.3 Master: _____

3 BALLAST WATER MANAGEMENT SYSTEM INSTALLED ON SHIP

3.1 BWMS manufacturer: _____

3.2 BWMS model: _____

[20] IMO, 2017d.

4 PORT/LOCATION OF SOURCE OF NON-COMPLIANCE BALLAST WATER

4.1 Country: _____

4.2 Name of port or area: _____

4.3 Longitude/Latitude: _____

4.4 Time and date of occurrence: _____hrs __/__/____ (dd/mm/yyyy)

5 INTENDED BALLAST WATER DISCHARGE

5.1 Country: _____

5.2 Name of port or area: _____

5.3 Quantity of ballast water to be discharged (m^3): _____

6 INFORMATION ON THE CAUSE OF POTENTIALLY NON-COMPLIANT BALLAST WATER

6.1 Brief description of cause of the non-compliant ballast water. Full details are provided in the report on the cause of the potentially non-compliant ballast water and the plan to resolve the cause of the potentially non-compliant ballast water, including any BWMS issues, enclosed:

_____

_____

_____

_____

7 ADDITIONAL REMARKS AND INFORMATION

_____

_____

_____

_____

8 PROPOSED CONTINGENCY MEASURE

Insert description of the proposed contingency measure including all relevant details on how the measure will be conducted, as per the details provided in the ship's BWMP. Only contingency measures included in the ship's BWMP should be proposed.

Insert additional details relating to the time and location the measure will be conducted, as per the Ballast Water Reporting Form.

9 ADDITIONAL INFORMATION

The following documents are appended to this Form (as applicable):

1. A completed Ballast Water Report Form as per the recommended format provided in the 2017 Guidelines for ballast water exchange (G6) – resolution MEPC.288 (71)
2. A report on the cause of the potentially non-compliant ballast water as submitted by the designated officer in charge on the ship.
3. A plan to resolve the BWMS issues.
4. International Ballast Water Management Certificate
5. Copy of the BWMS Type Approval Certificate
6. Copies of the Ballast Water Record Book covering at least the previous three ballast water management operations.

We invite you to review the information provided together with the proposed contingency measure and advise the undersigned as soon as possible of your consent to undertake the procedure described above.

In the event an alternative measure is proposed or more details are required, please contact the undersigned.

Company representative: _____Date: __/__/_____(dd/mm/yyyy)

6 Harmonised Procedure: Additional Measures

6.1 Mediterranean Sea context

The Mediterranean BWM Strategy (2022-2027) recommends that there should be regional harmonisation of activities which are necessarily implemented at national level, including additional measures.

6.2 Harmonised procedure for developing additional measures in the Mediterranean Sea

In line with the Guidelines (G13), the development of additional measures in the Mediterranean Sea should follow this process:

Step 1: Assessment (Section 6.2.1)
Step 2: Identification (Section 6.2.2)
Step 3: Effects and consequences (Section 6.2.3)
Step 4: Consultation (Section 6.2.4)
Step 5: Submission for approval or notification (Section 6.2.5)
Step 6: Communication of information (Section 6.2.6)

6.2.1 Step 1: Assessment

The need for and nature of additional measures should be assessed, including:

- Identification of the concern,
- Description of the cause of the identified concern,
- Identification of potential additional measures to be introduced, and
- Identification of potential effects and consequences, beneficial and detrimental, resulting from introduction of the proposed additional measure(s).

The character of the concern should also be assessed, taking into consideration:

- What are the probabilities or consequences of future introductions of HAOP on the environment, human health, property, or resources?
- If HAOP have already been introduced, what effects are they already having on the environment, human health, property, or resources, and how might this be affected by future introductions?
- Whether ballast water from ships is a vector for the introduction of HAOP?

6.2.2 Step 2: Identification

The additional measure(s) to be introduced should be in accordance with Article 7(2) and regulation C-1.3 of the BWM Convention and be clearly identified in respect of:

- The area(s) where the additional measure(s) is/are applicable defined by precise coordinates,
- The operational and/or technical requirement(s) which applies to ships in the area(s), and the requirement(s) to provide documentation for compliance if needed,

- The arrangements which may be provided to facilitate ships' compliance with the additional measure(s),
- The effective date and duration of the measure(s), and
- Any other requirements and services in relation to the additional measure(s).

The Party or Parties assessing the additional measure(s) should ensure that any additional measure(s) do(es) not compromise the safety and security of the ship and in any circumstances not conflict with any other conventions or customary international law with which the ship is required to comply.

The legal determination upon which the additional measure(s) is submitted should be identified.

6.2.3 Step 3: Effects and Consequences

The economic consequences resulting from the introduction of the additional measure(s) should be taken into account, for example:

- The economic benefits and possible costs, including costs to the industry, associated with the additional measure(s), and
- Any other effects and consequences.

6.2.4 Step 4: Consultation

Adjacent states, and any other state that may be affected by the additional measure(s) should be consulted. Such consultation should meaningfully inform decision making on the additional measure(s). The assessment (Step 1: Assessment) should be provided to affected port States and the port State(s) should be invited to comment on the draft assessment. The following information should be communicated:

- The precise co-ordinates where and applicable date when additional measure(s) is/are applicable,
- The need and reasoning for the application of the additional measure(s), including, whenever possible, benefits,
- A description of the additional measure(s), and
- Any arrangements that may be provided to facilitate ships' compliance with the additional measures.

6.2.5 Step 5: Submission for approval or notification

Two procedures for introducing additional measures are possible under regulation C-1: one procedure which requires IMO approval (the approval procedure), and another which only requires IMO notification (the notifying procedure).

Notifying procedure: Where a Party or Parties may seek to introduce additional measures through the notifying procedure, the IMO should be notified at least 6 months prior to the projected date of implementation, except in emergency circumstances in accordance with regulation C-1.3.2 of the BWM Convention.

Communication to the IMO should include:

- The precise co-ordinates where additional measure(s) is/are applicable,
- The need and reasoning for the application of the additional measure(s), including, whenever possible, benefits,
- A description of the additional measure(s), and

- Any arrangements that may be provided to facilitate ships' compliance with the additional measure(s).

Approval procedure: If the additional measure(s) require(s) approval by the IMO under international law, as reflected in UNCLOS, an application to introduce additional measure(s) should be submitted to the Marine Environment Protection Committee (MEPC) for its approval. If the MEPC approves the application, the additional measure(s) may be implemented. If the application is not approved, the additional measure(s) cannot be implemented.

6.2.6 Step 6: Communication of information

Adjacent port States and other port States that may be affected, the shipping industry and ships entering the areas concerned should be informed about the additional measure(s) as soon as possible (or as soon as approved by the IMO if applicable).

The information to be communicated should include:

- The precise co-ordinates where additional measure(s) is/are applicable,
- The operational and/or technical requirement(s) which applies or apply to ships in the area(s), and the requirement(s) to provide documentation for compliance if needed,
- The arrangements which may be provided to facilitate ships' compliance with the additional measure(s),
- The effective date and duration of the measure(s), and
- Any other requirements and services in relation to the additional measure(s).

Communications should be submitted to the IMO.

7 Harmonised Procedure: Warnings

7.1 Harmonised procedure for issuing warnings in the Mediterranean Sea

Port State Authorities should notify mariners, the IMO and relevant coastal States of any areas under their jurisdiction where ships should not uptake ballast water due to known conditions. The notification should include the following information:

- Precise coordinates of the area(s) and, where possible, the location of any alternative area(s) for the uptake of ballast water,
- Advice to ships needing to uptake ballast water in the area, describing arrangements for alternative supplies, and
- The time period the warning is likely to be in effect.

Port State Authorities should also provide notice to mariners, the IMO and relevant coastal States when the warning is no longer applicable.

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9 Appendix A – Protocol for Identifying Target Species

Background and context

The Guidelines (G7) include methods to determine target species for species-specific assessments. Target species should be selected based on criteria that identify species that can be transported via ballast water and have the ability to invade and become harmful.

The HELCOM-OSPAR JHP includes target species selection criteria, for use in risk assessments that follow the JHP's two-step process (noting that this does not necessarily include assessments for SRAs). The selection criteria include a practical method for determining a target species list, using verified data and expert groups to review species against selection criteria.

Protocol for identifying target species

This protocol has been adapted from the Guidelines (G7), the HELCOM-OSPAR JHP and recent research on same risk areas[21].

An initial target species list should be developed based on existing scientific data if available. Regular port surveillance, either using traditional surveillance methods, eDNA analysis or remote operated vehicles (or a combination of all three), is the best way to develop a dataset from which to draw the initial list from.

If verified and validated data is not available, expert judgement may be used. The following questions should be considered for the initial list:

- Is there potential for the species to be primarily introduced, or secondarily spread, via ballast water or sediments?
- Is the species present only in part(s) of the region but not the entire region?

If the answer to both or one of these questions is no, then the species should not be considered a target species.

If the answer to these first two questions is yes, then the following questions should be considered to refine the target species list:

- Has it been demonstrated that the species has a negative impact on human health?
- Has it been demonstrated that the species has a negative impact on the environment (e.g., native communities, habitats and/or ecosystem functioning, strength, and type of ecological interactions)?
- Has it been demonstrated that the species has a negative impact on the economy?

If the answer to any of these questions is yes, or uncertain, the species should be included on the refined target species list.

Target species to be considered in an SRA risk assessment should also be analysed based on the following life history traits specific to natural dispersal:

- Mortality,
- Temperature tolerance,
- Salinity tolerance,
- Vertical position or movement behaviour in the water column,
- Horizontal swimming behaviour,
- Habitat preference,
- Duration and timing of free-swimming stages,

[21] Staur-Lauridsen, F. *et al*., 2018.

- Seasonal life events e.g., spawning,
- Time to maturation, and
- Lifetime expectancy.

Target species lists should be regarded as living documents that are regularly updated as additional data becomes available.

It is recommended that a regional target species list be prepared that can be applied to all exemption applications under regulation A-4.

10 Appendix B – Port Survey Protocol

This protocol takes into account the comprehensive port survey protocol included in the HELCOM-OSPAR JHP, in addition to the GloBallast guidance on port biological baseline surveys[22], and research to validate molecular techniques for the purposes of HAOP surveillance. This protocol is specific to exemption applications in the Mediterranean Sea and is not a protocol for a comprehensive port survey aimed at identifying all native and non-indigenous species in a port or location.

Port surveys for the purposes of exemption applications in the Mediterranean Sea should focus on:

- Port information,
- Environmental information, and
- Target species.

This protocol provides guidance for the identification of appropriate sites for sampling, establishment of a sampling design and ensuring data is collected in a consistent manner for storage in a central location, such as the Marine Mediterranean Invasive Alien Species Database (MAMIAS).

Sampling design

Sampling timing and frequency

Sampling timing should reflect the lifecycle and movement patterns of the target species so that sampling is undertaken during seasons when it is predicted that a target species, if present, is most likely to be found. It is recommended that at least two seasons should be sampled in a one-year period. If the target species list includes species with planktonic larval stages, plankton sampling will need to occur during seasons when target species planktonic larval stages are in their greatest numbers.

Settlement plates should be deployed at the time of the first seasonal sampling and retrieved during the second seasonal sampling.

Site selection

All types of benthic habitats that occur in the port should be sampled, with sufficient replication to ensure scientific rigor. Highly frequented berths and ballast release locations should be prioritised. Sampling should not disrupt port operations, so consideration of sampling methods is particularly important (noting that newer methods, such as species specific eDNA analysis and use of remote operated vehicles are likely to have less impact on port operations than traditional surveillance methods).

The GPS location of each field site should be recorded.

[22] Awad, A., Haag, F., Anil, A.C., and Abdulla, A. 2014.

Port information

Port information, such as benthic habitats, port traffic, and ballast uptake and discharge areas should be recorded using the port characteristics field data sheet.

Environmental information

Environmental information, in particular salinity, is necessary for step one of the exemption risk assessment. Temperature, depth, oxygen, and turbidity should also be recorded for the step two detailed risk assessment.

This environmental data can be collected through a variety of techniques. Submersible data loggers can be used to collect a data on a range of parameters from multiple depths at a single point in time. Similarly, secchi discs (if used correctly – at noon - to avoid reflection from the sun) or electronic turbidity sensors can record turbidity at a single point in time.

Field environmental data should be recorded on using the site and environmental field data sheet.

Remote sensing data can provide longer term environmental data for surface waters, which can be useful to detect seasonal variations and compare locations at the same point in time. Use of satellite data can also reduce cost and time delays associated with field intensive techniques, which is particularly important in port environments.

Species information

The survey should aim to determine the presence or absence of each target species, in each relevant port or location. If a target species is determined to be present in a location, the survey should also provide sufficient information to estimate its abundance.

A list of target species should be provided by the port State Authorities for the donor port and the recipient port, based on the Appendix A – Protocol for Identifying Target Species. It is recommended that a regional target species list be prepared that can be applied to all exemption applications under regulation A-4.

If a regional list is not available, and port or country specific lists are used, the lists of donor and recipient ports should be reconciled. If the lists of species differ, the lists should be combined to provide a complete target species list to be assessed in both ports.

The sampling design will be dependent on the target species. This protocol includes details of traditional methods for sampling to collect species information. Port State Authorities may accept the use of alternative techniques, such as remotely operated underwater vehicles (ROVs) and the analysis of eDNA in addition to, or replacement of, the traditional techniques described in this protocol.

Alternative techniques can reduce cost and time delays associated with field intensive techniques. If these tools are to be used, they should undergo a process of validation to assess their overall performance and fitness for purpose. For example, guidelines for the development and validation of eDNA assays for marine pests have been developed in Australia[23] and Finland[24].

[23] Australian Government, 2018.
[24] Finish Environment Institute (2022). Roadmap for implementing environmental DNA (eDNA) and other molecular monitoring methods in Finland Vision and action plan for 2022–2025. https://helda.helsinki.fi/bitstream/handle/10138/342992/SYKEra_20-2022_Roadmap%20for%20implementing%20environmental%20DNA.pdf?sequence=4&isAllowed=y

Traditional techniques that can be employed to determine target species presence/absence target different types of species. Detailed sampling and processing instructions for the following are provided:

- Table 2 - Phytoplankton: plankton tows,
- Table 3 - Zooplankton: plankton tows,
- Table 4 - Mobile epifauna: crab traps, minnow traps, artificial habitat collectors,
- Table 5 - Fouling organisms: settlement plates, scraping underwater structures, and
- Table 6 - Benthic infauna: benthic grabs.

Table 2. Detailed species information field sampling collection techniques for phytoplankton.

Technique and minimum number of samples per site	**Sampling instructions**
10 µm net x 1	A concentrated vertical sample using a small hand-held 10 µm net should be taken. The dimensions of the net and description of sampling procedure should be recorded. Three tows, pooled into one sample, 10 to 15m apart should be conducted. Haul and tow rates should not exceed 0.25 – 0.3 metres/second. A flow metre can be mounted to the web for quantification of the water volume sampled. Samples should be preserved in acid Lugol's solution (0.25 – 0.5 cm^3/100 cm^3 sample) and placed in a cooler for transport[25].
Water sample x1	Obtain a 250ml water sample pooled from three locations at least 15m apart at each site. Samples (500ml to 1000ml) should be taken at each location at the surface and 5m depth (or 1m from the seabed if shallower). Samples should be preserved in acid Lugol's solution (0.25 – 0.5 cm^3/100 cm^3 sample) and placed in a cooler for transport.
Sample processing	
Sample processing and species identification should be conducted by a quality assured laboratory according to their best practices. All non-indigenous species should be identified. Phytoplankton species composition should be recorded.	

[25] Preservation guidance may be given by the analyzing laboratory in accordance with their potential accreditation.

Table 3. Detailed species information field sampling collection techniques for zooplankton.

Technique and minimum number of samples per site	Sampling instructions
100 µm net x1	A vertical sample should be collected using a 100 µm mesh free-fall drop-net (or similar). The dimensions of the net and description of sampling procedure should be recorded. Three tows, pooled into one sample, 10 to 15m apart should be conducted. Haul and tow rates should be approximately 1 metre/second. A flow metre can be mounted to the web for quantification of the water volume sampled. Gelatinous species should be identified and/or photographed immediately after collection without preservation. Samples should be preserved in 4% formaldehyde solution for transport. If target species include larger zooplankton, a vertical sample should also be collected using a 500 µm mesh free-fall drop-net (or similar).
500 µm net x1	
Sample processing	
Sample processing and species identification should be conducted by a quality assured laboratory according to their best practices. All non-indigenous species should be identified. Zooplankton species composition should be recorded.	

Table 4. Detailed species information field sampling collection techniques for mobile epifauna.

Technique and minimum number of samples per site	Sampling instructions
Crab trap x3	Crab traps catch larger invertebrates and some lager fish (e.g., the Fukui designed crab trap (63cm x 42cm x 20cm with 1.3cm mesh netting). Minnow traps are more effective for catching small fish and small crabs and shrimp (e.g., the Gee-minnow trap (42cm x 23cm with 6.4mm netting and 2.5cm mouth). Artificial habitat collectors catch smaller mobile fauna which require shelter, such as amphipods, isopods, mysids and decapods. An example collector is a plastic crate (30 x 30 x 30cm) filled with dead, autoclaved oyster shells or alternative content to provide shelter. Crab and minnow traps should be baited using locally available fish and weighted (1-2kg weight on the frame for crab traps and artificial habitats; 1kg inside for minnow traps). Traps should be tethered securely to wharves and/or other structures. Three traps should be deployed at each site for at least 48 hrs. On collection, material from artificial habitats should be carefully washed in a bucket with water and filtered through a 0.5mm sieve. Collected organisms should be preserved in 4% formaldehyde or 98% ethanol. Record the dimensions of the trap, bait species, depth and location that trap was set at, deployment duration, substrate type, and catch species and abundance. Identification of species should be verified. If specimens need to be preserved for identification, fish and larger invertebrates can be frozen, smaller invertebrates preserved in 4% formaldehyde solution
Minnow trap x3	
Artificial habitat collector (optional) x3	
Sample processing	
Quality assured laboratories or local authorities should confirm species identification from the preserved samples and/or photographs. Catch per time interval per trap should be reported.	

Table 5. Detailed species information field sampling collection techniques for fouling organisms.

Technique and minimum number of samples per site	Sampling instructions
Settlement plates x3 units (of 3 plates each)	Each fouling plate unit should be constructed of polypropylene rope (0.5cm diameter) of sufficient length, three grey 15cm x 15cm, or 14cm x 14cm, PVC plates and a brick. Each plate should be sanded for a few seconds (sanding paper 80) prior to the deployment. A hole (0.5cm) should be drilled at the centre of each plate for the rope, and a tube should be placed between the rope and the plate to prevent the rope from breaking. Plates should be secured on the rope at set distances using knots secured with zip ties on both sides of the plate. The plates should be secured in the rope in such a way that they will be deployed at around 1m, 3m and 7m depths. A brick should be tied at the end of the rope for weight when deploying the unit in the port. Three replicate fouling units should be deployed per site in locations where they will not be disturbed by for example port traffic. Units should be tied securely to the dock structures so that the first plate is submerged at approximately 1 m depth. The unit should always remain in a vertical position and the rope should be tight. Units should be deployed for 6 weeks. On retrieval, plates should be separated, photographed, placed in labelled plastic bags and sealed. The brick and rope should be stored in a separate bag and checked for mobile epifauna. identified on site, or preserved in 4% formaldehyde or 98% ethanol, or frozen for identification in the laboratory.
Fouling scrape x 3 to 6	Sampling of fouling organisms by scraping should be conducted during the warmest season (spring or summer). At least three pilings or similar structures should be sampled at each site. The pilings should be located at equal distance (10-15m) from each other. Breakwaters, groynes, rock walls and natural rocky reefs, as well as hulks (wrecks) should also be sampled if possible. Scrapings should be taken in the sublittoral zone. An area of 0.1m2 should be scraped using a hand-held scraping tool, operated either in the water (diver) or from the dock (with a collection net attached to the scraper). Samples should be collected in pre-labelled zipper bags. Ropes can also be scraped and/or photographed at depths of 1m, 3m and 7m. Sampling area should be estimated, and samples should be identified on site, or preserved in 4% formaldehyde or 98% ethanol, or frozen for identification in the laboratory.
Sample processing	
Scrape and settlement plate samples should be quantitatively analysed by experts with good knowledge and experience of species identification from the Mediterranean Sea, or by a quality assured laboratory. Identifying organisms from plates is easiest when they are fresh. Observed species should be reported. The rope and brick should be rinsed thoroughly above a 0.5mm sieve and all organisms identified and reported.	

Table 6. Detailed species information field sampling collection techniques for benthic infauna.

Technique and minimum number of samples per site	**Sampling instructions**
Benthic grab x3	At least 3 grab samples should be taken at each site in at least 15m distance from each other using a benthic grab, preferably operable from the dock. It may be necessary to operate the grab from a boat to reach sites further from shore where the substrate is suitable for benthic grab samples (soft sediment). Samples should be at least 10cm deep into the sediment. Samples should be sieved with a 0.5mm sieve, transferred to sample jars and identified on site, preserved in 4% formaldehyde or 98% ethanol, or frozen for identification in the laboratory.
Sample processing	
Samples should be analysed and processed by a quality assured laboratory. All non-indigenous species should be identified and reported.	

A detailed list of field equipment is provided on the next page.

Species data should be recorded using the species information field data sheet.

Data collected using the species information field data sheet includes the minimum data for contributions to the Marine Mediterranean Invasive Alien Species Database (MAMIAS)[26]:

- Scientific name of the species,
- X,Y coordinates of where the species has been observed (using World Geodetic System WGS84, as reference coordinate system),
- Depth, number of individuals, and
- Date when the species was observed.

Species data should be provided to MAMIAS.

[26] https://dev.mamias.org/page/contribution

Field sampling equipment

Suggested equipment for field sampling:

- Water sampler
- Plankton nets
    - Small hand hauled 10 µm net for phytoplankton
    - 100 µm free fall drop net for zooplankton
    - 500 µm drop-net for larger zooplankton
- 500 ml glass bottles for zooplankton samples
- 250 ml clear glass bottles for phytoplankton samples
    - Lugol solution
- Clean funnel and a bail (for water samples)
- Scrapers for fouling communities (handheld, mesh bag attached or hand-held scrapers)
    - 1 – 2 l zip-lock bags for the obtained samples
- Traps
    - 9 x Collapsible Chinese crab trap
        - 9 x 2 kg lead weights
        - Cable ties (for attaching the lead weights to the traps)
    - 9 x Shrimp trap (Box or cylinder, 2 mm plastic mesh, 150-200 mm high, 400-500 mm long)
    - Rocks (approx. 1 kg) inside the traps for weight
    - 9 x artificial habitat collectors
        - 9 x 2 kg weight
        - Cable ties (for attaching the lead weights to the traps)
    - Approximately 400 m of rope for tethering the traps
    - 1 l zip-lock bags for the catch
    - Bait fish
- Petersen, Ponar or similar hand-operated benthic grab
    - 0.5 mm sieve
- Jars (1 l) for benthic samples
- Alcohol and/or 4% formaldehyde solution (at minimum 2 l per 3 sites)
- Buckets (rope attached to one for obtaining rinsing water)
- 3 large coolers with cold blocks
- Submersible data loggers (e.g. YSI or CTD)
- Secchi disc or turbidity meter
- Digital camera and a GPS device
- Permanent markers
- Labelling tape for the sample containers
- Mesh bags (0.5 mm)
- 50 m transect line, labelled at 1 m intervals
- 0.10 m2 quadrate frame(s)
- Camera in an UW housing

Port characteristics field data sheet

Port name and ID		**Date (day, month, yr)**	
Established (year)		**Location (Lat, Long in WGS84)**	
Assessor(s) (name, surname)			

General description (general info about the port: size, area, type of transport cargo or people)			
Recent construction (Description of any recent construction activities)			
Main shipping routes			
Habitat description			
Existing monitoring			
Adjacent waters			
Salinity max (psu)		**Sea surface temp max (°C)**	
Salinity min (psu)		**Sea floor temp min (°C)**	
Sea surface temp min (°C)		**Sea floor temp max (°C)**	
Tidal range (m)			
Comments			

Provide map of the area as an attachment

Sampling site and environmental field data sheet

Port name and ID		**Date (day, month, yr)**	
Site ID		**Time (hh:mm)**	
Location (Lat, Long in WGS84)		**Field surveyor (name, surname)**	

Environmental Data

Air temp (°C)		**Dissolved oxygen at bottom (mg/l)**	
Cloud cover (%)		**Water transparency (m)**	
Wind direction (grad)		**Wind speed (m/s)**	
Water temp at surface (°C)		**Salinity at surface (psu)**	
Water temp at 1m (°C)		**Salinity at 1m (psu)**	
Water temp at 3m (°C)		**Salinity at 3m (psu)**	
Water temp at 5m (°C)		**Salinity at 5m (psu)**	
Water temp at 7m (°C)		**Salinity at 7m (psu)**	
Water temp at bottom (°C)		**Salinity at bottom (psu)**	
Sea state (m)		**Comments**	

Sediment Data – Method of collection: _____

Sediment organic content (g)		**Sediment <0.5-0.25mm (% dry weight)**	
Sediment median (µm)		**Sediment <025-0.125mm (% dry weight)**	
Sediment >1mm (% dry weight)		**Sediment <0.125-0.063mm (% dry weight)**	
Sediment <1 – 0.5mm (% dry weight)		**Sediment <0.063mm (% dry weight)**	

Species information field data sheet

Port name and ID		**Date (day, month, yr)**		**Location (Lat, Long in WGS84)**	
Site ID		**Time (hh:mm)**		**Field surveyor (name, surname)**	
Water depth					

Details of sample collection - Plankton

	Phytoplankton		**Zooplankton**	
	Water sample	**100 µm net**	**100 µm net**	**500 µm net**
Sampling start (dd.mm.yy or hh.mm)				
Sampling finish (dd.mm.yy or hh.mm)				
Total water volume filtered (m^3)				
Total number of samples				
Sampling method (including dimensions of sampling device)				
Storage method				

Details of sample collection – Mobile epifauna

	Mobile epifauna								
	Crab trap			**Minnow trap**			**Artificial habitat**		
	Trap 1	**Trap 2**	**Trap 3**	**Trap 1**	**Trap 2**	**Trap 3**	**1**	**2**	**3**
Sampling start (dd.mm.yy or hh.mm)									
Sampling finish (dd.mm.yy or hh.mm)									
Total number of samples									
Sampling method (including dimensions of sampling device)									
Storage method									

Species information field data sheet page 2 of 3: Details of sample collection

Details of sample collection – Fouling organisms

	Settlement plates			Fouling scraping		
	Unit 1	Unit 2	Unit 3	Scraping 1	Scraping 2	Scraping 3
Sampling start (dd.mm.yy or hh.mm)						
Sampling finish (dd.mm.yy or hh.mm)						
Total number of samples						
Sampling method (including dimensions of sampling device)						
Storage method						

Details of sample collection – Benthic epifauna

	Benthic grab		
	Grab sample 1	Grab sample 2	Grab sample 3
Sampling start (dd.mm.yy or hh.mm)			
Sampling finish (dd.mm.yy or hh.mm)			
Total water volume filtered (m^3)			
Total number of samples			
Sampling method (including dimensions of sampling device)			
Storage method			

Species information field data sheet page 3 of 3: Details of species

Sample	Species observed (scientific names)	Abundance of species of observed
Phytoplankton water		
Phytoplankton 100 µm net		
Zooplankton 100 µm net		
Zooplankton 500 µm net		
Crab trap 1		
Crab trap 2		
Crab trap 3		
Minnow trap 1		
Minnow trap 2		
Minnow trap 3		
Artificial habitat trap 1		
Artificial habitat trap 2		
Artificial habitat trap 3		
Settlement plate 1		
Settlement plate 2		
Settlement plate 3		
Fouling scraping sample 1		
Fouling scraping sample 2		
Fouling scraping sample 3		
Grab 1		
Grab 2		
Grab 3		

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