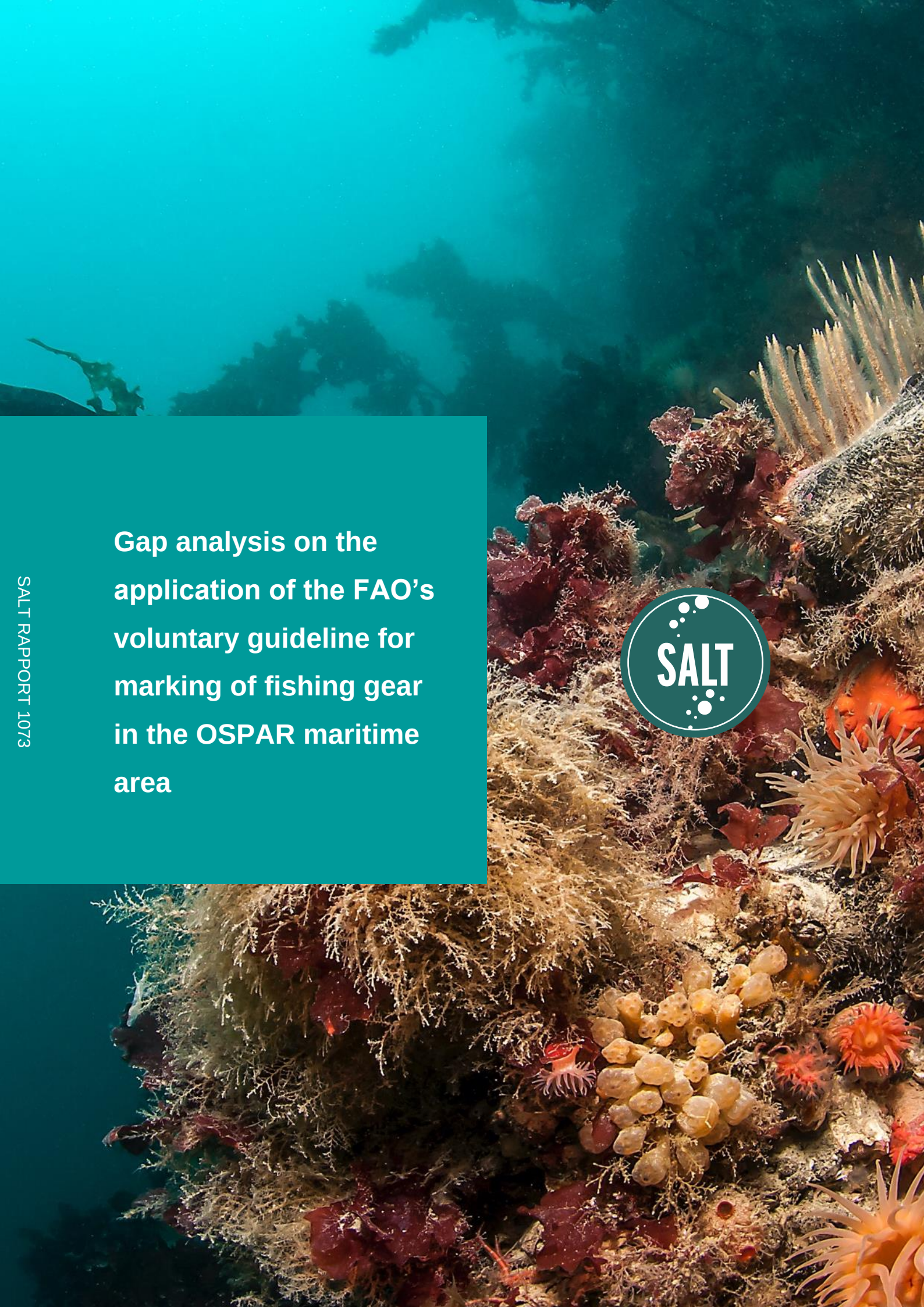

Gap analysis on the application of the FAO's voluntary guideline for marking of fishing gear in the OSPAR maritime area

SALT RAPPORT 1073

Report title
Gap analysis on the application of the FAO's voluntary guideline for marking of fishing gear in the OSPAR area

Report nr.
1073

Date
08.11.2023

Number of pages
72

Client
Swedish Agency for Marine and Water Management

Client representative
Maja Högvik

Project leader
Joan Fabres

Quality control
Kjersti Eline Tønnessen Busch

Authors
Joan Fabres, Carl Höjman, Hilde Rødås Johnsen, Jason Bryan

Photography cover page
Erling Svendsen

About this document
This report is the result of a contracted assignment commissioned by the Swedish Agency for Marine and Water Management, as a contribution to the work of OSPAR's Intersessional Correspondence Group on Marine Litter, in fulfilment of the first phase of the action "B.4.1 Prevent, locate, retrieve and handle abandoned, lost and otherwise discarded fishing gear", included in OSPAR's Second Regional Action Plan for Marine Litter. As a first step in the implementation of this action, this report presents results of a gap analysis on the application of the FAO's Voluntary Guidelines on the Marking of Fishing Gear by the OSPAR's contracting parties. Effective gear marking systems are regarded as an effective tool to combat marine litter in that losses of fishing gear are prevented, and chances of retrieval are raised.

Salt Lofoten AS post@salt.nu salt.nu

CONTENTS

Acronyms and abbreviations **4**

Executive summary **5**

1 Introduction **8**

1.1 Background, purpose, and scope 8

1.2 The FAO Guidelines 9

1.3 Definitions 11

1.4 Gear types 12

1.5 Methodological approach 12

2 Gear usage and marking in the OSPAR Maritime Area **15**

3 Regulation and practices at the EU and regional level **22**

3.1 Status in the EU and its waters 22

3.2 Status in the NEAFC Regulatory Area 28

4 Regulation and practices at the national level **30**

4.1 EU member Contracting Parties 30

4.2 Non-EU member Contracting Parties 41

5 Gap analysis at OSPAR level **51**

5.1 Use of the FAO Guidelines by OSPAR Contracting Parties 51

5.2 Scope, principles, and implementation 52

5.3 Monitoring, control, and surveillance 56

5.4 Reporting and Recovery of ALDFG 58

5.5 Commercial traceability of fishing gear 59

5.6 Research and development 60

5.7 Awareness raising, communication and capacity development 61

5.8 Summary of gaps at OSPAR level 62

6 Bridging the gaps and future work **65**

6.1 Scope and design of marking systems through risk assessments 65

6.2 Information and reporting 67

6.3 Fishing gear traceability, ALDFG disposal and recycling systems 68

6.4 Research and development programmes and initiatives at the OSPAR or other relevant regional levels 69

6.5 Communication, best practice sharing and capacity development at the OSPAR level 70

7 Appendix **71**

ACRONYMS AND ABBREVIATIONS

AIS – Automatic Identification System

ALDFG – Abandoned, Lost or otherwise Discarded Fishing Gear

CP – Contracting Party

EPR - Extended Producer Responsibility

FAD – Fish Aggregating Device

FAO – Food and Agriculture Organization of the United Nations

FAR - Fishing Activity Reports

FFL – Fishing for litter

Cefas - Centre for Environment Fisheries and Aquaculture Science

COFI – FAO Committee on Fisheries

GGGI – Global Ghost Gear Initiative

HELCOM - The Baltic Marine Environment Protection Commission (Helsinki Commission, HELCOM)

ICG-ML - the Intersessional Correspondence Group on Marine Litter (ICG-ML) of OSPAR

ISSCFG - International Standard Statistical Classification of Fishing Gear

IUU – Illegal, Unreported and Unregulated fishing

MCS – Monitoring, control, and surveillance

NEAES 2030 – North-East Atlantic Environment Strategy 2030

NAFO – Northwest Atlantic Fisheries Organization

NEAFC – North-East Atlantic Fisheries Commission

NGO – Non-Governmental Organisation

OSPAR – Oslo and Paris Conventions. The Commission is the mechanism by which 15 individual state governments & the EU cooperate to protect the marine environment of the North-East Atlantic

PLN – Port Letters and Number

RAP ML 2 – 2nd OSPAR's Regional Action Plan for Marine Litter

RFB – Regional Fisheries Bodies

SwAM – Swedish Agency for Water and Marine Management

UKFMC - UK Fisheries Monitoring Centre

VHF – Very High Frequency radio

EXECUTIVE SUMMARY

To fulfil one of the objectives of the OSPAR Commission's environment strategy (NEAES 2030), the OSPAR's 2nd Marine Litter Regional Action Plan[1] (RAP ML 2) was adopted in 2022. This report contributes to the work of OSPAR's Intersessional Correspondence Group on Marine Litter (ICG-ML), in fulfilment of the first phase of the RAP ML 2's action "B.4.1 Prevent, locate, retrieve and handle ALDFG (Abandoned, Lost or otherwise Discarded Fishing Gear)". As a first step in the implementation of this action, a gap analysis on the application of the FAO's Voluntary Guidelines on the Marking of Fishing Gear[2] (hereafter called "the FAO Guidelines") has been conducted by SALT in relation to its implementation by relevant OSPAR Contracting Parties. The gap analysis is to inform a regional roadmap for filling the identified gaps and to give advice on improvements. This report presents the essential findings of the gap analysis and discusses the way forward towards filling the gaps.

Results of this work are based on input collected during fall 2023 from relevant public bodies in the respective OSPAR Contracting Parties', as well as input from other relevant competent organisations, industry organisations and NGOs. Participation in the information gathering process has been uneven when it comes to the Contracting Parties representatives being closer or further to the authorities responsible for policy and control of fishing activities and in terms of covering all the relevant Contracting Parties as some have provided little or no information to this study.

This unevenness does not hinder the gathering of key findings and gaps at the OSPAR level which are:

- Several Contracting Parties point to the FAO Guidelines to be used for reference in guiding the development of future regulations on marking of fishing gear. However, since current relevant national and EU regulations were enacted prior to the publishing of the FAO Guidelines in 2019, none of the current regulations or practices are directly resulting from, or based on the FAO Guidelines.
- The EU Fisheries Control Regulation[3] currently includes comprehensive provisions on the marking of fishing gear, which apply to those Contracting Parties that are EU Member States. The EU Fisheries Control Regulation has recently undergone an amendment process that has impacted the regulation's provisions relevant for the marking of fishing gear and reporting

[1] https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan/rap2
[2] The FAO's Voluntary Guidelines on the Marking of Fishing Gear (FAO, 2019) were published in 2019, purposed to combatting, minimizing and eliminating abandoned, lost or otherwise discarded fishing gear (ALDFG) and facilitating the identification and recovery of such gear.
[3] "Council Regulation (EC) No 1224/2009 of 20 November 2009

and recovering of ALDFG. The impact of this amendment as it only came into force at the beginning of January 2024.

- There is a broad agreement amongst the Contracting Parties and other contacted stakeholders that, to ensure effective implementation of gear marking systems, inclusion and involvement of the fishing industry is key to mitigate concerns that gear marking could have unwanted practical implications for gear handling and/or create increased costs and administrative burden for the industry.

The major gaps identified in relation to the recommendations set out in the FAO Guidelines can be summarized as:

- Formal risk assessments have not been conducted to determine the need for, and requirements of, fishing gear marking systems and regulations. Presently the types of gear, fisheries, fishing activities, and the design of the systems for gear marking are not based on a comprehensive risk assessment that takes ecological harm, economic harm, safety at sea and the impact on fishing operations into due consideration.
- Most Contracting Parties have only implemented gear marking systems for passive gear types, whilst most active gear types (except beam trawls and dredges) are not marked.
- There are overall good procedures for reporting the loss of fishing gear by the user to many of the flag and coastal states, but limited procedures on data storage, retrieval, and information exchange.
- The fishing gear marking systems and associated reporting do not provide enough information or have the necessary components, aspects and requirements for the identification and reporting of found fishing gear, reporting on the recovery of ALDFG, and safe and environmentally sound disposal of unwanted gear.
- Information on the marks is not documented in the form of a fishing gear record or through the fishing licensing or authorisation systems.
- Several countries report being unsure of efforts relating to traceability of fishing gear across the supply chain and no formal system is currently in place. Whilst the potential contribution of traceability practices on resolving ALDFG has not been assessed, industry is encouraged to do so by the authorities of several Contracting Parties.
- No system is in use across the Contracting Parties to provide information about ALDFG at the OSPAR level.
- There is no coordination or cooperation at the OSPAR level with regards to information sharing, communication, and training on fishing gear marking and ALDFG. Several initiatives on this exist at the Contracting Party level.
- No targeted education, training, technology exchange or other forms of capacity development exist at the OSPAR level to address constraints to the effective implementation of a system for gear marking.

Future work on the following aspects could help Contracting Parties in bridging the identified gaps improving and reinforcing the existing practices for marking of fishing gear and prevention of ALDFG:

- Carrying out comprehensive risk assessments on all types of gear, fisheries, and fishing activities could be crucial in identifying pitfalls in existing marking systems. The risk assessment approach is suited to identify marking needs and solutions adapted to the present-day goals for marking of fishing gear including marine litter and ghost fishing. Beyond better defining the scope of marking systems, risk assessments can crucially contribute to better designing marking systems to allow identification of parts or pieces of gear sets when these are separated from surface elements or directly lost from fishing vessels. The guidance and recommendations regarding risk assessment procedures included in the FAO Guidelines cover stakeholder participation and transparency and feasibility and affordability of marking systems are central in the risk assessment considerations.
- A revision of the systems for marking of fishing gear could include broadening, strengthening, and standardising the reporting and information management mechanisms specially with a view to gather insight on the complete life cycle of fishing gear, including retrieval, and discarding of fishing gear. Fishing gear registers could be a complement to reporting and information systems to allow gathering of understanding of the amount of fishing gear in use at every given time.
- Improved information and knowledge on the life cycle of fishing gear could bring forward argumentation for the need of improving traceability of gear and materials across the supply chain and the need for further strengthening disposal and recycling systems. Extended producer responsibility towards gear and materials marking would allow traceability upwards into the supply chain and better targeting measures for specific groups of users, activities, and procedures to significantly reduce ALDFG.
- The systematic compilation at the OSPAR level of marking and ALDFG research results would certainly allow for streamlining the use of resources in filling up knowledge gaps.
- Finally, OSPAR level communication, best practice sharing, and capacity development approach would also ensure capitalization on the efforts carried out by each individual contracting party and much better coordination across the OSPAR Maritime Areas.

1 INTRODUCTION

1.1 Background, purpose, and scope

This report is the result of a contracted assignment commissioned by the Swedish Agency for Marine and Water Management (SwAM), as a contribution to the work of OSPAR's Intersessional Correspondence Group on Marine Litter (ICG-ML), in fulfilment of the first phase of the action "B.4.1 Prevent, locate, retrieve and handle ALDFG", included in OSPAR's Second Regional Action Plan for Marine Litter (OSPAR, 2022). The Second Regional Action Plan was launched in June 2022, and it is the mechanism to help implement one of the strategic objectives of the OSPAR North-East Atlantic Environment Strategy (NEAES 2030).

This specific action is aimed towards effective cooperation among Contracting Parties to prevent, locate, retrieve and handle abandoned, lost, or otherwise discarded fishing gear (ALDFG). The cooperation is intended to disseminate information of existing national and international ALDFG work through the development of best practices addressing the marking of fishing gears, reporting, location/verification, and their retrieval in an environmentally sound way. The aim is to contribute to a circular economy, building on existing experience linked to EU processes, such as the implementation of Single-Use Plastics Directive (and related EPR-systems/collecting targets for end-of-life gear, etc.) and other relevant developments in the same policy space[4,5]. Simultaneously, developments must be consistent with other international provisions, such as the IMO process of amending MARPOL Annex V on issues such as ALDFG and marking of gear and potential future provisions in a legally binding UN treaty on plastic pollution.

As a first step in the implementation of this action, SwAM has commissioned SALT to conduct this gap analysis on the application of the Voluntary Guidelines on the Marking of Fishing Gear (hereafter called "the FAO Guidelines" or "the Guidelines") by the relevant OSPAR Contracting Parties. The Guidelines are global in scope and specifically designed to enable fishing gear marking as a tool to prevent ALDFG. This is why the OSPAR Commission looks to the Guidelines, with the intention of understanding the extent to which these guidelines are being implemented in the OSPAR Maritime Area, to inform a regional roadmap for filling the identified gaps and consider any improvement. Robust gear marking systems are regarded as an effective tool to combat marine litter in that losses of fishing gear are prevented and chances of retrieval are raised, as pointed out by the FAO and IMO.[6]

[4] E.g. CEN/TC 466 - Circularity and recyclability of fishing gear and aquaculture equipment
[5] E.g. OSPAR scoping study on best practices for the design and recycling of fishing gear as a means to reduce quantities of fishing gear found as marine litter in the North-East Atlantic (2020)
[6] FAO, IMO, "Report on good practices to prevent and reduce marine plastic litter from fishing activities", (2022).

1.2 The FAO Guidelines

The FAO's Voluntary Guidelines on the Marking of Fishing Gear (FAO, 2019) were published in 2019.[7] The process to issue the guidelines was initiated during the 31st session of the Committee on Fisheries (COFI) in 2014, where concern was expressed over continued 'ghost fishing' and marine litter from ALDFG. As a result, the FAO convened an Expert Consultation on the Marking of Fishing Gear in 2016 at FAO headquarters, Rome, Italy, which produced draft guidelines on the marking of fishing gear. The COFI welcomed the draft guidelines and decided that the FAO should further develop this work through a technical consultation, which the FAO conducted in 2018.[8] The final version of the FAO Guidelines was later endorsed at the 33rd session of COFI in 2018. The FAO Guidelines are published in English, French and Spanish in a single document, while the Arabic, Chinese and Russian versions are published separately.

As detailed in the Abstract, the FAO Guidelines are purposed as a:

- *"…tool to contribute to sustainable fisheries, to improve the state of the marine environment, and to enhance safety at sea by combatting, minimizing, and eliminating abandoned, lost or otherwise discarded fishing gear (ALDFG) and facilitating the identification and recovery of such gear…*
- *…The Guidelines assist fisheries management and can be used as a tool in the identification of illegal, unreported, and unregulated (IUU) fishing activities…*
- *…The Guidelines address the purpose and principles, the scope of application and the implementation of a gear marking system and its associated components, including reporting, recovery, and disposal of ALDFG or unwanted fishing gear and commercial traceability of fishing gear…*
- *…The Guidelines also contain special considerations for developing States and small-scale fisheries with a view to capacity development, as well as guidance on conducting a risk-based approach to implementing gear marking systems…*
- *…The Guidelines are expected to assist States in meeting their obligations under international law, including relevant international agreements and related governance frameworks and the specific requirements for gear marking contained in FAO's Code of Conduct for Responsible Fisheries."*

The FAO Guidelines contains 72 separate paragraphs with individual recommendations to guide its users. The paragraphs are divided into categories, covering (i) statement of purpose, (ii) scope and principles, (iii) implementation of a gear marking system, (iv) monitoring, control and surveillance, (v) reporting of ALDFG, (vi) recovery of ALDFG, (vii) commercial traceability of fishing gear

[7] https://www.fao.org/responsible-fishing/resources/detail/en/c/1470106/
[8] COFI/2018/Inf.24

marking, (viii) fish aggregating devices, (ix) research and development, (x) awareness raising, communication and capacity development and (xi) special requirements of developing states and small-scale fisheries.

Since the FAO Guidelines were first published, the FAO has published the following supplementary material: "A framework for conducting a risk assessment for a system on the marking of fishing gear - Suppl. 1"[9] which provides a framework for conducting a risk assessment to assist in determining the need for, and requirements of, a system for the marking of fishing gear and a "Manual for the marking of fishing gear – Suppl. 2"[10], providing practical instructions on marking methods for the main types of fishing gear to identify ownership.

Since the FAO Guidelines is a relatively recent tool, work on promoting it and implementing its provisions is currently ongoing at different levels. The analysis within this document covers the status of implementation at the OSPAR level and within its Contracting Parties, therefore covering the regional and national level. Before elaborating further, it is worth mentioning that international organisations of global scope are also furthering the use and implementation of the FAO Guidelines. Of special relevance is the cooperation between the FAO and IMO, especially whereby MARPOL Convention Annex V prohibits the discharge of into the sea of all plastics, including synthetic fishing gear[11]. The London Convention and Protocol on dumping of wastes at sea also does not permit the dumping of fishing gear at sea.[12] Both MARPOL and the London Convention and Protocol are IMO instruments and the IMO works for their effective implementation through the Marine Environment Protection Committee and the Sub-Committee on Pollution Prevention and Response. The Sub-Committee was tasked in 2022 with developing draft amendments to MARPOL Annex V and its associated guidelines to make the marking of fishing gear mandatory, using a goal-based approach to develop an appropriate circular promoting the implementation of fishing gear marking systems and the FAO Guidelines.[13] This work is ongoing[14] and closely connected to further work carried out by the FAO to facilitate the implementation of the Guidelines through the publication of the abovementioned supplements to the Guidelines.

[9] He, P. & Lansley, J. 2023. Voluntary Guidelines on the Marking of Fishing Gear – A framework for conducting a risk assessment for a system on the marking of fishing gear. Suppl. 1. Rome, FAO.

[10] Einarsson, H., He, P. & Lansley, J. 2023. Voluntary Guidelines on the Marking of Fishing Gear – Manual for the marking of fishing gear. Suppl. 2. Rome, FAO

[11] https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx

[12] https://www.imo.org/en/About/Conventions/Pages/Convention-on-the-Prevention-of-Marine-Pollution-by-Dumping-of-Wastes-and-Other-Matter.aspx

[13] https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/MEPC-78th-session.aspx

[14] https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/PPR-10th%20session.aspx

Since the scope of this assignment covers the OSPAR Maritime Area, the analysis presented here leaves out the part of the FAO Guidelines on "Special requirements of developing states and small-scale fisheries" as they were deemed not to apply. Instead, the study focuses on commercial fisheries, which also includes small-scale coastal fisheries with vessels below 12 meters overall length, and while artisanal fisheries may therefore be included in the results presented, they were not specifically mentioned or focused on when interviewing staff from the OSPAR Contracting Parties. The section on fish aggregating devices is also not included in this analysis, because while these devices are used in tuna fisheries by OSPAR Contracting Parties' vessels in the tropical and equatorial Atlantic, Pacific, and Indian oceans, they are not used in the OSPAR Maritime Area.

1.3 Definitions

Besides the purpose covered in the section above and reflected in the abstract and the section on "Statement of purpose" the FAO Guidelines include in the section "Definitions" additional clarification on the use of terms in the guidelines. It is worth quoting the definition included in §16b) here, as it is fundamental to this report:

*"**Mark**" means:*

i) an identifier, that allows the relevant authority to discern the person or entity ultimately responsible for the use of the fishing gear; and/or

ii) a means of providing an understanding of the presence, scale and nature of fishing gear in the water.

The use of the term mark or marking in both meanings does carry with it a degree of potential confusion when gathering information about the regulations and practices associated with fishing gear marking, because both meanings relate to the traditional uses of gear marking aimed at i) increasing navigational safety through indicating the presence of gear in the water and ii) supporting fisheries management by allowing verification that the user or owner of the gear deployed in the water operates lawfully and with a license or authorisation. For both applications, the marking refers to either the use of gear surface elements (buoys, flags, lights, and reflectors) and the associated "labelling or tagging" of these surface elements with an identifier that allows linking it with the owner or the operator.

When it comes to the need for marking to achieve the main purpose of the FAO Guidelines i.e. "to improve the state of the marine environment by combatting, minimising and eliminating abandoned, lost or otherwise discarded fishing gear (ALDFG)" it is important to place equal or even more attention on the "labelling or tagging" of the actual fishing gear. In other words, the marking of the subsea elements, as opposed to only the surface elements of it, is relevant to be able to trace as much as possible all elements of ALDFG fishing gear back to the owner or operator and to be able

to devise targeted measures for its quantification, identification, and retrieval. When possible, in this document labelling or tagging has been used as an alternative to marking to help the reader discern between the two possible uses of the term "marking" even if this clarification has not been consistently used during the information gathering process.

1.4 Gear types

To facilitate gathering of information on fishing gear marking in a uniform manner, gear types have been grouped according to the International Standard Statistical Classification of Fishing Gear (ISSCFG)[15] developed by the Coordinating Working Party on Fishery Statistics Secretariat at the FAO. In general, gear is categorized into "passive" and "active" gear types (Figure 1). Active gear such as surrounding nets, trawl nets, dredges, and seine nets, are intentionally moved through the water using mechanical means to seek out fish and shoals of fish, whereas passive gear such as hooks and lines, nets, fish traps, fish pots and longlines, must be encountered or sought out by fish for the fish to then be caught. Passive gear is "fixed in place" during fishing and the setting and hauling locations are typically very close to each other, if not identical.

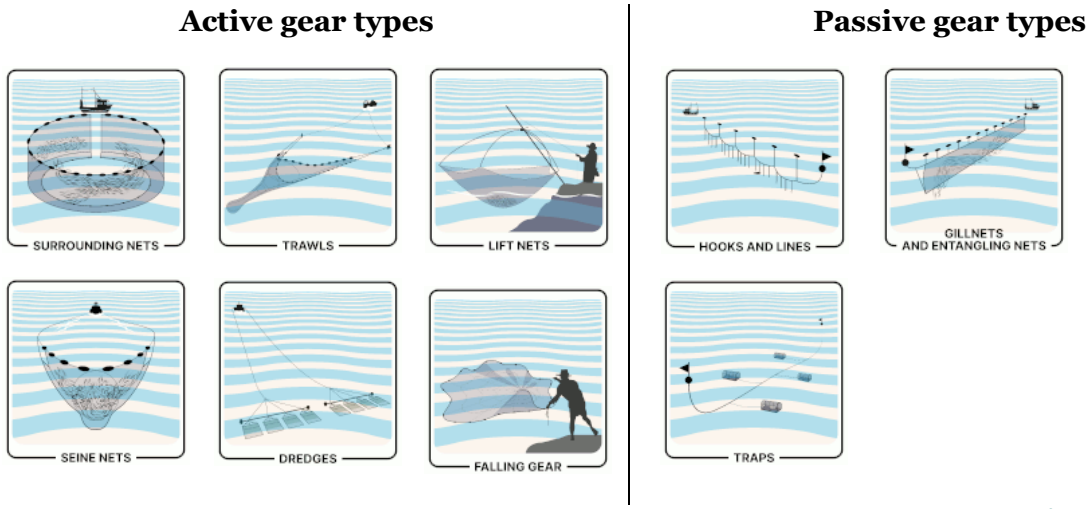

Figure 1. Active and passive gear types, from the general gear categories. Illustrations by the FAO.[16]

1.5 Methodological approach

Information presented in this report has been collected from organisation representatives selected from relevant public authorities in OSPAR Contracting Parties, as well as from other internationally competent organisations, international and national industry representatives, and non-governmental organisations (see list of contacts in the Appendix).

[15] https://www.fao.org/cwp-on-fishery-statistics/handbook/capture-fisheries-statistics/fishing-gear-classification/en/
[16] https://www.fao.org/fishery/en/geartype/search

All OSPAR Contracting Parties except Finland, Luxembourg, and Switzerland, were included in the information collection process for this study. Finland, Luxembourg, and Switzerland were excluded since they have no fishing fleets operating in the OSPAR Maritime Area.

Relevant public bodies within each Contracting Party were selected through recommendations from delegates to the OSPAR Intersessional Correspondence Group on Marine Litter (ICG-ML) and those organisations then nominated the individual representatives to be interviewed. Unfortunately, France, Portugal and Spain were unable to respond to the request for participation in the information gathering process within the available time frame, and no interviews could be conducted to gather information from these Contracting Parties. The Portuguese authorities however shared information on the relevant regulation in Portugal through e-mail exchange.

Relevant industry organisations and their representatives were mainly selected based on recommendations from the interviewed public bodies from each country. At the international level for the EU and its waters, and due to the commonalities across the Contracting Parties that are EU Member States, international industry organisations were approached that had mandates covering the whole or different parts of the EU maritime areas. Two out of the three interviewed organisations are also OSPAR observer organisations. For the non-EU members, one fisheries organisation per Contracting Party was approached (see Appendix).

In addition, the North-East Atlantic Fisheries Commission was also interviewed in order to gather insight on regulations and praxis in areas beyond national jurisdiction of relevance to the OSPAR Maritime Area.

Additional information supplied by the Global Ghost Gear Initiative (GGGI), based on their knowledge on ADFLG was used as input to this report.

Interviews were conducted as semi-structured (Knott et al. 2022)[17] verbal interviews via virtual web meetings, where a standard survey questionnaire was made available to the interviewees before the interviews.[18] Both the interviews and the survey questionnaire were structured following the structure of the FAO Guidelines and covering its main sections enumerated in section 1.2. Afterwards, the respondents were given an opportunity to quality check registered responses from each interview and revisions have been made according to received feedback from the interviewees.

[17] Knott et al. (2022). DOI: 10.1038/s43586-022-00150-6
[18] Survey questionnaires used in this study available upon request from SwAM.

The results of the information gathering process were presented to the OSPAR Intersessional Correspondence Group on Marine Litter (ICG-ML) in November 2023. The ICG-ML discussed the results obtained and was provided with the opportunity to suggest input for bridging the gaps and identify what future work was required for further progress on the marking of fishing gear as a measure to combat marine litter from fisheries related sources.

Results are divided between findings at the international level, relative to the whole of the EU (section 3.1), to areas beyond national jurisdiction (section 3.2) and at the national level. For the latest results divided between EU Member States (section 4.1) and non-EU Contracting Parties (section 4.2).

2 GEAR USAGE AND MARKING IN THE OSPAR MARITIME AREA

Through the survey questionnaire, the degree of use of different gear types, as well as the respective status of marking regulations for each gear type was reported from the responding Contracting Parties. The results are summarized in Figure 2.

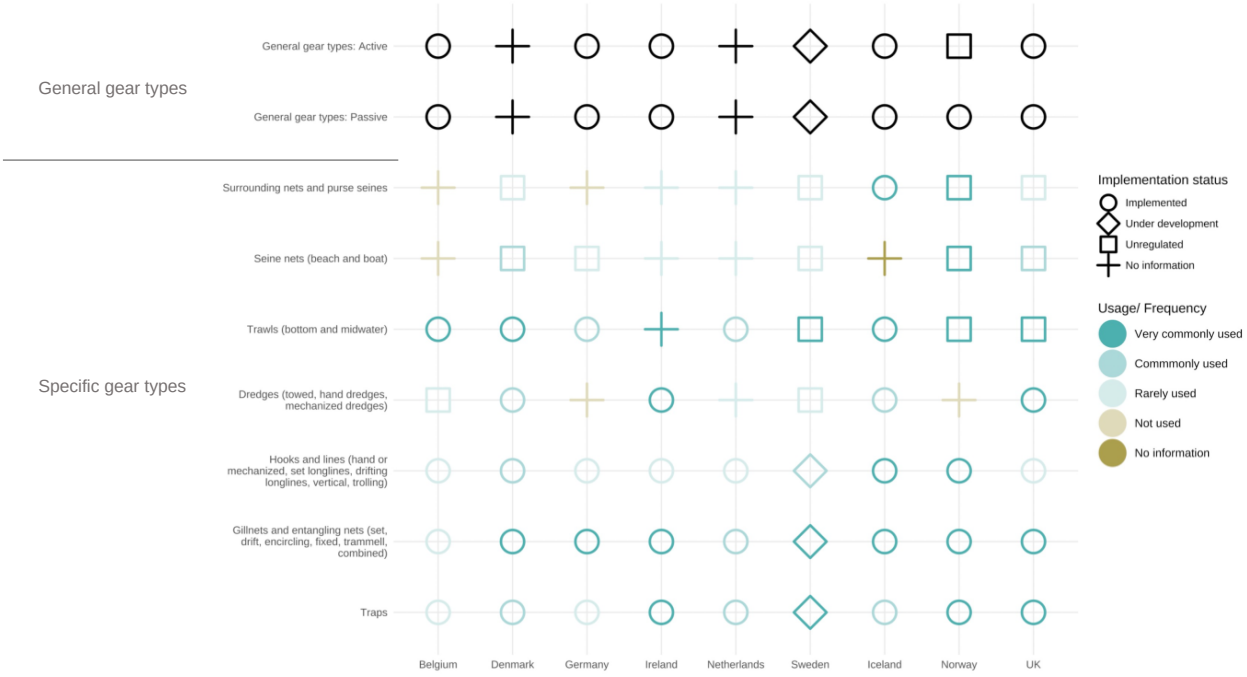

Figure 2. Specific gear types depicted in terms of their degree of use (colour) and their respective status of implementation with regards to gear marking regulations (symbol shape) for each Contracting Party state that reported on this through the survey.

Regulated marking systems are in place for specific gear types in all the Contracting Parties for which information was available. Gillnets, trawls and traps are the three major gear types utilized in the OSPAR region by the OSPAR Contracting Parties fleets, according to an average weighted scoring of the information provided by each of the Contracting Parties authorities, as depicted in Figure 3 below. All gear types are widely represented amongst the Contracting Parties, except for lift nets and falling gear. The results are in line with the responses from the 2020 OSPAR Scoping study on best practices for the design and recycling of fishing gear.[19] As the responses presented here are qualitative, they should be interpreted only as indicative of what gear types are more or less

[19] https://www.ospar.org/documents?v=42718

commonly used, but they still provide a good indication of which gears should be targeted by marking practices if those gears are also associated with high loss and/or damage risk.

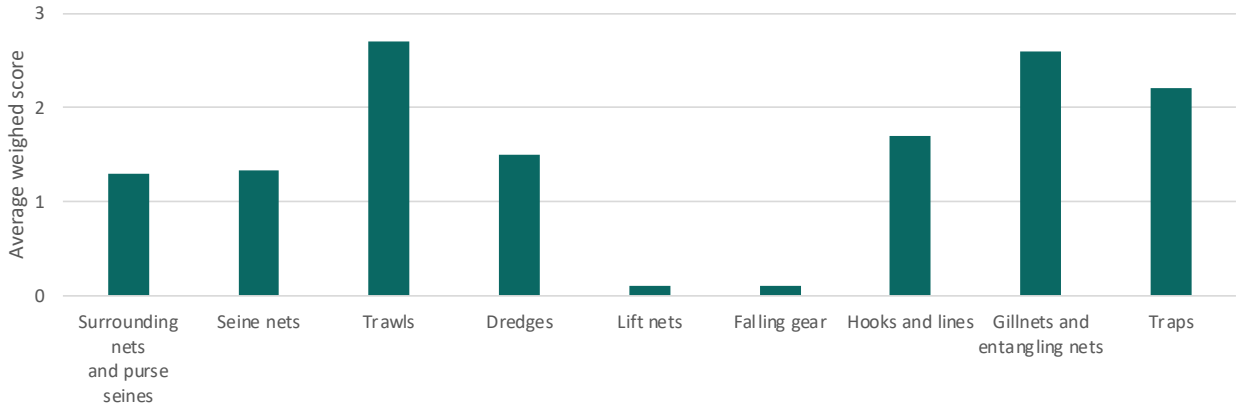

Figure 3. The average weighted score for how commonly a gear type is used in fisheries associated with the responding Contracting Parties. The score is the average of the responding CP answers, with each answer given the following score: Not used (0), Rarely used (1), Commonly used (2), Very commonly used (3). "No information" answers are not included in the calculation of the average score.

The FAO Guidelines states that a system for gear marking should be put in place for all gear types unless the relevant authority deems otherwise based on a risk assessment or other appropriate means. Such risk assessments should address the potential risks to navigation, safety and the environment, and the benefits of having an effective gear marking and reporting system established in a fishery. The FAO Guidelines' Annex provides a framework and guidance for criteria that can be used for undertaking a risk assessment to identify the appropriateness of implementing a system for marking fishing gear.

To provide high level insight on what risk factors are regarded as most relevant, this study has collected the opinions of the responding OSPAR Contracting Parties authorities' with regards to a) which risks are the main reasons for why active and passive gear types are marked (Figure 4) and b) on what priorities reported ALDFG is recovered (Figure 5).

As seen in Figure 4, most respondents indicate that for passive gear, both the risk for loss of gear as well as navigational hazards and hazards to fishing operations are reasons for gear marking. For active gear, only one responded that both risk types are considered. Perhaps surprisingly, active gear types (which are more seldomly lost) collected three responses pointing to "Risk for loss of gear", whilst only one CP responded "navigational and operational reasons". Note that not all the risk

categories proposed in the FAO Guidelines Annex[20] were listed as response alternatives in this study, which might have affected the resulting outcome of responses.

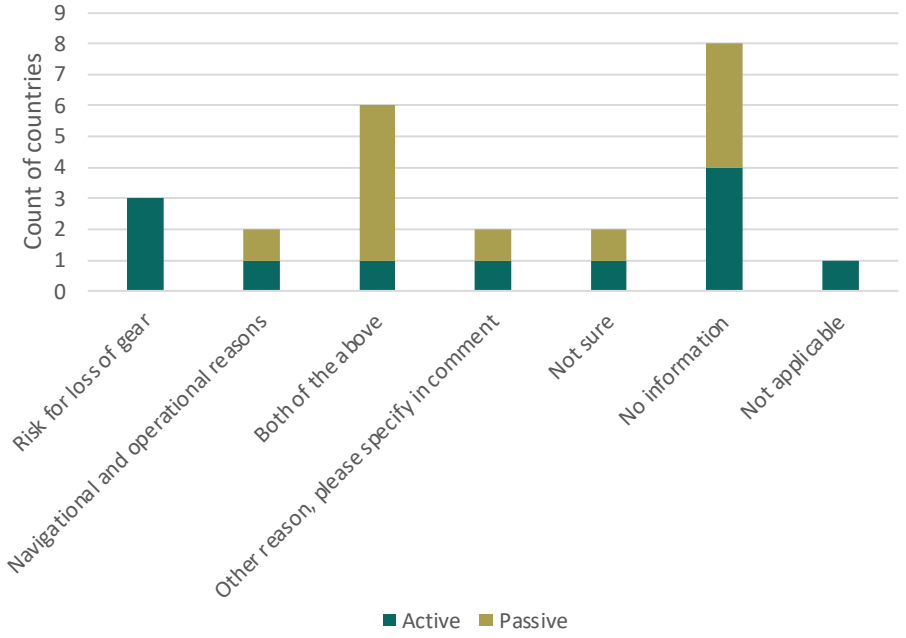

Figure 4. Question posed to Contracting Parties' authorities: "Why is this gear type regulated to be marked?".

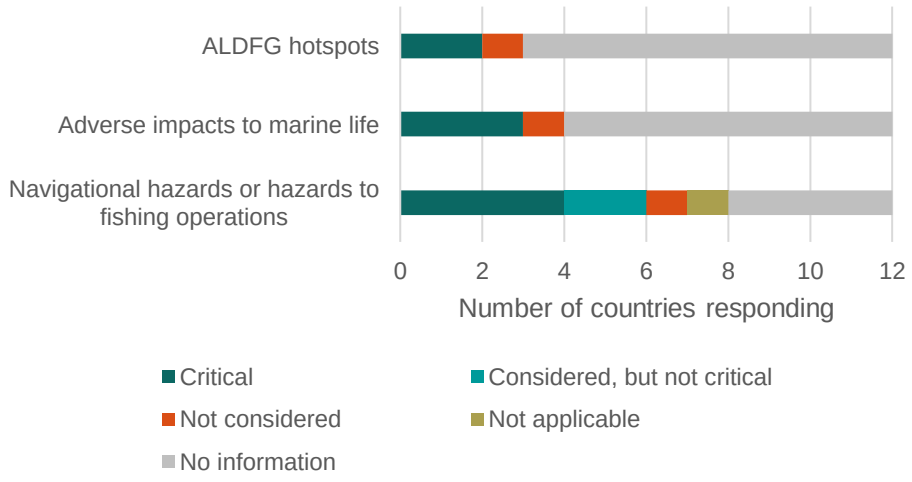

Figure 5. Question posed to Contracting Parties' authorities: "Based on what priorities does your country recover reported ALDFG?".

Navigational hazards or hazards to fishing operations are deemed by most responding Contracting Parties to be a "critical" (four responses) or "considered" (two responses) factor for prioritizing recovery when a fishing gear is reported as ALDFG (Figure 5). While collecting fewer responses, both

[20] a) ecological harm; b) economic harm due to ghost fishing or illegal, unreported, and unregulated fishing; c) safety at sea; and d) the impact on fishing operations.

"Adverse impacts to marine life" as well as "Identification of hotspots for ALDFG" were considered critical priorities by three and two Contracting Parties, respectively.

There seem to be several significant risks underlying the reasons for marking regulations as well as recovery reasons for ALDFG and a more detailed risk assessment for individual gear types and fishing fleets is likely necessary to uncover concrete risk drivers in each case. For reference, Figure 6 below shows a visual representation from Höjman et al. (2022)[21], presenting the results of a risk assessment from the project Clean Nordic Oceans (Langedal et al. 2020[22]) covering the Nordic Council region (Denmark, Finland, the Faroe Islands, Greenland, Iceland, Norway and Sweden). The assessment produced a risk assessment for different gear types, including which fishing equipment has a higher risk of being lost, the risk of ghost fishing after the gear being lost and the risk that the lost equipment will cause the entanglement of other equipment, resulting it also becoming lost. As the figure shows, gillnet fishing gear appears to be the equipment type with the highest risk in all three categories. Pots and traps are associated with a particularly high risk of loss and ghost fishing, while gillnets, trawls, Danish seine, and purse seine that have already been lost are associated with a relatively high risk of contributing to other equipment being lost.

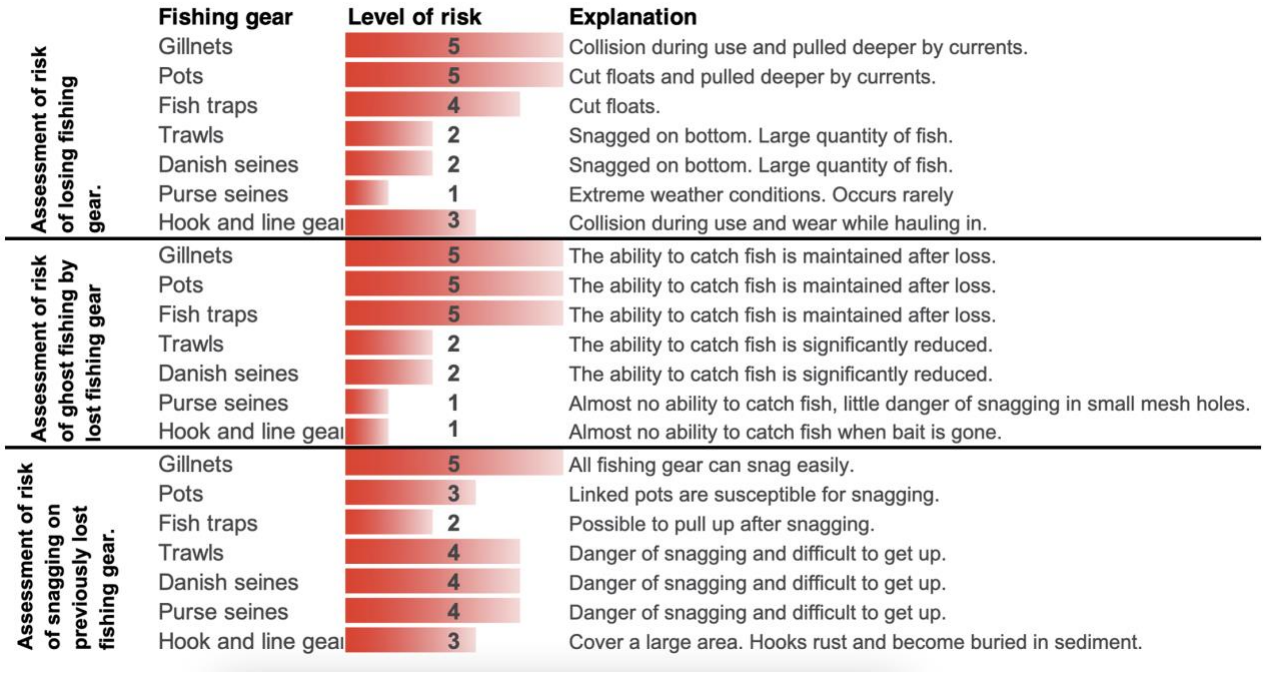

Figure 6. Graphical representation of the risk model presented in the main report from Clean Nordic Oceans (Höjman et al. 2022).

[21] Höjman, C. et al. (2022), "Macro plastic from fisheries and aquaculture: Knowledge status, preventive measures and knowledge needs". Available from: https://www.marfo.no/sjobaserte-kilder/ny-rapport-omfanget-av-sjobasert-forsopling-er-betydelig/

[22] Langedal et al. (2020). DOI: http://dx.doi.org/10.6027/temanord2020-509

According to responses from the Contracting Parties, ownership of gear is, to a large extent, detailed in the labelling of the gear for traps, gillnets and entangling nets, hooks and lines (six Contracting Parties responded "Yes" per gear type, see Figure 7). Also, three countries reported to have ownership information included in the labelling requirements of dredges and trawls, while one country reported the same for surrounding nets and purse seines.

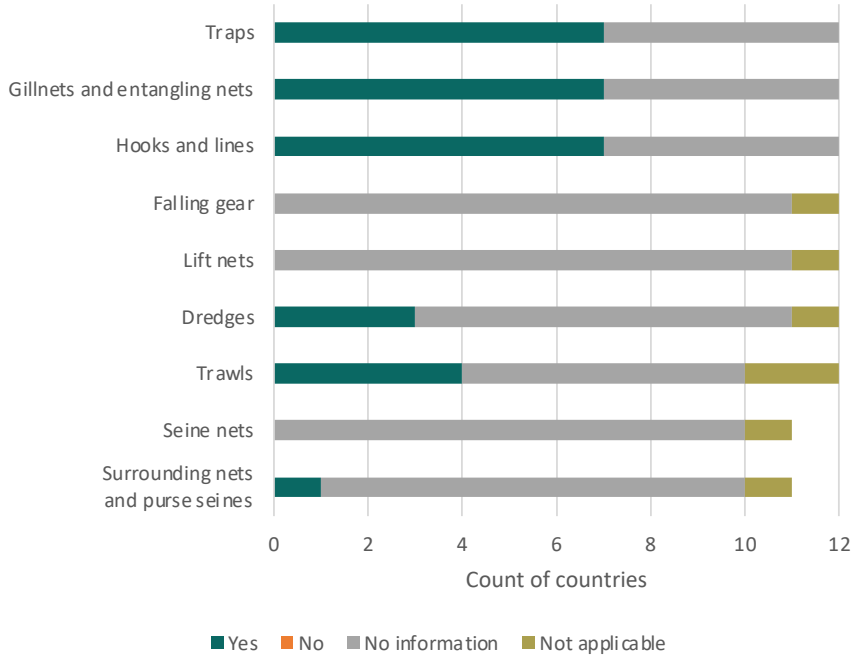

Figure 7. Question posed to Contracting Parties' authorities: "Does marking detail ownership of fishing gear?".

The responding Contracting Parties state that location (i.e. a transponder broadcasting location information as opposed to visual sighting) of gear is not provided by gear marking systems (Figure 8), except for one country (Belgium). Dredge vessels harvesting mussels in Denmark must have an active transmitting "black box" which shows the location and operations of the vessel, however, the location of the gear itself is not transmitted.

For the OSPAR countries that have gear marking systems for specific gear types, most of the marking types are physical tags, floats or flags that are commonly labelled (Figure 9). In the EU, buoys with flags, radar reflectors and lights at night are mandatory for passive gear if operated beyond 12 nautical miles from the coast. In all EU waters, permanent labels with the external registration letters and numbers displayed on the hull of the fishing vessel to which it belongs, shall be applied for nets (on a durable label securely fixed to the upper first row), lines/longlines and pots/traps (durable label securely fixed to the ground rope), as per Regulation (EU) 404/2011.[23] In all EU waters, the

[23] https://eur-lex.europa.eu/eli/reg_impl/2011/404

same regulation establishes that beam trawls must clearly display the external registration letters and numbers of the fishing vessel on the beam of each beam trawl assembly.

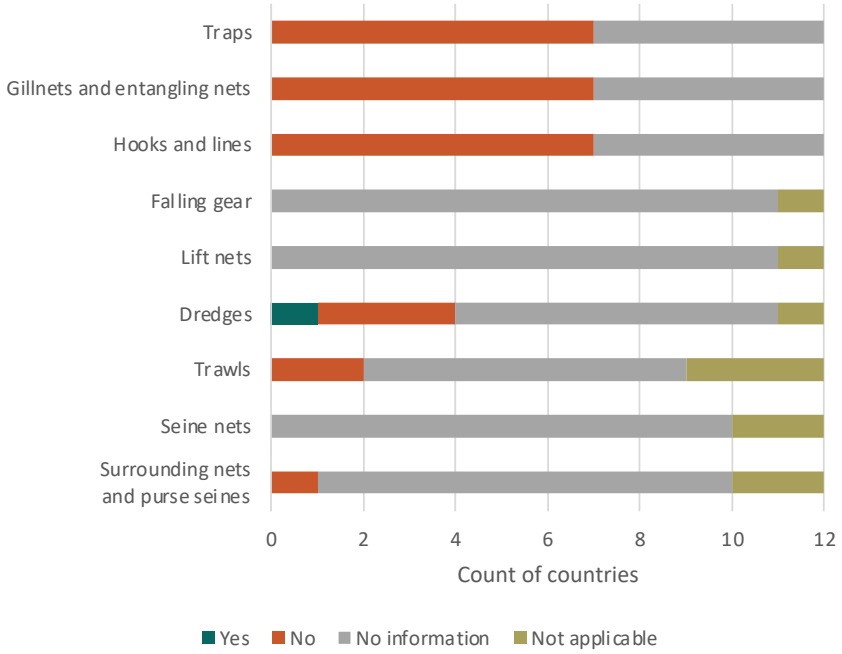

Figure 8. Question posed to Contracting Parties' authorities: "Does marking provide location of fishing gear?".

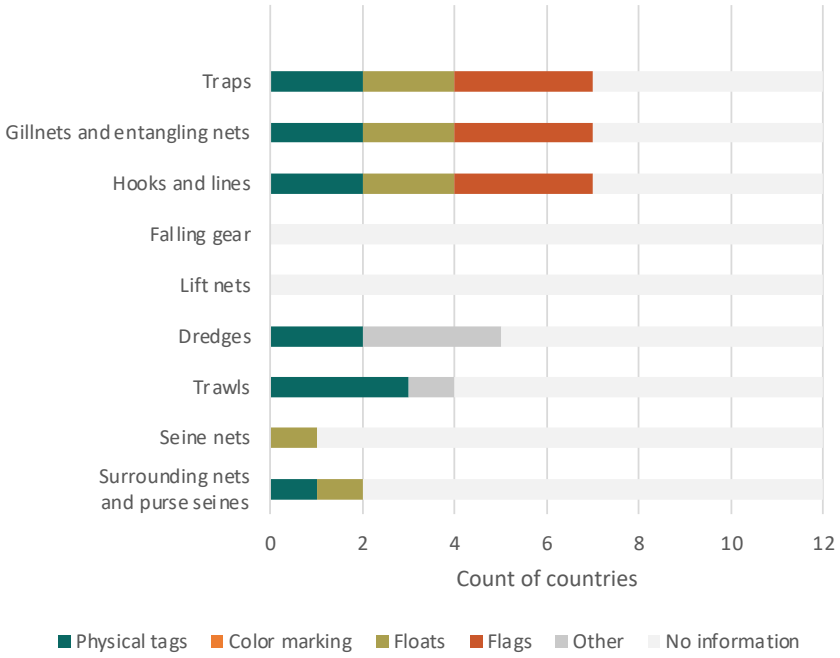

Figure 9. Contracting Parties' authorities specified the type of marking required per gear type.

For non-EU countries, there is some variation in marking and labelling rules. The UK implemented the rules on fishing gear marking included in the EU Control Regulation and Implementing Regulation while it was an EU Member State. After leaving the EU, the UK has brought the existing regulations and praxis into national regulations and hence still has similar marking rules as the EU. Iceland has a general rule to mark cod ends of active gear, and for passive gear to have labels at buoy, pods and anchors and also at the rail (gillnets must put tags on the lower rail). Purse seines should be marked with three labels on the corkline and on the lower line. Iceland is the only country stating that AIS transponders are used as additional markings on hooks and lines and gillnets and entangling nets when fishing below 400 meters depth. Norway has no marking system for active gear, while passive gears should have at least one float marked with the vessel's PLN. For non-licensed vessels, the marking should detail owner's name and address in the surface boys. This includes when fishing with traps. For snow crab traps, there are special requirements for marking the first and last pot in a chain, applicable from 01.01.2024.

3 REGULATION AND PRACTICES AT THE EU AND REGIONAL LEVEL

OSPAR, EU and NEAFC (North-East Atlantic Fisheries Commission) provide relevant supranational and regional frameworks for the cooperation amongst States on the establishment, implementation and harmonisation of fishing gear marking systems, as advised in the FAO Guidelines. The two sections below provide insight into the marking systems envisaged within the two regional frameworks that include several of the OSPAR Contracting Parties and that are of application within the OSPAR Maritime Areas. Each section covers (i) the scope of the regulations that are in place, (ii) the implementation, including monitoring, control and surveillance, reporting and recovery, (iii) research and development, (iv) communications and dissemination, (v) industry views if available and (vi) a summary of gaps with respect to the FAO Guidelines.

3.1 Status in the EU and its waters

The European Union (and 11 of its Member States) are OSPAR Contracting Parties. All of them but Finland and Luxembourg are within the scope of this study. This section covers the current status at the EU level and connected to EU-wide policy, initiatives and activities.

3.1.1 Regulation on marking of fishing gear

The FAO Guidelines were published ten years after the adoption of the Council Regulation (EC) No 1224/2009 of 20 November 2009, establishing a Community control system for ensuring compliance with the rules of the common fisheries policy (hereafter "the Control Regulation")[24] and eight years after the Commission implementing Regulation (EU) No 404/2011 of 8 April 2011 laying down detailed rules for the implementation of the Control Regulation (hereafter "the Implementing Regulation")[25], both already including comprehensive provisions on the marking of fishing gear. These regulations are of direct application in EU Member States and therefore require no transposition to national legislation. The EU and its Member States are responsible for the control of their fishing vessels and vessels operating on their waters and infringement of regulations, including those of the marking of gear, needs to be reported to and by the European Commission.

Article 8 of the Control Regulation states the obligation with regards to the marking and identification of the vessel and its gears and the process for establishing the detailed rules for this.

[24] https://eur-lex.europa.eu/eli/reg/2009/1224
[25] https://eur-lex.europa.eu/eli/reg_impl/2011/404

The Implementing Regulation covers in Section 2 (Articles 9 to 17) the provisions regarding the marking and identification of fishing gear:

- Article 9 covers the general rules for passive gear and beam trawls.
- Article 10 covers the specific rules for beam trawls.
- Article 11 covers the specific rules for passive gear.
- Article 12 covers the rules for labels.
- Articles 13 to 17 cover the rules for buoys and cords.

The EU and its member states carry out inspections at sea and at port that cover the marking of fishing gear and there is a sanction system that involves both administrative and financial penalties, plus criminal sanctions that may result in the suspension and eventually permanent withdrawal of the fishing license.

The EU fisheries control system has recently undergone a review process that has impacted the regulation's provisions relevant for the marking of fishing gear and reporting and recovering of ALDFG. This review process was concluded with the approval by the European Parliament on 17 October 2023[26] and the adoption by the Council on 13 November 2023. The act was signed on 22 November 2023 and entered into force on 9 January 2024. The revised control regulation (Regulation (EU) 2023/2842, the "Amended Control Regulation") includes revised or new provisions regarding: (i) the establishment of rules for the marking and identification of gear, for labels for the marking of fishing gear, for marking of buoys and setting cords, and for procedures pertinent to the notification and return to port of end-of-life fishing gear (Article 8), (ii) the requirement to record fishing gear loss in the fishing logbook (Articles 14 and 48), (iii) the collection of information on lost fishing gear by Member States and the publishing of a compilation of that information by the Commission every year (Article 48), (iv) the establishment of rules for gear marking in recreational fisheries (Article 55), (v) the inclusion of the verification of having the necessary equipment for the retrieval of lost fishing gear in vessel inspections (Article 74), (vi) the qualification of the non-fulfilment of the obligations to duly mark fishing gear as a serious infringement (Article 90). In addition, as per the Amended Control Regulation, Member States shall report to the Commission on an annual basis on control and inspections, including aspects related to the marking of fishing gear. The Commission shall make publicly available on its website a yearly compilation of information from the Member State reports (Article 93b). This is a substantial increase on the reporting frequency for the control on fishing gear marking in relation to the previous regulation that only required reporting on the application of the whole Control Regulation every fifth year.

[26] https://www.europarl.europa.eu/news/en/press-room/20231013IPR07124/parliament-approves-new-eu-fisheries-control-rules

The FAO Guidelines or the manual for the Guidelines has not been explicitly used to guide the amendment of the control regulation.

3.1.2 Implementation and management of marking systems

The interview survey conducted as part of this study with the European Commission Directorate General for Maritime Affairs and Fisheries did not reveal any challenge on the implementation or barriers on the enforcement of the already existing obligation to mark beam trawls and passive gears, which is covered by the above-mentioned regulations. The scope and design of the system for marking gear included in the Control Regulation and Implementing Regulation has not been guided by a risk analysis however. Alternatively, the best available scientific advice from the Scientific, Technical and Economic Committee for Fisheries was used for the development of the EU Implementing Regulation that limits and defines the marking of fishing gear for beam trawlers and passive gear.

According to the annual reports of the European Fisheries Control Agency there were only 14 infringements regarding marking rules between 2019 and 2022 in the operational areas of the three Joint Deployment Plans that correspond to the OSPAR Maritime Area (i.e. the North Sea, the Western Waters and the NEAFC Joint Deployment Plans). This is under 1.5% of the total infringements covering all aspects of the Control Regulation recorded in these operational areas, showing that infringement of gear marking provisions is relatively uncommon.

The EU regulations cover the marking of beam trawls by labelling the beam itself by clearly displaying the PLN of the vessel operating the trawl and the marking of passive gear with labels on the gear themselves and with end and intermediary buoys. Both labels and buoys are to be marked with the vessel's PLN. The buoys provide visual indication of the presence of gear in the water column to other fishers and authorities but there is no requirement and system for the registration of marked gear that provides information on its location beyond direct visual observation.

The implementation and enforcement of regulations regarding the marking of fishing gear are seen to aid in fisheries resource management as they contribute to reduced IUU (for the gears where marking is regulated), good fishing practices and increased potential of recovery of ALDFG.

The retrieval of lost gear is covered under Article 48 of the Control Regulation and establishes the master's obligation to attempt to retrieve any gear or part of it that is lost. In addition, it establishes the obligation to inform the competent authority within 24 hours of gear loss or by logging the loss in the fishing logbook as per the Amended Control Regulation. EU Member States have the obligation to include information on reported lost fishing gear in the 5-year report on the

implementation of the Control Regulation and, with the entry into force of the Amended Control Regulation, to collect and record information that will be used by the Commission to produce and publish yearly compilations.

The Amended Control Regulation includes provisions so that fishing gear at the end of its life cycle is brought back to shore for treatment in port reception facilities established specifically for that purpose, under Directive (EU) 2019/883 on port reception facilities for the delivery of waste from ships[27]. That also allows Member States to report to the Commission on amounts of waste fishing gear, including gear at the end of its life cycle, which they collect each year under Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment[28]. To that respect, it is important to note the provision included in Article 8 of the last directive on extended producer responsibility. This regards the request of the Commission to develop harmonised standards relating to the circular design of fishing gear, encouraging the preparation for re-use and facilitating better recyclability at end of fishing gear's life. The Technical Committee 466 of the European Committee for Standardization (CEN/TC 466) is carrying out work to cover this and Part 2 (User manual and labelling) of the standard on "Circular design of fishing gear and aquaculture equipment" should include requirements for gear/polymer labelling and marking to ensure traceability of fishing gear components[29].

3.1.3 Research projects on fishing gear marking and ALDFG

The EU is involved in research projects directed towards fishing gear marking and ALDFG, but the officer interviewed did not have specific details regarding this.

3.1.4 Communication and dissemination efforts

When it comes to communication, dissemination and training on the marking of fishing gear and ALDFG, the European Commission is constantly and actively promoting the implementation of the common fisheries policy and the importance of sustainable development of marine areas within the EU through cross sectorial initiatives.

3.1.5 Industry assessment of the implementation of the FAO Guidelines

The European Commission gathers advice on aspects relative to the common fisheries policy from the Advisory Councils which have therefore provided advice on the EU fisheries control regulation of 2009 and its amendment. The Advisory Councils are stakeholder-led organisations that include representatives from the fishing industry and from other interest groups. To gather further insight

[27] https://eur-lex.europa.eu/eli/dir/2019/883
[28] https://eur-lex.europa.eu/eli/dir/2019/904
[29] CEN/TC 466 Work programme

in the status of implementation of the FAO Guidelines at the EU level and challenges related to fishing gear marking regulations, representatives of stakeholder organisations were also approached for interviews. The Association of National Organizations of Fishing Enterprises in the European Union (Europêche) and two Advisory Councils (the North Sea Advisory Council and the South West Waters Advisory Council), provided input to the information gathering process through interviews. Advisory Councils are stakeholder-led organisations that provide the European Commission and EU countries with recommendations on fisheries management matters.

While the degree of familiarity with the FAO Guidelines varied amongst the interviewed organisations, none used the FAO Guidelines actively due to their voluntary application and the pre-existence of EU regulations that defined the obligations regarding the identification and marking of fishing gear.

None of the organisations interviewed identified major challenges in the implementation of the existing regulations beyond operational ones, like maintaining the integrity of the markings and tags which are exposed to substantial use and wear. According to the representatives interviewed, the enforcement of the regulations has the desired effect and the regulations are observed in a large majority of the fishing activities carried out by members or stakeholders represented by the organisations.

One of the interviewed organisations attributed the above-mentioned low number of infringements on identification and marking of gear to the overall willingness of the sector to operate within the legality. The representative attributed the very few infringements detected to be related to a determined willingness by some vessel operators to carry out unreported or unregulated fishing more than being related to the burden or the cost to duly mark gear.

Marking of fishing gear is considered to contribute to better fisheries management with, for example, the conduct of licensed fisheries and the use of duly authorised gear. In this respect, one of the organisations mentioned the potential challenges in implementation connected to vessels from states that are not EU Member States and therefore not subject to the same stringent national regulations by their flag state.

The organisations indicated a good level of consultation in the development of the Control Regulation and the Amended Control Regulation while at least one pointed to the lack of dialogue on the Implementing Regulation, an aspect that could be improved as consensual procedures for the implementation are important for wide observance by vessel operators.

With regards to potential improvements to the regulations or praxis for the OSPAR Maritime Area, reference was made to the challenges brought by the different legal frameworks existing for Contracting Parties that are not EU members. Also the substantial improvements brought by the Amended Control Regulation were highlighted, namely: the provision for the possibility of adopting procedures for ensuring notification of the end-of-life of fishing gear to the competent authorities and of its returning to port reception facilities or other equivalent collection systems; the consideration of disposal of fishing gear at sea as a serious infringement; and the improvement of transmission of information on fishing gear and loss of fishing gear to Member States' competent authorities by means of the fishing logbook. The extension of the obligation to mark and identify fishing gear to recreational fisheries was also signalled as one area of potential improvement without making specific reference to the revised Amended Control Regulation.

Organisations also commended their members and stakeholders for the efforts they make in the retrieval of lost gear motivated by avoiding economic loss, the existing regulations and the willingness to preserve the environment. Even though the retrieval of lost fishing gear is not within the core activities of the organisations that were interviewed, it was clear that they were aware of efforts being made by the fishing sector in this regard, as well as the reporting of lost fishing gear when recovery was not possible due to safety. To this respect it was mentioned that it is not always possible to recover parts or fragments of gear when lost.

The Advisory Councils constitute a forum through which individual Producer Organisations and the masters of fishing vessels can establish contact and communicate with regards to avoiding conflict between gears from different fleets operating in the same grounds, which is generally regarded a risk factor for fishing gear loss.

3.1.6 Gaps with respect to the FAO Guidelines

The primary gap between the current regulations of fishing gear marking in the EU, including the Amended Control Regulation and the FAO Guidelines, is that a full risk assessment has not been conducted for the inclusion of marking of fishing gear in the fisheries regulations (FAO Guidelines §7-8, §11a, §15).

The information and reporting systems in the former EU regulations differ in several aspects with regards to the recommendations included in the FAO Guidelines, but the progressive application of the Amended Control Regulation will certainly bring substantial improvements to this respect. Nevertheless, even with the Amended Control Regulation, the reporting of found and retrieved ALDFG may still not be covered by the information systems and reporting mechanism (FAO Guidelines §20c, d). The scope of the revised information systems and reporting mechanisms will

only be possible to evaluate when the implementing acts connected to the Amended Control regulation are issued.

There are no mechanisms at the EU level for the traceability of fishing gear marks that provides for reporting of marks' loss or damage and for their replacement (FAO Guidelines §27, §32).

Traceability of gear across the supply chain (FAO Guidelines §46) is an existing gap in the EU, although work is ongoing through the development of standards relating to the circular design of fishing gear.

3.2 Status in the NEAFC Regulatory Area

The areas beyond national jurisdiction within the OSPAR Maritime Area are encompassed within the NEAFC Regulatory Area. Denmark (in respect of the Faroe Islands & Greenland), the European Union, Iceland, Norway, the Russian Federation and the United Kingdom are Contracting Parties of the Convention on Future Multilateral Cooperation in North-East Atlantic Fisheries[30] that established the NEAFC. In 1998, NEAFC adopted a recommendation on a Scheme of Control and Enforcement in Respect of Fishing Vessels Fishing in Areas Beyond the Limits of National Fisheries Jurisdiction in the Convention Area (hereafter "the NEAFC Scheme") which has been subsequently amended to the most recent version in force from 15 January 2024[31]. The original NEAFC Scheme included provisions for the marking of gear (Article 7) and requirements to not deliberately abandon or discard fishing gear or discharge garbage (Article 7b). Article 7b was amended to its present form to include all types of fishing gear in 2020 and to include the prohibition to discharge garbage in 2021.

3.2.1 Regulation on marking of fishing gear

Article 7 covers the requirement that gear used by the fishing vessels of the NEAFC Contracting Parties is marked consistent with the Convention on Conduct of Fishing operations in the North Atlantic signed in London on 1 June 1967[32]. Therefore, marking regulations within the NEAFC Regulatory Area cover the gears included in Annex II (Identification and marking of fishing vessels and gear) and Annex IV (Marking of nets, lines and other gear) of the Convention on Conduct of Fishing operations in the North Atlantic. Annex II, Rule 1(4) states that "where practicable, all fishing implements shall be marked with the letter or letters and number of the fishing vessel to which they belong. The ownership of nets or other fishing implements may be distinguished by private marks.". Annex IV covers the marking of passive anchored gear (Rule 1) and passive drift gear (Rule 2) with

[30] https://www.neafc.org/system/files/Text-of-NEAFC-Convention-04.pdf
[31] https://www.neafc.org/scheme/ERS-Schemes
[32] https://faolex.fao.org/docs/pdf/mul20797.pdf

buoys including flags or radar reflectors by day and lights by night. Gear that is attached to a fishing vessel does not require a buoy.

3.2.2 Implementation and management of marking systems

The results of the survey carried out with the NEAFC Secretariat did not reveal challenges on the implementation or enforcement of the existing provisions for the marking of fishing gear. According to the annual reports of the European Fisheries Control Agency that also cover the EU vessels operating in the NEAFC Regulatory Area under the NEACF Joint Deployment Programme, there have been no infringement of the requirements to the marking and identification of fishing gear between 2019 and 2022. Both the regulations linked to the NEAFC Scheme and to the EU Control Regulation predate the publication of the FAO Guidelines and therefore these have not been used in the regulation of the marking of fishing gear in the NEAFC Regulatory Area.

3.2.3 Research projects on ALDFG

NEAFC is not directly involved in research projects as research is not within the objectives of NEAFC. NEAFC uses scientific advice from The International Council for the Exploration of the Sea (ICES).

3.2.4 Communication and dissemination efforts

NEAFC is not directly involved in communication and dissemination efforts. The Contracting Parties are themselves engaged in such activities and may decide on the efforts placed on the work carried out within their commitments in regard to the NEAFC convention.

3.2.5 Gaps with respect to the FAO Guidelines

The primary gap between the current regulation of fishing gear marking in the NEAFC Regulatory Area and the FAO Guidelines is that a full risk assessment was not conducted for the inclusion of marking of fishing gear in the NEAFC Scheme (FAO Guidelines §7-8, §11a, §15).

4 REGULATION AND PRACTICES AT THE NATIONAL LEVEL

As depicted in the previous chapter, the EU's fisheries policy regulatory framework largely influences fishing gear marking and ALDFG praxis among OSPAR Contracting Parties that are EU Member States. Therefore, the findings at the national level covered in this chapter have been organised according to EU membership of the Contracting Parties. Each Contracting Party section covers (i) the scope of the regulations that are in place, (ii) the implementation, including monitoring, control and surveillance, reporting and recovery, (iii) research and development, (iv) communications and dissemination and (v) industry views when it has been possible to source this information from the answers to the survey and interviews carried out for each of the Contracting Parties.

4.1 EU member Contracting Parties

4.1.1 Belgium

4.1.1.1 Regulation on marking of fishing gear

The Belgian fishing fleet is small in comparison with other Contracting Parties and majorly dominated by medium to large vessels devoted almost exclusively to bottom trawling with gillnet and long line fishing to a much lesser degree. Fishing gear is marked because of concerns of gear loss and to reduce navigational hazards to passing vessels for passive gear. Belgian fisheries are conducted following the EU Control Regulation and the Implementing Regulation. These had been in place for some years when the FAO Guidelines were produced and therefore the guidelines have not been used in the development of regulation or implementation of marking and identification of fishing gear.

4.1.1.2 Implementation and management of marking systems

There are no challenges identified in the implementation of existing regulations for the marking and identification of fishing gear and no infringements of the relevant provisions of the Control Regulation and the Implementing Regulation have been recorded in recent years. The identification of active gear is done in beam trawls by welding the vessel port letters and number on the trawl beam while the otter boards in otter trawls are also marked in the same manner. Passive gear is not very common in the Belgian fleet but when it is used, these are identified and marked according to EU regulations. There is a good dialogue between the authorities and Belgian fisheries organisations on the practical implementation of fishing gear marking regulations.

Retrieval of ALDFG is undertaken and non-retrieved gear is registered according to EU regulations. Retrieval attempts are conducted by the same fishing vessel when gear is lost and if the retrieval

operations are not successful the loss of gear is notified to the relevant authorities. In the case of lost or snagged bottom trawls the recovery attempts target specifically the trawl beam and doors as it may not be possible to retrieve a badly snagged trawl net. If lost fishing gear poses a navigational hazard, this is reported to the relevant coastal authority. Navigational hazard or hazards to fishing operations is the critical consideration when prioritizing the retrieval of ALDFG.

4.1.1.3 Research projects on ALDFG

There is no planned or ongoing research directed towards fishing gear marking, monitoring or retrieval of ALDFG, or any other research aimed at preventing ALDFG.

4.1.1.4 Communication and dissemination efforts

In Belgium there are efforts in raising awareness in recreational fishing around wrecks as they are fishing gear loss hotspots.

4.1.2 Denmark

4.1.2.1 Regulation on marking of fishing gear

Fishing gear systems and marking regulations have existed since 1992 and there was no change in the Danish regulations when the FAO Guidelines were published in 2019 as these practices were designed to meet both EU regulations and supplementary national rules. Gear marking is implemented for passive gear due to risk for loss of gear and navigational and operational reasons, and for active gear (trawl) due to risk of gear loss. For dredges (another active gear type) marking is implemented for operational and navigational reasons while surrounding nets, purse seines and seine nets are unregulated. Trawls and gillnets are very commonly used in Danish fisheries, while nets, traps, dredges and seine nets are commonly used. Surrounding nets or purse seines are rarely used. For all gear types regulated for marking, the marking provides details of ownership. For dredges the vessel is equipped with electronic positioning equipment and the resulting location data is saved, showing the operating areas of the vessel. Passive gear will be visible for navigational safety, but not traceable through marking and unmarked gear will be removed. It is the fishers' responsibility to ensure that gear is legally marked and to replace lost and damaged marks. Requirements for design and marking follows the decisions by the Danish Ministry of Food, Agriculture and Fishery and EU regulation and is overseen by the Ministry of Food, Agriculture and Fisheries of Denmark (Fiskeristyrelsen). There are no requirements for specific material for tags and marks, other than that the material must be saltwater resistant and yellow marks are not allowed in Danish commercial fisheries, since yellow marking is a requirement in recreational fishery. It is the fishers' responsibility that all marks can be read clearly. Both professional and recreational fishers are obliged to report lost gear according to national legislation. The position and relevant data of lost

gear is reported to authorities by phone and/or website. Data storage requirements require reporting for amount of gear, age of gear, bycatch and location for retrieval projects (both EU and national financed retrieval).

4.1.2.2 Implementation and management of marking systems

For years the main consideration was on identifying illegal fishing, with less focus on littering. As a result, regulations did not require marking of the gear itself. According to interviewed bodies, this mindset has been the main barrier to implementation and enforcement of gear marking practices and regulations in Denmark, along with the concern of stakeholders that labelling and new requirements must be both practical to comply with, as well as feasible economically. The main drivers motivating the regulation and implementation of gear marking has been a combination of EU regulations, national initiatives and regulations on gear marking for bottom trawling and passive gear. In addition, gear marking legislation and vessels responsibilities have been a topic of discussion in retrieval projects. The recently published FAO Manual for The Guidelines has not been utilized as a tool in the development or implementation of regulation or practices for marking of fishing gear in Denmark. Gear marking is part of political discussions about measures against marine litter, and meetings have been held with stakeholders regarding both prevention and retrieval. According to interviewed bodies, the decision-making process for the development, implementation and regulation of a fishing gear marking system has to a large degree been inclusive and transparent to interested parties, with many stakeholders involved in relevant projects. No risk assessments have been done for fishing gear marking, but larger surveys on the amount of ghost fishing gear have been carried out in Denmark, including information on retrieved gear. There are identical rules for commercial and recreational fishers and retrieval efforts in areas with large amounts of ghost gear have been carried out.

The practices are not monitored for the need for changes on gear marking specifically. Monitoring is targeting retrieval and specific areas with waste problems, including the effects of prevention and marking. Besides cooperation in the implementation of the EU and NEAFC regulations regarding the marking of fishing gear Denmark has no specific bilateral cooperation on this subject. Denmark is engaged in the implementation of OSPAR's RAP-ML2 in which this study is framed.

Enforcement of the system for marking of fishing gear is secured through:

- Inspections by the relevant authority to verify that owners and operators mark their fishing gear as required.
    - Port state inspections of fishing gear include provisions in relation to marking of the fishing gear.
    - Penalties or sanctions for non-compliance with the various requirements of the fishing gear marking system.

The presence of gear in the water column is indicated to other fishers and authorities only through visual surface markers. The marking of fishing gear aid fisheries resource management as it contributes to control by the required marking being linked to fishing licenses issued for the area and the allowed amount of gear. Unmarked passive gear will be removed.

4.1.2.3 Research projects on ALDFG

In total 9 million Danish kroner are allocated for ALDFG research projects in 2023 (EU and national funding), with 7 million to retrieval and 2 million to information and prevention. Projects initiated in 2023 will continue into 2024.

4.1.2.4 Communication and dissemination efforts

There are no systematic data exchange formats or protocols on reported ALDFG with other countries, but data can be made available for research projects. Data is primarily used to uncover areas in need for efforts against marine litter nationally. The adverse impacts to marine life at ALDFG hotspots are considered as critical in the priorities to recover reported ALDFG, while navigational hazards and hazards to fishing operations are considered important but not critical.

Traceability of fishing gear marking is encouraged by the state to fishing companies and industry associations to a large extent and to sustainable seafood certifications programs and other sustainability initiatives to some extent.

Involvement in communications, training and awareness raising takes place through the allocation of funding to external actors. Dialogue with the involved organisations about marine waste has a high focus. Real-time communication between different fishing fleets operating over the same ground to reduce the risk of gear conflicts is being facilitated.

4.1.3 France

No information submitted. France was unable to respond to the information request within the available timeframe.

4.1.4 Germany

4.1.4.1 Regulation on marking of fishing gear

As a member of the EU, Germany follows the relevant EU regulations on the marking of fishing gear. EU regulations are transposed into national and sub-national legislations (federal state rules), that both transposes the rules but also in some cases extend them. Marking systems and regulations were

already in place when the FAO Guidelines were published, hence the guidelines were not utilized as a tool in the development or implementation of regulation or practices on marking of fishing gear. According to the interviewed bodies, the FAO guidelines are potentially not well known in Germany. Both for active and passive gear types, regulations for gear marking are implemented, except for seine nets, which are rarely used. The markings detail ownership of the fishing gear. Marking of trawls is regulated due to the risk of loss of gear, while passive gear is regulated because of the risk of loss, navigational hazards and operational reasons. Trawls are commonly used in Germany while passive gears such as gillnets and entangling nets are very commonly used. Hooks, lines and traps are rarely used.

As there is no governmental system for issuing marks, it is fishermen's responsibility to replace marks immediately if lost.

4.1.4.2 Implementation and management of marking systems

According to the interviewed bodies, there is no barrier for implementation or enforcement of current regulations, but national requirements could be supported by further development of regulations at EU level. The German practices are being monitored for the need for changes, and the national regulations defining the marking of fishing gear are currently in a process to be updated with stakeholders being consulted for national regulations. Marking types and design are in accordance with technical specifications or international standards, included in the EU regulations, though the existing regulations are described as rather unspecific. Marking types and designs are not approved by the authorities as labelling is not overly specified within EU regulations, but surface markers are controlled by the relevant control agencies. The rules are very general and normally specify that PLN should be on any label on specific parts of the gear. Surface markers indicate the presence of gear in the water column to other fishers and authorities (passive gear). Surface buoys are visually inspected by authorities for control purposes.
Enforcement of the system for marking of fishing gear is being secured through:

Inspections by the relevant authority to verify that owners and operators mark their fishing gear as required.

- Port state inspections of fishing gear include inspecting the marking of the fishing gear.
- Penalties or sanctions for non-compliance with the various requirements of the fishing gear marking system.

4.1.4.3 Research projects on ALDFG

Different research is ongoing regarding preventing ALDFG, including dolly ropes and biodegradable gear. Projects about collecting and retrieval of fishing gear are carried out by environmental NGOs. Due to this, priorities to recover ALDFG is not considered by the fisheries authorities.

4.1.4.4 Communication and dissemination efforts

Involvement in communications, training and awareness raising takes place through projects about the collection and retrieval of fishing gear, led by environmental NGOs. The interviewed authority is not aware of real-time communication between different fishing fleets to reduce the risk of gear conflicts or of information about reported ALDFG being distributed to other entities. The traceability of fishing gear is not currently encouraged by the state to fishing gear manufacturers and suppliers, including small-scale and artisanal producers, fishing companies, industry associations, sustainable seafood certification programmes and other sustainability initiatives.

4.1.5 Ireland

4.1.5.1 Regulation on marking of fishing gear

As an EU member, Ireland implements the provisions on marking of fishing gear included in the EU Control Regulation and Implementing Regulation, which were already in place at the time when the FAO Guidelines were published. It is the fisher's own responsibility to be compliant with these regulations.

The Irish authority representatives recognize that marking of fishing gear aids resource management in that it reduces the potential for gear conflict and navigational hazard, while it can also be used for denoting ownership and help to reduce ALDFG. Recovery of reported ALDFG is prioritized based on navigational hazards, hazards to fishing operations and that it can have adverse impacts on marine life.

Owners and operators of fishing gear are encouraged by the Irish state to retrieve ALDFG through schemes such as Fishing for Litter[33], which facilitates fishers to retain on board and subsequently bring ashore and dispose of ALDFG caught up as part of standard fishing operations.

Traceability of gear is not actively encouraged by the Irish state to the industry.

[33] https://fishingforlitter.org/

4.1.6 The Netherlands

4.1.6.1 Regulation on marking of fishing gear

Dutch fisheries are quite diversified in terms of gear utilized. Trawls clearly dominate, but dredges, gillnets, hooks and lines and traps are all used to a similar extent. Dutch fisheries are conducted following the EU Control Regulation and the Implementing Regulation. These were in place for many years by the time the FAO Guidelines were produced and therefore the guidelines have not been used in the development of regulation or implementation of marking and identification of fishing gear.

4.1.6.2 Implementation and management of marking systems

There are no challenges identified in the implementation of existing EU regulations and fisheries are following existing marking requirements. The main driver for the regulation and implementation of fishing gear marking is the EU regulatory framework, and the major barrier for implementation is the internal communication across the different sectors of the public administration. Fortunately, the loss of entire net gears is very seldom. The most common challenge is the loss of pieces of net, and these are not marked. It is uncertain whether additional marking would help to tackle this challenge. It must be practical, effective, cost- efficient and discussed with the fisheries sector to gather support towards it.

Broadening the implementation of the FAO guidelines beyond the level that is done today would imply additional costs to fishing activity and the sector, which is already under pressure from environmental considerations, fuel prices and competition with the sea wind sector in relation to fishing grounds. There is a resistance from the sector to implement additional administrative tasks and if there are doubts about its effectiveness the resistance will stay. A practical solution approach would be to use different colours for the gears used by different fisheries, thereby making identification of each fishing fleet easier.

Retrieval and registration of ALDFG is done following EU regulations. The system for the reporting and registering the loss of gear is only used sporadically as fishermen do their utmost to recover fishing gear and therefore avoid having to report their loss. There is additionally a certain reluctancy towards reporting systems amongst the fishing community even if the information on the reports of lost gear is not open and publicly available.

4.1.6.3 Research projects on ALDFG

The Netherlands actively supports research on marine litter and specifically "The Arctic Marine Litter Project"[34] led by Wageningen University & Research. This project has identified that a large

[34] https://www.wur.nl/en/research-results/research-institutes/economic-research/projects-1/the-arctic-marine-litter-project.htm

proportion of litter in the Arctic is fisheries related with fishing gear being a considerable part of the litter recorded by the project. Also a NGO report "Analyse van aangespoelde visnetten"[35] was published in 2021 concluding that most of pieces of net found on beaches are from trawling ships that are active in the Southern North Sea that are cut off and lost during repair at sea. None of the nets found were complete nets.

4.1.6.4 Communication and dissemination efforts

The Dutch Ministry of Economic Affairs supports the development and maintenance of the website "Vist ik het maar"[36] which is a platform for knowledge exchange in the fishing industry. This website contains teaching materials on fisheries science and technology, and knowledge files are maintained on current themes in fisheries including fisheries regulations and the impact of ALDFG, amongst many other subjects. In addition, there is a large fishery driven initiative "Fishermen for a clean sea"[37] that is focussed on improved waste management by the fishing industry including gear related waste and ALDFG that is recovered during fishing operations.

4.1.7 Portugal

As a contribution to this study, the Portuguese Directorate-General for Natural Resources, Safety and Maritime Services provided the relevant Portuguese national regulations appurtenant to the marking of fishing gear but did not fill up the survey and participated in an interview in the same fashion than the other Contracting Parties. Therefore, the extent of the available information is limited.

4.1.7.1 Regulation on marking of fishing gear

The Portuguese Decree-Law 73/2020, in its article 20, covers the marking and identification of fishing gear and refers to the EU Implementing regulation for the identification and marking of fishing gear. Establishing specific rules for the marking of fishing gear in the territorial sea and internal waters is up to the government instance responsible for the marine areas. The decree law also establishes that recovered ALDFG will be declared lost in favour of the State and either destroyed or donated to the Portuguese Institute for Sea and Atmosphere or other scientific institutions responsible for assessing marine resources in the Autonomous Regions if they express interest.

[35] https://www.noordzee.nl/analyse-van-aangespoelde-visnetten-roept-op-tot-specifieke-maatregelen/
[36] https://vistikhetmaar.nl/
[37] https://visserijvooreenschonezee.nl/

4.1.7.2 Implementation and management of marking systems

The only available information regarding implementation and management is that the implementation of fishing gear marking and identification regulations is still on its early stages.

4.1.8 Spain

No information submitted. Spain was unable to respond to the information request within the available timeframe

4.1.9 Sweden

4.1.9.1 Regulation on marking of fishing gear

Sweden has a set of regulations specific for recreational fisheries, whilst commercial fisheries are carried out according to the provisions on the EU regulations. Sweden is currently using the FAO Guidelines for reference as part of revising its existing national regulations on gear marking for both commercial and recreational fisheries, including both active and passive gear types. For both gear types, the risk for loss of gear is the reason for gear marking. As for passive gear types, marking is also regulated for navigational and operational reasons by using floats and flags with ownership labelling.

Normally in Sweden, regulatory development processes involve several steps of stakeholder engagement, including a 'public consultation', based on which responsible authorities produce a remittance document, which is then commented on by the public. But, since marking of fishing gear implies costs for fisheries and a complex mix of parameters involving both littering, gear use and limited scientific basis, the Swedish Agency for Marine and Water Management (SwAM) has extended the process of updating existing national regulation on gear marking to an "extended public consultation", including capacity building and involvement of the fisheries industry in the development process. The project 'SPIRAL'[38] has contributed to the knowledge background that will be used for the further development of rules. The remittance will be finalized in the first quarter of 2024, after which an environmental impact assessment (including risk assessments for environmental impacts) will be conducted.

Sweden is an EU member country, as well as a signatory of both the OSPAR and the HELCOM (Convention on the Protection of the Marine Environment of the Baltic Sea Area). The main drivers for Sweden to regulate and implement gear marking are EU requirements, namely: the regulations

[38] https://www.havochvatten.se/en/facts-and-leisure/environmental-impact/producer-responsibility-for-fishing-gear.html

(EC) No. 1224/2009 and (EU) 2023/2842 on fisheries control[39], the Marine Strategy Framework Directive 2008/56/EC (with its accompanying action plans) and the EU single-use-plastic directive (EU) 2019/904[40]. Other motivating factors for Sweden are obligations under the OSPAR convention, specifically with regards to its regional action plans for marine litter. Even if the scope of HELCOM is the Baltic Sea and not the North Atlantic, it is also regarded as a driving factor in the sense that regional cooperation and international regulation in general are important to create a level playing field for fisheries. Collaboration is ongoing between Sweden and its regional partners in the Nordic council of ministers, as well as in the OSPAR and HELCOM, although neither of these mechanisms involve concrete obligations on marking of fishing gear, as per now.

The EU Amended Control Regulations that has recently entered into force will influence the revision of gear registry and sanctions systems. Since Sweden has not had a gear registry for recreational fisheries before, the SwAM anticipates that the new regulations will largely influence the opportunities to prevent gear losses while increasing traceability and introducing sanction systems.

4.1.9.2 Implementation and management of marking systems

The SwAM does not recognize current practices with marking of fishing gear to aid fisheries resource management under the current regulations. The county administrative boards have systems in place which couple gear markings with fishing licenses, but no such system is in place at national level. Due to limitations in current regulation as well as a lack of data, Sweden does not have the opportunity to monitor the need for changes with practices on the marking of fishing gear. The EU's e-log on fish catch, which requires logging losses of gear, applies for Swedish commercial fisheries while for recreational fisheries, the national service "Ghost Guard" is available for registering losses and retrieval of gear. However, these services are rarely used by either commercial or recreational fishers, according to the SwAM.

The EU Control Regulation is of direct application in Sweden. Hence infringements to gear marking may lead to administrative and/or criminal sanctions. Unmarked gear is confiscated by the fishing inspection authorities (e.g. SwAM's landing inspectors, the County administrative board, the Swedish Coast Guard, and the Sea Police ('Sjöpolisen')) and reported to the police either at sea or during landing controls during port state inspections. If gear can be connected to an owner, charges can be brought to court.

[39] Council Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy
[40] Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products in the environment

The SwAM informs that fishing gear labelling or tagging to facilitate traceability is encouraged by the Swedish state to fishing gear manufacturers and suppliers to a large extent and to small-scale and artisanal producers of gear to some extent. Fishing companies, industry associations and sustainable seafood certification programmes are not actively encouraged to facilitate or promote fishing gear traceability.

4.1.9.3 Research projects on ALDFG

The SwAM has procured or been involved in several relevant studies related to fishing gear marking and ALDFG:

- Participation in the Interreg project Marelitt Baltic (2017-2019) - resulting in several reports and a guideline which SwAM often refers to ("The Baltic Sea Blueprint Documentation — MARELITT Baltic").
- SwAM procured an investigation looking at ghost gears' effects on fish stocks and marine life. This resulted in report from 2022 by HMI[41]:
- On commission by the Nordic Council of Ministers, the Swedish Environmental Research Institute conducted in 2022 an investigation on fishing gear losses in the Nordic countries[42].
- Ongoing and current work: collaboration between SwAM and the Swedish Maritime Administration exploring utilisation of bottom dredging data in the Baltic Sea, Oresund and the Kattegat/Skagerrak for the locating of lost fishing gear.
-

4.1.9.4 Communication and dissemination efforts

There are publicly funded information efforts targeting commercial fishers regarding lost fishing gear and fishing related litter, conducted as part of educational programs by the 'Öckerö Maritima Centrum'. The SwAM has also financed campaigns by the foundation 'Keep Sweden Tidy' regarding information on ghost fishing from losses of lobster pots.

The Swedish state does not facilitate real-time communication between fishing fleets operating over the same ground to make these groups aware of factors that may increase the risk of gear conflict.

[41] Available from: https://havsmiljoinstitutet.se/publikationer/havsmiljoinstitutets-rapportserie/spokfiskets-paverkan-pa-fiskeresursen
[42] Available from: https://pub.norden.org/temanord2022-568/

4.2 Non-EU member Contracting Parties

4.2.1 Iceland

4.2.1.1 Regulation on marking of fishing gear

Gear marking has been mandatory for quite a long time in Iceland, and the practice of marking of fishing gear is established in national law. Rules on the marking of fishing gear and lost fishing gear are provided by Article 16. Act no. 116/2006 on fisheries management and Article 2. and Article 30 Act no. 57/1996 on handling of marine resources. Up to 2020 it was defined in the yearly regulations how gear should be marked, but from 2020 Iceland adopted a new joint regulation for the marking of all gear and at the same time making the rules stricter. As marking systems and regulations were already in place when the FAO Guidelines were published, the FAO Guidelines were not utilized and have not been used as a tool in subsequent development or implementation of regulation or practices on marking of fishing gear. The interviewed representative was not aware about the FAO Guidelines.

Gear marking is implemented in the form of physical tags for both passive and active gear types. Passive gear must have all anchors and buoys marked and must have flags. Marking must be in sequence, numbered for each net for inspection reasons. Flags must have reflectors. Hooks, lines and gillnets (passive gear) also require AIS transponders when used at depths greater than 400 meters. Gear marking is regulated both due to the risk for loss of gear and navigational and operational reasons for both active and passive gear, although traps, hooks and lines (passive gear) are mainly marked for the risk of gear loss. Active gear such as surrounding nets, purse seine and trawls are very commonly used in Iceland, while dredges are commonly used. Passive gear such as hooks and lines and gillnets are still very commonly used, though the gillnet fleet has been declining. Traps are commonly used. For all marked gear types, the marking details ownership. The presence of gear in water column is indicated to other fishers or authorities through marking on buoys. If gillnets are set in areas with trawling they must also be marked with a blinking light, though these fisheries are not very commonly occurring in the same area. It is required to report lost gear, including parts of gear, both to the Coast Guard and The Directorate of Fisheries. The report must include location and must also be noted in the vessel's logbook. Marking types and designs are approved by the competent authority and follow regulations by the Directorate of Fisheries.

4.2.1.2 Implementation and management of marking systems

National regulations have been the main drivers motivating regulation and implementation of fishing gear marking in Iceland. Reporting lost fishing gear is mandatory and marking is seen as a motivation to retrieve lost gear. The interviewed representatives stated that, for Iceland as a fishing nation, it is very important to handle this in the best way. The main barrier for the implementation and enforcement of gear marking practices and regulations in Iceland is the industry's scepticism, probably due to cost and inconvenience. The decision-making process for the development,

implementation and regulation of a fishing gear marking system has been open to interested parties for active participation and information sharing to a large degree, according to interviewed bodies. New regulations are posted for reading and comments in an online consultation portal for public hearings. Also, for the new rules on marking of fishing gear (2020) a group of experts from the Marine Research Institute, the Fisheries Ministry and fishing organisations/industry took part in an advisory committee. The observance of NEAFC rules is monitored in port inspections carried out in Iceland. Practices are monitored for the need for change as inspectors follow up and hear the opinion of the fishers, whereby changes might be done for practical reasons. The practices of marking of fishing gear are seen as aiding fisheries resource management.

Enforcement of the system for marking of fishing gear is being secured through:

- Port state inspections of fishing gear include conditions in relation to marking of the fishing gear.
- Penalties or sanctions for non-compliance with the various requirements of the fishing gear marking system.

At the time of the interview, gear marking records are not directly connected to a fishing licensing or authorisation system. Unmarked gear found in vessel inspections is reported and if directions from inspections are not followed up repeatedly there is a risk to lose the fishing license.

Provisions are in place for loss, damage, and replacement of individual marks due to the regulated marking being required. Owners/operators of fishing gear are encouraged to make every reasonable effort to retrieve ALDFG, both in the regulation on markings and lost fishing gear (474/2020) and in the law on access to marine resources. Lost and recovered fishing gear, including parts of gear, is to be registered by the fishers via the onboard VMS (vessel monitoring system) which both the Coast Guard and Directorate of Fisheries have access to. According to the interviewed bodies, reporting unfortunately is not done frequently by the fishers. Industry can be charged for retrieval costs or gear can be sold if the owner is not found, and this logically might not be encouraging proper reporting by fishers. Navigation hazards and hazards to fishing operations are considered as critical priorities to recovering reported ALDFG. Adverse impact to marine life and ALDFG hotspots is also considered but not critical.

Traceability of fishing gear marking is encouraged by the state to fishing companies and industry associations to a large extent, and to fishing gear manufacturers and suppliers, including small-scale producers, to some extent.

4.2.1.3 Research projects on ALDFG

According to interviewed bodies, Iceland has planned or ongoing research directed towards fishing gear marking, and monitoring, retrieval and preventing ALDFG.

4.2.1.4 Communication and dissemination efforts

The informant did not have any information on the involvement in communications, training and awareness raising regarding the marking of fishing gear and/or, the problems caused by ALDFG.

4.2.1.5 Industry views regarding the marking of fishing gear

A representative of Fisheries Iceland[43], the main organisation representing the Icelandic fisheries industry, was interviewed as part of this study. Fisheries Iceland covers only domestic fisheries, with members of the organisation being the fishing fleet. The FAO Guidelines is known to the interviewed representative, but they are not familiar with its details. Moreover, the representative does not see any barriers to implementation of gear marking practices or to its enforcement in Iceland, which is also reflected in that the Icelandic fishing fleet is generally considered to comply well with the current regulations.

The development of current regulations (first adopted in 2006 and revised in 2020) on gear marking was, to the representative's best knowledge, inclusive and involved the fishing industry to a large degree. The current regulations are deemed as suitable and without need for revisions. Traceability of gear is seen to be encouraged by the state towards fishing companies and industry associations. Moreover, standard practice in Iceland is that manufacturers of fishing gear mark gear with identification numbers for tracking (this is not mandatory according to regulations), as well as gear being marked by the vessel operator onboard using the vessel's national registration number or IMO number.

The Fisheries Iceland representative considers that current regulations on gear marking are critical with regards to preventing adverse impacts to marine life, while regulations are also considered to also fill a non-critical purpose in preventing navigational hazards and hazards to fishing operations, as well as identifying ALDFG hotspots. However, it is deemed by the interviewed representative that gear conflicts are not an issue in Iceland, and have not been either, thanks to the fluent and frequent communication between vessel operators, who, to a large degree, have personal knowledge of one another.

[43] Webpage: https://www.sfs.is/en
Interviewed representative: Hildur Hauksdóttir, Sustainability office at Fisheries Iceland

4.2.2 Norway

4.2.2.1 Regulation on marking of fishing gear

As marking systems and regulations were already in place in Norway when the FAO Guidelines were published, the FAO Guidelines were not utilized, but have been used as a reference on marking of fishing gear. The guidelines are planned to be utilized in further development of regulations, and the recently published FAO Manual for the Guidelines has to some extent been utilized as a tool in the development of regulation or practices on marking of fishing gear. Marking regulations are implemented for passive gear for both navigational and operational reasons and for the risk of loss of gear. Active gear is unregulated, though both surrounding nets and purse seines, seine nets and trawl are very commonly used in Norwegian fisheries. Passive gears such as hooks and lines, gillnets and traps are all very commonly used. For gillnet and lines, gear identification by fishers and control authorities is an important driver for marking regulations. Gear is to be marked with floats tagged with the ship's PLN, while additional marking through Automatic Identification Systems (AIS) is voluntary. Traps are marked for the risk of gear loss. Individual marking of each trap used in snow crab fishery is required from 01.01.24. In recreational fishing, vessels without license number should mark each trap with owner's name and address. It is fishers' responsibility to replace marks.

4.2.2.2 Implementation and management of marking systems

Both national and international requirements are drivers motivating the regulation and implementation of fishing gear marking in Norway. To ensure that lost gear is being reported, as well as the possibility to return and reuse the gear in case of recovery, is described as an important motivation at the national level. According to interviewed bodies, technical solutions are the main barriers for the implementation and enforcement of gear marking practices and regulations. Implementation and enforcement have been particularly challenging in fisheries with a high number of gear sets and risk of loss e. g., in the snow crab fishery, though new regulations are being implemented from the start of 2024. Passive gears are primarily used by the Norwegian fleet inside Norwegian waters, therefore Norway does not cooperate bilaterally or through subregional or regional fishery bodies on the regulation or implementation of fishing gear marking systems for those gear types. A risk assessment has indirectly been conducted to guide the regulation and implementation of gear marking, through analyses of passive and active gear usage, and the practices are regularly monitored for the need for changes. The marking practices aid fisheries resource management through increased reporting and support a better circular economy. The practices also indicate, through surface markers and voluntary AIS, the presence of gear in the water column to other fishers and authorities. The practices in main fisheries are designed to meet obligations of relevant international conventions and agreements and are supported by national or sub-national legislation and regional legal frameworks. There are no automatic registration systems available for reporting and data storage on gear marking. The marking types and designs are regulated by The

Directorate of Fisheries and fitted according to technical specifications or international standards. Fishing gear marking connects to vessel registration number.

Enforcement of the system for marking of fishing gear is being secured through:

- Inspections by the relevant authority to verify that owners and operators mark their fishing gear as required.
- Penalties or sanctions for non-compliance with the various requirements of the fishing gear marking system.

Due to marking requirements being limited to passive gear in use in the Norwegian Economic Zone, and where the corresponding fisheries operate under a strict quota and reporting system, the marking systems does only to a small extent function as a means of uncovering IUU fishing. Though marking systems increase the probability that all lost fishing gear will be reported as required and ensures owner identification, according to the interviewed body, the affected fisheries will have little to gain from fishing with unmarked gear from an IUU perspective.

Owners/operators of fishing gear are required to both report and make every reasonable effort to retrieve lost gear.

Reported ALDFG is recovered based on the following priorities: ALDGF hotspots (critical), adverse impact on marine life (considered but not critical) and navigational hazards or hazards to fishing operations (considered but not critical). The Norwegian Directorate of Fisheries has long experience with retrieval of lost fishing gear and yearly retrieval operations have been carried out and financed by the authorities since the 1980`s. In this period more than a thousand tons of lost gear have been removed from the seafloor. Retrieval of lost gear is based on fishermen reporting of lost gear through BarentsWatch/FishInfo[44] and between 70 and 80 percent of reported lost gear is being retrieved. The gear is either returned to its owner (reused), recycled, or delivered to landfill.

The decision-making process for the development, implementation and regulation of a fishing gear marking system has to a large degree been inclusive for active participation and information sharing to interested parties, including fishing communities. The Norwegian process for legislation changes has been followed, including drafting regulations based on established knowledge being made available for public consultation before being finalized and implemented in law.

[44] https://www.barentswatch.no/fiskinfo/

4.2.2.3 Research projects on ALDFG

According to interviewed bodies there are several planned or ongoing research projects directed towards fishing gear marking, monitoring, and retrieval.

4.2.2.4 Communication and dissemination efforts

Information about reported ALDFG is distributed to other relevant entities. The position and type of gear are being shared, but no information on the owner or operator is distributed. Traceability of fishing gear is to some extent encouraged by the state to fishers and gear manufactures and suppliers, including small-scale and artisanal producers, and to fishing companies and industry associations. Real-time communication between different fishing fleets operating over the same ground to make others aware of deployed passive gear and other factors which may increase risk of gear conflict is facilitated through BarentsWatch/FishInfo.

4.2.2.5 Industry views regarding the marking of fishing gear

A representative of The Norwegian Fishermen's Association (NFA)[45] was interviewed as part of this study. The NFA is the largest organisation representing fishermen in Norway and has national scope. Gear marking has not been on the agenda for NFA in the recent years, but the interviewed representative assumes that the NFA would be involved if regulations should be revised. The FAO Guidelines are known to the representative, but not in a detailed way.

When asked about potential barriers for implementing gear marking practices and regulations, additional work required by fishers is mentioned. In addition, commercial fishers are sceptical as they themselves are not responsible for the losses of recreational fishers or other fishing gear types, which might be more prone to losses than their own. Extra costs might also be a problem depending on how marking standards are formulated, but as per today, the number of the license is already marked on gear and therefore has no extra cost to the fisheries.

With regards to enforcement of gear marking regulations, the NFA representative does not state any known barriers. However, the authorities' practices with enforcement and its effectiveness are not known.

To the NFA representative's best knowledge, the fisheries in which gear marking is regulated (passive gear types) comply well with current regulations and current regulations are functional. Reported lost gear is to a high degree retrieved as detailed above. The NFA representative notes that state authorities provide general information to the public and the fishing industry on ALDFG retrieval, but it is not known if specific information is sent directly to individual ship operators. The NFA

[45] In Norwegian "Norges Fiskarlag". Webpage: https://fiskarlaget.no/english/
Interviewed representative: Maria Pettersvik Arvnes, senior advisor at NFA

representative sees potential for even stricter enforcement and more emphasis on the issue of retrieval of ALDFG towards the industry, e.g. through fees for non-compliance.

As per today, traceability of fishing gear has not been encouraged by the state towards the fishing industry according to the NFA representative.

Gear marking regulations are considered critical for identifying ALDFG hotspots according to the NFA representative, while they may not be specifically purposed for preventing adverse impacts on marine life. With regards to navigational hazards, the regulations are seen to fulfil a purpose in preventing gear conflict. Moreover, gear conflict is not specially considered by RFBs (regional fisheries bodies) known to the NFA representative. Gear conflict has partly been resolved thanks to real-time communication between fishing operators via VHF or telephone. However, some challenges with gear conflict remain between gillnet and seine fisheries in Norway, as well as for shrimp trawls colliding with snow crab traps. Such gear conflict issues are being handled by Norwegian state authorities.

The NFA is currently planning a campaign on ALDFG to be rolled out to cod fisheries next season. Moreover, there are several projects ongoing with regards to technical developments of solutions for traceability and tracking of gear (e.g. "Ping me" and satellite buoys[46]).

4.2.3 United Kingdom

4.2.3.1 Regulation on marking of fishing gear

The United Kingdom (UK) had already implemented EU's control regulations at the point of publication of the FAO Guidelines. After the UK left the EU, existing regulations were kept intact in a practical sense, although formal referencing is now adapted to UK's own legislation. Current legislation on the marking of fishing gear is deemed to exceed the requirements by the FAO Guidelines, according to national authorities. In addition, inshore conservation authorities can add bylaws which are relative to the spatial area they regulate, including restrictions on gear and marking.

There are currently no planned revisions of UK's regulations on fishing gear marking. Interviewees at relevant national authorities mention that the FAO Guidelines (and other relevant international guidelines) are a natural document to consider when national regulations are to be further developed. Such developments would also include cooperation with regional fisheries bodies.

[46] An overview of marking technologies available in Norwegian in the Sintef (2018) report: https://sintef.brage.unit.no/sintef-xmlui/handle/11250/2787955

4.2.3.2 Implementation and management of marking systems

Costs for the fishing industry related to implementing marking systems, as well as health and safety onboard, are mentioned by the national authorities to be the main barriers for implementing and enforcing gear marking practices in the UK.

Monitoring the practices of marking fishing gear for the need for change is not actively done. Feedback from the industry on the marking of fishing gear is considered ad hoc as well as treated in conjunction with information from Cefas (Centre for Environment Fisheries and Aquaculture Science) other relevant bodies.

The UK had G7 presidency in 2021, where tackling ALDFG was advanced - with one of the recommendations being to implement the FAO Guidelines. The UK also feeds into the IMO process of amending MARPOL Annex V on issues such as ALDFG and marking of gear mentioned in section 1.2.

Fishing gear marking records are not connected to a fishing licensing or authorisation system, although the marking of pots helps fish conservation authorities manage licensing and pot limitations and other recreational gear within 6 nautical miles.

The UK state authorities do not encourage the private sector in adopting fishing gear traceability, although the UK is feeding into the CEN process for potential future gear marking certifications.

Inspections are conducted by UK's authorities (e.g. the Marine Management Organisation in England and Scotland Enforcement in Scotland) to verify that owners and operators mark their fishing gear as required. Non-compliance is sanctioned[47]. The interviewed representatives from the Department for Environment, Food & Rural Affairs argue that by having an effective and robust gear marking system, unmarked gear or gear belonging to unlicenced or unauthorised vessels can be identified by compliance authorities and removed from the catching sector or action taken against the vessel.

Regarding the reporting of lost gear, UK authorities refer to The Merchant Shipping Regulations 2020 (Prevention of Pollution by Garbage from Ships), which transpose the requirements under MARPOL Annex V on reporting of lost gear into UK law. Under the Merchant Shipping Regulations, it is an offence to fail to report the discharge of fishing gear which poses a significant threat to the

[47] Non-compliance when monitoring would lead to action taken in line with the MMO's Compliance and Enforcement Strategy. Depending on the severity of offending and taking into account any aggravating factors, the range of actions the MMO can take are: Oral Advice, Advisory Letter, Official Written Warning, Financial Administrative Penalty and finally Prosecution.

marine environment or navigation to (a) the ship's flag state and (b) any coastal state who has jurisdiction over the waters where the loss or discharge occurs. If a vessel loses all or part of its fishing gear, they must attempt to retrieve it as soon as possible. They must carry equipment on board the vessel to retrieve lost gear unless the vessel operates exclusively within the territorial waters (12 nautical mile limit), or it never spends more than 24 hours at sea from departing to returning to port. If the vessel cannot retrieve the lost gear, it must inform the UK fisheries authorities within 24 hours with the following information: 1) PLN and name of fishing vessel, 2) type of gear lost, 3) time when the gear was lost, 4) position where the gear was lost, 5) measures taken to retrieve the gear. If the vessel uses an electronic logbook, lost gear can be reported using the lost gear declaration when the vessel submits daily fishing activity reports. If the vessel does not have an electronic logbook, it must report lost gear to the UK Fisheries Monitoring Centre (UKFMC). UKFMC can then distribute the reported data to other relevant authorities in the UK.

4.2.3.3 Research projects on ALDFG

Based on a case study[48] undertaken in 2019 (on fishers' attitudes and behaviour towards abandoned, lost or discarded fishing gear in the UK), the UK is planning to undertake social research looking into the barriers faced by fishers around the prevention of abandoned, lost and otherwise discarded fishing gear, including measures such as gear marking and reporting of lost gear. This social research project will conduct primary data collection in the form of questionnaires and semi-structured interviews to explore views and experiences of the fishing sector around the UK.

For research on actions to address ALDFG, the UK commissioned the OECD report 'Towards G7 Action to Combat Ghost Fishing gear' in 2021, as part of the UK G7 presidency[49].

For research on monitoring ALDFG, the UK and all other OSPAR Contracting Parties, collect data on beach litter and seafloor litter to feed into the UK and regional (OSPAR) monitoring programmes. Both indicators have information about fishing gear found in the marine environment[50]. A recent study undertaken by Cefas (under draft for peer review publication) analysed items collected during seafloor litter trawls in the North and Celtic Seas to estimate the proportion of seafloor litter that is

[48] https://randd.defra.gov.uk/ProjectDetails?ProjectId=20488
[49] G7 Climate and Environment Ministers' meeting, May 2021: communiqué - GOV.UK: https://www.gov.uk/government/publications/g7-climate-and-environment-ministers-meeting-may-2021-communique
[50] The latest assessments available from links:
Abundance, Composition and Trends of Beach Litter (ospar.org)
Composition and Spatial Distribution of Litter on the Seafloor (ospar.org)

made up by ALDFG. Another Cefas recent study looked at "Fishers' views and experiences on abandoned, lost or otherwise discarded fishing gear and end-of-life gear in England and France".[51]

4.2.3.4 Communication and dissemination efforts

Voluntary training directed towards active skippers is available through SeaFish[52], a public body with one of its mandates targeting marine litter.

The UK Government encourages open discussion and real-time communication between fishing fleets and supports best practices in gear marking to prevent gear conflict. This is something that can only be encouraged, otherwise the issues are dealt with by local police.

[51] https://www.researchgate.net/profile/Peter-Randall/publication/373389024_Fishers'_views_and_experiences_on_abandoned_lost_or_otherwise_discarded_fishing_gear_and_end-of-life_gear_in_England_and_France/links/64e8af320453074fbdb195c7/Fishers-views-and-experiences-on-abandoned-lost-or-otherwise-discarded-fishing-gear-and-end-of-life-gear-in-England-and-France.pdf
[52] https://www.seafish.org/safety-and-training/

5 GAP ANALYSIS AT OSPAR LEVEL

5.1 Use of the FAO Guidelines by OSPAR Contracting Parties

None of the contacted authorities from the OSPAR Contracting Parties in this report have stated that they have utilized the FAO Guidelines in their current regulations, largely because their marking systems, regulations and associated practices were already in place when the guidelines were produced. However, Belgium, Norway, Sweden and UK have all indicated they will consider using the FAO Guidelines in the further development of their regulations (Table 1).

Table 1.Summary of survey responses regarding the utilisation of the FAO Guidelines.

Survey question: *"In what way has The Guidelines been utilized by your country in the development or implementation of regulation or practices on marking of fishing gear in your country?"*	
Response options	**OSPAR Contracting Party**
Yes	None
Planned to be utilized in the (further) development of regulations.	Belgium, Norway, Sweden, UK
Marking systems and regulations were already in place in our country when The Guidelines were published, hence The Guidelines were not utilized.	Belgium, Denmark, EU, Germany, Iceland, Ireland the Netherlands, Norway, UK,
No information	France, Spain, Portugal

Sweden and Norway state that the FAO Manual for the Guidelines has been used as technical guidance for further development of regulations on fishing gear marking by their country authorities. Sweden and Norway are the only countries that have utilized the recently released manual.

Based on the information collected through interview studies and literature review (see methodology section 1.5 for details), the gaps between the FAO Guidelines and current regulation and practices were identified as part of this study. These gaps are described below, divided into the corresponding subsections of the FAO Guidelines (e.g. "Scope and principles", etc.).

This gap analysis has also shed light on areas where regulation and practices are fully or partly in line with the FAO Guidelines on marking of fishing gear, providing an excellent base on which to build further efforts for improving the existing systems. The following list summarizes those findings:

- Through the EU regulatory framework, which applies to most Contracting Parties, and the implementation of the NEAFC Scheme, states do cooperate on the establishment,

implementation and harmonisation of fishing gear marking systems (FAO Guidelines §18-19).

- Reporting of abandonment or loss and the duty to attempt to retrieve gear is covered by regulations in all Contracting Parties either through EU Control Regulation, or other national regulations in Iceland, Norway and the UK (FAO Guidelines §20a, 34, 35, 39).
- The enforcement of a system for the marking of fishing gear through fisheries MCS arrangements is covered in most Contracting Parties through either EU Control Regulation, or other national regulations (e.g. Iceland, Norway, UK). There are generally penalties or sanctions for non-compliance with the various requirements of the fishing gear marking system and inspections by the relevant authority to verify that owners and operators mark their fishing gear as required. Most countries also report that port state inspections include fishing gear marking (FAO Guidelines §28-31).

5.2 Scope, principles, and implementation

The FAO Guidelines describe the scope and principles upon which fishing gear marking systems should be based on. Risk assessment is described as a fundamental element in defining the scope and prioritisation of marking systems. Risk assessments have not been systematically conducted to guide the regulation and/or implementation of fishing gear marking for any of the responding Contracting Parties. Norway does however imply that such assessment has been made indirectly as several decades of retrieval of lost fishing gear has gathered knowledge showing that passive fishing gear is most susceptible to loss. As for the development of the EU regulations, the EU has not conducted a full risk assessment for the marking of fishing gear. The best available scientific advice from the Scientific, Technical and Economic Committee for Fisheries was used for the development of the EU Implementing Regulation for beam trawlers and passive gear. Sweden's ongoing update of national regulations should include risk assessments for defining the scope of marking systems.

The prioritisation and selection of types of gears to be marked (Figure 10) and the design of the marking and labelling systems to be used in existing regulations and practices has therefore been done without a formal risk assessment that takes into due consideration all the aspects recommended within the FAO Guidelines, namely: potential risks to navigation, safety and the environment and the benefits of having an effective gear marking and reporting system established in a fishery.

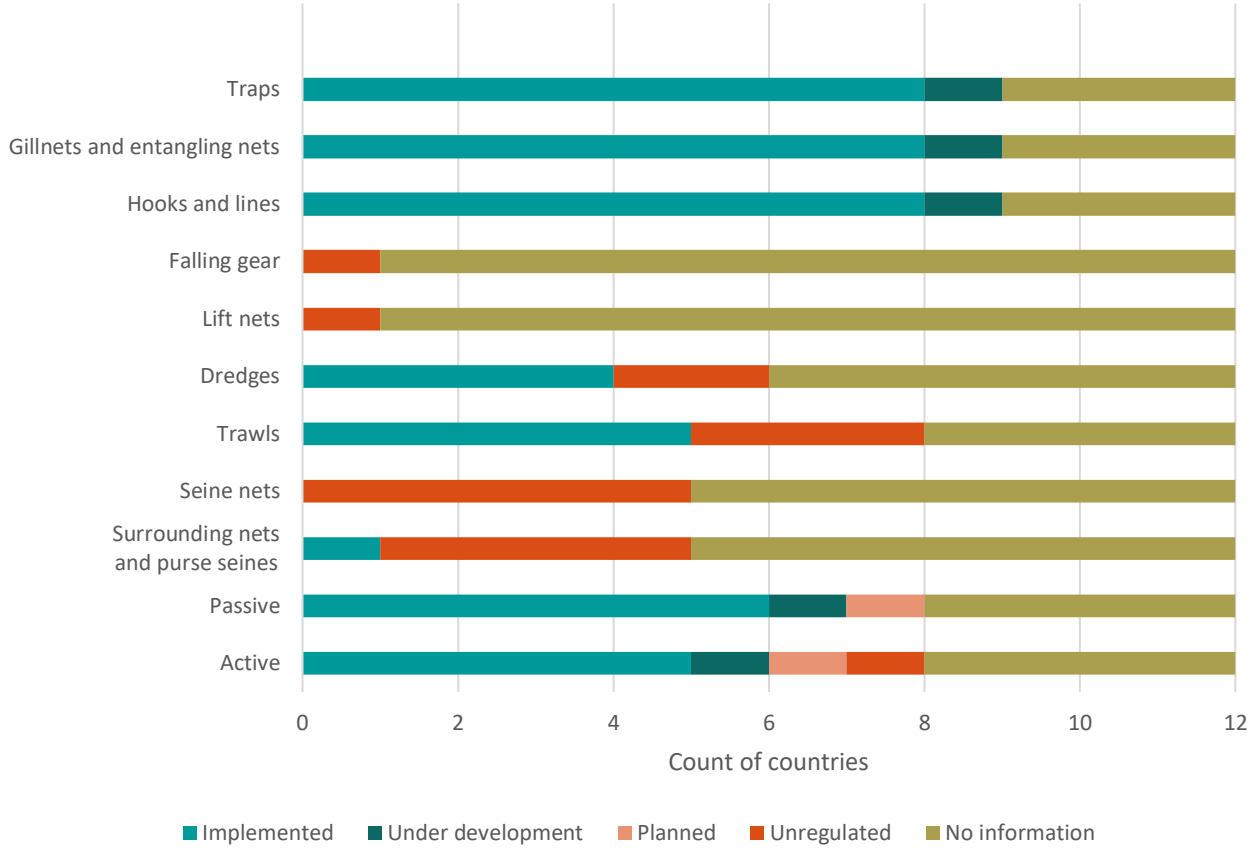

Figure 10. Status of implementation of systems for gear marking per gear type for the 12 Contracting Parties included in this study according to the information captured during the interviews. The EU has not been included in the chart as the implementation status in the Contracting Parties that are EU Member States is already covered by the information on each of them.

Active and inclusive participation of interested parties is a key principle in the FAO Guidelines and most of the contacted authorities state that the process of development and implementation of fishing gear marking systems has been inclusive for active participation and information sharing. This is usually done as part of the legislative processes through public consultations at the national level in the respective Contracting Parties. Stakeholder consultations within impact assessments were also used for the Control Regulation but stakeholder inclusion is more limited for Commission Implementing Regulations such as the one laying down the rules for the implementation of the Control Regulation (the Implementing Regulation).

Some of the Contracting Parties state that they monitor the practices with gear marking for the need for changes (Germany, Iceland, Netherlands, Norway). Iceland states that the feedback of the fishermen collected during state fisheries inspections is taken into consideration when reviewing regulations. Germany and Sweden are currently in the process of updating their national regulations affecting fishing gear markings, and their processes involve public and stakeholder consultations.

There is some variation on how the respective OSPAR Contracting Parties have designed their current system for gear marking to meet obligations of relevant international conventions and agreements. EU Member States and the UK state that their systems comply with or are in line with the EU Control Regulation and Implementing Regulation. Iceland (not an EU member) states that their fisheries comply with the gear marking rules included in the NEAFC Scheme when operating in the NEAFC Regulatory Area. Norway states that practices with gear marking for the main of the fisheries industry is designed to meet international conventions and agreements, but that the authorities are not sure about the alignment for regulations for "small fisheries".

Several countries also state that they have bilateral or regional collaborations which cover the implementation of systems for fishing gear marking. Examples of such collaborations being the OSPAR, HELCOM and the Nordic Council of Ministers. When rules in regional fisheries management organisations or bilateral fishing agreements differ from Contracting Parties regulations, there is also cooperation for the implementation of those rules. NEAFC is referred as an example whereby the rules of NEAFC apply to all flag state vessels and the cooperative implementation is supported by all members, including port state inspections conducted in ports of NEAFC Contracting Parties.

The gathering and provision of information during the implementation of gear marking systems is another important element to ensure that the systems achieve their intended benefits. The implemented systems cover the need for information to a certain extent and this is presented in more detail in section 5.4 regarding reporting. Even if not specifically assessed in this study, the existing systems do not seem to provide or gather information on the safe and environmentally sound disposal of unwanted gear.

The marking types and designs are approved by some country authorities (Denmark, Iceland, Netherlands, Norway). Norway states that marking types and designs are fitted in accordance with technical specifications and international standards, such as the FAO Guidelines. Other countries (Germany) claim that the EU regulations do not yet provide specific enough regulative requirements on the types and designs of markings .

When asked about the main drivers motivating each country to regulate and implement the marking of fishing gear, most countries point primarily to EU Control Regulation and the Implementation Regulation as international requirements. Sweden also points to the Marine Strategy Framework Directive[53] and the EU Single-use-plastics directive[54] as drivers for the collection and recycling of

[53] Directive 2008/56/EC
[54] Directive (EU) 2019/904

fishing gear. Norway indicates that gear marking together with the national requirements to report lost gear enables returning it to its owner in case of recovery. Naturally, the OSPAR Commission's regional action plan on marine litter is also mentioned as a motivating factor to work on topics related to gear marking and ALDFG. The HELCOM is mentioned by Sweden as another driving factor, as regional cooperation is important to create a level playing field for fisheries. As for Portugal, which is currently working on the implementation of national regulations on the marking of fishing gear, it is stated that the main driver for their development is the internal initiative by the national fisheries authority.

The contacted Contracting Parties' authorities were asked about opinions on potential barriers to implementing gear marking systems. Three of them ascertain that there are no barriers to implementation of the relevant regulations on gear marking. However, among the answers of the other Contracting Parties, it is stated that for years, the main consideration of the authorities was to identify illegal fishing, with less focus on marine litter. As a result, labelling of the actual fishing gear was not prioritized by authorities. Several Contracting Parties' authorities also mention that a barrier to implementation is the fishing industry's concerns that gear marking could have practical implications for gear handling and create increased costs and administrative burden for the industry. Building industry support for gear marking systems is mentioned in the FAO Guidelines as an important factor for successful implementation. One Contracting Party mentions that, if made available, a gear registry coupled with fishing licenses and a sanctions system would potentially be important provisions to prevent gear losses. The lack of gear registries is currently seen as a barrier to effective implementation of their marking system. Another Contracting Party states that internal communication across the different sectors of the public administration is a barrier to effective implementation of gear marking practices and regulations.

Six parties (Denmark, EU, Iceland, Ireland, Norway, and Sweden) report that the practices with marking of fishing gear aid fisheries resource management and have many other positive impacts for the fisheries sector. Examples of this being PLN labelling of fishing gear contributing to increased loss reporting, thereby partially addressing ALDFG, and surface marking with buoys reducing the potential for gear conflict and navigational hazards. The obligation to marking or tagging gear with a vessels' PLN increases the pressure to report lost or abandoned gear and avoid covering the retrieval cost as provided for in the Control Regulation. Labelled gear allows checking for gear loss reporting and increases the possibility of it being returned to the user or owner in case the gear is recovered by authorities or other users. Overall, the implemented gear marking systems indicate the presence of gear in the water column to other fishers and authorities through surface markings (and eventually through radio/satellite beacons). Norway also states that gear marking increases reporting practices and improves the circular economy of materials. Conversely, four other

Contracting Parties state that gear marking and or labelling does not help fisheries resource management.

5.2.1 Identified gaps

In relation to scope and purpose of gear marking systems, the FAO Guidelines recommend risk assessments (for which guidance is provided in the guidelines' annex) to identify the fisheries and gear scope and appropriateness of systems. Such risk assessments have not been formally made by the Contracting Parties.

A likely direct consequence of this is that the Contracting Parties covered in the survey have implemented marking systems for some kinds of fishing gear (e.g. passive gear), whilst other gear types are still not covered by the marking regulations. Gear used by recreational fisheries have until now not been covered by marking regulations, except for crab and lobster fisheries in Norway (marking and labelling) and the UK, and for marking but not labelling of passive gear in Sweden. The Amended Control Regulation includes provisions relevant to the marking of fishing gear in recreational fisheries. How this will impact praxis across Contracting Parties that are EU Member States is still unknown as the provision included in the Amended Control regulation reads that "The Commission may, by way of implementing acts, adopt detailed rules concerning: (b) the marking of gear used for recreational fisheries, except hand-held gear, in a simple and proportionate manner.".

The lack of continuous monitoring of the system's adequacy and for the need for changes, as a fundamental design unit, implies that the systems in use have no mechanism by which gaps related to the scope and design would be revealed unless this is externally detected, as is the case in this study.

The existing gear marking systems do generally not include information about safe and environmentally sound disposal of unwanted gear.

5.3 Monitoring, control, and surveillance

As stated at the beginning of this chapter, monitoring, control, and surveillance (MCS) arrangements for existing fishing gear marking systems are covered by most Contracting Parties through either the EU Control Regulation, or other national regulations and this is therefore an area where gaps are limited.

Several countries state that it is the responsibility of the fishers to replace individual marks to continuously fulfil regulatory requirements. This is linked to the fact that no system is in place for the issuance of marks and or labels by the Contracting Parties authorities that carries with it the need to reacquire the ones lost or damaged from the issuing authority.

Most countries report that they have both penalties or sanctions for non-compliance with the various requirements of existing fishing gear marking systems, as well as inspections (including but not limited to port state inspections) by the relevant authority to verify that owners and operators mark their fishing gear as required. Table 2 below provides an overview of the types of enforcement in the respective countries. The Control Regulation make Member States responsible for control of their fishing vessels and vessels operating on their waters and all infringements need to be reported.

Table 2. Types of enforcement practices

Contracting Parties	**Types of enforcement**			**Specifications**
	Penalties & sanctions	**Inspections**	**No information**	
Belgium	X	X		Non marking results in gear confiscation and fines.
Denmark	X	X		Punishable to not mark gear. Fines but not loss of licenses. Unmarked passive gear is removed.
EU	X	X		
France			X	
Germany	X	X		
Iceland	X	X		
Ireland			X	
Netherlands	X	X		
Norway	X	X		
Portugal			X	
Sweden	X	X		
Spain			X	
UK	X	X		

Denmark and Sweden acknowledge that gear marking systems can function as a means of uncovering IUU, in the sense that unmarked passive gear is removed. However, Norway states that this only is the case to a very small extent as gear marking is limited to passive gear in use in the Norwegian Economic Zone and the corresponding fisheries operate under a strict quota and reporting system. Though marking systems increase the probability that all lost fishing gear will be reported as

required and ensures owner identification, the affected fisheries will have little to gain from fishing with unmarked gear from an IUU perspective.

At the EU level, the Control Regulation required member states to report to the Commission and other Member States on the implementation of the regulation every fifth year. This report included information on the number of infringements related to the marking of fishing gear. In the Amended Control Regulation, the reporting frequency has been increased to yearly reporting.

5.3.1 Identified gaps

This study has not assessed whether port state inspections are carried out in accordance with "Annex B paragraph e) in the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate IUU" as recommended in the FAO Guidelines.

The FAO Guidelines recommend standardisation of marks and that designs are approved by competent authorities. In addition, the guidelines recommend the establishment of a record, associated or not with the fishing licensing or authorisation system, to record information associated with the marks. This would allow for the traceability of marks and eventually the provision of new individual marks after the reporting of the loss or damage to previously provided marks. Standardisation, issuance, registration and reprovision of marks constitutes a gap in monitoring control and surveillance with regards to the systems presently in use by the Contracting Parties.

Otherwise, no clear gaps are identified in general based on the given information from the respective countries with respect to monitoring, control, and surveillance of the existing marking systems.

5.4 Reporting and Recovery of ALDFG

For reporting, most EU countries refer to the EU regulations on the requirements to report on losses of gear to competent authorities, while Iceland, Norway and the UK have provisions in their regulations on the obligation to report lost gear. The EU Control Regulation does not cover reporting of the marking of gear but only reporting of the loss of gear. Denmark and Norway refer to national requirements for the reporting of lost gear.

Most countries acknowledge that retrieval of reported ALDFG that is a hazard for both navigation and fishing operations is prioritized versus the retrieval of gear which "only" brings adverse impact to habitats or is a threat to marine life. Fishing vessels in EU Member States are required to make attempts at retrieval of lost gear, as well as reporting it in case of non-retrieval. Norway has implemented similar requirements in its national legislation. In addition, information on position

and type of gear lost, but not gear ownership or operator, is made publicly available through the system BarentsWatch[55]. Some member states encourage retrieval of lost gear through programs, such as Fishing for Litter (Ireland, Norway) and Fishermen for a Clean Sea (Netherlands). Denmark and Norway state that data on reported losses is used by authorities to plan actions to reduce marine litter (through clean-ups, etc.), although no systematic data exchange between authorities or other countries was discovered. Sweden states that the e-logbooks are distributed to other EU members, but that these logbooks contain hardly any data since losses are almost never reported.

5.4.1 Identified gaps

Even if reporting of gear loss to the flag and coastal state authorities is mandatory in all the Contracting Parties, standardized digital infrastructure for sharing information on ALDFG are not available, and only a few countries indicate that they have functional platforms for reporting and sharing of information on ALDFG to relevant organisations, entities and interested stakeholders. The existing platforms have also been used to identify 'ALDFG hotspots' by authorities (e.g. Denmark and Norway).

The level of detail of the records/registers of fishing gear reported as being abandoned, lost, otherwise discarded or found has not been researched in detail though this study. Unfortunately, because of the obligation to report the loss but not the finding and retrieval it is unlikely that these records are maintained with the level of detail recommended in the FAO Guidelines.

Some countries report of programs to responsibly handle recovered ALDFG but this is not a common practice. Fishing for Litter is an example of an initiative that is replicated in several OSPAR countries and financed at the national or EU level. As the EU directive of port reception facilities for the delivery of waste from ships (EU 2019/883)[56] is being implemented in the OSPAR countries, harbours will be obliged to offer waste handling facilities for incidentally fished waste, and the amount of such waste on at national level will need to be reported.

5.5 Commercial traceability of fishing gear

The traceability of fishing gear across the supply chain, from production to use and disposal, is encouraged by the FAO Guidelines. Table 3 provides an overview of the information provided from the respective Contracting Parties covered by this study. Nordic Contracting Parties, plus the

[55] https://www.barentswatch.no/fiskeriaktivitet/
[56] https://eur-lex.europa.eu/eli/dir/2019/883

Netherlands, have actively encouraged traceability systems for fishing gear to different stakeholder groups along the value chain.

Table 3. Overview of in which countries the commercial traceability of fishing gear has been encouraged to actors along the value chain.

Traceability of gear encouraged by state to:	To a large extent	To some extent
Fishing gear manufacturers and suppliers	Sweden, Netherlands	Iceland, Norway
Fishing companies, industry associations	Denmark, Iceland, Netherlands	Norway
Sustainable seafood certification programs and other sustainability initiatives?		Denmark
Small-scale and artisanal producers of fishing gear?		Sweden, Iceland, Norway

5.5.1 Identified gaps

Some countries in the study region have been unsure of, or not provided, information on the matter of traceability of gear. The FAO Guidelines introduce a source of confusion in this section as the heading refers to the "Commercial traceability of fishing gear marking" while the content of the section is targeting the commercial traceability of fishing gear itself.

The actual implementation of traceability using marking systems has not been assessed per se in this study even though several states indicate active encouragement in this matter. This indicates that a focussed review of regulation and practices across contracting parties could confirm this potential gap.

5.6 Research and development

Most countries state that there is ongoing research in their respective countries towards fishing gear marking and the monitoring of amounts, retrieval and impacts of ALDFG. A good example is the broad study to discern the sources and origin of fishing nets washed up on the shores of the North-East Atlantic and the Arctic[57]. Most research efforts seem to be focused on ALDFG prevention and retrieval in general, whilst little is mentioned about projects specifically focusing on gear marking.

The FAO Guidelines also emphasize the importance of research into strategies which ensure responsible management of fishing gear throughout its complete lifecycle. OSPAR has already

[57] https://research.wur.nl/en/publications/fishing-nets-on-the-coastline-of-the-arctic-and-north-east-atlant

devoted efforts into the analysis of best practices for the design and recycling of fishing gear [58] and this a good starting point for carrying out and coordinating more research on the subject.

Some of the research projects and initiatives are described in more detail under respective sections for the individual countries in this report (see chapter 44).

5.6.1 Identified gaps

There is a potential a gap in the implementation of the FAO Guidelines in terms of research specifically focusing on gear marking. Research on ALDFG prevention and retrieval and fishing gear management is actively ongoing in many of the Contracting Parties, but it is difficult to ascertain the specific gaps on research on ALDFG, gear marking systems and on end-of-life management and specially at the nexus of these three and at the OSPAR level due to the lack of a compilation of these results.

5.7 Awareness raising, communication and capacity development

Seven out of twelve Contracting Parties confirmed involvement in communications, training and awareness raising activities regarding the marking of fishing gear and/or the problems caused by ALDFG. Several Contracting Parties state that they provide direct funding for educational programs.

Real-time communication between fishing fleets operating on the same grounds varies amongst the OSPAR Contracting Parties. Denmark states that the country has regulations in place which prevents conflicts between active and passive gear at sea and Norway refers to information sharing through Fisheryactivity[59] and FishInfo[60] sites of the digital platform BarentsWatch[61] that support communications between fishing vessels in operation. Iceland states that fishermen communicate via VHF to coordinate themselves on gillnet set areas. Several countries (Sweden, Ireland, Belgium) state that neither the state nor regional fisheries bodies or other bodies involve themselves in such communication, whereas some countries state that they are not sure about the facts (Germany, Iceland).

5.7.1 Identified gaps

There is no standard or recurring program for communications, training and awareness raising regarding marking of fishing gear and/or ALDFG. Each country has their own undertakings, although most countries indicate and have an active level of engagement in such efforts.

[58] https://www.ospar.org/documents?v=42718
[59] https://www.barentswatch.no/fiskeriaktivitet/
[60] https://www.barentswatch.no/fiskinfo/
[61] https://www.barentswatch.no/

The FAO Guidelines encourage states and other interested parties to cooperate to identify and share best practices, collate, and share information, as well as coordinate effective communication and training which constitutes a gap at OSPAR level as such targeted cooperation is not organized.

None of the Contracting Parties reported on efforts on systematic gathering of information on ALDFG trends and impacts over time or on attitudes and behaviour towards fishing gear management measures which would allow monitoring the effectiveness of the measures employed. This could constitute a gap both at the national and OSPAR level.

There is generally a low level of information available on real-time communication efforts between fleets in operation to avoid gear conflict, which could potentially constitute a gap.

5.8 Summary of gaps at OSPAR level

Table 4 summarises the gaps and findings from this chapter (5), with references to the relevant paragraphs in the FAO Guidelines.

Table 4.Summary of gaps at the OSPAR level grouped into the major areas addressed by the FAO Guidelines.

Thematic area in the FAO Guidelines	**Gaps between FAO Guidelines and Contracting Parties in the OSPAR**
Scope and principles	- Targeted risk assessments have not been conducted to guide the design of the fishing gear marking systems included in existing regulations and implemented by the Contracting Parties (§§ 7, 8, 11a, Annex) - Although the systems are to some extent monitored for the need of changes, there is no formal monitoring process that is ensuring that the marking systems are responsive to the changing conditions of all stakeholders (§11d) - Even if there has been an inclusive dialogue about fishing gear marking systems the impact on the efficiency of the fisheries has not been formally assessed (§§ 9, 10, Annex) - Lack of risk assessments leads to uncertainty on the benefits of having a marking and reporting system in place (§15)

Thematic area in the FAO Guidelines	**Gaps between FAO Guidelines and Contracting Parties in the OSPAR**
Implementation of gear marking systems	- Most countries have only implemented gear marking systems for passive gear types, whilst most active gear types (except beam trawls and dredges) are not marked (§ 18b) - There are overall good procedures for reporting the loss of fishing gear by the user to the flag and coastal state but limited procedures on data storage, retrieval, and information exchange (§ 18c) - The fishing gear marking systems and associated reporting does not provide enough information or have the necessary components, aspects and requirements for: - Reporting of found fishing gear - Reporting on the recovery of ALDFG - Safe and environmentally sound disposal of unwanted gear (§ 20 b, c, d) - Information on the marks is not documented in the form of a fishing gear record or through a fishing licensing or authorisation system (§ 27) - There are no mechanisms for the traceability of fishing gear marks that provides for reporting of marks' loss or damage and for their replacement (§ 32)
Reporting and Recovery of ALDFG	- The reporting systems for most Contracting Parties cover reporting of gear abandonment and loss. Reporting and provision of information of found and retrieved ALDFG has not been assessed in this study and may potentially also be a gap. (§§ 20b, 20c, 36, 64) - No system is in use across the Contracting Parties to provide information about ALDFG at the OSPAR level (§§ 20, 37, 64) - Beyond port reception facilities, ALDFG disposal and recycling infrastructure and programs are not encompassing enough amongst most Contracting Parties and may also potentially be a gap (§§ 20d, 44, 45)

Thematic area in the FAO Guidelines	Gaps between FAO Guidelines and Contracting Parties in the OSPAR
Commercial traceability of fishing gear[62]	- Several countries report to be unsure of efforts relating to traceability of fishing gear across the supply chain and no system being in place. (§§ 46, 47, 48) - Actual performance of traceability has not been assessed, although several Contracting Parties authorities actively encourage it (§§ 46, 47, 48)
Research and development	- No systematic compilation of information about R&D targeting specifically new technologies for gear marking and strategies for responsible management of fishing gear exists, although research on measures to reduce the impacts of ALDFG issues are/ have been researched by Contracting Parties. (§57, 58, 59)
Awareness raising, communication and capacity development	- No coordination or cooperation exists at the OSPAR level with regards to information sharing, communication, and training on fishing gear marking and ALDFG. Several initiatives on this exist at the Contracting Party level. (§ 60) - No systematic gathering of information on ALDFG trends and impacts and especially limited periodic information on attitudes and behaviour towards fishing gear management measures and may also potentially be a gap. (§ 62) - No targeted education, training, technology exchange or other forms of capacity development exist at the OSPAR level to address constraints to the effective implementation of a system for gear marking (§ 65).

[62] The English version of the FAO Guidelines entitles this section as "Commercial traceability of fishing gear marking" but the text is on "Commercial traceability of fishing gear" and therefore is the last used in the gaps summary.

6 BRIDGING THE GAPS AND FUTURE WORK

The summary of gaps included at the end of the previous chapter provides insight on the different aspects of the FAO Guidelines that could benefit from further work by the Contracting Parties in improving and reinforcing the existing practices for marking of fishing gear and prevention of ALDFG.

6.1 Scope and design of marking systems through risk assessments

The analysis carried out here has revealed that the major gap is the lack of formal risk assessments to support the scope and design of gear marking systems in use by OSPAR Contracting Parties.

The scope and design of existing systems are mostly inherited from the traditional use of gear marking. This is increasing navigation safety, through marking the presence of gear in the water, and supporting fisheries management by allowing verification of the lawful use of fishing gear connected to a license or authorisation. For both applications marking refers mostly to either the use of signalling surface elements (buoys, flags, lights, and reflectors) and the labelling or tagging of these surface elements with an identifier (PLN) that allows it to be linked with the owner or the operator. These two marking motivators (navigation safety and owner/operator identification) explain the almost exclusive focus on the marking of passive gear used in professional fisheries and that the marking/signalling is increased outside 12 nautical miles in the EU Implementing Regulation. This also explains that most of the labelling effort is concentrated in the surface or near surface elements of gear sets. Navigation safety in inshore areas and ownership of gear amongst recreational fishermen is therefore not addressed by most contracting parties with the present marking systems. The focus on improving gear marking systems for small scale fisheries operating in nearshore areas and by recreational fisheries could have a marked impact on marine litter and ghost fishing effects of ALDFG. Marking of passive fishing gear by recreational fishermen is an area that some of the Contracting Parties (Denmark, Norway, Sweden) have recently started addressing through regulation and awareness raising for ensuring implementation. Marking of gear in recreational fisheries is to be addressed by all Contracting Parties that are EU members as per the Amended Control Regulation but the details for how this is to be done is pending the corresponding implementing acts. The FAO Guidelines are applicable to all fishing gear types used in all types of fishing activities and could therefore be used as guidance for broadening regulations to the recreational sector.

When it comes to the need for marking to achieve the main purpose of the FAO Guidelines (i.e. "to improve the state of the marine environment by combatting, minimising and eliminating abandoned, lost or otherwise discarded fishing gear (ALDFG)") it is important to place equal or even more attention on the "labelling or tagging" component of marking gear and not only the surface elements of it. This is relevant to being able to identify and trace all elements of fishing gear left behind in the marine environment back to the owner or operator and be able to devise targeted measures.

The use of risks assessments to support the scope and design of gear marking systems is a key guidance element provided in the FAO Guidelines. The guidelines Annex and the recently published framework for conducting risk assessment for gear marking systems[63] provide recommendations on the parameters to be included in such risk assessments, such as ecological, economical, and technological risks, safety and navigational risks, social and cultural risks and finally the availability and quality of information and synergies derived from harmonising gear marking systems.

In addition to supporting and legitimising the scope and design of marking systems, the risk assessments provide the opportunity of incorporating two important elements for ensuring successful implementation. The first is participation and transparency in the scoping and design process and the second is the assessment of feasibility and affordability of the systems. The first two elements, if included in future risk assessment to further develop marking systems in the OSPAR Maritime Area, would allow for some of the concerns expressed both by authorities and industry representatives to be addressed, with regards to revisions of the systems presently under implementation bringing additional economic and financial burden. Inclusion of interested stakeholders at the risk assessment level would help ensuring that systems for the marking of fishing gear are designed to make their implementation as feasible as possible and ensure adoption, as also recommended in the FAO Guidelines.

Risks assessments could therefore lead to the prioritisation of gear, fisheries and sectors that today are seen as bringing substantial environmental impacts and that are not adequately covered by the present-day regulations and practices focused on navigational safety and fisheries management. The scoping of the risk posed by aspects not covered by existing systems would allow devising targeted and prioritized plans for addressing them and allow gathering information on the effectiveness of systems used elsewhere for the relevant gears, fisheries, or sectors, before proceeding with marking design and implementation.

[63] He, P. & Lansley, J. 2023. Voluntary Guidelines on the Marking of Fishing Gear – A framework for conducting a risk assessment for a system on the marking of fishing gear. Suppl. 1. Rome, FAO.

6.2 Information and reporting

Another area where gaps have been identified regards the holistic design of information gathering and management systems in a way that these would provide information not only on lost or abandoned fishing gear but also on found, recovered and disposed fishing gear, including on the safe and environmentally sound disposal. The information and reporting systems used today are naturally biased towards ensuring the collection and sharing of information on gear loss and abandonment as that is crucial for being able to take recovery or other mitigation measures.
If fishing gear marking and ALDFG information gathering and management systems would have a more holistic design this would allow for gathering insight on the amount of gear accumulating in the environment over time, the amount of gear that is safely and soundly disposed of at the end of life and, last but not the least, the effectiveness of regulations and practices, as is desirable from any monitoring system.

Broadening, strengthening and standardising reporting and information management systems is not a simple nor cheap undertaking for Contracting Parties. The OSPAR Commission provides a forum with relevant expertise, capacity and diversity of individual Contracting Parties' ambitions and needs that could allow for furthering the work on holistic information systems on gear marking and ALDFG. Further work in reporting would provide benefits to Contracting Parties beyond the OSPAR realm. End-of-life reporting is also, as mentioned before, an area that the Amended Control Regulation should strengthen when it is implemented.

To this respect it is worth mentioning the digital tool "Artes perdidos"[64] that has been developed within the Spanish project LIFE INTEMARES[65] and could be used as model for other similar systems to be developed either at the OSPAR level or at the national level to broaden and integrate reporting on ALDFG. Online marking can help to prevent gear conflict before gear loss and identify hotspots for gear loss afterwards. This enables analysis to inform management decisions that could reduce gear loss going forward.

To help close this gap, which is also prevalent in other regions, the Global Ghost Gear Initiative has developed the global data portal[66] that serves as a global repository for disparate data sets on ALDFG and end of life gear. This platform could also be used by Contracting Parties to report and house data collected on ALDFG, particularly for those countries that do not have the digital infrastructure in place to support such reporting.

[64] https://www.artesperdidos.es/
[65] https://intemares.es/en
[66] GGGI Dataportal

The need for strengthening information gathering on the life cycle and fate of fishing gear brings forward the one aspect on monitoring, control, and surveillance in which an important gap has been identified with respect to the guidelines. Fishing gear records or registers are not in use by Contracting Parties and the adequacy and benefits of initiating such praxis could be discussed as a way forward on gathering systematic information on gear usage by the fishing industry. An additional benefit would being able to trace gear through its life cycle and better plan end of life measures.

6.3 Fishing gear traceability, ALDFG disposal and recycling systems

An area that is highlighted within the FAO Guidelines and could certainly complement the information and insight brought forward by fishing gear registers is the implementation of measures targeting gear traceability across the whole supply chain. While registers are targeting the gear end user, measures to improve traceability from production to use and subsequent disposal could allow for tracing gear parts or components that are not labelled with authority mandated user identification. This also provides the opportunity for groups of users like specific fisheries and/or geographies to develop practices for targeted measures to improve pollution and waste management. Commercial traceability of gear would also allow for gathering information about material flows that could inform the planning of disposal and recycling systems and has already been targeted as part of the work carried out by OSPAR in the previous RAP-ML[67].

ALDFG disposal and recycling systems and infrastructure is another area that warrants further action from the Contracting Parties. Some of the contracting parties have supported the establishment of systems for ALDFG and end of life gear such as Fishing for Litter[68], but the coverage of such programmes is still limited and the scope focussed on collection with marginal amounts of recycling that can contribute to covering end of life management costs. The necessary integration of the indirect fee system brought forward by the EU Port Reception Facilities (PRF) directive[69] with fishing for litter schemes and the harmonisation of practises related to the provision and use of PRF, covered in action B.1.1[70] of RAP ML 2, are certainly aspects that warrant further work.

Fishing gear producers extended producer responsibility (EPR) is certainly relevant here. The provisions included in the EU directive on the reduction of the impact of certain plastic products on the environment[71] address the EU Member States' obligation to establish extended producer responsibility schemes for fishing gear containing plastic. This includes collection targets, reporting

[67] https://www.ospar.org/documents?v=42718
[68] https://www.kimointernational.org/fishing-for-litter/
[69] https://eur-lex.europa.eu/eli/dir/2019/883
[70] https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan/rap2-commercial-shipping/b.1.1-port-reception-facilities
[71] https://eur-lex.europa.eu/eli/dir/2019/904

and separate collection and awareness, raising costs coverage by producers. These provisions could form the basis of further work on fishing gear EPR at the OSPAR level. It is worth noting that the EU directive does not include detailed provisions on the marking of fishing gear to allow for efficient EPR schemes to be implemented but refers to the marking provisions on the EU Control Regulation that, as discussed, fall short when it comes to gear traceability across the whole supply chain. As an example of work on holistic life cycle assessments and EPR implementation, the project Oceanwise[72] is focusing on the expanded polystyrene (EPS) and extruded polystyrene (XPS) used for fish boxes and float production. This project concluded in 2023 and the outcomes are being taken up by the OSPAR Commission under a separate action[73] of RAP ML 2. There could opportunities to link this to the work on ALDFG by guiding efforts with other material streams used in fishing gear.

Increased fishing gear traceability would also allow better environmental footprint assessment for different fisheries and species that could be incorporated into integrated sustainable seafood certification programmes and other sustainability initiatives. This would also lead to increased accountability within and outside the fisheries sector with potential benefits on the value of the catch, based on environmentally oriented market demand.

Activities on this area will contribute to, and should be coordinated with, activities framed within Action B.4.2 of RAM-ML2 "Stimulate circular design and developments in waste management of fishing and aquaculture gear"[74].

6.4 Research and development programmes and initiatives at the OSPAR or other relevant regional levels

Certainly, considerable research has been carried out across OSPAR Contracting Parties on i) monitoring and retrieving of ALDFG, ii) new technologies and procedures for the marking of fishing gear, iii) responsible management of fishing gear throughout its complete lifecycle and iv) measures to reduce ALDFG impacts such as non-entangling and/or biodegradable gear materials and escape mechanisms for trapped animals. Our study has however unearthed the need for and potential benefit from a compilation of those research results to support the need for comprehensive risk assessments or the risk assessments themselves to be performed to improve and broaden existing marking regulation and practices and ensure full exploitation of those research results by all the Contracting Parties. This would be especially meaningful and profitable because of the multidisciplinary nature of the subject where fisheries, environment, technology, economics, and

[72] https://www.oceanwise-project.eu/
[73] https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan/rap2-productsandpackaging/a.4.2-polystyrene
[74] https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan/rap2-fishing-aquaculture/b.4.2-stimulate-circular-design-and-developments-in-waste-management-of-fishing-and-aquaculture-gear

law expertise are needed to further develop optimal marking systems across a broad geographic range while relevant results may not be known and directly available across disciplines.

6.5 Communication, best practice sharing and capacity development at the OSPAR level

Most Contracting Parties are, or have to some extent, worked with communication and awareness raising of at least ALDFG but also on the marking of fishing gear. There is however no specific cooperation across OSPAR Contracting Parties to identify, collate and share best practices, or to share information and coordinate effective communication and training. The work carried out in the previous RAP-ML and the inclusion of the action in which this study is framed in RAP-ML2 poses a good foundation and opportunity for targeted cooperation on this area.

Communication efforts on the risks associated to ALDFG and the benefits from the use of adequate and commensurate fishing gear marking systems should be prominent to ensure adequate stakeholder understanding, motivation and engagement. When marking systems are designed and prioritized based on risk, emphasis can be placed on ensuring that all stakeholders are aware that all affected sectors will be subject to the same level of enforcement, regardless of location, to reinforce the trust on a level playfield irrespective of the Contracting Party and sector.

Finally, fisheries focussed education should target the importance of not losing or discarding parts or pieces of gear. Some parts of the OSPAR Maritime Areas the loss of whole gear set is not that common, but the marine litter problem is linked to parts or pieces of gear because of wear and tear and because of repair and maintenance work leading to bits and pieces being lost or discarded. RAP-ML2 action B.4.3 on "Promoting practical solutions for reducing the impact of certain specific fishing related items, such as net cuttings and dolly rope"[75] is specifically targeting this and communication efforts on this area should be closely coordinated for maximum effect. Drastically reducing the amount of these types of items would decrease the need for marking across the supply chain to be able identify which users or user groups are responsible for the deposit of these items in the marine environment. The overall awareness and improved education in the fishing sector with regards to marine litter is also the focus of another action of RAP ML 2[76].

[75] https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan/rap2-fishing-aquaculture/b.4.3-fishing-related-items
[76] https://www.ospar.org/work-areas/eiha/marine-litter/regional-action-plan/rap2-fishing-aquaculture/b.4.5-improve-education-in-the-fishing-sector

7 APPENDIX

Contacted IGOs and NGOs that have provided information to the present study either by participating in an interview or through other means:

Organisation	**Contact person/s**	**Interview**		**Other input**
		Yes	**No**	
North-East Atlantic Fisheries Commission (NEAFC)*	Darius Campbell	X		X
European Association of Fish Producers Organisations*	Paul Thomas		X	
North Sea Advisory Council (NSAC)*	Sofie Smedegaard Mathiesen, Jacob Handrup	X		
Europêche*	Daniel Voces	X		
North Western Waters Advisory Council (NWWAC)*	Mo Mathies		X	
South West Waters Advisory Council (SWWAC)	Sergio Lopez Garcia	X		
Norwegian Fishermen's Association,	Maria Pettersvik Arvnes	X		
Norwegian Coastal Fishermen's Association	Petter Myklebust		X	
Fisheries Iceland	Hildur Hauksdóttir	X		
*Global Ghost Gear Initiative (GGGI)**	Joel Baziuk, Hannah Pragnell-Raasch		X	X

*OSPAR observer organisations

Sustainable coastal development