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RAPPORTI

Legal and Policy Aspects Relevant for the Ships' Ballast Water Management in the Adriatic Sea Area

BALMAS Project Final Report

The project is co-funded by the European Union, Instrument for Pre-Accession Assistance

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Rapporti 250/2016

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CONTENTS

PREFACE: THE CHALLENGE OF BALLAST WATER MANAGEMENT IN THE ADRIATIC SEA AND THE BALMAS PROJECT

The United Nations had recognized the transfer of Harmful Aquatic Organisms and Pathogens (HAOPs) across natural barriers as one of the greatest pressures the world's oceans and seas are subject to, causing global environmental changes, threatening human health, property and resources. Among the main human activities that unintentionally transfer HAOPs is international shipping i.e. the ships' uptake and discharge of ballast water, a routine operation carried out to guarantee stability and maneuverability.

The possible damages caused by the discharge at sea of ballast water containing HAOPs are likely to be more dramatic if considering the characteristic of the recipient environment. In the Adriatic Sea, a semi-enclosed basin wedged within the Mediterranean Sea, there is a huge and increasing volume of shipping that coexists with vulnerable ecosystems as well as with significant economies that are highly dependent on its good environmental status. This biological form of pollution may impair the environment, human health, tourism, fisheries and other uses and values of the sea, affecting the development of densely populated coastal areas.

Taking account of these considerations, the European Union and IPA-participating countries have identified protection from ballast water pollution among the strategic priorities for funding under the IPA Adriatic Cross-Border Cooperation Programme and, in 2012, the BALMAS project "Ballast Water Management System for Adriatic Sea Protection" received financial assistance. The BALMAS project activities focus on the development of knowledge and tools, including the establishment of links between experts and national authorities, supporting a common Adriatic cross-border system for the control and management of risks deriving from the introduction of HAOPs. Such system would facilitate the development of consistent measures and coherent policy responses for the entire basin.

Currently, the global legal regime for the control and management of ships' ballast water hinges upon the entry into force of the 2004 International Convention on the Control and Management of Ships' Ballast Water and Sediments (hereinafter, the BWM Convention), as complemented by a number of international guidance documents. Pending the entry into force of these global obligations,[1] States have approved national measures on ballast water management or have developed regional policies acting through international organizations. In the Adriatic Sea, three bordering States ratified the BWM Convention and approved legislative acts on the matter while other Adriatic countries already set administrative arrangements in light of the forthcoming global standards.

A specific work package of the BALMAS project (No. 9) focused on the existing legal and policy framework in order to identify the main challenges that the Adriatic States would have to address in the implementation of the BWM Convention and in the use of the main project outputs. A number of recommendations in this regard are reproduced in the present report. Furthermore, a hardback book collecting relevant legal texts is available for specific training on legal and policy aspects of the control and management of ballast water in the Adriatic Sea region.[2]

1 Entry into force is expected on September 8, 2017.

2 See RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* BALMAS Project Final Report, Documenti Tecnici ISPRA, pp. 535. An electronic version of the book is downloadable from the project website (http://www.balmas.eu) or from the ISPRA website (http://www.isprambiente.gov.it/en/publications/technical-documents/control-and-management-of-ships2019-ballast-water-in-the-adriatic-sea-region.-a-collection-of-legal-texts?set_language=en).

1. INTRODUCTION: ASPECTS CONSIDERED BY THE REPORT

Achieving compliance with legal obligations can be generally considered as a result of multiple factors. The "quality" of the rules is indeed important, though the compliance challenge is strictly linked with the State's capacity of implementing, monitoring and enforcing them. When local problems are in the first instance governed by international regulations - as is in the case of the control and management of ships' ballast water - the implementation challenge has specific characteristics and requires an increased effort to deliver concrete results.

Modern law is constituted of rules and obligations pertaining to multiple legal systems. In the case of the Adriatic region, international customary law, global treaties, Mediterranean agreements and European Union legislation are of relevance in shaping the national legal regimes, according to the sovereign decisions of each bordering State. Moreover, when the protection of the marine environment from pollution deriving from international shipping is at stake, different "sectors" of law coexist, even though, in this case, environmental law normally gives way to relevant global rules and standards as established within the International Maritime Organization (hereinafter, IMO) as the competent international organization.[3]

The concerns and risks for the marine environment (as well as for other sea uses) deriving from the introduction of "invasive", "non-indigenous", "alien" or otherwise "harmful" aquatic species and organisms are relevant for different international, European and national legal documents.[4] As international shipping is among those activities that may cause the transfer of these species through the uptake and discharge of the vessels' ballast water, in 2004 global rules on the control and management of ships' ballast water were agreed upon as BWM Convention, facilitated by the IMO. In parallel to developments in the maritime sector, the States' cooperation on environmental matters has produced declarations, agreements and legislation on the presence of non-indigenous or invasive marine species, further developing international law. Even if these legal materials are not directly referred to the ships' operations, they are still of relevance and could play an important role in terms of helping the implementation of the ballast water management global regime in the Adriatic Sea region.

The main relations between these different legal acts have been explored in this report, structured according to the legal and policy levels concerned: paragraph 2 is focused on the global context, paragraph 3 on the Mediterranean and Adriatic cooperation, while paragraph 4 is devoted to the policies and legislation of the European Union. A screening of national legislations has been carried out as a part of the project activities and the methodology used to gather national information is described in paragraph 5, although national approaches have not been the focus of this report. The Adriatic Sea basin would benefit from a joint cross-border system for ballast water management that would mean consistent national decisions as well as a renewed sub-regional dialogue. To this end, this report includes specific recommendations concerning the main challenges identified for the implementation of global obligations in the Adriatic region as well as for the use of the BALMAS project outputs (paragraph 6).

As regards the methodology followed in finalizing this report, a draft version has been circulated to the partners as well as to the project's Reference User and Advisory Group (RUAG) and comments received have been incorporated in the final version.[5]

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3 On the role of the IMO's Marine Environment Protection Committee see LA FAYETTE L. (2001). *The Marine Environment Protection Committee: The Conjunction of the Law of the Sea and International Environmental Law,* in The International Journal of Marine and Coastal Law, 16(2), pp. 155-238.

4 For an updated list of legal materials relevant for Adriatic countries see RAK G., DE VENDICTIS G. (2015). *Annotated list of BWM relevant international, European and local regulations and policies. Review*. BALMAS project. Work Package 9, Activity 1, pp. 44.

5 The BALMAS project partners are: Institute for Water of the Republic of Slovenia (SLO) (coordinator); Italian Ministry of Infrastructure and Transport - Coast Guard Headquarters (I); Italian National Institute for Environmental Protection and Research (ISPRA) (I); Marine Research Centre Foundation (I); National Research Council (CNR) (I); National Institute of Oceanography and Experimental Geophysics (OGS) (I); Ministry of the Maritime Affairs, Transport and Infrastructure (HR); University of Dubrovnik (HR); Institute of Oceanography and Fisheries (HR); Rudjer Boškovic Institute – Center for Marine Research (HR); Mare Nostrum (HR); National Institute of Biology (SLO); Faculty of Civil Engineering University of Mostar (BH); Maritime Safety Department (MNE); University of Montenegro (MNE); Agriculture University of Tirana (AL). Associated partners are: Italian Ministry of Environment, Land and Sea (I); Marche Region (I); Environment Protection Agency of the Friuli-Venezia Giulia Region (ARPA FVG) (I); Croatian Environment Agency (HR); Ministry of Agriculture and the Environment (SLO); Ministry of Sustainable Development and Tourism (MNE); Interinstitutional Maritime Operational Centre (AL). Members of the RUAG are: Sarah Bailey, Michael Kennedy, Jan Linders, Markus Helavuori.

2. THE BALLAST WATER MANAGEMENT CONVENTION AND THE WIDER GLOBAL FRAMEWORK

2.1. The BWM Convention regime: main provisions and related international guidance

The transfer of Harmful Aquatic Organisms and Pathogens (hereinafter, HAOPs) represents a major threat for aquatic ecosystems as well as for other legally protected interests and uses of the sea. Shipping is a major pathway for introducing such organisms into marine environments and risks are increasing along with the expanding volumes of international and domestic ship borne trade. Since 1993, the international community has committed to the adoption of global standards and procedures on the matter, facilitated by the IMO, the agency, within the UN system, specialized in international shipping and maritime issues.[6] The text of the International Convention for the Control and Management of Ships´ Ballast Water and Sediments was eventually adopted in London on the 13th of February 2004, aiming at preventing and minimizing the spread of HAOPs.

As for many other global instruments on shipping matters, the global obligations laid down in the BWM Convention refer to further international guidance. The extensive cooperation of States within the IMO's Marine Environment Protection Committee (hereinafter, MEPC) while smoothing constrains in the implementation of standards has thus far resulted in a vast amount of legal materials. At the time of publishing this report, 14 guidelines, 7 resolutions and more than 40 circulars have been adopted by the IMO, some of them being currently under review (i.e. G8 Guidelines).[7]

Notwithstanding this notable international process, the BWM Convention's entry into force is still pending. The conditions set to this end (12 months after the ratification by 30 States, representing 35 per cent of world merchant shipping tonnage) have been met during the publication of this report.[8] Several factors have delayed the efficacy of the new rules, among which were the technical complexity of implementation and the extent of the investments that the shipping industry would have to make, including in many cases the fundamental retrofitting of ships. There are still some open issues and the position of that part of the shipping industry that has already invested in on-board ballast water management treatment systems which might be considered non-compliant should be considered. With IMO Resolution A.1088(28) States have shared a new schedule for the enforcement of the BWM Convention's discharge standards and a draft amendment to the convention text has been discussed by the MEPC.[9]

The BWM Convention consists of 22 articles and an Annex containing Regulations for the Control and Management of Ships' Ballast Water and Sediments. Regulations are organized into sections, from A to E. Two Appendixes show standard formats of the International Ballast Water Management Certificate and of the Ballast Water Record Book. The BWM Convention structure and correspondent guidelines are outlined in Fig. 1 (see next page). The main Parties' obligations according to the BWM Convention are summarized below.

Relevant definitions. According to the BWM Convention (Article 1):

"Harmful Aquatic Organisms and Pathogens" means aquatic organisms or pathogens, which, if introduced into the sea including estuaries, or into fresh water courses, may create hazards to the environment, human health, property or resources, impair biological diversity or interfere with other legitimate uses of such areas.

"Ballast Water" means water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the ship, while "Ballast Water Management" means mechanical, physical, chemical, and biological processes, either singularly or in combination, to remove, render harmless, or avoid the uptake or discharge of HAOPs within Ballast Water and Sediments.

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6 In 1991, the IMO's Marine Environment Protection Committee began the process of creating the framework of regulations, which would become the BWM Convention. For the purpose of addressing the transfer of HAOPs, in 1993 the IMO Assembly adopted Resolution A.774(18) followed, in 1997, by Resolution A.868(20) containing "Guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens".

7 For the consultation of relevant texts see RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* cit.

8 As happens for all shipping-related multilateral agreements, conditions set for its entry into force are linked not only to the number of ratifying States but also to the percentage of world tonnage that these States represent. On September 8, 2016, the Contracting Parties to the BWM Convention reached the number of 52, representing the 35.1441% of the world's merchant fleet. The convention will therefore enter into force on September 8, 2017.

9 IMO Resolution A.1088(28) adopted on 4 December 2013 concerning the "Application of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004". For the text see RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* cit. For the draft amendments see the relevant decision adopted by the 69th Session of the Marine Environment Protection Committee, held in London, 18-22 April 2016.

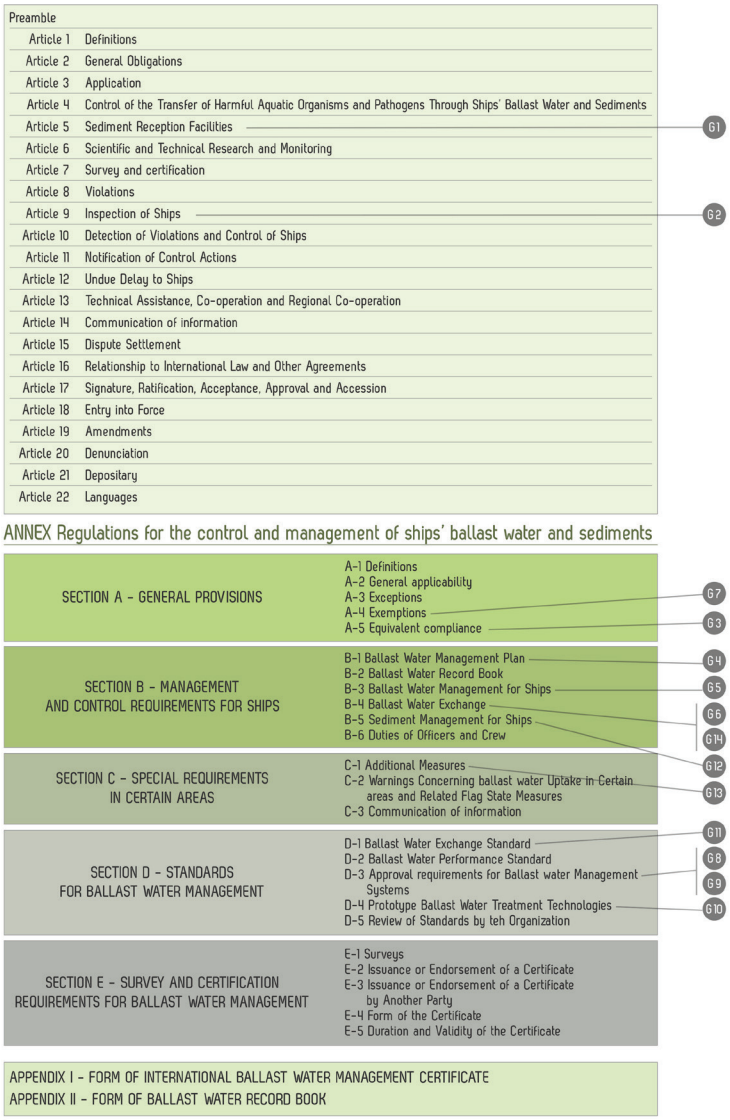

Fig. 1 *The BWM Convention structure and correspondent IMO Guidelines*

"Ship" means a vessel of any type whatsoever operating in the aquatic environment and includes submersibles, floating crafts, floating platforms, FSUs and FPSOs.

"Administration" means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly a flag of any State, the Administration is the Government of that State. With respect to floating platforms engaged in exploration and exploitation of the sea-bed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of its natural resources, including Floating Storage Units and Floating Production Storage and Offloading Units, the Administration is the Government of the coastal State concerned.

General obligations. Parties to the BWM Convention undertake to give full and complete effect to its provisions, including those in the Annex, in order to prevent, minimize and ultimately eliminate the transfer of HAOPs through the control and management of ships' ballast water and sediments. Parties should also ensure that ballast water management practices do not cause greater harm than they prevent to their environment, human health, property or resources, or those of other States. States shall encourage ships to avoid as far as practicable, the uptake of HAOPs (Article 2).

State Parties may adopt, individually or jointly, more stringent measures on the control and management of ships' Ballast Water and Sediments aiming at preventing, reducing or eliminating the transfer of HAOPs, provided that such measures are consistent with international law. Parties shall also endeavor to cooperate under the auspices of the IMO to address threats and risks to sensitive, vulnerable or threatened marine ecosystems and biodiversity in areas beyond the limits of national jurisdiction in relation to Ballast Water Management (Article 2).

Each Party shall require ships entitled to fly its flag or operating under its authority to comply with the convention requirements and shall develop national policies, strategies or programmes for ballast water management in its ports and in waters within its jurisdiction, promoting the attainment of the objectives of the convention (Article 4).

Exceptions to the application of the BWM Convention. The BWM Convention does not apply to certain types of ships (Article 3). Among these, are:

- Ships of a Party operating only in waters under the jurisdiction of the same Party, unless the ballast water discharges would impair or damage those waters or those of an adjacent State (Art. 3.2.b),
- Ships flying a foreign flag and operating only in waters under the jurisdiction of a Party and subject to its authorization, unless the ballast water discharges would impair or damage these waters or those of an adjacent State (Art. 3.2.c),
- Ships authorized by a Party to operate only between its waters of jurisdiction and the high seas, unless the ballast water discharges would impair or damage those waters or those of an adjacent State (Art. 3.2.d).

Additionally, the Annex (Regulation A-3) establishes a number of exceptions to the implementation of certain ballast water requirements on ships (e.g. Regulation B-3 standards, more stringent measures and any special requirement for specific areas), in particular for:

- Ballast water operations necessary for the safety of a ship or in case of emergencies;
- Under certain conditions, accidental discharges following damage to a ship or to equipment;
- Ballast water operations used for avoiding or minimizing pollution incidents;
- The uptake and discharge in the high seas of the same ballast water;
- The uptake and discharge of ballast water at the same location, without any mixing with other waters.

The Ballast Water Exchange Standard (D-1). The Ballast Water Exchange Standard (Regulation D-1) requires ships to exchange a minimum of 95% of their ballast water volume. Depending on the ballast capacity and on the age of the ship, the standard will apply until a certain date, after which the ship shall comply with the Ballast Water Performance Standard (D-2).[10]

Ships shall undertake ballast water exchange at least 200 nm from the nearest land and in water depths of at least 200 m, taking into account the relevant Guidelines (G6) (Regulation B-4). When the ship is unable to comply with these requirements, the exchange shall be conducted at least 50 nm from the nearest land and in water at least 200 m in depth. In areas where the depth and distance requirements cannot be met, the port State may designate areas for ballast water exchange in consultation with adjacent or other States, taking into account related Guidelines (G14). A ship shall not be required to substantially deviate from its intended voyage or to delay the voyage unless to comply with these areas.

The Ballast Water Performance Standard (D-2) and possible amendments. The Ballast Water Performance Standard (Regulation D-2) requires concentrations of viable organisms in ships' ballast water below specified limits (Fig. 2). Depending on their ballast water capacity and age, ships will have to comply with the performance standard by scheduled dates.

The IMO MEPC is required (Regulation D-5) to undertake no later than three years to the earliest effective date and on a periodical basis, in view to propose possible amendments of the Annex or recommendations, a review including a determination of whether appropriate technologies are available to achieve the standard, an assessment of related socio-economic effect(s) as well as an assessment of a number of criteria including safety considerations, environmental acceptability, cost effectiveness, practicability and biological effectiveness in terms of removing, or otherwise rendering inactive HAOPs in ballast water.

QUANTITY OF ORGANISMS	DIMENSION OF ORGANISMS
< than 10 viable organisms per cubic metre	≥ to 50 micrometres in minimum dimension
< than 10 viable organisms per millilitre	< to 50 micrometres in minimum dimension and ≥ to 10 micrometres in minimum dimension

AND

Discharge of the indicators microbes shall not exceed:

1. Toxicogenic *Vibrio cholerae* (01 and 0139) with less than 1 colony forming unit (cfu) per 100 millilitres or less than 1 cfu per 1 gram (wet weight) zooplankton samples
2. *Escherichia coli* less than 250 cfu per 100 millilitres
3. Intestinal Enterococci less than 100 cfu per 100 milliliters

Fig. 2 *Ballast Water Performance Standard according to Regulation D-2*

SHIP'S AGE	BALLAST WATER CAPACITY	STANDARD TO BE MET	WHEN
Constructed before 2009[1]	Between 1,500m³ and 5,000m³	D-1 or D-2	Until 2014*
		D-2	After 2014*
	Less than 1,500 m³ or greater than 5,000 m³	D-1 or D-2	Until 2016*
		D-2	After 2016*
Constructed in or after 2009	Less than 5,000 m³	D-2	*
Constructed in or after 2009 but before 2012	5,000 m³ or more	D-1 or D-2	Until 2014*
		D-2	After 2014*
Constructed in or after 2012	5,000 m³ or more	D-2	*

Fig. 3 *Ballast water management for ships according to Regulation B-3*

The phase-in of the standards and other management methods. Ships have to carry out ballast water management according to the D-1 and D-2 standards depending on their ballast water capacity and their age (Regulation B-3). The standards phase-in schedule for existing ships is shown in Fig. 3, currently under renegotiation. Other ballast water management methods may also be accepted as alternatives provided that they ensure at least the same level of protection to the environment, human health, property or resources, and are approved in principle by IMO's Marine Environment Protection Committee (MEPC).

10 Even if the BWM Convention does not refer to any guidelines in this respect, the MEPC identified the need for additional guidance on design and construction standards for ships conducting ballast water exchange according to D-1, currently included in the G11 Guidelines.

Technologies for ballast water treatment. In order to comply with the Ballast Water Performance Standard, the ballast water management systems installed on board ships must be approved by the Administration taking into account relevant guidelines (G8) (Regulation D-3).[11] When systems make use of active substances, they shall be approved by the IMO by following a specific procedure and according to relevant guidelines (G9).[12] Ships participating in a programme approved by the Administration to test and evaluate Prototype Ballast Water Treatment Technologies taking into account relevant guidelines (G10), have a leeway of five years before having to comply with the ballast water standards (Regulation D-4).

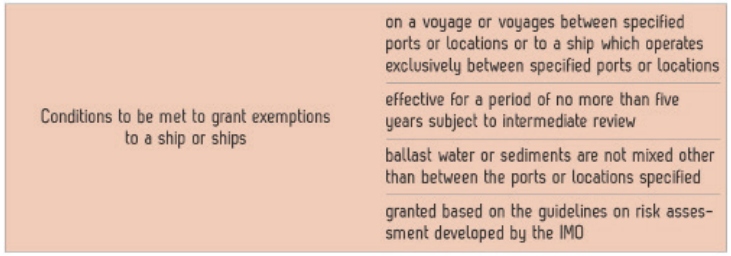

Fig. 4 *Conditions for exemptions according to Regulation A-3*

Exemptions to the application of the BWM Convention requirements. Parties may exempt ships in waters under their jurisdiction from the application of the standards and of other special requirements (Regulation A-4). Exemptions may be granted only on voyages between specified ports or locations or to ships operating exclusively between specified ports or locations, based on the relevant guidelines on risk assessment (G7). Exemptions become effective after communication to the IMO and the circulation of relevant information to the Parties. Exemptions shall not be effective for more than 5 years subject to intermediate review and shall not impair or damage environment, human health, property or resources of adjacent or other States. Any State that the Party determines may be adversely affected shall be consulted, with a view to resolving any identified concerns.

The Ballast Water Management Plan. Each ship shall have on board and implement a Ballast Water Management Plan (Regulation B-1) which details actions and procedures specific to each ship regarding the actions to be taken to implement the ballast water management requirements and relevant practices. The ships' plan shall be approved by the Administration taking into account relevant guidelines (G4).

The Ballast Water Record Book. Each ship shall have on board a Ballast Water Record Book, either electronic or integrated into another record book or system, containing at least the information specified in Appendix II of the BWM Convention's Annex, where each operation concerning ballast water has to be fully recorded (Regulation B-2).

Survey and certification requirements. Administrations shall ensure that ships of 400 gross tonnage and above are surveyed at specified intervals to verify compliance with relevant BWM Convention provisions (Regulation E-1). After successful completion of surveys, ships are issued a certificate that shall not exceed 5 years of duration, drawn up in the form set forth by the convention (Appendix I) and subject to certain conditions of validity (regulations E-2, E-3, E-4, E-5).

Sediment management. Ships shall remove and dispose sediments from spaces designated to carry ballast water in accordance with the ship's Ballast Water Management Plan (Regulation B-5). The newest ships should be designed and constructed to minimize the uptake and undesirable entrapment of sediments, facilitating their removal and sampling, taking into account relevant guidelines (G12).

Sediment and ballast water reception facilities. The implementation of the D-1 and D-2 standards as scheduled, does not apply to ships discharging ballast water to a water reception facility designed according to relevant guidelines (G5) (Regulation B-3.6). In ports and terminals where cleaning or repair of ballast tanks occurs designated by the Party, adequate facilities for the reception and the safe disposal of sediments shall be available, taking into account relevant guidelines (G1) (Article 5).

Additional measures in certain areas. A Party (or Parties) may, taking into account relevant guidelines (G13), require ships to meet a specified standard or requirement, consistent with international law, if it determines that

11 In regard to the performance of approved ballast water management systems and the implementation of G8 Guidelines, an assessment of the situation concerning the testing, approval and operation of these systems was requested by the MEPC to the IMO Secretariat. The "Study on the Implementation of the Ballast Water Performance Standard described in Regulation D-2 of the BWM Convention", conducted in partnership with the World Maritime University, has been presented by the IMO Secretariat in December 2015.

12 The MEPC agreed upon the establishment of a Technical Group under the auspices of GESAMP, to evaluate such systems and advise the Committee accordingly, which operates following the methodology for information gathering and conduct of work of the GESAMP-BWWG disseminated as BWM.2/Circ.13.Rev.3. For the text see RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* cit., p. 274.

additional measures are necessary to prevent, reduce, or eliminate the transfer of HAOPs through the ships' Ballast Water and Sediments, after consultation with adjacent or other States that may be affected (Regulation C-1). The IMO shall be notified, at least 6 months in advance of the date foreseen for the implementation of the additional measure, including specific information on the measure. When customary international law as reflected in the United Nations Convention on the Law of the Sea so provides, the additional measure shall obtain IMO approval.

Ballast water uptake warnings in certain areas. Parties shall endeavour to notify mariners of areas where ships should not uptake ballast water due to specific known conditions, including the area coordinates and, where possible, advise on the alternatives available, arrangements for alternative supplies and the time period such warning is likely to be in effect. Parties shall also notify the IMO and other potentially affected coastal States (Regulation C-3).

Violations. Violations of the BWM Convention and of relevant requirements shall be prohibited and sanctions shall be established under the law of the Administration of the ship concerned, wherever the violation occurs, as well as under the law of the Party within whose jurisdiction the violation occurs. Sanctions shall be adequate in severity to discourage violations (Article 8).

Surveys and certification. Ships of 400 gross tonnage and above to which the BWM Convention applies shall be surveyed and carry a certificate in accordance with the requirements established for initial, annual, intermediate and renewal surveys (Article 7 and Annex - Section E).

Port State Control (PSC) and inspections. Foreign ships may be inspected by Port State Control Officers (hereinafter, PSCOs) (Article 9) in any port or offshore terminal of a Party for determining whether the ship is in compliance with the BWM Convention. In principle, the inspection is limited to: verifying whether the ship has a valid certificate, inspecting the Ballast Water Record Book and/or sampling the ship's ballast water according to relevant guidelines (G2). The time required for analysis cannot be used as a basis for unduly delaying the ship's operation or its departure.[13] PSCOs may carry out a detailed inspection in the absence of a valid certificate, or where there are clear grounds for believing that the condition of the ship or its equipment does not correspond substantially to the certificate, or if the master or the crew are not familiar with essential shipboard ballast water management procedures or have not implemented them. During the detailed inspection the Party carrying the inspection shall take such steps as will ensure that the ship shall not discharge ballast water until it can do so without presenting a threat of harm to the environment, human health, property or resources.

If a violation is detected, the Flag State and/or the Port State may take steps to warn, detain or exclude the ship (Article 10). The Port State may, provided that this would not present a threat of harm to the environment, human health, property or resources, grant the ship permission to leave the port/offshore terminal for the purpose of discharging ballast water, or to proceed to the nearest appropriate repair yard or reception facility available. If the sampling leads to a result, or supports information received from a Party, indicating that a ship poses a threat, the Party in whose waters the ship is operating shall prohibit the ship from discharging ballast water until the threat is removed. A Party may also inspect a ship when it enters the ports or offshore terminals under its jurisdiction, if a request for an investigation is received from any Party, together with sufficient evidence that the ship is operating or has operated in violation of the BWM Convention.

If an inspection indicates a violation of the BWM Convention, the ship shall be notified and a report including evidence shall be forwarded to the Administration under which the ship is operating (Article 11). In the event that certain control actions have been taken (i.e. the ship was required not to discharge, has been warned, detained or excluded, has been asked to proceed to the nearest repairing yard or facility, the sampling revealed a threat and the ship was consequently required not to discharge), the PSCOs shall forthwith inform, in writing, the ship's Administration - or, if this is not possible, the consul or diplomatic representative - and shall notify the recognized organization responsible for the certificate as well as the next port of call.[14]

Research and monitoring. Parties promote and facilitate scientific and technical research on Ballast Water Management as well as monitor the effects of Ballast Water Management in waters under their jurisdiction, including observation, measurement, sampling, evaluation and analysis of the effectiveness and adverse impacts

13 See BWM Convention, Article 12, which adds that all possible efforts shall be made to avoid a ship being unduly detained or delayed and that if this occurs the ship is entitled to compensation for any loss or damage suffered.

14 "Guidelines for port State control under the BWM Convention" have been adopted by Resolution MEPC.252(67) to provide basic guidance for the conduct of inspections, envisaging a four-stage procedure (an initial inspection/a more detailed inspection/a third stage inspection, including sampling and indicative analysis/a fourth stage if necessary incorporating detailed analysis to verify D-2 standard compliance); it is worth noting that the guidelines do not mention sampling in the "initial inspection" stage.

of any technology or methodology as well as any adverse impacts caused by HAOPs transferred through ships' ballast water. Relevant information on scientific and technology programmes and technical measures should be made available (Article 6).

Technical assistance and regional cooperation. Upon request, Parties should receive, directly from other Parties or through international organizations or bodies, technical assistance to train personnel, to ensure the availability of relevant technology, equipment and facilities, to initiate joint research and development programmes and to undertake any action aimed at the effective implementation of the BWM Convention. Those Parties having common interests to protect the environment, human health, property and resources in a given geographical area, in particular those bordering enclosed and semi-enclosed seas, shall endeavour to enhance regional cooperation, including through the conclusion of regional agreements, and shall seek to cooperate with the Parties to regional agreements to develop harmonized procedures (Article 13).

2.2. The implementation of the BWM Convention in the Adriatic Sea in the light of the United Nations Law of the Sea Convention (Montego Bay, 1982)

As any other international multilateral agreement dealing with the protection of marine environment from ships-derived pollution, the implementation and enforcement of the BWM Convention by States will have to be based on the wider legal framework provided by the Law of the Sea. The United Nations Convention on the Law of the Sea (hereinafter, LOSC), done in Montego Bay (Jamaica) in 1982 and entered into force more than 20 years afterward,[15] outlines powers, duties and commitments of States over the sea. Many LOSC provisions currently reflect international customary law. The LOSC regime of marine zones addresses global needs by balancing the (opposite) interests of States when acting both as Flag States - for the free and speedy movement of their merchant fleets - and as Coastal States - for the protection of the marine environment under national jurisdictions and the control of related areas.[16] Such regime assigns to "generally accepted international rules and standards" for the prevention of pollution from vessels - among which could be those provided by the BWM Convention - a crucial role,[17] at the same time recognizing that States may need specific international solutions to jointly address vulnerabilities of identified and delimited marine areas.[18] All countries bordering the Adriatic Sea as well as the European Union are Parties to the LOSC, and many of its provisions would shape the implementation of the BWM Convention obligations in the basin.

The LOSC extensively addresses the States' obligations on the protection and preservation of the marine environment from different pollution sources.[19] "Pollution" is defined in terms broad enough[20] to cover the effects of the introduction into the marine environment of ballast water that, even if not contaminated by cargo residues, may contain harmful organisms and pathogens. According to the LOSC, States shall take, individually or jointly as appropriate, all measures that are necessary to prevent, reduce and control pollution of the marine environment from any source,[21] to ensure that activities under their jurisdiction or control do not cause damage to other States environment and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights.[22] The LOSC specifically addresses intentional or accidental introductions of "alien" or "new" species to a particular part of the marine en-

15 The LOSC entered into force on 16.11.1994.

16 Reference is made to the States' powers of adopting and enforcing on foreign ships national legislation for the protection and preservation of the marine environment according to the different marine zones regimes i.e. territorial sea, economic exclusive zone, high seas, etc. In general terms, States may adopt national requirements on ballast water as conditions for the entry of vessels in their ports, remaining the global standards the sole ones applicable to foreign ships while in navigation and if the Flag State has adhered to it. The main responsibility for the global standards implementation on ships lies with the Flag States, while the Coastal States would mainly exercise their powers of enforcement while the foreign ship is in port. Flag State rights are supported by an important set of legal safeguards and guarantees. See, among others, LOSC, articles from 17 to 21, and Part XII, Sections 6 and 7.

17 Coastal States' legislation on the prevention of pollution from foreign ships within their economic exclusive zone may only conform and give effect to "generally accepted international rules and standards" adopted acting through the competent international organization or a general diplomatic conference. Even in its territorial sea, the Coastal State legislation for the preservation of the marine environment affecting the foreign ships' innocent passage shall not apply to the design, construction, manning or equipment of foreign ships unless it is giving effect to generally accepted international rules or standards. See LOSC, articles 211.5 and 21.2.

18 See, for instance, Article 211.6.

19 See LOSC, Part XII - Protection and preservation of the marine environment, articles from 192 to 233. Main sources of pollution considered are: from land-based sources, from seabed activities subject to national jurisdiction, from activities in the Area, by dumping, from vessels, from or through the atmosphere.

20 According to LOSC, Article 1.4, "pollution of the marine environment" means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.

21 LOSC, Article 194, Measures to prevent, reduce and control pollution of the marine environment.

22 LOSC, Article 195, Duty not to transfer damage or hazards or transform one type of pollution into another.

vironment that may cause significant and harmful changes thereto. In this regard, States shall take all necessary measures in order to prevent, reduce and control such introductions. The same obligation is posed to States in regard to pollution of the marine environment resulting from the use of technologies under their jurisdiction, which could be of relevance relating to ballast water management systems.[23]

As the BWM Convention will enter into force, the LOSC regime will shape both the adoption of possible additional measures on ballast water management and the enforcement of the new global standards on foreign ships, to which the LOSC safeguards and guarantees regime applies.[24] In this regard, the current status of maritime jurisdictions in the Adriatic Sea is of relevance and will have to be taken into consideration in the future developments of the ballast water control and management across the basin. Notwithstanding there are still some unsolved issues on maritime delimitations in the area, several agreements between bordering countries are in place.[25] To give a general picture, along the western coast of the basin is the 12 nm Italian territorial sea. Even if the Italian legislation provides for the possibility of exercising national jurisdiction for ecological protection purposes beyond these limits, up to now the country has not implemented this option in the Adriatic Sea.[26] Along the eastern coasts of the basin, it extends the territorial sea of five countries - namely, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro and Albania - with related coastal lengths that vary greatly, being the Croatian coast by far the longest.[27] Both Slovenia and Croatia extended their sovereign rights and jurisdiction beyond their territorial sea specifically referring to environmental protection purposes, with maritime boundaries remaining a sensitive issue in need of a bilateral agreement.[28] In this situation, the Adriatic Sea includes a corridor of high seas along the basin and these basic legal features will have to be considered while further discussing specific sub-regional options and proposals for joint cross-border ballast water management development (see below in paragraph 6.1. of this report).

The LOSC also outlines sub-regional cooperation as a specific duty of States bordering enclosed and semi-enclosed seas.[29] In these areas, States shall endeavour, directly or through an appropriate regional organization, to coordinate the implementation of their rights and duties with respect to the protection and preservation of the marine environment as well as their scientific research policies, inviting, as appropriate, other interested States or international organizations to cooperate.[30] Further sub-regional cooperation is particularly relevant for the joint management of threats from the transfers of HAOPs through ships' ballast water across the Adriatic Sea and may be based on this LOSC commitment, shared by all Adriatic States.

Together with general principles, the thorough consideration of specific LOSC provisions may influence the implementation of certain aspects of the ballast water management regime, providing a legal basis for an enhanced action for the protection of the sub-region marine environment.[31] As reported, the BWM Convention text limits States' monitoring efforts to the effects of the HAOPs transfer through ballast water, whilst, in light of the LOSC, observation, measurements, evaluation and analysis should also cover risks, with the consequence that the monitoring scope of HAOPs in national legislations might be expanded to cover the prevention of threats of damages.[32] Moreover, the BWM Convention provision regarding the States' warnings to mariners of areas where ships should not uptake ballast water due to the presence of certain harmful conditions (e.g. algal blooms) might be strengthened in the light of the LOSC. In effect, according to the Law of the Sea,

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23 LOSC, Article 196, Use of technologies or introduction of alien or new species.

24 See, in particular LOSC, Part XII, Section 6, Enforcement and Section 7, Safeguards.

25 Slovenia, Croatia and Montenegro succeeded in the formerly Italian-Yugoslav maritime borders. The main delimitation agreements are: the 1968 continental shelf agreement between Italy and Yugoslavia; the 1975 Treaty of Osimo between Italy and Yugoslavia delimitating also the territorial sea; the 1992 continental shelf agreement between Albania and Italy; the 1999 treaty on the State border between Croatia and Bosnia and Herzegovina, not entered into force. In some cases, agreements are referred only to specific boundary segments. For a picture of maritime delimitation and jurisdiction issues in the Adriatic Sea, see SCOVAZZI (2006), SCOVAZZI (2015), VIDAS D. (2006) and GRBEC (2013).

26 See Italian Law No. 61 of 8.2.2006 establishing ecological protection zones beyond the external boundaries of the territorial sea.

27 According to VIDAS D. (2009), p. 5, Croatia has by far the largest coastline, which extends over 6200 kilometres, including islands, almost the 75% of the length of all the basin coastline (the total length of the Adriatic coastline being around 8300 kilometres). Italy's coastline extends over some 1300 kilometres, approximately 15% of the total length. The other bordering States have very short coastline: Albania around 476 kilometres, Slovenia around 45 kilometres, Bosnia and Herzegovina even less, some 20 kilometres, with no ports within its territory.

28 See the Ecological Protection Zone and Continental Shelf of the Republic of Slovenia Act ("Zakon o razglasitvi zaš□itne ekološke cone in epikontinentalnem pasu Republike Slovenije" (ZRZECEP), Official gazette of the Republic of Slovenia, No. 93/2005 and the Croatian Parliament Decision for the Extension of Jurisdiction of the Republic of Croatia in the Adriatic Sea, adopted on 3.10.2003. For related delimitations see the Arbitration Agreement between the Government of the Republic of Slovenia and the Government of the Republic of Croatia, signed on 4 November 2009.

29 For the LOSC purposes, "enclosed or semi-enclosed sea" means a gulf, basin or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States (Article 122). The Adriatic Sea can be considered a semi-enclosed sea located within a broader semi-enclosed sea, which is the Mediterranean.

30 LOSC, Part IX, Enclosed or Semi-Enclosed Seas.

31 It is worth recalling that according to the EU Marine Strategy Framework Directive the Adriatic Sea is a marine sub-region for environmental purposes for which specific protection goals have to be reached in relation to the presence of non-indigenous species.

32 LOSC, Section 4, Monitoring and Environmental Assessment and, in particular, Article 204, Monitoring of the risks or effects of pollution.

States have to keep under surveillance the effects of any activities that they permit or in which they engage and, in parallel, have the duty to immediately notify States deemed likely to be affected by damages when they become aware that the marine environment is in imminent danger.[33] Even if deeper legal analysis would be required, depending on the specific action at stake, it reasonably emerges from the above how the LOSC may influence - when not actually improve - in several directions the implementation of the BWM Convention within the Adriatic Sea basin.

2.3. Alien and invasive species in global multilateral agreements: exploring synergies between different international commitments

In line with the Law of the Sea principles and with the current division of work within the UN system, the negotiation of global standards on the prevention of pollution of the marine environment from ships' ballast water, as included in the BWM Convention, has been facilitated by the international maritime community gathered within the IMO. According to its founding treaty, such organization provides machinery for cooperation among governments for the prevention and control of marine pollution from ships and encourages the general adoption of the highest practicable standards on international shipping.[34] The range of aspects that the international maritime community has to address when negotiating global standards for the prevention of vessels' sources of pollution is, by definition, different from the range of those considered by the international environmental debate leading to multilateral environmental agreements. While producing shipping agreements and related compromises integrating environmental considerations, different public interests are carefully weighted, the environmental aspect being only one of them.[35]

The Convention on Biological Diversity (hereinafter, CBD) (Rio de Janeiro, 1992) is the major global treaty on the protection of the Earth's biological resources, which are considered - at the species level, at the ecosystems level and as genetic resources - a global asset to present and future generations. Parties to the CBD pursue the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources and biological diversity, which are referred also to marine components.[36] All Adriatic Sea bordering countries, as well as the EU, are bound by this global instrument.

Alien and invasive species are a threat for biodiversity. CBD calls on each Party, as far as possible and as appropriate, "to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species".[37] The related CBD Strategic Plan for Biodiversity 2011-2020 includes among relevant "biodiversity targets" that "by 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment".[38]

1	PRECAUTIONARY APPROACH
2	THREE-STAGE HIERARCHICAL APPROACH
3	ECOSYSTEM APPROACH
4	THE ROLE OF STATES
5	RESEARCH AND MONITORING
6	EDUCATION AND PUBLIC AWARENESS
7	BORDER CONTROL AND QUARANTINE MEASURES
8	EXCHANGE OF INFORMATION
9	COOPERATON, INCLUDING CAPACITY-BUILDING
10	INTENTIONAL INTRODUCTION
11	UNINTENTIONAL INTRODUCTION
12	MITIGATION OF IMPACTS
13	ERADICATION
14	CONTAINMENT
15	CONTROL

Fig. 5 *CBD Guiding Principles on Invasive and Alien Species*

33 LOSC, Article 198, Notification of imminent or actual damage.

34 The original 1948 Treaty on the Intergovernmental Maritime Consultative Organization (IMCO) was amended by the IMCO Assembly resolutions A.358 (IX) of 14 November 1975 and A.371 (X) of 9 November 1977 [rectification of Resolution A.358 (IX)], which had changed the organization's name into "International Maritime Organization (IMO)", enhancing its scope to the protection of the marine environment and including to this end among its bodies the "Marine Environment Protection Committee" (MEPC).

35 In relation to the role of IMO MEPC in this regard see LA FAYETTE L. (2001), cit.

36 See CBD, Article 2, according to which "Biological diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, **marine** and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (bold added).

37 CBD, Article 8(h).

38 Aichi Biodiversity Target No. 9. The CBD Strategic Plan was revised and updated by the 10th meeting of the Conference of the Parties, held from 18 to 29 October 2010, in Nagoya, Aichi Prefecture, Japan.

The CBD Conference of the Parties identified the item of "Invasive Alien Species" (hereinafter, IAS) as a cross-cutting issue, adopting Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species (summarized in Fig. 5), to be implemented by Parties and Governments.[39]

Due to the mentioned difference in institutional aspects, legal scopes and public interests reflected in the CBD and the IMO BWM Convention, the definition of "Invasive Alien Species" under the CBD coincides only partially with the definition of "HAOPs" provided by the BWM Convention. Under the CBD, IAS refer to "alien species whose introduction and/or spread threaten biological diversity", where "alien species" is "a species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce".[40] Instead, the BWM Convention defines HAOPs as "aquatic organisms or pathogens which, if introduced into the sea including estuaries, or into freshwater courses, may create hazards to the environment, human health, property or resources, impair biological diversity or interfere with other legitimate uses of such areas".[41] Leaving aside the differences between these definitions,[42] it may at least be assumed for the purposes of this report, that not all HAOPs are IAS (i.e. harmful aquatic organisms may be also native species, pathogens are not IAS, etc.) no can all IAS be classified as HAOPs of ballast water management concern (i.e. some marine IAS might not be up-taken together with ballast water). Still, there is a significant area of overlap between the two legal definitions in terms of actual organisms, as well as of legally protected interests addressed (e.g. to avoid threats to biodiversity), which could lead, once implemented at the national level, to significant synergies.

In this direction, it should be noted that according to the CBD, the threats posed by IAS have to be addressed by governments within national biodiversity strategies and action plans, which should identify priorities and create mechanisms to coordinate with other national programmes, incorporating IAS considerations into other sectoral and cross-sectoral policies, strategies and plans.[43] International and national cooperation should play a crucial role, both with key stakeholder groups (including the private sector that might provide pathways or vectors for the unintended transfer of IAS) and between different government levels.[44] Prevention, early detection, eradication and/or control of IAS should be improved, and policies, legislation and institutions shall be adjusted or developed, as appropriate.

Notwithstanding the BWM Convention does not provide for commitments focused on identified species, the ballast water management national programmes and policies can be considered as sectoral instruments directly relevant for the IAS threat. Especially for the implementation of those ballast water management provisions which strictly depend on the availability of relevant knowledge and information on the marine environment (i.e. the granting of exemptions according to risk assessments, the warning to mariners on no ballast water uptake areas), the advantages of building comprehensive national policies as well as specific sub-regional cooperation should be furthered. The development of comprehensive national legislation and policies in this regard may benefit the implementation of parallel legal obligations, at the same time easing the burden that the public system and responsible authorities will have to face to address compliance. Hence, different international commitments may mutually support each other. A comprehensive Adriatic dialogue on these issues could facilitate coherence of measures and widen the opportunities deriving from the international support.

In this regard, some CBD recent developments may be relevant and related potential synergies should be explored[45] as well as those with other multilateral agreements, codes, guidelines and tools providing guidance for

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39 CBD COP 6 Decision VI/23 "Alien species that threaten ecosystems, habitats or species".

40 These definitions result from Decision VI/23 cit., Annex, footnote to the Introduction, and where opposed by one delegation. For a comprehensive glossary of invasive species CBD relevant terminology, see https://www.cbd.int/invasive/terms.shtml.

41 BWM Convention, Article 1.8.

42 One of the criteria for defining both these terms is rather functional, related to the capacity of threatening protected interests which are different according to each instrument (namely, biodiversity, environment, human health, other legitimate uses of the sea).

43 For further reference see Paragraph 6 of COP Decision V/8 and COP Decision VI/23.

44 See previous footnote.

45 Among them, the Capacity building Strategy for the Global Taxonomy Initiative, the establishment of the Global Invasive Alien Species Information Partnership, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, the identification of Ecologically or Biologically Significant Marine Areas (EBSAs). See also COP Decision XI/28 "Invasive alien species - Ways and means to address gaps in international standards regarding invasive alien species introduced as pets, as aquarium and terrarium species, and as live bait and live food"; COP Decision XII/16 "Invasive alien species: management of risks associated with introduction of alien species as pets, aquarium and terrarium species, and as live bait and live food, and related issues"; COP Decision XII/17 "Invasive alien species: review of work and considerations for future work". Furthermore, within IPBES the scoping for a thematic assessment of IAS has been initiated, see Decision IPBES-2/5 "Work programme for the period 2014-2018". Finally, it is worth noting that three areas within the Adriatic Sea have been identified as EBSAs.

the control of species' introductions and the mitigation of their negative impacts.[46] Adriatic bordering States may benefit from the convergence of these parallel efforts even as a tool to leverage differences between one another. Along these lines, other convergences may be explored, such as the effects on the pathogens' uptake and discharge of a reduction of land based sources of pollution by implementing relevant international instruments.[47] Hence, the abatement of discharges of untreated sewage would also help decrease the risks of transferring of pathogens through shipping. This aspect could have a specific relevance for the Mediterranean and Adriatic seas, where correspondent regional binding agreements apply. In particular, regional and national monitoring obligations could help in identifying areas where the uptake of ballast water would be particularly at risk.

46 See *inter alia*: Bern Convention, Recommendation No. 57 on the "Introduction of Organisms belonging to Non-Native Species into the Environment"; ICES Code of Practice on the Introductions and Transfers of Marine Organisms; FAO Code of Conduct on Responsible Fisheries; IUCN Guidelines for the prevention of biodiversity loss caused by alien invasive species. Furthermore, is to be noted that Parties to the CBD invited the Convention on the Conservation of Migratory Species of Wild Animals, the Convention on Wetlands (Ramsar, Iran, 1971), the Convention on the Conservation of European Wildlife and Natural Habitats, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the World Heritage Convention, and the Man and the Biosphere Programme of the UNESCO, in collaboration with relevant organizations, to promote further the implementation of Article 8(h) within their mandates, through, *inter alia,* the development of guidance, best practices and pilot projects that address the threats of invasive alien species to particular sites or habitats, including means to enhance the capacity of ecosystems to resist or recover from alien species invasions.

47 i.e. the Global Programme of Action for the Protection of the Marine Environment fromLand-Based Activities. For further reference consult http://www.unep.org/gpa/.

3. THE MEDITERRANEAN CONTEXT: RELEVANT ELEMENTS FOR THE ADRIATIC STATES COOPERATION ON THE MANAGEMENT OF BALLAST WATER

3.1. The regional cooperation on environment and shipping matters and non-indigenous species: a framework for the BALMAS project outputs

The environmental cooperation developed so far within the Mediterranean Sea is strongly influenced by the peculiar features of this region. Unlike other European regional seas, the Mediterranean is a crossroad of three continents (Asia, Europe, Africa) with a longstanding history of connections.[48] Political, economic and development conditions are highly varied across the basin, and, unfortunately, the Mediterranean shores still host armed conflicts. The sea basin is at the heart of many different interests, involving coastal States as well as wider geopolitical and international concerns. Oil and goods transportation by sea are well-developed activities, carried out by many States, with the Mediterranean as one of the world's major shipping transit routes. Tourism and fisheries are fundamental economies and the cultural and archaeological assets of the region are a heritage for mankind. The region is one of the worlds' 25 top priority hotspots, with exceptional biodiversity value, a large number of species native only to the region and critical levels of habitat loss. The Mediterranean waters' extension is relatively small and coasts have a high proximity, approximately half of the basin being no more than 50 nm from the nearest land. Almost half of the bordering Countries are EU Member States. Marine areas where the high seas regime apply, still extend over the majority of the basin, whereas jurisdiction claims are growing, often targeting specific objectives i.e. environmental protection zones, fishery protection zones, etc. and resulting in an asymmetric picture of the State powers over this sea.[49] This rich, fragmented as well as challenging picture does not facilitate rapid solutions to the increasing environmental pressures pending on this vulnerable semi-enclosed sea.

The Mediterranean Sea has a longstanding history of regional cooperation in the environmental sector, which proved to be lively and resistant over time. In the early '70s, the Mediterranean was among the first areas addressed by the Regional Seas Programme of the brand newly established United Nations Environmental Programme (hereinafter, UNEP), which facilitated the approval by coastal States of a Mediterranean Action Plan (MAP). Over the years, cooperation led to the adoption of a number of multilateral binding agreements with regional scope dealing with several aspects of marine environmental protection and pollution prevention, aiming at contributing to the regions' sustainable development. The framework regional agreement, the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (last amended in 1995), is complemented up to now by seven protocols covering different themes, two of which are of particular relevance for the purpose of this report (see below).[50] Related Secretariat functions are carried out by the UNEP/MAP, and a number of regional centers have been established with technical functions, providing organizational machinery to work towards the area's sustainable development.[51] Besides its sectoral focus, this institutional system is up to now the only existing stable forum for the regional dialogue, based on solid legal commitments and gathering the whole community of States' authorities around the same table. All Adriatic bordering States are Parties to the Barcelona Convention, while not all of them have ratified all the Protocols. The European Union also joined the legal system.

The Barcelona framework Convention does not specifically address the presence of alien, invasive or harmful species, although the protection of natural resources is considered as an integral part of the national development processes. States are committed to prevent, abate, combat and, to the fullest extent, eliminate pollution of the area as well as to take, individually or jointly, all appropriate measures to protect and preserve the area's biological diversity, rare or fragile ecosystems and rare, depleted, threatened or endangered species of wild fauna and flora and their habitats.[52] Instead, the legal references, both direct and indirect, to the protection of

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48 On the history and culture of the marine region see: BRAUDEL F. (1994). *The Mediterranean and the Mediterranean World in the Age of Philip* II, Volume 1, University of California Press, pp. 1375; MATVEJEVIC P. (1999). *Mediterranean: A Cultural Landscape,* University of California Press, pp. 218; ABULAFIA D. (2014). *The Great Sea: A Human History of the Mediterranean*, Allen Lane, pp. 783.

49 On jurisdiction claims consult http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/depositpublicity.htm. For the status of Mediterranean jurisdictions see SUÁREZ DE VIVERO J. L. (2012). *Fisheries Cooperation in the Mediterranean and the Black Sea,* European Parliament, Directorate-General for Internal Policies, Brussels.

50 The themes covered are: dumping from ships, prevention and response to ships' pollution, biodiversity and protected areas, land based pollution, transboundary movements of hazardous wastes, offshore exploration and exploitation and integrated coastal zone management. For further information on the UNEP/MAP and on regional agreements see http://www.unepmap.org.

51 For further information on the UNEP/MAP and on relevant regional agreements and structures see http://www.unepmap.org.

52 Barcelona Convention, Article 4, General obligations and Article 10, Conservation of biological diversity.

the region's environment against the threats posed by non-indigenous species may be found in the following two protocols.

According to the 1995 Protocol on Biodiversity and Specially Protected Areas, Parties shall take all appropriate measures to regulate the intentional or accidental introduction of non-indigenous or genetically modified species to the wild, and shall prohibit those that may have harmful impacts on the ecosystems, habitats or species in the Mediterranean.[53] Parties shall also endeavor to implement all possible measures to eradicate those species that have already been introduced when, after scientific assessment, it appears that they cause or are likely to cause damage to the ecosystems, habitats or species. All Adriatic Sea bordering States, with the exception of Bosnia and Herzegovina,[54] are Parties to this Protocol, for which the UNEP/MAP Regional Activity Centre for Specially Protected Areas (RAC/SPA) provides technical support.[55] Hence, the presence and introduction of non-indigenous or of otherwise harmful species (e.g. genetically modified species) is recognized as a Mediterranean environmental problem, even though the Protocol does not focus on specific activities that may cause such introduction.

On the other hand, according to the 2002 Prevention and Emergency Protocol, which deals, in the Mediterranean, with ships' sources of pollution, States' obligations are generically related to the "implementation of international regulations to prevent, reduce and control pollution of the marine environment from ships", and the BWM Convention would be considered, once entered into force, among them.[56] All Adriatic States, excepting Albania and Bosnia and Herzegovina, are Parties to this Protocol, the implementation of which is technically facilitated by the UNEP/MAP-IMO jointly administered Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC).[57]

From a legal perspective, the presence of non-indigenous species is at the same time a general objective of biodiversity protection regional obligations and, to the extent those species are also included in the HAOPs definition according to the BWM Convention, a type of ships-derived pollution regulated at the global level that should be addressed by specific Mediterranean implementation policies. Given this legally binding framework, in 2012, the Contracting Parties to the Barcelona Convention adopted a specific Strategy on the Control and Management of Ships' Ballast Water in the Region, referred to the BWM Convention, which identifies States' commitments and voluntary arrangements on the matter (for details, see next paragraph of this report). After this policy development, in parallel with the environmental global developments reported above, the wider theme of "invasive non-indigenous species" became of growing concern for the regional system. According to the UNEP/MAP Midterm Strategy 2016-2021, the major overarching policy document for the near future, keeping non-indigenous species introduced by (all) human activities at levels that do not adversely alter the ecosystem, is one out of six ecological objectives of the Mediterranean cooperation on biodiversity.[58]

Further Mediterranean decisions on the matter - based on both the Protocols on Prevention and Emergency and on Biodiversity - have been developed in parallel, and need to be considered when planning Adriatic Sea cooperation actions on ballast water management envisaged by the BALMAS project.

Based on the 2002 Prevention and Emergency Protocol and focused on shipping matters, the Regional Strategy for Prevention of and Response to Marine Pollution from Ships (2016-2021)[59] identifies "invasive alien species" as an area in need of further work. The ratification of the BWM Convention is a high priority commitment for States, and the 2012 BWM Strategy is considered as an essential part of the regional implementation of global standards. The Strategy also considers the need to control and manage biofouling on ships entering the waters of the Mediterranean by applying the relevant IMO 2011 Guidelines.[60]

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53 Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, adopted on 9-10 June 1995 and entered into force on 12.12.1999. See Article 13, Introduction of non-indigenous or genetically modified species.

54 The country ratified the previous 1982 Specially Protected Areas Protocol.

55 See http://www.rac-spa.org/.

56 Protocol concerning cooperation in preventing pollution from ships and, in cases of emergency, combating pollution of the Mediterranean Sea (Malta 2002), Article 3, General provisions. Normally, global shipping agreements do not have a regional legal projection, even if cooperation would be needed at the marine regions' level in order to seek their smooth and, what is equally important, effective, implementation.

57 The REMPEC was established by Resolution 7 adopted by the Conference of the Parties of the Barcelona Convention on 7.2.1976. Its most recent mandate has been adopted by the 16th Ordinary Meeting of the Contracting Parties (Marrakesh, Morocco, 3-5 November 2009). See http://www.rempec.org/.

58 Decision IG.22/1 "UNEP/MAP Mid-Term Strategy 2016-2021" adopted by the19th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Athens, Greece, 9-12 February 2016).

59 Decision IG.22/4 "Regional Strategy for Prevention of and Response to Marine Pollution from Ships (2016-2021)" adopted by the19th Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Athens, Greece, 9-12 February 2016). The document should be seen as an integral part of the UNEP/MAP's Mid-Term Strategy.

60 IMO "2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species", adopted by Resolution MEPC.207(62). This commitment was considered as a medium priority output of the Contracting Parties, to be pursued with the advice and assistance of the UNEP/MAP Secretariat and the REMPEC. See Decision IG.22/4, cit., point 4.2.

In parallel with these strategic decisions regarding ships' mediated introduction of non-indigenous species, a specific Action Plan (revised in 2016) on Species Introductions and Invasive Species in the Mediterranean Sea, implementing the 1995 Biodiversity and Specially Protected Areas Protocol, has framed the regional action on the matter within the CBD global commitments.[61] The Action Plan aims at promoting the development of coordinated management measures throughout the Mediterranean region in order to prevent, minimize, limit, monitor and control marine biological invasions and their impacts on biodiversity, human health, and ecosystem services. The strengthening of States' capacities as well as of institutional and legislative frameworks, the support of a regional information network, the conduct of baseline studies and monitoring programmes as well as the establishing of mechanisms for cooperation and exchange of information are specific objectives of the Plan. The development of an on-line information platform on Marine Mediterranean Invasive Species (MAMIAS) is a priority in support of regional and international policies.[62] The regional coordination of the Action Plan implementation is carried out by the UNEP/MAP Secretariat through the RAC/SPA, which is also responsible for maintaining a regular dialogue with other conventions' Secretariats and relevant organizations such as the IMO. These commitments, fully involving the Adriatic States, are certainly broader than the BWM Convention obligations, but still they should be considered as the actual institutional framework where the specifics of the Adriatic Sea environmental protection against HAOPs transfer should be recognized or further developed.

From the sub-regional Adriatic Sea perspective of the monitoring needs linked to the HAOPs introduction, the most relevant policy development is the Mediterranean Ecosystems Approach (EcAp) to the management of human activities[63] and the connected Integrated Monitoring and Assessment Programme, envisaged over the 2016-2021 period.[64] Relevant decisions follow the European Union's renewed efforts on marine and maritime issues and, in particular, the adoption of the Marine Strategy Framework Directive No. 2008/56/EC (see below, Section 4). The EcAp implements several different Protocols obligations and led to the adoption of regional definitions of Good Environmental Status and related targets, including the theme of non-indigenous species.[65] The approach connects the marine environmental protection objectives on invasive non-indigenous species with the regional measures on their different sources of introduction, among which is the 2012 Mediterranean Ships' Ballast Water Strategy (for relevant contents see next page, Fig. 6). The identification of

OPERATIONAL OBJECTIVE	INDICATOR	GES	PROPOSED TARGETS
2.1 Invasive non-indigenous species introductions are minimized	2.1.1. Spatial distribution, origin and population status (established vs. vagrant) of non-indigenous species	Introduction and spread of NIS linked to human activities are minimised, in particular for potential IAS	STATE The number of species and abundance of IAS introduced as a result of human activities is reduced. PRESSURE/RESPONSE - Improved management of the main human related pathways and vectors of NIS introduction (**Mediterranean Strategy for the management of ballast waters**, Aquaculture early warning systems, etc.) - Action plans developed to address high risk NIS, should they appear in the Mediterranean
	2.1.2 Trends in the abundance of introduced species, notably in risk areas	Decreasing abundance of introduced NIS in risk areas	STATE Abundance of NIS introduced by human activities reduced to levels giving no detectable impact
2.2 The impact of non-indigenous particularly invasive species on ecosystems is limited	2.2.1 Ecosystem impacts of particularly invasive species	No decrease in native species abundance, no decline of habitats and no change in community structure that have been generated by IAS via competition, predation or any other direct or indirect effect	PRESSURE/RESPONSE Impacts of NIS reduced to the feasible minimum
	2.2.2[16] Ratio between non-indigenous invasive species and native species in some well-studied taxonomic groups	Stable or decreasing proportion of NIS in the different habitats	STATE To be set upon species choice and their related impact degree of the invasive upon the indigenous ones, taking into account the role of Climate Change in accelerating the establishment of NIS populations

Fig. 6 *Good Environmental Status operational objectives and related targets for the Mediterranean in relation to non-indigenous and invasive species (Decision IG.21/3, Annex I)*

61 See Decision IG.22/12 including "Updated Action Plan concerning Species Introductions and Invasive Species" adopted by the 19th Meeting of the Contracting Parties to the Barcelona Convention (Athens, Greece, 9-12 February 2016).

62 It is worth noting that the development of the MAMIAS was considered by the Regional Strategy for Prevention of and Response to Marine Pollution from Ships as directly related to the Specific Objective 1 b) ii) of the 2012 BWM Strategy. See Decision IG.22/4, cit. point 3.9.2.

63 See Decision IG.17/6 of the 15th meeting of the Contracting Parties to the Barcelona Convention (Almeria, Spain, 2008) providing for "A healthy Mediterranean with marine and coastal ecosystems that are productive and biologically diverse for the benefit of present and future generations" and the seven steps roadmap for the implementation of the ecosystem approach; see also Decision IG.20/4 of the 17th meeting of the Contracting Parties to the Barcelona Convention (Paris, France, 8-10 February 2012) and Decision IG.21/3 on the "Ecosystems Approach including adopting definitions of Good Environmental Status (GES) and targets", adopted by the 18th meeting of the Contracting Parties to the Barcelona Convention (Istanbul, Turkey, 3-6 December 2013).

64 See Decision IG.22/7 "Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria" adopted by the 19th Meeting of the Contracting Parties to the Barcelona Convention and related Protocols (Athens, Greece, 9-12 February 2016).

65 Decision IG.21/3 cit.

high risk species is mentioned as a target of possible ballast water management measures, and this aspect has been further developed by the BALMAS Project outputs in relation to the Adriatic Sea sub-regional specificities.

EcAp is being implemented through an adaptive Integrated Monitoring Programme and constitutes the framework of an Integrated Assessment Policy. These instruments should evaluate the status of the marine and coastal environment, the achievement of good environmental status and targets as well as the effectiveness of the implementation of regional measures, such as the 2012 Ballast Water Strategy. Definitions and common indicators related to non-indigenous species have been agreed in this regard. According to the Integrated Monitoring and Assessment Programme, the establishment of a Mediterranean Integrated Data and Information System pursues the regional harmonization of various countries' monitoring plans, including non-indigenous species information. Non-indigenous species hotspots will be identified and an effective method of Rapid Assessment Survey will be developed, to be performed yearly at the national level. Furthermore, the existing directory of specialists, laboratories, institutions and organizations working on non-indigenous species in the Mediterranean region will be updated.[66] It should be noted that in the near future, National Action Plans on biodiversity would be aligned with EcAp, including aspects of the introduction of invasive species.

As a conclusive consideration, the UNEP/MAP policy documents delineate initiatives on non-indigenous species that would cross and interrelate with the implementation of the BWM Convention obligations in the Mediterranean. Much of the Adriatic information and knowledge, as well as the specialists' network developed by the project might feed these initiatives, as appropriate. It is worth noting that, within the UNEP/MAP organization, no direct participation of REMPEC to the biodiversity work is envisaged up to now. However, it is likely that, sooner or later, the two branches of initiatives will increase their convergence, coherence and consistency, and in this framework, the emphasis of the Adriatic specificities might find appropriate consideration.

3.2. Mediterranean cooperation on ballast water management: the 2012 Strategy and further strategic commitments to 2021

As mentioned, following the adoption of the 2004 BWM Convention and pending its entry into force, the Mediterranean States specifically addressed environmental concerns linked to the uptake and discharge of ballast water by ships within the region, facilitated by REMPEC's work and by a Mediterranean GloBallast Regional Task Force, supported financially by the GloBallast project.[67]

In 2012, the "Regional strategy addressing ship's ballast water management and invasive species" was adopted by the 17th Meeting of the Contracting Parties to the Barcelona Convention.[68] The Strategy is the main policy document defining the Mediterranean States' commitments on the matter and can be considered as non-mandatory early implementation of the BWM Convention, based on the relevant provision on regional cooperation.[69]

For the purpose of the Strategy the definition of "invasive alien species" coincide with the one of "Harmful Aquatic Organisms and Pathogens" provided by the BWM Convention.[70] The Strategy set eight strategic priorities, shown in Fig. 7, and is complemented by an Action Plan, with annexed work plan and implementation timetable, both covering the period until 2015. The Strategy includes as annexes also Harmonized Voluntary Arrangements for Ballast Water Management in the Mediterranean Region (Annex 2), Harmonized Procedures for a Regional Compliance Monitoring and Enforcement System (Annex 3) and the structure of a Web-based Mediterranean Information Exchange System (Annex 4). Within the same decision, the Parties 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".[71] After the

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66 See Decision IG.22/7 on "Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria", cit.

67 The Mediterranean region was identified as one of the six priority regions included in the GEF/UNDP/IMO Project entitled "Building Partnerships to assist Developing Countries to Reduce the Transfer of Harmful Aquatic Organisms in Ships' Ballast Water". For more information on the GloBallast Partnerships Project see http://globallast.imo.org/.

68 Decision IG.20/11 adopted by the 17th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Paris, France, 8-10 February 2012). The full text of the Decision IG.20/11 is reproduced in RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* cit. The commitment to develop the Strategy was taken by Decision IG.19/11 adopted by the 16th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Marrakesh, Morocco, 3-5 November 2009).

69 Decision IG.20/11, cit.; BWM Convention, Article 13.

70 BWM Convention, Article 1.8.

71 Decision IG.20/11, Annex II. For the text, see RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts*, cit.

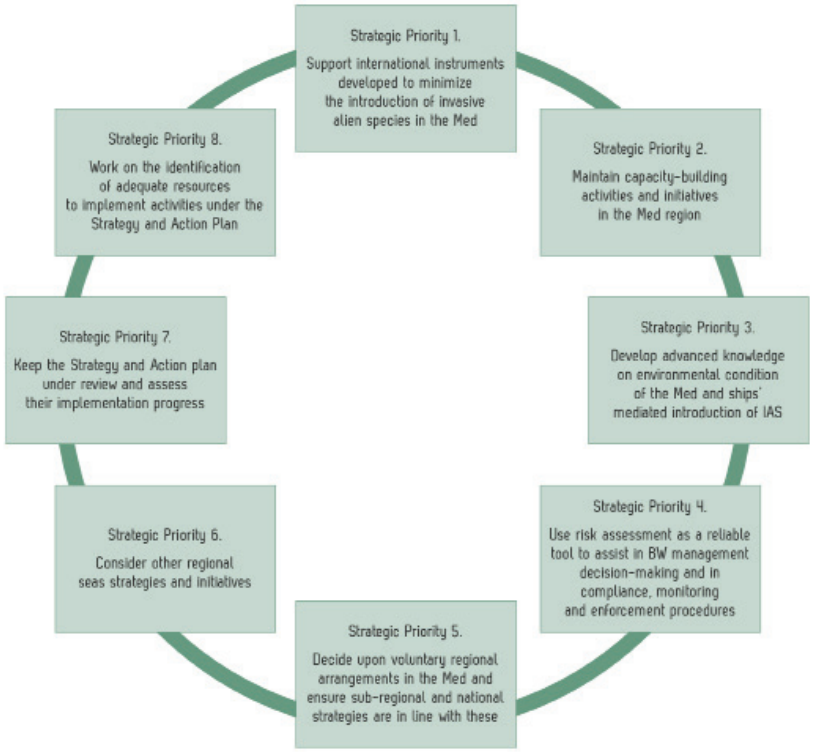

Fig. 7 *Strategic priorities according to the 2012 Regional strategy addressing ships' ballast water management and invasive species*

Strategy adoption by the Contracting Parties, the IMO was formally notified of the ballast water exchange arrangements included herein.[72]

The Strategy highlights the relevance of fostering further cooperation at the sub-regional level on two specific issues. Under Strategic Priority 8 on the use of risk assessment to assist in ballast water management decision making and in compliance, monitoring and enforcement procedures, an Adriatic port - e.g. Brindisi - was identified among those at increased risk of biological invasions because of the higher volumes of ballast water received, which originates from ports located outside the Mediterranean Sea. Risk assessments were considered as an appropriate tool to guide on possible ballast water management measures also at the sub-regional level. Under Strategic Priority 5, concerning voluntary arrangements in the Mediterranean, sub-regional approaches to harmonized procedures incorporated in a compliance, monitoring and enforcement system are encouraged, and the work of the BWM Sub-Commission in the Adriatic Sea was explicitly recalled (see below, paragraph 3.4. of this report).

As mentioned, the BWM Strategy has been followed by the broader Regional strategy for the prevention of and response to marine pollution from ships (2016-2021),[73] which establishes outputs for Contracting Parties and for the Secretariat - particularly, REMPEC on its behalf - relating to two aspects of the BWM Convention's future regime. Firstly, the ratification and implementation of the 2004 BWM Convention is considered a high priority output (expected to be accomplished by the end of 2018) and the national ratification processes should coordinate with the Mediterranean Strategy implementation. In this respect, assistance to States is expected from the Secretariat through REMPEC, also in its role as Regional Coordinating Organization (RCO) for the GloBallast Project in the Mediterranean, in collaboration with the RAC/SPA.[74] Secondly, proper action of the Contracting Parties is expected with high priority on all major ports and terminals where cleaning or repairing of ballast water tanks occurs, so that they may be in a position to implement the BWM Convention once it enters into force.[75] It is worth noting that REMPEC has been asked by the Parties to collaborate on current and future initiatives with relevant organizations, in particular with EMSA.

Finally, the broader UNEP/MAP Mid-Term Strategy outlines as a strategic outcome on the core theme of biodiversity and ecosystems the update of the Ballast Water Management Strategy to achieve the Good Environmental Status.[76]

72 Related notifications are reproduced in RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts*, cit.

73 Decision IG.22/4. For the text, see RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts*, cit.

74 Decision IG.22/4, point 4 and specific objective 1.b).

75 Decision IG.22/4, point 4.5.6.g).

76 Decision IG.22/1, Core theme 2, Biodiversity and Ecosystems, Paragraph 66 and Indicative Key Output No. 3.2.1.

3.3. Other Mediterranean agreements relevant for BWM Convention compliance: the maritime authorities cooperation on port State control

Under the Law of the Sea, the Flag States are primarily responsible for the effective implementation and enforcement over their ships of maritime safety and marine pollution prevention standards laid down in relevant international instruments. Among these will be the BWM Convention, once entered into force. However, the control by Port States of the foreign ships' compliance to global standards remains crucial for preventing the operation of "substandard" ships, improving maritime safety and labor conditions as well as the protection of the marine environment. As mentioned, general conditions to the exercise of port State control are laid down in the LOSC and most international instruments provide specific obligations on their enforcement on foreign ships while in a port or terminal of jurisdiction of a Party.[77] As general worldwide guiding principles IMO adopted "Procedures for Port State Control" which are regularly updated.[78]

The existing legally binding framework has not significantly reduced, by itself, the number of "substandard" vessels across the world's oceans and seas. Hence, specific cooperation agreements between maritime authorities sharing the same marine region have been developed worldwide, in the form of Memorandum of Understanding (MoU), as a solution to increase effectiveness of port State control activities, at the same time reducing related costs, currently reaching the number of nine MoU.[79] Cooperation and exchanges of information for a regular and systematic control of ships by regional groups of States, increased the efficacy of controls, reduced the burdens and avoided possible unfair competition deriving from the shifting of substandard ships' traffic from one port to another of the same area.

Several provisions of the BWM Convention are related to compliance and enforcement aspects, such as the ships' inspection, the detection of violations, the notification of control actions, the survey and certification of ships.[80] Related technical implementation has been addressed by IMO through the adoption of relevant guidelines and circulars.[81] Once the 2004 BWM Convention enters into force, port State controls will be of the outmost importance to enforce related standards on ships calling at the Adriatic Sea ports and terminals. In the basin, Croatia, Italy and Slovenia participate in the 1982 Paris MoU for Europe and the North Atlantic, which gathers maritime authorities from European countries plus Canada, the Russian Federation and the European Commission; another Adriatic State, Montenegro, is formally an observer to this MoU and participates as a cooperating member.[82] In the Mediterranean region is also operating the 1997 Mediterranean MoU, gathering southern and eastern Mediterranean countries, to which the European Commission participates as an observer.[83]

The list of relevant instruments that, according to the Paris MoU, authorities shall apply to foreign ships has already been amended to include the reference to the 2004 BWM Convention and draft Port State Control Committee instructions are being prepared to this end by the MoU Committee.[84] The scope, frequency and priority of port inspections are determined on the basis of a ship's risk profile, according to which ships are classified in High Risk Ships (HRS), Standard Risk Ships (SRS) or Low Risk Ships (LRS), based on each ship's generic and historic parameters,[85] recalculated daily and available through the MoU's Information System on Inspections.[86]

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77 See i.e. ILO Convention No. 147; International Convention on Load Lines, 1966, Article 21; International Convention on Tonnage Measurement of Ships, 1969, Article 12; MARPOL 73/78, articles 5 and 6; SOLAS Convention, regulations IX-6.2, XI-2 and XI-4.

78 IMO Resolution A.1052(27) "Procedures for Port State Control, 2011", adopted on 30 November 2011.

79 These MoUs concern: Europe and the North Atlantic (Paris MoU); Asia and the Pacific (Tokyo MoU); Latin America (Acuerdo de Viña del Mar); the Caribbean (Caribbean MoU); West and Central Africa (Abuja MoU); the Black Sea region (Black Sea MoU); the Mediterranean (Mediterranean MoU); the Indian Ocean (Indian Ocean MoU); and the Gulf region (Riyadh MoU). The first example of port State control MoU was concluded in The Hague in 1978, signed by eight North Sea States, in order to ensure that labor requirements according to the ILO Convention No. 147 were met on foreign ships.

80 Relevant BWM Convention provisions are Article 3.3, Article 9, Article 10, Article 11, Article 12 and regulations B-2.6 and E-1.6.

81 See Resolution MEPC.173(58) "Guidelines for ballast water sampling (G2)", adopted on 10 October 2008; Resolution MEPC.252(67) "Guidelines for Port State Control under the BWM Convention", adopted on 17 October 2014; IMO Circular BWM.2/Circ.42 of 24 May 2013 "Guidance on ballast water sampling and analysis for trial use in accordance with the BWM Convention and Guidelines" (G2). Relevant texts are reproduced in RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts*, cit.

82 Administrations signing the Paris MoU are those of Belgium, Bulgaria, Canada, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Slovenia, Spain, Sweden and the United Kingdom; Montenegro (cooperating member).

83 The authorities of Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, Tunisia and Turkey joined the Mediterranean MoU, whose headquarters are in Alexandria. The MoU applies an annual Target Inspection Rate of 15% per country within 3 years, which has not yet been met. Detention policies still differ from the Paris MoU ones.

84 According to the Paris MoU, Sections 2.3 and 2.4, the maritime authorities apply to foreign ships those international legal instruments in force to which they are Parties and ensure that no more favorable treatment is given to ships of non-Parties. For the development of this standard clause in international shipping agreements and in the context of IMO see PAMBORIDES G. P. (1999). *International Shipping Law: Legislation and Enforcement.* Martinus Nijhoff Publishers, pp. 107-109.

85 Section 3.2 and Annex 7. Elements of the ships risk profile include ship type, age (keel laying date), flag of registry, the performance of recognized organizations, company performance, number of deficiencies and detentions recorded within the previous 36 months.

86 According to Section 7.4 and Annex 3 of the Paris MoU, the system – set up and managed by the Netherlands' Ministry of Infrastructure and the Environment – makes available to authorities up-to-date information on ships, inspections, companies' performance as well as other data required.

Ships, depending on whether they are HRS, SRS or LRS, become due for periodic inspections in specific time windows after the last inspection in the Paris MoU region.[87] The selection scheme for inspections identifies Priority I and II ships: Priority I ships are those which must be inspected because either the time window has closed or there is an overriding factor, and Priority II ships are those which may be inspected because they are within the time window or the port State considers that an unexpected factor warrants an inspection.[88] According to the Paris MoU, States commit to carrying out inspections on every ship with a Priority I status calling at one of its ports, even if subject to a certain flexibility, and to carrying out a number of inspections on Priority I and II ships that corresponds at least to its annual inspection commitment.[89] Furthermore, authorities should refrain from selecting Priority II periodic inspections when these are not required in order to meet their annual commitment.[90] While periodic inspections are carried out at intervals determined by the ship risk profile, in between such periodic inspections only overriding or unexpected factors might trigger additional inspections.

The suitability of such a system to address the threats posed by the transfer of HAOPs through the discharge of ballast water will be discussed further on in this report, as it represents a challenging aspect for the protection of the Adriatic Sea (see below, paragraph 6.7.). Here, it is worth noting that also in regard to the inspections as outlined in the BWM Convention, the comparison with the Paris MoU types of inspections may give rise to some uncertainty and would need further clarifications as well as specific additional and uniform training for PSCOs. The MoU defines inspections as "initial", "more detailed" and "expanded", describing in detail the activities to be carried out in each case. In order to carry out a "more detailed" inspection there must have been, during the "initial inspection", clear grounds for believing that the condition of the ship or of its equipment or crew, or the working and living conditions of seafarers, does not substantially meet the requirements of a relevant instrument, based on evidence and on the PSCOs professional judgement.[91] According to the BWM Convention, sampling on board may be conducted any time during all these types of inspections and should be carried out in a moment initial enough as to allow PSCOs to stop the discharge. This action will be feasible on the basis of an indicative analysis conducted without delaying the ship. Therefore, conditions to trigger samplings depend from the actual threat posed to the environment by the specific ballast water discharge, somehow enhancing the definition of clear grounds.[92]

A further aspect that will have a peculiar relevance for the Adriatic Sea system proposed and tested by the BALMAS project, is related to reporting to port States. The Paris MoU reporting requirements are, usually, a 24hour message notification in advance of the ship's arrival time or, if the voyage time from the previous port is less than 24 hrs, at the time of leaving it, or, if the port of call has changed during the voyage, as soon as the information is available.[93] Ships eligible for expanded inspections (HRS and any passenger ship, oil tanker, gas or chemical tanker or bulk carrier, older than 12 years) shall notify 72 hrs in advance of arrival in a port (3 days pre-arrival notification). As far as Adriatic sub-regional ship reporting is concerned, in 2002 IMO adopted ADRIREP, a Mandatory Ship Reporting System in the Adriatic Sea which entered into force on the 1st of July 2003 and to which Italy, Slovenia, Albania, Montenegro and Croatia participate.[94] Mandatory reporting requirements apply to all oil tanker ships of 150 GT and above and to all ships of 300 GT and above carrying on board, as cargo, dangerous or polluting goods, in bulk or in packaged form. The area of mandatory ship reporting is divided into five sectors, each of them assigned to a competent authority (from Italy, Croatia and Montenegro).[95] Reports shall be submitted at a certain time and when in a geographical position by ships sailing the Adriatic Sea northwards and southwards as well as by ships crossing the Adriatic.

Formats for mandatory reporting in the Adriatic have been developed by the project and were derived from those attached in the IMO resolution containing general principles for ship reporting systems and ship report-

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87 HRS become due for periodic inspection between 5-6 months after the last inspection in the Paris MoU region, while SRS between 10-12 months and LRS between 24-36 months.

88 The Paris MoU abandoned a 25% quota for inspections for each State by adopting in May 2009 the New Inspection Regime (NIR) which is also the main element of the EU Port State Control Directive No. 2009/16/EC.

89 National inspections commitments are calculated as a share of the regional inspection commitment.

90 Paris MoU, Section 1.3 and Annex 11.

91 Paris MoU, Section 3.1 and Annex 9, point 6. It should be underlined that the Authorities, when exercising control under the Memorandum, make all possible efforts to avoid unduly detaining or delaying a ship, for which the LOSC entitle shipowners/operators the right to compensation. With the exception of the case in which the ship is clearly hazardous to safety, health or the environment, the ship on which a deficiency is detected that cannot be rectified in the same port, may be allowed to proceed to a port where this can be done.

92 It is worth noting that the IMO Guidelines on Port State Control give examples how sampling for compliance with ballast water management standards may be approached, stating also that thei are not intended to limit the rights the Port State has in verifying compliance with the BWM Convention.

93 Paris MoU, Annex 12.

94 Resolution MSC.139(76) adopted on the 5th of December 2002.

95 According to the MSC resolution, the sectors' competent authorities are: for Sector 1, Brindisi Coast Guard (I); for Sector 2, Bar MRCC (Montenegro); for Sector 3, Rijeka MRCC (HR); for Sector 4, Ancona MRSC (I); for Sector 5, Trieste MRSC (I), Venezia MRSC (I) and Koper MRCC (SLO).

ing requirements.[96] In ADRIREP, a "first reporting", containing the general information as well as any relevant information[97], is followed by a "position report" with navigation details.[98] Once a report has been received, the ADRIATIC TRAFFIC competent authority provides the ship with information on navigational conditions (status of aids to navigation, presence of other ships and, if necessary, their position, etc.), on weather conditions and with any other relevant information. If a ship fails to comply with the requirements of the system, not submitting the reports, information will be passed to the competent Flag State authorities for investigation and possible prosecution as well as to port State control inspectors. In order to tackle the peculiar needs of protection and management of threats deriving from HAOPs introduction in the Adriatic Sea, both the timing and the content of the mandatory reporting could be adapted (for details see infra paragraphs 6.5 and 6.7).

To complete this general picture on port State controls, it is worth noting that the mentioned UNEP/MAP Strategic Plan until 2021 focuses on improving cooperation on the matter by strengthening the Mediterranean MoU performance, in which commitments for inspections (set to a 15% inspections rate) have not been reached yet. The UNEP/MAP would also help a convergence with the EU Directive No. 2009/16/EC detention policy and enhance the cooperation between the Mediterranean MoU and the Paris MoU. A participation of the UNEP/MAP Secretariat in the MoU meetings is envisaged, as well as port State control training activities, carried out in association with the Paris MoU and including training related to ballast water management. The improvement of the general performance of the Mediterranean MoU would certainly help also the protection of the Adriatic environment, considering that a major volume of ballast discharges in the region proceed from Mediterranean donor ports.

3.4. Initiatives and organizations where the Adriatic dialogue on ballast water could be addressed: sub-regional and EU supported cooperation

In the Adriatic region, exchanges are a matter of fact for coastal populations, driven by proximity, whilst the recent cooperation between States went through parallel and discontinuous paths, affected by broader political and historical factors. Treaties regarding maritime borders have been signed in Osimo (Ancona) in 1975.[99] Since the early '70s, facilitated by the environmental regional institutions, the cooperation on the protection of Adriatic Sea waters and coastal areas from pollution had a legal reference in a specific agreement.[100] On the basis of these commitments, a Joint Commission for the Protection of the Adriatic Sea Waters and Coastal Areas was established, dealing also with shipping matters.[101] The Commission currently includes Italy, Croatia, Montenegro and Slovenia, while Albania and Bosnia and Herzegovina are invited as State observers. Cooperation descending from these agreements has continued, in parallel to other initiatives, producing relevant joint statements and proposals, in some cases giving birth to formal agreements, as in the field of responses to pollution emergencies at sea with the adoption of a sub-regional contingency plan. The ability of the Commission to adopt decisions was strengthened by the constant involvement, under the aegis of the Ministries of Foreign Affairs, of different national administrations (maritime, environmental as well as other agencies and bodies), further enhanced during the years by the participation of representatives of the EU Commission and of UNEP/MAP regional centers, thereby increasing the coherence with the work of various organizations. In this way, broader legal commitments have frequently framed the sub-regional cooperation, at the same time being feed by related discussions and joint positions.[102] Ballast water management problems were soon included in the Commission agenda: in 2003, a Ballast Water Management Task Force was established to cope with the ballast water issue at the Adriatic level, which in 2004 developed into a more formal Ballast Water

96 IMO Resolution A.851(20) adopted on 27 November 1997 "General principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants".

97 Information to be provided with ADRIATIC TRAFFIC is: ship's name, call sign, IMO identification number and flag; date and time of the report; present position; course; speed; port of departure; destination and estimated time of arrival; estimated time of arrival at the next check point; ship's draught; the general category of hazardous cargo as defined by the IMDG, IBC, IGC Codes and MARPOL Annex I; ship's representative and/or owner available on 24-hour basis; ship's type, deadweight, gross tonnage and length overall; total number of persons on board; and any other relevant information.

98 Information included in the position report is the following: ship's name, call sign, IMO identification number and flag; date and time of the report; present position; course; speed; port of departure; destination and estimated time of arrival; estimated time of arrival at the next check point; and any other relevant information.

99 Treaty signed in 1975 in Osimo, Ancona, included ten annexes and an Agreement on the development of economic cooperation between Italy and Yugoslavia, with four annexes.

100 In 1974, the Agreement on Cooperation for the Protection of the Waters of the Adriatic Sea and Coastal zones from pollution was signed in Belgrade between Italy and former Yugoslavia, under the influence of the Barcelona Convention commitments.

101 During the years the Commission focused, amongst other matters, on shipping reporting, routeing measures, a proposal for a Particularly Sensitive Sea Area in the Adriatic.

102 For example in the case of the implementation of the EU Marine Strategy Framework Directive and the parallel work of UNEP/MAP on EcAp.

Management Sub-Commission (BWMSC), wherein experts and government representatives started working on relevant proposals.[103]

A parallel cooperation iniative was launched in the year 2000, when the Ancona Declaration re-launched co-operation as a tool for stabilizing the post-conflict area. The initiative called the Adriatic Ionian Initiative (AII) had proper inter-governmental decision making bodies and a rotating chairmanship.[104] The focus was politically broader than the previous cooperation activities had been, emphasizing cooperation among its members in relation to tourism, culture, universities, small and medium-sized enterprises, maritime transport, environment and protection against fire. The initiative progressively enhanced the number of participating States to eight.[105]

Furthermore, the Adriatic and Ionian Seas in 2012 have been the focus of a specific EU Commission document on the development of maritime economies and blue growth in the area, thus implementing the Europe 2020 wider agenda, envisaging a maritime strategy for the region.[106]

Sub-regional cooperation efforts were recollected again in 2014, in parallel to existing initiatives, in a new and different strategic effort under the EU umbrella, with the adoption by the EU Council of the EU Strategy for the Adriatic and Ionian Region (EUSAIR), accompanied by a related Action Plan.[107] The need of a Strategy was driven by the EU Integrated Marine Policy developments[108] even if EUSAIR was designed with a broader policy vision which is reflected in the EU Commission management, assigned to the DG Regional and Urban Policy in close cooperation with DG Maritime Affairs and Fisheries. The EUSAIR general objective is promoting the sustainable economic and social prosperity of the Adriatic-Ionian region through growth and the creation of jobs, by improving its attractiveness, competitiveness and connectivity, while at the same time preserving the environment and ensuring healthy and balanced marine and coastal ecosystems.[109] The Strategy would also contribute to the EU integration of participating Western Balkans pre-accession countries, and would address as a major challenge the heterogeneity of administrative and economic capacities of the region. EUSAIR and the related action plan are focused on four independent thematic pillars, which are trans-boundary and transnational by nature (e.g. blue growth, connecting the region, environmental quality, sustainable tourism). These pillars currently frame priorities for mobilizing the whole spectrum of relevant funding sources, since the Strategy does not rely on one specific EU budgetary line or instrument.[110] According to the Action Plan adopted in 2014, related actions identified for each pillar by 2020 are referred, amongst others, to institutional capacities, to standards and regulation harmonization, to improving maritime skills and to support data and knowledge sharing targets.[111] These issues are particularly relevant for the control and mangament of ballast water within the region.

3.5. The path followed by different European marine regions in the implementation of the BWM Convention

It is interesting to note that the cooperation of the coastal States of two other European marine regions, the North Sea and the Baltic Sea have developed over the years several instruments for a coordinated and effective implementation of ballast water management measures. In both regions, bordering States are bound by specific agreements: on the Oslo and Paris Commission (hereinafter, OSPAR Convention) and on the Helsinki Baltic Marine Environment Protection Commission (hereinafter, HELCOM). Cooperation on ballast water has taken into account the Article 13.3 of the BWM Convention on regional cooperation, and addressed at first the

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103 In 2011, the 12th Ordinary meeting of the Commission held in Portoroz, established two more sub-commissions, focused on the implementation of the EU Marine Strategy Framework Directive and on the integrated coastal zone management and sustainable development.

104 The AII decision-making body is the Adriatic-Ionian Council - where countries are represented by Ministries of Foreign Affairs - that establishes the agenda through periodic meetings of Senior Officials. The initiative is connected with several organizations in South East Europe. For further information see http://www.aii-ps.org/.

105 Croatia, Greece, Italy and Slovenia, as EU Member States, and Albania, Bosnia and Herzegovina, Montenegro and Serbia.

106 Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions, "A Maritime Strategy for the Adriatic and Ionian Seas", COM(2012) 713 final, Brussels, 30.11.2012. The southern limit of the Ionian sea was considered according to the International Hydrographic Organisation definition, the line from Cape Tenaron to Capo Passero.

107 See Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions concerning the "European Union Strategy for the Adriatic and Ionian Region", COM(2014)357 final. The Strategy was endorsed by the European Council, see Council conclusions of 29.9.2014 and of 23/24.10.2014.

108 See Council conclusions on the Integrated Maritime Policy of 19.12.2011.

109 See Commission Staff Working Document, "Analytical Document accompanying the Communication concerning the European Union Strategy for the Adriatic and Ionian Region", Brussels, 17.6.2014, SWD(2014)191 final.

110 First EUSAIR Governing Board took place in Ancona on 2015, coordinating the work of the Thematic Steering Groups in charge of the implementation of the Strategy.

111 Commission Staff Working Document, "Action Plan accompanying the Communication concerning the European Union Strategy for the Adriatic and Ionian Region", SWD(2014)190 final, Brussels, 17.6.2014

voluntary interim implementation of the D-1 standard on Ballast Water Exchange. In order to reduce the risk of species entering and circulating within both regions OSPAR, supported by the European Union, developed voluntary guidelines for vessels on the application of ballast water exchange entering the areas of jurisdiction of the Contracting Parties (effective since the 1st of April 2008).[112] According to the voluntary arrangements, each vessel entering these waters should have on board a Ballast Water Management Plan complying with relevant IMO Guidelines (G4) and should keep records of all ballast water operations.

Further steps in regional cooperation have been developed based on the results of a number of projects co-funded by the HELCOM and OSPAR organizations through which port surveys in selected ports have been carried out and a port sampling methodology was agreed upon.[113] In some cases, sampling has been conducted for different legal purposes, such as to fulfill the EU Marine Strategy Framework Directive commitments.

The availability of fundamental data so gathered has been considered sufficient to regionally cooperate on the granting of exemptions to the BWM Convention application, which shall be subject to risk assessments according to the IMO Guidelines (G7). By parallel decisions of the State Parties to HELCOM and OSPAR, the "Joint HELCOM/OSPAR harmonized procedure on the granting of exemptions under International Convention for the Control and Management of Ships' Ballast water and Sediments, Regulation A-4" has been adopted and was further amended in 2015.[114] Technical cooperation extended to the development of a joint management instrument, and in 2013, HELCOM adopted a Joint Decision tool on the introduction of alien species in ballast water, an online tool administered by the HELCOM and OSPAR Secretariats including a database of port and environmental data.[115] However this work is not in all subjects following the IMO risk assessment principles. In contrast, the risk assessment prepared during the BALMAS project is fully in line with IMO guidelines.

Recently, a list including more than 100 target species was evaluated by HELCOM, and the criteria to identify them have been discussed and harmonized between the Contracting parties that are members of the two organizations. The species' list has been considered as a living document that will be further updated.[116]

112 See BWM.2/Circ.14 of 28 August 2008 "Communication received from the Administration of the United Kingdom on behalf of the Contracting Parties to the OSPAR and Helsinki Conventions (Belgium, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, the Russian Federation, Spain, Sweden, Switzerland and the United Kingdom), concerning the general guidance on the voluntary interim application of the Ballast Water Exchange Standard contained in Regulation D-1 of the BWM Convention in the North-East Atlantic and the Baltic Sea".

113 i.e. HELCOM ALIENS 3 project, HELCOM BALSAM project.

114 Adopted as OSPAR Agreement 2013-09 and by HELCOM Ministerial Meeting in Copenhagen, 3 October 2013. Amended by HELCOM HOD 48-2015 June and OSPAR Agreement 2015-01.

115 The OSPAR Commission has concluded with IMO an Agreement of Cooperation on shipping issues.

116 At the meeting of the Heads of Delegation of June 2015.

4. THE EUROPEAN UNION FRAMEWORK AND OPTIONS FOR THE ACTIONS OF THE ADRIATIC STATES

Out of the six States bordering the Adriatic Sea, three of them are EU Member States; their national legal frameworks integrate the legislation and the policy orientations of the EU as a whole. However, EU legislation and policies are also relevant for the other three States which are not members of the Union, as they all have already entered in relations with the European institutions in order to join the enlargement process.[117] The main aspects of the EU legal framework relevant for the purposes of this report are described below.

4.1. The European Union environmental policy and the general framework on invasive species

In recent years, the EU environmental policy has addressed the problem of alien, invasive and otherwise harmful species and organisms within the wider context of the protection of biodiversity. As reviewed, Parties to the CBD, among which are Member States as well as the EU, committed to the Aichi Target 9, which was reflected in Target 5 of the EU Biodiversity Strategy to 2020. The Strategy, adopted in 2011 by the Commission, is the main policy document setting objectives on the protection of European biodiversity and represents the European contribution to the global scenario.[118] According to Target 5, the EU Member States have collectively committed by 2020, to identifying and prioritizing Invasive Alien Species (IAS) and their pathways, to controlling or eradicating priority species, and to preventing the establishment of new IAS by managing their introductions.[119]

In 2014, these political commitments became a mandatory instrument dedicated to mitigating the impacts of biological invasions in Europe: Regulation (EU) No. 1143/2014 on the prevention and management of the introduction and spread of invasive alien species.[120] This new legislative measure considers the appearance of alien species in new locations - whether the species concerned are animals, plants, fungi or micro-organisms - not always as being a cause for concern. IAS addressed by the regulation are that subset of alien species that may become invasive and have serious adverse impact on biodiversity and related ecosystem services or have other social and economic impact. The IAS include marine species.

The implementation of the new legal framework might have several points of connection with the implementation of the global regime on the introduction of HAOPs through the pathway of the ships' ballast water.[121] According to an assessment of the species' volume and related potential damage, the Member States have to prioritize pathways of unintentional introduction and spread within their territories and marine waters. National action plans shall be adopted accordingly, ensuring coordination with other Member States sharing the same marine sub-region (i.e. the Adriatic Sea).[122]

Furthermore, a "Union list" of IAS considered to be of common concern shall be established and regularly updated.[123] In order to prevent the spread within the Union of the IAS included in the List, the Member States should establish a surveillance system, collect and record data on the species' occurrence in the environment through the use of surveys, monitoring or other procedures. The surveillance system shall include within its scope marine territorial waters in order to determine the presence and distribution of new and already established species. The system should be sufficiently dynamic to rapidly detect the appearance of any IAS previously unknown and shall build upon, or be compatible with, provisions for assessment and monitoring laid down by Union law under international agreements, making use of the information provided by Directive No.

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117 At the moment of writing this report, Albania was awarded the candidate status by the EU in 2014, Bosnia and Herzegovina submitted its application to join the EU in February 2016 and is a potential candidate, Montenegro was awarded candidate status in 2010 and is proceeding speedily through the EU chapters' negotiations. For a status update consult the EU enlargement policy web portal at http://ec.europa.eu/enlargement/index_en.htm

118 Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions "Our life insurance, our natural capital: an EU biodiversity strategy to 2020", COM(2011)244 final, Brussels, 3.5.2011.

119 At the time of drafting the Strategy, with the exception of legislation concerning the use of alien and locally absent species in aquaculture (Council Regulation (EC) No. 708/2007 of 11 June 2007), there has been no dedicated, comprehensive policy addressing the challenges posed by IAS, which were estimated to have caused some €12.5 billion worth of damage each year in the EU.

120 Regulation (EU) No. 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species.

121 IAS introduction by means of ships' pathway is recalled as one of those requiring effective management and reference is made, to this end, to IMO's work and measures.

122 When complying with their obligations under the regulation, Member States shall make every effort to ensure close coordination with all Member States concerned and, where practical and appropriate, use existing structures arising from regional or international agreements.

123 The Union list will include those IAS that, after appropriate risk assessments are: alien to the territory of the Union, capable of establishing a viable population and spreading in a marine sub-region, likely to have a significant adverse impact on biodiversity or the related ecosystem services and that may have an adverse impact on human health or the economy.

2008/56/EC (see below, next paragraph). The surveillance system should take into account, to the possible extent, trans-boundary impacts and features, avoiding any duplication of provisions. It is worth recalling that since 2012 the European Commission launched the European Alien Species Information Network (EASIN) in order to facilitate the exploration of existing information on alien species and to assist the implementation of the new regulation and the other EU policies on biological invasions.

Finally, when IAS cause damage to ecosystems or reduce their resilience, it is necessary to take prevention, restoration and reparation measures along with those to enhance the conservation status of species and their habitats; as far as marine species are concerned, these should be those identified by relevant EU legislation i.e. the Marine Strategy Framework Directive, the Habitats Directive and the Birds Directive.[124] It is worth noting that the "polluters pay principle" should apply to related costs and that Member States are required to recover the costs of the measures needed to prevent, minimise or mitigate the adverse impact of invasive alien species, including environmental and resources costs as well as the cost of restoration.[125]

4.2. The Marine Strategy Framework Directive: the presence of non-indigenous species as a descriptor of the Good Environmental Status of marine waters

In the EU legal framework, marine non-indigenous species (hereinafter, NIS) are of concern within a different legal act, Directive No. 2008/56/EC, which establishes a framework for community action in the field of marine environmental policy, the Marine Strategy Framework Directive (hereinafter, MSFD).[126] The MSFD requires Member States to determine the characteristics of the Good Environmental Status (GES) of marine waters, that has to be reached or maintained by 2020, in regard to each European marine region or sub-region, among which the Adriatic Sea is included. To this end, States are also required to establish a comprehensive set of environmental targets, to establish monitoring programmes as well as relevant programmes of measures. Strategies are to be developed in a coherent and coordinated manner within the marine regions/sub-regions, including coordination with any concerned third countries, using to this end the existing regional institutional cooperation structures e.g. the regional seas conventions, and building upon relevant existing programmes and activities.[127]

According to the MSFD, the determination of the GES to be achieved has to be based on a set of qualitative descriptors, among which descriptor No. 2 establishes that "Non-Indigenous Species introduced by human activities" shall be "at levels that do not adversely alter the ecosystems".[128]

Even if marine IAS and marine NIS are different categories, the IAS Regulation and the MSFD scopes partially coincide. Further methodological guidance developed by the European Commission[129] has clarified that especially "impacts of invasive NIS are the main concern for achieving GES" and that "alien" can be considered as a synonymous of "non-indigenous". In defining GES, consideration should be given both to the "abundance and state characterization of non-indigenous species, in particular of invasive species" and to the "environmental impact of invasive non-indigenous species".[130] On the other hand, both marine IAS and marine NIS can be considered HAOPs according to the BWM Convention, and further possible national implementation measures - i.e. granting of exemptions, warnings, etc. - might take into account whether the level of threat of danger posed by an identified species is to be specifically considered while taking national or sub-regional decisions on ballast water management.

The actual overlapping of these legal definitions has resulted for Italy, one of the Adriatic EU Member States, in the development of measures that while implementing the Marine Strategy Directive objectives may facilitate the parallel implementation of other legal obligations, namely Regulation (EU) No. 1143/2014 as well as the BWM Convention. The environmental targets adopted at the national level by Italy have included the establishment in national ports of international relevance of an early warning system for the timely detection of the presence of invasive NIS as well as alerts' reporting to the competent authorities.[131] Coherently with these tar-

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124 Council Directive No. 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora and Directive No. 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

125 Regulation (EU) No. 1143/2014, Article 21.

126 Directive No. 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

127 MSFD, Article 6, Regional cooperation.

128 MSFD, Annex I, Qualitative descriptors for determining good environmental status.

129 See Commission Decision of 1 September 2010 on "Criteria and methodological standards on good environmental status of marine waters (2010/477/EU)".

130 Commission Decision 2010/477/EU cit., Annex, Part B, points 2.1 and 2.2.

131 Decree of the Italian Ministry of Environment, Land and Sea Protection of 17 October 2014 concerning the determination of the Good Environmental Status and the definition of environmental targets, Annex II, point T.2.1. The indicator associated to the target is the early warning system territorial coverage.

gets, also the monitoring programmes approved have been aimed at establishing an alert system, together with an assessment of relevant risks posed by NIS, including related potential invasiveness, and the development of remediation measures.[132] These national measures match with the implementation needs of various legal objectives, including those of the BWM Convention, and could be further discussed by the Adriatic States, the broader Mediterranean regional bodies and involve the European Commission, which shall draw conclusions on the first cycle of the MSFD implementation and possible 2018 revision, aiming at ensuring consistency of monitoring methods across the sub-region and more cost-effective solutions to parallel legal obligations.

4.3. The EU legislation on shipping matters relevant for ballast water management

The role of the European Union on the protection of the marine environment from ship-derived pollution is influenced on one hand by the adhesion of the Union to the LOS Convention principles and, on the other, by the evolution of the shared competences according to the funding Treaties with their institutional evolutions. In this general legal framework, the EU action has been mainly directed at enhancing the uniformity and standardization of implementation and control procedures and administrative practices, leaving aside the adoption of dramatically different standards on shipping pollution matters among Member States.[133]

However, in the last decade, there has been significant innovation in European maritime and marine policies, pushed by the growth potential represented by maritime economies and the interest of building a more competitive economy. The development of the EU Maritime Integrated Policy of which the MSFD would represent the environmental pillar, has given birth, amongst other measures, to a directive on maritime spatial planning and to an increasing effort concerning the gathering of knowledge and data on marine environments that should be taken into account as a further framework for the implementation of the BWM Convention obligations in the Adriatic basin.[134]

Specific EU legislation that is of direct relevance for the implementation and enforcement of the ballast water management regime is the EU port legislation. Among the main acts, as already mentioned in this report, is the EU inspection system of foreign ships, based on the legal requirements of Directive No. 2009/16/EC[135] and largely coinciding with the 1982 Paris MoU on Port State Control (see paragraph 3.3. of this report), applying to commercial ships and their crews calling at a port or anchorage of a Member State and to inspections in waters within Member States' jurisdiction. Consideration has to be given to Directive No. 2010/65/EU on reporting formalities[136] and to Directive No. 2005/35/EC on ship-source pollution and on the introduction of penalties for infringements [137] as both instruments could be adapted to address specific requirements for ballast water management purposes.

Although the current system of port reception facilities in European ports does not include within the scope of relevant legislation the reception of clean ballast water, nor does the BWM Convention establish an obligation in this regard, this legal measure still has to be considered, in particular as a model for sharing possible costs in the event that any of the Adriatic States would opt for mobile solutions to port reception. [138]

Finally, it has to be considered that those provisions of the BWM Convention and guidelines on the reception and treatment of the ballast water sediments shall be implemented by the Adriatic EU Member States according to EU waste legislation: an analysis of its application to Adriatic shipyards and dry-docks deserves specific attention in the future (see paragraph 6.6. of this report).[139]

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132 Decree of the Italian Ministry of Environment, Land and Sea Protection of 11 February 2015 concerning the determination on indicators associated to environmental targets and monitoring programmes according to Legislative Decree No. 190/2010, articles 10.1 and 10.11, Annex II, point 2.9.

133 On the position of the European Union in respect of the Law of the Sea see: FRANK V. (2007). *The European Community and Marine Environmental Protection in the International Law of the Sea. Implementing global obligations at regional level,* Publications on ocean Development, LVIII, Martinus Nijhoff Publishers, pp. 482 and EHLERS P. and LAGONI R. (eds.). (2008). *Maritime Policy of the European Union and the Law of the Sea,* Hamburg, pp. 295.

134 For an update on the integrated maritime policy developments see European Commission (2012). "Progress of the EU's Integrated Maritime Policy. Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions", COM(2012)491 final. See also Directive No. 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning.

135 Directive No. 2009/16/EC of the European Parliament and of the Council of 23 April 2009 on port State control (Recast). The text is reproduced in RAK G. and DE VENDICTIS G. (eds.). (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* cit.

136 Directive No. 2010/65/EU of the European Parliament and of the Council of 20 October 2010 on reporting formalities for ships arriving in and/or departing from ports of the Member States and repealing Directive 2002/6/EC.

137 Directive No. 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringements.

138 Directive No. 2000/59/EC of the European Parliament and the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues.

139 For general references see http://ec.europa.eu/environment/waste/index.htm.

5. THE ADRIATIC NATIONAL LEGAL FRAMEWORKS AT A GLANCE: THE BALMAS QUESTIONNAIRE

The BALMAS project activities on legal and policy matters have included a review of national legislation and regulations, aiming at collecting national and local regulations as well as other information relevant for ballast water management, thus gaining knowledge also on the actual distribution of public competences in each Adriatic country. To this end, a questionnaire has been prepared and circulated between partners and related feedback has been used as a further basis to draw the conclusions and recommendations included in this report (see paragraph 6).

The questionnaire has focused on legal acts adopted at national (State), regional, municipal and/or port levels. Questions have been grouped into three different sections related to:

- Current regulations in sectors relevant to ballast water management (law of the sea, shipping, environment, ports, fisheries, aquaculture, etc.) (Section A),
- Competences of authorities and relevant bodies (Section B),
- Questions on the foreseen implementation of the BWM Convention (London, 2004) (Section C).

The main aspects considered by Section A have been the following:

A.1 United Nations Convention on the Law of the Sea (Montego Bay, 1982) and its implementation
A.2 Environmental laws and regulations
A.3 Pollution caused by ships (discharges, safety) and ports legislation
A.4 Fisheries and aquaculture legislation

Section B, concerning information on national and local authorities and activities relevant to ballast water management, has developed questions focused on the following two items:

B.1 Maritime and port authorities
B.2 Environmental authorities

Section C of the questionnaire has covered the following aspects of the implementation of the BWM Convention:

C.1 Ratification instrument
C.2 Competent authorities and other bodies involved
C.3 Adoption of measures for BWM Convention implementation, including “more stringent measures” and “voluntary measures”
C.4 Exemptions
C.5 Enforcement of the BWM Convention and Port State Control (PSC) on BW: sanctions, inspections and detection of violations
C.6 Identification and availability of reception facilities for ballast water and sediments
C.7 International cooperation

The project partners circulating the questionnaire were only in some cases experts on legal matters and in order to provide their feedback they have consulted relevant authorities at national level. In many of the questions, the partners were allowed to freely describe the context of the rule/obligation, delivering as much information as they deemed necessary. When information was gathered from more than one authority or body, a copy of the questionnaire was filled out for each of them and the details and contacts of the subjects who provided the information were included.[140]

140 The full text of the questionnaire is in RAK G. (2014). *Questionnaire to guide the identification of legal and policy aspects and constraints.* BALMAS project, Work package 9, Activity 1, pp. 12.

6. CRITICAL ISSUES EMERGING FROM THE REVIEW: RECOMMENDATIONS TO FACILITATE THE IMPLEMENTATION OF THE BWM CONVENTION IN THE ADRIATIC SEA AND THE USE OF BALMAS PROJECT RESULTS

The BWM Convention is a multilateral treaty dealing with the prevention of risks for the environment and other protected values deriving from a ships' routine operation. The convention sets quality standards in relation to the presence of HAOPs in ballast water to be discharged, and these are meant to be valid everywhere. In reality, the possible damage caused by discharges is not only linked to the presence of HAOPs in ballast water. To determine actual threats, the relation between the characteristics of HAOPs and those of the recipient environment is fundamental. Under certain conditions, damages to certain marine environments from the introduction of HAOPs could be possible even if quality standards are met and, on the contrary, it is not certain that HAOPs contained in ballast water above the established concentration limits would produce damages once discharged. Hence, under certain circumstances the Parties to the BWM Convention are allowed to address particular needs and specific marine areas conditions.[141]

The Adriatic Sea is a very sensitive marine area, environmentally vulnerable and economically important, exposed to high volumes of both domestic and international shipping. In the background of the BALMAS project was the need to facilitate the implementation of the BWM Convention global obligations taking into account these specific sub-regional features. The activities carried out provided elements to enable the long-term, environmentally efficient and financially sustainable adoption of ballast water measures in the Adriatic basin, that could lead to a strategic common cross-border approach to address the peculiar needs of the marine area. Related Adriatic States decisions are fundamental and sub-regional cooperation was considered as a crucial element to achieve the maximum extent of protection available in the given legal framework. Taking into account the instruments developed by the project, the main legal and policy challenges that bordering States would likely see emerging from the implementation of the BWM Convention in the basin have been reviewed, leading to the identification of the following recommendations on consistent national actions and sub-regional coordinated positions that might in the future facilitate the path towards a sustainable management of ballast water discharges in the basin.

The Adriatic Sea and the Mediterranean Sea (elaboration of a map taken from the *Nations Online Project*)

141 In particular, according to Regulation A-4, certain ships or ships' routes can be exempted from the compliance with standards subject to specific risk assessments and special requirements can be adopted in certain areas (Section C of the Annex).

6.1. Stepping from ratification to implementation: developing Adriatic States co-operation within and outside the Mediterranean

The entry into force of the BWM Convention has been identified by Mediterranean States as a strategic priority and in several occasions, both international organizations and EU institutions have urged States to ratify.[142] However, by itself, the mere adoption of ratification instruments will not give effectiveness to global standards nor would it be sufficient to address the multiple threats posed by the HAOPs that are transferred within the Adriatic Sea basin. In order to achieve the protection objectives underpinning the BWM Convention, the implementation process should go beyond formal ratification processes.

On the national level, the BWM Convention's compliance entails a significant investment by the shipping industry, and places additional burden to countries while playing their roles of Flag, Coastal and Port States. Several project activities, in line with Mediterranean States formal commitments, underlined that national implementation processes would benefit by institutional arrangements involving authorities and bodies providing environmental knowledge and technical expertise, by the development of adequate training and capacity building programmes as well as by promoting public awareness of the problem.[143]

Furthermore, in order to make the protection effective, national measures on ballast water matters should be accompanied by parallel developments in Adriatic sub-regional cooperation. On one hand, such cooperation corresponds to a legal commitment. From the broader perspective of the increasing and multiple uses of the Adriatic Sea, the legal review has shown how EU Member States are required to establish national integrated decision-making processes on maritime issues, in which due regard has to be given to the fact that decisions made on one shore of the basin may affect or otherwise influence the other shore as well as involving areas beyond national jurisdictions.[144] Moreover, the application of the ecosystem-based approach to the management of human activities impacting the marine environment, which is a duty both for the EU and the Mediterranean bordering States, has to consider the marine sub-regions such as the Adriatic Sea. Cooperation in the Adriatic region is also explicitly required by EU legislation to attain the GES of marine waters and by Mediterranean agreements to implement the ecosystem approach.[145] Therefore, the Adriatic basin has to be considered as a whole, as a single marine environment to be preserved taking into account its ecological and physical interconnections as well as existing pressures and impacts, and regional and sub-regional cooperation are crucial to this end.[146] Although pertaining to different legal systems, commitments to endeavor sub-regional cooperation on both maritime (i.e. shipping) related decisions and relevant environmental consequences, should frame those BWM Convention provisions requiring Parties to carefully consider the effects of national decisions on ballast water management on adjacent or interested States. In other words, shipping and environmental commitments shall be implemented coherently and, as appropriate, jointly.

Still, the development of sub-regional cooperation on the control and management of HAOPs is more than a legal duty of bordering States. Several project results lead to consider further cooperation as essential in order to efficiently manage ballast water threats in the basin: Adriatic traffic flows and related ballast water discharges derive mostly from Mediterranean ports, while many of them are intra-Adriatic routes; a number of invasive and/or harmful species and organisms are present in several Mediterranean and Adriatic ports while they are not in others, being already introduced in these earlier with vessels or some other ways;[147] there are currently no environmental monitoring obligations in place helping States in undertaking evidence-based management decisions.

In order to tackle the problems of the Adriatic Sea, bilateral case-by-case consultations and the obligations of the States not to impair the other jurisdictions' environment envisaged by the BWM Convention are not enough.[148] A renewed cooperation at sub-regional level seems crucial. States' efforts should re-open a sub-re-

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142 See Ballast Water Mediterranean Strategy, Strategic priority No. 1; Mediterranean Regional Strategy for Prevention of and Response to Marine Pollution from Ships (2016-2012), Specific objective No. 1; Regulation (EU) No. 1143/2014, 21st recital; Convention on Biological Diversity, COP Decision VIII/27 on invasive alien species, Paragraph 25.

143 For formal references see Ballast Water Mediterranean Strategy, Strategic priorities No. 2 and 3. On the same line the work developed by the GEF-UNDP-IMO GloBallast Partnerships Programme. See http://globallast.imo.org/ for further reference. For the BALMAS project activities see i.e. RAK G., DE VENDICTIS G. (2016). *Recommendations on know-how and education and training needs. Final Report.* BALMAS project. Work Package 9, Activity 2, pp. 6 and AZZURRO E. (2016). *Nuove specie in Adriatico: cosa fare, come riconoscerle. Un quaderno per la pesca artigianale e sportiva*. Quaderni ISPRA Ricerca Marina, No. 9/2016, pp. 18.

144 Directive No. 2014/89/EU establishing a framework for maritime spatial planning and, in particular, Article 4.5, Article 6.2.f, Article 11 and Article 12 in combination with the Directive No. 2008/56/EC obligations in relation to the Adriatic Sea marine sub-region.

145 See legal references reported in Paragraph 3.1. and Section 4 of this report.

146 In particular, see Mediterranean commitments reported in paragraphs 3.1. and 3.2. of this report and Directive No. 2008/56/EC.

147 See among others: ZUPANČIČ G., GOSAR L., DAVID M. (2015). *Report summarizing and analysing shipping patterns in the Adriatic Sea - upgrade (Final beta Report).* BALMAS project. Work package 4, Activity 4.1, 37 pp.; DAVID M., PENKO L., ZUPANČIČ G., GOSAR L. (2016). *Ballast water discharge assessment methods and analysis of ballast discharge patterns in the Adriatic area.* Final report. May 2016. BALMAS project, pp. 162.

148 On the obligations to consult other States, cooperate with them and consider the effects on other jurisdictions of national decisions see BWM Convention articles 2.4, 2.6, 2.7, 2.9, 5.1 and 13.2, regulations A-4.3, B-4.2 and C-1.2 as well as G7 and G13 Guidelines.

gional dialogue covering both political and technical discussions on ballast water management decisions combining them with the available information on invasive, alien and harmful marine species.

In this regard, it has to be considered that within the Adriatic, the level of institutionalization of international relations is generally low and mainly based on ad hoc bilateral cooperation. However, the proximity of the Adriatic bordering States to each other and the existence between them of many shipping connections may facilitate cooperation, as has been the case in other European marine regions (see paragraph 3.5. of this report). In any case, the environmental challenges identified by the project are Adriatic-specific and the broader Mediterranean institutional cooperation can address only part of the related problems. Hence, the Adriatic States would benefit from the re-opening of a formal joint discussion on ballast water management as a stand-alone multilateral process, also to be able to feed correspondent Mediterranean actions. To this end, already existing institutional sub-regional processes or organizations could be used (see paragraph 3.4. of this report). As appropriate, the re-vitalization of the Adriatic Ballast Water Sub-Commission, which was recalled also by the 2012 Mediterranean Ballast Strategy, could re-focus the discussion on ballast water, dealing more with the negotiation on the technical contents. A different (or parallel) opportunity would be to use the organizational structure of the EU Strategy for the Adriatic and Ionian Region (EUSAIR) that may help enlarge the States' participation, with a more project-focused approach. The major advantage of the EUSAIR discussion would be the straightforward involvement of the European Commission and of EMSA, whose roles are strategic in facilitating consistent legal developments and for port State control training.[149] A number of BALMAS project results may serve as a technical contents basis of the renewed confrontation, leading to joint Adriatic declarations and/or operational agreements, as appropriate.[150]

Once the sub-regional dialogue has re-opened, forthcoming Adriatic proposals could be reflected at multiple institutional levels, depending on the specific aspect at stake and benefiting from specific facilitations offered by each international organization and/or institution. Thus, the Mediterranean institutional framework, the UNEP/MAP Secretariat and related binding agreements would be of the greatest relevance for gaining recognition of the Adriatic problems linked to HAOPs transfers. Mediterranean cooperation would facilitate the dialogue with other marine regions or provide for additional Mediterranean measures based on globally applicable instruments and consistent with international law. Based on existing States' decisions and action programmes, UNEP/MAP may also play an important role by facilitating consistent and integrated monitoring which tackles sub-regional specificities with regard to the IAS presence and by smoothing the differences that still exist between the Adriatic bordering States, through training and institutional support to maritime administrations in cooperation with EMSA.[151]

Where appropriate, the Adriatic States' coordinated positions at the global level (IMO, but also CBD), would enhance the preservation of the entire basin's natural and ecological heritage from international unintentional introductions of invasive species (i.e. amending Adriatic IMO mandatory reporting obligations with ballast water specifics according to the project results).

6.2. Identifying responsible authorities and bodies: the cross-road of shipping, ports and environmental competences

The BWM Convention, as other global multilateral treaties dealing with the prevention of pollution from ships,[152] was negotiated under the auspices of the IMO, the international organization within the United Nation system competent on shipping matters, and focus mainly on ships, their characteristics and operations. At the national level, the responsibility for the implementation and enforcement of these type of treaties usually lies primarily in maritime and port authorities. However, unlike other shipping agreements, maritime authorities, while implementing the international ballast water management regime, would deal not only with the ship's

149 The following EU legislation may be relevant to the ballast water control and management needs: Directive No. 2008/56/EC (Marine Strategy Framework), Regulation (EU) No. 1143/2014 (Invasive Alien Species), Directive No. 2009/16/EC (port State control), Directive No. 2005/35/EC (ship-source pollution and penalties), Directive No. 2002/59/EC (vessel traffic monitoring and information system). For details see Section 4 of this report.

150 See the recommendations in paragraphs 6.3., 6.4. and 6.6. of this report and relevant project outputs. For general conclusions see MARKOVČIĆ KOSTELAC M., ZEC D., RAK G. (2016). *BWM Strategy for Adriatic.* Final Report. BALMAS project. Work package 9, Activity 3, pp. 9 and PENKO L., ZUPANČIČ G., KOCIJANČIČ U., POPIT A., FORTE C., MAGALETTI E., MARINI M., GRILLI F., BASTIANINI M., NINČEVIĆ GLADAN Ž., ZEC D., JOKSIMOVIĆ D., MARKOVČIĆ KOSTELAC M., VIDAS S. (2016). *Integrated Operational Plan for Ballast Water Management in the Adriatic.* Final report. BALMAS project. Work package 7, Activity 5, pp. 49.

151 In this regard, it is worth noting the converging commitments of the 2012 Ballast Water Mediterranean Strategy, of the Mediterranean Integrated Monitoring and Assessment Programme and of the Action Plan on Invasive Alien Species as described in paragraphs 3.1. and 3.2. of this report.

152 i.e. the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997(MARPOL 73/78), the International Convention for the Safety of Life at Sea, 1974 (SOLAS), etc. For the full list of IMO conventions see http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/Default.aspx.

Port of Ravenna (Italy), Molo Guardiano Sud (S. Pigozzi, Fondazione Centro Ricerche Marine)

operation and safety but also with the characteristics of the surrounding natural environment. A number of legal and administrative implementation measures would require specific information and assessments on environmental conditions and risks i.e. for authorizing exceptions, for granting of exemptions, for warning mariners on no-uptake areas and for possible additional measures. As a consequence, authorities and/or other public bodies entrusted with environmental and technical functions are likely to play a crucial role in the implementation of the BWM Convention.[153] Furthermore, PSCOs would be responsible for additional activities, i.e. ballast water sampling and related analysis, the performance of which at present Adriatic ports are neither prepared nor equipped to perform. In most cases, the involvement of services and expertise external to the normal organization will be required. Finally, the ability of HAOPs introduced by ballast water to affect health, tourism and fisheries suggests planning a proper involvement of relevant stakeholders as a part of national policies on ballast water. This enhanced participation would both facilitate ships' compliance to the BWM Convention's D-2 standard i.e. by enhancing the monitoring of the IAS presence through the fishermen's contribution through the Local Ecological Knowledge approach or by preventing damages to protected interests through proper information campaigns on the presence of harmful species for coastal populations and tourists.

In the Adriatic basin, the implementation and enforcement of ballast water management and control measures would therefore benefit from an enhanced involvement of interested authorities and institutions. The promotion of specific cooperation arrangements and connections could be pursued at all levels (i.e. sub-regional, national and local). In line with analysis and priorities as reflected in the 2012 Mediterranean Ballast Water Strategy and further Mediterranean developments, the following recommendations would help to increase the consistency of institutional actions across the basin as well as to facilitate sub-regional cooperation:

- **To involve shipping, port and environmental authorities, as appropriate,** when identifying competent authorities for the implementation of the BWM Convention, in particular for environmental assessments and monitoring purposes. While it is likely that the main responsibility for the implementation will remain within one type of authority (normally, maritime/port), the entire range of decision-making processes will benefit from the appropriate involvement of the environmental authorities and bodies.
- **To appoint national technical focal points,** providing scientific and technical expertise and advice, integrating different scientific competences. National technical focal points could play a role in the national and international information exchange as well as facilitate joint assessments and further sub-regional discussions and activities. The focal points could be either a specific institution or a network or committee gathering relevant institutions, and could provide specialized support for multiple legal objectives of different EU legal instruments and global commitments.
- **To establish specific cooperation arrangements with public/private institutions and bodies,** such as universities, research centres, NGOs, economic interest organizations (shipping, fishery, tourism), which

153 The review conducted by the project showed that in most of the Adriatic countries main responsibility for the implementation of international shipping agreements rests with the following maritime authorities: Ministry of Transport and Infrastructure (Albania), Ministry of Maritime Affairs, Transport and Infrastructure (Croatia), Ministry of Transport and Infrastructure and Italian Coast Guard (Italy), Ministry of Transport and Maritime Affairs and Maritime Safety Department (Montenegro), Slovenian Maritime Administration (Slovenia). National environmental ministries participate with different degrees of relevance to some of the implementation processes. For details on national authorities see RAK G., DE VENDICTIS G. (2015). *Contact list of authorities and main stakeholders relevant for the ballast water management in the Adriatic. Review.* BALMAS project. Work Package 9, Activity 2, pp. 23.

may play a role in the implementation of ballast water measures or in promoting the public awareness on the presence of HAOPs. The latter can be specifically enhanced by participatory approaches aimed at involving local communities in the monitoring of alien species. It is worth underlining that, thanks to the cooperation developed by the project, after the activities termination, it is likely that a first Adriatic network of scientific institutions will be established on a voluntary basis, with the aim of enlarging in the future the number of Adriatic participating institutions and the expertise available in the region.

- **To promote and support consistent training and capacity building across the Adriatic area,** including knowledge build-up and sharing, networking and staff exchange, promotional programs, actions and projects, as it may be appropriate and making use of all relevant international, regional and European mechanisms and programs.

6.3. First steps towards a common approach: using the same language (agree on definitions, target species and impacts) to attain the same goals

The BWM Convention defines HAOPs without referring to identified species.[154] Thus, ballast water management standards (both the exchange, D-1, and the performance, D-2, standards) refer to the quantity of, any and all, "viable" organisms, which are likely to be present in ballast water, regardless of the actual hazard posed by different species to different ecosystems.[155] This was the most precautionary legal solution found by the international maritime community in order to guarantee a uniform degree of environmental protection at the global level. As reviewed in this report, other legislative or policy instruments refer to threats posed by organisms and species defined in a different way, totally or partially coinciding with the HAOPs definition (see paragraphs 2.3., 3.1. and 4.1. of this report).[156]

Cladocora caespitosa (frame of the BALMAS documentary, M. Pisapia, ISPRA 2015)

In reality, as already mentioned, the discharge of ballast water with organisms' concentration above the D-2 standard would not automatically represent a threat in relation to the species' presence. On the other hand, ballast discharges in compliance with the BWM Convention standards could – hypothetically and under certain conditions – create hazards to the environment, to economies or to human health. Only acknowledging specific local circumstances, which are linked to the relation between the HAOP presence and characteristics and those of the recipient environment, would it be possible to reasonably assess actual risks. Particularly in the case of the Adriatic Sea, the availability of detailed information and data on both the biodiversity and the functioning of ecosystems is crucial for identifying, developing and adopting measures, consistent with international law and the global regime. The more information and associated knowledge is common to countries sharing the same marine area, the smoother the decision making process will be, preventing conflicting national decisions and increasing the protection of the region's environment as a whole.

The project, based on biological baseline surveys carried out on selected Adriatic ports[157] developed an initial set of information on the presence of HAOPs therein.[158] Species and organisms found have been associated to a certain degree of potential impact (strong, medium and low) ascribed to them, depending on their characteristics, their abundance and on their likely harmful effects on human health and on ecosystems. The spread,

154 According to Article 1.8 of the BWM Convention "Harmful Aquatic Organisms and Pathogens" means aquatic organisms or pathogens which, if introduced into the sea including estuaries, or into fresh water courses, may create hazards to the environment, human health, property or resources, impair biological diversity or interfere with other legitimate uses of such areas.

155 Human health standards are instead linked to the presence of specific indicator microbes.

156 Mediterranean Ballast Water Strategy refers to Invasive Alien Species, meaning HAOPs as defined by the BWM Convention.

157 A Port Baseline Survey (PBS) protocol was developed by the project as a comprehensive study providing baseline knowledge of the local environment. See NINČEVIĆ GLADAN Ž., MAGALETTI E., SCARPATO A. et al. (2014). *BALMAS Port Baseline Survey Protocol.* BALMAS project. Work package 5, Activity 1, pp. 23.

158 The list was elaborated based on the alien species list resulting from the EU MSFD implementation, which was further integrated including Adriatic native species harmful for human health and pathogens.

Ports for which biological baseline surveys have been carried out by the BALMAS project (frame of the BALMAS documentary, M. Pisapia, ISPRA 2015)

introduction or transfer across the basin of these species, may represent a particularly significant hazard for the Adriatic as a whole.

The knowledge and information gathered would be helpful as a basis for increasing consistency of national approaches and for providing sound knowledge for species-specific risk assessment purposes, guiding national measures as well as further sub-regional and Mediterranean cooperation. A formal technical discussion between Adriatic States might aim at reaching the following two main objectives:

- **To complete port surveys and to agree on the identification of Adriatic HAOPs.** The preliminary list of those harmful species, organisms and pathogens already present in Adriatic ports should be acknowledged by Adriatic Countries and brought to the attention of the Mediterranean regional organization and relevant regional UNEP/MAP centers (REMPEC and RAC/SPA). Port surveys may be completed and the list enhanced, as appropriate, providing for their periodical update. Related information should be shared with organizations in other marine regions, opening a dialogue on risks of related transfers based on sound and reliable knowledge. Furthermore, relevant information could facilitate the implementation of existing EU legislation (i.e. identifying IAS to be included in the EU List according to Regulation (EU) No. 1143/2014; considering identified HAOPs in MSFD measures and monitoring programmes) at the same time enhancing the coherence of different legal instruments and maximising cost-effectiveness of related public actions.
- **To agree on the categorization of HAOPs risks.** In the project, the HAOPs found in Adriatic ports have been associated to specific levels of demonstrated impacts (strong, medium and low) in relation to the protected interests (environment, human health, fisheries) exerted elsewhere or for species known to be toxic or venomous. By agreeing on the proposed criteria, Adriatic States will build the basis for a transparent and consistent assessment of risks in granting exemptions and targeting port State control actions, so as the consideration of transboundary features and impacts at a basin level would be helped, preventing conflicting decisions across the basin.

6.4. The need for regular HAOPs monitoring in the Adriatic: controlling current impacts and preventing new risks

In general, the development of sound environmental policies should be based on proper environmental knowledge, information and data. The Law of the Sea addressed this concept. According to the LOSC, States shall cooperate, directly or through competent international organizations, for the purpose of promoting studies, undertaking scientific research programmes and encouraging the exchange of information and data regarding

pollution of the marine environment. Such cooperation is meant to acquire "knowledge for the assessment of the nature and extent of pollution, exposure to it, and its pathways, risks and remedies".[159] In light of this knowledge, States shall cooperate in jointly developing "appropriate scientific criteria for the formulation and elaboration of rules, standards and recommended practices and procedures for the prevention, reduction and control of pollution of the marine environment".[160]

In the Mediterranean region, bordering countries are committed to establishing a pollution monitoring system in close cooperation with international bodies, including, as appropriate, complementary or joint programmes at a bilateral and multilateral level, and the joint States' practice had been focused for a long time on land-based sources of pollution.[161] Furthermore, the 2002 Prevention and Emergency Protocol requires States, regarding pollution from ships, "to develop and apply, either individually or through bilateral or multilateral cooperation, monitoring activities covering the Mediterranean in order to prevent, detect and combat pollution and to ensure compliance with the applicable international regulations"[162] among which the BWM Convention is certainly to be included. Implementing biodiversity obligations, the Action Plan on Invasive Species envisaged the creation and regular updating of national databases of NIS - in particular, of those invasive - existing in marine waters under national jurisdictions.[163] Further important steps on monitoring have been taken following the decision on the implementation of the ecosystem approach (see paragraph 3.2. of this report).[164] The related Mediterranean Integrated Monitoring and Assessment Programme outlines the establishment of a Mediterranean Integrated Data and Information System pursuing the regional harmonization of the countries' monitoring plans, including information on NIS. Among the actions of the programme is the identification of NIS hotspots where an effective method of Rapid Assessment Survey is to be developed and performed yearly at the national level.[165] It should be noted that in the near future, National Action Plans on biodiversity shall be aligned with EcAp, including aspects on the introduction of invasive species.

For the EU Member States the performing of marine monitoring is a legal obligation according to specific environmental legislation.[166] Both the Bathing Quality Directive[167] and the Marine Strategy Framework Directive,[168] require Member States to establish monitoring programmes in order to, respectively, guarantee adequate water quality conditions for bathing and attain or maintain the GES of marine waters. Moreover, the IAS Regulation defined a general obligation of surveillance of those invasive alien species included in the list of EU concern, setting related intervention duties. It is interesting to note that no marine species are currently included in the list of species of EU concern and that a sub-regional discussion on this issue may help the work of compiling the list based on proper assessments. The legal review carried out by the project has identified that some monitoring activities carried out by Adriatic bordering countries partially coincide with the BWM Convention HAOPs monitoring needs.[169]

As far as ports are concerned, these areas were generally considered until now as pollution hotspots, and neither EU legislation nor multilateral agreements contain specific obligations on the regular monitoring of their conditions.[170] A very recent exception to this tendency is the case, mentioned above, of the Mediterranean Integrated Monitoring and Assessment Programme.

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159 LOSC, Article 200, Studies, research programmes and exchange of information and data.

160 LOSC, Article 201, Scientific criteria for regulations.

161 Barcelona Convention, Article 12 on monitoring, according to which States "undertake to cooperate in the formulation, adoption and implementation of those annexes that may be required to prescribe common procedures and standards for pollution monitoring".

162 2002 Prevention and Emergency Protocol, Article 5, Monitoring.

163 National databases should take into account the already existing national, regional and international information networks and databases and, notably, the Marine Mediterranean Invasive Alien Species (MAMIAS) developed by RAC/SPA, the "Andromeda" invasive species database developed by the EU funded Perseus project and the European Alien Species Information Network (EASIN) developed by the Joint Research Centre of the European Commission.

164 For details see previous Paragraph 3.1. of this report.

165 See Decision IG.22/7 "Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria" mentioned above in Paragraph 3.1. of this report.

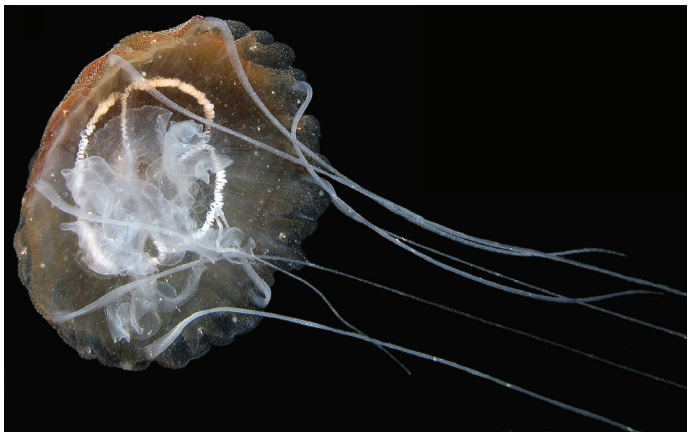
166 For details see previous Paragraph 3.3. of this report.

167 Directive No. 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC.

168 For details see Paragraph 4.2. of this report.

169 i.e. Montenegro carried out monitoring activities according to the EU bathing quality directive, thanks to international funding; Italy, while implementing the MSFD has adopted among targets to reach by 2020 the GES of marine waters, the establishment in all ports of international relevance of early warning systems for IAS detection and prompt notification to competent authorities. Related monitoring programmes are planning to address IAS presence and transfer in marine and coastal areas, including data on ballast water discharges' volumes and related donor ports through voluntary ships' ballast water reporting.

170 It is worth considering that neither the Law of the Sea nor international conventions on shipping sources of pollution generally include ports in their scope, as they form part of the States' territory. The LOSC considers ports mainly for the purpose of delimiting the extension of marine jurisdictions areas, as the territorial sea, or for other specific purposes, such as guaranteeing an equal access of landlocked States; see articles 11, 128, 129 and 131 of the LOS Convention.



Pelagia benovici (F. Marcuzzo, MED-JELLYRISK Project)

According to the BWM Convention, Parties shall endeavor "to monitor the effects of Ballast Water Management in waters under their jurisdiction" including activities such as "observation, measurement, sampling, evaluation and analysis of the effectiveness and adverse impacts of any technology or methodology as well as any adverse impacts caused by such organisms and pathogens that have been identified to have been transferred through ships' Ballast Water".[171] This provision therefore (1) is not referred exclusively to ports, (2) does not refer to general environmental conditions, and (3) is focused on the effects of ballast water management, rather than on the prevention of possible risks. However, as previously mentioned, the relation between the vessel and the environment where the same vessel is operating, is definitely important and the availability of environmental information on the ballast water both donor and recipient locations would be crucial for implementing a number of BWM Convention's other provisions.[172] In this regard, the 2011 Mediterranean Ballast Water Strategy stressed the importance of the development of a uniform regional biological monitoring system, targeting it to port environments. States agreed *inter alia* to develop a regionally standardized biological sampling and monitoring protocol to be used in order to build the databases supporting IAS management objectives. The possibility of identifying sub-regional mechanisms for cooperation, in particular for the Adriatic, was specifically mentioned within the Strategy (see paragraph 3.2. of this report).

Notwithstanding these commitments, the review carried out on current Adriatic legal requirements shown the absence of national legal obligations on port monitoring and available information is gathered on a voluntary and very heterogeneous basis.[173] Even Adriatic States that at present have ratified the BWM Convention (Albania, Croatia and Montenegro) did not include specific requirements on monitoring of the presence of HAOPs.

The existence of comparable knowledge between States remains crucial to the coherence and the consistency of the Adriatic implementation of the BWM Convention obligations as well as for the functioning of some instruments developed by the project in this regard.[174] The current absence of specific legal obligations on HAOPs monitoring represent a major obstacle in this direction. The projects' elements and criteria developed on an Adriatic Port Monitoring Protocol might be the basis of further sub-regional discussion leading to a formal endorsement by countries.[175] In particular, the following steps would enable the availability of sound, comparable and regular information within the basin:

- **The formalization of an HAOPs monitoring commitment at the Adriatic level,** that was already envisaged by the Mediterranean Ballast Water Strategy and by the Mediterranean Integrated Monitoring Programme as a national committment. National legal frameworks and administrative actions should provide for a regular environmental monitoring in ports and/or in marine areas under national jurisdiction and beyond, integrating different management objectives (environmental and/or specific to ballast water management needs).[176]
- **The formal joint endorsement of an Adriatic Port Monitoring Protocol** after proper multilateral discussion within the intra-Adriatic dialogue based on the elements developed by the project.[177]
- **Providing stable financial and organizational support for the operation of monitoring programmes.** Support and facilitation of this work may be sought from the EU institutions and programmes as well as by the UNEP/MAP Secretariat and other international organizations. In particular, opportunities deriving

171 BWM Convention, Article 6, Scientific and Technical Research and Monitoring.

172 There is also a specific duty of Parties to provide certain information upon request in the BWM Convention, Article 6.2.

173 i.e. the port of Koper in Slovenia, voluntarily performs a regular monitoring of the water quality, without including HAOPs, the Ancona Port Authority, in Italy, carries out only monitoring linked to the control of projects subject to environmental impact assessments.

174 Notably, the Decision Support System, the risk assessment model and the early warning system developed by the BALMAS project on which see relevant final reports reported at the end of this report. In particular, in order to allow the decision support system to be effectively used by countries, whether individually or jointly, the projects' database, which includes the data gathered through the harmonized surveys carried out in selected Adriatic ports, would need to be regularly updated according to shared methodologies.

175 See BASTIANINI M., PEZZOLESI L., MAGALETTI E., AZZURRO E., PIGOZZI S., KRAUS S., MOZETIČ P., GOLLASCH S. (2016). *BALMAS Port Monitoring for NIS and HAOP in the Adriatic Sea.* BALMAS project. Work package 5, Activity 2, pp. 25.

176 It is worth noting that the extension of jurisdiction in the Adriatic Sea claimed by Croatia with the establishment of its Ecological Protection and Fishery Zone may have consequences in terms of monitoring obligations spatial coverage.

177 See BASTIANINI M. et al. (2016). *BALMAS Port Monitoring for NIS and HAOP in the Adriatic Sea,* cit.

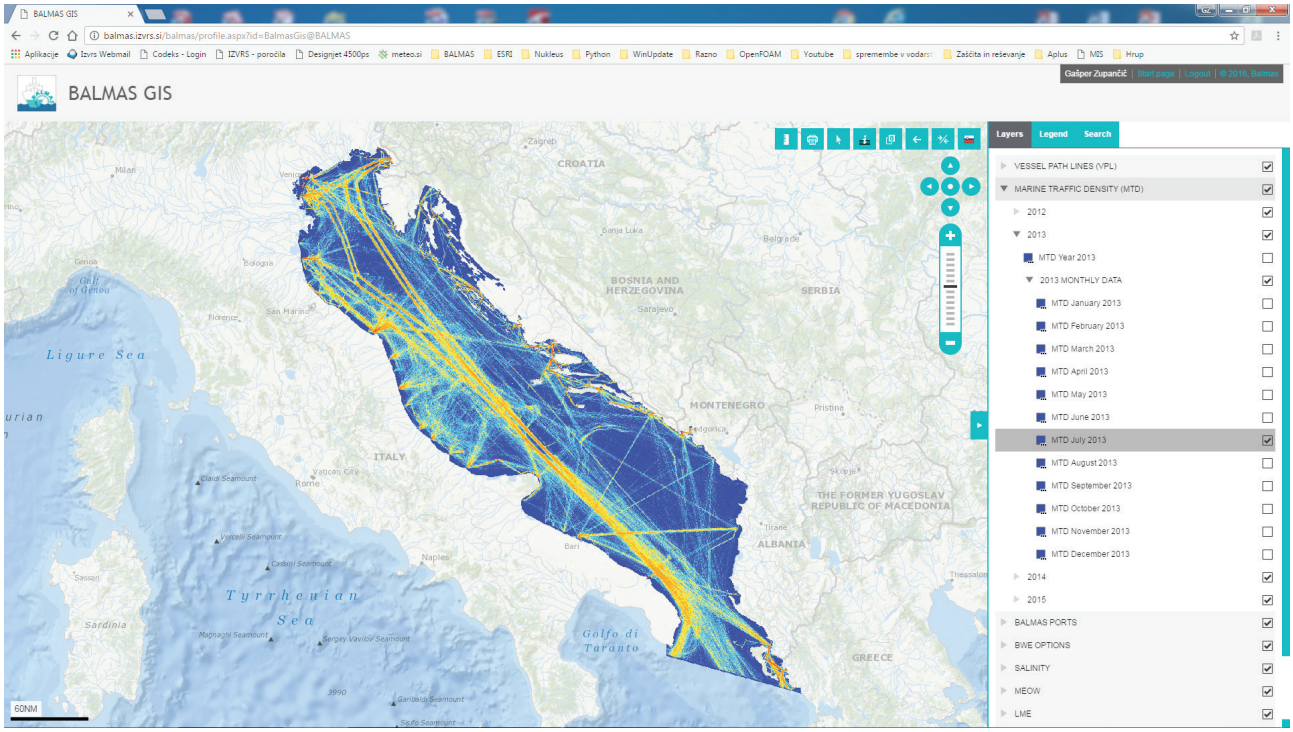
from the implementation of partially overlapping objectives' of different EU environmental legislation and regional programmes should be taken advantage of, thereby avoiding the duplication of activities and maximising the cost-effectiveness of related actions. Promoting sub-regional as well as EUSAIR discussion to this end would be of help.

- **The enhancement of stakeholders' participation to port monitoring.** The monitoring in ports may present specific legal problems.[178] Further, traditional monitoring techniques may be unable to detect certain species. The involvement of local communities, especially professional and sports fishermen in the process of data collection through standard methodologies could be further developed across the Adriatic Sea.[179]

6.5. Intra-Adriatic maritime traffic and traffic from other regions: different problems, same solutions?

Due to the high vulnerability of the Adriatic Sea, to its specific environmental features and to the close proximity of its coasts, ballast water management measures adopted within national jurisdictions in the area may affect, comparatively more than in other regions, other bordering States' interests. The project activities have shown, on one hand, that Adriatic ports are highly inter-connected: approximately half of the basin's traffic volumes are intra-Adriatic, followed by intra-Mediterranean traffic. On the other hand, port baseline surveys detected the presence of pathogens as well as harmful or invasive species in selected Adriatic ports which, although up to now have remained confined within their locations, might at any rate spread, under certain conditions, across the basin, threatening the environment, health and economies.

As mentioned, the BWM Convention, while establishing global standards for ballast water discharges (D-1 and D-2), provides Parties with a certain flexibility, allowing them, in relation to specific conditions and circumstances, to adopt national decisions, shaping the ballast management framework on certain areas and/or addressing specific needs. The main legal limits to these decisions are consistency with international law and the framework set by the BWM Convention itself.[180]



Marine traffic density in the Adriatic Sea during July 2013, internet BALMAS Project GIS application (G. Zupančič et al., 2016)

178 i.e. in Italy constrains are linked to safety reasons or due to the internal port regulations.

179 This participatory approach, often indicated as Local Ecological Knowledge (LEK), was tested by the BALMAS project and can be used to both track the potential introduction of exotic species and to generate awareness among the stakeholders. Results allow the gathering of information that otherwise cannot be obtained and contribute to the development of an early detection system for alien species. See BASTIANINI M. et al. (2016). *BALMAS Port Monitoring for NIS and HAOP in the Adriatic Sea,* cit.

180 As a general principle, Parties may always adopt more stringent measures - individually, as Flag or Port States, or jointly - with respect to the prevention, reduction or elimination of the transfer of HAOPs. BWM Convention, Article 2.3 and Article 4.2.

In particular, States may adopt special requirements for ships in certain areas, which include additional measures taking into account the G13 Guidelines and warnings to ships for no-uptake areas.[181] Furthermore, States may, within their jurisdiction and subject to appropriate risk assessments according to G7 Guidelines, exempt those ships' operating - permanently or exclusively – on voyages between specified ports or locations, from the application of ballast water standards and of possible additional measures. Finally, exceptions to the BWM Convention's application are possible for those ships operating only within the jurisdiction of a Party or only between such jurisdiction and the high seas.[182] Bordering countries' decisions applying to domestic traffic will have to carefully take into account their overall effects and risks on other States' jurisdictions.[183]

The global regime also envisages the development, in particular for enclosed and semi-enclosed seas, of States' cooperation on technical matters, including relevant relations with other marine regions in the world. According to the BWM Convention, Parties having common interests in protecting the environment, human health, property and resources in a given geographical area, shall endeavor to enhance regional cooperation, including through the conclusion of regional agreements and seeking the development of harmonized procedures with the Parties to regional agreements.[184] It is worth recalling that, in areas beyond national jurisdiction, which still cover a large portion of the Adriatic Sea, Parties have a specific duty of cooperation under the auspices of the IMO in order to address threats and risks in relation to ballast water management to sensitive, vulnerable or threatened marine ecosystems and biodiversity,[185] and that the uptake and subsequent discharge of ballast water in the high seas is among the exceptions provided by the BWM Convention.[186]

In the Adriatic Sea, the relative relevance of the various traffic flows should be taken into account when planning cooperation objectives and priorities. The intra-Adriatic as well as the intra-Mediterranean traffic, representing more than half of the basins' traffic flows, are of the utmost importance for the Adriatic protection against HAOPs transfers and deserve specific attention when considering the implementation of the project's instruments and related recommendations for a joint and consistent sub-regional action.

6.5.1. Implementing the exemptions' regime in the Adriatic Sea: consistent risk assessments and coordinated actions. As mentioned, a significant number of ships' in the Adriatic are engaged, permanently or exclusively, on voyages between specified ports or locations without mixing ballast water or sediments from other ports or locations and, therefore, may apply for exemptions (i.e. ferries, ro-ro multipurpose, etc.).[187] Parties may grant exemptions in waters under their jurisdiction - valid for a maximum period of 5 years - based on the undertaking of risk assessments, which will decide on the acceptability of the risk level posed by exempted discharges.[188] According to G7 Guidelines, assessments should be scientifically robust and conditions that influenced the exemption decision shall be monitored over time. Parties may either undertake risk assessments or require shipowners or operators to undertake them. In this latter case, Parties - which remain responsible for evaluating and verifying the assessments - have to provide relevant information, including any application requirement, the risk assessment model to be used, any target species to be considered, data standards and other required information.[189]

The BWM Convention stresses the importance of States' consultation in the decision-making process regarding exemptions. Any exemption shall not impair or damage the environment, human health, property or resources of adjacent or other States, and Parties granting exemptions have a duty to identify and consult those States that may be adversely affected.[190] Exemptions granted shall not be effective until after communication of relevant information to the IMO and to Parties.[191] The G7 Guidelines further specify that affected States include those located in the same biogeographic region as recipient ports, listing the information that should be provided within the mandatory consultation process i.e. the risk assessment method, the quality of information used, criteria or reference for defining target species, inventories used, the criteria used in defining or

181 BWM Convention, Annex, Section C, Special requirements in certain areas.

182 BWM Convention, Article 3.2., Application.

183 It is worth recalling that the strategic environmental assessment of trans-boundary environmental effects of national plans and programmes covering those related to marine and maritime activities is mandatory according to EU Directive No. 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment and to the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Trans-boundary Context (Kiev Protocol, 2003) signed by all Adriatic Countries.

184 BWM Convention, Article 13, Technical Assistance, Cooperation and Regional Cooperation. For regional experiences see Paragraph 3.5. of this report.

185 BWM Convention, Article 2.9.

186 BWM Convention, Annex, Regulation A-3.4.

187 BWM Convention, Annex, Regulation A-4, Exemptions.

188 BWM Convention, Regulation A-4, see in particular A-4.1.

189 G7 Guidelines, Paragraph 7.

190 BWM Convention, Regulation A-5.3 and G7 Guidelines, Paragraph 8.

191 BWM Convention, Annex, regulations A-4.3 and A-4.2.

delimiting the biogeographic regions.[192] Finally, each Party that will grant exemptions should establish points of contact for receipt of applications whose details will be circulated to all States by IMO.

Based on the global requirements and applying a precautionary approach[193] the project developed a model for risk assessment in the Adriatic, fully aligned with G7 Guidelines principles, combining the three different risk assessment methods outlined therein (environmental matching, species' biogeographical and species-specific).[194] The model is based on the consideration of the Adriatic Sea as one biogeographical unit, taking advantage of the flexibility given in this regard by G7 Guidelines.[195] This choice was driven by the consideration that the EU Marine Strategy Framework Directive refers to the Adriatic marine sub-region for determining the GES of marine waters in relation, *inter alia,* to the presence of the invasive species. The idea behind the model development was to increase consistency of the national decision-making processes on exemptions, applied either to intra-Adriatic and extra-Adriatic voyages.[196]

In order to implement the proposed risk assessment model within the Adriatic area, some prerequisites have to be met. According to G7 Guidelines, where reliable and updated data on donor and recipient regions and ports are lacking, no risk assessment-based exemption could be granted.[197] Consequently, major constrains for the implementation of the model will be linked to the data availability and reliability i.e. the absence of environmental and biological data for almost all donor ports worldwide, etc. Moreover, periodical monitoring of the presence and abundance HAOPs is a further condition for a solid exemptions system, allowing detection of new presence of HAOPs that may lead to the exemptions' withdrawal.

Regarding Adriatic traffic proceeding from regions other than the Mediterranean, the model was nevertheless tested as a component of the project's decision support system, including existing data. Still, additional actions would be recommended, in line with the Mediterranean Ballast Water Strategy commitments, using the regional organizations and IMO support. In relation to the significant volumes of intra-Adriatic shipping, considering that in the basin no goal-specific port survey was carried out until the BALMAS project approval and that no HAOPs monitoring is currently in place, the granting of exemptions could be questioned, leading to uncertainties in the regime implementation within the basin.

The opening of a formal sub-regional cooperation dialogue outlined in previous paragraphs of this report (see paragraph 6.1.), would certainly help building the pre-conditions for solid and consistent risk assessments across the basin (i.e. information availability and reliability, identification of target species, establishment of recurrent monitoring, adoption of a risk assessment model). Although the risk assessment model developed by the project is to be applied by States within national jurisdictions, its endorsement at a sub-regional level would have major added value and advantages. By sharing the proposed model, States would establish uniform criteria to distinguish a priori between unacceptable high risks scenarios and acceptable risks scenarios, corresponding to G7 Guidelines. The consistency of exemptions would be facilitated, preventing conflicting decisions or complaints, also for the benefit of the shipping sector operating in the area.[198]

In relation to risk assessments in the region and the need of smoothing the mandatory consultations process when the exempted route will connect two Adriatic ports, the following relevant policy issues might be discussed at the sub-regional level, as appropriate: the establishment of a sub-regional information mechanism on the status of exemptions granted and/or withdrawn; the coordination between HAOPs monitoring institutions as well as the contribution of the wider Adriatic HAOPs experts network and national technical focal points; provided that the relevant information is available and consistent monitoring is in place, the establishment of a common procedure for granting exemptions, in line with the examples provided by other European marine regions.[199]

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192 See G7 Guidelines, Paragraph 8 on Consultation.

193 Paragraph 5 of G7 Guidelines, includes the "precautionary" among the principles defining risk assessments for the purpose of exemptions. Paragraph 5.3. further states that "In undertaking risk assessment when considering granting an exemption, the risk assessment principles should be carefully applied. The lack of full scientific certainty should be carefully considered in the decision making process (…)". On the specific implementation of precautionary approach to IMO activities see SAGE-FULLER B. (2013). *The Precautionary Principle in Marine Environmental Law: with Special Reference to High Risk Vessels,* Routledge, pp. 320.

194 See DAVID M. and GOLLASCH S. (2016). *Risk assessment decision support system models for ballast water management purposes in the Adriatic – RA DSS, including reviews, models and test results of RA DSS on different scenarios that may occur in shipping in the Adriatic. Final Report,* BALMAS project, pp. 68.

195 The G7 Guidelines focus the environmental matching approach to risk assessments on the Large Marine Ecosystems (LME) scheme although with possible local and regional adaptations, according to which the Mediterranean Sea as a whole is an LME. It is however recognized that when the suggested LME scheme is not appropriate, other recognized biogeographical schemes may be considered. See G7 Guidelines, Paragraph 6.2.3.

196 The use of the risk assessment model to support other public functions linked to the BWM Convention implementations - such as to trigger samplings during port State control - was also explored, although it does not represent an international obligation according to the BWM Convention.

197 See DAVID M., GOLLASCH S., LEPPÄKOSKI E., HEWITT C. (2015). *Risk Assessment in Ballast Water Management,* in DAVID M., GOLLASCH S. (eds.), *Global Maritime Transport and Ballast Water Management – Issues and Solutions,* Springer Science + Business Media, Dordrecht Heidelberg New York London. Among the project reports see DAVID M. and GOLLASCH S. (2016). *Risk assessment decision support system models for ballast water management purposes in the Adriatic*, cit.

198 This would be in line with other legal obligations as those stated by the EU Maritime Spatial Planning Directive, see Paragraph 4.3. of this report.

199 See Paragraph 3.4. of this report.

6.5.2. Special requirements for certain areas: options for cooperation on additional measures. The BWM Convention outlines two types of special ballast water management requirements that can be adopted in certain areas:[200] measures in addition to those outlined in the BWM Convention's Section B[201] to be adopted taking into account G13 Guidelines, and warnings issued to mariners in order to prevent the uptake of ballast containing HAOPs.

Hypothetical additional measures are generically and broadly described: based on identified concerns relating to certain areas, States may adopt, individually or jointly, additional measures to prevent, reduce or eliminate the transfer of HAOPs through ships' ballast water, and ships may be required to meet specified standards or requirements.[202] In doing so, States should consult with other States that may be affected and, except in emergency or epidemic situations, shall communicate relevant information to the IMO, at least 6 months in advance of the implementation date of the planned measure.[203]

It is worth noting that States may, consistent with international law, use as additional measures options available under different international legal instruments addressing specific environmental, social or economic vulnerabilities of marine areas i.e. the approval by IMO of associated measures in a Particularly Sensitive Sea Area according to IMO Resolution A.982(24), the adoption of mandatory routeing measures or reporting requirements according to the SOLAS Convention, etc.[204] In such cases, the measure's approval follows the formal procedure established by the relevant international legal instrument.

Regarding possible additional measures within the Adriatic Sea explored by the project, an example could be the specific reporting based on the approval of a mandatory Ballast Water Reporting Form developed and tested to be applied in the Adriatic Sea, in line with the Mediterranean Ballast Water Strategy commitments. During the project activities, the form was adopted on a voluntary basis in selected Adriatic ports.[205] The adoption of the Ballast Water Reporting Form as a mandatory requirement for all ships in the Adriatic Sea, may be pursued according to two different formal options. Firstly, the mandatory reporting can be approved as a condition for the entry into each Adriatic port. In this case, the adoption would follow different Adriatic States legal systems with a clear disadvantage in terms of uniformity of the discipline at the sub-regional level, timing divergences, etc. As a second formal option, the mandatory reporting can be adopted based on the SOLAS Convention, in this case needing a political agreement among Adriatic States to seek IMO approval, and following related international law procedures.

6.5.3. Special requirements for certain areas: developing a consistent system of warnings to the HAOPs uptake. Considering the high volumes of intra-Adriatic traffic, the possibility of warning mariners of the presence of certain dangerous conditions relevant for the ballast uptake has a particular relevance for the protection of the Adriatic Sea. According to the BWM Convention,[206] States should notify mariners of areas under their jurisdiction where vessels should not uptake ballast water, because they are known to contain outbreaks, infestations or populations of HAOPs, or because they are close to sewage outfalls or they have poor tidal flushing which is likely to be relevant for ballast uptake. Related warnings should be limited in time and delimited in space, and include, where feasible, suggestions for alternative uptake locations. The IMO and potentially affected States should be notified of such areas. The ultimate aim of this legal provision is to prevent ships from HAOPs uptake, consequently protecting the marine environment of ballast water recipient States, at the same time helping the ships' compliance, facilitating the good performance of on board treatments. It is worth noting that, according to the BWM Convention, the issue of warnings is a possibility and not an obligation for States, with the consequence that in case of a serious threat, the legal basis for the States' action would be different if warnings are referred to ports/internal waters or to other areas of jurisdiction.[207]

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200 See BWM Convention, Annex, Section C.

201 The measures in the BWM Convention, Annex, Section B, are the following: Ballast Water Management Plan, Ballast Water Record Book, Ballast Water Management for Ships, Ballast Water Exchange, Sediment Management for Ships, Duties of Officers and Crews.

202 It is worth recalling that in line with the Law of the Sea, States may always approve national requirements as conditions for the entry of foreign vessels into their ports.

203 Such information includes the coordinates where the measure is applicable, a description of the measure, the need and reasoning for its adoption including possible benefits, the arrangements to facilitate the ships' compliance.

204 Refer inter alia to Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas, IMO Resolution A.982(24) and related Guidance Document for Submission of PSSA Proposals to IMO, MEPC.1/Circ.510 as well as to Chapter V of the International Convention for the Safety of Life at Sea (SOLAS), 1974.

205 Information so gathered is essential for the envisaged functioning of the decision support system proposed by the project. See PENKO L., DAVID M., GOSAR L., ZUPANČIČ G. (2015). *Ballast water reporting form (BWRF). Final report.* BALMAS project. Work package 4, Activity 2, pp. 13.

206 BWM Convention, Annex, Regulation C-2.

207 The relevant LOSC provision will apply. For other applicable measures see i.e. International Regulations for Preventing Collisions as Sea (COLREGs), 1972; International Convention for the Safety of Life at Sea (SOLAS), 1974; General Provisions on Ships' Routeing in IMO Resolution A.572(14), as amended.

As mentioned, the consistent implementation of this provision across the Adriatic is particularly relevant in terms of prevention of the shifting of bioinvasions or other ballast water threats, even more considering the possibility of granting exemptions in/between Adriatic ports. The project developed an "Early Warning System", including related methodology and procedure, which were tested through national exercises and integrated in the project's decision support system.[208] Based on the BWM Convention requirements, the Adriatic warning system so developed has a broader scope as it considers parallel legal obligations on non-indigenous species monitoring and of invasive alien species surveillance in place for Adriatic EU Member States, thereby being able to implement diverse legal objectives. The timing of the warning is essential for prevention purposes and therefore the system was focused on the "earliness" of action, even though the BWM Convention text does not make direct reference to this aspect.

As in the case of the implementation of the exemptions' regime, the precondition of the functioning of the envisaged system is that a regular monitoring will take place. As warnings should be cancelled when the reasons for issuing them cease to exist, monitoring in place for warning purposes should have specific characteristics.

The following aspects are crucial for the functioning of the Early Warning System model across the basin as well as for its integration in the decision support system proposed by the project:

- **Uniformity of conditions considered by Adriatic authorities as triggering warnings.** The consistency of the actions of the Adriatic authorities regarding warnings would be supported by agreeing on the HAOPs list and related classification of impact, guaranteeing an equal prevention of damages across the basin. Within the sub-regional dialogue, a specific commitment on the establishment of consistent Early Warning Systems should include an agreement on those criteria and other circumstances triggering warnings.[209]
- **Consistent design and functioning of databases.** Regarding the implementation of the early warning system component of the decision support system developed by the project, consistent national choices should be made on the design and operation of databases providing information to the system. The following aspects should be tackled: identification of data providers, possible involvement of stakeholders, quality standards and scientific reliability of data, information management policy, data privacy policy, transparency policy and openness of data.
- **Identified responsibilities and cooperative management.** Due to the highly skilled scientific and technical assessments needed in order to identify the conditions that may lead to warnings, it is recommended that the related responsibility would be shared between competent (maritime, port and environmental) authorities. According to the model tested by the project, environmental experts responsible for monitoring the beginning and the continuity of alert conditions would provide responsible authorities with the technical contents of warning messages (e.g. species description, area definition). In this regard, the establishment of formal cooperation arrangements with technical bodies and institutions as well as the identification of national technical focal points could be of help to tackle national management needs as well as international cooperation (see above, paragraph 6.1. of this report).
- **Communicating with ships.** Once the decision on the issuing of a warning is taken, maritime authorities could communicate with ships using the NAVTEX, which currently broadcasts safety information to ships, particularly those on coastal passages, as a part of the IMO Global Maritime Distress Safety System (GMDSS).[210] Considering the importance of ballast uptake and discharge for the ships' safety, the use of this system would be appropriate in this regard.[211] In the Adriatic Sea, Italian and Croatian stations currently manage the NAVTEX area. In order to facilitate the participation of Albanian, Montenegrin and Slovenian authorities appropriate arrangements should be considered.[212]

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208 For more information see GARAVENTA F., MAGALETTI E., CASTRIOTA L., SILVESTRI C., TORNAMBE A., FALAUTANO, M., MAGGIO, T., GOLLASCH S., MUHA T. P., MOZETIČ P., PIGOZZI S., DAVID M. (2014). *Review and comment general categorization criteria and selection of a promising EWS approach for the Adriatic. Final Report.* BALMAS project. Work Package 6, Activity 3, pp. 16

209 The project findings suggest that warnings should be triggered when all the following criteria are met: the species is a HAO with a high impact, is in a bloom state or mass development and has relevance for ballast water uptake. The presence of a pathogen would be sufficient to trigger a warning.

210 NAVTEX is an international service for promulgation of navigational and meteorological warnings, meteorological forecasts and other urgent information to ships. The legal basis for NAVTEX use is in SOLAS Regulation IV/12.2 which states that "Every ship, while at sea, shall maintain a radio watch for broadcasts of maritime safety information on the appropriate frequency or frequencies on which such information is broadcast for the area in which the ship is navigating". See 2011 Revised NAVTEX Manual, IMO MSC.1/Circ.1403 of 23 May 2011, in force since the 1st of January 2013.

211 Warnings related to ballast water no-uptake areas could be considered as "Other urgent safety-related information", which "means maritime safety information broadcast to ships that is not defined as a navigational warning, meteorological information or SAR information. This may include, but is not limited to, significant malfunctions or changes to maritime communications systems, and new or amended mandatory ship reporting systems or maritime regulations affecting ships at sea". 2011 Revised NAVTEX Manual, cit., Paragraph 2.2.1.25.

212 Adriatic NAVTEX stations (part of the Mediterranean Area III) are managed for the Western Adriatic in Mondolfo by Italian maritime authorities (Coast Guard) and for the Eastern Adriatic in Split by Croatian authorities (Ministry of Transport).

6.6. Ports and shipyards in the Adriatic Sea: options for ballast water and sediment reception facilities

The BWM Convention does not address ballast water management for ports with mandatory provisions. However, at least two aspects of the ballast water global regime have an impact on port and terminals organization and, for this reason, the project included a review of options for related implementation in the Adriatic Sea bordering countries.[213]

Firstly, according to the BWM Convention, both the performance and exchange standards do not apply to those ships which would discharge ballast water to a reception facility, which has to be designed taking into account G5 Guidelines.[214] However, ports are not required by the BWM Convention to make available such facilities nor current international legal framework on the matter, as further developed by the EU legislation, included within its scope the reception of clean ballast water from ships.

The option to treat ballast water in ports would certainly seem an attractive solution to address the problem of vulnerability to HAOPs in the Adriatic basin. Moreover, land-based facilities have the advantage of being potentially used also to provide biologically clean ballast water, thereby preventing problems linked to uptake.[215] Favoring the feasibility of this option, the '70s experience of major crude oil export ports was recalled which, driven by international regulations in force at that time, provided massive shore-based facilities for the reception and treatment of oily ballast from crude oil tankers; it was noted that thanks to advancements in technology, the inclusion of biological treatments to remove or inactivate HAOPs from the ballast is not likely to be any more challenging or less viable than the original development of these facilities.[216] From the policy perspective, a further advantage of port facilities would be the possibility of recovering, according to the "polluter pays" principle, part of the financial burden from the shipping sector, considering that the conferring of ballast water could be legally treated as the other port services.[217]

However, it should be considered that the experiences mentioned above were very specific to the context in which they were developed. In the absence of a specific legal obligation for ships (of conferring) or for ports (of ensuring the availability of facilities), the land-based reception is not likely to be implemented in the Adriatic basin. Furthermore, considering the actual characteristics of the Adriatic ports, a number of technical aspects render it difficult to foresee in the near future the adaptation of the existing infrastructures to the collection, treatment and disposal of ballast water. Among such aspects are the huge volumes of ballast water that ships might need to discharge, the lack of standardized ships' discharge connections, the need of additional equipment on ships, etc. More legal and institutional considerations linked to port management emerged from this review add further critical aspects to be considered in equipping Adriatic ports i.e. the investments dimension, the formal procedures for approval of temporary storage facilities, infrastructures, piping, etc. The project also reviewed the feasibility of options different from land-based ones, already in use in some countries.[218] The use of mobile reception facilities in Adriatic ports (i.e. using barges, pontoons, trailers, etc.) was considered feasible only under certain circumstances. The need to not unduly delay ships makes the use of these facilities appropriate only for Adriatic ports with very low traffic or for specific purposes i.e. as a support of port State control measures in case of ships non complying with the BWM Convention D-1 and D-2 standards. Furthermore,

Port of Ancona (Italy) (S. Pigozzi, Centro Ricerche Marine)

213 See ZEC D., FRANČIĆ V., RADONJA R., MAGLIĆ L., ŠIMIĆ HLAČA M., MARKOVČIĆ KOSTELAC M., VIDAS S., VUKELIĆ M. (2016). *Report on sediment disposal demands and patterns in the Adriatic and best sediment management practices for ports and shipyards. Final Report.* BALMAS project, Work Package 4, Activity 4, pp. 670 and ZEC D., FRANČIĆ V., RADONJA R., MAGLIĆ L., ŠIMIĆ HLAČA M., MARKOVČIĆ KOSTELAC M., VIDAS S., VUKELIĆ M. (2016). *Report on Ballast Water Management options for ports. Final Report.* BALMAS project, Work package 4, Activity 4, pp. 53.

214 BWM Convention, Annex, Regulation B-3.6.

215 GOLLASCH S. et al. (2007). *Critical review of the IMO international convention on the management of ships' ballast water and sediments,* Harmful Algae, 6, pp. 585–600.

216 GOLLASCH S. et al. (2007). *Critical review of the IMO international convention on the management of ships' ballast water and sediments,* cit.

217 According to Article 8 of EU Directive No. 2000/59/EC on port reception facilities, Member States shall ensure that the costs of port reception facilities for ship-generated waste, including the related treatment and disposal, are covered through the collection of a fee from ships. The fee is composed of a fixed contribution for all ships, irrespective of actual use of the facilities, and, a part which is linked to the waste conferred. Fees must be fair, transparent, non-discriminatory and shall reflect the costs of the facilities and services made available. Fees can be differentiated with respect to the category, type and size of the ship.

218 For instance, India has promoted the use of port-based mobile ballast water treatment facilities.

in case a Port State would require their use as a national measure, the legal obligation of not unduly delaying ships would be a major constraint.

A second aspect outlined by the BWM Convention having an impact on the ports' work regards the availability, in ports and terminals identified by the Parties, of sediment reception facilities,[219] where the term "sediment" means the matter settled out of ballast water within a ship.[220] The ports' and shipyards' identification is not an obligation for the Parties, however, if reception facilities for sediments are made available to ships, these have to follow relevant guidance provided by G1 Guidelines and Parties shall ensure their functioning, as well as the safe disposal of sediments, without unduly delaying ships.[221] It should be noted that ports and shipyards considered are only those where cleaning or repairing of ballast tanks occurs, as not all Adriatic ports have dry-docks nor do they perform this type of activity. On the basis of the review carried out by the project of the potential features of the most important Adriatic shipyards offering tank cleaning services, it is recommended to Adriatic authorities to investigate the overall availability of public and private shipyards and dry-docks as well as their current practices in regard to waste management, in order to plan appropriate action.

Finally, it is worth recalling that when considering the sediment reception facilities' applicable requirements, the regional, national and local legislation has to be taken into account. The review of the Adriatic States' legislation carried out by the project has shown the current absence of specific requirements in relation to the treatment and disposal on shore of ballast water sediments. The relevant EU legislation on waste would in principle apply also to the treatment of ballast water sediments that can be considered, totally or partially, as waste. A further consequence of this consideration would be that, although the BWM Convention does not oblige Parties either to collect or to treat sediments from ballast water tanks, the treatment and disposal of sediments - e.g. separated from ballast water - would fall under the scope of the ordinary waste management legislation. It would be recommendable, as far as Adriatic EU Member States are concerned, to have the proper involvement of competent EU institutions, and primarily the DG Environment of the European Commission in order to further explore the legal and practical implications of these assumptions especially for the ordinary work of dry-docks and shipyards as well as the possible adaptations and amendments to current EU legislation.

6.7. A critical enforcement: the challenge for port State control

The project has addressed several aspects of the overall BWM Convention compliance, monitoring and enforcement activities in the Adriatic Sea, including port State controls.[222]

As reviewed in this report, all Adriatic States are Parties to the LOSC and apply relevant provisions related to the enforcement on ships of international rules for the protection of the marine environment and the prevention of ships' sources of pollution.[223] On port State control matters, further global guidance is provided by the IMO Procedures for port State control, which are likely to be amended once the BWM Convention enters into force as to include the new instrument.[224] The EU has in force relevant legislation and EMSA is supporting related technical implementation, including the availability of European information on port controls through the THETIS information system.[225] As far as regional cooperation on port controls is concerned, maritime authorities of three out of six Adriatic littoral States (Croatia, Italy and Slovenia) participate, together with the European Commission, to the 1982 Paris MoU on port State control, of which Montenegro is a cooperating member. The Paris MoU is one of the two agreements between maritime administrations linking Mediterranean coun-

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219 BWM Convention, Article 5.

220 BWM Convention, Article 1.11.

221 Guidelines on sediment reception facilities (G1), Resolution MEPC.152(55).

222 See DAVID M. and GOLLASCH S. (2014). *BALMAS Ballast Water Sampling Protocol for Compliance Monitoring and Enforcement of the BWM Convention and Scientific Purposes*. BALMAS project, Korte, Slovenia, Hamburg, Germany, pp. 48, DAVID M., PIRELLI F., PETRI A., GOLLASCH S. (2016). *Detailed guidance for PSC for compliance control measures, including BWS, introduced according to the BWM Convention for CME in the Adriatic*. *Final report*, BALMAS project, pp. 25, DAVID M., GOLLASCH S., FLANDER-PUTRLE V., MOZETIČ P., FRANCÉ J., TURK V., LIPEJ L., TINTAT., DRAKULOVIĆ D., PESTORIĆ B., HUTER A., JOKSIMOVIĆ D., UHAN J., KLUN J., CABRINI M., FABBRO C., FORNASARO D., DE OLAZABAL A. (2016). *Ballast water sampling for compliance monitoring and enforcement of the BWM Convention conducted in ports and on vessels, containing reviews, models and test results of BWS methods and sampling*. *Final report*, BALMAS project, pp. 128, DAVID M., PIRELLI F., PETRI A., GOLLASCH S. (2016). *Compliance monitoring and enforcement measures and decision support systems for implementation of the BWM Convention in Adriatic, including reviews, models and test results of compliance control measures according to the BWM Convention*. *Final report*, BALMAS project, pp. 44.

223 Particular relevance has the LOSC regime on safeguards, responsibility and liabilities related to States' enforcement of international rules and national legislation to prevent, reduce and control pollution of the marine environment. See LOSC, Part XII and relevant provisions in Part II, III, V, VI and VII.

224 Procedures for Port State Control, 2011, IMO Resolution A.1052(27) adopted on 30 November 2011.

225 Directive No. 2009/16/EC of the European Parliament and of the Council of 23 April 2009 on port State control. For the text consultation see RAK G. and DE VENDICTIS G. (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region*. *A Collection of Legal Texts*, cit. See also Regulation (EU) No. 100/2013, as amended.

tries.[226] Albania as well as Bosnia and Herzegovina are not part of any port State control agreement neither are they currently bound by the EU legislation, even if accession candidate countries would progressively align their legislation with the European acquis, including port State control legislation. As a further element of the basic legal framework in force in the Adriatic Sea, it is worth noting that a mandatory ship reporting system in the Adriatic Sea has been approved by IMO (ADRIREP), and all ships sailing northwards and southwards as well as those crossing the basin, should report certain information to competent authorities in Croatia, Italy, Montenegro and Slovenia (see paragraph 3.3. of this report).

The BWM Convention provides further specific principles and requirements relevant for the States enforcement activities - whether acting as Flag, Port or Coastal States - regarding ships' inspection, detection of violations, controls and related notification, undue delay, certifications and surveys.[227] The IMO further complemented this regime at the global level with two guidance documents e.g. the G2 Guidelines for ballast water sampling[228] and the Guidelines for port State control under the BWM Convention.[229] Further technical recommendations are in the Guidance on ballast water sampling and analysis for trial use in accordance with the BWM Convention and Guidelines (G2)[230] related to methodologies and approaches to sampling and analysis to test compliance with D-1 and D-2 standards.

Taking into account the project review and results, the following issues emerge as particularly challenging for a consistent implementation of port State controls within the Adriatic area and may be addressed by an intra-Adriatic dialogue, leading, as appropriate, to further joint States' action addressing competent international and regional organizations.

Using current inspections priorities to effectively control the threat of the introductions of HAOPs. The current international system of maritime inspections, as reflected in the Paris MoU and in the EU Directive, is largely based on the ships' characteristics. Vessels subject to inspections are identified in advance on the basis of pre-defined criteria - the ship risk profile and the time elapsed since the last inspection - assigning ships a priority for port controls (Priority I ships, that must be inspected, and Priority II ships, that may be inspected). The system aims to ensure that the frequency and detail of inspections carried out would reflect the risk posed by the single ship, reducing the burden of inspection on those ships considered as low risk.

Certainly, the risks for the Adriatic environment deriving from HAOPs transfer by non-compliant ships are linked to the ship risk profile and to the ships' detention history i.e. a ship already detained because its ballast water treatment system did not work properly. However, unlike pollution addressed by other international instruments (i.e. MARPOL 73/78), actual threats posed by the introduction of HAOPs also depend on the relation between the environment where the ship uploads the ballast (donor port) and the one where it will be discharged (recipient port). The current international discussion on port State control is developing guidance to PSCOs allowing them to use "overriding" factors as a tool to bring about additional inspections of those ships which have been sampled and left proceeding to the next port of destination, pending the results of the sampling analysis.[231] To this end, the project has developed instruments to identify "high risk" or "extreme risk" discharges (note: not ships!) for the Adriatic ports that could help PSCOs in targeting samplings within existing port State control priorities. However, the same project instruments could be used in the Adriatic to enhance the ordinary control priorities, thereby allowing specific ballast water inspection programmes at the sub-regional level focused on risks and selecting for control ships not falling under Priority I and II categories. In order to give enhanced consideration to this new type of information in the given legal and institutional framework, further sub-regional political discussion and joint decisions would be needed, after which related interpretations could be reflected, as appropriate, by existing agreements on port State control at the different levels (i.e. sub-regional, regional, global).[232]

Facilitating port State control activities by enhancing the available environmental expertise. Knowledge and tools necessary for performing port State controls on ballast water standards require going beyond the

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226 The other is the Mediterranean MoU. See above, Paragraph 3.3. of this report.

227 See BWM Convention, Article 3.3. (Application), Article 9 (Inspection of Ships), Article 10 (Detection of Violations and Control of Ships), Article 11 (Notification of Control Actions), Article 12 (Undue delay to Ships), Regulation B-2.6 (Ballast Water Record Book) and Regulation E-1.6 (Surveys). On Ballast Water Record Book see also Regulation B-2.6.

228 Resolution MEPC.173(58) adopted on 10 October 2008. For the text consultation see RAK G. and DE VENDICTIS G. (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* cit.

229 Resolution MEPC.252(67) adopted on 17 October 2014. These Guidelines are not provided for by the Convention. For the text consultation see RAK G. and DE VENDICTIS G. (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* cit.

230 Adopted as IMO Circular BWM.2/Circ.42 Rev.1 of 24 May 2013. For the text consultation see RAK G. and DE VENDICTIS G. (2016). *Control and Management of Ships' Ballast Water in the Adriatic Sea Region. A Collection of Legal Texts,* cit.

231 In this direction is going i.e. the draft Paris MoU instruction on the matter.

232 See DAVID M. and GOLLASCH S. (2016). *Risk assessment decision support system models for ballast water management purposes in the Adriatic*, cit.

"ordinary". Specific expertise, skills, instruments and devices are crucial. During inspections - even in their very initial stage - PSCOs might have to assess the level of threats to the environment posed by a ship's ballast water discharge or perform technical activities i.e. samplings and related analysis[233] interpreting results and thereby choosing the appropriate action to take in order to mitigate risks.[234] As an additional remark, it should be noted that according to the general IMO Procedures on port State control[235] citizens and NGOs might ask for additional inspections, subject to the evaluation of the maritime authorities. Considering the relevance of Adriatic economies that might be directly affected by the presence of HAOPs, the maritime authorities should be put in a condition to promptly assess any petition or complaint coming from stakeholders with solid motivations. Thus, in order to support the actions of the PSCOs, specific education and training programmes would have to be delivered uniformely across the basin and an e-learning model course has been developed by the project.[236] Furthermore, even if the responsibility of the decisions on the ship remains in the authority in charge of port control, in many cases, the preventive involvement of other authorities or local bodies competent on environmental matters and provided with relevant expertise would be of help (i.e. authorities in charge of port surveys or monitoring). Institutional arrangements to this end are highly recommendable (see also paragraph 6.2. of this report).

Developing further common technical guidance to the Adriatic PSCOs for the conduct of sampling. According to the BWM Convention, any inspection – excepting when detailed controls take place - has to be limited to the verification of the ship's documentation - existence of a valid certificate and inspection of the Ballast Water Record Book - and may include sampling of ballast water according to G2 Guidelines.[237] When such a detailed inspection is carried out, the PSCOs shall adopt those measures as to ensure that the ship shall not discharge ballast water if the discharge presents a threat of harm the environment, property of resources i.e. stop the deballasting, etc. In any case, the time required to analyze samples shall not be taken as a basis for unduly delaying the ship.[238] It is worth stressing that, according to general rules, the ship-owner/operator has the right to appeal against detention decisions or refusal of access taken by authorities, and that a duty for

On board ballast water sampling activities (frame of the BALMAS documentary, M. Pisapia, ISPRA 2015)

233 Procedures for the assessment of threats during port State controls are described in point 3.11. of the Paris MoU.

234 Actions are to be chosen among those available under applicable law i.e. impeding the ballast water discharge in case of threats, asking to proceed to repair shipyard or to a facility, warn, detain or exclude a ship, etc.

235 Resolution A.789(19), Paragraph 2.3.

236 The model is annexed to RAK G., DE VENDICTIS G. (2016). *Recommendations on know-how and education and training needs, cit.*

237 BWM Convention, Article 9.1. It should be noted that the provision of sampling, representing a physical inspection, shall take place according to the LOSC, only after the examination of the ships' certificates and only when: (i) there are clear grounds for believing that the condition of the vessel or its equipment does not correspond substantially with the particulars of those documents; (ii) the contents of such documents are not sufficient to confirm or verify a suspected violation; or (iii) the vessel is not carrying valid certificates and records (LOSC, Article 226, Investigation of foreign vessels). The BW sampling may be included in case (iii).

238 BWM Convention, Article 12, Undue Delay to Ships. See also LOSC, Article 226.1 and Paris MoU, sections 3.12 and 3.13 according to which the burden of proof of the undue detention lies with the owner/operator.

compensation is recognized when enforcement measures are unlawful or exceed those reasonably required in the light of available information.[239]

In line with the global regime, in order to facilitate the consistent performance of port controls in Adriatic ports once the BWM Convention enters into force, the project has developed and tested additional technical guidance for the Adriatic port State control activities, integrating existing global documents and targeting Adriatic features. Three main aspects were addressed: elements that may trigger sampling during inspections, recommendations on adequacy of specific sampling methods to measure compliance, and specifications for both the D-1 and D-2 (indicative and detailed analysis) standards to check for compliance.

A sub-regional endorsement by appropriate formal instruments of these technical aspects would be necessary. Adriatic authorities are recommended to further discuss and share within the intra-Adriatic dialogue the guidance contents in a view of adopting consistent commitments. Relevant decisions should be brought within the relevant MoUs Committees and regional organizations, including the European Union institutions e.g. EMSA and REMPEC, as well as within IMO, with a view to provide elements of further discussion and propose possible instructions adjustments. In particular, the possibility to perform consistent national programmes of inspections targeting ballast water risks should be explored, aiming at assessing in advance the possible risks posed by certain discharges based on agreed criteria deriving from a shared HAOPs list, including target species, and related impact categorization (see paragraph 6.3. of this report).

Dedicated ballast water reporting in the Adriatic. As the mitigation of threats connected to ballast water discharges is one of the objectives set by the BWM Convention for port State control activities, and that the ship shall not be delayed unduly, in order to facilitate the PSCOs assessments, the ship's ballast water information should be available sufficiently in advance to its entrance in a port or terminal of a Party. Although the 1997 IMO resolution on ballast water control and management included a Ballast Water Reporting Form[240], this issue was not retained by the BWM Convention text. Further adapting the 1997 model, the project developed and tested a specific reporting form, also in a view of the effective functioning of the proposed decision support system, which has been voluntarily endorsed by Adriatic maritime authorities for the project purposes.

It would be essential for the efficacy of the controls that ballast water ships' reporting would be adopted as a mandatory requirement. To this end, as mentioned, reporting may be adopted by each State as a condition for the ships' entry into Adriatic national ports. This formal option may have disadvantages in terms of the decisions' consistency within the Adriatic and a joint States' commitment would be in any case recommended. A different practicable solution would be to develop through the intra-Adriatic dialogue, a joint formal proposal, shared, as appropriate, with the broader Mediterranean cooperation context, to amend the already existing IMO Mandatory Reporting System for the Adriatic Sea (ADRIREP) (see paragraphs 3.3. and 6.1. of this report).

Additional tools for port State control and related resources. Consistent and effective port State activities would need the availability of specific tools and devices which were tested by the project in relation to their ability to provide information relevant for compliance assessment. The project identified port State control cost categories in this regard i.e. additional human resources (including PSCOs man-hours), port State control education and training programmes, ballast water sampling kits, devices for indicative analysis, etc.[241] In any case, the control activities performed should be technically adequate to afford administrative or judicial proceedings. The 2015 Guidance on sampling and analysis for trial use, stresses that all samples and analysis should be performed under reliable and verified Quality Assurance and Quality Control procedures. Furthermore devices and other instrumentation should be calibrated according to international standards, as appropriate. These aspects should be taken into account both at the national level and in terms of relations between bordering countries.

The importance of consistent sanctions for BWM Convention violations within the Adriatic Sea area. Considering the specific Adriatic Sea vulnerability, consistency of sanctions across the basin would be important to uniformly discourage violations of the BWM Convention across the basin. According to the convention, national legislation should be adequate as to discourage violations by vessels flying Adriatic flags as well as for those violations committed in waters under jurisdiction of Adriatic coastal States. Regional and sub-regional cooperation should consider sharing information on this aspect as a means to jointly improve the protection of the basin. Relevant EU legislation amendments may facilitate coherence of national legislation in this regard.[242]

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239 See LOSC, Article 232, Liability of States arising from enforcement measures.

240 IMO Resolution A.868(20) adopted on 27 November 1997 "Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens", Appendix 1.

241 For details see DAVID M. et al. (2016). *Ballast water sampling for compliance monitoring and enforcement of the BWM Convention conducted in ports and on vessels, containing reviews, models and test results of BWS methods and sampling*, cit.

242 In particular, Directive No. 2005/35/EC of 7 September 2005 on ship-source pollution and on the introduction of penalties, including criminal penalties, for pollution offences.

6.8. Potential side-effects of the implementation of the BWM Convention: cumulative impacts on the Adriatic Sea environment

Two aspects emerging from the project's review might be relevant in the future evolutions of the global regime as well as for related implementation within the Adriatic Sea. Firstly, once the BWM Convention will enter into force and the D-2 standard is phased in, a hopefully relevant number of ships will have a ballast water treatment system on board, part of which making use of active substances following the IMO's procedure for approval. The relevance for the Adriatic Sea basin's environment and ecology of a significant amount of additional chemical discharges (i.e. remaining toxicity from active substances for ballast water treatment or the neutralizing agent) would have to be carefully taken into consideration in order to avoid transferring one form of pollution into another, as prohibited by international law.[243] The project port surveys carried out included a specific chemical survey baseline that could serve as a knowledge basis to assess fundamental changes of pollution conditions in the future.[244] Especially long-term effects of active substances used in ballast water treatment and the neutralizers can only be estimated today, but should be measured in the future to confirm their environmental acceptability.

A second remark has to do with the overall pressure on the Adriatic Sea of unmanaged ballast water discharges resulting from the implementation of the BWM Convention. As mentioned, a relevant number of flexibility options are in principle available to Parties at the national level, i.e. exceptions subject to authorizations and exemptions subject to risk assessment. The majority of the significant volume of the shipping traffic in the basin is intra-Adriatic and may fall within the flexibility options provided by the BWM Convention. Considering the high proximity of Adriatic coasts as well as the basin's other physical and oceanographic features, the extent of the consequences that national decisions will have for other jurisdictions of unmanaged ballast water discharges for marine waters of adjacent or of other interest States would be comparatively relevant in respect to other marine regions of the world. The BWM Convention partially acknowledges this issue explicitly setting related duties of the coastal State in whose jurisdiction ships are operating in respect of other potentially affected States.[245] However, it should be considered that exceptions in addition to exemptions could result in a high percentage of ships not complying with ballast discharge standards. This would mean an increased risk in absolute terms of the HAOPs transfer across the basin and assessment of risks should also have to take into account also possible relevant cumulative effects. This issue could be further discussed as a part of the Adriatic sub-regional dialogue to be developed, looking at the basin's environment as a whole, common heritage that would be preserved by promoting the sustainable development of the area's activities.

243 See *inter alia* LOSC, Part XII, Article 195, Duty not to transfer damage or hazards or transform one type of pollution into another.

244 See NINČEVIĆ GLADAN Ž., MAGALETTI E., SCARPATO A. et al. (2014). *BALMAS Port Baseline Survey Protocol. Protocol*, cit.

245 For exceptions, see BWM Convention, articles 3.2.b) and 3.2.c). For exemptions, see BWM Convention, Annex, Regulation A-3.

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LIST OF ACRONYMS AND ABBREVIATIONS

BWM Convention	International Convention for the Control and Management of Ships' Ballast Water and Sediments (London, 2004)
CBD	Convention on Biological Diversity (Rio de Janeiro, 1992)
EcAp	Ecosystem Approach
EU	European Union
GES	Good Environmental Status
GT	Gross Tonnage
HAOPs	Harmful Aquatic Organisms and Pathogens
HRS	High Risk Ships
hrs	hours
IAS	Invasive Alien Species
IMO	International Maritime Organization
LEK	Local Ecological Knowledge
LOSC	United Nations Convention on the Law of the Sea (Montego Bay, 1982)
LRS	Low Risk Ships
MEPC	Marine Environment Protection Committee
MoU	Memorandum of Understanding
MSFD	Marine Strategy Framework Directive
NIS	Non-Indigenous Species
nm	nautical miles
PSC	Port State Control
PSCO	Port State Control Officer
RAC/SPA	Regional Activity Centre for Specially Protected Areas
REMPEC	Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea
SRS	Standard Risk Ships
UNEP/MAP	United Nations Environmental Programme/Mediterranean Action Plan

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