



The Healthy Seas Initiative: Legal and Policy Framework

REPORT



ECNC Group

AQUAFIL  **Group**

 **STAR SOCK**

TABLE OF CONTENTS

INTRODUCTION.....	5
CHAPTER 1: DESCRIBING THE PROBLEM.....	9
1.1. Sources of Marine Litter.....	9
1.2. Negative Impacts of Marine Litter.....	10
§ 1.2.1. Impacts on Human Health.....	10
§ 1.2.2. Impacts on Marine Wildlife.....	10
§ 1.2.3. Impacts on Marine Ecological Systems.....	11
§ 1.2.4. Impacts on Beach Quality.....	12
§ 1.2.5. Impacts on Navigational Safety.....	12
§ 1.2.6. Economic Loss Caused by Marine Litter.....	12
1.3. A Growing Problem.....	13
CHAPTER 2: AN OVERVIEW OF RELATED LAWS AND POLICIES.....	14
2.1. International Action.....	14
§ 2.1.1. Legally Binding International Agreements.....	14
§ 2.1.1.1. <i>The MARPOL Convention</i>	14
§ 2.1.1.2. <i>The London Dumping Convention</i>	14
§ 2.1.1.3. <i>The Basel Convention on Hazardous Wastes</i>	15
§ 2.1.1.4. <i>The Convention on Biological Diversity</i>	15
§ 2.1.2. Not Legally Binding International Acts.....	15
§ 2.1.2.1. <i>United Nations General Assembly Resolutions</i>	15

§ 2.1.2.2. <i>The Global Programme of Action</i>	16
§ 2.1.2.3. <i>The Honolulu Strategy</i>	16
2.2. The European Union’s Applicable Laws and Policies.....	17
§ 2.2.1. Water and Nature-Related European Legislation.....	17
§ 2.2.1.1. <i>The Marine Strategy Framework Directive</i>	17
§ 2.2.1.2. <i>The Habitats Directive</i>	17
§ 2.2.1.3. <i>The Bathing Water Directive</i>	18
§ 2.2.1.4. <i>The Common Fisheries Policy</i>	18
§ 2.2.2. Waste and Resource-Related Laws and Policies.....	19
§ 2.2.2.1. <i>The Directive on Port Reception Facilities for Ship-Generated Waste and Cargo Residues</i>	19
§ 2.2.2.2. <i>The Waste Framework Directive</i>	19
§ 2.2.2.3. <i>The Packaging and Packaging Waste Directive</i>	19
§ 2.2.2.4. <i>The Landfill Directive</i>	19
§ 2.2.2.5. <i>The Regulation on Shipments of Waste</i>	20
§ 2.2.2.6. <i>The Flagship Initiative for a Resource-Efficient Europe</i>	20
§ 2.2.2.7. <i>The Green Paper on a European Strategy on Plastic Waste in the Environment</i>	20
CHAPTER 3: A CLOSER LOOK AT SELECTED EUROPEAN LAWS AND POLICIES.....	22
3.1. The Marine Strategy Framework Directive.....	22
§ 3.1.1. Good Environmental Status and Marine Litter.....	22
§ 3.1.2. Implementation Schedule.....	23
§ 3.1.3. The MSFD and Regional Seas Conventions.....	23
§ 3.1.4. Reflections on the MSFD.....	24

§ 3.1.4.1. <i>The Discretion of Member States</i>	24
§ 3.1.4.2. <i>Implementation Schedule</i>	25
§ 3.1.4.3. <i>Economic Requirements of the MSFD</i>	25
3.2. The Common Fisheries Policy.....	26
§ 3.2.1. The CFP ‘Basic’ Regulation.....	26
§ 3.2.2. The CFP Control Regulation.....	26
§ 3.2.3. The Regulation on the European Fisheries Fund.....	27
§ 3.2.4. Reform of the Common Fisheries Policy.....	27
3.3. The Port Reception Facilities Directive.....	28
§ 3.3.1. Lack of Facilities for Segregated Waste and Discarded Fishing Gear.....	29
§ 3.3.2. Fees for Use of Port Reception Facilities.....	29
§ 3.3.3. Mandatory Discharge of Waste at Reception Facilities.....	30
3.4. The Waste Framework Directive.....	31
§ 3.4.1. Recycling Targets.....	31
§ 3.4.2. Permits and Information on Granting of Permits.....	32
CONCLUSION.....	33
BIBLIOGRAPHY.....	35

INTRODUCTION

Marine litter (also called 'marine debris') has become a pervasive pollution problem affecting all of the world seas.¹ Most of marine litter worldwide is made-up of plastics.² It is found in all the world seas, everywhere from polar regions to the equator.³

It is widely documented that marine debris, such as plastics and derelict fishing gear, has negative impacts on many aspects, including human health, marine wildlife, marine ecological systems, beach quality, navigational safety, economic well-being of states and fishing and maritime industries.⁴

The Healthy Seas initiative was established by ECNC Group (the European Expertise Centre for Biodiversity and Sustainability), Aquafil and Star Sock with the purpose to apply a holistic solution to the problem of plastic marine litter.⁵

The Healthy Seas initiative ('the Initiative') aims to remove waste, in particular fishing nets and other marine litter from the seas and oceans for the purpose of creating healthier seas and recycling marine litter. The objectives are:

1. To identify and to implement coordinated activities related to the removal of fishing nets and other marine litter from the seas and the oceans.
2. To recycle as much as possible of this waste into raw material, to be reused for the production of new, attractive products such as socks, carpets, swimwear, etc., which the consumer can recognize as being generated through the Initiative, and therefore being beneficial for the seas.
3. To create a cooperation model in which NGOs and businesses work together in a sustainable and rewarding manner for a better planet.⁶

As well the Initiative targets creating public and stakeholder groups' awareness raising for preventing further pollution of the world's seas and oceans by marine litter originating from

¹ M Allsopp, A Walters, D Santillo and P Johnston, 'Plastic Debris in the World's Oceans' (Greenpeace, 2 November 2006) <<http://act.gp/LqRJwh>> accessed 13 June 2013

² José G.B. Derraik, 'The Pollution of the Marine Environment by Plastic Debris: a Review' [2002] Marine Pollution Bulletin 44 842, 843; Green Paper on a European Strategy on Plastic Waste in the Environment [2013] COM(2013) 123 final 18

³ Allsopp et al. (n 1) 5.

⁴ Chung-Ling Chen and Ta-Kang Liu, 'Fill the Gap: Developing Management Strategies to Control Garbage Pollution from Fishing Vessels' [2013] Marine Policy 40 34

⁵ Aquafil is one of the leading players in the production of polyamide 6 globally. Star Sock is a leading development and production partner for socks. More information on the Healthy Seas initiative can be found at www.healthyseas.org

⁶ The Healthy Seas Initiative, 'Mission Statement for the 'Healthy Seas, a Journey from Waste to Wear' initiative' (2013) 3 http://www.barabinolabs.com/HealthySeas/wp-content/uploads/2013/05/HealthySeas_MS_FINAL.pdf accessed 26 June 2013

sources from both land and sea, with an emphasis on preventing fishing nets to be left in the seas.⁷

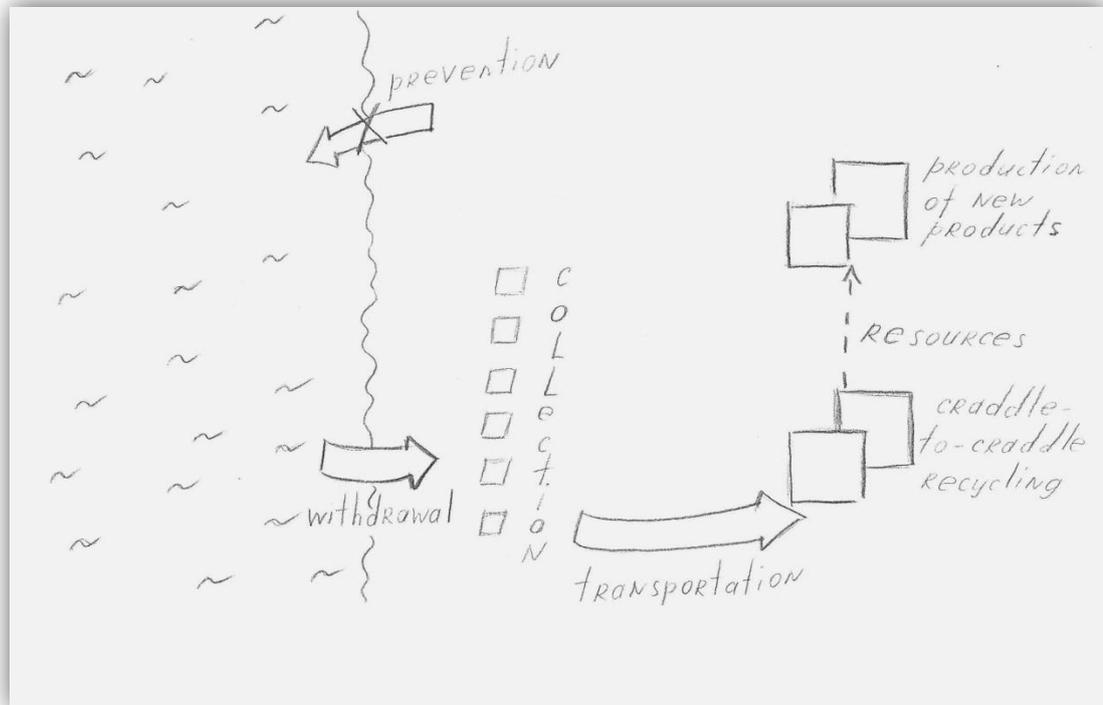


Figure 1: Holistic approach to the problem of plastic marine litter

As Figure 1 shows, the Initiative applies a holistic approach to the problem of marine litter including prevention, withdrawal of litter from the seas, recycling and production of new products from recycled waste.

It can be argued that the Healthy Seas initiative is very much in line with current trends in international and the European Union's environmental policy and initiatives. The United Nations Environment Programme launched a Global Initiative on Marine Litter which provides a global platform for the establishment of partnerships, cooperation and coordination of activities for the control and sustainable management of marine litter.⁸ The European Commission, recognizing the problem of marine pollution by plastic debris, recently issued the 'Green Paper on a European Strategy on Plastic Waste in the Environment'.⁹ According to Janez Potočnik, the European Commissioner for the Environment, Europe has no future without a transfer to a circular economy which presupposes resource efficiency and greater levels of

⁷ *ibid* 3.

⁸ UNEP, 'Global Initiative' <http://www.unep.org/regionalseas/marinelitter/initiatives/unepglobal/default.asp> accessed 26 June 2013

⁹ European Commission - Press Release, *Environment: What should we do about plastic waste? New Green Paper opens EU-wide reflection* (7 March 2013) http://europa.eu/rapid/press-release_IP-13-201_en.htm accessed 26 June 2013

recycling; this would be beneficial equally for the environment and the European economy.¹⁰

This report seeks to assist the Initiative by providing information on international and European laws and policies that are related to prevention, withdrawal and recycling of plastic marine litter in general and fishing gear in particular. Also it is hoped that some facts and conclusions of the report will be used in the future when preparing proposals in the framework of the Healthy Seas initiative to the European Commission on necessary changes to existing policies related to plastic debris and its recycling.¹¹ It appears that it is the right moment for attempts to influence policy-making process with regard to plastic debris and its recycling because several related European policies are currently under review (the Common Fisheries Policy, Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues¹², European waste policy).

It should be noted that during its initial phase the Initiative deals with one particular type of marine litter – plastic fishing gear – and after the initial phase the scope of the Initiative will be broadened to other types of marine litter.¹³ This is the reason why this report is limited to policies relevant to plastic marine litter, and focuses on discarded fishing gear where possible. Abandoned, lost or otherwise discarded fishing gear is recognized as a major worldwide concern, in particular by the United Nations Environment Programme.¹⁴ Among the most widely used materials for the composition of fishing nets are plastics, such as nylon, and polyethylene (PE), though other materials can also be found in fishing nets and related apparel.¹⁵

The report is based on the following structure. Chapter 1 characterizes the problem of plastic marine litter. Chapter 2 provides an overview of laws and policies at international and European levels which relate to the holistic approach to solving the problem of marine litter taken by the Healthy Seas initiative. Chapter 3 focuses on selected pieces of European legislation which seem to be of special importance for activities aimed at prevention of, removal and recycling plastic marine litter. A concentration on European laws is motivated by the fact that the Initiative currently operates at European scale, with a possibility of expansion

¹⁰ A talk at an intern-only event *What Will You be Doing in 2030? The skills and expertise young professionals will need to tackle future environmental challenges* 2 May 2013, Brussels

¹¹ ECNC Group, Aquafil and Star Sock, 'Healthy Seas, a Journey from Waste to Wear' <http://www.ecnc.org/projects/business-and-biodiversity/healthy-seas-a-journey-from-waste-to-wear/> accessed 26 June 2013

¹² Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues [2000] OJ L332/81

¹³ The Healthy Seas Initiative (n 6) 2, 4.

¹⁴ UNEP and FAO, *Abandoned, Lost or Otherwise Discarded Fishing Gear* (2009) iv; P Ten Brink, I Lutchman, S Bassi, S Speck, S Sheavly, K Register, and C Woolaway, C., *Guidelines on the Use of Market-based Instruments to Address the Problem of Marine Litter* (UNEP 2009) 5.

¹⁵ 3R-Fish Project, *New Opportunities for Fishing and Port Generated Waste* (White Book, 2011) 14. 3R FISH Project was implemented in 2009-2011 within the framework of the European programme LIFE+ and aimed at improving the quality of marine environment through the correct use and waste management of fishing equipment.

in case of success.

This study is based on secondary sources, including the literature review, evaluation studies, and an analysis of the policy framework. Besides that, several interviews were conducted in order to provide stakeholders' input. In particular, policy officers at European Commission DG Environment, dealing with plastic waste in the marine environment, were interviewed in Brussels. It was a follow-up of a bilateral meeting that the Commissioner for the Environment had with the representatives of the Initiative during the International Conference on Prevention and Management of Marine Litter in European Sea (Berlin, 10-12 April 2013).

CHAPTER 1: DESCRIBING THE PROBLEM

Plastics are light-weight, durable, versatile, strong and cheap¹⁶, allowing their incorporation into a diverse range of applications. From helmets and protective clothing, to major components in automation and aviation, plastics are a crucial part of the world we live in.¹⁷ These same properties happen to be the reasons why plastics are a serious hazard to the environment. Since they are also buoyant, an increasing load of plastic debris is being dispersed over long distances.¹⁸ For example, islands in the South Pacific were surveyed, and the alarming conclusion was made that beaches in remote areas had a comparable amount of garbage to a beach in the industrialized western world.¹⁹

Plastic never biodegrades, it doesn't break down into natural substances. These materials persist in the environment for up to 600 years²⁰ and are not readily degraded or processed by natural biological mechanisms. However, plastics in the ocean are weathered; broken up either mechanically or by the action of sunlight into smaller and smaller fragments. Eventually, fragments are reduced to into tiny pieces the size of grains of sand (so-called 'micro plastics'). These particles have been found suspended in seawater and on the seabed in sediments. Even such tiny particles may be causing harm to the marine environment since they have been shown to be ingested by small sea creatures and may concentrate persistent organic pollutants (POPs) present in the seas.²¹

1.1. Sources of Marine Litter

Most marine debris comes from land-based sources, accounting for up to 80%, which is transported via sewage/drainage systems, natural water ways, wind or human neglect.²² Sources include inappropriate or illegal dumping of domestic and industrial rubbish; public littering; inadequately covered waste containers and waste container vehicles; poorly managed waste dumps; manufacturing sites, processors, and transporters; sewage treatment and combined sewer overflows; beachgoers; fishermen; shore-based solid waste disposal and processing facilities.²³

¹⁶ José G.B. Derraik, 'The Pollution of the Marine Environment by Plastic Debris: a Review' [2002] *Marine Pollution Bulletin* 44 842.

¹⁷ A Brems, J Baeyens, R Dewil, 'Recycling and Recovery of Post-Consumer Plastic Solid Waste in a European Context' [2012] *Thermal Science* Vol. 16 No. 3 669.

¹⁸ Derraik (n 16) 842.

¹⁹ *ibid* 844.

²⁰ UNEP and FAO, *Abandoned, Lost or Otherwise Discarded Fishing Gear* (2009) xvi.

²¹ Allsopp et al. (n 1) 5.

²² P Ten Brink, I Lutchman, S Bassi, S Speck, S Sheavly, K Register, and C Woolaway, *Guidelines on the Use of Market-based Instruments to Address the Problem of Marine Litter* (UNEP 2009) 5.

²³ *ibid* 5.

The remaining comes from sea-based sources, mainly ships.²⁴ In particular, fishing vessels are a common source of sea-based marine debris.²⁵ Commercial and recreational fishers create marine debris when they discard ship-generated trash overboard or fail to retrieve nets, ropes, trawl floats and other fishing-related gear. It should be noted that abandoned, lost or otherwise discarded fishing gear is one of the major sources of sea-based marine litter.²⁶

1.2. Negative Impacts of Marine Litter

Marine litter poses problems across the economy, environment and society.²⁷ The main areas, affected by marine litter, are presented below.

1.2.1. Impacts on Human Health

Visitors to a beach can be harmed by broken glass and fishing line; swimmers, divers and snorkelers can become entangled in submerged or floating debris.²⁸

Persistent organic pollutants (POPs), such as pesticides like DDT²⁹ and polychlorinated biphenyls (PCBs)³⁰, can attach themselves from the surrounding water to plastic fragments which can be harmful³¹ and enter the food chain via marine fauna which ingest the plastics (Trojan horse effect)³². These POPs do not break down naturally very easily but accumulate in body tissue, potentially having carcinogenic, mutagenic and other health effects on the human being at the other end of the food chain.³³

1.2.2. Impacts on Marine Wildlife

The threats to marine life are primarily mechanical due to *ingestion* of plastic debris and *entanglement* in packaging bands, synthetic ropes and lines, or drift nets.³⁴ The list of affected species indicates that marine debris is affecting at least 267 species worldwide, including 86% of all sea turtle species, 44% of all seabird species, and 43% of all marine mammal species.³⁵

²⁴ Chen and Liu (n 4) 34.

²⁵ *ibid* 34.

²⁶ UNEP, *Marine Litter: A Global Challenge* (UNEP, 2009) 9.

²⁷ E Hastings and T Potts, 'Marine Litter: Progress in Developing an Integrated Policy Approach in Scotland' [2013] *Marine Policy* 42, 50.

²⁸ Ten Brink et al. (n 22) 6.

²⁹ Dichlorodiphenyltrichloroethane.

³⁰ Y Mato, T Isobe, H Takada, H Kanehiro, C Ohtake, T Kaminuma, 'Plastic Resin Pellets as a Transport Medium for Toxic Chemicals in the Marine Environment' [2001] *Environmental Science and Technology* 35(2) 318.

³¹ LM Rios, C Moore, PR Jones, 'Persistent organic pollutants carried by synthetic polymers in the ocean environment' [2007] *Marine Pollution Bulletin* 54 1230.

³² Green Paper on a European Strategy on Plastic Waste in the Environment [2013] COM(2013) 123 final 18 5 and 6.

³³ European Commission DG ENV, *Plastic Waste in the Environment* (2011) 116.

³⁴ Derraik (n 16) 844.

³⁵ Derraik (n 16) 844.

Ingestion can impair digestion and cause internal injuries or even death. It is also likely to impair growth and reproduction.³⁶ Moreover, concerns have been raised about the potential for chemicals associated with plastics to be released upon ingestion, with possible toxicological effects.³⁷ Some examples of ingestion are simply unthinkable: one study cited a turtle found in New York that had swallowed 540 m of fishing line.³⁸

Entanglement is a particular problem for marine mammals, such as fur seals, which are both curious and playful. Young fur seals are attracted to floating debris and dive and roll about in it.³⁹ They will approach objects in the water and often poke their heads into loops and holes.⁴⁰ Though the plastic loops can easily slip onto their necks, the lie of the long guard hairs prevents the strapping from slipping off.⁴¹ Many seal pups grow into the plastic collars, and in time as it tightens, the plastic severs the seal's arteries or strangles it.⁴² Ironically, once the entangled seal dies and decomposes, the plastic band is free to be picked up by another victim,⁴³ as some plastic articles may take centuries to decompose.⁴⁴

Derelict fishing gear has been found to be lethal to ocean life for years after fishermen no longer use it. In a process called 'ghost fishing', an abandoned fishing net will continue to catch and kill ocean life.⁴⁵ There is an increasing recognition of the worldwide ghost fishing problem and the impact it is having on the viability of already stressed fisheries.⁴⁶

1.2.3. Impacts on Marine Ecological Systems

There is a potential danger to marine ecosystems from the accumulation of plastic debris on the sea floor. The accumulation of such debris can inhibit the gas exchange between the overlying waters and the pore waters of the sediments, and the resulting hypoxia or anoxia in the benthos can interfere with the normal ecosystem functioning, and alter the make-up of life on the sea floor.⁴⁷ As well the accumulation of plastic debris on the sea floor is capable to block essential for ecosystem functioning sunlight.⁴⁸

Another concern is that drifting debris can host entire communities of encrusting and attached

³⁶ Commission Staff Working Document, *Overview of EU Policies, Legislation and Initiatives Related to Marine Litter* (SWD(2012) 365 final) 4.

³⁷ *ibid* 4.

³⁸ Derraik (n 16) 845.

³⁹ *ibid* 846.

⁴⁰ *ibid* 846.

⁴¹ *ibid* 846.

⁴² *ibid* 846.

⁴³ *ibid* 846.

⁴⁴ UNEP and FAO (n 20) xvi.

⁴⁵ SB Sheavly and KM Register, 'Marine Debris & Plastics: Environmental Concerns, Sources, Impacts and Solutions' [2007] *J Polym Environ* 15 301, 303.

⁴⁶ *ibid* 303.

⁴⁷ Derraik (n 16) 844.

⁴⁸ Sheavly and Register (n 45) 303.

organisms and transport them over great distances – often to areas where they can harm or compete with native species as invasives.⁴⁹ Drift plastics can therefore increase the range of certain marine organisms or introduce species into an environment where they were previously absent.⁵⁰ It has been pointed out that the arrival of unwanted and aggressive alien taxa could be detrimental to littoral, intertidal and shoreline ecosystems.⁵¹

Besides that, debris can physically damage shorelines, living coral reefs, and other important habitats. Ropes, nets and tarps are moved by currents and tides, and can abrade, scour, break, smother, and destroy fragile aquatic habitats.⁵²

1.2.4. Impacts on Beach Quality

Litter makes shorelines unattractive⁵³ and potentially hazardous. Marine debris discourages people from fishing, boating, swimming, and visiting coastal areas.⁵⁴ Notably, a study found that 85% of tourists and residents would not visit a beach with more than two litter items per metre and 97% would not go to a beach with ten or more large items of litter per metre.⁵⁵ This could have significant impacts on the geography of tourism, and on areas where tourism forms the main stay of the local economy.⁵⁶

1.2.5. Impacts on Navigational Safety

Nets, ropes and other derelict fishing gear can cause serious damage to vessels by entangling propellers and rudders. Plastic bags are a common cause of clogged and blocked water intakes, resulting in burned out water pumps in recreational boats. Such incidents cause costly repairs, loss of time, and danger to boaters and crews. The true scope and frequency of damaging encounters between debris and vessels is difficult to calculate, as most incidents go unreported.⁵⁷

1.2.6. Economic Loss Caused by Marine Litter

Litter, debris and solid wastes in coastal and inland waterways can result in serious economic impacts including the loss of tourism revenue for coastal communities and for fishing and maritime industries. Studies from around the world confirm that marine litter harms wildlife, in particular commercially important species. Economic costs include lost fishing time due to propellers entangled in nets and other debris, depressed tourism, and labour intensive beach

⁴⁹ Ten Brink et al. (n 22) 6.

⁵⁰ Derraik (n 16) 847.

⁵¹ *ibid* 847.

⁵² Ten Brink et al. (n 22) 6.

⁵³ *ibid* 6.

⁵⁴ Sheavly and Register (n 45) 302.

⁵⁵ Hastings and Potts (n 28) 50.

⁵⁶ *ibid* 50.

⁵⁷ Ten Brink et al. (n 22) 6.

clean-ups.⁵⁸ To cite one instance, removing beach litter costs municipalities in the Netherlands and Belgium approximately €10.4 million per year.⁵⁹

1.3. A Growing Problem

It is worrying that according to current consumption trends the problem of plastic marine litter is likely to grow and worsen. Consumption of plastics grows fast. According to recent statistics compiled by Plastics Europe, the global and European procurement of plastic has grown substantially over the last 60 years. Global production and consumption have increased annually on average by 10%, from 1.5 million tons in 1950, to 245 million tons in 2007. Production during the last 10 years equalled production during the whole of the 20th century combined.⁶⁰ It is estimated (under a business as usual scenario) that 66.5 million tons⁶¹ of plastic will be placed on the EU market in 2020 and global plastic production could triple by 2050.⁶²

Giant masses of plastic waste, which have been discovered in the North Atlantic and Pacific Ocean, demonstrate a scale of the problem well.⁶³ In 2010, the Sea Education Association discovered a mass of plastic waste in the North Atlantic. It is similar to the one in the Pacific Ocean discovered in 1997.⁶⁴

Nevertheless, the problem of plastic marine litter appears to be solvable, and strong laws and policies are undoubtedly the building blocks for a successful solution.

⁵⁸ *ibid* 6.

⁵⁹ Commission Staff Working Document (n 36) 4.

⁶⁰ Green Paper on Plastic Waste (n 32) 4.

⁶¹ European Commission DG ENV (n 33) 73.

⁶² Brems et al. (n 17) 2.

⁶³ European Commission DG ENV (n 33) 119.

⁶⁴ *ibid* 112.

CHAPTER 2: AN OVERVIEW OF RELATED LAWS AND POLICIES

In this chapter a short overview of legislation and policies that are applicable to plastic marine litter will be presented. This overview by no means claims to be exhaustive because the legal and policy framework for the problem of plastic marine litter is ‘voluminous and complex, and consists of ... regulations which cover ocean-based as well as land-based sources’.⁶⁵ Thus, it would be impossible and also useless to claim exhaustiveness in the context of this report. The pieces of legislation have been chosen on the basis of their relevance and (relative) importance for tackling the problem of plastic marine litter and also the problem of discarded fishing gear in particular. Firstly international laws and policies will be depicted and subsequently European ones.

2.1. International Action

For the sake of clarity the overview of international policies describes separately legally binding and not legally binding instruments.

2.1.1. Legally Binding International Agreements

2.1.1.1. *The MARPOL Convention*

The United Nations International Maritime Organisation (IMO) has played a crucial role in the definition of a stable regulatory corpus for marine environment protection, and the IMO’s Conventions have set the basis for mostly all national and regional legislation.⁶⁶ The MARPOL Convention was the first agreement reached by IMO in terms of prevention and control of marine pollution.⁶⁷ The Convention regulates operational vessel-source pollution,⁶⁸ and Annex V of the MARPOL prohibits discharge into the seas of all plastics, expressly mentioning synthetic fishing nets inter alia.⁶⁹ Other relevant provisions include obligation to provide for adequate reception facilities in ports and terminals.⁷⁰

From the perspective of discarded fishing gear, interestingly, the MARPOL has been criticized for a virtual exemption of most fishing vessels from the scope of regulation of its Annex V.⁷¹ It has been noted that most of the global fishing fleet is below 400 gross tonnage⁷², while many of

⁶⁵ Arie Trouwborst, ‘Managing Marine Litter: Exploring the Evolving Role of International and European Law in Confronting a Persistent Environmental Problem’ [2011] *Merkourios – International and European Environmental Law* Vol. 27/73 4, 9.

⁶⁶ 3R-Fish Project (n 15)

⁶⁷ International Convention for the Prevention of Marine Pollution from Ships 1973/1978, 12 ILM 1319.

⁶⁸ Trouwborst (n 65) 10.

⁶⁹ MARPOL (n 67) annex V regulation 3 (2).

⁷⁰ Trouwborst p. 9

⁷¹ Chen and Liu (n 4) 34.

⁷² *ibid* 35.

the MARPOL rules concerning garbage apply only to ships of 400 gross tonnage and above.⁷³

2.1.1.2. *The London Dumping Convention*

The London Dumping Convention 1972 and its 1996 Protocol aim to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping at sea of wastes and other matter generated on land.⁷⁴

2.1.1.3. *The Basel Convention on Hazardous Wastes*⁷⁵

The overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes.⁷⁶ The Basel Convention obliges parties to ensure the availability of adequate disposal facilities for the environmentally sound management of hazardous wastes and other wastes that shall be located to the extent possible within the party's territory whatever the place of their disposal. This general requirement applies also to plastic waste.⁷⁷ Regarding fishing gear, it must be noted that normally fishing gear and materials it is made of are considered to be non-hazardous waste.⁷⁸

2.1.1.4. *The Convention on Biological Diversity*

The Convention on Biological Diversity 1992 represents a dramatic step forward in the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources.⁷⁹ As other global conservation agreements, the Convention is (indirectly) relevant to the topic of plastic marine litter,⁸⁰ bearing in mind negative impacts of plastic marine litter on marine biodiversity and ecosystems.

2.1.2. **Not Legally Binding International Acts**

2.1.2.1. *United Nations General Assembly Resolutions*

The issues of marine debris and discarded fishing gear have been raised at the level of the United Nations General Assembly on several occasions, in particular in adopted in recent years:

- Resolution A/RES/60/30 of 2005 notes the lack of information and data on marine debris and encourages relevant national and international organizations to undertake further studies on

⁷³ For example, requirements to carry out waste management plans and garbage record books.

⁷⁴ Commission Staff Working Document (n 36) 9.

⁷⁵ The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1989.

⁷⁶ 'Overview of the Basel Convention' <http://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx> accessed 28 June 2013.

⁷⁷ Green Paper on Plastic Waste (n 32) 19.

⁷⁸ 3R-Fish Project (n 15) 16.

⁷⁹ 'History of the Convention' <http://www.cbd.int/history/default.shtml> assessed 28 June 2013.

⁸⁰ Trouwborst (n 65) 11.

the extent and nature of the problem;

- Resolution A/RES/60/31 of 2005 calls upon States, the Food and Agriculture Organization (FAO), the International Maritime Organization (IMO), the United Nations Environment Programme (UNEP), and in particular its Regional Seas Programme (RSP), regional and subregional fisheries management organizations and arrangements and other appropriate intergovernmental organizations to take action to address the issue of lost or abandoned fishing gear and related marine debris through the collection of data on gear loss, economic costs to fisheries and other sectors, and the impact on marine ecosystems;
- Resolution A/RES/61/222 of 2006 welcomes the activities of the UNEP relating to marine debris carried out in cooperation with relevant United Nations bodies and organizations; and
- Resolution A/RES/61/105 of 2006 reaffirms the importance it attaches to the issue of lost, abandoned, or discarded fishing gear and related marine debris expressed in its resolution 60/31.

2.1.2.2. *The Global Programme of Action*

In 1995 the European Commission and 108 states adopted the Global Programme of Action on the Protection of the Marine Environment from Land-Based Activities ('the GPA').⁸¹ One of its objectives is to 'reduce significantly the amount of litter reaching the marine and coastal environment by the prevention or reduction of the generation of solid waste and improvements in its management, including collection and recycling of litter'.⁸²

The GPA and the UNEP launched jointly the 'Global Initiative on Marine Litter'. This initiative, which includes the issue of discarded fishing gear, took an active lead in addressing the challenge of marine litter by assisting 12 Regional Seas around the world in organizing and implementing regional activities and strategies on marine litter.⁸³

It should be borne in mind that even though the Global Programme of Action is not legally binding itself, the various Regional Seas Conventions are. Thus, Europe's four Regional Seas are each governed by a Regional Sea Convention:

- the Mediterranean Sea – by the 1995 Barcelona Convention;
- the Baltic Sea – by the 'Convention on the Protection of the Marine Environment of the Baltic Sea Area' (the Helsinki Convention or HELCOM);
- the North-East Atlantic – by the 1992 OSPAR Convention;

⁸¹ '1995 Global Programme of Action on the Protection of the Marine Environment from Land-Based Activities' (1995) 6 Yearbook of International Environmental Law 883.

⁸² *ibid* para 144 (b).

⁸³ UNEP and FAO (n 20) xi.

- the Black Sea – by the 1992 Bucharest Convention.⁸⁴

Within OSPAR, two years ago a discussion was held on a proposal by one of the stakeholders to reduce marine litter by 40% in 2020. Nevertheless, the final version of the Ministerial declaration of OSPAR 2010 much more humbly states: ‘We note that quantities of litter in many areas of the North-East Atlantic are unacceptable, and therefore we will continue to develop reduction measures and targets, taking into consideration an ambitious target resulting in a reduction in 2020’.⁸⁵

2.1.2.3. The Honolulu Strategy

As a pre-cursor to the Rio+20 Summit, in 2011 the Honolulu Strategy was developed in the course of and after the 5th International Marine Debris Conference, organized by UNEP and the US National Oceanic and Atmospheric Administration (NOAA) Marine Debris Programme.⁸⁶ No quantified targets are proposed but a more generic reduction objective is envisaged:

- Reduced amount and impact of land-based sources of marine debris introduced to the sea;
- Reduced amount and impact of sea-based sources of marine debris, including solid waste, lost cargo, abandoned, lost or otherwise discarded fishing gear (ALDFG) and abandoned vessels, introduced into the sea.⁸⁷

2.2. The European Union’s Applicable Laws and Policies

Plastic waste is not specifically addressed by the EU legislation despite its growing environmental impact.⁸⁸ It is considered to be one of key examples of waste streams of growing concern which may not adequately be covered by existing European waste regulations.⁸⁹

European legislation and policies, discussed in this chapter, will be divided in two groups as a matter of convenience: water and nature-related and waste-related.

2.2.1. Water and Nature-Related European Legislation

2.2.1.1. The Marine Strategy Framework Directive

The Marine Strategy Framework Directive directly addresses the issue of marine litter. The Directive calls for the development and implementation of strategies by Member States so that

⁸⁴ Commission Staff Working Document (n 36) 14.

⁸⁵ *ibid* 13.

⁸⁶ *ibid* 20.

⁸⁷ The Honolulu Strategy, 13 <http://5imdc.files.wordpress.com/2011/03/honolulustrategy.pdf> accessed 28 June 2013.

⁸⁸ Green Paper on Plastic Waste (n 32) 6.

⁸⁹ BIO Intelligence Service, *Study on Coherence of Waste Legislation* (Final Report Prepared for the European Commission (DG ENV), 2011) 7.

all of the EU's marine regions and sub-regions attain 'Good Environmental Status' (GES) by 2020.⁹⁰ This important for the problem of plastic marine debris Directive will be described in more detail in chapter 3.

2.2.1.2. *The Habitats Directive*

The Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora⁹¹ – known as the Habitats Directive – aims to maintain or restore natural habitats and species of wild fauna and flora. The measures required of Member States fall into two main categories: the conservation of sites for habitats and species of Community interest; and the strict protection of selected species. The Directive requires the establishment of a coherent-European ecological network known as Natura 2000, in which Member States must establish the 'necessary conservation measures', for each site to provide the necessary ecological conditions for the habitats and species of Community interest that are present. It also requires Member States to take appropriate steps to avoid the deterioration of the habitats concerned and any disturbance of those species for which the sites have been designated. Thus, if any habitats and species protected by marine Natura sites are under threat from marine litter, Member States should be responsible for ensuring that there are appropriate measures in place to avoid this.

When it comes to the strict protection of certain species of Community interest⁹², the Habitats Directive explicitly requires Member States to take measures against ghost fishing. According to the article 12 (4) of the Habitats Directive Member States 'shall establish a system to monitor the incidental capture and killing of the animal species listed in Annex IV (a)'. This provision concerns, for instance, small cetaceans (whales, dolphins and porpoises) that are reported to be caught in nets in amount of minimum 130,000 a year.⁹³ Then on the basis of gathered information Member States should take further research or conservation measures as required to ensure that incidental capture and killing 'does not have a significant negative impact on the species concerned'.

2.2.1.3. *The Bathing Water Directive*⁹⁴

The Bathing Water Directive aims to guarantee bathing water quality, which may be threatened by pollution. In particular, the Directive provides that bathing waters must be inspected visually for pollution such as tarry residues, glass, plastic, rubber or any other waste as part of the beach profile. In case such pollution is identified, adequate management measures must be taken. All bathing waters in the EU must be at least of sufficient quality by the end of the 2015

⁹⁰ Commission Staff Working Document (n 36) 12.

⁹¹ Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora [1992] OJ L 206.

⁹² Listed in Annex IV (a) of the Habitats Directive.

⁹³ Allsopp et al. (n 1) 15.

⁹⁴ Directive 2006/7/EC concerning the management of bathing water quality and repealing Directive 76/160/EEC [2006] OJ L 64.

bathing season. If quality is poor and/or when waste is visually detected, Member States must adopt the necessary measures to manage and reduce pollution, and to protect and inform bathers.

2.2.1.4. *The Common Fisheries Policy*

The European fisheries are managed by EU countries in collaboration through the common fisheries policy (CFP). The Common Fisheries Policy covers the conservation, management and exploitation of marine resources, and the processing and marketing of fishery and aquaculture products.⁹⁵

The main Regulations comprising the CFP are:

- the ‘Basic’ Regulation of the CFP (N 2371/2002);⁹⁶
- the CFP Control Regulation (N 1224/2009);⁹⁷
- the Regulation on the European Fisheries Fund (N 1198/2006).⁹⁸

Provisions of main CFP Regulations, related to marine litter, will be described in detail in chapter 3.

2.2.2. Waste and Resource-Related Laws and Policies

2.2.2.1. *The Directive on Port Reception Facilities for Ship-Generated Waste and Cargo Residues*

The Directive on port reception facilities for ship-generated waste and cargo residues⁹⁹ has a purpose to enhance the protection of the marine environment by improving the availability and use of port reception facilities for ship-generated waste and cargo residues.¹⁰⁰ The specific provisions of this Directive will be discussed in chapter 3.

2.2.2.2. *The Waste Framework Directive*¹⁰¹

The Waste Framework Directive constitutes the legislative framework for the handling of waste in the European Union and has set the basis to minimise the negative effects of waste generation and management on human health and the environment.¹⁰² The Waste Framework

⁹⁵ Summary of EU Legislation, ‘Conservation and exploitation of marine resources’ http://europa.eu/legislation_summaries/maritime_affairs_and_fisheries/fisheries_resources_and_environment/l6_6006_en.htm accessed 28 June 2013.

⁹⁶ Council Regulation (EC) No 2371/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy [2002] OJ L 358.

⁹⁷ Council Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy [2009] OJ L 358/59.

⁹⁸ Council Regulation (EC) No 1198/2006 on the European Fisheries Fund [2006] OJ L 223/1.

⁹⁹ PRFD (n 12).

¹⁰⁰ *ibid* art 1.

¹⁰¹ Directive 2008/98/EC on waste and repealing certain Directives [2008] OJ L312/3.

¹⁰² 3R-Fish Project (n 15) 12.

Directive sets out essential conditions for waste management and concerns all waste. It has thus a direct influence on marine litter. The Directive introduces a binding waste hierarchy, defining the order of priority for treating waste. Top of the list is waste prevention, followed by re-use, then recycling and then other recovery operations, with disposal such as landfill to be used only as the last resort.¹⁰³ Chapter 3 will elaborate further on certain rules of the Waste Framework Directive.

2.2.2.3. *The Packaging and Packaging Waste Directive*¹⁰⁴

The Directive sets a range of requirements to reduce the impact of packaging and packaging waste on the environment. It contains provisions on the prevention of packaging waste, on the re-use of packaging and on the recovery and recycling of packaging waste. Prevention of the production of packaging waste is the first priority.¹⁰⁵

2.2.2.4. *The Landfill Directive*¹⁰⁶

The Directive is applicable to litter from landfills entering the seas and becoming marine litter.¹⁰⁷ The Landfill Directive establishes technical requirements for the operation of landfills, with the goal of reducing their impact on the environment, including the pollution of surface water. This Directive, for example, requires that the location of landfill sites takes into account factors such as the proximity of water bodies and coastal waters and that wind-blown materials are minimized. Such measures should reduce potential penetration of plastic packaging waste and other debris into the marine environment.¹⁰⁸

2.2.2.5. *The Regulation on Shipments of Waste*¹⁰⁹

The EU Regulation on shipments of waste establishes procedures and control regimes for the shipment of waste, depending on the origin, destination and route of the shipment, the type of waste shipped and the type of treatment that will be applied to the waste at its destination.¹¹⁰ The Regulation applies to shipments of waste between Member States, between EU countries and non-EU countries and in transit through the EU.¹¹¹ Plastic waste destined for recovery operations (for example, recycling) is normally a subject to general information requirements laid down by the Regulation; the more difficult procedure of prior written notification and

¹⁰³ Commission Staff Working Document (n 36) 6 and 7.

¹⁰⁴ Directive 94/62/EC on packaging and packaging waste [1994] OJ L365/10.

¹⁰⁵ Commission Staff Working Document (n 36) 7.

¹⁰⁶ Council Directive 1999/31/EC on the landfill of waste [1999] OJ L182/1.

¹⁰⁷ F Galgani, D Fleet, J Van Franeker, S Katsanevakis, T Maes, J Mouat, L Oosterbaan, I Poitou, G Hanke, R Thompson, E Amato, A Birkun and C Janssen, *Marine Strategy Framework Directive – Task Group 10 Report Marine Litter* (Luxembourg: Office for Official Publications of the European Communities, 2010) 13.

¹⁰⁸ Commission Staff Working Document (n 36) 8.

¹⁰⁹ Regulation (EC) No 1013/2006 on shipments of waste [2006] OJ L 190/1.

¹¹⁰ *ibid* art 1 (1).

¹¹¹ *ibid* art 1 (2).

consent is not needed.

2.2.2.6. The Flagship Initiative for a Resource-Efficient Europe

Avoiding waste (and thus the loss of raw materials) and using the remaining waste as a secondary resource, will help to make Europe a 'resource efficient economy', which is one of the objectives of the Europe 2020 Strategy. That Strategy incorporates seven flagship initiatives, including one on resource efficiency. Concrete actions are set out in the European Commission's Roadmap to a Resource Efficient Europe. Contributing to marine litter strategies in all four EU marine regions is among these actions. Furthermore, a reduction in material usage during product manufacture will lead to a direct reduction in the amount of end-of-life material accumulating in the environment.¹¹²

2.2.2.7. The Green Paper on a European Strategy on Plastic Waste in the Environment¹¹³

Recognizing the challenges posed by plastic waste (for the marine environment in particular), very recently the European Commission issued the Green Paper on a European Strategy on Plastic Waste in the Environment ('the Green Paper'). In March 2013 a public consultation on the Green Paper was launched in order to start public reflection on the problem of plastic waste and how this problem should be addressed in European legislation. The Green Paper gives information and raises various questions concerning plastic waste. For instance, it poses a question if an EU wide quantitative reduction target for marine litter would contribute to the solution of the plastic debris problem. A follow-up on the public consultation on the Green Paper is planned for September 2013 in the form of a seminar.¹¹⁴

¹¹² Commission Staff Working Document (n 36) 6.

¹¹³ Green Paper on Plastic Waste (n 32).

¹¹⁴ Interview Prof. H. Maurer.

CHAPTER 3: A CLOSER LOOK AT SELECTED EUROPEAN LAWS AND POLICIES

This chapter provides more detailed overview and reflections on the European Union’s laws which are considered to be principal for prevention, withdrawal and recycling plastic marine litter in general and fishing gear in particular. The following selected pieces of legislation will be analysed below: the Marine Strategy Framework Directive, the Common Fisheries Policy, and two pieces of the European waste policy - the Port Reception Facilities Directive and the Waste Framework Directive.

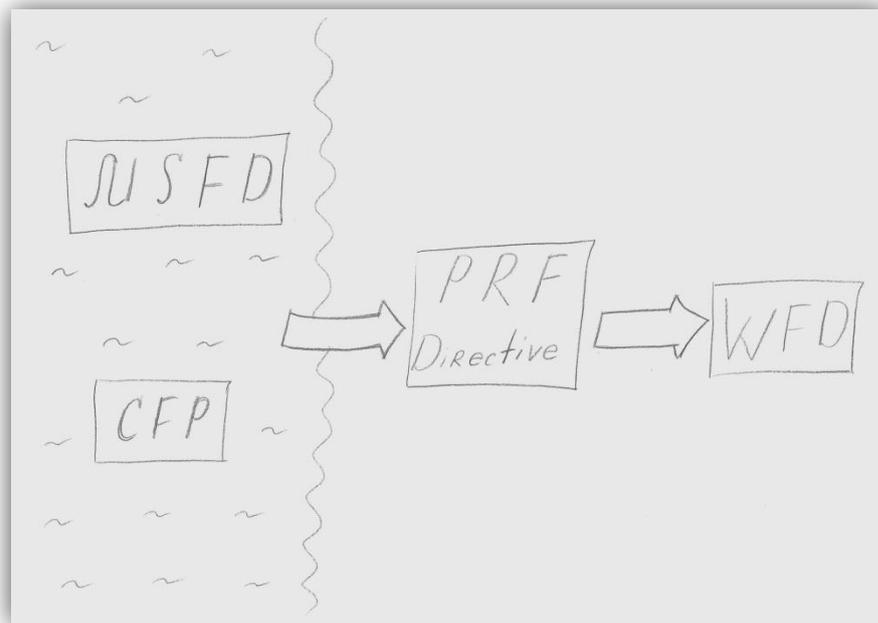


Figure 2: Selected for an analysis laws and policies

3.1. The Marine Strategy Framework Directive

The Marine Strategy Framework Directive is a key element in Europe’s actions to address marine litter.¹¹⁵ It requires Member States to take the necessary measures to achieve or maintain good environmental status (‘GES’) in the marine environment by the year 2020.¹¹⁶ For this purpose each Member State shall develop a Marine Strategy for its marine waters.¹¹⁷

3.1.1. Good Environmental Status and Marine Litter

Member States determine a set of characteristics for GES themselves on the basis of 11 qualitative descriptors listed in Annex I MSFD, in respect of each marine region or subregion

¹¹⁵ Commission Staff Working Paper (n 36) 12.

¹¹⁶ Directive 2008/56/EC establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) [2008] OJ L 164/19, art 1.

¹¹⁷ *ibid* art 5(1).

concerned.¹¹⁸ Descriptor 10 in Annex I reads as follows: ‘Properties and quantities of marine litter do not cause harm to the coastal and marine environment’.¹¹⁹

On 1 September 2010, the European Commission adopted a Decision (2010/477/EU) outlining the criteria to be used by Member States in the context of the MSFD to assess the environmental status of their seas. Criteria elaborate qualitative descriptors of Annex I further; they are meant to direct and assist Member States in the determination of characteristics of GES. The two criteria and four indicators relating to marine litter are:

10.1 Characteristics of litter in the marine and coastal environment

- Trends in the amount of litter washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution and, where possible, source (10.1.1)
- Trends in the amount of litter in the water column (including floating at the surface) and deposited on the sea-floor, including analysis of its composition, spatial distribution and, where possible, source (10.1.2)
- Trends in the amount, distribution and, where possible, composition of micro-particles (in particular micro-plastics) (10.1.3)

10.2 Impacts of litter on marine life

- Trends in the amount and composition of litter ingested by marine animals (e.g. stomach analysis) (10.2.1).¹²⁰

It should be noted that no quantitative indications of any kind are determined by EU legislator for GES which have to be followed or taken into account by Member States.¹²¹

3.1.2. Implementation Schedule

To achieve GES, each Member State must progressively put in place its own Marine Strategy to protect the seas. MSFD provides for that an implementation schedule for Member States is as follows:

- by 15 July 2012, Member States had to make an initial assessment of the current state of, and determine GES for their marine waters together with environmental targets and associated indicators;
- by 15 July 2014, they should have put a monitoring programme in place for ongoing

¹¹⁸ ibid art 9.

¹¹⁹ ibid Annex 1.

¹²⁰ Commission Decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters [2010] OJ L 232.

¹²¹ MSFD (n 114) art 10 (1).

assessment and updating of targets;

- by 2015, they should have their Marine Strategies in place;

- by 2016 at the latest operation of Marine Strategies should start.¹²²

3.1.3. The MSFD and Regional Seas Conventions

Cooperation between Member States and coordination with third countries is strongly promoted in the MSFD in order to ensure that the different elements of the Marine Strategies are coherent and coordinated across the marine (sub)region in question.¹²³ Such cooperation shall take place 'where practical and appropriate' with the use of existing regional institutional cooperation structures, in particular Regional Seas Conventions, for instance the OSPAR Convention in case of the North-East Atlantic and the North Sea.¹²⁴

3.1.4. Reflections on the MSFD

Several aspects of the MSFD will be discussed below, namely an amount of discretion granted to Member States by the MSFD, the implementation schedule and economic requirements. These features are considered by researchers to be capable to undermine the environmental effectiveness of the MSFD, and consequently its capability to stimulate achieving GES with regard to marine litter in particular.

3.1.4.1. The Discretion of Member States

It has been opined that the MSFD leaves a too large amount of discretion to Member States in respect to determining GES and establishing their Marine Strategies.¹²⁵

The following provisions of the MSFD serve as a basis for the above-mentioned critique:

- Member States have to notify the Commission after the completion of each action from the following: the initial assessment, the determination of GES, the establishment of environmental targets, the establishment of monitoring programmes and the establishment of their programmes of measures.¹²⁶ The Commission has a quite limited advisory mandate for responding to the notifications.¹²⁷ The Commission may provide 'guidance' to Member States on any modification it considers necessary.¹²⁸

¹²² *ibid* art 5 (2).

¹²³ Trouwborst (n 65) 16.

¹²⁴ *ibid* 16.

¹²⁵ T Markus and M Salomon, 'The Law and Policy Behind the Upcoming Reform of the Common Fisheries Policy' [2012] JEEPL 9.3-4 257.

¹²⁶ MSFD (n 114) articles 9 (2), 10 (2), 11 (3), 13 (9).

¹²⁷ T Markus, S Schlacke, N Maier, 'Legal Implementation of Integrated Ocean Policies: the EU's Marine Strategy Framework Directive' [2011] The International Journal of Marine and Coastal Law 26 59, 85.

¹²⁸ MSFD (n 114) articles 12 and 16.

- Member States can use ‘opt-out’ of certain qualitative descriptors in Annex I where these are deemed inappropriate and provided that justification is given to the Commission.¹²⁹

Thus, the MSFD hands the main responsibility for solving the transboundary by nature problem of marine environmental protection (including the problem of marine debris) to Member States. The European Commission justifies this, referring to the diverse conditions and needs of the European marine environment. It has been argued that while such diversity undoubtedly exists, an example of Regional Seas Conventions alone shows that in spite of the diversity it would still be possible to give the MSFD a greater normative force.¹³⁰

Additionally, there is a view that a wide margin of discretion of Member States provides room for political value judgments. Eventually, success will thus depend on how Member States value the marine environment, and which pressures and risks they will deem acceptable.¹³¹

3.1.4.2. Implementation Schedule

It has been noted that the implementation schedule of the MSFD is not particularly ambitious given that comprehensive status reports had already been prepared in international cooperation activities on marine protection.¹³² To illustrate, OSPAR prepares Quality Status Reports for the North-East Atlantic on a regular basis.¹³³ OSPAR started to carry out a beach litter monitoring already in 2001.¹³⁴

Besides that, the schedule is deemed to be inconsistent: Member States are given time until 2016 to implement their programmes of measures but only four years after that to attain GES.¹³⁵

3.1.4.3. Economic Requirements of the MSFD

According to the MSFD, Member States are required to ensure that measures (for achieving GES) are ‘cost-effective and technically feasible, and shall carry out impact assessments, including cost-benefit analyses, prior to the introduction of any new measure’.¹³⁶

Scientists have raised concerns that the MSFD might fail to achieve its environmental targets due to the aforementioned provision. Cost-benefit analysis and environmental evaluation have certain limitations in the marine context. The problem is that the costs of such improvement

¹²⁹ ibid Annex I.

¹³⁰ M Salomon, ‘Recent European Initiatives in Marine Protection Policy: Towards Lasting Protection for Europe’s Seas?’ [2009] *Environmental Science & Policy* 12 359, 363.

¹³¹ Markus et al. (n 125) 79 and 80.

¹³² Salomon (n 128) 363.

¹³³ For example, see Quality Status Report 2000 for the North-East Atlantic at

http://www.ospar.org/content/content.asp?menu=00650830000000_000000_000000 accessed 28 June 2013.

¹³⁴ UNEP 2009 (n 26) 107.

¹³⁵ Salomon (n 128) 363.

¹³⁶ MSFD (n 114) art 13 (3).

measures for achieving GES are often relatively easy to determine (for example in terms of foregone revenues), the determination of the associated benefits is more challenging for at least two reasons. Firstly, it is difficult to trace how change in the marine biosphere (e.g., less marine litter) that leads to a change in the provisioning of ecosystem goods or services finally affects benefits for humans. Second, the associated benefits need to be quantified in monetary terms to carry out the cost-benefit analysis. Many ecosystem goods and services, particularly those created in a marine environment, are not traded on markets and thus prices, as an indicator for values, do not exist. Environmental valuation methods can be used to value such non-market goods and services.¹³⁷

However, existing valuation studies, for example, tend to look at changes in tangible benefits like recreation and food provisioning but mostly ignore changes in more intangible benefits derived, e.g., from ecosystem functioning or resilience. Nonetheless, it might be these services that are more important for sustainable development and society as a whole. A cost-benefit analysis that ignores such services will most likely underestimate the true value of marine ecosystem goods and services significantly. Since the costs of improvement measures are easier to determine, this in turn might reduce the probability of measures being implemented.¹³⁸

Consequently, the cost-benefit analysis under the MSFD is likely to result in an underestimation of the related benefits for the environment and a relative overestimation of the related costs of measures to achieve GES.¹³⁹ Hence, there is a risk that the environmental effectiveness of the MSFD might be hampered, and the GES might not be achieved.¹⁴⁰

3.2. The Common Fisheries Policy

The Common Fisheries Policy contains provisions which are highly relevant for the problem of discarded fishing gear.

3.2.1. The CFP 'Basic' Regulation

Article 1 of the so-called CFP 'Basic' Regulation contains a generally phrased statement that the CFP should provide for measures aimed at resource conservation and management, and the limitation of the environmental impact of fishing.¹⁴¹ Arguably, this provision can be considered a legal basis for measures to address ghost fishing as a source of fishing mortality and impacts on the wider marine environment. As it has been mentioned previously, ghost fishing is a process when a discarded fishing gear continues to catch and kill marine wildlife.

¹³⁷ C Bertram and K Rehdanz, 'On the Environmental Effectiveness of the EU Marine Strategy Framework Directive' [2013] Marine Policy 38 25,26.

¹³⁸ *ibid* 26.

¹³⁹ *ibid* 37.

¹⁴⁰ *ibid* 26.

¹⁴¹ Basic CFP Regulation (n 94) art 1 (2).

3.2.2. The CFP Control Regulation

The CFP Control Regulation requires Community fishing vessels to have the equipment on board to retrieve lost gear, to attempt to retrieve it as soon as possible, and to inform coastal authorities of the incident if it cannot be retrieved.¹⁴² This requirement undoubtedly has a great potential in struggling with the problem of discarded fishing gear. Nevertheless, a question of ensuring compliance remains, which throughout history has been 'the Achilles heel of the CFP'.¹⁴³ One of the obvious obstacles to the proper enforcement of and providing compliance with CFP rules is the difficulty to collect evidence that rules have been violated at sea, that is, most often, far away from any inspection service.¹⁴⁴ However, it is hoped that relatively new CFP Control Regulation (2010) is capable to resolve the long-standing compliance problem of the CFP.

3.2.3. The Regulation on the European Fisheries Fund

The European Fisheries Fund, the financial instrument supporting the CFP in the period 2007-2013, may provide financial assistance for measures to remove lost fishing gear from the seabed in order to combat ghost fishing. These measures are to be implemented with the active support of operators themselves or by organisations acting on behalf of producers.¹⁴⁵ Nevertheless, for the period 2014-2020 the European Commission has proposed a new instrument for a financial support of the CFP within the framework of a reform of the CFP.

3.2.4. Reform of the Common Fisheries Policy

The Common Fisheries Policy is currently under reform. The new policy is expected to enter into force by 1 January 2014.¹⁴⁶ In 2011 the European Commission has proposed a reform package which contains, in particular:

- Proposal for a new 'Basic' Regulation on the CFP¹⁴⁷ and
- Proposal for a Regulation on the European Maritime and Fisheries Fund.¹⁴⁸

It should be noted that the existing CFP Control Regulation is not planned to be reformed. That

¹⁴² CFP Control Regulation (n 95) art 48.

¹⁴³ Markus and Salomon (n 123) 265.

¹⁴⁴ A Laurec, 'Common Fisheries Policy – the Present Situation and the Challenges That Lie Ahead' [2007] IOS Press 328, 329.

¹⁴⁵ Regulation on the European Fisheries Fund (n 96) art 37.

¹⁴⁶ European Commission, *Questions and Answers on the new, reformed Common Fisheries Policy* (MEMO/13/482, 2013) http://europa.eu/rapid/press-release_MEMO-13-482_en.htm accessed 28 June 2013.

¹⁴⁷ European Commission, *Proposal for a Regulation of the European Parliament and of the Council on the Common Fisheries Policy* (COM/2011/0425 final - 2011/0195 (COD)).

¹⁴⁸ European Commission, *Proposal for a Regulation of the European Parliament and of the Council on the European Maritime and Fisheries Fund [repealing Council Regulation (EC) No 1198/2006 and Council Regulation (EC) No 861/2006 and Council Regulation No XXX/2011 on integrated maritime policy]* (COM/2011/0804 final - 2011/0380 (COD)).

is why the proposals for the new CFP integrate the basic elements of the existing control and enforcement regime for compliance with the rules of the CFP.¹⁴⁹

Interestingly, article 38 of the Proposal for a Regulation on the European Maritime and Fisheries Fund ('EMFF') states that

"1. In order to stimulate the participation of fishermen in the protection and restoration of marine biodiversity and ecosystems including the services they provide in the framework of sustainable fishing activities, the EMFF may support the following operations:

(a) collection of waste from the sea such as the removal of lost fishing gears and marine litter;
...

2. Operations under this Article shall be implemented by public law bodies and shall involve fishermen or organisations of fishermen, recognised by the Member State, or non-governmental organisation in partnership with organisations of fishermen..."¹⁵⁰

Comparing to the existing European Fisheries Fund, it can be seen that the newly proposed fund may provide financial assistance not only for collection of lost fishing gear but for other types of marine litter. Additionally, it provides for involvement of NGOs in collection operations as partners of fishermen's organisations. These proposed changes look positive and promising from a perspective of handling the problem of marine litter in general and discarded fishing gear in particular.

3.3. The Port Reception Facilities Directive

It has been observed that causes of discarding fishing gear include the unavailability of onshore waste disposal facilities, as well as their accessibility and cost of use.¹⁵¹

This Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues¹⁵² ('Port Reception Facilities Directive', 'PRF Directive') seeks to enhance the availability and use of port reception facilities for ship-generated waste and cargo residues in the European Union. The PRF Directive transposes into EU legislation the requirements under the MARPOL Convention, which regulate the conditions for discharges of ships' waste and residues at sea and the obligation for ports to provide reception facilities. It addresses in detail the legal, financial and practical responsibilities of the different operators involved in delivery of ship-generated waste and cargo residues.¹⁵³

¹⁴⁹ 'Commission plans revamped CFP' [2011] EU Focus 2011 286 4.

¹⁵⁰ Proposal on the European Maritime and Fisheries Fund (n 146) art 38. FLAGS stand for Fisheries Local Action Groups.

¹⁵¹ UNEP and FAO (n 20) xvii.

¹⁵² PRDF (n 12).

¹⁵³ Summary of EU Legislation, 'Port facilities for ship-generated waste and cargo residues'

A number of deficiencies have been observed in the PRF Directive in force, which undermine its environmental performance.¹⁵⁴ Studies have shown that results of adoption of the PRF Directive in terms of decreasing the amount of marine litter are lower than it could be expected. For instance, stomach contents of fulmars in the Netherlands indicate that implementation of the PRF Directive may have stopped further deterioration in a period where potential sources of debris have increased, but has not resulted in the environmental improvement that it intended.¹⁵⁵

At the moment the European Commission is preparing a proposal for an amended PRF Directive which is expected in summer 2013.¹⁵⁶ It is the review of the PRF Directive that provides a key opportunity to tackle the dumping of ship generated waste.¹⁵⁷ It is hoped that main critique of the current system of port reception facilities in the EU, discussed below, will be taken into account in the course of law-making process.

3.3.1. Lack of Facilities for Segregated Waste and Discarded Fishing Gear

A practice of onboard segregation of recyclable materials only makes sense if port reception facilities accept separated recyclable materials. Only a small number of ports operate a system to segregate and recycle waste.¹⁵⁸ Unfortunately, in Europe it is often the case that such facilities are not available; a common scenario entails a ship pulling up beside a barge that is not equipped with separation units, and where upon all the onboard separated waste is dropped into the barge. Such a scenario gives little incentive for crews to practice good onboard management.¹⁵⁹

Besides that, it is highly desirable that port authorities also provide facilities for handling damaged or otherwise redundant fishing gear. It would also be effective here, in line with established 'fishing for litter' schemes and initiatives similar to the Healthy Seas, that the Directive would encourage states to provide free - or have the costs reduced - reception facilities for litter recovered at sea by fishing vessels or divers within the framework of initiatives.¹⁶⁰

http://europa.eu/legislation_summaries/environment/waste_management/l24199_en.htm accessed 28 June 2013.

¹⁵⁴ Seas At Risk, *Position Paper - Ship waste dumping and the clean ship concept - How an improved EU PRF Directive can play a key role in Cleaning up the Seas* 5 <http://www.seas-at-risk.org/1images/Seas%20At%20Risk%20Position%20Paper160911.pdf> accessed 26 June 2013.

¹⁵⁵ JA Van Franeker and the SNS Fulmar Study Group, *Fulmar Litter and EcoQO Monitoring along Dutch and North Sea Coasts in Relation to EU Directive 2000/59/EC on Port Reception Facilities: Results to 2009* (IMARES Report N C037/11, 2011) 45.

¹⁵⁶ Interview L. De Vrees.

¹⁵⁷ Seas at Risk (n 152) 1.

¹⁵⁸ *ibid* 6.

¹⁵⁹ *ibid* 5.

¹⁶⁰ *ibid* 11.

It has been recommended that protocols for reception to facilities for fishing gear should be carefully adapted to 4 different states in which nets and related apparel are collected: clean, quite clean, rather dirty and dirty.¹⁶¹ This measure would substantially ease a subsequent recycling of fishing gear.

Therefore, it appears that the PRF Directive could make a difference if it would encourage (or better requiring) Member States to provide adequate facilities for segregated recyclable materials and for damaged and/or discarded fishing gear. Requirements for recycling of fishing gear need to be taken into account when formulating relevant provisions.

3.3.2. Fees for Use of Port Reception Facilities

One of, if not the main reason for dumping waste at sea is the cost of discharging waste at a port reception facility.¹⁶² Any additional tariff for reception of waste such as fishing gear may be a disincentive to fishers compared to burning or dumping at no immediate direct cost.¹⁶³

The PRF Directive provides for that the cost recovery systems for using port reception facilities 'shall provide no incentive for ships to discharge their waste into the sea'.¹⁶⁴ Further the PRF Directive lays down principles which should be followed in order to ensure absence of incentives for ships to carry out illegal discharges of waste,¹⁶⁵ and in this part disincentives hide. The principles in question state in particular that:

- all ships should pay a fixed part of costs (which the Commission interprets as meaning at least 30%¹⁶⁶), whether they use facilities or not. That said, the fee can be *incorporated* in the port dues or represent a *separate* waste fee; this choice is to be made by Member States;
- the part of costs which is not covered by the fixed fee should be covered on the basis of the types and quantities of waste *actually delivered* (a variable part).

Regarding the incorporation issue, it has been suggested that a removal of separated waste fees is necessary. By incorporating the full cost of reception facilities use in the general harbour dues which all ships pay (regardless of whether they use the facilities) one very obvious and substantial reason for ships choosing to dump at sea will be removed. Such an approach, generally known as a 'no-special-fee' system, is already in place in the Baltic Sea, for example.¹⁶⁷

¹⁶¹ 3R-Fish Project (n 15) 18.

¹⁶² Seas at Risk (n 152) 12.

¹⁶³ UNEP and FAO (n 20) 60.

¹⁶⁴ PRFD (n 12) art 8 (2).

¹⁶⁵ *ibid* art 8 (2).

¹⁶⁶ *ibid* Statement from the Commission.

¹⁶⁷ Seas at Risk (n 152) 12.

In respect to criterion of waste actually delivered, because at present the PRF Directive only requires a partial inclusion of fees in harbour dues, savings still to be made by ships that choose to dump at sea instead.¹⁶⁸ It stands to reason that ships would try to decrease the amount of waste actually delivered by dumping in the seas, with the purpose to cut down expenses.

Among other alternatives, suggested to modify the existing system of fees under the PRF Directive, is a deposit-refund system. In a deposit-refund system, ships pay deposits that are added to the fees and receive refunds when they dispose waste. This system is one of the economic instruments used for environmental protection; it combines taxes and subsidies to prevent littering and promote material recovery. Consumers of deposit-refund goods have an incentive to dispose waste and receive refunds, and a high recovery rate can be attained with low monitoring costs. If consumers dispose waste in an inappropriate manner, the deposits can be used to recover the negative externality from this activity.¹⁶⁹

3.3.3. Mandatory Discharge of Waste at Reception Facilities

Currently, exemptions are granted, when a ship has sufficient storage capacity, until the next port of delivery.¹⁷⁰ However, it is very likely that in many cases the slippery vessel operator will make use of this exemption in order to retain waste on board and dump it in open seas later during their voyage. To avoid this happening, and to keep things clear, the PRF Directive should insist on mandatory discharge for all ship-generated garbage before leaving port, applied to all ships.¹⁷¹

3.4. The Waste Framework Directive

Directive 2008/98/EC on waste¹⁷² (known as ‘Waste Framework Directive’) requires that waste is managed without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odours, and without adversely affecting the countryside or places of special interest.¹⁷³

With regard to the Waste Framework Directive and the problem of plastic marine litter, issues of recycling targets and permits (and information on their granting) will be discussed below.

3.4.1. Recycling Targets

Currently the Waste Framework Directive provides for that Member States should ‘take

¹⁶⁸ *ibid* 6.

¹⁶⁹ DA Georgakellos, ‘The Use of the Deposit-Refund Framework in Port Reception Facilities Charging Systems’ [2007] *Marine Pollution Bulletin* 54 508, 518-519.

¹⁷⁰ PRFD (n 12) art 7 (2).

¹⁷¹ *Seas at Risk* (n 152) 11.

¹⁷² *Waste Framework Directive* (n 99).

¹⁷³ European Commission, ‘Directive 2008/98/EC on waste (Waste Framework Directive)’ <http://ec.europa.eu/environment/waste/framework/index.htm> accessed 26 June 2013.

necessary measures designed to achieve' the target of 50% by weight for the preparing for re-use and the recycling of materials such as at least paper, metal, plastic and glass from households. Waste from other origins with similar to households' waste streams can be included as well. The target is to be achieved by 2020.¹⁷⁴

The described target has been met with criticism from NGOs, politicians and regulators by a number of reasons. First, many have considered the target to be set too low¹⁷⁵ thereby failing to reflect adequately the importance of waste management in resource efficiency.¹⁷⁶

Secondly, it has been emphasized that the target obligations are carefully (presumably politically) crafted so that Member States are obliged to introduce 'the necessary measures designed to achieve the targets¹⁷⁷; ... and the separate collection and overall recycling obligations are subject to what is 'technically, environmentally and economically practicable'.¹⁷⁸ It has been argued that these formulations make the precise nature of the recycling obligation ambiguous.¹⁷⁹

Thirdly, the fact that the target is weight-based is considered to be ineffective when it comes to plastic waste. This limits the incentive to separate and prepare for recycling plastic waste when, for example, other elements of the waste stream such as paper or glass will meet weight-based targets far more easily and quickly.¹⁸⁰

So, what could be recommended for improving the situation? Studies have shown that material-based recycling targets in European waste legislation in addition to the current targets could bring significant environmental benefits.¹⁸¹ At the moment the Packaging Directive is the only EU legal instrument establishing a specific recycling target for plastic (22,5% for the return and/or collection of plastic materials contained in packaging).¹⁸² It could be considered to set further specific plastic waste recycling targets beyond plastic packaging waste.¹⁸³ It seems that in this context setting the recycling target for plastic waste in Waste Framework Directive would be a step forward to resolving the problem of plastic marine litter.

It may also be worth contemplating such ambitious options as setting a specific target for plastic marine litter or even damaged and/or discarded fishing gear. Arguably, such targets

¹⁷⁴ Waste Framework Directive (n 99) art 11 (2)(a).

¹⁷⁵ Belgium, Germany, Austria and the Netherlands are already recycling 50% of household wastes.

¹⁷⁶ HA Nash, 'The Revised Directive on Waste: Resolving Legislative Tensions in Waste Management?' [2009] *Journal of Environmental Law* 21:1 139, 146.

¹⁷⁷ Waste Framework Directive (n 99) art 11 (3) check; E Scotford, 'The New Waste Directive - Trying to Do It All...an Early Assessment' [2009] *Env. L. Rev.* 2009 11(2) 75, 86.

¹⁷⁸ Waste Framework Directive (n 99) arts 10 (2) and 11 (1).

¹⁷⁹ Nash (n 174) 146.

¹⁸⁰ European Commission DG ENV (n 33) 24.

¹⁸¹ BIO Intelligence Service (n 89) 7.

¹⁸² European Commission DG ENV (n 33) 26.

¹⁸³ Green Paper on Plastic Waste (n 32) 11.

would stimulate authorities to initiate or actively support projects similar to 'fishing for litter' schemes and the Healthy Seas.

3.4.2. Permits and Information on Granting of Permits

The Waste Framework Directive requires that any entity which intends to carry out waste treatment should obtain a permit from the competent authority.¹⁸⁴ It is a competence of Member States to issue permits and define permitting procedures.

Two problematic issues have been disclosed during the process of this study with regard to permits. Firstly, due to a margin of discretion given to Member States permitting requirements considerably differ from Member State to Member State. The same waste management operation can require just a registration in one EU country and a license in another.¹⁸⁵ This causes confusion for recycling companies operating at European level, and thus potentially may serve as an obstacle for developing a European market for recycling of plastic (marine) litter.

Additionally, information on granted permits for certain waste management operations is not available to public and to recycling companies willing to operate at EU level in particular. It is argued that this information would allow recycling companies to search more easily and successfully for partner undertakings (around the EU), which have all necessary permits for collection, storage and/or transportation of certain codes of plastic waste.¹⁸⁶

¹⁸⁴ Waste Framework Directive (n 99) art 23.

¹⁸⁵ European Commission Guidance on Permitting and Inspection of Waste Management Operations [2012] 07030/2010/576173/SER/C2 41 Table 4.2-2; interview R. Pecoraro.

¹⁸⁶ Interview R. Pecoraro.

CONCLUSION

The problem of marine litter is not an easy one. In 2012 the UNEP concluded that little or no progress has been achieved in preventing, reducing or controlling pollution of the marine environment.¹⁸⁷ Plastic marine litter is an inherently ‘wicked’ problem¹⁸⁸ due to a myriad of drivers, from individual responsibility to industry actions, from land and at sea.¹⁸⁹

This report has depicted the nature of the problem of plastic debris in the marine environment, its main sources and environmental impacts. As well it has provided a short overview of international and European policies which are (more) relevant to the problem of plastic marine pollution and derelict fishing gear. Several European policies have been selected for more detailed analysis; on the basis of reflections on selected policies some changes to existing European policies could be recommended for (hopefully) more effective struggle with the problem of plastic marine litter. These are:

the Marine Strategy Framework Directive

- decreasing the amount of discretion given to Member States in respect to defining good environmental status for their marine waters and developing their Marine Strategies; strengthening a mandate of the European Commission accordingly;
- making implementation schedule in the MSFD more consistent and ambitious, at least for Member States in regions where monitoring activities are already well-developed;
- removing/modifying economic requirements of the MSFD, so probability of measures (to achieve good environmental status) being implemented is not reduced;

the Common Fisheries Policy

- ensuring compliance to the rules of the CFP Control Regulation on retrieval of lost fishing gear;

the Port Reception Facilities Directive

- providing adequate port reception facilities for waste segregated onboard and for damaged and/or discarded fishing gear (for fishing gear - free of charge or having the costs reduced);
- removing separate fees for using port reception facilities, full incorporation of these fees in general harbour dues in order to get rid of incentives for ships to dump their waste in the seas;
- requiring mandatory discharge of waste at port reception facilities from all ships, without exceptions that are currently laid down;

¹⁸⁷ GEO 5-UNEP Press Release, ‘Under Strict Embargo’ (6 June 2012) 5 http://www.unep.org/geo/pdfs/geo5/GEO5-Global_PR_EN.pdf accessed 28 June 2013.

¹⁸⁸ Hastings and Potts (n 28) 51.

¹⁸⁹ *ibid* 50.

the Waste Framework Directive

- introducing a specific and ambitious recycling target for plastic waste into the WFD;
- considering adoption of collection and recycling targets for marine plastic litter and discarded fishing gear in particular;
- creating a more uniform European system of requirements to obtaining permits for waste management operations;
- requiring Member States to make information about granted permits public with the purpose of developing the market for recycling plastic litter in the European Union.

It should be kept in mind, however, that if the Common Fisheries Policy, the Port Reception Facilities Directive and European waste policy are currently under review, that is not the case for the Marine Strategy Framework Directive. Amending the MSFD is not planned by the European legislator in the near future.

BIBLIOGRAPHY

Allsopp M, Walters A, Santillo D and Johnston P, 'Plastic Debris in the World's Oceans' (Greenpeace, 2 November 2006) <<http://act.gp/LqRJwh>> accessed 13 June 2013

Bertram C and Rehdanz K, 'On the Environmental Effectiveness of the EU Marine Strategy Framework Directive' [2013] *Marine Policy* 38 25

BIO Intelligence Service, *Study on Coherence of Waste Legislation* (Final Report Prepared for the European Commission (DG ENV), 2011)

Brems A, Baeyens J, Dewil R, 'Recycling and Recovery of Post-Consumer Plastic Solid Waste in a European Context' [2012] *Thermal Science* Vol. 16 No. 3 669

Chen Chung-Ling and Liu Ta-Kang, 'Fill the Gap: Developing Management Strategies to Control Garbage Pollution from Fishing Vessels' [2013] *Marine Policy* 40 34

Derraik José G.B., 'The Pollution of the Marine Environment by Plastic Debris: a Review' [2002] *Marine Pollution Bulletin* 44 842, 843; Green Paper on a European Strategy on Plastic Waste in the Environment [2013] COM(2013) 123 final 18

ECNC Group, Aquafil and Star Sock, 'Healthy Seas, a Journey from Waste to Wear' <http://www.ecnc.org/projects/business-and-biodiversity/healthy-seas-a-journey-from-waste-to-wear/> accessed 26 June 2013

European Commission - Press Release, *Environment: What should we do about plastic waste? New Green Paper opens EU-wide reflection* (7 March 2013) http://europa.eu/rapid/press-release_IP-13-201_en.htm accessed 26 June 2013

- - *Questions and Answers on the new, reformed Common Fisheries Policy* (MEMO/13/482, 2013) [http://europa.eu/rapid/press-release MEMO-13-482_en.htm](http://europa.eu/rapid/press-release_MEMO-13-482_en.htm) accessed 28 June 2013

- - 'Directive 2008/98/EC on waste (Waste Framework Directive)' <http://ec.europa.eu/environment/waste/framework/index.htm> accessed 26 June 2013

European Commission DG ENV, *Plastic Waste in the Environment* (2011) 116

Galgani F, Fleet D, Van Franeker J, Katsanevakis S, Maes T, Mouat J, Oosterbaan L, Poitou I, Hanke G, Thompson R, Amato E, Birkun A and Janssen C, *Marine Strategy Framework Directive – Task Group 10 Report Marine Litter* (Luxembourg: Office for Official Publications of the European Communities, 2010)

Georgakellos DA, 'The Use of the Deposit–Refund Framework in Port Reception Facilities Charging Systems' [2007] *Marine Pollution Bulletin* 54 508

GEO 5-UNEP Press Release, 'Under Strict Embargo' (6 June 2012) 5 http://www.unep.org/geo/pdfs/geo5/GEO5-Global_PR_EN.pdf accessed 28 June 2013

Hastings E and Potts T, 'Marine Litter: Progress in Developing an Integrated Policy Approach in Scotland' [2013] *Marine Policy* 42 50

Healthy Seas Initiative, 'Mission Statement for the 'Healthy Seas, a Journey from Waste to Wear' initiative' (2013) 3 http://www.barabinolabs.com/HealthySeas/wp-content/uploads/2013/05/HealthySeas_MS_FINAL.pdf accessed 26 June 2013

'History of the Convention' <http://www.cbd.int/history/default.shtml> assessed 28 June 2013

Laurec A, 'Common Fisheries Policy – the Present Situation and the Challenges That Lie Ahead' [2007] IOS Press 328

Markus T and Salomon M, 'The Law and Policy Behind the Upcoming Reform of the Common Fisheries Policy' [2012] JEEPL 9.3-4 257

Markus T, Schlacke S, Maier N, 'Legal Implementation of Integrated Ocean Policies: the EU's Marine Strategy Framework Directive' [2011] The International Journal of Marine and Coastal Law 26 59

Mato Y, Isobe T, Takada H, Kanehiro H, Ohtake C, Kaminuma T, 'Plastic Resin Pellets as a Transport Medium for Toxic Chemicals in the Marine Environment' [2001] Environmental Science and Technology 35(2) 318

Nash HA, 'The Revised Directive on Waste: Resolving Legislative Tensions in Waste Management?' [2009] Journal of Environmental Law 21:1 139

'Overview of the Basel Convention' <http://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx> accessed 28 June 2013

Rios LM, Moore C, Jones PR, 'Persistent organic pollutants carried by synthetic polymers in the ocean environment' [2007] Marine Pollution Bulletin 54 1230

Salomon M, 'Recent European Initiatives in Marine Protection Policy: Towards Lasting Protection for Europe's Seas?' [2009] Environmental Science & Policy 12 359

Scotford E, 'The New Waste Directive - Trying to Do It All...an Early Assessment' [2009] Env. L. Rev. 2009 11(2) 75

Seas At Risk, *Position Paper - Ship waste dumping and the clean ship concept - How an improved EU PRF Directive can play a key role in Cleaning up the Seas* 5 <http://www.seas-at-risk.org/1images/Seas%20At%20Risk%20Position%20Paper160911.pdf> accessed 26 June 2013

Sheavly SB and Register KM, 'Marine Debris & Plastics: Environmental Concerns, Sources, Impacts and Solutions' [2007] J Polym Environ 15 301

Summary of EU Legislation, 'Conservation and exploitation of marine resources' http://europa.eu/legislation_summaries/maritime_affairs_and_fisheries/fisheries_resources_and_environment/l66006_en.htm accessed 28 June 2013

- - 'Port facilities for ship-generated waste and cargo residues' http://europa.eu/legislation_summaries/environment/waste_management/l24199_en.htm accessed 28 June 2013

Ten Brink P, Lutchman I, Bassi S, Speck S, Sheavly S, Register K, and Woolaway C, *Guidelines on the Use of Market-based Instruments to Address the Problem of Marine Litter* (UNEP 2009)

Trouwborst A, 'Managing Marine Litter: Exploring the Evolving Role of International and European Law in Confronting a Persistent Environmental Problem' [2011] *Merkourios – International and European Environmental Law* Vol. 27/73 4

UNEP, 'Global Initiative'

<http://www.unep.org/regionalseas/marinelitter/initiatives/unepglobal/default.asp> accessed 26 June 2013

- - *Marine Litter: A Global Challenge* (UNEP, 2009)

UNEP and FAO, *Abandoned, Lost or Otherwise Discarded Fishing Gear* (2009) iv; P Ten Brink, I Lutchman, S Bassi, S Speck, S Sheavly, K Register, and C Woolaway, C., *Guidelines on the Use of Market-based Instruments to Address the Problem of Marine Litter* (UNEP 2009)

Van Franeker JA and the SNS Fulmar Study Group, *Fulmar Litter and EcoQO Monitoring along Dutch and North Sea Coasts in Relation to EU Directive 2000/59/EC on Port Reception Facilities: Results to 2009* (IMARES Report N C037/11, 2011)

3R-Fish Project, *New Opportunities for Fishing and Port Generated Waste* (White Book, 2011)