Marine litter
in the
Baltic Sea Region

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Assessment of the Marine Litter problem in the Baltic region and priorities for response

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1 Abstract

HELCOM marine litter project is the first effort in the region to look into the scale of the problem, the availability of information and the actions needed in the Baltic Sea area. Lack of comparable and reliable data is a major gap in marine litter issues in the Baltic Sea. There is dispersed information collected with different practices, the practice depending on the reporting organization or authority. Therefore HELCOM has prepared a Recommendation for the Harmonization of methods of sampling and reporting the amount and type of marine litter on the beach within the Baltic Sea region, and a Survey form for reporting marine litter, in order to get more harmonized data from different initiatives in the future. Amendments to the HELCOM Recommendation 28/1 on Application of the no-special-fee system to ship-generated wastes in the Baltic Sea area has been prepared by the project to include the litter caught in the fishing nets to the no-special-fee system.

Main land-based sources of marine litter indicated by five countries are tourism and recreational use of the coasts. Five countries reported major sea-based sources in the Baltic Sea to be commercial shipping (fishing boats, cargo ships, tankers, passenger ships) and pleasure craft. The importance of a source varies in different areas of the Baltic Sea.

The most common type of litter in the Baltic Sea is related to the most common land-based source, tourism- and recreation. Other common findings in the Baltic coasts are fishing related litter, wood, food waste, sanitary and sewage-related litter, clothing and rubber. Detached vegetation accumulating on the shore can be a major problem in certain areas. Plastic items are the most common type in many areas. The amount of plastics is a good indicator of marine litter trends according to the data provided by the countries and information found on the literature, since plastics make 30-60% of both litter pieces and litter weight.

The amounts reported by the countries and the information provided by NGOs suggest that there is no clear descending or ascending trend in the marine litter found on coasts of the Baltic Sea. The amounts can be substantial in some specific sites near the sources of litter (e.g. shipping routes, rivers, public beaches). The highest amounts in the data from the Baltic Sea were between 700 and 1200 pieces per 100 m of a coast, which is the similar level found on the beaches of the Northern North Sea (Final Report of OSPAR Pilot Project on Monitoring Marine Beach Litter 2007). However, in many cases the average amount of litter found on the coasts varied between 6 and 16 pieces of litter per 100 m of coast. It can be said that littering is not as big problem in the Baltic Sea as in the North Sea area. Yet attention should be paid to the specific points were littering is more extensive and has harmful effects on the environment, or creates a risk or economical losses to the people using or living at the coast.

2 HELCOM

The Helsinki Commission, or HELCOM, works to protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental co-operation between Denmark, Estonia, the European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.

HELCOM is the governing body of the "Convention on the Protection of the Marine Environment of the Baltic Sea Area" - more usually known as the Helsinki Convention.
HELCOM's vision for the future is a healthy Baltic Sea environment with diverse biological components functioning in balance, resulting in a good ecological status and supporting a wide range of sustainable economic and social activities.

The Helsinki Commission meets annually. Ministerial level meetings are also held occasionally. The Commission unanimously adopts Recommendations for the protection of the marine environment, which the governments of the Contracting Parties must act on in their respective national programmes and legislation.

In order to ensure that all possible measures are taken to reduce pollution in the Baltic Sea and to repair the damage done to the marine environment, the HELCOM Member States and the EU resolved to develop an innovative HELCOM Baltic Sea Action Plan in 2005. This plan is based on Ecological Objectives, which are defined to reflect a common vision of a healthy Baltic Sea. The Ecological Objectives and their associated indicators will be used to evaluate the efficiency of existing environmental measures and to provide guidance for the development of future management measures for the region.

In order to ensure the development of the Baltic Sea Action Plan within the given timeframe, representatives of the coastal countries of the Baltic Sea have established an *ad hoc* Task Force for the development of the Baltic Sea Action Plan. The aim of the Task force is to link the ongoing scientific work with the political processes. The Task Force consists of experts from the HELCOM Member States and other stakeholders in order to ensure commitment to the process and to the implementation of the decided steps. The HELCOM Baltic Sea Action Plan will be adopted at the Ministerial Meeting to be held on 15 November 2007.

3 Background

Worldwide the problem of marine litter, also known as marine debris or marine garbage, is recognized and considered to be one of the major threats to the oceans around the world. Globally the US Academy of Sciences has estimated the total input of marine litter into the oceans worldwide to be approximately 6.4 million tonnes per year (UNEP 2005). It is commonly assumed that up to 70 % of the marine litter that enters the sea sinks to the bottom, 15 % is found on beaches and 15 % floats on the water surface (The Ocean Conservancy 2004 and UNEP 2006). Despite international and national efforts have been made during the last decades there are no clear indications that the quantities and distribution of marine litter would be decreasing (Save the North Sea 2004).

The problem of marine litter was recognized by the UN General Assembly, which in its Resolution A/60/L.22 - Oceans and the Law of the Sea - of 29 November 2005 in articles 65-70 calls for national, regional and global actions to address the problem of marine litter. This GA resolution notes the lack of information and data on marine debris, encourages States to develop partnerships with industry and civil society, urges States to integrate the issue of marine debris within national environmental strategies, and encourages States to cooperate regionally and sub-regionally to

develop and implement joint prevention and recovery programmes for marine debris. In response to the GA call, UNEP (GPA and the Regional Seas Programme), through its Global Marine Litter Initiative took an active lead in addressing the challenge, among others, by assisting 11 Regional Seas around the world in organizing and implementing regional activities on marine litter (Baltic Sea, Black Sea, Caspian Sea, East Asian Seas, Eastern Africa, Mediterranean Sea, Northwest Pacific, Red Sea and Gulf of Aden, South Asian Seas, South East Pacific, and Wider Caribbean).

In the Baltic Sea marine litter has not been seen as a major problem so far. However, there has not been any wide and comprehensive study on marine litter in the Baltic Sea. There have not been any systematic monitoring activities in marine litter field in the Baltic Sea either. Scattered information on marine litter is available in some countries.

Some steps have already been taken on marine litter issues. Baltic Sea has obtained a Special Area status under Annex V to MARPOL 73/78 (Regulations for the Prevention of Pollution by Garbage). The Baltic Sea is considered to have among the world's most dense shipping traffic. In an effort to further address, on a Baltic specific level, the problem of ship generated waste, HELCOM has since the late 1990s been successfully working to implement a comprehensive set of measures to reduce pollution by ship generated waste (known as the Baltic Strategy for Port Reception Facilities for Ship Generated Wastes and Associated Issues). The cornerstones of the Baltic Strategy are adequate port reception facilities, mandatory delivery and implementation of "No-Special -Fee" system for delivery of ship-generated wastes as well as efficient law enforcement. The Baltic Strategy has proven to be an effective tool for addressing ship generated waste with a reduction in detected illegal oil discharges due to increasing surveillance flight hours and increased reception of waste at port reception facilities. HELCOM has also adopted measures concerning proper handling of waste/land filling to prevent pollution of the Baltic Sea from landfills and dumping sites.

The marine litter project of HELCOM was co-funded by UNEP. This is the first effort in HELCOM area to look into the scale of the problem, the availability of information and the actions needed in order to develop and implement a regional strategy for addressing marine litter.

The first step in the project was to collect all readily available information on marine litter in the Baltic Sea by searching the literature and contacting relevant organizations who could provide the data on marine litter. The project also prepared a questionnaire in which information was required about the amounts, types and sources of marine litter in the Baltic Sea countries. The questionnaire was subsequently sent out to the Baltic Sea countries on November 2006. The questionnaire was distributed to either the appointed contact persons or the official contact persons of the HELCOM Maritime Group. Additionally, several relevant non-governmental organizations and associations as well as individuals were identified and asked to provide the information on marine litter according to the questionnaire. Replies to the questionnaire were received from six countries out of nine (Denmark, Estonia, Latvia, Lithuania, Poland, Russia).

3.1 Definition- What is marine litter?

According to UNEP (2005) marine litter is any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment. Marine litter consists of items that have been made or used by people and deliberately discarded into the sea or rivers or on beaches; brought indirectly to the sea with rivers, sewage, storm water or winds; accidentally lost, including material lost at sea in storms (fishing gear, cargo); or deliberately left by people on beaches and shores. Marine litter consists of for example: plastics, fishing gear, polystyrene (coffee cups, takeaway food containers, packing material), rubber, glass, wood, metals, sanitary and sewage-related litter, clothing, paper and cardboard.

Marine litter is one of the most pervasive pollution problems affecting the marine environment. It affects the economies and inhabitants of coastal and waterside communities, but most important it endangers sensitive marine ecosystems and wildlife both in the open sea areas as well as coastal areas. Marine litter can travel long distances with sea currents to end up in accumulation sites (UNEP 2005). Serious public health issues are associated with hazardous materials, medical wastes, syringes, glass and other sharp and/or dangerous debris washed-up on beaches. Plastic materials, which are durable and slow to degrade have become worldwide the most abundant material of marine litter. In addition, many plastic items are highly buoyant, allowing them to be carried with currents a long way. More than one million birds and 100 000 marine mammals and sea turtles die each year throughout the world after either becoming entangled in or eating plastic materials dumped in the sea (UNEP 2006).

3.2 Amounts of marine litter in different parts of the Baltic Sea

There is a certain amount of information concerning the amounts of litter found on the beaches along the Baltic coasts. However, no statistically based monitoring has been done. Most of the information available has been gathered by NGOs (WWF, The Ocean Conservancy) and municipalities in the Baltic coast. The comparison of the results is difficult since there is no common method for reporting the litter. The beach clean-ups usually report the litter as pieces per a length of coastline (500m). The municipalities report the total amount of litter as kilograms or cubic meters (m^3).

3.2.1 Amounts found at beaches

WWF has collected information in litter in Naturewatch Baltic network. The yearly report describes also amounts of litter found in the coasts and beaches of the Baltic Sea (Figure 1). The amount of litter is presented as litter pieces found per 500 m of coast. The differences between the countries are great. The information collected in Naturewatch does not describe the general situation in the coasts of the Baltic Sea. It describes a situation at a certain moment in certain areas. The number of people taking part in Naturewatch also affects the results significantly.

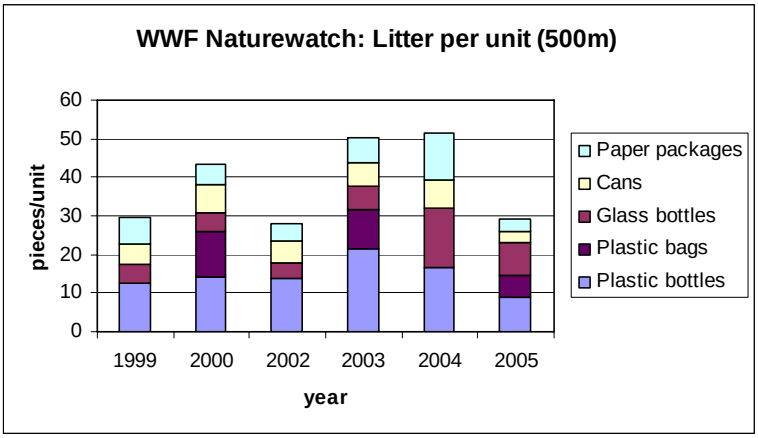

Figure 1. Averages of different types of Litter found on beaches within WWF Naturewatch Baltic.

In a study done in Finland 1994 by Tuomisto the average of litter found in 15 beaches was 11 kg/ 260 pieces per 100 m of coastline, (minimum 1 kg/21 pieces $100m^{-1}$, maximum 45 kg/ 691 pieces $100m^{-1}$).
The International Coastal Cleanup is organized every year by an international NGO, The Ocean Conservancy (The Ocean Conservancy 2004 and 2005). Almost 58 per cent of the litter found in ICC has been attributed to shoreline and recreational activities such as beach-picnickers and general littering. In the Baltic countries in 2004 and 2005 the amount of litter varied between 2-328 kg/ 4-181 pieces of litter per 500m of coast.

Within a project Coastwatch in Estonia school pupils have collected litter found on beaches (Figures 2 and 3). Year 2004 was a peak year during both autumn and spring, but fewest areas were surveyed that year. Otherwise there is no clear decreasing or increasing trend in the amounts of litter. Experts in Estonia estimated the amount of litter per 500 m to be in the level of 20 kg. In some areas much more than that can be found. State Forest Management Centre of Estonia (RMK) has surveyed and collected litter in Hiiumaa region in Putkaste and Kärdla districts. The amounts per 500 m of coastline varied between 90 and 316 kg on average (Figure 4). In Putkaste the amount of litter has decreased during last years whereas in Kärdla the amount of litter has increased. This could be due to normal variation in the amount of litter. It is yet interesting that in the different sites of the same island the situation can be quite opposite.

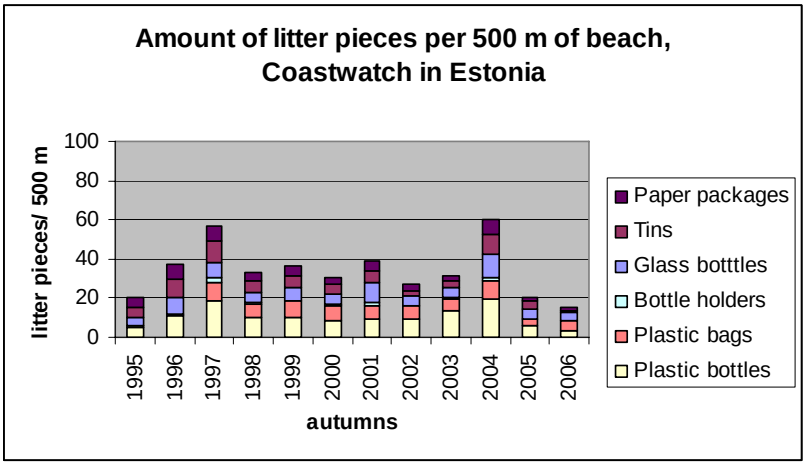

Figure 2. Amount of litter pieces per 500 m of beach during autumns 1995-2006. Data provided by Coastwatch in Estonia.

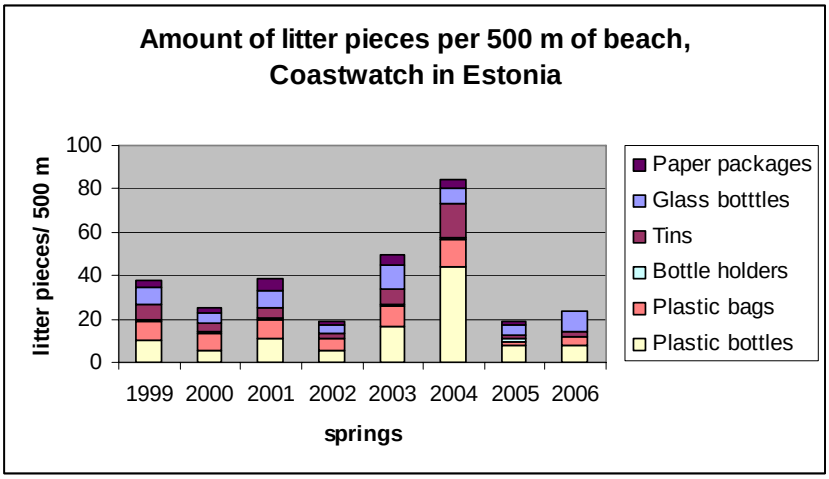

Figure 3. Amount of litter pieces per 500 m of beach during springs 1999-2006. Data provided by Coastwatch in Estonia.

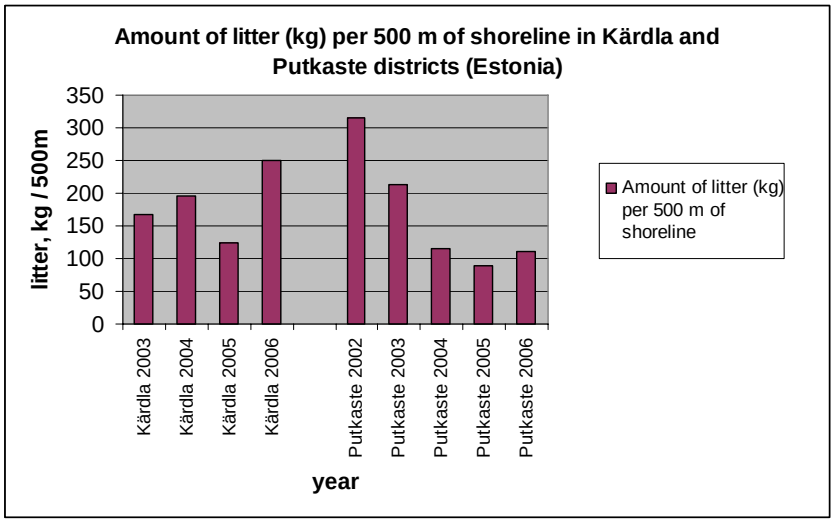

Figure 4. Amount of litter as kg per 500 m of coast in Kärdla and Putkaste districts in Hiiumaa area, Estonia. Data provided by State Forest Management Centre (RMK), Estonia.

In Poland the amount on beaches per 500 m is 12 000 kg, but this amount includes the waste baskets in the beaches as well as the cleaned beach litter. The amount of litter found and collected in the seven biggest Latvian coastal towns at beaches during 10 months in 2006 was 9537 m^3, of which 63 % was paper, packaging material (other than plastic), glass and clothing.

Amount of litter collected in the city of St. Petersburg in Russia (including banks of Neva River) in 2006 was 1128 m^3, of which 48 m^3 was seaweed. The size of the area was 540 m^2.

3.2.2 Amounts found at sea

In a study 1996 1.26±0.82 items of litter per hectare were found in the waters of western Baltic Sea (Galgani *et al*. 2000). The litter was collected from the water by trawling. The amount of litter found in the Baltic Sea was almost at the same level as in the North Sea.

In Pärnu region it is estimated that the amount of marine litter at the sea has decreased from 100-200 tons in 1995-1996 to 1 ton in 2006. The main component of marine litter in this area is cargo residues from ships, especially timber and plywood.

In four Polish ports collection of marine litter has been done in 2006. The total amount of marine litter in the summer months of 2006 was 9300 kg. Mean value per hectare was 23 kg.

In the port waters in 2005 the amount of litter collected in St. Petersburg was 1016 m^3, in Vyborg/Vysotsk 19 m^3 and in Kaliningrad 132 m^3.

3.3 Types of marine litter in different parts of the Baltic Sea

The yearly report of Naturewatch Baltic network (WWF) describes also types of litter found in the coasts and beaches of the Baltic Sea (Figure 1). Plastic bottles were the most common type (31-43%) of litter pieces found. Also in a study on marine litter on the sea floor along European coasts (Galgani *et al*. 2000) plastic bottles were the most common item found (36 %). Plastic bags were registered only on some years of Naturewatch Baltic and constituted 19-27% of all the litter, when reported. Plastic items constituted 50-63% of all the litter when both plastic bags and bottles were reported. In a study made by Tuomisto (1994) plastic items constituted 54% of litter pieces found in 15 beaches along the coast of Finland and 33% of the total weigh of litter.

Five countries reported tourism- and recreation-related litter to be most common type of litter. This includes plastic and glass bottles, plastic bags and packaging materials from plastic, polystyrene, paper and cardboard as well as cans and tins. In the data from Estonian Coastwatch plastic items constituted on an average 52% of all the litter items. Other common litter in the coast of Estonia is plywood. It is a decreasing item whereas the amount of plastic bottles is constantly increasing. At the data provided by Board of the Protection of Fisheries from Poland 48% of total weight of litter were plastics (bottles, bags, ropes, packaging material and so on).

Other common findings in Baltic coasts are fishing related litter (fishing nets, fishing floats), wood, food waste, sanitary and sewage-related litter, clothing and rubber. The amounts of these items are uncertain. Three countries also mentioned detached vegetation (sea grass, seaweed or thatch) accumulating on the shore to be a major problem in certain areas.

3.4 Environmental effects, economic losses and other negative effects caused by marine litter

According to UNEP report on marine litter (2005) entanglement and ingestion are the primary kinds of direct damage to wildlife caused by marine litter. Marine litter can be a source of accumulation of toxic substances in the marine environment. Marine litter can also cause habitat destruction by affecting water quality and causing physical damage to ecosystems. Marine litter can be related to transfer and introduction of invasive species since plastic items can be highly buoyant and travel long distances.

Marine litter can cause serious economic losses to various sectors and authorities (Hall 2000). Sectors that can be economically affected by marine litter are communities (beach cleaning, public health, waste disposal), tourism (local business, publicity), shipping (fouled propellers, broken engines, removal of litter in harbours, waste management in harbours), fishing (reduced catch, damaged nets, fouled propellers, contamination), fish farming and agriculture by the coast.

In the West Coast of Sweden it was estimated that the costs for cleaning the beaches in Bohuslän were at least 10 million Sek (1 125 000 €) in 1997. Near the city of Göteborg 11 464 plastic bags were removed manually from the coast throughout the year (Hall 2000).

From Baltic Sea there is not much information about the effects of marine litter. In Poland deaths of 25 animals were reported from one city during 2006. It is however uncertain whether marine litter was the reason of the deaths. Poland also reported the costs for beach cleaning and removal of litter from harbour waters to be 570 000 € for year 2006. This amount of money was spent in five communes and two ports in Poland to remove litter from the beaches and port waters.

Swedish Board of Fisheries has surveyed the problem of lost fishing nets in studies made in 2000-2004. An estimation of the amount of lost cod nets has been made as well as an estimation of mortal effect of the lost nets on stocks of cod and other species. In the study the searches were concentrated in certain limited areas where the risk for losses is high (for example due to extensive ferry traffic) and where no trawling is practiced which would affect the amount of the found fishing gear. In 2004 24 km of lost fishing nets were found. The research emphasizes that despite the catch by lost fishing nets is quite moderate, it is unnecessary and harmful for species that are already at risk.

3.5 Main sources for the marine litter in the Baltic Sea

Marine litter enters the seas from both land-based sources and from ships and other installations at sea. Marine litter can be brought indirectly to the sea or coast with rivers, sewage, storm water or winds. Recognized sea-based sources for marine litter

are shipping (commercial, recreational and other) and fishing industry. Possible land-based sources are riverine transport of litter, tourism or recreational visitors to the coast, landfills and waste dumps located in the coast, sewage overflows and other industrial discharges.

The sources indicated in the study 1994 (Tuomisto 1994) were the following: in the Gulf of Bothnia and in Åland most litter pieces that could be identified originated from cruise liners between Finland and Sweden, and recreational boating. In the western Gulf of Finland the origin of the litter pieces could be recognized from the text on them in almost 30% of the pieces. The litter was mainly from cargo ships. 40% of the litter was from Russia and Baltic countries and 21% was Polish origin. In the eastern Gulf of Finland the biggest part of the litter originated also from shipping industry. Litter pieces from fishing activities were abundant everywhere in the Baltic Sea.

Main land-based source indicated by five countries is tourism and recreational use of the coasts. Fishing by the rivers and intentional waste dumping were also mentioned as major land-based sources for litter. According to the answers given by five countries, major sea-based sources in the Baltic Sea are commercial shipping (fishing boats, cargo ships, tankers, passenger ships) and pleasure craft. The importance as a source varies in different areas of the Baltic Sea.

The countries were asked about the garbage delivery to the ports. Garbage constitutes approximately 3-10% of the total amount of waste delivered to the ports based on four answers. Two countries indicated that the “No-Special-Fee” system has had an effect to the amounts of garbage delivered to the ports, whereas one answered that the system has had no effect at all. Most of the countries do not collect any relevant data on central level, so it is not possible to assess the effectiveness of the system.

4 Existing requirements and activities governing marine litter

4.1 International

4.1.1 Conventions and agreements

United Nations Convention on the Law of the Sea (UNCLOS) and General Assembly (GA) Resolutions
Sets out the legal framework within which all activities in the oceans and seas must be carried out. The General Assembly carries out annual reviews of the law of the sea (Resolutions), based on annual comprehensive reports prepared by the Secretary-General.
http://www.un.org/Depts/los/index.htm

Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (UNEP GPA)
An intergovernmental programme which addresses the inter-linkages between freshwater and the coastal environment.
http://www.gpa.unep.org/

International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) and Annex V
http://www.imo.org/

London Convention 1972, Convention on the Prevention of Maritime Pollution by Dumping of Wastes and Other Matter and 1996 Protocol Thereto
http://www.imo.org/home.asp?topic_id=1488

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
http://www.basel.int/

Agenda 21 and the Johannesburg Plan of Implementation
Agenda 21 is a programme ran by the United Nations (UN) related to sustainable development.
http://www.un.org/esa/sustdev/

Convention on Biological Diversity, with the Jakarta Mandate
Ministerial Statement on the Implementation of the Convention on Biological Diversity.
http://www.oceanlaw.net/texts/jakarta.htm

FAO Code of Conduct for Responsible Fisheries
The Code provides a framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment.
http://www.fao.org/docrep/005/v9878e/v9878e00.htm

4.1.2 Global activities

Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)
GESAMP is an advisory body, established in 1969, that advises the United Nations (UN) system on the scientific aspects of marine environmental protection.
http://gesamp.net/page.php?page=1

International Coastal Cleanup (ICC)
ICC is the largest coastal cleanup campaign. Each year tons of trash is cleared from coastlines, rivers and lakes worldwide and everything is reported.
http://www.oceanconservancy.org/site/PageServer?pagename=press_icc

Clean Up the World
Clean Up the World is a community based environmental program that inspires and empowers individuals and communities to clean up, fix up and conserve their environment.
http://www.cleanuptheworld.org/en/

4.2 Regional

4.2.1 HELCOM

The Baltic Strategy on Port Reception Facilities for Ship-generated Wastes

Already since the late 1990s the HELCOM Member States have been implementing the complex set of measures known as the Baltic Strategy on Port Reception Facilities for Ship-generated Wastes (the Baltic Strategy) to prevent illegal discharges of waste into the Baltic Sea and providing for economic incentive to deliver wastes, including garbage, onshore. The main objectives of the Baltic Strategy are to ensure ships' compliance with global and regional discharge regulations and to eliminate illegal discharges into the sea of all wastes from all ships, and thus prevent pollution of the Baltic Sea. Another objective is to ensure an environmentally sound treatment of ship-generated wastes when these wastes have been delivered to port reception facilities ashore.

Today, all discharges into the Baltic Sea of garbage as defined in Annex V to MARPOL 73/78 are prohibited. This prohibition stems from the international designation of the Baltic Sea as a "special area" under Annex I and Annex V of MARPOL 73/78.

To uphold this prohibition, HELCOM requires all ships to deliver all garbage to reception facilities before leaving the port. To further encourage delivery, the countries bordering the Baltic Sea have agreed that ships should not be charged for using such reception facilities, under the "no-special-fee" system. Costs are instead recovered from general harbour fees or general environmental fees, for instance. The Baltic Strategy has been elaborated through a number of HELCOM Recommendations enumerated below.

Valid HELCOM recommendations addressing marine litter issues:

28/1 (2007) Application of the no-special-fee system to ship-generated wastes in the Baltic Sea area

Recommendation 28/1 notes that the port authorities are responsible for providing reception facilities for wastes covered by Annex V (garbage) of the MARPOL 73/78, and recommends that the Governments of the Contracting Parties apply the Guidelines for the establishment of a harmonized "no-special-fee" system for the operation of reception facilities in their ports for ship-generated wastes covered by Annex V (garbage) of MARPOL 73/78.

24/5 (2003) Proper handling of Waste/Landfilling

Recommendation 24/5 recalls a need for harmonized requirements on proper handling of inert, non hazardous and hazardous waste, introducing of modern landfill techniques and phasing out improper dumping sites, and desires to prevent pollution of the Baltic Sea from discharges originating from landfills and dumping sites.

23/1 (2002) Notification of Ship's wastes

Recommendation 23/1 addresses reporting of ship's wastes with notification of Annex II to the EU Directive on Port Reception Facilities.

22/3 (2001) Unified interpretations to ensure a harmonized and effective implementation of the strategy for port reception facilities for ship-generated wastes and associated issues

Recommendation 22/3 states that garbage, other than food wastes, cf. Annex IV to the Helsinki Convention and of Annex V of MARPOL 73/78 are included under the mandatory delivery of wastes.

19/16 (1998) Co-operation in investigating violations or suspected violations of discharge and related regulations for ships, dumping and incineration regulations
Recommendation 19/16 gives guidelines for cooperation in investigating violations or suspected violations of the discharge provisions of Annex V to MARPOL 73/78.

19/13 (1998) Basic Principles of Ashore Handling of Ship-Generated Wastes
Recommendation 19/13 gives guidelines concerning basic principles of ashore handling of ship-generated wastes.

19/12 (1998) Waste Management Plans for Ports, supplemented by 22/3
Recommendation 19/12 states that the Governments of the Contracting Parties should ensure that waste management plans are developed for the ports according to the guidelines of the recommendation.

19/9 (1998) Installation of the Garbage Retention Appliances and Toilet Retention Systems and Standard Connections for Sewage on Board Fishing Vessels, Working Vessels and Pleasure Craft, supplemented by 22/1, 22/3
Recommendation 19/9 addresses that the Governments of the Contracting Parties shall ensure that all fishing vessels, working vessels and pleasure craft are equipped with garbage retention appliances suitable for collecting and, wherever possible, separating garbage on board.

14/7 (1993) Guidelines for Provisions of Facilities for the Handling, Storage and Processing of Shipboard Garbage
Recommendation 14/7 gives guidelines for shipboard garbage handling, storage and processing facilities for ships.

13/6 (1992) Definition of Best Environmental Practice
Recommendation 13/6 gives guidelines in the usage of BEP in order to prevent pollution of the sea from diffuse sources, minimizing or eliminating inputs from such sources to the aquatic environment by providing control strategies. Particular consideration should be given to environmental hazard of the product, its production, its use and ultimate disposal.

12/3 (1991) Definition of Best Available Technology
Recommendation 12/3 defines BAT to mean the latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges.

10/7 (1989) General Requirements for Reception of Wastes, supplemented by 19/12
Recommendation 10/7 notes that the Governments of the Contracting Parties to the Helsinki Convention should take into account the following general requirements for reception of wastes:
Garbage
Containers and/or garbage bags should be provided on the quay or lifted on board the ship for domestic and other non-hazardous operational waste. Non-hazardous cargo residues, dunnage, linings, etc. should be taken care of separately in accordance with port requirements.

10/5 (1989) Guidelines for the Establishment of Adequate Reception Facilities in Ports, supplemented by 19/8
Recommendation 10/5 recalls that the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) has adopted guidelines on the provision of adequate reception facilities in ports for garbage to assist Governments in implementing the requirements of the MARPOL 73/78. It is also recommended that the Governments of the Contracting Parties to the Helsinki Convention should promote the use of shore reception facilities for residues and wastes from ships by making such facilities and services available at reasonable cost or without charging special fees to the individual ships.

4.2.2 EU Directives addressing Marine Litter Issues

The EU Directive on the landfill of waste (Directive1999/31/EC)
The objective of the Directive is to prevent or reduce as far as possible negative effects on the environment from the landfilling of waste, including the pollution of surface water, by introducing stringent technical requirements for waste and landfills. The Directive is applicable to collected marine litter entering landfills, as well as the garbage from the landfills entering the seas and becoming marine litter.

The EU Directive on port reception facilities for ship-generated waste and cargo residues (Directive 2000/ 59/EC, December 2002)
The EU Directive on port reception facilities for ship-generated waste and cargo residues requires that all ports provide facilities to meet the needs of those vessels normally calling in at them. The Directive pursues the same aim as the MARPOL 73/78 on the prevention of pollution by ships, which all the Member States have signed. However, in contrast to the MARPOL 73/78, which regulates discharges by ships at sea, the Directive focuses on ship operations in Community ports and addresses in detail the legal, financial and practical responsibilities of the different operators involved in delivery of waste and residues in ports.

The EU Directive on packaging and packaging waste (Directive 2004/12/EC)
The main objective of the Directive on Packaging and Packaging Waste is to prevent packaging waste by encouraging packaging re-use and recycling, while at the same time avoid distortions in the internal market. The Directive requests that Members States introduce systems for the return and/or collection of used packaging and defines specific targets for packaging waste recovery and recycling.

4.2.3 The European Marine Strategy and the forthcoming EU Marine Strategy Directive

The European Marine Strategy aims to bring European seas back to "good environmental status" by 2021. Litter Pollution is mentioned as one of the identified threats to the marine environment. Objective 8 of the European Marine Strategy is to improve by 2010 at the latest compliance with all existing discharge regulations for ships and with existing regulations on the protection of marine environment from pollution derived from shipping and maritime transport and to further reduce the environmental impact of shipping, inter alia, by developing and applying the concept of the “Clean Ship” and further promote “safe shipping”. Objective 9 is to progressively reduce discharges, releases and losses of marine debris to the marine environment by improving enforcement of waste legislation and to developing a more

effective waste management, including campaigns to increase public awareness about the environmental problem of litter and ship generated waste or cargo residues.

The proposal for Marine Strategy Directive (Proposal for a Directive of the European Parliament and of the Council establishing A Framework for Community Action in the field of Marine Environmental Policy, December 2006) lists marine litter as other physical disturbances. Paragraph "Generic qualitative descriptors to be considered when determining Good Environmental Status" states that properties and quantities of marine litter should not cause harm to marine environment.

4.2.4 Other

UNEP Regional Seas Programme
The Regional Seas Programme (RSP) covers 18 regions of the world, making it one of the most globally comprehensive initiatives for the protection of marine and coastal environments. Marine litter is one of the Key Issues in RSP.

OSPAR Convention 1992
OSPAR Convention operates in the North Sea area and has collaboration with HELCOM, HELCOM/OSPAR Declaration. The OSPAR Pilot Project on Monitoring Marine Beach Litter includes identification and testing of marine litter types to be used as indicators of marine litter. The final report of the project will be presented in 2007.

4.3 National legislations and policies

There is no national legislation addressing marine litter in the Baltic Sea countries. There are general statutory orders, regulations, bylaws and acts governing mainly waste handling and port reception facilities. Some countries have municipalities acting on collection of litter from beaches. The regulations on wastes from the ships seem to be better enforced than legislation addressing littering of the beaches.

One country expressed an opinion that there might be problems when the issue of marine litter is covered and implemented by several authorities (e.g. maritime authorities, environmental authorities). Coordination of enforcement is therefore essential. Two countries reported the general legislations to be insufficient and some of the present regulations to be too vague or difficult to understand for the people working with marine litter in practice. Political commitment in the Baltic countries is essential. Improving relevant legislation for the land-based sources is important.

5 Strengths, gaps and needs

The most obvious observation was the difference in practices in sampling and reporting marine litter in the Baltic Sea area. There are several ways to sample beach litter. The litter is reported as pieces, weight and volume depending on the practices of the reporting organization. Also, in the beach cleaning campaigns different lengths of the coast have been surveyed. The information collected in different initiatives is not comparable. Therefore it is difficult to draw conclusions about the former and present situation. No trends could be seen in the data provided by the Contracting Parties. There are advantages and disadvantages for each method and the aims of the study should of course in the end to determine the method (Rees & Pond 1995, Velander &

Mocogni 1999). Yet to get a comprehensive picture of the problem in the Baltic Sea a similar method should be used as often as possible.

Lack of data is a major gap in marine litter issues in the Baltic Sea according to the countries. Clear information should be presented for the society in order to get a solid response. For now voluntary surveying fails to give a comprehensive overview of the scale of the problem due to incomparable results. Harmonization of methods will help in the collection of long term data. Wide scale monitoring is not considered to be a cost effective measure in the Baltic Sea area. Different initiatives are providing enough information when the practices are harmonized.

Some countries indicated that there are gaps in even very basic things, i.e. there is lack of waste baskets in quays and coastal areas, and problems in sorting the litter in ports. Ship owners and ship personnel should be educated on marine litter issues. Some land-based sources (industries, municipalities) are well covered by different regulations, recommendations and legislations. Yet the main land-based source, tourism and recreation-related litter, is not covered at all. The only way to affect this type of litter is raising public awareness, especially on the environmental and economical effects of marine litter.

Economic incentives have already been introduced in the Baltic Sea area. The Baltic Strategy on Port Reception Facilities for Ship-generated Wastes is already working and has probably affected the amount of marine litter in the Baltic Sea. The main strength in the HELCOM area is that the sea-based sources are well covered by the Strategy, and the work should focus on enforcement of existing requirements. At present no evaluation could be made on the effectiveness of the “no-special-fee” system. Detailed data on the amount of garbage delivered to reception facilities per number of calls into major Baltic port of different types of ships would be needed in order to asses the effectiveness of legislation in place and its enforcement.

General trend indicators of marine litter should be used in the Baltic Sea area since wider scale monitoring is not organized at this stage. The indicators are: plastic bottles, caps and lids, and plastic pieces up to a size of 50 cm. Similar indicators were suggested by the OSPAR Pilot Project 2000-2006 on Monitoring Marine Beach Litter. It should be kept in mind though that these indicators do not cover all kinds of possible sources. The amount of plastics is a good indicator according to the data provided by the countries and information found from the literature, because plastics usually make 30-60% of both litter pieces and litter weight. Some indicators should probably be set locally, since there are big differences between the areas. In some areas fishing-related litter can be major finding whereas in some areas the origin of the litter is clearly in cargo ships and tankers or passenger ships. Recreational use of the coastal areas is a significant source everywhere. Different kinds of packaging materials as well as food and drink containers make the major part of this type of litter. Regardless of the source the proportion of plastics is extensive.

6 Proposals for action

Based on the results of the project two draft HELCOM Recommendations addressing marine litter have been developed. .

One of the proposed Recommendations addresses the Harmonization of methods of sampling and reporting the amount and type of marine litter on the beach within the Baltic Sea region, including also a Survey form for reporting marine litter, in order to get more harmonized data from different initiatives in the future. The method has been used successfully in the OSPAR area (OSPAR 2007), and the method was only slightly amended to suit the Baltic Sea Region. The new HELCOM Recommendation will be adopted by 29. Meeting of the Helsinki Commission in 2008. Furthermore, if needed the Recommendation will be updated according to global guidelines on monitoring of marine litter to be developed by UNEP in order to ensure further harmonization.

The other proposal concerns updating the HELCOM Recommendation 28/1 on Application of the no-special-fee system to ship-generated wastes in the Baltic Sea area, to include marine litter caught in the fishing nets and trawls of fishermen to the no-special-fee system. So far this type of litter has not been covered by the no-special-fee system in the Baltic. The updated Recommendation will be included to the HELCOM Baltic Sea Action Plan and adopted at the HELCOM Ministerial Meeting in November 2007 in Krakow, Poland

In recognition of an importance of public awareness in diminishing the problem of marine litter in the Baltic highlighted by the Project, the Contracting Parties have already agreed to include specific provisions addressing this issue in the Baltic Sea Action Plan. The main focus will be on recommending to the Governments of the Baltic Sea countries to take actions raising public awareness on environmental and economic effects of marine litter, including e.g. “ghost fishing” of lost fishing nets, and to mobilize the participation in the beach cleanup initiatives, like a Regional Cleanup Day within the framework of the International Coastal Cleanup Campaign.

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