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**BALLAST WATER AND SEDIMENT RECEPTION
FACILITIES – PREVENTION OF HARMFUL AQUATIC
ORGANISMS AND PATHOGENS IN BALTIC PORTS**

**INSTALACJE DO ODBIORU STATKOWYCH
WÓD BALASTOWYCH I OSADÓW –
PRZECIWDZIAŁANIE SZKODLIWYM ORGANIZMOM
MORSKIM I PATOGENOM W PORTACH BAŁTYCKICH**

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ABSTRACT

Shipping is regarded as a main factor for the accidental introductions of non-indigenous aquatic organisms. Therefore, in 2004 the International Convention for the Control and Management of Ships' Ballast Water and Sediments was adopted by the IMO. To facilitate

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global and uniform implementation of the Convention, a number of guidelines have been developed. The Guidelines G1 concerns sediment reception facilities, which according to the Convention, should be provided by the parties of the Convention. The Guidelines G5 refers to the ballast water reception facilities, which parties of the Convention are not obligated to provide. Within the Baltic Sea region the ballast water reception facilities may appear to be relevant. The Baltic Sea does not meet the depth and distance from the shore requirements posed by the Regulation B-4 of the Convention. Moreover, the designation of the special areas, where the ship may conduct the ballast water exchange, in the Baltic Sea region, taking into account the Guidelines G14, may not be possible, because it might increase the risk of species introductions to nearby coasts. Therefore, by the time of the complete introduction of the onboard ballast water treatment systems, the ballast water reception facilities may be needed in the Baltic ports.

Keywords

Ballast water convention; reception facilities; invasive alien species.

STRESZCZENIE

Działalność żeglugowa jest oceniana jako jeden z głównych czynników sprzyjających przypadkowym uwolnieniom do środowiska morskiego organizmów obcych. Z tego względu w 2004 roku przyjęta została w ramach MOM międzynarodowa konwencja o kontroli i postępowaniu ze statkowymi wodami balastowymi i osadami. W celu ułatwienia globalnej i jednolitej implementacji konwencji wydanych zostało szereg interpretacji. Wskazówki nr G1 dotyczą instalacji do odbioru statkowych wód balastowych i osadów, które zgodnie z konwencją powinny być utworzone przez państwa strony, podczas gdy Wskazówki nr G5 dotyczą rodzajów takich instalacji, których utworzenie nie jest obligatoryjne. Tworzenie tych instalacji może być problematyczne w przypadku Morza Bałtyckiego. Akwen ten nie spełnia kryteriów głębokości i odległości od brzegu wynikających z Regulacji B-4 przyjętej do konwencji. Podobnie wyznaczenie na tym obszarze specjalnych stref wymiany wody balastowej w sposób określony we Wskazówkach nr G14 może okazać się niemożliwe z uwagi na ryzyko uwolnienia gatunków obcych do środowiska obszarów brzegowych. Z tego względu, w przypadku Morza Bałtyckiego, do zakończenia okresu wprowadzenia pokładowych systemów oczyszczania wód ba-



lastowych, instalacje do odbioru tych wód w portach bałtyckich są konieczne.

Słowa kluczowe

Wody balastowe; instalacje do odbioru; inwazyjne gatunki obce.

1. INTRODUCTION

Ballasting is necessary to stabilise a vessel. It provides stability by lowering the centre of gravity¹. Ballasting helps trim the vessel and submerge the propeller, when the ship is unladen². By keeping the vessel stable, ballasting improves maneuverability and compensates for weight lost due to the fuel and water consumption³. Since the introduction of steel hulled vessels in the 19th century, sea water has been used as the ballast. Therefore, sea water is charged into the ballast tanks in one area and discharged into another. The volume of the water used as ballast depends on the size and purpose of the vessel and may vary from several hundred liters up to more than million tons of water. It has been estimated that major cargo vessels transport about 10 billion tonnes of ballast water world-wide every year⁴. According to the United Nations Conference on Trade and Development (UNCTAD) the volume of world seaborne shipments is continually increasing⁵ and it is around 80% of total world

¹ L. Furmaga, J. Wójcicki, *Balast*, In: *Mały Słownik Morski*, Gdynia 1993, p. 15.

² S. Gollasch, E. Macdonald, S. Belson, H. Botnen, J.T. Christensen, J.P. Hamer, G. Houvenaghel, A. Jelmert, I. Lucas, D. Masson, T. McCollin, S. Olenin, A. Persson, I. Wallentinus, L. Wetsteyn, T. Wittling, *Life in ballast tanks*, In: *Invasive Aquatic Species of Europe: Distributions, Impacts and Management*, E. Leppäkoski, S. Olenin, S. Gollasch (eds.), Kluwer Academic Publishers, Dordrecht 2002, p. 217–231.

³ D. Pughuic, *Ballast Water Management and Control: An Overview*, “Trop. Coasts” 2001 (8), p. 42–49.

⁴ S. Gollasch et al., op. cit.

⁵ UNCTAD (2015). Review of Maritime Transport 2015.



merchandise trade⁶. The share of seaborne shipments in the total world merchandise trade could rise up to 85% in 2020, reducing the share of land transport⁷. Transport of goods by water can be considered as a foundation for the international trade.

At first, using the sea water as the ballast was considered as a harmless solution for the environment⁸. Mixing sea water from different areas was not regarded as threatening to ecosystems. It is now known that in the sea water used as the ballast, all forms of life are transported⁹, *inter alia*, bacteria, microbes, small invertebrates, eggs and larvae of various species, which, in contrast to larger organisms, have not been detained by the appropriate onboard filtering devices. Research has proven that despite long-lasting passages living organism are able to survive in the ballast water and sediments and some of them are able to grow and reproduce¹⁰. These organisms, when transported outside their natural habitat, become alien species.

Of all the vectors for the accidental introductions of non-indigenous aquatic organisms, shipping is regarded as the main factor¹¹. For the first time, the spread of invasive species via ballast water was discovered in 1903 by Ostenfeld¹². The first documented sampling of the ballast water has been carried out

⁶ Ibidem.

⁷ A. Grzelakowski, *Globalny rynek morskich przewozów kontenerowych i jego wpływ na światowy rynek frachtowy i logistyczny*, „Logistyka” 2013 (5), p. 8–16.

⁸ M. Tsimplis, *Alien Species Stay Home: The International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004*, “The International Journal Of Marine And Coastal Law” 2005 (19), p. 411–483.

⁹ S. Gollasch et al., op. cit.

¹⁰ S. Gollasch, J. Lenz, M. Dammer, H.-G. Andres, *Survival of tropical ballast water organisms during a cruise from the Indian Ocean to the North Sea*, “J. Plankton Res.” 2000 (22), p. 923–937; J.C. Medcof, *Living marine animals in a ships ballast water*, “Proc. Natl. Shellfish. Association” 1975 (65), p. 11–12.

¹¹ S. Gollasch et al., *Survival of tropical ballast...*, p. 923–937.

¹² C.H. Ostenfeld, *On the immigration of Biddulphia sinensis Grev. and its occurrence in the North Sea during 1903–1907: And on its use for the study of the direction and rate of flow of the currents*, “Meddelelser fra Kommissionen for Havundersogelser. Plankton” 1908 (1), p. 1–25 – as cited in: Y. Zhang, Z. Wang, L. Cai, X. Cai, W. Sun, L. Ma, *Tests to evaluate the ecological impact*



70 years later, in 1973, on a vessel going from Japan to Australia¹³. The results revealed the presence of live organisms in the ballast water after a two weeks voyage.

2. HARMFUL AQUATIC ORGANISMS AND PATHOGENS THREATENING THE BIODIVERSITY

An alien species is a species introduced intentionally or accidentally by man, outside of its natural distribution¹⁴. This definition does not include species spreading spontaneously, without human influence. An alien species may be invasive or not. An invasive species conquers new habitat causing severe effects on new environment and/or economy. Thus, an invasive species can also be a native species, not necessarily alien. To summarize, an invasive aliens species (IAS) is a non-indigenous species introduced intentionally or accidentally by man, outside of its natural distribution, causing a threat to the ecosystem and affecting the economy¹⁵. According to the definition proposed by the Conference of the Parties to the Convention on biological diversity in the COP 6 Decision VI/23¹⁶, an invasive alien species is an alien species which introduction and/or spread threaten biological diversity. Article 8(h) of the Convention on biological diversity states that each party should prevent the introduction of alien species and control or eradicate those alien species which threaten ecosystems, habitats or other species¹⁷. Main

of treated ballast water on three Chinese marine species, "Chinese J. Oceanol. Limnol." 2014 (32), p. 1105–1117.

¹³ J.C. Medcof, op. cit., p. 11–12.

¹⁴ *Gatunki obce w faunie Polski*, Z. Głowaciński, H. Okarma, J. Pawłowski, W. Solarz (eds.), Instytut Ochrony Przyrody PAN Kraków 2012, <http://www.iop.krakow.pl/gatunkiobce>.

¹⁵ Ibidem.

¹⁶ CBD (2002). Decision VI/23 adopted by the Conference of the Parties to the Convention on biological diversity at its sixth meeting. UNEP/CBD/COP/6/20.

¹⁷ CBD (1992). The Convention on biological diversity. Rio de Janeiro.



vectors of aquatic species introductions are shipping through the ballast water, sediments and hull fouling, and aquaculture activities¹⁸.

Invasions of the alien species are considered to be one of the main biodiversity threats, next to the overfishing, habitat loss, and pollution¹⁹.

The Baltic Sea is a semi-enclosed, shallow sea and it is one of the largest brackish water bodies in the world²⁰. It is particularly vulnerable to accumulation of pollutants. The Baltic Sea is highly susceptible to invasions. "The comparably species-poor communities of the Baltic Sea are probably more sensitive to the successful introductions of NIS (non-indigenous species) than other areas characterised by a higher biodiversity"²¹. Furthermore, the salinity gradient in the Baltic varies from 0 PSU to 25 PSU²², what makes it favourable to live for freshwater, brackish and marine species²³. The Baltic Sea offers a wide variety of habitats²⁴. In the Baltic Sea over a 100 alien species have been identified (117 species by May 2010, of which 77 have already

¹⁸ S. Gollasch, *Marine vs. freshwater invaders: is shipping the key vector for species introductions to Europe?*, In: *Biological Invaders in Inland Waters: Profiles, Distribution, and Threats*, F. Gherardi (ed.), Springer 2007, p. 339–345; M.J. Costello, M. Coll, R. Danovaro, P. Halpin, H. Ojaveer, P. Miloslavich, *A census of marine biodiversity knowledge, resources, and future challenges*, "PLoS ONE" 2010 (5), p. 1–15.

¹⁹ Ibidem; K.E. Skóra, *Dlaczego ochrona przyrody Bałtyku jest nieskuteczna?*, In: *Słowiński Park Narodowy. 40 lat ochrony unikatowej przyrody i kultury*, W. Florek (ed.), Smołdzino 2008, p. 87–104; P. Lemke, K. Smolarz, A. Zgrundo, M. Wołowicz, D. Pyć, C. Halling, *RISKGOV report – Biodiversity with regard to Alien Species*, RISKGOV Report 2010.

²⁰ J. Piechura, J. Pempkowiak, T. Radziejewska, S. Uściniowicz, *What we know about the Baltic Sea: A summary of BSSC 2005*, „Oceanologia” 2006 (48), p. 3–19; A. Omstedt, J. Elken, A. Lehmann, M. Leppäranta, H.E.M. Meier, K. Myrberg, A. Rutgersson, *Progress in physical oceanography of the Baltic Sea during the 2003–2014 period*, "Prog. Oceanogr." 2014 (128), p. 139–171.

²¹ S. Gollasch, E. Leppäkoski, *Initial Risk Assessment of Alien Species in Nordic Coastal Waters*, Nordic Council of Ministers, Copenhagen 1999, p. 14.

²² Ibidem, p. 16–19.

²³ S. Gollasch, E. Leppäkoski, *Risk assessment and management scenarios for ballast water mediated species introductions into the Baltic Sea*, "Aquat. Invasions" 2007 (2), p. 313–340.

²⁴ S. Gollasch, E. Leppäkoski, *Initial Risk Assessment...*, p. 16–19.



been established)²⁵. Most of the alien species have been introduced into the Baltic Sea from North America and the Ponto-Caspian region (the Black, Caspian, and Azov seas and adjacent waters)²⁶.

The negative impact of the invasive alien species in Polish waters can be exemplified by *Neogobius melanostomus*, a round goby, demersal fish species of the family *Gobiidae*. The first round goby in Polish waters was discovered in 1990 near the Port of Hel in the Gulf of Gdańsk²⁷. The round goby is a native species of the Ponto-Caspian region. Most likely *Neogobius melanostomus* was transported to the Gulf of Gdańsk either in the ballast waters of the vessels originated from the Ponto-Caspian region or it had migrated naturally by a river route from the Black Sea²⁸.

Findings from the Puck Bay indicate that the round goby is displacing native species, mostly other fish of the family *Gobiidae* (especially *Pomatoschistus microps*, *Pomatoschistus minutus*, *Gobius niger*)²⁹, occupying their conventional hiding places. Without an access to their shelters, native displaced species are more visible to the predators, which results in an increase in mortality of native species³⁰. Another threat posed by the round goby is the competition for food, which is particularly disadvantageous in the situation of limited availability of food resources.

²⁵ A. Pikkarainen, *Maritime traffic and alien species introductions in the Baltic Sea*, Centre for Marine Studies, University of Turku 2010; K.E. Skóra, *Obce w naszym morzu*, "Pomerania" 2007 (2), p. 5–8.

²⁶ Ibidem.

²⁷ K.E. Skóra, J. Stolarski, *Neogobius melanostomus (Pallas 1811), a new immigrant species in the Baltic Sea*, In: E. Styczyńska-Jurewicz (ed.) *Estuarine ecosystems and species: Proc. of 2nd International Estuary Symposium*, Gdynia 1996, p. 101–108.

²⁸ K.E. Skóra, M.R. Sapota, L.D. Corkum, *The round goby, Neogobius melanostomus, a fish invader on both sides of the Atlantic Ocean*, "Biological Invasions" 2004 (6), p. 173–181.

²⁹ Ibidem.

³⁰ K.E. Skóra, *Neogobius melanostomus (Pallas, 1811)*, In: *Gatunki obce w faunie Polski*, Z. Głowaciński, H. Okarma, J. Pawłowski, W. Solarz (eds.), Instytut Ochrony Przyrody PAN Kraków 2012, <http://www.iop.krakow.pl/gatunkiobce>.



Research shows that the round goby diet may overlap with some demersal Baltic fish species³¹. Furthermore, the round goby has become a mass consumer of mussels, mainly *Mytilus edulis*³². This ecological role was not assigned to any of the native species. Thus, the round goby initiated the transfer of the pollutants accumulated in the mussels up the food chain. Such a situation can affect human health, because humans are more likely to be affected by chemical pollutants as they feed at the end of the food chain³³. Introduction of the *Neogobius melanostomus* is altering the food chain, causing changes in the structure and composition of ecosystems, decreasing biodiversity. It affects the economy as well, for example by the growing number of round goby in commercial catches, while lowering demand for this species. The fishing capacity of other fish has been reduced.

3. INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS' BALLAST WATER AND SEDIMENTS IN SHORT

International Convention For The Control And Management Of Ships' Ballast Water And Sediments of 2004 is intended to prevent, minimize and eliminate the transfer of harmful aquatic organisms and pathogens (HAOP) by continuing the development of safer and more effective ballast water management options. The BWMC does not use the term "invasive alien species" but it provides the definition of harmful aquatic organisms and pathogens instead. According to the Art. 1(8) of the BWMC, HAOP are "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,

³¹ K.E. Skóra, J. Rzeźnik, *Observations on Diet Composition of Neogobius melanostomus Pallas 1811 (Gobiidae, Pisces) in the Gulf of Gdansk (Baltic Sea)*, "J. Great Lakes Res." 2001 (27), p. 290–299.

³² K.E. Skóra, *Neogobius melanostomus...*, op. cit.

³³ Ibidem.



property or resources, impair biological diversity or interfere with other legitimate uses of such areas". Which of these terms, IAS or HAOP is broader in scope is unspecified³⁴.

The harmful effects of invasive alien species were first reported to Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) in 1988 by Canada (IMO 2009)³⁵. Therefore, in 1991, MEPC adopted the first voluntary guidelines for preventing that problem. Following the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, the guidelines were reviewed and adopted as a resolution in 1993. The new resolution was adopted in 1997 which superseded earlier, less comprehensive guidelines. The preparation of the Convention started by establishing by MEPC the Ballast Water Working Group in 1994. The Convention for the Control and Management of Ships' Ballast Water and Sediments (BWMC) was adopted at the International Conference on Ballast Water Management for Ships, held at IMO's Headquarters in London in 2004 (IMO 2009)³⁶. The BWMC will enter into force 12 months after signing³⁷ by 30 States, representing 35% of gross tonnage of the world's merchant shipping³⁸. According to the IMO's information from 10th June 2016, 51 States have become party to the BWMC, representing 34,87% of the world's merchant fleet tonnage. At that time the BWMC's final entry-into-force requirement has not been met yet, as the combined merchant fleets of states par-

³⁴ M. Tsimplis, *Alien Species Stay Home: The International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004*, "The International Journal of Marine and Coastal Law" 2005 (19), p. 411–445; D. Pyć, *Zarządzanie ryzykiem introdukcji do środowiska morskiego obcych gatunków inwazyjnych. Analiza wytycznych IMO do konwencji balastowej*, "Prawo Morskie" 2011 (XXVII), p. 179–203.

³⁵ IMO, *Ballast Water Management Convention and the Guidelines for its implementation*, London 2009.

³⁶ *Ibidem*.

³⁷ States may become parties to the Convention by signature not subject to ratification, acceptance or approval, or signature subject to ratification, acceptance or approval, followed by ratification, acceptance or approval, or accession (Art. 17 BWMC).

³⁸ Art. 18 BWMC.



ties were still insufficient. At 8th September 2016 the BWMC was accepted by Finland, which has triggered the entry into force of the Convention. According to the IMO's information from 8th September 2016, the BWMC was signed by 52 states, representing 35.1441% of gross tonnage of the world's merchant shipping. The BWMC will enter into force on 8 September 2017.

4. SEDIMENT RECEPTION FACILITIES AND BALLAST WATER RECEPTION FACILITIES

A number of guidelines have been developed by the IMO in order to facilitate global and uniform implementation of the BWMC. The guidelines directly related to the ports are G1 and G5, concerning the reception of sediment from ballast tanks and reception of the ballast water. Guidelines for sediment reception facilities (G1)³⁹ are purposed to provide guidance for the provision of such facilities, that shall be provided in accordance with the Art. 5 of the BWMC and also to encourage a worldwide uniform interface between those facilities and ships. According to the Art. 5(1) states parties are obligated to provide adequate facilities for the reception of sediments in ports and designated terminals where cleaning or repair of ballast tanks occurs.

It is questionable, if this obligation apply to the ports in particular. Cleaning or repairing of the ballast tanks is more likely to be carried at the shipyard's dry docks. Thus, it seems that the definition of the ports and designated terminals where cleaning or repairing of ballast tanks occurs, should include shipyards.

The BWMC sets the condition of not causing undue delay to the ship during the reception in facilities and the condition of the safe disposal of the sediments, without impairing or damaging the environment, human health, property or resources, of

³⁹ IMO, Guidelines for sediment reception facilities (G1), Resolution MEPC.152(55) adopted on 13 October 2006.



the party or any other state⁴⁰. The reception facilities should be accessible for use by all ships⁴¹, moreover each party should provide the information on the availability and location of the reception facilities⁴².

The Guidelines G1 contains general requirements for the sediment reception facilities⁴³, for treatment, handling and for the disposal of received sediment⁴⁴, including requirements for the personnel⁴⁵. According to the Art. 6 of the G1, the reception facilities should be designed considering the types of ships that may be using them. Details of the capabilities of the facility, such as the maximum capacity of sediment, maximum volume or weight that can be handled at one time, ship-to-shore transfer details, should be available to the ships wishing to use it.

The Guidelines G5⁴⁶ refers to the ballast water reception facilities and are purposed to provide guidance for the provision of such facilities and also to encourage a worldwide uniform interface between such facilities and the ships. Contrary to the sediment reception facilities, the parties have no obligation to provide the ballast water reception facilities. The Regulation B-3.6 of the BWMC states that the requirements of the Regulation B-3, which sets the procedure regarding ballast water management depending on the construction date and the ballast water capacity of the ship, do not apply to the ships discharging the ballast water to the reception facility.

The Guidelines G5 contains general requirements for the reception facilities⁴⁷ such as not creating a risk to the environment, human health, property and resources arising from the release to the environment of harmful aquatic organisms and pathogens. The reception facilities should be accessible for use

⁴⁰ Art. 5(1) *in fine* BWMC.

⁴¹ Art. 3.2 G1.

⁴² Art. 3.3 G1.

⁴³ Art. 3 G1.

⁴⁴ Art. 5 G1.

⁴⁵ Art. 5.2 and Art. 7 G1.

⁴⁶ IMO, Guidelines for Ballast Water Reception Facilities (G5), Resolution MEPC.153(55) adopted on 13 October 2006.

⁴⁷ Art. 3 G5.



by all ships wishing to discharge ballast water in port by providing the necessary equipment, such as pipelines and other resources⁴⁸. Moreover each party should provide the information on the availability and location of any reception facilities for the environmentally safe disposal of the ballast water⁴⁹. The details of the capabilities and any capacity limitations of the facility should be made available to the ships wishing to discharge the ballast water⁵⁰. The Guidelines G5 contain a list of factors, that should be taken into account, when considering the requirements of ballast water reception facilities, *inter alia*, regional, national and local legislation which will affect the facility, handling, sampling, testing, analysis and storage of the ballast water, effect on the environment in construction and operation of the facility or waterway access⁵¹. The disposal of ballast water from the facilities⁵², applied methods of treatment⁵³, should not create a risk to the environment, human health, property and resources arising from the release or transfer of harmful aquatic organisms and pathogens. The ballast water should be accepted including its suspended matter⁵⁴. Moreover the facilities should provide ship-to-shore connections, compatible with a recognized standard⁵⁵. The final provisions of the guidelines G5 concern the personnel and their appropriate training⁵⁶.

⁴⁸ Art. 3.1 G5.

⁴⁹ Art. 3.2 G5.

⁵⁰ Art. 7.1 G5.

⁵¹ Art. 4 G5.

⁵² Art. 5.1 G5.

⁵³ Art. 5.2 G5.

⁵⁴ Art. 6.1 G5.

⁵⁵ Such as standards in the Oil Companies International Marine Forum (OCIMF) "Recommendations for Oil Tankers Manifolds and Associated Equipment"; Art. 7.4 G5.

⁵⁶ Art. 8 G5.



5. DISCUSSION AND CONCLUSIONS

According to the Art. 196(1) of the United Nations Convention on the Law of the Sea, 1982⁵⁷, states shall take all measures necessary to prevent, reduce and control the intentional or accidental introduction of the alien species, which may cause significant and harmful changes in the marine environment. The ratification of the BWMC and implementation of the IMO's guidelines may contribute to minimizing the risk of further introductions of invasive alien species via ships' ballast water and sediments.

It should be noted, according to the IMO's information, that the problem posed by IAS in the ballast waters is complex and multi-disciplinary, thus the guidelines are kept under review by the MEPC and will be updated as new technologies will be created and additional knowledge becomes available. More studies and research are needed. It is recommended that the shipping companies should co-operate in studies and provide information for research purpose⁵⁸.

Nonetheless, the provisions of the BWMC apply only to the ballast water and sediment, and that is only a part of the problem caused by shipping when it comes to the introduction of invasive alien species. The IAS can be introduced also as a result of hull fouling. Even vessels with no ballast on board (NOBOB) have been discovered to pose a risk for species invasions⁵⁹.

The invasive alien species threaten the biodiversity, alter the ecosystems, generate costs for the economy and may threaten the human health. The transfer of alien species outside their natural habitats continues for decades, but in the second half of the 20th century this process has accelerated significantly, along

⁵⁷ United Nations Convention on the Law of the Sea of 10 December 1982.

⁵⁸ A. Pikkarainen, op. cit., p. 29.

⁵⁹ S.A. Bailey, I.C. Duggan, C.D.A. van Overdijk, P.T. Jenkins, H.J. MacIsaac, *Viability of invertebrate diapausing eggs collected from residual ballast sediment*, "Limnol. Oceanogr." 2003 (48), p. 1701–1710; A. Pikkarainen, op. cit., p. 29.



with the globalization of the economy⁶⁰. This problem seems to be especially important for the coastal states by the closed and semi-enclosed seas, which are particularly vulnerable to the accumulation of contaminants, including biological invasions.

The Baltic Sea is a semi-enclosed sea. Its biogeographical peculiarities have developed since the last glacial period⁶¹. Currently, it loses its biogeographical integrity due to the breakdown of geographical barriers, leading to an exchange of species. Moreover, the brackish waters of the Baltic do not protect it from the introductions of invasive alien species⁶². The further introductions may increase because of the increasing shipping traffic.

The Annex IV to the Helsinki Convention⁶³ establishes that the contracting parties shall co-operate in the effective and harmonized implementation of rules adopted by the IMO. It is highlighted in the HELCOM Guide to Alien Species and Ballast Water Management in the Baltic Sea⁶⁴ that the IMO's guidelines reflect consensus at the IMO level and sometimes they lack all the details needed for harmonised implementation in such a specific region like the Baltic Sea. These details can and should be provided through HELCOM regional cooperation⁶⁵. The regional co-operation is highlighted in the Art. 13(3) of the BWMC as well. In 2007, as stated in the Road Map towards harmonised implementation and ratification of the 2004 International Convention for Control and Management of Ships' Ballast

⁶⁰ J. Firestone, J.J. Corbett, *Coastal and Port Environments: International Legal and Policy Responses to Reduce Ballast Water Introductions of Potentially Invasive Species*, "Ocean Dev. Int. Law" 2005 (36), p. 291–316; C. Perrings, K. Dehnen-Schmutz, J. Touza, M. Williamson, *How to manage biological invasions under globalization*, "Trends Ecol. Evol." 2005 (20), p. 212–215.

⁶¹ E. Leppäkoski, S. Olenin, *The meltdown of biogeographical peculiarities of the Baltic Sea: the interaction of natural and man-made processes*, "Ambio" 2001 (30), p. 202–209.

⁶² S. Gollasch, E. Leppäkoski, *Initial Risk Assessment...*, p. 19.

⁶³ Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention 1992).

⁶⁴ HELCOM, *Guide to Alien Species and Ballast Water Management in the Baltic Sea*, 2014.

⁶⁵ *Ibidem*, p. 21.



Water and Sediments⁶⁶, the contracting parties to the HELCOM agreed to ratify the BWMC as soon as possible, but in all cases not later than 2013. In September 2016, within the Baltic Sea region the BWMC was ratified by Denmark, Russia, Sweden, Germany and Finland.

Within the Baltic Sea region the ballast water reception facilities may appear to be relevant. According to the Regulation B-4 of the BWMC ballast water exchange (BWE) can only be conducted at least 200 nautical miles from the nearest land and in water at least 200 metres in depth or, if it is not possible, as far from the land as possible, and in all cases at least 50 nautical miles from the nearest land and in water at least 200 metres in depth. The Baltic Sea does not meet these depth and distance from the shore requirements. In such cases the port state may designate special areas where the ship may conduct BWE⁶⁷, taking into account the Guidelines G14⁶⁸. The designation of the BWE areas for shallow and inland seas, such as the Baltic Sea, may not be possible to achieve, because it might increase the risk of species introductions to nearby coasts⁶⁹. According to the HELCOM the BWE areas are not a suitable management option in the Baltic Sea even for Intra-Baltic shipping⁷⁰. Therefore, by the time of the complete introduction of the onboard ballast water treatment systems, the ballast water reception facilities may be needed in the Baltic ports.

⁶⁶ HELCOM, Road map towards harmonised implementation and ratification of the 2004 International Convention for Control and Management of Ships' Ballast Water and Sediments, 2010.

⁶⁷ Reg. B-4(2) BWMC.

⁶⁸ IMO, Guidelines on Designation of Areas for Ballast Water Exchange (G14), Resolution MEPC.151(55) adopted on 13 October 2006.

⁶⁹ U.C. Oliveira, *The Role of the Brazilian Ports in the Improvement of the National Ballast Water Management Program According the Provisions of the International Ballast Water Convention*, New York 2008; S. Gollasch, M. David, M. Voigt, E. Dragsund, C. Hewitt, Y. Fukuyo, *Critical review of the IMO international convention on the management of ships' ballast water and sediments, "Harmful Algae" 2007 (6)*, p. 585–600.

⁷⁰ HELCOM MARITIME, Ballast Water Management Options for Intra-Baltic Shipping. Document 7/5 of HELCOM MARITIME 8/2009.



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