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A Review of Marine Litter Management Practices for the Fishing Industry in the North-East Atlantic Area

Report for OSPAR Action 36: to develop best practice in
the fishing industry

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FINAL REPORT



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List of Abbreviations

ALDFG	Abandoned, Lost or otherwise Discarded Fishing Gear
BIM	Bord Iascaigh Mhara
CIIMAR	Interdisciplinary Centre of Marine and Environmental Research
DFG	Derelict Fishing Gears
EC	European Commission
EEA	European Economic Area
EU	European Union
FAO	Food and Agriculture Organisation
FFL	Fishing for Litter
GES	Good Environmental Status
MSFD	Marine Strategy Framework Directive
ICG-ML	Intercessional Correspondence Group on Marine Litter
NGO	Non-Governmental Organisation
PRF	Port Reception Facilities
RAP	Regional Action Plan
RIF	Responsible Irish Fish
RFS	Responsible Fishing Scheme
SGW	Ship-Generated Waste
SwAM	Swedish Agency for Marine and Water Management

1. Executive summary

Action 36 of the OSPAR Regional Action Plan on Marine Litter seeks to develop and promote best practice in the fishing industry in relation to marine litter. As part of Action 36, a questionnaire was distributed to 12 OSPAR Contracting Parties (Belgium, Denmark, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the UK) to obtain information on the measures implemented (or in preparation) in their countries in relation to marine litter produced (or recovered) by the fishing industry. This report presents the information provided in the responses to the questionnaires and additional information, as summarised below.

Questionnaire responses were received from all the Contracting Parties. There is awareness in all 12 countries that waste from the fishing sector is a source of marine litter. All countries are implementing management measures to prevent waste from the fishing industry entering the marine environment. Eight countries (Belgium, Germany, Ireland, the Netherlands, Norway, Spain, Sweden and the UK) have a Fishing for Litter or associated scheme in place. Seven countries (Iceland, Ireland, the Netherlands, Norway, Portugal, Spain and the UK) are promoting training and raising awareness in order to reduce waste from the fishing industry becoming marine litter. Five countries (Iceland, Ireland, the Netherlands, Spain and the UK) have a national code of practice or guidance and/or a voluntary agreement relating to marine litter. Five countries (Belgium, Denmark, Norway, Spain and Sweden) operate Indirect Fee Systems as part of their waste management practices.

From the information provided by the Contracting Parties, the following approaches could be considered for further investigation in support of Action 36:

- The promotion of Fishing for Litter schemes.
- Incorporating the Fishing for Litter scheme into the Indirect Fee System for ship-generated waste.
- The use of mobile phone applications for reducing Abandoned, Lost or otherwise Discarded Fishing Gear.
- Identifying alternative fishing gear materials and methods, for example, developing biodegradable materials and investigating alternative net designs.
- Further raising awareness that waste from the fishing sector is a source of marine litter.
- Improving waste management in the fishing sector.
- Investigating funding opportunities for marine litter projects.
- Undertaking a comprehensive review of the effectiveness of current measures.

2. Introduction

Marine litter is recognised as a global problem, with wide ranging impacts on the marine environment. The ecological impacts include marine organisms becoming trapped in or ingesting litter, as well as litter smothering or scouring the seabed causing damage to marine organisms and habitats.¹ The economic impacts associated with marine litter include the cost of clearing litter from beaches and harbours, the detrimental impact on tourism, and the cost to the fishing industry, the aquaculture industry and shipping, for example, through lost time and damage to gear or boats.²

OSPAR define marine litter as ‘solid material which has been deliberately discarded, or unintentionally lost on beaches and on shores or at sea, including materials transported into the marine environment from land by rivers, draining or sewage systems or winds. It includes any persistent, manufactured or processed solid material’.³ Marine litter predominantly originates from land, with an estimated 80% from sources such as landfill, sewage, tourism and industrial facilities, and an estimated 20% from sea-based sources such as sea going vessels, oil and gas platforms and aquaculture.⁴

Due to the breadth of sources contributing to marine litter, the objects found in the marine environment can be made of materials such as plastic, metal, wood, rubber, glass and paper.⁵ Monitoring surveys in the OSPAR area have shown that plastic is the most commonly found material at the sea surface, on the seabed and on beaches, with approximately 80% of litter that is found on beaches being made of plastic.⁶

In recent years, addressing the problem of marine litter has become a focus of the EU Member States and the Regional Seas Commissions (OSPAR, Barcelona, Bucharest and HELCOM). In 2014, OSPAR adopted a Regional Action Plan for Marine Litter (RAP), the main objective of which, is to ‘substantially reduce marine litter in the OSPAR maritime area to levels where properties and quantities do not cause harm to the marine environment’ and to ‘develop appropriate programmes and measures to reduce amounts of litter in the marine environment

¹UNEP, 2009. Marine Litter: A Global Challenge. Nairobi: UNEP. 232 pp.

² Mouat, J., Lozano, R. L., & Bateson, H. (2010). Economic Impacts of Marine Litter

³ <http://www.ospar.org/work-areas/eiha/marine-litter>

⁴ Allsopp, M., Walters, A., Santillo, D. and Johnston, P. (2006) Plastic debris in the world’s oceans

⁵ Marine Litter Action Plan OSPAR Commission:

http://www.ospar.org/site/assets/files/2019/p00643_mlrp_brochure.pdf

⁶ <http://www.ospar.org/work-areas/eiha/marine-litter>

and to stop litter entering the marine environment, both from sea-based and land-based sources'.⁷

Action 36 of the OSPAR RAP seeks to develop and promote best practice in the fishing industry in relation to marine litter. It includes all relevant aspects, for example, dolly ropes, waste management on board vessels and at harbours, as well as operational losses and net cuttings.⁸ Therefore, this report focusses on the fishing industry and it does not include marine litter from the aquaculture industry or from recreational fishing activities.

This report summarises information provided by 12 OSPAR Contracting Parties (Belgium, Denmark, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the UK) on the measures implemented (or in preparation) in their countries in relation to marine litter produced (or recovered) by the fishing industry. It does not include the following four OSPAR Contracting Parties: Finland, Luxembourg, Switzerland and the European Union. The similarities and differences in approach are summarised, gaps in relation to current measures are described, and potential approaches for further investigation are provided. Since the information provided in this report is based on the questionnaire responses, it is not exhaustive.

3. Materials and methods

A questionnaire was designed by the Action 36 Task Leads in order to collect information on the existing practices in relation to marine litter from the fishing industry in the OSPAR countries, to ascertain any gaps and to identify best practice. The questionnaire (presented in the box on page 9) was sent to the following 12 OSPAR Contracting Parties: Belgium, Denmark, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the UK.

The questionnaires were completed by the Contracting Parties in 2016 and the responses were collated and processed in October 2016. Since the interpretation of the meaning of the questions and the amount of detail provided in the responses varied, some of the Contracting Parties were contacted for further clarification. Additional desk based research was undertaken to provide supplementary information on the scale of the problem, the fishing

⁷ OSPAR Marine Litter Action Plan: http://www.ospar.org/site/assets/files/2019/p00643_mlrp_brochure.pdf

⁸ <https://www.cbd.int/doc/meetings/mar/mcbem-2014-03/other/mcbem-2014-03-140-en.pdf>

industry, and the legislation covering marine litter from the fishing industry. A summary of the questionnaire responses was discussed at the Intercessional Correspondence Group on Marine Litter (ICG-ML) held in Denmark in November 2016, and further clarification on the questionnaire responses was received. Additional questions were asked at the workshop, which were: 1) what is the most favoured national measure, and 2) what is missing. The OSPAR countries are listed alphabetically throughout this report.

QUESTIONNAIRE ACTION 36

RAP ML Action 36 shall develop and promote best practice in the fishing industry in relation to marine litter and include various aspects (dolly rope, waste management on board, waste management at harbours, operational losses/ net cuttings, code of practices).

As we have previously discussed in ICG-ML, as a first step, we need to understand the scope of existing measures to enable an assessment to be made as to whether there is a need for OSPAR to develop own measures (i.e. guidelines). If effective measures already exist within OSPAR, then the project will be about identifying gaps and/or to disseminate best practice, not about duplicating what contracting parties have already developed.

To assist in taking this action forward, please can you provide answers to the following questions:

1. Is there awareness in your country that litter from the fishing sector (household waste / operational waste: nets, ropes, dolly rope) is a source of marine litter?
2. What is the state of knowledge regarding the sources and pathways of marine litter stemming from the fishing sector (e.g. research or projects finalized/ running/ planned)?
3. Does your country have measures in place for preventing waste from the fishing sector to enter the marine environment in cooperation with the fishing sector? Such measures might refer to:
 - A national code of practice or guidance that delivers the FAO Code (e.g. in the UK, the Responsible Fishing Scheme was established in 2006 and covers most aspects of the FAO)
 - Voluntary agreements with the fishing sector
 - Practical solutions to improve waste management practices on board / in ports and/or to increase recycling
 - Fishing for litter
 - Education and awareness

Please provide a brief description of how the measure is organised / managed.

4. What aspects of fishing practice does the respective measure cover? Does it include litter and waste management on board and on shore?
5. What percentage of your fishing industry is involved in the respective measure?
6. What external influences exist to persuade your fishing industry to be involved in the measure (e.g. for code/guidance, retailers requiring membership as a condition of supply)?
7. Question concerning a code of practice / guidance: What external audit provisions or quality standards does your country's national code or guidelines comply with?
8. If your country does not have any measures in place, why not? What are the barriers that have prevented adoption?

4. Scope and scale of the problem

Marine litter may be generated by the fishing industry in many forms including, fishing gear (such as nets, pots, ropes, dolly ropes), general operational waste (such as plastic or polystyrene fish boxes, packing materials, gloves, plastic buckets) and domestic waste (such as plastic drinks bottles, food or drink cans). Fishing gear, general operational waste and domestic waste may be accidentally lost or deliberately discarded at sea, in harbours and on beaches.

It is very difficult to quantify marine litter and there are no reliable estimates of the amount of marine litter originating from the fishing industry in the OSPAR area. Sherrington *et al.*⁹ made an estimate for the European Economic Area (EEA), which is approximately analogous to the OSPAR area. They estimated that between 1,700 and 12,000 tonnes per annum of debris (i.e. litter) arising from the fishing industry enter the sea in the EEA and that the amount of debris from the fishing industry that has accumulated in the sea in the EEA since the 1950's may be in the order of 130,000 to 550,000 tonnes. However, as the authors of that report themselves point out, these figures are first approximations. The estimates rely on several assumptions and extrapolations so, despite the wide ranges given, they may not be very reliable.

4.1 Description of the fishing industry

The marine fishing industry is economically important and provides food and employment. In terms of the volume of the catch of fish and shellfish, the 12 OSPAR countries participating in this marine litter project caught almost 8 million tonnes (live weight) between them in 2015. Approximately 30% of this was taken by Norway, 20% by Iceland, 10% each by Denmark, Spain and the UK and 20% by the other seven countries combined.

The fisheries in the OSPAR area are diverse and range from small-scale artisanal fisheries to large-scale offshore fisheries. Vessels range in size from under 6 metres to over 75 metres in length. A wide variety of fish, crustaceans and molluscs are targeted, using a range of fishing gears. The species targeted include, for example, pelagic fish such as herring, mackerel and pilchard; demersal fish such as cod, plaice and Dover sole, crustaceans such as crab, langoustines and shrimps; and molluscs such as scallops, cuttlefish and squid. The

⁹ Sherrington, C., Darrah, C., Hann, S., Cole, G., & Corbin, M. (2016). *Study to support the development of measures to combat a range of marine litter sources.*

fishing gears used are determined primarily by the target species and include for example; hooks and lines, pots and traps, dredges, gill and entangling nets, Danish seines, otter trawls, beam trawls, midwater trawls and purse seines. In terms of volume of catch, the pelagic species such as herring and mackerel predominate, but they are relatively low value per unit weight, and species with a higher value per unit weight make a significant contribution to the value of the catch.

4.2 Factors relevant to marine litter in the fishing industry

A wide range of interacting factors are relevant to the relationship between the fishing industry and marine litter, some of which are mentioned below:

- The number, size and power of vessels, and the amount of time they spend at sea per year, which may affect the overall amount of gear that might be lost or waste that might be generated.
- The number of crew and the duration of the voyage, which might affect the amount of domestic waste generated that could become litter if not properly stored at sea and disposed of later at appropriate facilities ashore.
- The space and facilities on board for the storage of waste.
- The type of gear used. For example, static gears that are often left unattended may be more prone to accidental loss, whereas gears that are towed across the sea bed, such as beam trawls and otter trawls, may be more likely to catch litter during their normal fishing operations and therefore have greater potential to remove litter from the sea, for instance in 'Fishing for Litter' schemes.
- The density of vessels and/or static gear on the fishing grounds, which may influence the likelihood of different vessel's gear becoming foul of one another, leading to gear damage or loss. This is of particular relevance where static gears such as gill nets and active gears such as trawls are used in the same area.
- The nature of the sea bed. Gear may become snagged on rough ground or on wrecks leading to the loss or damage of the gear.
- The weather. For example, marker buoys for static gear may break off, submerge, or be difficult to locate in rough weather, leading to the potential loss of the gear.
- The navigational equipment of the vessel, particularly whether they have GPS, which may affect the ability to negotiate known hazards on the seabed or to relocate gear that has either been deliberately left unattended during normal fishing operations, or has previously been lost.

- The availability of adequate on-shore facilities for the disposal of waste brought in from sea.
- The cost of disposal ashore and how costs are distributed and charged.
- Awareness of the potential harm caused by marine litter and the willingness to reduce it.
- The regulatory requirements for the control and disposal of waste, and the level of enforcement.

5. Key legislation

The legal framework covering the prevention of marine litter is complex. There are many international and European agreements and legislation designed to protect the marine environment that include marine litter, or can be used in the context of marine litter. The degree to which countries have enacted the legislation and European directives varies but many countries also have national legislation that applies to marine litter.¹⁰ The legal framework provided below is not a comprehensive list but provides the main examples of agreements, laws and regulations covering marine litter relevant to the fishing industry.

5.1 International legislation

The following are key international conventions that are relevant to marine litter:

- The **United Nations Law of the Seas (UNCLOS)** entered into force in 1994 and covers all aspects of ocean space. Specific articles are dedicated to the protection and preservation of the marine environment and they can be used in the context of marine litter regulation.¹¹
- The **International Convention for the Prevention of Pollution from Ships (MARPOL)** which was adopted in 1973, is 'the main international convention covering the prevention of pollution of the marine environment by ships from operational or accidental causes'. MARPOL Annex V, which entered into force in 1988, addresses the disposal of garbage at sea from ships. In 2013, Annex V was revised to forbid the discharge of all garbage into the sea except under specific circumstances. One of the main points of Annex V is the obligation for all ships of 100 gross tons and above, or

¹⁰ Mouat, J., Lozano, R. L., & Bateson, H. (2010). Economic Impacts of Marine Litter

¹¹ United Nations Convention on the Law of the Sea:

http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

ships certified to carry more than 15 persons, to develop and follow a written garbage management plan.¹²

- The **London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter** signed in 1972 and the 1996 **Protocol to the Convention (London Protocol)** cover exclusively the control of dumping of wastes at sea. The difference between the Convention and the Protocol is that the latter is more restrictive in regulating the dumping of waste.¹³
- The **Food and Agricultural Organization of the United Nations (FAO) Code of Conduct for Responsible Fisheries** was adopted in 1995. It addresses management measures covering pollution and lost or abandoned gear as well as disposal systems in ports and harbours.¹⁴

5.2 European legislation

The following are key pieces of European legislation that are relevant to marine litter:

- The **Directive 2000/59/EC on Port Reception Facilities (PRF)** for ship-generated waste (SGW) and Cargo Residues, (referred to in this report as the ‘PRF Directive’), aligns EU law with the obligations of MARPOL to ensure effective implementation and enforcement. The PRF Directive requires vessels to land the waste produced offshore to port reception facilities. It also requires ports to develop Waste Handling Plans and provide PRF to the ships using their port. Vessels must pay a mandatory fee for landing waste and they must notify the port what waste they are carrying prior to the arrival at port. However, the Directive allows that ‘fees may be reduced if the ship’s environmental management, design, equipment and operation are such that the master of the ship can demonstrate that it produces reduced quantities of ship generated waste’. Yet, the rules vary between ports and the decision to introduce reduced fees is left to the port authorities.¹⁵
- The **Waste Framework Directive 2008/98/EC**, which aims to 1) encourage the prevention or reduction of waste production and its harmfulness 2) encourage the

¹² International Convention for the Prevention of Pollution from Ships (MARPOL): [http://www.imo.org/en/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-\(marpol\).aspx](http://www.imo.org/en/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-(marpol).aspx)

¹³ London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter <http://www.imo.org/en/OurWork/Environment/LCLP/Documents/LC1972.pdf>

¹⁴ FAO Code of Conduct for Responsible Fisheries <http://www.fao.org/docrep/005/v9878e/v9878e00.htm>

¹⁵ Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:32000L0059>

recovery of waste, including recycling, reuse or reclamation and the use of waste as a source of energy 3) ensure that waste is recovered or disposed of without endangering human health and without using processes or methods which could harm the environment.¹⁶

- The **EU Marine Strategy Framework Directive (MSFD)**, which is an integral policy tool for the protection of the marine environment for the European Community. The directive establishes a framework, within which Member States are required to take the measures necessary to achieve or maintain Good Environmental Status (GES) in the marine environment. Marine litter is included as one of the aspects of GES.¹⁷
- The **Council Regulation 1224/2009, Article 48** deals with the retrieval of lost gear and establishes that ‘a Community fishing vessel shall have the equipment on board to retrieve lost gear’ and in case the lost gear cannot be retrieved, the master of the vessel is responsible to inform the competent authority of its flag Member State. In case the gear that is retrieved by the competent authority has not been reported as lost, the master of the fishing vessel may be obliged to cover the costs bared by these authorities to retrieve the lost gear.¹⁸

6. Awareness and knowledge

The following sections provide information on measures taken by the Contracting Parties based on the questionnaire responses provided by those Parties. In some cases the responses were incomplete or lacked detail. Therefore, the mention of a measure by one or more Contracting Parties does not necessarily mean that similar measures are not being taken by the remaining Parties; they may simply have been left out of the questionnaire response.

6.1 Awareness that waste from the fishing sector is a source of marine litter (responses to question 1)

There is an awareness in all 12 countries (**Belgium, Denmark, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the UK**) that waste from

¹⁶The Waste Framework Directive 2008/98/EC

<http://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:32008L0098>

¹⁷ EU Marine Strategy Framework Directive 2008/56/EC

<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0056>

¹⁸ Council Regulation (EC) 1224/2009

<http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009R1224>

the fishing sector is a source of marine litter. In **Spain**, there is limited awareness but there are measures in place to raise awareness.

Awareness is increasing in the following countries:

- In **Belgium, Denmark and Sweden** awareness is increasing in the fishing sector. **Sweden** also noted that more focus is needed on increasing the awareness of marine litter for recreational fishermen since they also use fishing gear. **Denmark** is planning an information campaign for 2017 directed specifically at raising awareness in the fishing sector.
- In **France**, awareness is raised through NGO beach cleans, which show that litter from the fishing sector is commonly found on beaches. The results are communicated by the NGO's via, for example, using 'the top ten of marine litter' established by the Surfrider Foundation, or the operation 'clean beaches'.
- In **Ireland**, awareness increased after storms in 2013 caused damage to fishing gear, resulting in an increase in marine litter.
- In **Norway**, the general population are becoming more aware due to articles in newspapers and other publications (about marine litter, plastics and microplastics) and information that is published on the government's website. Initiatives such as the recovery of fishing gear and the Fishing for Litter scheme increases awareness further amongst fishermen.
- **Portugal** has several actions designed to raise awareness, including those from the MARLISCO Project, the Portuguese Association for Marine Litter, and DocaPesca projects. Projects include 'Networks Ghost: abandoned fishing gear, lost and discarded: contributions to the prevention, mitigation, remediation and awareness of impacts on the north coast' and 'Fishing for Sea No Trash'.
- In the **UK**, there are numerous schemes, including the Responsible Fishing Scheme and Fishing for Litter, that continue to increase awareness among fishermen.
- Although not specifically raised in the questionnaire responses, there are other indications that awareness of this issue is increasing in further Contracting Parties. For example, the increase of Fishing for Litter schemes in the **Netherlands** contributes to raising awareness that waste from the fishing sector is a source of marine litter.

6.2 Knowledge of sources and pathways of marine litter from the fishing sector (responses to question 2)

Of the responses received from the Contracting Parties to question 2, 'What is the state of knowledge regarding the sources and pathways of marine litter stemming from the fishing sector (e.g. research or projects finalized, running or planned)?', nine countries (**Denmark, France, Germany, Ireland, Norway, Portugal, Spain, Sweden and the UK**) reported that they have some knowledge gained through a variety of projects. **Belgium and Iceland** said that very limited knowledge exists on sources and pathways of marine litter from the fishing sector. **Belgium** also stated that only general monitoring for all types of litter is in place and there is no specific monitoring for marine litter from the fishing industry. The **Netherlands** responded that they have no projects relating to this.

Information on sources and pathways stemming from the fishing sector were from projects including, OSPAR beach monitoring (**Germany, Spain and Sweden**), HELCOM beach monitoring (**Sweden**), NGO beach monitoring (**Germany**), the Fishing for Litter scheme (**Germany, Norway and Sweden**), and MARELITT projects (**Ireland and Sweden**).

The projects and initiatives listed below are examples specifically provided by the Contracting Parties in the questionnaire responses:

- **Denmark** provided the names of 10 projects which have been undertaken or financed by the Nordic Council of Ministers, KIMO Denmark, the Danish Centre for Environment and Energy (DCE), Hold Danmark rent, the European Commission (EC) and the OSPAR commission. The projects included 'Marine Littering and sources in Nordic Waters', 'Marine Litter in European Seas - Social Awareness and Co-Responsibility' and 'Status on beach litter monitoring in Denmark 2015'.
- In **France**, information on litter has been collected during scientific observation campaigns of fisheries resources on the sea floor (under the MSFD monitoring programmes, in trawlable areas in the Atlantic and Mediterranean) as well as MEDSEACAN surveys with approximately 250 dives.
- **Norway** has various beach cleaning initiatives, including the national initiative 'Keep Norway Beautiful' as well as regional and local initiatives, where the sources of marine litter are compared. Awareness of ghost fishing and general marine litter has increased in association with projects where fishermen search for lost fishing gear.

- In **Portugal**, a study has been undertaken by Docapesca and the University of Lisbon on the 'Quantification and type of waste collected in fishing gear and generated on board trawl vessels'.
- **Sweden** is the lead partner for the EU-project MARELITT BALTIC (2016 - 2018), which will investigate the issue of Derelict Fishing Gears (DFG) in the Baltic Sea. The project will develop a comprehensive methodology focused on: mapping and cleaning of sea areas, reception and recycling facilities in harbours, and preventive measures to reduce losses in the future.
- In the **UK**, there are numerous projects that have been, or are being, organised by the Contracting Parties, the EC and the OSPAR Commission.

7. Measures to prevent waste from the fishing industry from entering the marine environment (responses to question 3)

All 12 countries have measures in place in co-operation with the fishing sector to prevent waste from the fishing industry becoming marine litter. Examples of measures that were provided in the questionnaire as part of question 3 were: a national code of practice or guidance that delivers the FAO Code (e.g. the Responsible Fishing Scheme); voluntary agreements with the fishing sector; practical solutions to improve waste management practices on board vessels, in ports, and/or to increase recycling; Fishing for Litter; and education and awareness. These measures are discussed below along with abandoned, lost or otherwise discarded fishing gear (ALDFG), and dolly ropes.

7.1 National code of practice or guidance that delivers the FAO code and/or a voluntary agreement with the fishing sector

Five out of 12 countries (**Iceland, Ireland, the Netherlands, Spain and the UK**) have a national code of practice or guidance that delivers the FAO Code of Conduct for Responsible Fisheries and/or a voluntary agreement with the fishing sector. The following information was provided:

- In **Iceland**, there is a voluntary agreement where fishermen can deliver nets and dolly ropes to waste reception facilities free of charge. The voluntary agreement between the fishermen and the Icelandic Recycling Fund (a state-owned agency) aims to recover and recycle fishing nets made from plastic.

- In **Ireland**, the Bord Iascaigh Mhara (BIM) provides a Responsibly Sourced Standard by issuing a ‘Certification of Best Practice’ for wild caught Irish seafood.¹⁹ This certification involves a commitment to environmental responsibility, which includes waste management. Twenty-seven vessel are currently certified and 25 vessels are ready to be audited. BIM also supports fishermen with implementing Environment Management Systems on vessels. Responsible Irish Fish (RIF) has a code of practice and has 130 vessel members.²⁰
- In the **Netherlands**, there is a voluntary agreement called the ‘Green Deal Fishery for a Clean Sea’, in which the fishing sector, fishing harbours, waste organisations, NGO’s and the ministry, work together to decrease the amount of marine litter from the fishing sector and to increase the recycling of the fishing waste collected.
- In **Portugal**, there is voluntary co-operation from fishermen resulting from the Docapesca project ‘Fishing for Sea No Trash’.
- **Spain** has a national code of practice but did not provide further details.
- In the **UK**, the Responsible Fishing Scheme (RFS) is a voluntary scheme which supports a responsible fishing industry by ensuring best practice. One of the five key areas is ‘care for the environment’ which includes management of waste that may become litter and the recovery of fishing gear.²¹

In **France**, a project called ‘Pechpropre’, is being undertaken to assess the feasibility and acceptability of implementing a voluntary agreement with the fishing sector. This 20-month project is being conducted by a national professional federation of artisanal fisheries (who represents about 80% of the French fishing sector), with the support of the French Ministry of Environment.

The Climate and Environment Department in **Norway** has stated that a voluntary agreement, introducing extended producer responsibility for fishing gear, should be initiated.

¹⁹Ireland Certification of Best Practice:

<http://www.bim.ie/media/bim/content/downloads/BIM%20Responsibly%20Sourced%20Fishing%20Vessel%20Standard%20and%20Annexes.pdf>

²⁰<http://responsibleirishfish.ie/products>

²¹<http://www.seafish.org/rfs/index.php/about/about-rfs/>

7.2 Practical solutions to improve waste management

Ten countries (**Belgium, France, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the UK**) provided examples of specific practical solutions that they have in place, or solutions that they are developing, to improve waste management practices on board, in ports and/or to increase recycling.

Denmark and Germany mentioned solutions for waste management relating to regulations and general waste management at harbours. Under the PRF Directive, vessels are required to land the waste they produce offshore at port facilities, and ports are required to develop Waste Handling Plans and provide waste facilities. Vessels must pay a mandatory fee for landing waste but fees may be reduced in certain circumstances. **Iceland** has a regulation in accordance with the PRF Directive that ensures that all harbours have waste reception facilities.

7.2.1 Solutions to improve waste management that have been implemented in OSPAR countries

The solutions to improve waste management that have been implemented in nine of the OSPAR countries (**Belgium, Iceland, Ireland, the Netherlands, Norway, Portugal, Sweden, Spain and the UK**) are summarised below. There may be other solutions for waste management that were not reported.

- In **Belgium**, the fishing sector has its own waste reception facilities in harbours that are adapted to their situation and needs.
- In **Iceland**, recovered fishing nets made from plastic are recycled.
- In **Ireland**, BIM helps fishermen to put in place Environment Management Systems on vessels, which includes waste management systems, to ensure that unwanted fishing gear is dealt with in a responsible way.²²
- In the **Netherlands**, the 'Green Deal Fishery for a Clean Sea' involves the fishing sector, fishing harbours, waste organisations, NGO's and the ministry, working together on practical solutions to improve waste management on board vessels and in harbours. Projects in harbours include 1) integrating waste facilities for the different waste streams (domestic waste, operational waste, Fishing for Litter waste and dolly ropes), so that waste streams can be separated on board and stored in one container

²²<http://www.bim.ie/our-services/your-environment/for-fishermen/fisheries-environment-management-system/>

in separate bags, 2) co-operation of the Dutch Wadden Sea harbours to improve their waste management linked to the 'ecoports' scheme, 3) the study 'Waste management in small Dutch harbours' which will give an overview of how waste management is organised in the different small fishing harbours in the Netherlands. This will include the views of the users on the present facilities and will provide proposals of how facilities can be improved and what the best practices are.

- As part of **Norway's** 2013 waste strategy, marine litter caught in fishing gear can be handed in with no fee (an Indirect Fee System, where the fee for landing waste from a vessel is incorporated in an overall port charge and is not dependent on the quantity of waste landed), the waste generated on board a fishing vessel can be handed in at a port and the fishing gear can be recycled.
- In **Portugal**, waste generated by fishing vessels or litter caught in fishing gear can be placed in recycling containers or waste containers located at a port. For the project 'Fishing for Sea No Trash', containers were distributed to collect mixed waste and packaged waste on board vessels.
- In **Spain**, several pilot projects have been undertaken to improve waste management on board vessels and in harbours. These include 1) installing waste containers in participating fishing vessels to collect waste generated on board, 2) installing recycling points in fishing and recreational navigation docks (for glass, paper, cardboard, batteries and domestic waste), which is now incorporated in Waste Reception and Handling Plans, 3) research on potential markets for plastic waste from the fishing industry, which has considered the recovery of fishing nets and polystyrene boxes from the fishing sector.
- In **Sweden**, fishing ports are responsible for receiving ship-generated waste including marine litter collected in fishing gear. As part of the 'No-Special-Fee' system, commercial fishermen pay a port fee and can hand in any amount of waste (including marine litter) at the port. Additionally, the project 'Keep the Sea Clean' facilitates fishermen in Bohuslän (west coast of Sweden) to collect and recycle plastic marine litter caught while fishing, as well as recycling fishing gear, such as trawls, nets and ropes. The project is carried out by Smögens Fish Auction with support from the Swedish Agency for Marine and Water Management (SwAM). The Swedish Programme of Measures under MSFD is aimed at improvements in implementation of already existing regulations for waste management in fishing ports and 'Promoting an effective and sustainable collection and reception of lost fishing gear and preventing the losses of new ones'.

- The **UK** have a Responsible Fishing Scheme (RFS) and Fishing for Litter (FFL) projects. In conjunction with FFL, a project is being developed to collect and recycle redundant fishing gear.

7.2.2 Solutions to improve waste management that are in preparation in OSPAR countries

The following countries responded that they have measures or projects in preparation:

- **Belgium** had multiple measures for the fishing industry in preparation in 2016 as part of the Programme of Measures under the MSFD, such as the improvement of a waste deposit system for fishing vessels.
- In **France**, a study will be undertaken to make an inventory of waste management practices in all French ports. This project aims to identify good practices (such as, a 'clean port' approach, environmental management certification in ports, or awareness raising actions) or deficient waste management facilities, and to make recommendations. Additionally, pilot operations will be conducted to test the implementation of waste management or recovery. Local initiatives have already been identified, such as recovering and repairing nets from the Basque coast to be sent to Africa and elsewhere (in co-operation with countries including Senegal, Gabon and Haiti) or used for other applications (for example, to protect hives or vegetable gardens, or for use in manufacturing clothing or street furniture).
- **Spain** is expecting to implement measures included in the Spanish Programme of Measures under the MSFD including 1) separating and sorting of waste on board vessels, 2) raising awareness with fishermen, 3) promoting the installation of recycling points in harbours and providing harbours with facilities for selective collection of marine litter removed from the sea by the fishing fleet, 4) improvement of waste management in ports at a national level (development of a guide on waste management in state ports) and regional level (Waste Reception and Handling Plans for sound waste management in regional ports), 5) promoting projects to recycle fishing materials such as polystyrene boxes or fishing nets.

7.3 Measures for preventing and recovering abandoned, lost or otherwise discarded fishing gear

Abandoned, lost or otherwise discarded fishing gear (ALDFG) can have wide ranging impacts in the marine environment, such as continuing to catch or trap marine species (ghost fishing), and disturbing marine habitats.²³ International and national legislation is in place to prevent ALDFG, such as MARPOL Annex V (which prohibits the dumping of fishing gear at sea), and to promote the recovery of lost fishing gear, such as Council Regulation 1224/2009, Article 48, (fishing gear must be retrieved or the authorities must be notified). Although, as stated in the questionnaire response from Germany, fishing vessels of less than 12 m in length may be exempt from Article 48 if they operate exclusively within territorial seas of the flag Member State or do not spend more than 24 hours at sea from the time of departure to the return to the port. Fishermen in Norway have a duty to search for lost fishing gear and if the gear is not found, they have a duty to report this to the coast guard.

Fishing for Litter schemes (see Section 7.5) enable fishermen to land derelict fishing gear bought aboard during normal fishing operations, to be recycled or to be disposed of.

Initiatives and projects that are currently being undertaken in four countries to reduce or recover ALDFG, are listed below:

- In **Norway**, annual retrieval operations are conducted by the Directorate of Fisheries to recover lost gill nets. There is also a system in place to report the location of set static fishing gear, which reduces the likelihood of damage or loss of the gear and improves the chances of recovery if it is lost.
- **Sweden** are acting as a lead partner for a MARELITT project (2016 - 2018) which will investigate the problem of Derelict Fishing Gears (DFG) in the Baltic Sea. The project comprises a series of activities including professional fishermen undertaking trips specifically for the purpose of retrieving derelict gear and the retrieval of gears from wrecks by divers.
- In the **Netherlands**, a mobile phone application has been developed to help to reduce damaged and lost fishing gear. Dutch gill netters and trawlers fish the same grounds off the coast of the Netherlands and there have been problems with trawlers towing their gear through gill nets, resulting in damaged and lost nets. The phone application

²³Macfadyen, Graeme., Huntington, Tim., and Cappell, R. (2009). Abandoned, lost or otherwise discarded fishing gear. FAO Fisheries and Aquaculture Technical Paper 523, 523, 115 p.

gives the location of the gill nets so that the trawler fishermen can avoid them. The gill net fisherman have also started to set their nets with enough space for trawlers to fish between them. Since the app has been introduced, the number of gill nets that have been damaged or lost has declined substantially.²⁴

- In **Iceland**, plastic fishing nets are recovered and recycled as part of their voluntary agreement with fishermen (see Section 7.1). They estimate that the recovery rate of fishing nets is currently around 90%. Tariffs are added to the cost of fishing nets if the fishermen do not comply with the voluntary agreement.

7.4 Measures to address marine litter from dolly ropes

Dolly ropes are strands of unravelled ropes which are attached to the underside of trawls to protect them from wear and tear if they come into contact with the sea bed as they are towed along. Dolly ropes wear out as they are used and the pieces of the strands break off or whole strands are pulled off, becoming marine litter. Dolly ropes can also be lost during maintenance work on board a vessel, particularly when fishermen replace old strands of dolly rope with new ones.²⁵ Within the OSPAR countries, dolly ropes are used extensively in the Netherlands and Belgium, and to a lesser degree in France, Germany, Ireland, Norway and the UK.²⁶

The only questionnaire response for specific measures relating to dolly ropes was for **Belgium**, who as part of the MSFD Programme of Measures, will investigate the prevalence and impact of dolly ropes. Information was provided by the Action 36 Task Leads about the following projects being undertaken in the **Netherlands**. The project ‘DollyRopeFree’ aims to reduce the amount of dolly ropes that become marine litter by investigating the use of different materials, reviewing the design of the trawl gear, and developing better arrangements for managing marine litter on board vessels and in harbours.²⁷ A project involving the collection of nylon dolly ropes by fishermen at sea was successfully launched in 2015 and is currently ongoing on the island of Texel, where the fishermen are paid for the dolly ropes that are collected.²⁸

²⁴ Erfeling, M., 2016. Personal communication. Ministry of Infrastructure and Environment, Netherlands.

²⁵ DollyRopeFree Project: http://www.dollyropefree.com/the_use_of_dolly_rope_by_fishermen

²⁶ OSPAR Progress Report Concerning the elaboration and measures relating to RAP ML Action 37: Dolly Rope

²⁷ <http://www.dollyropefree.com/alternatives>

²⁸ <http://www.ecomare.nl/en/encyclopedia/natural-environment/matter-and-materials/marine-litter/>

7.5 Fishing for Litter and associated schemes

There are many projects where fishermen remove litter from the sea by retaining and landing litter caught during normal fishing operations. These projects remove litter whatever its origin (e.g. from other sea-based and land-based sources) as well as litter which may have been generated by the fishing industry itself. The main initiative is called Fishing for Litter (FFL) which is co-ordinated by KIMO.²⁹ For this initiative, the fishermen are given bags to put the marine litter into, which they land at participating harbours when full and the project pays for the removal of the bags and the recycling or disposal of the waste.³⁰ While these schemes primarily recover litter rather than preventing its loss to the marine environment, they also help to raise awareness among the fishermen in order to reduce waste from the fishing industry entering the marine environment.

Belgium, Germany, Ireland, the Netherlands, Norway, Sweden, and the UK take part in the KIMO Fishing for Litter scheme. **Spain** has projects that involve fishing for litter but these are not affiliated to the KIMO scheme. The following information on FFL and associated schemes was obtained:

- **Belgium** participates in FFL and has put structural financing in place for this project.
- **Germany** currently has six harbours that participate in the scheme with approximately 60 fishermen that are involved in FFL.³¹
- **Ireland** has 24 vessels in 3 ports that are currently participating in FFL, with a target of 7 ports in 2016.
- The **Netherlands** has several harbours that participate in FFL.
- **Norway** joined the FFL initiative in 2016 with a two-year pilot project at four locations along the Atlantic coast.³²
- **Spain** has undertaken two projects where fishermen have collected marine litter: ‘Nada po la borda: protegiendo y limpiando los fondos marinos’ (Nothing thrown overboard: protecting and cleaning sea beds) from 2009 to 2010 and ‘PESCAL: pesca sostenible en caladeros limpios’ (Sustainable fisheries in clean fishing grounds) from 2012 to 2014. Under the MSFD, Spain are also expecting to develop a framework document to implement a coherent scheme of fishing for litter, to promote and finance

²⁹ KIMO (Local Authorities International Environmental Organisation) is an association of coastal local authorities whose goal is to eliminate pollution from the Northern Seas.

³⁰ <http://www.kimointernational.org/>

³¹ <http://www.marlisco.eu/fishing-for-litter-in-germany.en.html>

³² Time to Fish for Litter: <http://www.miljodirektoratet.no/en/News1/2015/Time-to-Fish-for-Litter/>

fishing for litter activities, and to design and maintain a national database recording items collected from fishing for litter activities.

- In **Sweden**, the municipality of Simrishamn is responsible for a FFL scheme, which at the beginning of 2015 involved about 94 boats, but the number of vessels in the fishing fleet has reduced, and by 2016 approximately 30 boats were involved.
- The **UK** has two main areas that participate in the FFL scheme: Scotland and South West England. Fifteen harbours located around the coast of Scotland and 12 harbours around the coast of south-west England are involved in the scheme.³³

France is investigating the barriers to implementing the FFL scheme as part of the Pechpropre project.

Denmark, Iceland and Portugal do not take part in the FFL schemes. However, **Portugal** responded that many fishermen collect litter during fishing activities.

7.6 Education and awareness

The FFL initiative contributes to raising awareness of the marine litter issue in many countries. Awareness and information campaigns by not-for-profit organisations, environmental charities and governments also highlight the issue of litter.

The following countries responded that initiatives are being undertaken to educate and raise awareness:

- In **Iceland**, education is ongoing and awareness campaigns have been organised in the past.
- In **Ireland**, an information poster about Marine litter (published in 2005), is due to be redesigned and updated to include FFL.
- In the **Netherlands**, as part of the Green Deal, ProSea³⁴ provide training on sustainability in the marine environment (including marine litter issues) at fishing schools.
- **Norway** has developed educational material for fishermen to improve handling waste on board vessels, which has been trialled and has been successful. Workshops were

³³ <http://www.fishingforlitter.org.uk/project-areas>

³⁴ ProSea is a centre of expertise initiating, developing and conducting trainings about marine awareness and sustainability to professionals working at sea.

also undertaken in 2015 and 2016 with the fishing sector, where the problems and solutions for marine litter generated by the fishing industry were discussed.

- **Portugal** have awareness raising actions from the MARLISCO Project,³⁵ from the Portuguese Association for Marine Litter (APLM), and from the Interdisciplinary Centre of Marine and Environmental Research (CIIMAR). Projects include 'Networks Ghost: abandoned fishing gear, lost and discarded: contributions to the prevention, mitigation, remediation and awareness of impacts on the North Coast', and 'Fishing for Sea No Trash'. They also participate in international projects such as 'Coastwatch', 'Clean Up the Atlantic' and 'Clean Up the Med'.
- **Spain** has produced an environmental awareness module to raise awareness and promote good practices in the fishing industry as well as providing a manual of good environmental practices for training people in the fishing industry.
- In the **UK**, the Responsible Fishing Scheme includes educational modules on the topic of waste and litter management.

The following countries are planning to undertake education and awareness projects:

- **Belgium** is preparing an educational programme covering marine litter from the fishing industry as part of the MSFD Programme of Measures.
- In **Denmark**, specific campaigns focused on marine litter are planned to take place in 2017.
- In **France**, as part of the Pechpropre project, a survey of fishermen will be undertaken to find out about their knowledge of marine litter arising from the fishing industry and to increase awareness. Awareness kits will be also developed, including a best practice guide and flyers.
- **Spain** is expecting to implement a number of measures under MSFD including 1) training programs for the fishing industry, 2) programs to raise awareness of the impacts of fishing and recreational activities on marine biodiversity, 3) a training module for the protection of cetaceans, marine turtles and seabirds, 4) programs to raise public awareness about the problem of marine litter.

³⁵ MARLISCO, Social Awareness and Co-responsibility: <http://www.marlisco.eu/index.en.html>

8. Further information relating to the measures presented in section 7

8.1 Aspects of fishing practice covered by the measures and the fishing industry's involvement in the measures (responses to questions 4 and 5)

The Contracting Parties responded in different ways to question 4 'What aspects of fishing practice does the respective measure cover? Does it include litter and waste management on board and on shore?'. The responses were as follows:

- **Belgium and Norway's** response referred to answers already provided in the questionnaire.
- **France's** measures covered litter and waste management mainly on shore.
- In **Germany and Portugal**, the aspects cover the removal of existing marine litter from the seabed.
- **Iceland's** measures mainly cover the recovery and recycling of fishing nets made from plastic.
- For the **Netherlands and Spain**, the measures cover the whole waste cycle.
- **Sweden's** measures and projects are about waste management in fishing harbours as well as litter and waste management on board and recycling.
- In the **UK**, measures cover all aspects of fishing practice, including staff training, welfare, and ship management as well as litter and waste management on board and on shore, and guidance relating to lost fishing gear.

A summary of the types of waste management that are covered by the measures is provided in Table 1 (see page 28) for each country. Table 1 also provides a summary of the responses to question 5 'What percentage of your fishing industry is involved in the respective measure?'. The responses to question 5 were given in a variety of formats, including the number of vessels or harbours involved and percentages by number or registered tonnage.

Table 1. Summary of the types of waste management covered by the measures and estimates of the fishing industry's involvement in the measures

Country	Types of waste management covered by the measures presented in Section 7	Estimate of the fishing industry's involvement in the measure (where information was provided)
Belgium	<ul style="list-style-type: none"> • Waste management on board fishing vessels • Waste management on shore • Marine litter collected in fishing gear 	<ul style="list-style-type: none"> • Programme of Measures for MSFD (in preparation): will be 100% of the fishing sector • Waste reception facilities at harbours: 98% of the fishing sector • FFL: 20% of the fishing sector
Denmark	<ul style="list-style-type: none"> • No specific measures are in place 	<ul style="list-style-type: none"> • Not applicable
France	<ul style="list-style-type: none"> • Waste management on shore • Waste management on board fishing vessels will be investigated in the Pechpropre project 	<ul style="list-style-type: none"> • Approximately 80%
Germany	<ul style="list-style-type: none"> • Marine litter collected in fishing gear 	<ul style="list-style-type: none"> • Almost all fishermen support the FFL scheme in the main fishing harbours in Lower Saxony
Iceland	<ul style="list-style-type: none"> • Waste management on shore (recycling fishing gear) 	<ul style="list-style-type: none"> • The majority
Ireland	<ul style="list-style-type: none"> • Waste management on board fishing vessels • Marine litter collected in fishing gear 	<ul style="list-style-type: none"> • Responsibly Sourced Standard: 27 vessels certified with 25 ready for audit • Responsible Irish Fish code of practice: 130 vessel members • FFL: 24 vessels participating in 3 ports with a target of 7 ports in 2016
Netherlands	<ul style="list-style-type: none"> • Waste management on board fishing vessels • Marine litter collected in fishing gear • Waste management on shore 	<ul style="list-style-type: none"> • Green Deal voluntary agreement: one of the two fishing organisations that represent the Dutch fleet takes part
Norway	<ul style="list-style-type: none"> • Waste management on board fishing vessels • Marine litter collected in fishing gear • Waste management on shore 	<ul style="list-style-type: none"> • FFL: 21 vessels at 3 harbours are involved (due to be expanded)
Portugal	<ul style="list-style-type: none"> • Waste management on board fishing vessels • Marine litter collected in fishing gear • Waste management on shore 	<ul style="list-style-type: none"> • Project 'Fishing for Sea no Trash': 400 fishermen at one port (out of 16,000 fishermen nationally)
Spain	<ul style="list-style-type: none"> • Waste management on board fishing vessels • Waste management on shore • Operational losses/net cuttings 	<ul style="list-style-type: none"> • Unknown but limited
Sweden	<ul style="list-style-type: none"> • Waste management on board fishing vessels • Marine litter collected in fishing gear • Waste management on shore 	<ul style="list-style-type: none"> • Keep the Sea Clean: 17 boats • No-Special-Fee system: all fishermen • FFL: 30 boats involved
UK	<ul style="list-style-type: none"> • Waste management on board fishing vessels • Waste management on shore • Lost fishing gear 	<ul style="list-style-type: none"> • RFS: Approximately 40% of the UK registered fishing tonnage

8.2 External influences (responses to question 6)

Question 6 was ‘What external influences exist to persuade your fishing industry to be involved in the measure (e.g. for code/guidance, retailers requiring membership as a condition of supply)?’ Six countries (**Belgium, France, Germany, the Netherlands, Norway and Spain**) responded that there are currently no external influences to persuade the fishing industry to be involved in the measures. No responses were received from **Denmark, Portugal and Sweden** to this question. **Sweden** did not respond to questions 6, 7 and 8 as they did not have anything additional to add to the answers already provided in questions 1 to 5.

In **Iceland**, fishermen are fined if they don’t comply with the regulations and tariffs are added to the prices of fish nets if the voluntary agreement between the fishing industry and the Icelandic Recycling Fund is not complied with. In **Ireland**, maintaining market access is a key driver and building a relationship with local communities is important. In the **UK**, major retailers have announced that fishermen’s membership of the Responsible Fishing Scheme is a condition of supply.

Germany thought that the main drivers for participation in the measures might be: 1) less damage to the catch and a reduction in lost sea time, 2) the possibility of disposing the litter free of charge, and 3) the creation of a positive image of the fishing sector in the public awareness with respect to marine nature conservation issues.

8.3 External audit provisions or quality standards (responses to question 7)

Five countries (**Denmark, Iceland, the Netherlands, Portugal, Sweden**) did not respond to question 7, ‘What external audit provisions or quality standards does your country’s national code or guidelines comply with?’. **Norway** has a system based on laws, regulations, reporting requirements etc., therefore, a code of practice or guidance is not relevant to their system. **Belgium and Germany** do not have external audit provisions or quality standards and **France and Spain** do not have a code of practice or guidance. In **Ireland**, the BIM standard is an accredited standard and RIF is a voluntary standard. In the **UK**, the RFS is expected to achieve an ISO accreditation.

8.4 Barriers preventing the adoption of measures (responses to question 8)

Question 8 was 'If your country does not have any measures in place, why not? What are the barriers that have prevented adoption?'. All 12 countries have measures in place and most did not respond to this question. However, **Denmark** and **Germany** provided the following responses:

- In **Denmark**, there has not been a specific focus on the fishing sector. The municipalities are responsible for waste management which also covers the fishing sector. In many harbours, it is possible for fishing vessels to drop off marine litter within the No-Special-Fee system, which is implemented in Denmark in accordance with the PRF Directive. With an increased awareness on litter from the fishing sector, awareness initiatives targeted at the fishing sector have been planned for 2017.
- **Germany** are developing systems and processes to prevent ALDFG as part of the MSFD Programmes of Measures. These include 1) the development of alternative nets/materials and modification of fishing gear, 2) gear marking, 3) incentives to foster collection and disposal of old fishing gear (rented and owned), and 4) the evaluation of frequency and reasons for lost nets in order to develop further appropriate measures.

9. Assessment of the similarities, differences and relative effectiveness in approaches

9.1 Similarities and differences in approach

A summary of the similarities and differences in the measures used to prevent waste from the fishing sector from entering the marine environment, and to reduce the amount of litter already in the sea, is provided in Table 2 (see page 31). The table is based on the questionnaire responses and further clarification at the ICG-ML workshop.

Table 2. Summary of measures presented in section 7 and additional responses provided at the ICG-ML workshop

Measure Country	Awareness that waste from the fishing sector is a source of marine litter	National code of practice or guidance and/or voluntary agreement	Implementing or developing waste management and/or recycling solutions	Fishing for Litter and associated schemes	Indirect Fee System	Education and raising awareness
Belgium	✓		✓	✓	✓	✓
Denmark	✓		✓		✓	✓
France	✓	✓	✓			✓
Germany	✓		✓	✓		
Iceland	✓	✓	✓			✓
Ireland	✓	✓	✓	✓		✓
Netherlands	✓	✓	✓	✓		✓
Norway	✓	✓	✓	✓	✓	✓
Portugal	✓		✓			✓
Spain	✓	✓	✓	✓	✓	✓
Sweden	✓		✓	✓	✓	
UK	✓	✓	✓	✓		✓

Key

- ✓ Information received in the questionnaire responses
- ✓ Feasibility being investigated or projects in preparation (from the questionnaire responses)
- ✓ Additional information received at the ICG-ML workshop

The measures adopted by most countries include:

- All 12 countries have awareness that the fishing sector contributes to the creation of marine litter.
- All 12 countries are implementing management measures to prevent waste from the fishing industry from entering the marine environment.
- Eight countries (**Belgium, Germany, Ireland, the Netherlands, Norway, Spain, Sweden and the UK**) have a Fishing for Litter or associated scheme in place.

The measures that are being undertaken in fewer countries are:

- Seven countries (**Iceland, Ireland, the Netherlands, Norway, Portugal, Spain and the UK**) are conducting education and raising awareness to prevent waste from the fishing industry becoming marine litter.
- Five countries (**Iceland, Ireland, the Netherlands, Spain and the UK**) have a national code of practice or guidance and/or a voluntary agreement.
- Five countries (**Belgium, Denmark, Norway, Spain and Sweden**) have an Indirect Fee System.

The measures that are in preparation are:

- In **France**, projects will be undertaken to investigate the feasibility and acceptability of implementing a voluntary agreement with the fishing sector, the barriers to implementing FFL in France, increasing awareness of marine litter, testing the implementation of waste management or recovery, and an inventory of waste management practices in all French ports to identify good practices.
- **Belgium, Germany and Spain** are developing measures as part of the MSFD including waste management processes and educational programmes on marine litter for the fishing sector.
- In **Norway**, The Climate and Environment Department has stated that a voluntary agreement should be introduced which extends producer responsibility for fishing gear.

9.2 Effectiveness of approaches

The questionnaire responses provided detailed information of the measures used to prevent waste from the fishing sector from entering the marine environment. However, there was insufficient information available to assess the effectiveness of the approaches used.

9.2.1 Most favoured national measure

At the ICG-ML workshop, the Contracting Parties were asked which measures were most favoured in their own countries. Whilst no details were provided as to why the measures were favoured, they could be discussed further and their effectiveness assessed. Out of the measures currently undertaken by the countries, the favoured national measures are:

- **Belgium** - Indirect Fee System
- **Spain** - Indirect Fee System (in Spain this is not applied to the coastal fishing fleet) and fishing for litter scheme
- **Sweden** - Indirect Fee System
- **Germany** - education and raising awareness
- **Netherlands** - their voluntary agreement (the Green Deal Fishery for a Clean Sea) which aims to close the waste chain of the fishing sector in cooperation with stakeholders.

9.3 Gap analysis

9.3.1 Gaps identified by the Contracting Parties in relation to current measures

The following gaps in the current measures were identified by the Contracting Parties at the ICG-ML workshop and by email correspondence:

- **Belgium** identified the difficulty in combining the Fishing for Litter (FFL) scheme with the Indirect Fee System for Ship Generated Waste (SGW), since both schemes require a separate approach. The fishermen can't be expected to pay for the delivery of waste they did not generate, while for the delivery of SGW the 'polluter pays principle' is to be applied. Schemes for the delivery of SGW cannot be subsidised whilst FFL schemes are. It would be more effective and efficient if Fishing for Litter could be an integral part of the ship's waste management.
- **Germany** thought that more research is required to identify technical solutions for fishing gear since current research is only addressing dolly ropes.
- The **Netherlands** thought that awareness of marine litter in the fishing sector is inadequate and that waste management on board fishing vessels and in harbours is an important issue. An international action to increase awareness and to improve waste management across the OSPAR countries could have added value but only in consultation with the stakeholders (with the fishing sector, harbours and with waste companies).

- **Sweden** identified that waste management at harbours could be improved and that awareness of fishing gear becoming marine litter could be raised further. There appears to be inadequate waste management in harbours, resulting in net or rope cuttings from fishing gear that has been repaired on quays becoming marine litter, whereas waste from handling and repairing nets on board vessels can be disposed of in bins or bags on the vessels. Additionally, the lack of storage capacity on the quays means that nets and trawls are left on the quay and may become marine litter. In Sweden, the FFL project is mostly being used to create awareness about marine litter within the fishing sector but it would be more effective and efficient if FFL could be an integral part of the ship's waste management.

10. Assessment of potential of one approach to be used in other areas

The potential adoption of one approach in other areas is dependent on a complex interaction of many factors including, for example, the awareness and willingness by fishermen to take part in the approach, the size of fishing vessels and type of fishing gear used, and the cost of implementing the approach. Several approaches may be applicable in other areas but it is not possible to assess this from the responses to the questionnaire. However, several approaches may be worthy of further consideration, as outlined below.

10.1 Potential approaches for further investigation

The following list of approaches could be considered for further investigation to assess their potential implementation or more widespread use:

- **The promotion of Fishing for Litter** in the countries that don't already take part in the scheme as well in different parts of the countries that currently take part. The practicalities for this would depend on the type of vessels within the fishing fleets, the number of harbours that are able to take part and having available funding for the projects.
- **Incorporating the Fishing for Litter scheme into the Indirect Fee System for ship-generated waste by reviewing the PRF Directive and Indirect Fee System** (see Belgium's response in Section 9.3.1) in order to be more effective and efficient in the management of waste.

- **The use of mobile phone applications for reducing ALDFG**, such as the app used by the Dutch fishermen. This proved to be an effective method for reducing the amount of damaged gear by identifying the location of gill nets to enable the trawler fishermen to avoid them.
- **Identifying alternative fishing gear materials and methods** (as specified in OSPAR Action 37), for example, developing biodegradable materials and investigating alternative net design.
- **Further raising awareness and improving waste management in the fishing sector**, including practical solutions for better waste management on board fishing vessels and in harbours by discussing how best to do this with the stakeholders in the fishing sector, harbours and with waste companies (see Sweden's response in Section 9.3.1).
- **Investigating funding opportunities for marine litter projects** available at national and EU level for supporting marine environmental protection and tackling marine litter pollution, as well as participating in ongoing initiatives/schemes.
- **Undertaking a comprehensive review of the effectiveness of the measures** currently undertaken to reduce marine litter from the fishing industry, including an evaluation of the costs.



Centre for Environment Fisheries & Aquaculture Science



About us

The Centre for Environment, Fisheries and Aquaculture Science is the UK's leading and most diverse centre for applied marine and freshwater science.

We advise UK government and private sector customers on the environmental impact of their policies, programmes and activities through our scientific evidence and impartial expert advice.

Our environmental monitoring and assessment programmes are fundamental to the sustainable development of marine and freshwater industries.

Through the application of our science and technology, we play a major role in growing the marine and freshwater economy, creating jobs, and safeguarding public health and the health of our seas and aquatic resources

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Customer focus

We offer a range of multidisciplinary bespoke scientific programmes covering a range of sectors, both public and private. Our broad capability covers shelf sea dynamics, climate effects on the aquatic environment, ecosystems and food security. We are growing our business in overseas markets, with a particular emphasis on Kuwait and the Middle East.

Our customer base and partnerships are broad, spanning Government, public and private sectors, academia, non-governmental organisations (NGOs), at home and internationally.

We work with:

- a wide range of UK Government departments and agencies, including Department for the Environment Food and Rural Affairs (Defra) and Department for Energy and Climate and Change (DECC), Natural Resources Wales, Scotland, Northern Ireland and governments overseas.
- industries across a range of sectors including offshore renewable energy, oil and gas emergency response, marine surveying, fishing and aquaculture.
- other scientists from research councils, universities and EU research programmes.
- NGOs interested in marine and freshwater.
- local communities and voluntary groups, active in protecting the coastal, marine and freshwater environments.

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