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

Regional Expert Meeting on the harmonisation of procedures in the Mediterranean pursuant to the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004

Kappara, Malta, 22-23 March 2023

REMPEC/WG.54/2
8 March 2023
Original: English

Agenda Item 2: Harmonisation of procedures in the Mediterranean pursuant to the BWM Convention

Revised draft regional harmonised procedures for the uniform implementation of the BWM Convention in the Mediterranean

Note by the Secretariat

This document provides information on the revised draft regional harmonised procedures for the uniform implementation of the BWM Convention in the Mediterranean, as prepared by the Secretariat.

Background

1 The Twenty-second Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) and its Protocols (COP 22) (Antalya, Türkiye, 7-10 December 2021) adopted the Ballast Water Management Strategy for the Mediterranean Sea (2022-2027)[1], hereinafter referred to as the Mediterranean BWM Strategy (2022-2027).

2 The overall objective of the Mediterranean BWM Strategy (2022-2027), which is presented in the Annex to document REMPEC/WG.54/INF.4, is, amongst others, 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 International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention), as outlined in its Article 13(3).

3 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.

4 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 (IAS) carried out by the relevant organisations and fora, particularly the work of the International Maritime Organization (IMO), and are committed to take all appropriate actions towards the ratification and implementation of the BWM Convention in the Mediterranean*".

5 The Actions associated with Strategic Priority 1 include:

.1 Action 1: Ratification of the BWM Convention;

.2 Action 2: Harmonisation of BWM measures in the Mediterranean region;

.3 Action 3: Development, adoption, and implementation of a regional protocol for port baseline surveys and biological monitoring in Mediterranean ports;

.4 Action 4: Promotion of the use of risk assessment as a tool to assist in ballast water (and, more generally, IAS) management and decision-making; and

.5 Action 5: Alignment of BWM measures with neighbouring regions.

6 COP 22 also specifically requested the Secretariat, i.e. the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) and the Regional Activity Centre for Specially Protected Areas (SPA/RAC), to provide technical support for the implementation of the Mediterranean BWM Strategy (2022-2027), in synergy with the IMO, through technical cooperation and capacity building activities, including resource mobilisation (internal and external).

7 Moreover, COP 22 agreed to include the following activity in the UNEP/MAP Programme of Work and Budget for 2022-2023[2]:

- measures to control and manage ships' ballast water and biofouling to minimise the transfer of invasive aquatic species implemented; assistance provided and resources mobilisation strategy developed.

[1] UNEP/MED IG.25/27, Decision IG.25/17.
[2] UNEP/MED IG.25/27, Decision IG.25/19.

8 Given the international nature of shipping, the fact that an estimated 58% of the commercial maritime traffic in the Mediterranean Sea is internal[3], and the semi-enclosed nature of the Mediterranean, harmonisation of BWM measures in the region is especially important.

Harmonisation of procedures in the Mediterranean pursuant to the BWM Convention

9 The Seventeenth Ordinary Meeting of the Barcelona Convention and its Protocols (COP 17) (Paris, France, 8-10 February 2012) adopted the Regional strategy addressing ship's ballast water management and invasive species[4], hereinafter referred to as the 2012 Mediterranean BWM Strategy, which had the same overall objective as the Mediterranean BWM Strategy (2022-2027), as referred to in paragraph 2 above.

10 As part of the 2012 Mediterranean BWM Strategy, the Contracting Parties to the Barcelona Convention agreed to adopt harmonised voluntary arrangements for ballast water exchange in the Mediterranean region (Annex 2 thereto). Harmonised voluntary arrangements for ballast water management in the Mediterranean region were communicated to the IMO by REMPEC and subsequently circulated to IMO Member States for their information and action as appropriate, through BWM.2/Circ.35 dated 15 August 2011, as presented in document REMPEC/WG.54/INF.5.

11 COP 17 also adopted the "*General Guidance on the Voluntary Interim Application of the D1 Ballast Water Exchange Standard by Vessels Operating between the Mediterranean Sea and the North-East Atlantic and/or the Baltic Sea*", hereinafter referred to as the General Guidance Document, as outlined in Annex II to Decision IG.20/11. The General Guidance Document was communicated to the IMO by the Administration of Croatia and subsequently circulated to IMO Member States for their information and action as appropriate, through BWM.2/Circ.39 dated 20 August 2012, as presented in document REMPEC/WG.54/INF.6.

Draft regional harmonised procedures

12 In this context and, following the necessary procurement procedures, REMPEC contracted Ms Susan Kropman and Dr Guillaume Drillet, as lead consultant and associate consultant, respectively, to provide the necessary support to the Secretariat towards harmonising the procedures in the Mediterranean pursuant to the BWM Convention.

13 A joint kick-off meeting was held with the Consultants on 26 September 2022, through videoconference, to discuss the content of the reference documents to be analysed, the scope of the assignment, as well as to agree on the method of work and communication channel.

14 In accordance with the Terms of Reference, the following documents were prepared:

.1 a brief overview of the status of harmonisation of BWM measures in the Mediterranean region and their applicability, including a brief comparison with the corresponding status in other relevant regions, notably the North-East Atlantic[5] and the Baltic Sea[6]; and

.2 draft regional harmonised procedures for the uniform implementation of the BWM Convention in the Mediterranean, hereinafter referred to as the draft regional harmonised procedures, which are aimed at contributing to the implementation of the Mediterranean BWM Strategy (2022-2027), notably Actions 2, 3, 4 and 5 thereof.

[3] REMPEC 2020. Study on trends and outlook of marine pollution from ships and activities and of maritime traffic and offshore activities in the Mediterranean.
[4] UNEP(DEPI)/MED IG.20/8, Decision IG.20/11.
[5] the OSPAR Commission was established by the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention).
[6] the Baltic Marine Environment Protection Commission (Helsinki Commission or HELCOM) is the governing body of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention).

15 On 23 November 2022, the Secretariat requested all Contracting Parties to the Barcelona Convention to provide feedback and comments on the draft regional harmonised procedures, following the necessary internal consultations that they may need to carry out with relevant authorities or stakeholders, as appropriate. No feedback nor comment was received from Contracting Parties to the Barcelona Convention during these consultations that were held until 9 December 2022.

16 Following liaison with the IMO Secretariat, revised draft regional harmonised procedures for the uniform implementation of the BWM Convention in the Mediterranean, hereinafter referred to as the revised draft regional harmonised procedures, as set out in the **Annex** to the present document, were prepared and consist of seven (7) parts:

.1 Harmonised Procedure: Ballast Water Exchange Areas (Section 2);

.2 Harmonised Procedure: Regulation A-4 Exemptions (Section 3);

.3 Harmonised Procedure: Sediment Reception Facilities (Section 4);

.4 Harmonised Procedure: Ballast Water Reporting (Section 5);

.5 Harmonised Procedure: Contingency Measures (Section 6);

.6 Harmonised Procedure: Additional Measures (Section 7); and

.7 Harmonised Procedure: Warnings (Section 8).

17 With a view to facilitating the work of the Secretariat and to offering a further opportunity to provide feedback and comments, consultations with the Contracting Parties to the Barcelona Convention were launched on the revised draft regional harmonised procedures, as set out in the **Annex** to the present document, until 17 March 2023, the compilation of which is presented in document REMPEC/WG.54/INF.3.

18 Since Ms Susan Kropman's assignment, as lead consultant, was successfully completed on 31 December 2022 and, following the necessary procurement procedures, REMPEC contracted Ms Ernesta Swanepoel, as lead consultant, to continue to provide the necessary support to the Secretariat, together with Dr Guillaume Drillet, as associate consultant, towards harmonising the procedures in the Mediterranean pursuant to the BWM Convention.

Next steps

19 In this context, the Secretariat proposes to take the revised draft regional harmonised procedures, as set out in the **Annex** to the present document, as a basis for the development of regional harmonised procedures for the uniform implementation of the BWM Convention in the Mediterranean, within the framework of the Barcelona Convention.

20 With a view to facilitating the further process towards enhancing regional cooperation, including through the conclusion of regional agreements consistent with the BWM Convention pursuant to Article 13(3) thereof, the Secretariat suggests holding:

.1 a general discussion on the revised draft regional harmonised procedures, as set out in the **Annex** to the present document; and

.2 detailed discussions on the specific harmonised procedures referred to in paragraphs 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, and 16.7. above.

21 The Secretariat also proposes to liaise with the IMO Secretariat as well as the OSPAR Commission/Bonn Agreement[7] Secretariat and the HELCOM Secretariat to:

.1 assess the implications of the possible adoption of regional harmonised procedures for the uniform implementation of the BWM Convention in the Mediterranean, within the framework of the Barcelona Convention, on BWM.2/Circ.35 and BWM.2/Circ.39, as referred to, respectively, in paragraphs 10 and 11 above; and

.2 confirm the need for these to be eventually communicated to the IMO and circulated to IMO Member States for their information and action as appropriate.

22 In this context, the Secretariat considers that the Fifteenth Meeting of the Focal Points of REMPEC to be tentatively held in June 2023 should be informed of the proposals set out in the present document as well as of the outcome of the discussions referred to in paragraph 20 above.

Actions requested by the Meeting

23 **The Meeting is invited to**:

.1 **take note** of the information provided in the present document; and

.2 **comment** as deemed appropriate.

[7] Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil and Other Harmful Substances, 1983.

Annex

Revised draft regional harmonised procedures for the uniform implementation of the BWM Convention in the Mediterranean

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

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

Prepared by REMPEC consultants

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

Table of Contents

Figures

Tables

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. The BWM Convention now has 94 contracting parties representing 92.41% of world shipping tonnage, 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 and its Protocols agreed at their 22nd meeting to adopt 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, including the adoption of the 2012 Ballast Water Management Strategy for the Mediterranean Sea.

[1] UNEP/MED, 2022.

[2] Contracting Parties to the Barcelona Convention include: 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.

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). Appendix 1 sets out a work plan and implementation timetable while Appendix 2 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.

These 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.

There are seven (7) parts to these harmonised procedures:

- **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: Ballast Water Reporting** (Section 5)
- **Harmonised Procedure: Contingency Measures** (Section 6)
- **Harmonised Procedure: Additional Measures** (Section 7)
- **Harmonised Procedure: Warnings** (Section 8).

2 Harmonised Procedure: Ballast Water Exchange Areas

2.1 Background and context

2.1.1 Ballast Water Management Convention ballast water exchange requirements

The BWM Convention applies to all ships flagged to countries that are Party to the Convention, and those ships operating under the authority of countries that are Party to the Convention.

The ballast water exchange (BWE) regulations under the BWM Convention (regulations B-4 and D-1) provide a standard that must be met to undertake BWE in accordance with the BWM Convention.

These include that a ballast water exchange:

- must have an efficiency of at least 95% volumetric exchange of ballast water (regulation D-1), in accordance with the Guidelines for ballast water exchange (G6)[3],

and that ships must conduct ballast water exchange:

- at least 200 nautical miles from the nearest land and in water at least 200 metres in depth (herein referred to as the 200/200 requirement),
- if this is not possible, then ballast water exchange must be conducted at least 50 nautical miles from the nearest land and in water at least 200 metres in depth (herein referred to as the 50/200 requirement) (regulation B-4).

In situations where this cannot be met, a port State may designate BWE areas in accordance with the Guidelines on designation of areas for ballast water exchange (G14)[4]. Port States are not required to designate BWE areas, however designation of BWE areas may support ships to perform BWE while on a route where the 200/200 and 50/200 requirements are not possible (e.g. closer to the coast and in shallower depths), as long as doing so will not introduce unacceptable risk of introduction of HAOP. Alternative options to cater for unmanaged ballast water can also be explored, such as ballast water reception facilities.

As per regulation B-4 of the BWM Convention, if the safety or stability of the ship is threatened by a BWE operation, as determined by the master with sufficient justification, this operation should not be undertaken.

Ships should not normally be required to deviate from their voyage planned route or unduly delay their arrival for the purposes of meeting these requirements.

All BWE, or reasons for not undertaking BWE, must be recorded in the Ballast Water Record Book (BWRB).

Ballast water exchange (BWE) regulations were included in the BWM Convention as an interim risk mitigation measure until such time as ships are required to meet the regulation D-2 standard (at the latest 8 September 2024), in accordance with the ship-specific phasing in schedule (regulation B-3, as amended by resolution MEPC.297(72)[5]) of the BWM Convention (Figure 1).

[3] IMO, 2017b.
[4] IMO, 2006.
[5] IMO, 2017e.

It may also be the case after 2024 that a ship may need to utilise BWE as a contingency measure, if this is in accordance with the ship's Ballast Water Management Plan, as outlined in the Guidance on contingency measures under the BWM Convention (BWM.2/Circ.62, as may be amended)[6].

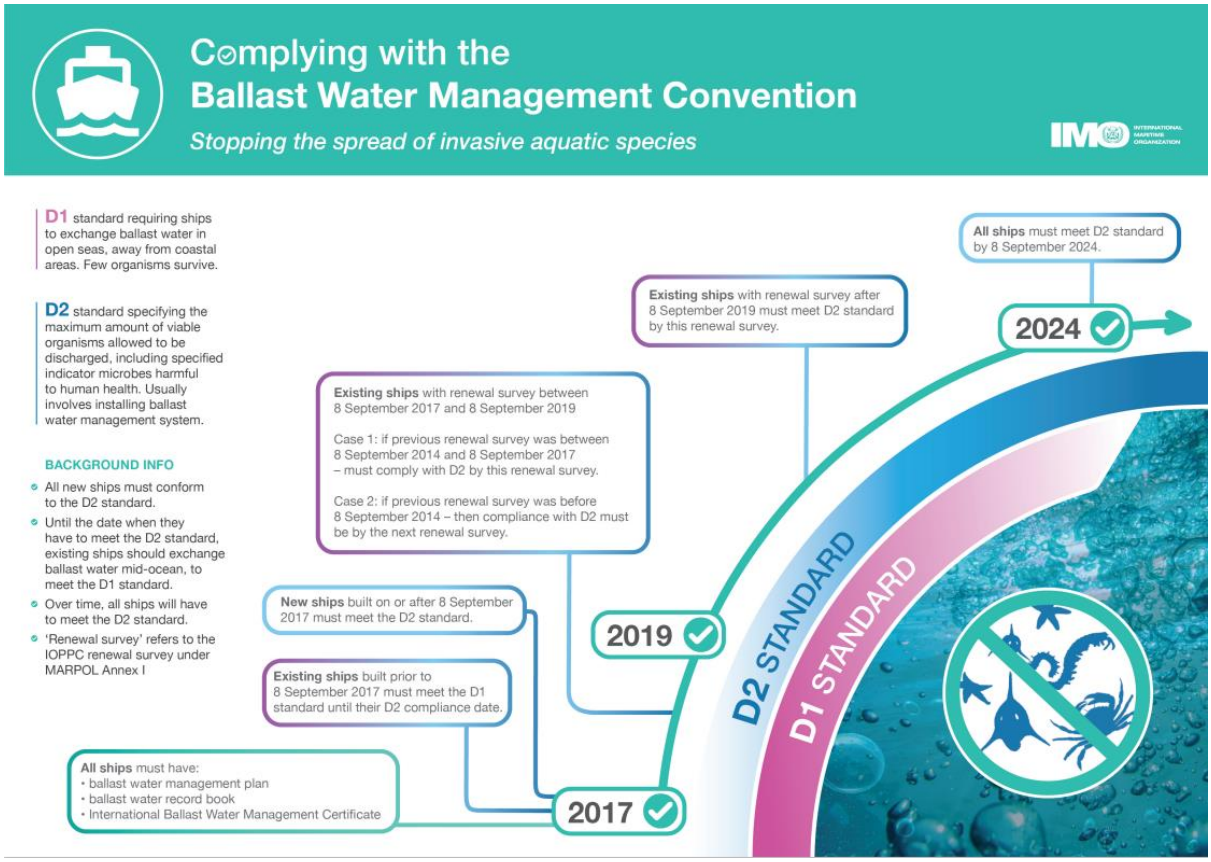

Figure 1. Infographic "Complying with the Ballast Water Management Convention", from the IMO Website.

The Guidelines (G14) provide a three-step process for designating an area as a BWE area: *identification*, *assessment* and *designation*. Port States should consult with adjacent or other States as appropriate when considering BWE areas, regardless of whether or not that State is a Party to the Convention. Before being implemented, BWE areas must be communicated to the IMO through the Global Integrated Shipping Information System (GISIS).

Ships operating in designated BWE areas that are not yet required to meet the D-2 standard and operating in areas where a full BWE (in accordance with regulation D-1) is not possible should:

- not be required to meet the regulation D-2 standard,
- not be required to use a ballast water reception facility or use other methods of ballast water management,
- not be required to have an exemption under regulation A-4, and
- record the reasons why BWE was not conducted in the BWRB, as per the guidance on Application of the Convention to ships operating in sea areas where ballast water exchange in accordance with regulations B-4.1 and D-1 is not possible (BWM.2/Circ.63[7]).

[6] IMO, 2017g.
[7] IMO, 2017h.

2.1.2 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[8] (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 2) 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 3) 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.

[8] IMO, 2011.

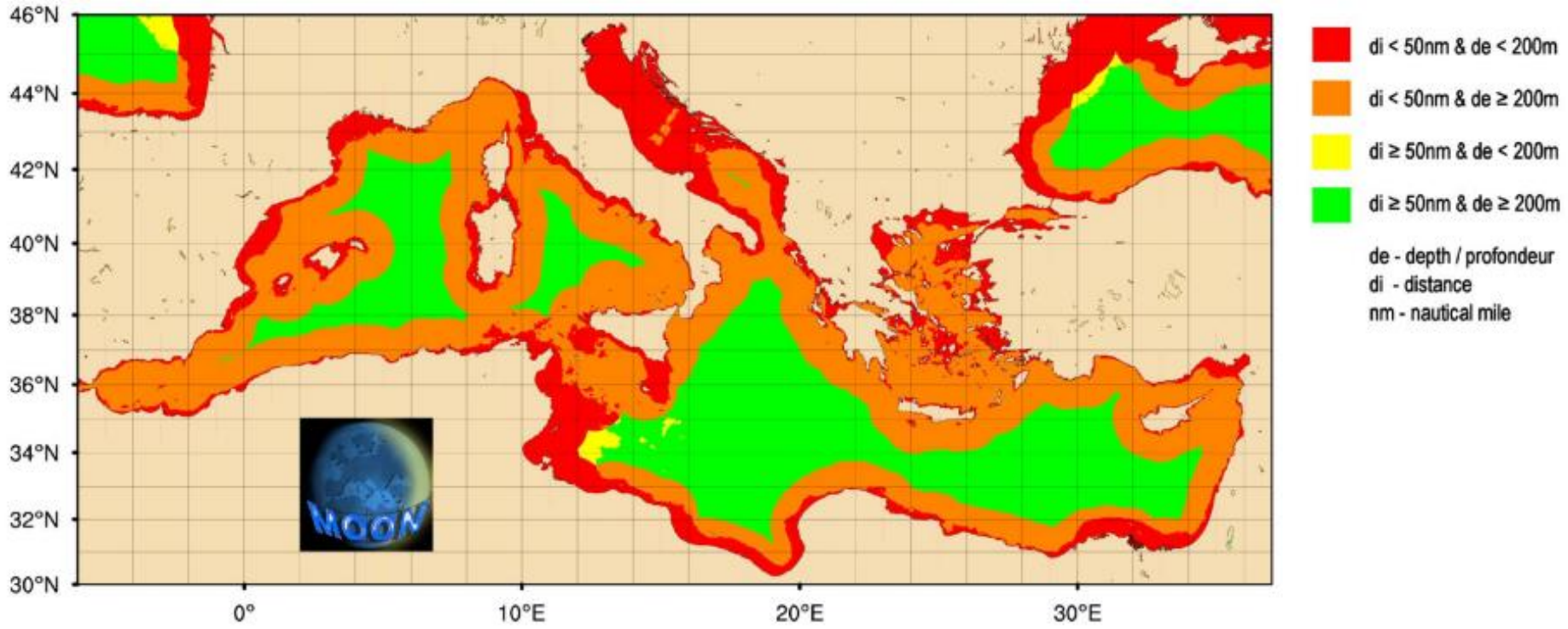

Figure 2. The Mediterranean Sea showing depth and distance from nearest land combinations, from the Mediterranean BWM Strategy (2022-2027).

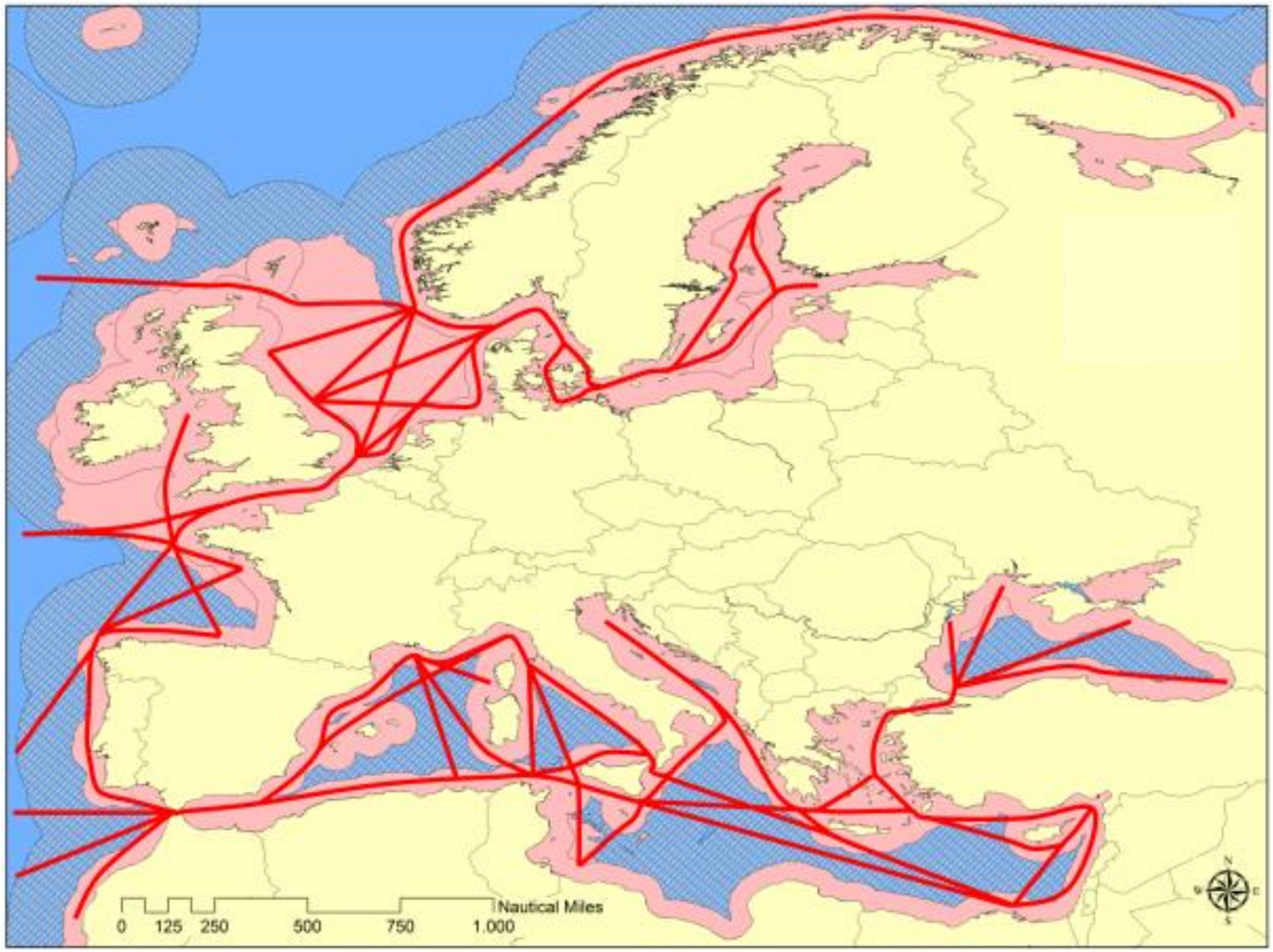

Figure 3. The seas surrounding Europe with red lines showing the main shipping routes, from David, M. and Gollasch, S. 2016. The pink areas are less than 50 nautical miles from nearest land and/or in waters less than 200m deep, and the pink shaded areas are more than 200 nautical miles from nearest land.

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 2;

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)[9] and to keep a record of all ballast water operations carried out.

[9] 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[10]), 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 International and regional actions to designate ballast water exchange areas

The processes used to identify and assess BWE areas in various parts of the world have varied considerably, however they are all in line with the Guidelines (G14) and are based on an evaluation of risk associated with BWE in the relevant areas. Each country or region's interpretation of risk, and definition of acceptable level of risk, varies. As a result, the outcomes are also quite different.

Australia undertook an assessment process to identify that, if ships could not meet the BWM Convention regulation B-4 requirements, BWE must be conducted at least 12 nautical miles from nearest land and in water at least 50 metres in depth[11]. The assessment used analysis of expert opinions to identify and assess biological risks, and analysis of shipping routes to identify BWE areas that would minimise the risk of harm from ballast water whilst also minimising the impact on shipping. The designated BWE areas were communicated to the IMO in BWM.3/Circ.1[12].

Norway designated specific BWE areas within the Norwegian Exclusive Economic Zone. The Norwegian Ballast Water Regulation entered into force on 1 July 2010. Norway designated three exchange areas on the basis of the areas being characterised by offshore directed water currents[13].

[10] IMO, 2012.
[11] Knight, E. *et al.* 2007.
[12] IMO, 2017f.
[13] David, M. and Gollasch, S. 2016. *These areas do not appear to have been communicated to the IMO separately – coordinates for the Norwegian areas are not included in Circ.56*

North Sea countries designated BWE areas in the North Sea which have been endorsed by the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Commission) and communicated to the IMO in BWM.2/Circ.56[14] (Notification on ballast water exchange areas in the North Sea). The BWE areas in the North Sea were identified and assessed using remote sensing water quality data obtained through the European Space Agency Due Innovator II project. North Sea waters (excluding Norwegian waters) with an acceptable risk index (as determined by the North Sea countries) were designated for BWE[15].

Since no area in the Baltic Sea meets the regulation B-4.1 requirements, the Baltic Marine Environment Protection Commission (HELCOM) has also considered the identification of BWE areas for intra-Baltic shipping. Through an extensive study it was found that the potential exchange zone would be too small, and ships would likely have to decrease speed to ensure sufficient time to carry out exchange within the potential zone. As a result, no BWE area has been designated in the Baltic Sea[16]. Similarly, there has been no agreement on BWE areas in the Adriatic[17].

Several countries, including Singapore[18] and China[19] have communicated that ships which cannot meet the BWM Convention regulation D-1 requirements to conduct a full BWE, under specified circumstances, do not need to undertake a BWE. The reason must be recorded in the Ballast Water Record Book, in line with the guidance on Application of the Convention to ships operating in sea areas where ballast water exchange in accordance with regulations B-4.1 and D-1 is not possible (BWM.2/Circ.63[20]). These arrangements are temporary, and only apply until ships are required to meet the regulation D-2 standard.

2.3.2 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.

[14] IMO, 2015.
[15] Rak, 2016.
[16] David, M. and Gollasch, S. 2016.
[17] Rak, 2016.
[18] Maritime and Port Authority of Singapore, 2017.
[19] BIMCO, 2019.
[20] IMO, 2017h.

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

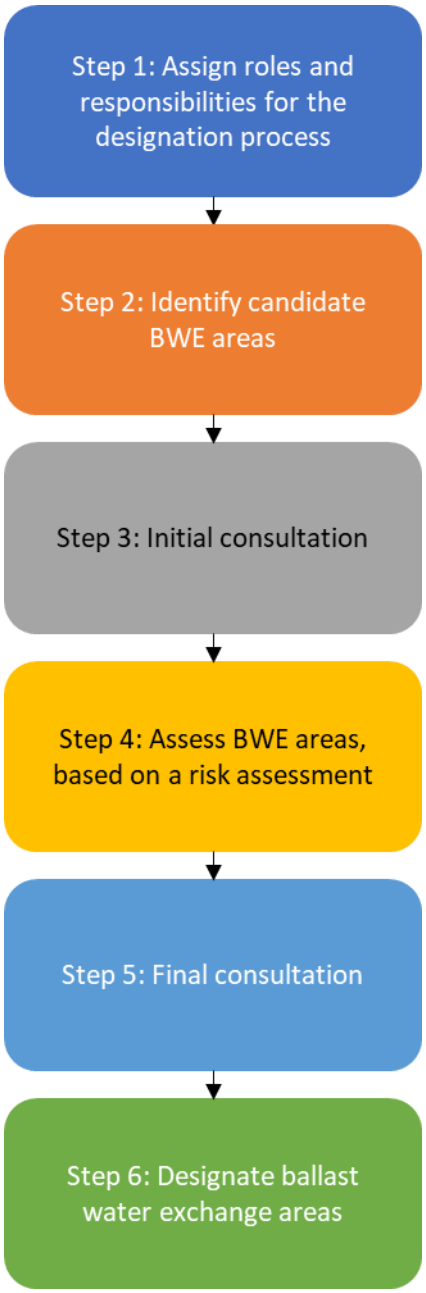

Figure 4. Steps for designating BWE areas in the Mediterranean Sea.

2.3.2.1 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 administration that has the lead responsibility for managing ballast water 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 administration. 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 administration - to be accountable for the designation process and to approve and progress the designation for government and/or bilateral or regional endorsement.

2.3.2.2 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 implemented the BWM Convention into their 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 implemented the BWM Convention into their national law, the port State administration must have the authority to introduce the designated BWE area requirements under their national law.

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.

[PLACEHOLDER FOR DESCRIPTION OF FURTHER IMPORTANT RESOURCES AND PROTECTED AREAS]

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.

2.3.2.3 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.

2.3.2.4 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, as indicated in the international examples in section 2.3.1. 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? [21]

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

[21] 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 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, e-DNA surveys 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.

2.3.2.5 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 administration(s) and the Contracting Parties to the Barcelona Convention.

2.3.2.6 Step 6: Designation

To designate the BWE area, three actions should occur:

- The area should be included or referred to in the national law,
- Stakeholders should be notified, and

- The IMO should be notified.

Ballast water exchange areas designated by a port State 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 administration 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) [22].

[22] IMO, 2017g.

3 Harmonised Procedure: Regulation A-4 Exemptions

3.1 Background and context

Under regulation A-4 of the BWM Convention, an exemption from the requirements in both regulations D-1 and D-2, to manage ballast water prior to discharge, may be issued to ships on voyages between specific ports and locations, but only:

- To ships that do not mix ballast water or sediments other than between the specified ports or locations, and
- Based on the 2017 Guidelines for risk assessment under regulation A-4 of the BWM Convention (G7)[1].

Exemptions can only be effective for up to 5 years, are subject to intermediate review, and must be communicated to the IMO and recorded in a ship's Ballast Water Record Book.

Exemptions only apply to the requirement to manage ballast water in accordance with the BWM Convention:

- In the case of a ship that would be required to meet the regulation D-1 standard, an A-4 exemption may mean the ship does not have to undertake a ballast water exchange, or,
- In the case of a ship that would be required to meet the regulation D-2 standard in line with the BWM Convention's implementation schedule (Figure 1), an A-4 exemption may mean the ship does not have to, for example, utilise an on-board ballast water management system (BWMS) or discharge to a ballast water reception facility.

Regulation A-4 exemptions do not relieve a ship from other requirements of the BWM Convention, such as the requirement to hold an International Ballast Water Management Certificate, Ballast Water Management Plan and Ballast Water Record Book.

The intent of the Guidelines (G7) is to ensure that exemptions are applied for, assessed, and issued in a consistent manner based on scientifically robust risk assessment. An additional purpose of the Guidelines (G7) is to ensure that any exemptions granted do not impair or damage the environment, human health, property, or resources of adjacent or other States.

The Guidelines (G7) include three risk assessment methods that should be used, either individually or in combination, to determine the level of risk associated with the proposed exemption. The risk assessment methods are:

- Environmental matching risk assessment,
- Species biogeographical risk assessment, and
- Species-specific risk assessment.

Environmental matching risk assessments compare environmental conditions, including temperature and salinity, between donor and recipient ports. The degree of similarity between the ports provides an indication of likelihood of survival and establishment of harmful aquatic organisms and pathogens (HAOP) transferred between ports. The guidelines do not provide guidance on the degree of similarity that is acceptable, however the precautionary principle should be applied.

[1] IMO, 2017c.

Species biogeographical risk assessments compare the biogeographical distributions of HAOP that currently exist in the donor and recipient ports and biogeographic regions. Overlapping species in the donor and recipient ports and regions are an indication that environmental conditions are sufficiently similar to allow a shared fauna and flora.

Species-specific risk assessments use information on life history and physiological tolerances to define a species' physiological limits and thereby estimate its potential to survive or complete its lifecycle in the recipient environment. To undertake a species-specific risk assessment, species of concern that may impair or damage the environment, human health, property or resources need to be identified and selected. These are known as target species (see I.a.i.1.a.i.Appendix A - Protocol for Identifying Target Species).

Both the species biogeographical risk assessment and the species-specific risk assessment focus on target species. Whilst assessments based on target species can aid decision making, it should be considered that any species can become invasive when introduced to a new environment, whether it has a history of doing so or not. This is the basis behind the ballast water management standards in the BWM Convention which target all species. The selection of target species is subjective and there will be a degree of uncertainty associated with this approach. In addition, there is an ongoing need to update target species lists.

The Guidelines (G7) were amended in 2017 to include the same risk area (SRA) concept. An SRA is an agreed geographical area based on completion of a risk assessment carried out in line with the Guidelines (G7). Within an SRA the likelihood of transfer of species via ballast water is considered equivalent to the movement of those species via natural dispersal within the same area. Therefore, ballast water sourced within the SRA poses the same risk as ballast water sourced from another location within the SRA, so the locations of take up and discharge within the SRA are inconsequential.

If an area is declared an SRA, an exemption may be granted to any ship sourcing and discharging ballast water within the SRA, on the condition that ballast water is not mixed with ballast water sourced outside the SRA.

3.1.1 Mediterranean Sea context

In the Mediterranean BWM Strategy (2022-2027)[1], 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[2]) 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.

[1] UNEP/MED, 2022.
[2] IMO, 2011.

3.1.1.1 Background for risk assessments in the Mediterranean Sea

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[1].

According to the Mediterranean BWM Strategy (2022-2027) the most up to date data available through the Marine Mediterranean Invasive Alien Species Database (MAMIAS [2]) 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[3]:

- 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 has been used to identify that the composition of HAOP in the Mediterranean differs among Mediterranean bioregions[4].

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 5, 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.

[1] Wang *et al*. 2022.
[2] Available at: http://dev.mamias.org/services/dash/med
[3] Spalding *et.al*., 2007.
[4] Katsanevakis, S. and others. 2014

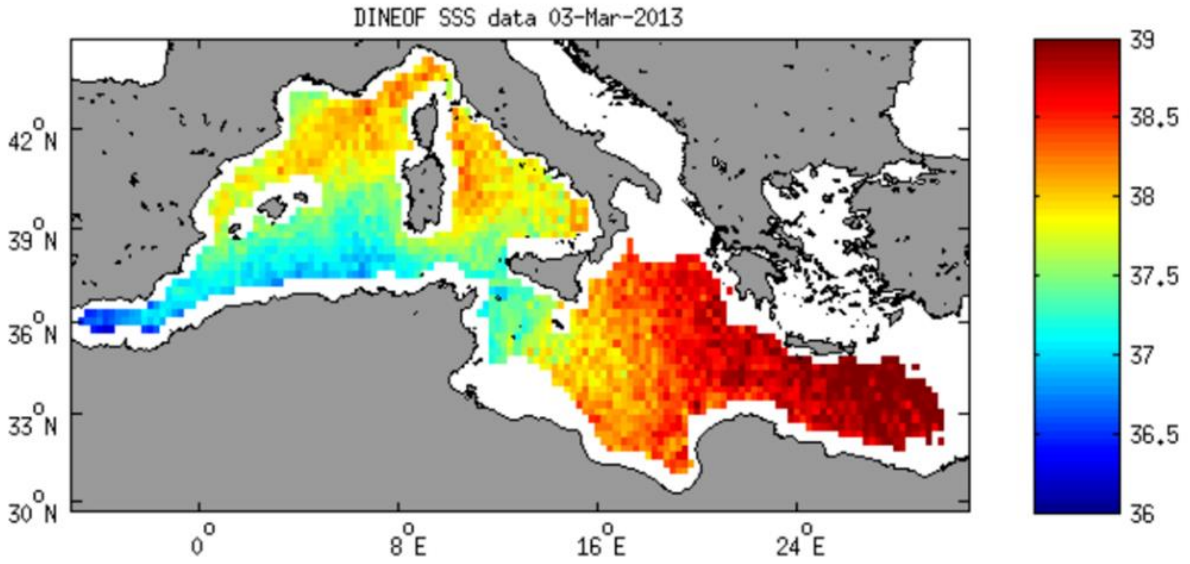

Figure 5. Salinity in the Mediterranean Sea on 3 March 2013, using information from the European Space Agency's (ESA) SMOS mission, from ESA - Mediterranean Sea salinity[1]

3.1.2 International and regional procedures for A-4 exemptions

Baltic Sea

The most comprehensive procedure developed for undertaking regulation A-4 exemption assessments is the Joint Harmonised Procedure for the Contracting Parties of HELCOM and OSPAR on the granting of exemptions under the International Convention for the Control and Management of Ships' Ballast Water and Sediments, Regulation A-4[2] (HELCOM-OSPAR JHP), adopted in 2013 and amended in 2015 and 2020.

The HELCOM-OSPAR JHP includes a port survey protocol, target species selection criteria, risk assessment, data storage and decision support tool, and administrative procedures.

Research in the Baltic undertaken prior to development of the HELCOM-OSPAR JHP informed the risk assessment procedure. The three risk assessment approaches in the Guidelines (G7) were considered and it was determined that the most appropriate approach in the Baltic was a two-step risk assessment, which is a combination of the environmental matching and species-specific risk assessments.

Step one of the HELCOM-OSPAR JHP risk assessment uses a risk assessment algorithm to determine high or low risk based on two key risk criteria – water salinity in the concerned ports, and presence of target species. The step one assessment provides an indication of the final decision (i.e., high risk after step one indicates that an exemption cannot be granted, unless step 2 indicates an acceptable risk; low risk after step one indicates an exemption can be granted, unless step 2 indicates an unacceptable risk).

Step two, the final detailed risk assessment, may include additional information on HAOP, species specifics (e.g., dispersal capacity), natural dispersal, and mitigation measures (e.g., volume of ballast water, position of discharge and uptake). As natural dispersal can be considered in step two, this process can be used to assess SRAs.

[1] https://www.esa.int/ESA_Multimedia/Images/2017/05/Mediterranean_Sea_salinity
[2] HELCOM-OSPAR, 2020a.

Denmark and Sweden Same Risk Area

An SRA between Denmark and Sweden was established in 2020[1] based on a study that identified relevant potential and existing HAOP in the region and determined the best estimate on the potential natural dispersal of each species[2] (Figure 6). Target species were identified through analysis of existing data.

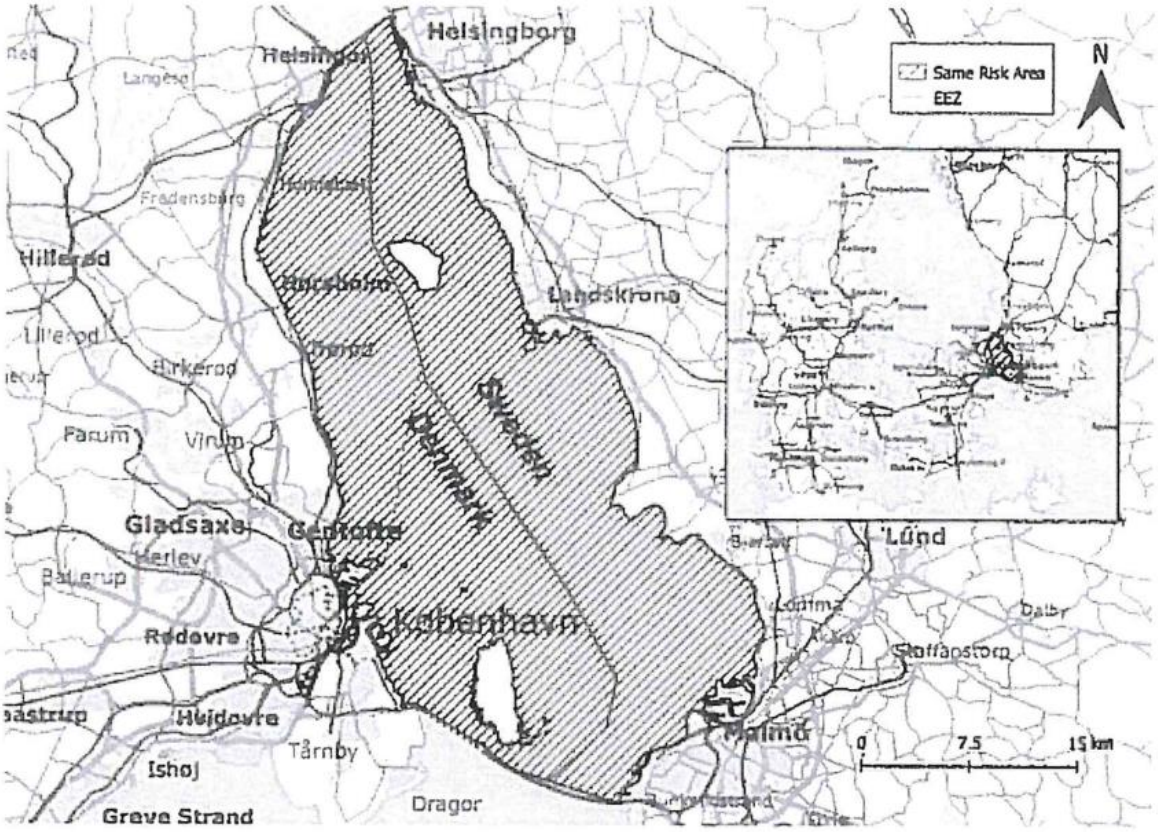

Figure 6. Map representation of the Same Risk Area in the Öresund, between Denmark and Sweden, from document MEPC 78/4/5 (Designation of a Same Risk Area in Öresund between Sweden and Denmark[3]).

Adriatic Sea

A model for risk assessment in the Adriatic has been developed which is aligned with the Guidelines (G7) and combines the three risk assessment methods[4]. The model considers the Adriatic Sea as a single biogeographical unit. It is noted, however, that the data requirements in accordance with the Guidelines (G7) are prohibitive and, in the absence of this data, the precautionary principle has been applied and no risk assessment-based exemptions could be granted in the Adriatic area.

[1] HELCOM-OSPAR, 2020b.
[2] Hansen, F. T., & Christensen, A. 2018.
[3] IMO, 2022.
[4] Rak, G. 2016.

Singapore

Singapore has been active in the development of the SRA concept and has submitted multiple documents to the IMO, describing proposed technical tools that may be used (MEPC 70/INF21[1], MEPC 71/4/24[2]). As yet, an SRA has not been declared in the region however an approach to select species that are relevant in the context of risk assessment has been developed, and some hydrodynamic models for the region exist.

China and Republic of Korea

The China Waterborne Transport Research Institute carried out a risk assessment, in accordance with the Guidelines (G7), in 2018 to evaluate a potential SRA in the Yellow Sea. The study used hydrodynamic modelling and agent-based modelling activities to assess the level of connectivity based on target species. The study concluded that the level of connectivity was too low to support the creation of an SRA in the Yellow Sea.

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. Much of this harmonised procedure is adapted from the HELCOM-OSPAR JHP.

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

[1] IMO, 2016.
[2] IMO, 2017.

Table 1.

The port State administration(s) 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 administration to be accountable for the exemption process and progress the exemption for the administration and/or bilateral or regional approval.

More than one port State 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 administration. 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 administrations and applicants.

APPLICANT	ADMINISTRATIONS
Consult with relevant port State administrations 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 administrations	Target species selection
Pay for data collection as necessary	Consult with other port State administrations as necessary.
Submit raw data to the port State administration	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 administrations	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 administrations	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 7.

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

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 1). 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.

If this is the intent of the applicant, this should be communicated to the port State administration. It is also the responsibility of the port State administration 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).

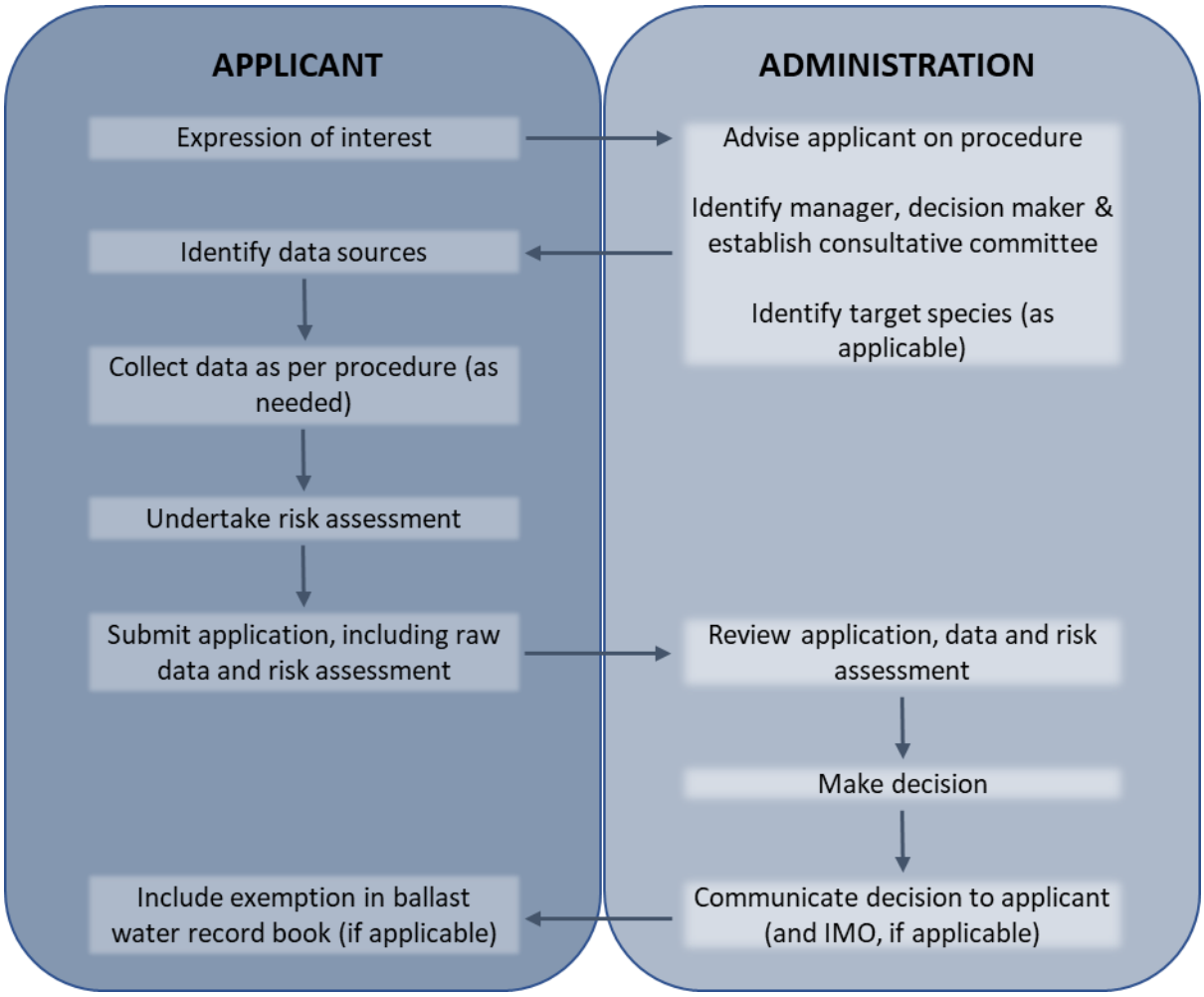

Figure 7. Assessment process in accordance with this procedure.

Upon receipt of an expression of interest, the administration 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 administration to review the application.

The administration 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 I.a.i.1.a.i.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 Administration 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 States. 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 States. 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[1])

- 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 administration. A list of contact points in each port State administration should be made publicly available, for example on the REMPEC or SPA/RAC websites[2].

[1] Available at: https://dev.mamias.org/page/contribution
[2] https://www.rempec.org/en or https://www.rac-spa.org/focal_points

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,
- **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 I.a.i.1.a.i.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 I.a.i.1.a.i.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.

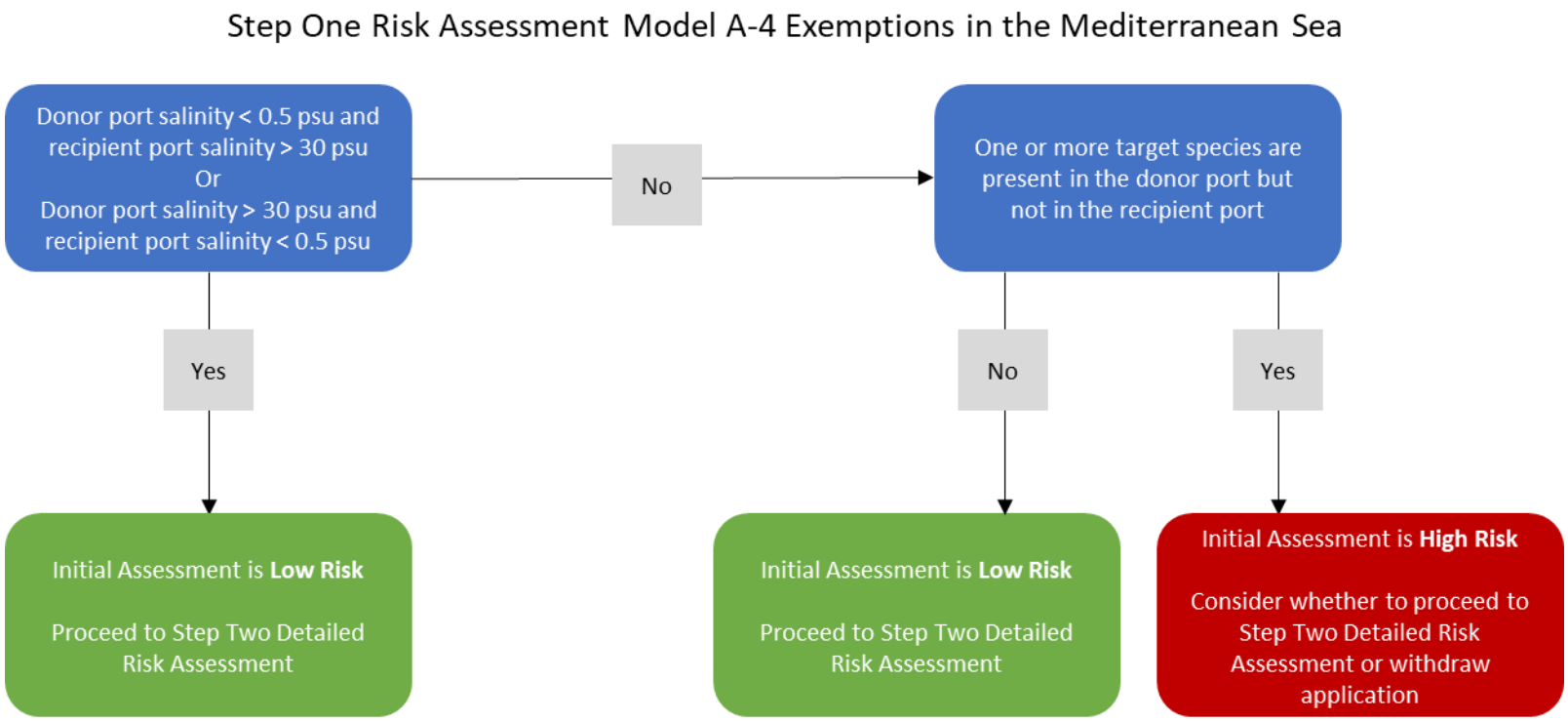

Figure 8. Risk assessment model for exemptions (step one).

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 I.a.i.1.a.i.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 I.a.i.1.a.i.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) or the European Alien Species Information Network (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 administrations 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[1] 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.

Risk Assessment Report

The risk assessment report, to be submitted to the port State administration 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.

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

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 administrations 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 administrations 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 Parties of the Barcelona Convention and the IMO 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 administrations and REMPEC.

4 Harmonised Procedure: Sediment Reception Facilities

4.1 Background and context

Article 5 of the BWM Convention includes that each Party undertakes to ensure that, in ports and terminals designated by that Party where cleaning or repair of ballast tanks occurs, adequate facilities are provided for the reception of sediments, and that such facilities shall operate without causing undue delay. Article 14(2) of the BWM Convention includes that Parties shall notify the IMO of the availability and location of reception facilities for ballast water and sediments.

The Guidelines for sediment reception facilities (G1)[1] provide guidance for the provision of facilities for the reception of sediments that are provided in accordance with Article 5 of the BWM Convention. The Guidelines (G1) recognise that some countries, areas, and ports have requirements relating to the disposal of waste materials from ships which may include sediment, and the guidelines are not intended in any way to replace or adversely impact any local or national requirements.

It is a general requirement that each sediment reception facility should provide the resources to enable, as far as practicable, their use by all ships wishing to discharge sediment from ballast water tanks.

Acknowledging that sediment reception facilities will be specialized, the Guidelines (G1) include factors that should be taken into account when considering the provision of a sediment reception facility, including, but not limited to:

- Relevant regional, national, and local legislation,
- Site selection
- Collection, handling, and transport of sediment,
- Sampling, testing and analysis of sediment,
- Storage of sediment and sediment conditions,
- Estimated required capacity (volume/weight) including moisture content of the sediment the facility will handle,
- Environmental benefits and costs,
- Proximity of available sites to local ballast tank cleaning and repair facilities,
- Effect on the environment of construction and operation of the facility,
- Training of facility staff,
- Equipment required to offload sediment from ships, such as cranes,
- Human health,
- Safety,
- Maintenance,
- Operational limitations, and
- Waterway access, approaches, and traffic management.

GloBallast Monograph 23: guidance on best management practices for sediment reception facilities under the BWM Convention[2] provides additional detail on these factors and examples of best management practices for shipyards with sediment reception facilities.

[1] IMO, 2006a.
[2] GEF-UNDP-IMO GloBallast Partnerships Programme and Florida Institute of Technology. 2017.

4.1.1 Mediterranean Sea context

BWM.2/Circ.35[1] and the Mediterranean BWM Strategy (2022 – 2027)[2] 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[3] 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 (Figure 1).

4.1.2 International and regional procedures for sediment reception facilities

According to the IMO's Global Integrated Shipping Information System (GISIS), 116 ports/terminals are registered as having sediment reception facilities in accordance with the BWM Convention. In the Mediterranean Sea, the Spanish Port of Barcelona reportedly has sediment reception facilities. Facilities are also registered in Canada, Denmark, Estonia, Germany, Latvia, Myanmar, Romania, Russian Federation, Saudi Arabia, and Ukraine.

Adriatic

According to GloBallast Monograph 23, best sediment management practices for ports and shipyards were developed as part of the Ballast water management system for Adriatic Sea protection project (BALMAS project), based on an evaluation of current sediment cleaning services in 24 shipyards in Italy, Slovenia, Croatia, Montenegro, and Albania. The BALMAS general guidelines were modified in GloBallast Monograph 23.

Türkiye

Türkiye's 2010 ballast water management national strategy[4] included a division of labour that assigns shipyard managers the responsibility of executing sediment reception from ships.

Singapore

Singapore requires shipowners, ship managers, operators, and ship masters to liaise directly with shipyards with cleaning or repair services for ballast water tanks for the use of ballast water sediment reception facilities[5].

[1] IMO, 2011.
[2] UNEP/MED, 2022
[3] IMO, 2012.
[4] Undersecretariat for Maritime Affairs of Türkiye, 2010.
[5] Maritime and Port Authority of Singapore, 2017

Australia

Australia's ballast water management requirements[1] prohibit the disposal of ballast tank sediment in Australia's Exclusive Economic Zone. Ships may discharge ballast tank sediment outside 200 nautical miles from nearest land and in waters at least 200 metres in depth or at an approved land-based facility.

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, relevant port State administrations 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 administrations 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.

[1] Australian Government, 2020.

5 Harmonised Procedure: Ballast Water Reporting

5.1 Background and context

The BWM Convention does not require Parties or ships to implement mandatory ballast water reporting. However, to guide implementation of the BWM Convention, the Guidelines for ballast water exchange (G6)[1] includes that, where a port State requires specific information regarding the management of ballast water on a ship bound for a port, offshore terminal or anchorage area in that port State, a completed ballast water reporting form may be submitted prior to entry into that port State in a timeframe required by that port State.

The Guidelines (G6) include a template ballast water reporting form.

Ballast water reporting can be useful to:

- Guide compliance and enforcement activities, including to target inspections,
- Build a dataset to allow administrations and scientists to evaluate the relevance and impact of regulations,
- Risk assess ballast water on incoming ships to determine if mitigating actions may be needed.

When considering implementing ballast water reporting, it is important to consider:

- Does the administration have legal power to require mandatory reporting,
- Does the administration, country or region have a system to collect and analyse reported information,

And, if reports will be used for compliance and enforcement purposes,

- Does the administration have officers available (including out of hours) to analyse and log information submitted and communicate with ships regarding the outcome of the analysis.

Any systems used to submit and receive pre-arrival reports should allow for the submission of reports from ships with poor internet connectivity.

Systems should also be compliant with any relevant privacy requirements associated with collecting and sharing the information. This equally applies if information is to be collected by an authority and stored nationally or regionally.

Ships without the ability to submit pre-arrival reports should also be considered. If a time window prior to arrival in which reports should be submitted is provided, this should allow sufficient time for the review and assessment of the information and communication with the ship.

Alternative options to mandatory reporting prior to each arrival, such as simple voluntary reporting or annual reporting, can also be useful.

Simple reporting would include minimal information on the ballast water management approach, whether the ballast water management system is working (if relevant), whether contingency measures have been implemented, and the expected volume and location of discharge. This approach has been implemented in Singapore.

[1] IMO, 2017b.

Annual reporting reduces the resource needs to assess and monitor incoming reports but still provides information to target arrivals for inspection, based on type of ballast water management used.

5.1.1 Mediterranean Sea context

The Mediterranean BWM Strategy (2022-2027) recommends that mandatory ballast water reporting in ports in the Mediterranean should be implemented to gather data from ships such as port of origin of ballast water, ballast water exchange records, any ballast water treatment regime, volume of treated or untreated water to be discharged, where and when the discharge is likely to take place.

The strategy notes that, while reporting at ports is to national port authorities, there should be a common reporting form and the information should be consolidated at the regional level.

5.1.2 International and regional procedures for ballast water reporting

In a review of ballast water reporting requirements in 2019, Lloyd's Register[1] found the following countries or regions had mandatory reporting for ballast water:

- Australia[2],[3]
- Bahrain (ROPME)
- Canada
- China
- Iraq (ROPME)
- Islamic Republic of Iran (ROPME[4])
- Israel
- Kuwait (ROPME)
- New Zealand
- Oman (ROPME)
- Peru
- Qatar (ROPME)
- Republic of Korea
- Saudi Arabia (ROPME)
- Ukraine
- United Arab Emirates (ROPME)
- United Kingdom
- United States

Whilst the following have either voluntary, or partially mandatory, ballast water reporting:

- Argentina[5]
- Brazil
- Croatia[6]
- India[7]

[1] Lloyd's Register, 2019.
[2] Australian Government, 2020.
[3] Available at: https://www.agriculture.gov.au/biosecurity-trade/aircraft-vessels-military/vessels/mars
[4] Regional Organisation for the Protection of the Marine Environment (ROPME) requires all ships passing the Strait of Hormuz to complete a regional ballast water reporting form.
[5] http://www.termap.com.ar/TermapWeb/Paginas_e/Download/Document%209.8%20Ballast%20water%20reporting%20form.pdf
[6] https://mmpi.gov.hr/UserDocsImages/arhiva/2007/060221-Prijava%20Dolaska-NOA-%20F.xls
[7] http://www.bwmindia.com/?q=node/8

- Mauritius[1]
- Singapore[2]
- Türkiye[3]

ROPME's regional ballast water reporting form is included in document MEPC 60/INF.2[4]. It is consistent with the example ballast water reporting form in the Guidelines (G6).

5.2 Harmonised procedure for ballast water reporting in the Mediterranean Sea

Ballast water reporting can provide Parties to the Convention of the Barcelona Convention with information to assist with compliance and enforcement efforts and risk assessment of ballast water on ships in the Mediterranean Sea.

However, in the absence of a centralised data storage system for reported data and without legal authority in all Parties to require mandatory reporting, voluntary ballast water reporting using a consistent form is encouraged.

The ballast water reporting form to be used is included in Section 5.2.1 Ballast water reporting form) and is consistent with the form in the Guidelines (G6). It should be kept in mind that, following the relevant decisions of MEPC 79, the example ballast water reporting form is to be updated, moved from the Guidelines (G6) and incorporated into yet-to-be-developed guidance on ballast water record-keeping and reporting under the BWM Convention that would also cover guidance on completing the Ballast Water Record Book and the voluntary ballast water log.

Ballast water reports submitted voluntarily should be analysed to risk assess incoming ballast water on ships. High risk ballast water is ballast water that, based on the information reported, has not been managed in accordance with the BWM Convention.

If ballast water on a ship is intended to be discharged and it is suspected, based on the report, that the ballast water has not been managed in accordance with the BWM Convention requirements, the administration should communicate with the ship owner/operator regarding any mitigation measures that should be implemented.

When national and regional data storage systems are developed, reports should be uploaded.

[1] https://blueconomy.govmu.org/Documents/Marine%20Notices/43a1of2008.pdf
[2] https://cdn.gac.com/prod/docs/SINGAPORE_Annex-A-Pre-Arrival-Notification-pc21-026.pdf
[3] https://www.rempec.org/en/knowledge-centre/online-catalogue/segment-3-bw-risk-assessment-system-a_-olgun.pdf
[4] IMO, 2009.

5.2.1 Ballast water reporting form

EXAMPLE BALLAST WATER REPORTING FORM

Date of Submission (DD/MM/YYYY):_____ Time of Submission (24:00 GST): _____ **AMENDED FORM: Yes ☐ No ☐**

1. SHIP INFORMATION	2. VOYAGE INFORMATION		3. BALLAST WATER USAGE AND CAPACITY		
Ship Name:	Arrival Port:				
IMO Number:	Arrival Date (DD/MM/YYYY):		Total Ballast Water on Board:		
Owner:	Agent:		Volume	Units	No. of Tanks and Holds in Ballast
Type:	Last Port:	Country:		m^3	
GT:	Next Port:	Country:	Total Ballast Water Capacity:		
Date of Construction (DD/MM/YYYY):	Next Port (2):	Country:	Volume	Units	Total No. of Ballast Tanks and Holds on Ship
Flag:	Next Port (3):	Country:		m^3	

4. BALLAST WATER MANAGEMENT

Total No. Ballast Water Tanks to be discharged: ☐

Of tanks to be discharged, how many: underwent exchange: ☐ were treated using a Ballast Water Management System: ☐

Please specify Ballast Water Management System used, if any (Manufacturer, Model):_____

If no Ballast Water Management conducted, state reason why not: _____

Approved Ballast Water Management plan on board? YES ☐ NO ☐ Management plan implemented? YES ☐ NO ☐

Ballast water record book on board? YES ☐ NO ☐

Does ship carry an International Ballast Water Management Certificate: YES ☐ NO ☐

Date of issue (DD/MM/YYYY): _____ Expiry Date (DD/MM/YYYY): _____

Authority that issued Certificate: _____ Place of issue: _____

Date Required to Meet Regulation D-2 (DD/MM/YYYY): _____

5. BALLAST WATER HISTORY: RECORD ALL TANKS/ HOLDS containing water taken on board to control trim, list, draught, stability or stresses of the ship, regardless of ballast water discharge intentions, on page 2. Note: BW Sources are the last BW uptakes prior to any Ballast Water Management practices.

6. RESPONSIBLE OFFICER'S NAME AND TITLE:

Ship Name IMO Number Arrival Date:

Tanks/Holds List multiple sources/ tanks separately	**TANK CAPACITY**	**BW SOURCES**		**CURRENT**	**BW MANAGEMENT PRACTICES**							**PROPOSED BW DISCHARGE**			
		DATE DD/MM/YYYY	PORT or LAT. LONG.	VOLUME (m^3)	DATE DD/MM/YYY	Start Point* Lat. & Long.	End Point* Lat. & Long.	VOLUME Used* (m^3)	% Exch*	METHOD (DM/SM/ FM, T)	SALINITY (PSU)	DATE DD/MM/YYYY	PORT or LAT. LONG.	VOLUME (m^3)	SALINITY (PSU)

Ballast Water Tank Codes: Forepeak = FP, Aftpeak = AP, Double Bottom = DB, Wing = WT, Topside = TS, Cargo Hold = CH, Other = O.
Methods: DM= Dilution, SM=Sequential, FM= Flow Through , T=Treatment.
Complete columns with (*) only if exchange was conducted.

***

6 Harmonised Procedure: Contingency Measures

6.1 Background and context

Contingency measure means a process undertaken on a case-by-case basis after a determination that ballast water to be discharged from a ship may not be compliant, to allow ballast water to be managed such that it does not pose any unacceptable risks to the environment, human health, property, and resources.

The Guidelines for Ballast water management and development of Ballast Water Management Plans (G4)[1] were amended in 2019 to include that the Ballast Water Management Plan (BWMP) may include contingency measures developed taking into account guidelines developed by the IMO.

The Guidance on contingency measures under the BWM Convention (BWM.2/Circ.62[2]) provides guidance to support ships and port States to apply sound and practical measures in the case of a ship unable to manage ballast water in accordance with its approved BWMP to meet the regulation D-1 or D-2 standards.

The guidance includes that the port State, the flag State and the ship should work together to agree on the most appropriate solution to allow for the discharge of ballast water found to be non-compliant. It is also noted that ships are required to do their best to correct any malfunction to a ballast water management system (BWMS) as soon as possible.

Contingency measures may be particularly relevant for ships operating in ports with water quality that is poorer than that used during the ship's BWMS type approval process.

In 2018 INTERTANKO released guidance to its members on practical contingency measures and the establishment of a standardised reporting procedure between the ship, company, port State and flag State[3]. The guidance provides a framework for reporting on inoperable BWMS and requesting the use of contingency measures from the port State, as well as providing model reporting forms to allow consistency and uniformity as well as example contingency measures for owners to consider including in their BWMP.

Meanwhile other countries, such as Singapore and Australia, have issued industry targeted guidance on contingency measures. The Australian Ballast Water Management Requirements[4] includes that ships installed with a BWMS and wishing to utilise a contingency measure should incorporate ship-specific contingency measures into the BWMP, noting that doing so does not permit a ship to discharge unmanaged ballast water in Australian waters. It also includes that the contingency measures and BWMP should be approved by a classification society.

6.1.1 Examples of contingency measures

The Guidance on contingency measures under the BWM Convention (BWM.2/Circ.62) provides a number of possible contingency measures, including:

- Actions predetermined in the Ballast Water Management Plan of the ship,

[1] MEPC.127(53) amended by MEPC.306(73); IMO, 2005 and 2019.
[2] IMO, 2017g.
[3] IMO, 2019.
[4] Australian Government, 2020.

- Discharging ballast water to another ship or to an appropriate shipboard or land-based reception facility, if available,
- Managing the ballast water or a portion of it in accordance with a method acceptable to the port State,
- Ballast water exchange carried out to an approved plan in accordance with regulation B-4 to meet the standard in regulation D-1. The ship and the port State should consider the potential disruption to the cargo handling operation plan of the ship and the potential impact to relating parties including port operators and cargo owners, or
- Operational activities such as modifying sailing or ballast water discharge schedules, internal transfer of ballast water or the retention of ballast water on board the ship. The port State and the ship should consider any safety issues and avoid possible undue delays.

The INTERTANKO guidance on contingency measures for tankers also describes a number of possible contingency measures, including:

- Repair BWMS at the ballast loading port,
- Repair BWMS *en route* [although it should be noted that fixing the BWMS *en route* may not necessarily fix the issue of untreated ballast water],
- Ballast water exchange mid-ocean without BWMS,
- Ballast water exchange mid-ocean through the BWMS,
- Ballast water exchange in a designated ballast water exchange area,
- Shore based mobile treatment systems at the ballast discharge port,
- Discharge to a port reception facility at the ballast discharge port,
- Retain ballast water on board,
- Use water from a public water supply, and
- Partial ballast water discharge at 12 nautical miles from the nearest land (in the United States only).

6.2 Harmonised procedure for contingency measures in the Mediterranean Sea

In the case of potentially non-compliant ballast water in the Mediterranean Sea, 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 administration 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 administration where the ballast water is intended to be discharged, in the form of a 'Ballast Water Contingency Measure Request Form' (Section 6.2.1). 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.

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)[1] 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.

[1] IMO, 2017d.

6.2.1 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: _____

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)

7 Harmonised Procedure: Additional Measures

7.1 Background and context

Regulation C-1 of the BWM Convention provides that Parties may require ships to meet a specified standard or requirement if it determines that measures in addition to the requirements of the BWM Convention are necessary to prevent, reduce or eliminate the transfer of harmful aquatic organisms and pathogens (HAOP) through ships ballast water and sediments.

In accordance with regulation C-1.3, a Party or Parties intending to introduce additional measures shall:

- Take into account guidance developed by the IMO,
- Communicate their intention to the IMO at least 6 months, except in emergency situations, prior to the projected date of implementation of the additional measure, including:
    - The precise coordinates where additional measures is/are applicable,
    - The need and reasoning for the application of additional measures,
    - A description of the additional measures, and
    - Any arrangements that may be provided to facilitate ships' compliance with the additional measure(s),
- To the extent required by international law, as appropriate, obtain the approval of the IMO.

Regulation C-1.2 includes that, prior to establishing any additional measures, a Party or Parties should consult with adjacent or other States that may be affected by such standards or requirements.

The Guidelines for additional measures regarding ballast water management including emergency situations (G13)[1] provide guidance under regulation C-1 for use when determining if additional measures are necessary.

The guidelines state that a Party, or Parties, may require ships, in accordance with international law, to meet or exceed a specified standard or requirement. Before a Party intends to introduce additional measures, it should assess the need for and nature of the measures and the character of the concern. The additional measure(s) should be clearly identified and the economic consequences resulting from the additional measure(s) should be taken into account. The guidelines also provide procedures to follow when establishing additional measures.

Article 7(2) of the BWM Convention includes that a Party implementing the BWM Convention shall not require additional survey and certification of a ship of another Party, nor shall the Administration of the ship be obligated to survey and certify additional measures imposed by another Party. Verification of such additional measures shall be the responsibility of the Party implementing such measures and shall not cause undue delay to the ship.

[1] IMO, 2007.

7.1.1 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.

7.2 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 7.2.1)
Step 2: Identification (Section 7.2.2)
Step 3: Effects and consequences (Section 7.2.3)
Step 4: Consultation (Section 7.2.4)
Step 5: Submission for approval or notification (Section 7.2.5)
Step 6: Communication of information (Section 7.2.6)

7.2.1 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?

7.2.2 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.

7.2.3 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.

7.2.4 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.

7.2.5 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.

7.2.6 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.

8 Harmonised Procedure: Warnings

8.1 Background and context

Regulation C-2 of the BWM Convention (Warnings concerning ballast water uptake in certain areas and related flag State measures) includes that a Party shall endeavour to notify mariners of areas under their jurisdiction where ships should not uptake ballast water due to known conditions.

Warnings may be issued for areas:

- Known to contain outbreaks, infestations or populations of HAOP which are likely to be of relevance to ballast water uptake or discharge,
- Near sewage outfalls, or
- Where tidal flushing is poor or times during which a tidal stream is known to be more turbid.

In addition to notifying mariners, the Party shall notify the IMO and any potentially affected coastal States.

8.2 Harmonised procedure for issuing warnings in the Mediterranean Sea

Administrations 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 (as outlined in Section 8.1). 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.

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

9 References

Australian Government, 2018. Guidelines for the development and validation of assays for marine pests. Australian Government Department of Agriculture and Water Resources. guideline-development-validation-assays-marine-pests.pdf (marinepests.gov.au)

Australian Government, 2020. Australian ballast water management requirements. Version 8. Available online at: https://www.agriculture.gov.au/sites/default/files/documents/australian-ballast-water-management-requirements.pdf

Awad, A., Haag, F., Anil, A.C., and Abdulla, A. 2014. GEF-UNDP-IMO GloBallast Partnerships Programme, IOI, CSIR-NIO and IUCN. Guidance on Port Biological Baseline Surveys. GEF-UNDP-IMO GloBallast Partnerships, London, UK. GloBallast Monograph No. 22. Available online at: https://archive.iwlearn.net/globallast.imo.org/wp-content/uploads/2015/11/Mono22_English.pdf

BIMCO, 2019. China and South Korea agree on ballast water exchange rules. Available online at: China and South Korea agree on ballast water exchange rules (bimco.org)

David, M. and Gollasch, S. 2016. Ballast water management options for vessels. In book: Ballast water management system for Adriatic Sea protection (BALMAS) (p.77). Available online from: https://www.researchgate.net/publication/313115533_Ballast_water_management_options_for_vessels

GEF-UNDP-IMO GloBallast Partnerships Programme and Florida Institute of Technology. 2017. Guidance on Best Management Practices for Sediment Reception Facilities under the Ballast Water Management Convention. GloBallast, Monograph No. 23.

Hansen, F. T., & Christensen, A. 2018. Same Risk Area Case-study for Kattegat and Øresund. Final report. DTU Aqua Report, No. 335-2018. Available online at: Same Risk Area Case-study for Kattegat and Øresund. Final report — Welcome to DTU Research Database

HELCOM-OSPAR, 2020a. Joint Harmonised Procedure for the Contracting Parties of HELCOM and OSPAR on the granting of exemptions under International Convention for the Control and Management of Ships' Ballast Water and Sediments, Regulation A-4. Adopted as OSPAR Agreement 2013-09 and by HELCOM Ministerial Meeting Copenhagen 3 October 2013 Amended by HELCOM HOD 48-2015 (June) and OSPAR Agreement 2015-01 and HELCOM HOD 59-2020 and OSPAR Agreement 2020-01. https://helcom.fi/wp-content/uploads/2021/01/HELCOM-OSPAR-Joint-Harmonized-Procedure-for-BWMC-A-4-exemptions_2020.pdf

HELCOM-OSPAR, 2020b. Designation of Oresund as a Same Risk Area (SRA). Presented by Sweden and Denmark. JTG-Ballast 20/08/01. Available online at: https://portal.helcom.fi/meetings/TG%20BALLAST%2011-2020-763/MeetingDocuments/0801_Designation%20of%20%C3%96resund%20as%20a%20Same%20Risk%20Area%20(SRA).pdf

IMO, 2005. Resolution MEPC.127(53). Guidelines for ballast water management and development of Ballast Water Management Plans (G4). Available online at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.127(53).pdf. The Guidelines were amended by resolution MEPC.306(73). Available online at:
https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.306(73).pdf

IMO, 2006. Resolution MEPC.151(55). Guidelines on designation of areas for ballast water exchange (G14). Available online at:

https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.151(55).pdf

IMO, 2006a. Resolution MEPC.152(55). Guidelines for sediment reception facilities (G1). Available online at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.152(55).pdf

IMO, 2007. Resolution MEPC.161(56). Guidelines for additional measures regarding ballast water management including emergency situations (G13). Available online at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.161(56).pdf

IMO, 2009. MEPC 60/INF.2. Implementation of ballast water exchange area outside the ROPME special area. Submitted by ROPME/MEMAC.

IMO, 2011. BWM.2/Circ.35. Communication received from the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC): Harmonized voluntary arrangements for ballast water management in the Mediterranean Region.

IMO, 2012. BWM.2/Circ.39. Communication received from the Administration of Croatia: General guidance on the voluntary interim application of the D1 ballast water exchange standard by vessels operating between the Mediterranean Sea and the North-East Atlantic and/or the Baltic Sea.

IMO, 2012a. Resolution MEPC.209(63). 2012 Guidelines on design and construction to facilitate sediment control on ships (G12). https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.209(63).pdf)

IMO, 2015. BWM.2/Circ.56. Communication received from the Government of the Netherlands: Notification on ballast water exchange areas in the North Sea.

IMO, 2016. MEPC 70/INF.21. Same risk area approach to exemptions under regulation A-4 of the Ballast Water Management Convention. Submitted by Singapore.

IMO, 2017. MEPC 71/4/24. Proposed amendments for the inclusion of the same risk area concept to risk assessment in the Guidelines (G7). Submitted by Belgium, Denmark, Singapore and INTERFERRY.

IMO, 2017b. Resolution MEPC.288(71). 2017 Guidelines for ballast water exchange (G6). https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.288(71).pdf

IMO, 2017c. Resolution MEPC.289(71). 2017 Guidelines for risk assessment under regulation A-4 of the BWM Convention (G7). Available online at: https://archive.iwlearn.net/globallast.imo.org/wp-content/uploads/2015/01/G7-GUIDELINES-FOR-RISK-ASSESSMENT-UNDER-REGULATION-A-4-OF-THE-BWM-CONVENTION.pdf

IMO, 2017d. Resolution MEPC.290(71). The experience-building phase associated with the BWM Convention. Adopted on 7 July 2017. MEPC 71/17/Add.1, Annex 12.

IMO, 2017e. Resolution MEPC.297(72). Amendments to the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004. Amendments to regulation B-3 (Implementation schedule of ballast water management for ships). Available online at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.297(72).pdf

IMO, 2017f. BWM.3/Circ.1. Communication received from the Government of Australia: Australia's implementation of the BWM Convention and ballast water exchange requirements.

IMO, 2017g. BWM.2/Circ.62. Guidance on contingency measures under the BWM Convention.

IMO, 2017h. BWM.2/Circ.63. Application of the Convention to ships operating in sea areas where ballast water exchange in accordance with regulations B-4.1 and D-1 is not possible.

IMO, 2018. MEPC 73/INF.8. Ballast water contingency measures for tankers. Submitted by INTERTANKO.

IMO, 2019. Ballast Water Management Convention and BWMS Code with guidelines for implementation. 2018 Edition. Supplement, December 2019.

IMO, 2022. MEPC 78/4/5. Designation of a Same Risk Area in Öresund between Sweden and Denmark. Submitted by Denmark and Sweden.

Katsanevakis, S. and others. 2014. Invading the Mediterranean Sea: Biodiversity patterns shaped by human activities. Frontiers in Marine Science. Available online at: https://www.frontiersin.org/articles/10.3389/fmars.2014.00032/full

Knight, E., Barry, S., Summerson, R., Cameron, S and Darbyshire, R. 2007. Designated exchange areas project – providing informed decisions on the discharge of ballast water in Australia (Phase 2). Australian Government Bureau of Rural Sciences. Available online at: https://www.researchgate.net/publication/266529915_Designated_Exchange_Areas_Project_-_Providing_informed_decisions_on_the_discharge_of_Ballast_Water_in_Australia_Phase_2

Lloyd's Register, 2019. National Ballast Water Management Requirements. Available online at: https://maritime.lr.org/l/941163/2022-01-13/2tdzw/941163/1642095304fcokrquv/lr_s_national_ballast_water_management_requirements_22.03.19.pdf

Maritime and Port Authority of Singapore, 2017. Port Marine Notice No. 120 of 2017. Available online at: pn17-120.pdf (marintech.sg)

Rak, G. 2016. Legal and policy aspects relevant for the ships' ballast water management in the Adriatic Sea Area. BALMAS Project Final Report. Rapporto ISPRA 250/2016, pp. 64.

Spalding, M, Fox, H & others. 2007. Marine ecoregions of the world: A bioregionalization of coastal and shelf areas. BioScience (57(7): 573 – 583). Available online at: Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas | Publications | WWF (worldwildlife.org)

Staur-Lauridsen, F., Drillet, G., Thorbjorn Hansen, F. and Saunders, J. 2018. Same Risk Area: An area-based approach for the management of bio-invasion risks from ships' ballast water. Marine Policy 97 (147-155).

Wang, Z., Saebi, M., Grey, E.K., Corbett, J.J., Chen, D., Yang, D. and Wan, Z. 2022. Ballast-water mediated species spread risk dynamics and policy implications to reduce the invasion risk to the Mediterranean Sea. Marine Pollution Bulletin 174 (113285). Available from: https://www.sciencedirect.com/science/article/pii/S0025326X21013199

Undersecretariat for Maritime Affairs of Türkiye, 2010. National Ballast Water Management Strategy for Türkiye. Available online at: https://archive.iwlearn.net/globallast.imo.org/wp-content/uploads/2015/03/Turkey-Ballast-Water-Management-National-Strategy.pdf

UNEP/MED, 2022. Ballast Water Management Strategy for the Mediterranean Sea (2022-2027). Decision IG.25/17. Available online at: https://wedocs.unep.org/bitstream/handle/20.500.11822/37139/21ig25_27_2517_eng.pdf

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[1].

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,

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

- Duration and timing of free-swimming stages,
- 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.

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[1], 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.

[1] 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 administrations for the donor port and the recipient port, based on the Protocol for Identifying Target Species (Appendix A). 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 administrations 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[1].

[1] Australian Government, 2018.

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 solution (0.25 – 0.5 cm^3/100 cm^3 sample) and placed in a cooler for transport[1].
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 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.	

[1] Preservation guidance may be given by the analyzing laboratory.

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)[1]:

- 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.

[1] 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		

***