BALLAST WATER MANAGEMENT IN THE BALTIC SEA REGION

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1. Introduction

Ballasting is absolutely necessary to providing balance and stability especially during the unloading of vessels. Ballast waters loaded in one port contain organisms and pathogens which are later discharged into another port or coastal waters. Thus, ballast waters are potentially harmful to the marine ecosystems because of the negative influence of its invasive alien species which changed their living places many nautical miles away from their natural environment and have a great impact for native species and ecosystems. It is a particular problem for the marine environment of the enclosed or semi-enclosed seas, such as the Baltic Sea. The International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 (BWM)[1] is the first international

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[1] The status of ratification of the BWM Convention, as of 5.5.2010 is as follows: number of Contracting States: 25 (% world tonnage: 24,28%) Algeria, Antigua & Barbuda, Barbados, Brazil, Canada, Cook Island, Egypt, France, Kenya, Kiribati, Korea, Liberia, Maldives, Marshall Islands, Mexico, Nigeria, Norway, Saint Kits and Nevis, Sierra Leone, South Africa, Spain, Sweden, Syrian Arab Republic, The Netherlands and Tuvalu. The BWM provides that it will enter into force 12 months after the date on which thirty

agreement which provides legal and technical instruments to assess the risks posed by the transfer of organisms by ships. Generally, the BWM Convention aims to reduce the introduction of pathogens and non-native species into port waters and coastal ecosystems. Accordingly, the BWM establishes an inspection and enforcement regime.

The problem of harmful aquatic organisms in ballast water was first raised at the International Maritime Organization (IMO) in 1988 when Canada and Australia were among the countries experiencing particular problems with alien species. Since then, the IMO's Marine Environment Protection Committee (MEPC), together with the Maritime Safety Committee (MSC) and IMO's technical sub-committees, have been dealing with the issue, focusing in the past decade firstly on guidelines and subsequently on developing the new convention[2]. The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) in 2001 Report "A Sea of Trouble"[3] noted that ships' ballast water transports thousands of species.

Nowadays, in the era of globalization of trade and technological development, vessels have become the primary vector for the introduction of non-indigenous species. This process was noted by international community over twenty years ago with increases in marine transport[4] and in 1991 the IMO's MEPC adopted "Guidelines for Preventing the Introduction of Unwanted Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges"[5]. Consequently, the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992, recognized that issue as a major international concern. In November 1993, the IMO Assembly adopted "Guidelines for Preventing the Introduction of Unwanted Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges"[6], based on the 1991 Guidelines. The resolution requested that the IMO's MEPC and MSC keep the Guidelines

states with combined merchant fleets constituting 35% of world gross tonnage have ratified or otherwise agreed to be bound by the BWM (Art. 18 BWM).

[2] www.imo.org.

[3] *A Sea of Troubles*, GESAMP Reports and Studies No.70, UNEP 2001, available at: www.unesdoc.unesco.org.

[4] See also: Convention Relative to the Preservation of Fauna and Flora in their Natural State done on 8.11.1933; Agreed Measures for the Conservation of Antarctica Flora and Fauna, 1964.

[5] MEPC.50(31).

[6] IMO A.774(18).

under review and placed emphasis on developing internationally applicable, legally-binding provisions. The 20th Assembly of the IMO in November 1997 adopted "Guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens"[7]. Finally, the IMO adopted the BWM Convention on 13.2.2004[8].

The European Commission has strongly recommended that European Union (EU) Member States should ratify the BWM Convention and has participated in the development of interim measures to reduce the risk of non-indigenous species being introduced through the discharge of ships' ballast water in the four regional organizations surrounding Europe: the Helsinki Commission (HELCOM)[9], the Convention for the Protection of the Marine Environment of the North-East Atlantic Commission (OSPAR), the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea Commission (REMPEC/Barcelona) and the Black Sea Commission. Actually, four EU Members States are already State Parties to the BWM Convention: France, Spain, Sweden and the Netherlands. The remaining EU Members States, and particularly the Baltic Sea States, are preparing national legislation to implement the BWM Convention in compliance with the IMO Guidelines and international law. It should be emphasized that this process is only a matter of time and that the BWM Convention will most likely enter into force in the nearest future according to an EU recommendation on the ratification by EU Members States of the BWM Convention.

2. General obligation to protect and preserve the marine environment

The main value of the law of the sea is unity of the Global Ocean[10]. During the Rio de Janeiro Earth Summit, the international community

[7] IMO A.868(20).

[8] During the Conference, the Secretary- General of the IMO, Efthimios E. Mitropoulos, told delegates: "the introduction of harmful aquatic organisms and pathogens to new environments has been identified as one of the four greatest threats to the world's oceans. Proper control and management of ships' ballast water is therefore a major environmental challenge for IMO and the global shipping industry."

[9] www.helcom.fi.

[10] According to the preamble to the Convention on the Law of the Sea "The problems of ocean space are closely interrelated and need to be considered as a whole" (UNCLOS 1982).

focused on a new concept of ocean management based on a holistic[11], ecosystem[12] and precautionary[13] approach. Nowadays the specific principles of ocean governance are sustainable development, the precautionary principle, the polluter-pays principle, self-regulation, the conservation of biodiversity and intergenerational equity, as well as the principles of integration and responsibility to protect the marine environment[14].

[11] A holistic approach is a conception to protect the marine environment as functional units in their own right. In the centre of a holistic approach is taking into account all factors, when deciding where, and to what extent, consideration should be given to one or other harmful activity. According to HELCOM statement the ecosystem approach and the development of Ecological Quality (EcoQ) require a holistic approach. Ecological Quality is defined as: "an overall expression of the structure and function of the marine ecosystem taking into account the biological community and natural physiographical, geographic and climatic factors as well as physical and chemical conditions including those resulting from human activities". A holistic approach is also the main idea of HELCOM Baltic Sea Action Plan (HELCOM HOD 18/2005); www.helcom.fi.

[12] An Ecosystem approach to international or regional marine and coastal network experiences and cooperation could be an excellent basis for developing the conception of Baltic Sea marine governance. An Ecosystem approach to marine governance is a conception of international marine environmental law and an appropriate alternative for a sector-by-sector approach to environmental protection and management. An Ecosystem approach is defined as "the integrated management of human activities based on knowledge of ecosystem dynamics to achieve sustainable use of ecosystem good and services and maintenance of ecosystem integrity"; D.R. Christie, *Implementing an Ecosystem Approach to Ocean Management: an Assessment of Current Regional Governance Models*, Duke Environmental Law & Policy Forum 2005–2006, Vol. 16, No. 2, at p. 117; HELCOM *Ecological Objectives for an Ecosystem Approach*, HELCOM Stakeholder Conference on the Baltic Sea Action Plan, Helsinki Commission, Finland 2006; www.helcom.fi.

[13] According to the precautionary principle "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not to be used as a reason for postponing coast–effective measures to prevent environmental degradation". The precautionary approach is the way to enforce precautionary principle. Marine governance should be based on the precautionary approach. It helps in developing ecosystem protection standards and measures; S. Marr, *The Precautionary Principle in the Law of the Sea. Modern Decision Making in the International Law*, Kluwer Law International 2003, at pp. 114–117.

[14] *Ten Principles for High Seas Governance* in their structural construction are based on modern approaches to marine governance. According to the idea of unity of the Global Ocean, they are common for all marine areas as a whole as well as the regional seas as special areas: 1. conditional freedom of activity on the high seas; 2. protection

The international rules and standards designed to prevent, reduce and control marine pollution and govern marine resources have fundamental meaning for the philosophy of the modern international marine environmental law and marine governance in Europe. Nevertheless, certain problems remain with the vertical and horizontal fragmentation of law and decision-making processes (sectoral issues/zonal approach). The duty to cooperate and the responsibility to protect the marine environment are based upon an obligation to protect the environment as *ius cogens* in public international law (United Nations Convention on the Law of the Sea; UNCLOS 1982). Additionally, the ecosystem and precautionary approaches are recognized as principles of marine risk assessment and risk management, together with the maintenance of marine biodiversity and a new paradigm of sustainable use of the Global Ocean[15].

and preservation of the marine environment; 3. international cooperation; 4. science--based approach to management; 5. public availability of information; 6. transparent and open decision making processes; 7. precautionary approach; 8. ecosystem approach; 9. sustainable and equitable use; 10. responsibility of States as stewards of the global marine environment; IUCN, *Marine Global Program*, IUCN 2008, www.cms.iucn.org.

[15] Working Toward High Seas Marine Protected Areas, *An Assessment of Progress Made and Recommendations for Collaboration*, UNEP – World Conservation Monitoring Centre, 2008; J. Roberts, *Marine environment protection and biodiversity conservation: the application and future development of the IMO's particularly sensitive sea area concept*, Springer 2006; O. Young, *International Cooperation. Building Regimes for Natural Resources and the Environment*, Cornell University Press, 1989; D. Hassan, *Protecting the marine environment from land-based sources of pollution: towards effective international cooperation*, Ashgate Publishing 2006; G. (Rock) Pring, S.Y. Noé, *The Emerging International Law of Public Participation Affecting Global Mining, Energy and Resources Development* [in:] D. Zillman, A. Lucas, A. (Rock) Pring (eds.), 'Human rights in natural resource development: public participation in the sustainable development of mining and energy resources', Oxford University Press 2002; H. Wang, *Ecosystem Management and Its Application to Large Marine Ecosystems: Science, Law, and Politics*, Ocean Development & International Law 2004, Vol. 35, No. 1, at p. 41; H. Wang, *An Evaluation of the Modular Approach to the Assessment and Management to Large Marine Ecosystems*, Ocean Development & International Law 2004, Vol. 35, No. 3, at p. 267; G. Shepherd, *The Ecosystem Approach, Five Steps to Implementation*, Ecosystem Management Series No. 3, IUCN 2004; *The Ecosystem Approach to Fisheries. Issues, terminology, principles, institutional foundations, implementation and outlook*, FAO Fisheries Technical Paper, No. 443, Rome 2003; A.M. Duda, K. Sherman, A *new imperative for improving management of large marine ecosystems*, Ocean & Coastal Management 2002, Vol. 45, No. 9–10, at p. 797; D. Rotwell, D. L. VanderZwaag, *Towards Principled Ocean Governance: Australian and*

Whilst numerous threats exert a negative influence on the Baltic Sea marine environment[16], the natural unity of the Baltic Sea can be ensured by the common desire to effectively cooperate shown by the Baltic Sea States and other interested actors. The pleasing environmental status of the Baltic Sea may be achieved by combating eutrophication, reducing the risks from hazardous substances, reducing the adverse effects of human activities of the Baltic Sea[17], preserving and increasing biodiversity (e.g. by responsible ballast water management), improving environmental awareness and education, marine research, reporting systems, monitoring compliance with and the effectiveness of the law. It is clear that "states should identify marine ecosystems exhibiting high levels of biodiversity and productivity and other critical habitat areas and provide necessary limitations on use in these areas through, inter alia, designation of protected areas"[18]. There is no doubt that Baltic Sea is threatened by ships' ballast water's invasive species (see Tab. 1.).

Canadian Approaches and Challenges, Routledge 2006; Y. Tanaka, A *Dual Approach to Ocean Governance: The Cases of Zonal and Integrated Management in International Law of the Sea*, Ashgate Publishing, 2009.

[16] The Impact of accidents (spills, collisions); operational discharges (oil, noxious liquid substances, sewage, air emissions, introduction of harmful aquatic organisms and pathogens through ships' ballast water); physical damage to marine habitats or organisms (anchor damage, ship strikes of marine fauna, harmful effect from anti-fouling system). The Helsinki Commission works to protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental cooperation and coordination of actions. There are no specific references to IAS in the Convention on the Protection of the Marine Environment of the Baltic Sea (Helsinki Convention, 1992), but IAS could be in a scope of definition of the pollution. According to Art. 2(1) Helsinki Convention: "Pollution means introduction by man, directly or indirectly, of substances or energy into the sea, including estuaries, which are liable to create hazards to human health, to harm living resources and marine ecosystems, to cause hindrance to legitimate uses of the sea including fishing, to impair the quality for use of sea water, and to lead to a reduction of amenities".

[17] A.C. Brusendorff, P. Ehlers, *The HELCOM Copenhagen Declaration: A Regional Environmental Approach for Safer Shipping*, The International Journal of Maritime and Coastal Law 2002, Vol. 17, No. 3, at p. 353.

[18] Chapter 15 of Agenda 21 "Conservation of biological diversity" acknowledges that: "Despite mounting efforts over the past 20 years, the loss of the world's biological diversity, mainly from habitat destruction, over-harvesting, pollution and the inappropriate introduction of foreign plants and animals, has continued". In Chapter 17 ballast water and maricultural/aquacultural issues are mentioned. States are encouraged

Table 1. Exemplary Marine Invasive Alien Species

Name	Native to	Introduced to	Impact
Cladoceran Water Flea Cercopagis pengoi	Black and Caspian Seas	Baltic Sea	Reproduces to form very large populations that dominate the zooplankton community and clog fishing nets and trawls, with associated economic impacts
Mitten Crab Eiocheir sinensis	Northern Asia	Western Europe, Baltic Sea and West Coast North America	Undergoes mass migrations for reproductive purposes. Burrows into river banks and dykes causing erosion and siltation. Preys on native fish and invertebrate species, causing local extinctions during population outbreaks. Interferes with fishing activities
Round Goby Neogobius melanostomus	Black, Asov and Caspian Seas	Baltic Sea and North America	Highly adaptable and invasive. Increases in numbers and spreads quickly. Competes for food and habitat with native fishes including commercially important species, and preys on their eggs and young. Spawns multiple times per season and survives in poor water quality
Zebra Mussel Dreissena polymorpha	Eastern Europe (Black Sea)	Introduced to: Western and northern Europe, including Ireland and Baltic Sea; eastern half of North America	Fouls all available hard surfaces in mass numbers. Displaces native aquatic life. Alters habitat, ecosystem and food web. Causes severe fouling problems on infrastructure and vessels. Blocks water intake pipes, sluices and irrigation ditches. Economic costs to USA alone of around US$750 million to $1 billion between 1989 and 2000
Toxic Algae (Red/Brown/Green Tides) Various species	Various species with broad ranges	Several species have been transferred to new areas in ships' ballast water	May form Harmful Algae Blooms. Depending on the species, can cause massive kills of marine life through oxygen depletion, release of toxins and/or mucus. Can foul beaches and impact on tourism and recreation. Some species may contaminate filter-feeding shellfish and cause fisheries to be closed. Consumption of contaminated shellfish by humans may cause severe illness and death

to cooperate and to develop legal and regulatory frameworks and safeguard against introduction of alien species. In Chapter 18 – States are encouraged to: "Control of noxious aquatic species that may destroy some other water species". UNCED 1992 Agenda 21, available at: www.un.org/esa/dsd/agenda21.

Name	Native to	Introduced to	Impact
European Green Crab Carcinus maenus	European Atlantic Coast	Southern Australia, South Africa, the United States and Japan	Highly adaptable and invasive. Resistant to predation due to hard shell. Competes with and displaces native crabs and becomes a dominant species in invaded areas. Consumes and depletes wide range of prey species. Alters inter-tidal rocky shore ecosystem

Source: www.globallast.imo.org/poster4_english.pdf

Furthermore, it should be emphasized that the International Convention for the Prevention of Pollution from Ships 1973/78 (MARPOL 1973/78) designates the Baltic Sea as a Special Area[19]. All states-parties can take protective measures in a Special Areas only in order to prevent sea pollution under the MARPOL 1973/78[20]. The measures that may be taken in the Special Area are established in accordance with existing instruments. In 2005 the Baltic Sea was officially classified by the International Maritime Organization (IMO) as a Particularly Sensitive Sea Area[21]. Under the Baltic Sea PSSA[22],

[19] According to the MARPOL 1973/78 the Baltic Sea is a Special Area: Annex I "Regulations for the Prevention of Pollution by Oil" – the Baltic Sea is the area with strict controls on discharge of oily wastes; Annex II "Regulations for the Prevention of Pollution by Noxious Liquid Substances" – the Baltic Sea is the area in which there are strict controls on tank washing and residue discharge procedures; Annex V "Regulations for the Prevention of Pollution by Garbage" the Baltic Sea one of the special areas in which there are strict controls on disposal of garbage; Annex VI established the Baltic Sea as a "SOx Emission Control Areas" (SECA) with more stringent controls on sulphur emissions from ships. Poland ratified all of MARPOL 1973/78 Annexes. Annex VI in 2005; Polish O. J. 2005, No. 202, item 1679.

[20] International Convention for the Prevention of Pollution from Ships, 1973 (and Annexes I–VI) Poland is a party to the Convention and Protocol. Instruments of accession were deposited on 2.10.1983. In Poland, MARPOL entered into force on 1.7. 1986, (Polish O. J. 1987, No. 17, item 101). Poland ratified the Annexes I-VI of the MARPOL 1973/78 Convention. The MARPOL 1973/78 Conventional system was incorporated with the Prevention of Pollution of the Sea from Ships Act. This was adopted and published in l995.

[21] Designation of the Baltic Sea Area as Particularly Sensitive Sea Area (PSSA) – outcome of HELCOM HABITAT 4/2003 and HELCOM MARITIME 1/2003, HELCOM HOD 11/2003, Document 5.2/2; Designation of parts of the Baltic Sea area as Particularly Sensitive Sea Areas (PSSA), HELCOM HABITAT 4/2003, Document 3.1/5.

[22] O. Lindén, A. Chircop, M. Pourzanjani, J-U. Schröder, S. Raaymakers, *PSSA in the Baltic Sea: present situation and future possibilities*, Baltic Master, World Maritime University, Malmö, Sweden, at pp. 3–25; see also www.baltic.master.org.

a state may propose associated protective measures (APMs) which may include "any measure that is already available in an existing instrument or any measure that does not yet exist but that should be available as a generally applicable measure and that falls within the competence of IMO"[23]. The most important and ecologically most valuable habitats in the Baltic Sea region are recommended for protection under the auspices of the HELCOM as a Baltic Sea Protected Area (BSPA)[24]. HELCOM works to ensure that the Baltic Sea States develop and implement measures to reduce the risk of alien species being introduced into the Baltic Sea Area[25].

3. Prevention of harmful aquatic organisms and pathogens

Protecting the Baltic Sea against pollution from maritime traffic and preventing the introduction of harmful aquatic organisms and pathogens have to be a maritime, environmental and transport policy priority for all Baltic Sea States. It should be emphasized that the Baltic

[23] The PSSA Baltic Sea Area comprises the Baltic Sea proper, the Gulf of Bothnia, the Gulf of Finland and the entrance to the Baltic Sea bounded by the parallel of the Skaw in the Skagerrak at 57°44.8'N, as defined in regulation 10(1)(b) of Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL1973/78) excluding those marine areas within the sovereignty of the Russian Federation, or subject to the sovereign rights and jurisdiction of the Russian Federation as referred to in Article 56 of the United Nations Convention on the Law of the Sea; Res A.982(24) IMO Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas (PSSAs) 2005; MEPC.136(53) 2005, http://www.imo.org.

[24] They are separated into three categories: landscape types and large biotope complexes, coastal biotope types and marine/brackish-water biotope types. According to the HELCOM recommendation 15/5, the Commission recommended to the Governments of the Contracting Parties to the Helsinki Convention: "that management plans be established for each BSPA (Baltic Sea Protected Area) to ensure nature protection and sustainable use of nature resources. These management plans shall consider all possible negatively effecting activities, such as: extraction of sand, stones and gravel; oil and gas exploration and exploitation; dumping of solid waste and dredge spoils; constructions; waste water from industry, municipalities and households; intensive agriculture and intensive forestry; aquaculture; harmful fishing practices; tourism; transport of hazardous substances by ship through these areas; military activities…".

[25] *HELCOM Activities Related to the Transfer of Alien Species in the Baltic Sea*, 11th Global Meeting of the Regional Seas Conventions and Action Plans, Bangkok, Thailand, 5–8.10.2009, UNEP(DEPI)/RS.11/INF.8.RS.

Sea is one of the most intense maritime transportation areas in the world[26]. The Baltic Sea States have agreed to ratify the International Convention for the Control and Management of Ships' Ballast Water and Sediments[27] by 2013 and to implement HELCOM measures[28] prior to ratification. The BWM Convention does not define the term "invasive alien species" but, rather, defines the term "harmful aquatic organisms and pathogens". It is arguable which term is more restrictive. "Harmful aquatic organisms and pathogens" are defined as aquatic organisms or pathogens which, if introduced into the water environment, may create hazards to the environment, human health, property or resources, impair biological diversity or interfere with the other's legitimate use of such areas[29].

The general principle for the management of invasive alien species is included in the Convention on Biological Diversity 1992 (CBD). Article 8(h) thereof requires that, as far as is possible, each contracting State should "prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species". The Eighth Conference of the Parties (COP-8)[30] to the CBD set out additional guidelines in relation to alien species and aquaculture[31]. The Parties and other Governments are invited: to promote aquaculture of native species with the aim of avoiding the accidental introduction of alien species and their parasites; to share, through the clearing-house mechanism

[26] P. Ehlers, *Baltic Sea*, Max Planck Encyclopedia of Public International Law, www.mpepil.com.

[27] The International Convention for the Control and Management of Ships Ballast Water & Sediments was adopted at a Diplomatic Conference at IMO in London on 13.2.2004. Representatives of 74 States, one Associate Member of IMO, observers from two intergovernmental organizations and 18 non-governmental international organizations attended the Conference; www.imo.org.

[28] For example, the HELCOM Baltic Sea Action Plan (BSAP) 2007; www.helcom.fi.

[29] Art. 1(8) BWM.

[30] The Conference of the Parties (COP) is the governing body of the CBD, and advances implementation of the Convention through the decisions it takes at its periodic meetings; www.cbd.int.

[31] Decision VIII/27 "Alien species that threaten ecosystems, habitats or species (Article 8(h)): further consideration of gaps and inconsistencies in the international regulatory framework", Report of the Eighth Meeting of the Parties to the Convention on Biological Diversity (UNEP/CBD/COP/8/31), 15.6.2006 at p. 316.

and other means, national experiences in dealing with invasive alien species, in particular animals and their parasites, introduced or spread through various conveyances (e.g., vessels, floating timber, equipment and machinery, household goods, packaging and containers, waste materials, air transport vessels, tourist vessels, etc.), including any risk assessments or risk management measures that have been carried out for particular species or pathways[32].

Decision VIII/27[33], which is entitled "Alien species that threaten ecosystems, habitats or species (Article 8(h)): further consideration of gaps and inconsistencies in the international regulatory framework", states that Parties and other Governments should as soon as possible implement the Code of Practice on the Introduction and Transfers of Marine Organisms of the International Council for the Exploration of the Sea, the Code of Conduct on Responsible Fisheries of the Food and Agriculture Organization of the United Nations[34], and Article 196 of the United Nations Convention on the Law of the Sea. Article 196 of UNCLOS 1982 requires States to "take all measures necessary to prevent, reduce and control (...) the international or accidental introduction of species,

[32] The following pathways were specifically concerned: aquaculture/mariculture; ballast water; marine biofouling, particularly hull-fouling; civil air transport; military activities; emergency relief, aid and response; international development assistance; scientific research; tourism; pets, aquarium species, live bait, live food and plant seeds; biocontrol agents; ex situ animal breeding programmes; inter-basin water transfer and navigational canals.

[33] www.cbd.int/decision/cop/?id=11041

[34] Code of Conduct for Responsible Fisheries contains measures related to introductions and transfers of non-native organisms. According to Art. 9.2.3: "States should consult with their neighboring States, as appropriate, before introducing non--indigenous species into transboundary aquatic ecosystems." Article 9.3.1 sates that: "States should conserve genetic diversity and maintain integrity of aquatic communities and ecosystems by appropriate management. In particular, efforts should be undertaken to minimize the harmful effects of introducing non-native species or genetically altered stocks used for aquaculture including culture-based fisheries into waters, especially where there is a significant potential for the spread of such non-native species or genetically altered stocks into waters under the jurisdiction of other States as well as waters under the jurisdiction of the State of origin. States should, whenever possible, promote steps to minimize adverse genetic, disease and other effects of escaped farmed fish on wild stocks". www.fao.org/fishery/ccrf; see also: DIAS – FAO Database on Introduction of Aquatic Species www.fao.org/fishery/dias.

alien or new, to a particular part of the marine environment, which may cause significant and harmful changes thereto"[35].

The BWM requires ships to develop ballast water management plans, maintain a Ballast Water Record Book and undertake certain ballast water management measures. The goal of the BWM is to "prevent, minimize and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments" (Art. 2(1) BWM))[36]. Under the "General Obligations" section of the BWM, the Parties undertake to give full and complete effect to the provisions of the Convention and the Annex in order to prevent, minimize and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments[37].

Regulation A-4 of the BWM Annex provides that a Party or Parties, in waters under their jurisdiction, may grant exemptions to any requirements to apply Regulations B-3 or C-1 of the BWM Annex, in addition to those exemptions contained elsewhere in the BWM Convention, but only when they are, *inter alia*, granted on the basis of the Guidelines on risk assessment developed by the IMO. There are three methods for assessing risk in accordance with Regulation A-4 of the BWM Annex: environmental

[35] The UNCLOS 1982 introduced obligation on all states to "*protect and preserve the marine environment*" (Article 192 UNCLOS 1982) and also obligation to protect and preserve rare or fragile species and ecosystems in all parts of the marine environment, as well as the habitat of depleted, threatened or endangered species and other forms of marine life (Article 194(5) UNCLOS 1982). States are obliged to take or cooperate with other States in taking, such measures for their respective nationals as may be necessary for conservation of the living resources of the high seas (Article 117 UNCLOS 1982); and to take measures to maintain and restore populations of harvested species at levels which can produce MSY based on the "*best scientific evidence available*" to the states concerned, as qualified by relevant environmental and economic factors (Article 119 UNCLOS 1982). www.un.org/depts/los/index.htm.

[36] The BWM ballast water quality standards will not be able to regulate ballast water management until 2016 when a new generation of vessels having the required new technology will be developed; M. Tsimplis, *Alien Species Stay Home: The International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004*, International Journal of Marine and Coastal Law 2005, Vol. 19, No. 4, at p. 411.

[37] Art. 2 BWM.

matching risk assessment[38], species' biogeographical risk assessment[39] and species-specific risk assessment[40].

[38] Environmental matching risk assessment: relies on comparing environmental conditions between locations including temperature and salinity between donor and recipient regions; data necessary to enable a risk assessment using environmental matching approach includes: origin of the ballast water to be discharged in recipient port; biogeographic region of donor and recipient port(s); the average and range of environmental conditions, in particular salinity and temperature; difficulty in using environmental matching risk assessment is identifying the environmental conditions that are predictive of the ability of the harmful species to successfully established and cause harm in the new location, and in determining whether the risk of ballast water discharged sufficiently low to be acceptable. A high-risk scenario could be indicated if the environmental conditions of the donor ports overlap the environmental conditions of the recipient region; a low-risk scenario could be indicated if the environmental conditions of the donor port do not overlap the environmental conditions of the recipient region.

[39] Species' biogeographical risk assessment: compares the overlap of native and non-indigenous species to evaluate environmental similarity and to identify high risk invaders; data to enable a risk assessment using species' biogeographical approach includes: records of invasion in the donor and recipient biogeographic regions and ports; records of native or non-indigenous species that could be transferred through ballast water in the donor biogeographic region that have invaded other biogoegraphic regions and the number and nature of biogeographic regions invaded; records of native species in the donor region that have the potential to affect human health or result in substantial ecological or economic impacts after introduction in the recipient region through ballast water transfer; is used to identify high risk invaders. A high-risk could be indicated if the recipient port presently contains non-indigenous species whose native range includes the donor biogeographic region; a high-risk could be indicated if the donor and recipient ports share non-indigenous species whose sources is from other biogeographic regions; a moderate to high risk could be indicated if the recipient biogeographic region presently contains non-indigenous species whose native range includes the donor biogeographic region; a moderate to high risk could be indicated if the donor biogeographic region is a major source for invaders for other biogeographic regions.

[40] Species-specific risk assessment: evaluates the distribution and characteristics of identified target species; data to enable a risk assessment using species-specific approach includes: biogeographic region of donor and recipient port(s); the presence of all non--indigenous species (including cryptogenic species) and native species in the donor port(s), port region and biogeogrphic region, not present in the recipient port, to allow identification of target species; the presence of all target species in the recipient port(s), port region and biogeographic region; the difference between target species in the donor and recipient ports, port region, and biogeographic region; life history information on the target species and physiological tolerances, in particular salinity and temperature, of each life stage; habitat type required by the target species and availability of habitat

The precautionary principle forms the essence of the BWM. The BWM places obligations both on the flag and the port states, and in relation to the certification system[41]. The main requirements of the BWM Convention include the following principles: ships should carry and implement a ballast water management plan that has been approved by the Administration, which must detail safety procedures for the ship and crew, and provide a detailed description of the actions to be taken to implement the ballast water management requirements[42]; ships should carry a Ballast Water Record Book, which must be completed after each ballast water operation (the phased implementation of two ballast water discharge performance standards, the application dates of which are based on the ships ballast water capacity and its construction date)[43]; ships undertaking ballast water exchange should conduct it at least 200 nautical miles from the nearest land and in water at least 200 meters in depth (or in cases where the ship is unable to conduct ballast water exchange in accordance with the above, as far from the nearest land as possible, and in all cases at least 50 nautical miles from the nearest land and in water at least 200 meters in depth); ships performing ballast water exchange, should do so with an efficiency of at least 95% volumetric exchange of ballast water[44]; and ships treating ballast water should adhere to a specific performance standard

type in the recipient port; factors to consider when identifying target species include: evidence of prior introduction; demonstrated impacts on environment, economy, human health, property or resources; strength and type of ecological interactions (e.g. ecological engineers); current distribution within biogoegraphic region and in other biogoegraphic regions; relationship with ballast as a vector. An assessment could be deemed high risk if it identifies at least one target species that satisfied all of the fallowing: likely to cause harm; present in the donor port or biogeographic region; likely to be translated to the recipient port through ballast water; likely to survive in the recipient port.

[41] J. Firestone, J.J. Corbett, *Coastal and Port Environments: International Legal and Policy Responses to Reduce Ballast Water Introductions of Potentially Invasive Species*, Ocean Development & International Law 2005, Vol. 36, No. 3, at pp. 298–302.

[42] It should be noted that for UK Flagged Ships this Ballast Water Management Plan approval will be delegated to Class Societies.

[43] This approach means that ballast water exchange as a management method will be replaced by treatment to meet stringent water quality standards as suitable technologies become available.

[44] For ships exchanging the ballast water by the pumping-through method, pumping through three times the volume of each ballast tank will be considered equivalent to meeting the 95% standard.

(Regulation D-2 Standard), which sets stringent levels of organisms by volume in ships' ballast water discharges.

Upon the entry into force of the Ballast Water Management Convention, it will be supported by a number of guidelines developed by the IMO[45]. As of 2008, fourteen such guidelines have been adopted: "Guidelines for ballast water management equivalent compliance" (G3)[46]; "Guidelines for ballast water exchange" (G6)[47]; "Guidelines for approval of ballast water management systems" (G8)[48]; "Guidelines for ballast water management and the development of ballast water management plans" (G4)[49]; "Guidelines for approval and oversight of prototype ballast water treatment technology programmes" (G10)[50]; "Guidelines for ballast water exchange design and construction standards" (G11)[51]; "Guidelines on design and construction to facilitate sediment control on ships" (G12)[52]; "Guidelines on designation of areas for ballast water exchange" (G14)[53]; "Guidelines for sediment reception facilities" (G1)[54]; "Guidelines for ballast water reception facilities" (G5)[55]; "Guidelines for additional measures regarding ballast water management including emergency situations" (G13)[56]; "Guidelines for risk assessment under regulation A-4" (G7)[57];

[45] The objectives of IMO's Guidelines, developed under technical and scientific guidance, are to assist Governments and appropriate authorities, ship masters, operators and owners, and port authorities, as well as other interested parties, in minimizing the risk of introducing harmful aquatic organisms and pathogens from ships' ballast water and associated sediments while protecting ships' safety; see also: GEF/UNDP/IMO GloBallast Partnership project – Building Partnership to Assist Developing countries to Reduce the Transfer of Harmful Aquatic Organisms in Ships' Ballast Water, operational since 2007 to assist vulnerable countries and/or regions to enact and policy reforms to meet the BWM Convention's objectives.

[46] Resolution MEPC.123(53).

[47] Resolution MEPC.124(53).

[48] Resolution MEPC.125(53).

[49] Resolution MEPC.127(53).

[50] Resolution MEPC.140(54).

[51] Resolution MEPC.149(55).

[52] Resolution MEPC.150(55).

[53] Resolution MEPC.151(55).

[54] Resolution MEPC.152(55).

[55] Resolution MEPC.153(55).

[56] Resolution MEPC.161(56).

[57] Resolution MEPC.162(56).

"Guidelines for ballast water exchange in the Antarctic treaty area"[58]; "Procedure for approval of ballast water management systems that make use of active substances" (G9)[59].

Furthermore, it should be observed that, a Party, individually or jointly with other Parties, may impose on ships additional measures to prevent, reduce, or eliminate the transfer of Harmful Aquatic Organisms and Pathogens through ships' Ballast Water and Sediments. In such cases, the Party or Parties should consult with adjoining or nearby States that may be affected by such standards or requirements and should communicate their intention to establish measure(s) additional to the IMO at least 6 months prior to the projected date of implementation of the measure(s), except in emergency or epidemic situations. Where appropriate, the Parties are required to obtain the approval of the IMO.

In accordance with international law, the BWM allows for additional measures to be imposed by the Parties in order to comply with the norms of the BWM, especially principles such as the prevention, reduction or elimination of the transfer of harmful aquatic organisms and pathogens. The BWM Parties are given the right to take, individually or jointly with other Parties, more stringent measures with respect to the prevention, reduction or elimination of the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments, consistent with international law. Parties should ensure that ballast water management practices do not cause greater harm than they prevent to the environment, human health, property or resources, whether in relation to their own State or other States[60]. Art. 2(3) of the BWM states that "nothing in this Convention shall be interpreted as preventing a Party from taking (...) more stringent measures (...) consistent with international law".

The BWM Annex in Regulation C-1(2) states that a Party should consult with other Parties that may be affected by such norms or standards prior to implementation of any additional measures. It should be emphasized that this consultation must be done with "adjacent or other

[58] Resolution MEPC.163(56).

[59] Resolution MEPC.169(57).

[60] Section C – Special Requirements in Certain Areas, Regulation C-1. Additional Measures, Annex to the BWM Convention.

States that may be affected", meaning that all States having ships trading in the region must also be consulted. According to the BWM Annex Regulation C-1(3) a Party or Parties intending to introduce additional measures are obliged to take into account the Guidelines developed by the IMO, should not compromise the safety of the ships and such measures may be introduced only after having being communicated to the IMO. Such additional measures must comply with all other requirements arising from the UNCLOS 1982 and other international agreements or international customary law.

None of the requirements arising from Regulation B-3 of the Annex to the BWM, nor those additional measures adopted by a Party pursuant to Art. 2(3) of the BWM and the BWM Annex Section C are applicable: where the uptake or discharge of ballast water and sediments in branch of those regulations has been undertaken for the purpose of saving life at sea or on board the ship (Regulation A-3(1)); to accidental discharge or ingress following damage to a ship or its equipment (Regulation A-3(2)); when the uptake or discharge of ballast water being used for the purpose of avoiding or minimizing pollution incidents from the ship (Regulation A-3(3)); where high seas water is taken as ballast water and then discharged again at the high seas (Regulation A-3(4)); where ballast water is taken from and returned to the same location without any other water being added (Regulation A-3(5)).

According to the BWM Annex Regulations A-4(1)(4) and A-4(2), these exceptions are applicable only if they are granted based on the Guidelines on risk assessment developed by the IMO and once the relevant information has been communicated to the IMO and the Parties. Any exception granted should be recorded in the Ballast Water Record Book (Regulation A-4(4)).

Generally, the BWM Convention provides two ballast water management options aimed at reducing the risk of alien species introduction to seas:

— ballast water exchange and;
— the application of onboard ballast water treatment technologies.

According to IMO "Guidelines for ballast water exchange" (G6), there are specific depth and distance from shore related requirements for ballast water exchange. Thus, as mentioned above, ballast water may only be discharged at least 200 nautical miles from the nearest

land and in water at least 200 meters in depth and, where this is not possible, as far from the nearest land as possible, but at least 50 nautical miles from the nearest land and in water at least 200 meters in depth. These requirements are incapable of being met in the Baltic Sea[61]. Nevertheless, it is worth mentioning that, in the case of the Baltic Sea, special areas for ballast water exchange could be designated on the basis of IMO Guidelines on designation of areas for ballast water exchange (G14)[62]. Regulation B-4.2 of the BWM Convention allows port States to designate areas, in consultation with adjacent or other States, as appropriate, in which ships may conduct ballast water exchange and the G14 provides general guidance to promote the uniform application of Regulation B-4.2 in designating areas for ballast water exchange, so as to minimize the risk of introduction of harmful aquatic organisms and pathogens[63].

The HELCOM Baltic Sea Action Plan (BSAP)[64] was adopted in 2007 by the environment ministers of the Baltic Sea Countries and the European Commission. The BSAP contains a Road Map towards a harmonized implementation and ratification of the 2004 International Convention for Control And Ballast Water Management of Ships' Ballast Water and Sediments[65]. This Road Map includes measures to be taken and the timetable for their implementation jointly agreed by the Baltic Sea States *inter alia*:

[61] The Baltic Sea is a shallow sea located in Northern Europe, the average depth being only 58 m, the maximum depth is 459 m, the Baltic Sea is about 1600 km long. The Baltic Sea covers a surface of about 377,000 km². The international law regime of the Baltic Sea is governed by the United Nations Convention on the Law of the Sea. Beyond territorial seas the Baltic Sea is divided between the Baltic Sea States mainly as exclusive economic zones. The maritime boundaries between States are defined in delimitation agreements.

[62] Resolution MEPC.151(55), adopted on 13.10.2006; www.imo.org.

[63] Under Art. 2.6. of the BWM Convention Party or Parties of the BWM designating an area according to Regulation B-4.2 should endeavour not to impair or damage their environment, human health, property or resources or those of other States.

[64] The Baltic Sea Action Plan is based on ecosystem approach and will provide a pilot project in BSR for implementation the EU Marine Strategy; HELCOM *Baltic Sea Action Plan*, HELCOM Ministerial Meeting, Krakow, Poland 16 November 2007, at pp. 1–101; www.helcom.fi/stc/files/BSAP/BSAP_Final.pdf.

[65] *Ibidem*, at pp. 97–98.

— an investigation and subsequent common view as to whether ballast water exchange in the Baltic Sea is a suitable management option;
— a common approach to risk assessment needed for granting exemptions from the application of ballast water management for intra-Baltic voyages;
— developing a regional monitoring programme for alien species that would be compatible with various international regulations, including the BWM Convention, the CBD Convention, European Union law and the various HELCOM recommendations.

Accordingly, the HELCOM Road Map requires investigation as to whether ballast water exchange areas could be designated in the Baltic Sea. In this case, ballast water exchange should be of limited use e.g. for voyages within the Baltic Sea assessed as posing a high risk that could be reduced to an acceptable level by undertaking ballast water exchange[66].

4. Control of harmful aquatic organisms and pathogens

The Annex to BWM Convention – Section A, "General Provisions", includes definitions, application and exemptions. Regulation A-2, "General Applicability", states as follows: "Except where expressly provided otherwise, the discharge of Ballast Water shall only be conducted through Ballast Water Management, in accordance with the provisions of this Annex". In accordance with the Annex to the BWM Convention – Section B, "Management and Control Requirements for Ships", vessels are required to have on board and to implement a Ballast Water Management Plan approved by the Administration (Regulation B-1). The Ballast Water Management Plan is specific to each ship and includes a detailed description of the actions to be taken to implement the Ballast Water Management requirements, as well as supplemental Ballast Water Management practices. Ships must have a Ballast Water Record Book (Regulation B-2) to record when ballast water is taken on board; circulated or treated for Ballast Water Management purposes; and discharged

[66] For example, routes between fresh water ports separated by more saline waters and situated in different sub-basins; *HELCOM Activities Related to the Transfer of Alien Species in the Baltic Sea*, *op. cit.*, at p. 3.

into the sea. It should also record when Ballast Water is discharged to a reception facility, together with any accidental or other exceptional discharges of Ballast Water. The specific requirements for ballast water management are contained in Regulation B-3 Ballast Water Management for Ships.

Under Regulation B-4 Ballast Water Exchange, all ships using ballast water exchange should: whenever possible, conduct ballast water exchange at least 200 nautical miles from the nearest land and in water at least 200 meters in depth, taking into account the Guidelines developed by the IMO. When a ship is unable to conduct ballast water exchange as above, this should be as far from the nearest land as possible, and in all cases at least 50 nautical miles from the nearest land and in water at least 200 meters in depth. When these requirements are incapable of fulfillment, areas may be designated where ships may conduct ballast water exchange. All ships shall remove and dispose of sediments from spaces designated to carry ballast water in accordance with the provisions of the ships' ballast water management plan (Regulation B-4).

The major part of the BWM Convention is rather general in character, but the Annex to the BWM in its Section D, "Standards for Ballast Water Management", provides two particular standards:

— Regulation D-1 "Ballast Water Exchange Standard" – Ships performing Ballast Water exchange shall do so with an efficiency of 95 per cent volumetric exchange of Ballast Water. For ships exchanging ballast water by the pumping-through method, pumping through three times the volume of each ballast water tank shall be considered to meet the standard described. Pumping through less than three times the volume may be accepted provided the ship can demonstrate that at least 95 percent volumetric exchange is met (see Tab. 2.);
— Regulation D-2 "Ballast Water Performance Standard" – Ships conducting ballast water management shall discharge less than 10 viable organisms per cubic meter greater than or equal to 50 micrometers in minimum dimension and less than 10 viable organisms per milliliter less than 50 micrometers in minimum dimension and greater than or equal to 10 micrometers in minimum dimension; and discharge of the indicator microbes shall not exceed the specified concentrations (see Tab. 2.).

The indicator microbes, as a human health standard, include, but shall not be limited to: a) Toxicogenic Vibrio cholerae (O1 and O139) with less than 1 colony forming unit (cfu) per 100 milliliters or less than 1 cfu per 1 gram (wet weight) zooplankton samples; b) Escherichia coli less than 250 cfu per 100 milliliters; c) Intestinal Enterococci less than 100 cfu per 100 milliliters. These then apply to different vessels at different times as set out in the table below, depending on the ratification date of the Convention.

Table 2. **Implementation dates of the IMO Ballast Water Convention**

BALLAST WATER CAPACITY [m^3]	CONSTRUCTION DATE	REQUIRED STATNDARD FOR BALLAST WATER MANAGEMENT
1500 ≤ capacity ≤ 5000	before 2009	Ships constructed before 2009 with a ballast water capacity of between 1500 and 5000 cubic meters must conduct ballast water management that at least meets the ballast water exchange standards D1 or the ballast water performance standards D2 until 2014, after which time it shall at least meet the ballast water performance standard D2.
5000 < capacity < 1500	before 2009	Ships constructed before 2009 with a ballast water capacity of less than 1500 or greater than 5000 cubic meters must conduct ballast water management that at least meets the ballast water exchange standards D1 or the ballast water performance standards D2 until 2016, after which time it shall at least meet the ballast water performance standard D2.
capacity < 5000	2009 or later	Ships constructed in or after 2009 with ballast water capacity of less than 5000 cubic meters must conduct ballast water management that at least meets the ballast water performance standard D2, until second annual survey of the ship, but not later than 31 December 2011.
capacity ≥ 5000	2009–2012	Ships constructed in or after 2009 but before 2012, with a ballast water capacity of 5000 cubic meters or more shall conduct ballast water management that at least meets the standard described in regulation D-1 or D-2 until 2016 and at least the ballast water performance standard D2 after 2016.
capacity ≥ 5000	2012 and later	Ships constructed in or after 2012, with a ballast water capacity of 5000 cubic meters or more shall conduct ballast water management that at least meets the ballast water performance standard D2.

Source: www.prs.pl

Other methods of ballast water management may also be accepted as alternatives to the ballast water exchange standard and ballast water performance standard, provided that such methods 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.

The ballast water exchange should take place at least 200 nautical miles from the nearest land and in water at least 200 meters in depth, taking into account the IMO Guidelines (Regulation B-4(1)(1)). But in the cases where the ship is unable to conduct ballast water exchange according to Regulation B-4(1)(1), the ballast water exchange should be conducted taking into account the IMO Guidelines and as far from the nearest land as possible, and in all cases at least 50 nautical miles from nearest land and in water at 200 meters depth (Regulation B-4(1)(2)). Generally, the distance from land is measured from the baseline of the territorial sea (Regulation A-1(6)) in accordance with international law. As concerns sea areas where the distance from the nearest land or the water depth do not meet the parameters described above, the port State may designate restricted areas for ballast water exchange (Regulation B-4(2)).

It should be noted that Regulation D-1(2) of the BWM Annex, which requires the flushing of ballast tanks three times, would have a major impact on the reduction of sediments in ballast waters. Additionally, in accordance with the provisions of the ships' Ballast Water Management Plan all ships must remove and dispose of sediments from areas designated to carry ballast water (Regulation B-5(1) of the BWM Annex). Any vessels constructed after 2009 should be designed: to minimize the amount of sediments taken into and entrapped in ballast tanks; to provide easy access for sampling and removal of sediments (Regulation B-5(2)). Regulation B-5(2) of the BWM Annex requires that vessels constructed prior to 2009 should comply with these provisions when practicable.

The BWM certification system will be able to regulate ballast water management. According to the BWM Annex Section E "Survey and Certification Requirements for Ballast Water Management" all ships of 400 gross tonnage and above as a subject to the BWM must possess a certificate after passing appropriate surveys (Regulation E-2).

Floating platforms, FSUs and FPSOs[67] are excluded from the scope of Regulation E.

The BWM Annex provides requirements for initial, renewal, intermediate and annual surveys and additional surveys: initial surveys must be conducted before the ship is put into service (Regulation E-1(1)(1)); renewal surveys are performed at periods of less than five years as specified by the administration Regulation E-1(1)(2); intermediate and annual surveys are based on the anniversary date, which is defined as the date of the year that corresponds to the date on which the certificate expires (Regulation E-1(1)(3) and (4), Regulation A-1(1)); additional surveys may be required when significant modifications are made to the ship or her equipment (Regulation E-1(1)(5)). The objective of such surveys is to ensure compliance with the BWM. Where ballast water management is not consistent with the certificate or the ship is unable to comply with the BWM, the surveyor must notify the administration and the port state and a certificate will not be issued, or will be withdrawn where previously issued (Regulation E-1(1)(6)).

According to the Article 9 BWM a ship to which the Convention applies may, in any port or offshore terminal belonging to another Party, be subject to inspection by officers duly authorized by that Party for the purpose of determining whether the ship is in compliance with this Convention. Such an inspection is limited to, *inter alia*, a sampling of the ships' ballast water, carried out in accordance with guidelines to be developed by the IMO. The MEPC.173(58) "Guidelines for Ballast Water Sampling" adopted on 10.10.2008, provide general recommendations for ballast water sampling by port State control authorities. Sampling by port State control or other authorized officers, should seek to use methods that are: safe to the ship, inspectors, crew and operators; simple, feasible, rapid and applicable at the point of ballast in discharge.

The purposes of such sampling are: risk assessment; performance test of ballast water treatment systems and compliance control with ballast water management requirements. Sampling ballast water on arriving vessel may inform on compliance with Regulation B-4 of the

[67] FPSO (Floating Production Storage and Offloading) and FSU (Floating Storage Unit) installations of a monohull form are being increasingly used, particularly for marginal fields and for deep water locations.

BWM Annex by analyzing their physical and/or chemical parameters. The Annex to MEPC.173(58) "Guidelines for Ballast Water Sampling" provides practical recommendations regarding sampling techniques and procedures for use by Member States and port State control and other authorized officers assessing compliance with Regulation D-1 or D-2 of the BWM Annex.

The Annex to MEPC.173(58) "Guidelines for Ballast Water Sampling" consists of eight parts: sampling from the ballast water discharge line (e.g. technical specifications for design of in-line sampling facilities; technical specifications for installation of a sample point in the ballast water discharge line); sampling from ballast water tanks (e.g. manholes; sounding pipes or air pipes; use of pumps); sampling and analysis protocols; sample data forms; health and safety aspects; recommendation for a port state control ballast water sampling kit; maintenance, storage, labeling and transportation; chain of custody record.

The BWM Convention contains no requirements governing the issue of sampling points, meaning the place in ballast water piping from which the sample is taken. Nevertheless, the "Guidelines for approval of ballast water management systems" (G8) adopted by resolution MEPC.174(58) do expressly call for the provision of sampling facilities, not only for the purpose of type approval, but also for the purpose of these ballast water sampling Guidelines. Regulation B-5(2) of the BWM Annex provides that ships constructed in or after 2009 should, without compromising safety or operational efficiency, be designated and constructed with a view to minimizing the uptake and undesirable entrapment of sediments, facilitating the removal of sediments, and providing safe access to allow for sediment removal and sampling, taking into account the MEPC "Guidelines on design and construction to facilitate sediment control on ships" (G12).

In accordance with the BWM Annex Regulation E-1(6) the port state must assist the surveying entity in compliance with Art. 9 "Inspection of ships" of the BWM. It should be pointed out that this obligation is imposed on the owner, operator or other person in charge of the ship to report to the administration, or its delegates, and to the port authority any accidents or defects to the ship that substantially affect the compliance of the vessel with the BWM regulations (Regulation E-1(7)).

5. Responsibility to protect the marine environment

According to the European Union law and European policy, EU Member States are obliged to protect, to allow recovery and, where practicable, to restore the function and structure of marine biodiversity and ecosystems in order to achieve and maintain the good ecological status of these ecosystems; to phase out pollution in the marine environment so as to ensure that there is no significant impact or risk to human and/ /or on ecosystem health, and/or on uses of the sea; to contain the use of marine services and goods and other activities in marine areas to levels that are sustainable and that do not compromise the uses and activities of future generations, nor the capacity of marine ecosystem to respond to changes; to apply the principles of good governance, both within Europe and globally in an integrated and sectoral resources management (energy, mineral resources, fisheries, mariculture, aquaculture, maritime transport, communication, scientific research). Interdisciplinary works on understanding the specific interrelations between integrated and sectoral approaches are helping to facilitate the development of good marine governance possible in practice[68].

Intergovernmental interactions provide the basis for cooperative governance and collective responsibility of all states to ensure the conservation of marine biodiversity and sustainable use of marine environment as a functional unity. The structure and procedures of the

[68] Work under the OSPAR 1992 is based on an ecosystem approach and is organized around six strategies. OSPAR 1992 has served as a platform for exchange of information on MSP following the Fifth North Sea Conference, and has taken this further in the context of its Biological Diversity and Ecosystem Strategy. The Helsinki Commission is working to protect the marine environment in the Baltic Sea since 1974. Of particular relevance is the HELCOM Baltic Sea Action Plan adopted in 2007 with Recommendation 28E/9 on the development of Marine Spatial Planning principles for the Baltic Sea Region. The Mediterranean became the first region to adopt a Management Plan (Mediterranean Action Plan – MAP) in 1975, under the UN Environment Programme. The MAP is to be implemented through the Barcelona Convention. The Convention's recently adopted ICZM Protocol 2008 requires contracting parties to establish a common framework for integrated management of the Mediterranean coastal zones.

Baltic Sea marine governance depend upon degree of powers which all States are capable of exercising over the marine environment. The legal framework of the European marine management (Marine Strategy Framework Directive – MSFD[69], Integrated Maritime Policy – IMP[70], EU Action Plan[71]) and duty to protect marine environmental development

[69] The Marine Strategy Framework Directive 2008/56/EC is the environmental pillar of the Integrated Maritime Policy (IMP). It requires Member States to achieve good marine environmental status by 2020, to apply an ecosystem approach, and to ensure that pressure from human activities is compatible with good environmental status. Member States are required to cooperate where they share a marine region or sub-region and use existing regional structures for coordination proposes, including with third countries. The Marine Strategy Framework Directive 2008/56/EC does not directly regulate maritime activities, but rather their impact must be taken into account for the determination of good environmental status. Annex VI lists examples of possible measures, including spatial and temporal distribution controls and tools for coordinated management. Some Member States have declared that they will use Marine Spatial Planning to implement the Marine Strategy Framework Directive. According to the MSFD the EU Members States must make an initial assessment of the environmental status of their European marine waters in order to identify measures that must be taken to achieve "good environmental status" which could include control/eradication of IAS. MSFD Annex I "Qualitative descriptors for determining good environmental status": non--indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems. The MSFD Annex III "Indicative list of characteristic, impacts and pressures": Table 1. "Biological Characteristics" – requires an inventory of the temporal occurrence, an abundance and spatial distribution of non-indigenous, exotic species or, where relevant, genetically distinct forms of native species, which are present in the marine region or subregion; Table 2. "Biological Disturbance" – includes introduction of microbial pathogens, introduction of non-indigenous species and translocations; O. J. L 164, 25.6.2008, at pp. 19–40.

[70] European Union Member States are required to cooperate where they share a marine region or sub-region and to utilize existing regional structures for coordination proposes, including with third countries (Roadmap for Maritime Spatial Planning: Achieving Common Principles in the EU). Maritime Spatial Planning is a key instrument for the Integrated Maritime Policy. It could help public authorities and stakeholders to coordinate their action and optimizes the use of marine space to benefit economic development and the marine environment. The Roadmap for Maritime Spatial Planning aims to facilitate the development of Marine Spatial Planning by EU Member States and encourage its implementation at national and EU level; Communication from the Commission – Roadmap for Maritime Spatial Planning: Achieving Common Principles in the EU; COM(2008)0791 final.

[71] www.europa.eu/legislation_summaries/maritime_affairs_and_fisheries/maritime_affairs/l66049_en.htm.

could make a case for governing the Baltic Sea holistically and building common maritime heritage[72].

6. Conclusions

As regards the BWM Convention, the regional rules and standards are established within a global framework. At a regional level, the BWM Convention basically obliges the Parties to take appropriate measures to prevent the introduction of invasive alien species. Although, the problem of introduction of the alien species into marine environment is not limited to ships' ballast water, it is well known that regulation applicable within regional seas as the Baltic Sea area are of central importance. Ballast water is crucial to the safe and efficient operation of modern shipping. Marine transportation is a crucial issue for the global trade. Nowadays, shipping is responsible for the transport of more than 85% of cargo around the world. It is obvious that vessel ballasting is a necessary condition for safe operations, but the use of sea water as ballast is not an environmentally neutral solution. Nevertheless, ballast water management is recognised as an effective way to prevent the spread of invasive alien species in the Baltic Sea area. According to the precautionary principle, it is also a good method for protecting the marine environment against dumping IAS especially in port waters and coastal zones.

Furthermore, it should be observed that recent years have witnessed various efforts to develop marine governance in the Baltic Sea Region (e.g. by harmonization of international obligations within the Baltic Sea/North Sea Region)[73]. It should be pointed out that technical development alone is not capable of resolving the problems associated with the introduction of invasive alien species by ships' ballast water. Cooperation between the Baltic Sea States' governments and agencies represents a pillar for

[72] T. Koivurova, A *Note on the European Union's Integrated Maritime Policy*, Ocean Development & International Law 2009, Vol. 40, No. 2, at pp. 171–183; L. Juda, *The European Union and the Marine Strategy Framework Directive: Continuing the Development of the European Ocean Use Management*, Ocean Development & International Law 2010, Vol. 41, No. 1, at pp. 34–36.

[73] E.A. Kirk, H.M. Silfverberg, *Harmonization in the Baltic Sea Region*, International Journal of Marine and Coastal Law 2006, Vol. 21, No. 2, at p. 235.

sustainable development of the Baltic Sea environment, economic and social aspects of marine governance. It is noteworthy that the BWM requires that:

> "Parties with common interests to protect the environment, human health, property and resources in a given geographical area, in particular, those parties bordering enclosed and semi-enclosed seas, shall endeavor, taking into account characteristic regional features, to enhance regional co-operation, including through the conclusion of regional agreements consistent with this Convention. Parties shall seek to co-operate with the Parties to regional agreements to develop harmonized procedures"[74].

Finally, the duty to ensure the monitoring of compliance with this law represents an important instrument for enforcing the law of the sea[75] and one of the most important tools in the effective protection of marine ecosystems by non-native and invasive alien species, and management of the marine environment. The sources of information on the procedures for monitoring compliance are: inspections, national monitoring and reporting, surveillance and marine environmental monitoring. All information should be analyzed in order to ensure the development of effective measures and the enforcement of marine governance in Europe and the Baltic Sea Region.

[74] Art. 13(3) BWM.

[75] Y. Tanaka, *Reflections on Reporting Systems In Treaties Concerning the Protection of the Marine Environment*, Ocean Development & International Law 2009, Vol. 40, No. 2, at pp. 146–147 and pp. 152–154.