European Commission

Study to support the implementation of obligations set out in the Single Use Plastics and Port Reception Facilities Directives

Final Report

July - 2020

EUROPEAN COMMISSION

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Luxembourg: Publications Office of the European Union, 2020

PDF ISBN 978-92-9460-262-6 doi: 10.2826/567796 EA-02-20-886-EN-N

EXECUTIVE SUMMARY

This '**Study to support the implementation of obligations set out in the Single Use Plastics Directive[1] and Port Reception Facilities Directive**'[2] will inform the two implementing acts foreseen in the Single Use Plastics (SUP) and Port Reception Facilities (PRF) Directives by providing proposals for a coherent monitoring and reporting framework for the fishing gear placed on the market in the EU Member States; the waste fishing gear and the passively fished waste collected in ports. The definitions set out in these two directives and further scope clarifications provided by the Commission confirm the following:

SUP Directive

'**Fishing gear**' includes both fishing and **aquaculture** gear without distinction in terms of commercial or recreational fishing gear. Most gears produced could be used in either **freshwater or marine** settings. Gear is only considered outside the scope of the SUP Directive if that gear is specific to freshwater, e.g. gear containing plastic associated with inland raceways. '**Producers**' are anyone that 'professionally manufactures, fills, sells or imports, irrespective of the selling technique used, including by means of distance contracts'. The SUP Directive specifies that 'fishermen themselves and artisanal makers of fishing gear containing plastic should not be considered as producers'. It will be up to the MS to establish who are the producers falling within the scope of the Directive and the Extended Producer Responsibility scheme to be established. The SUP Directive does not exempt **landlocked countries** from reporting or from establishing EPR schemes, but they are exempted from establishing national minimum collection targets for waste fishing gear (Art.8.8). Landlocked MS could report that gear is placed on the market, but if they only export, it should be part of the reported imports by traders in those MS receiving the gear.

PRF Directive

Article 8(7) states that 'Member States shall ensure that monitoring data on **the volume and quantity of passively fished waste** are collected, and shall report such monitoring data to the Commission. The Commission shall, on the basis of those monitoring data, publish a report by 31 December 2022 and every two years thereafter. The Commission shall adopt implementing acts to define monitoring data methodologies and the format for reporting.

The PRF Directive defines 'passively fished waste' as 'waste collected in nets during fishing operations'. This waste may well include Abandoned, Lost & Discarded Fishing Gear (ALDFG), which is collected by, but does not originate from the vessel that is delivering it to port. This makes ALDFG distinct from the 'waste fishing gear' that is to be reported under the SUP Directive.

Article 3 of the PRF Directive states that the directive applies to all ships[3] and all ports. However, while the delivery of waste should occur irrespective of size, electronic reporting of that waste to the European Maritime Safety Agency (EMSA) SafeSeaNet system is not required for vessels under 45m in length, which is more than 99.5% of

[1] Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment.

[2] Directive (EU) 2019/883 on port reception facilities for the delivery of waste from ships, amending Directive 2010/65/EU and repealing Directive 2000/59/EC.

[3] With the exception of any warship, naval auxiliary or other ship owned or operated by a State and used, for the time being, only on a government non-commercial basis.

the EU fleet by number. It is also evident from the PRF Directive that many of the small fishing ports used by the EU fishing fleet would not contribute to the waste information required under the PRF Directive as (a) not all fishing ports may have a Waste Reception and Handling Plan (WRHP) and (b) the information reported to SafeSeaNet that is contained within the plan may include how the port records waste, but not the data itself.

Existing Reporting Obligations & Data sources

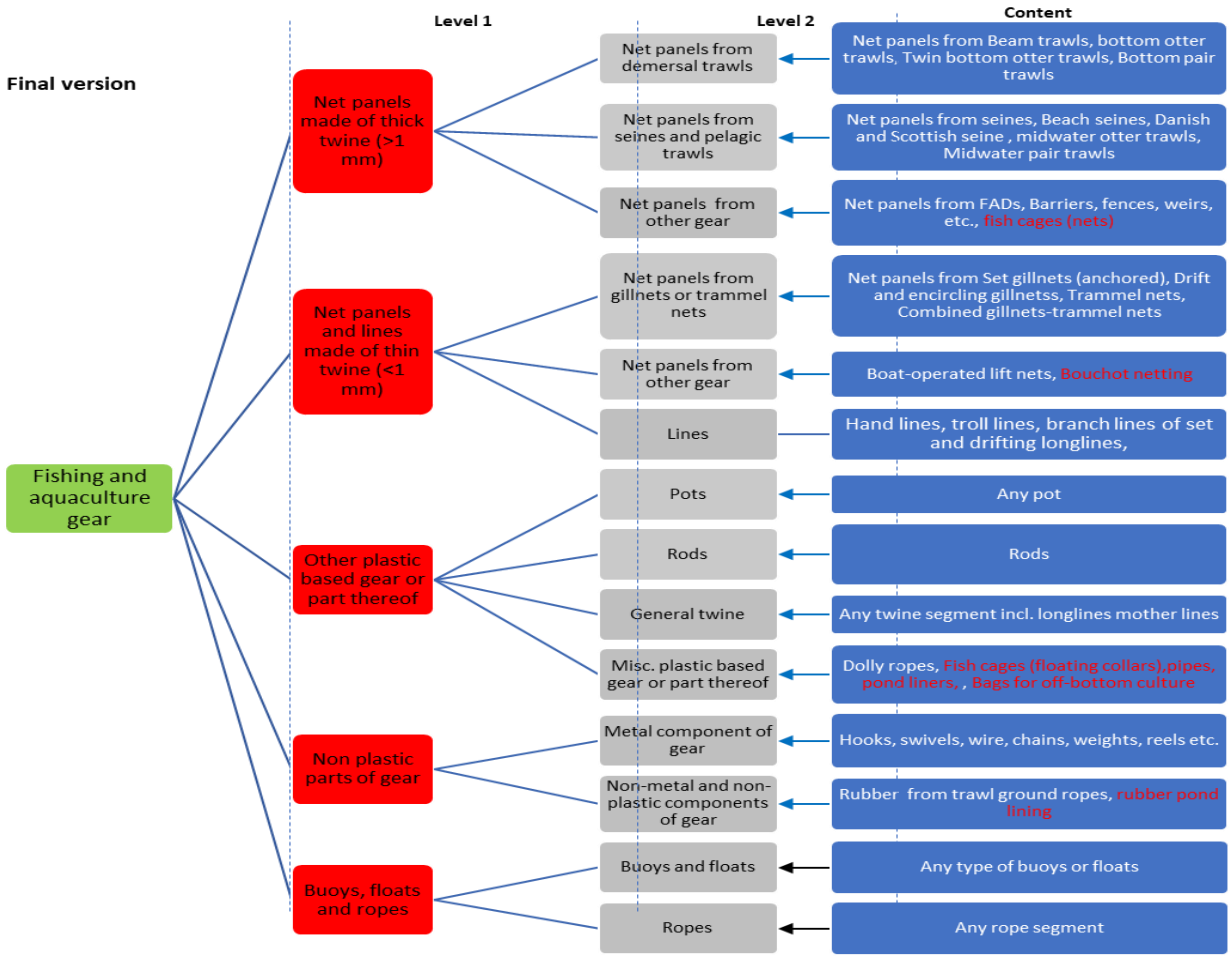
No existing EU Reporting Obligations require the reporting of waste fishing gear or passively fished waste delivered to ports. The Fisheries Control Regulation (1224/2009, which is currently under revision) requires the reporting of lost gear in e-logbooks for vessels, but this only relates to the vessel's own gear loss and the reporting requirement does not extend to ALDFG or other passively fished waste. The possibility to expand the e-logbook or the Safeseanet reporting schemes to include adequate data for the SUP and PRF Directives with respect to information on waste fishing gear & passively fished waste is still under investigation. However, it is expected that such expansions would be difficult to implement.

The **PRODOCOM** dataset, with two codes related to fishing gear was considered as a data source that could be used to estimate the type and quantity of **fishing gear placed on the market** in MS. However, these codes do not include the numerous components used in fishing and aquaculture gear. There are also likely to be low coverage rates and confidentiality issues for such a niche manufacturing sector as 'fishing gear producers', which severely limits the utility of this data set to derive realistic totals for fishing gear placed on the market.

Member States are likely to have to develop new data monitoring and reporting systems. For the SUP Directive, it is expected that ultimately the required data should be derived from the Extended Producer Responsibility (EPR) schemes that are required under the Directive. To minimise the additional administrative burden, and in recognition of the different structures and systems in place within and between Member States, the methods for collecting and monitoring data should be determined by the Member States themselves. The implementing acts should set out a simple and consistent format for Member States to report the data required by the Directives. The draft formats for reporting developed are consistent with other waste regulations, setting out mandatory data to be reported and more detailed voluntary data that could be based on that data collection or based on estimates using samples or ad-hoc studies.

The SUP Directive voluntary reporting uses a categorisation of fishing gear (figure A) developed in this study by gear specialists on the project team informed by industry consultation. Gear fiches detailing the typical structure and composition of fishing and aquaculture gears that are in use in the EU are presented in **Annex 5**.

Figure A Taxonomy of fishing and aquaculture gear



Section 4 of this report presents decision trees showing possible approaches to collating and calculating data on the fishing gear placed on the market; waste fishing gear collected and passively fished waste. The methods and conversion factors used will be developed by each Member States to account for the circumstances specific to that MS. These details should be presented in quality reports to be submitted along with the reports. It is proposed that Eurostat principles on data collection and monitoring are followed to allow integration with other waste statistics, collation and comparison across Member States.

SUP Reporting Format (one table each for fishing gear placed on the market and waste gear collected)

(white cells are mandatory data; light grey cells are voluntary data)

	Total fishing gear containing plastic (tonnes)	Net panes made of thick twine (Ø >1mm)	Net panes and lines made of thin twine (Ø<1mm)	Other plastic based gear or parts thereof	Non-plastic parts of gear[4]	Buoys, floats, ropes
Total	A+B+C+D +E	A	B	C	D = I+K	E = F+J+L
Plastics total	A+B+C+F	A	B	C		F
- Polypropylene (PP)						
- Polyethylene (PE)						
- High Molecular Polyethylene (HMPE)						
- Nylon						
- Other						
- Mixed						
Metals total	G = I+J				I	J
- Steel						
- Aluminium						
- Lead						
Rubber total	H = K+L				K	L

PRF Reporting Format for passively fished waste

(white cells are mandatory data; light grey cells are voluntary data)

	Total weight (tonnes)	ALDFG (tonnes)	Other marine litter (tonnes)	Total volume (m3)	ALDFG (m3)	Other marine litter (m3)
Total	A1+A2	A1=B1+ C1+D1+ E1	A2=B2+C2+ D2+E2	F1+F2	F1=G1+H 1+I1+J1	F2=G2+H2+I2 +J2

[4] Such as metal weights, rubber rollers, escape devices / grids, etc.

Plastics	B1+B2	B1	B2	G1+G2	G1	G2
Metals	C1+C2	C1	C2	H1+H2	H1	H2
Rubber	D1+D 2	D1	D2	I1+I2	I1	I2
Other waste	E1+E2	E1	E2	J1+J2	J1	J2

Quality Reports

Evaluations of existing EU waste reporting requirements (such as batteries, packaging, Electrical and Electronic Equipment and municipal waste) show that **data quality issues** must be taken into account when designing these reporting systems to ensure that collation at EU level and comparability between Member States are possible.

The MS reporting should be accompanied by a comprehensive Quality Report that is presented in a consistent format. A draft Quality Report format is presented in **Annex 3**, based on the Eurostat ESS handbook for quality reports.

Table of Contents

List of Tables

List of Figures

List of Acronyms / Abbreviations

Acronyms/Abbreviations	Definition
ALDFG	Abandoned, Lost and Discarded Fishing Gear
CFP	Common Fisheries Policy
CV	Curriculum Vitae
EEE	Electrical and Electronic Equipment
EFCA	European Fisheries Control Agency
EMSA	European Maritime Safety Agency
EoL	End of Life
EPR	Extended Producer Responsibility
EPS	Expanded Polystyrene
ESS	European Statistical System
EU	European Union
FAD	Fish Aggregating Device
FFL	Fishing For Litter
HDPE	High Density Polyethylene (incl. Ultra High Molecular Weight PE, e.g. Dyneema)
ISSCFG	International Standard Statistical Classification of Fishing Gear
LDPE	Low Density Polyethylene
MARPOL	International Convention for the Prevention of Pollution from Ships
MS	Member State (of the EU)
OJ	Official Journal (of the EU)
PA	Polyamide (Nylon)
PC	Polycarbonate
PET	Polyethylene Terephthalate (or PETE or Polyester)
PE	Polyethylene
POM	Placed on Market
PP	Polypropylene
PRF	Port Reception Facilities
PRO	Producer Responsibility Organisation
PVC	Polyvinyl Chloride
PS	Poly Styrene
QA	Quality assurance
RIC	Resin Identification Code
Safeseanet	Union Maritime Information and Exchange system
SUP	Single Use Plastic
ToR	Terms of reference
WEEE	Waste Electrical and Electronic Equipment

1.0 Introduction

This **Final Report** is submitted for the '**Study to support the implementation of obligations set out in the Single Use Plastics Directive[5] and Port Reception Facilities Directive**'[6].

The objective of the assignment is to inform the two implementing acts foreseen in the Single Use Plastics (SUP) and Port Reception Facilities (PRF) Directives by providing proposals for a coherent monitoring and reporting framework for the fishing gear placed on the market in the EU Member States; the waste fishing gear and the passively fished waste collected in ports.

This report is structured as follows:

- Overview of relevant existing reporting obligations and schemes including their reporting channels (Task 1);
- Taxonomy of different types of fishing gear placed on the EU market (Task 2);
- Methodology for calculation and verification of amounts of waste fishing gear (by gear types) and passively fished waste (Task 4).
- SUP Directive Reporting: format for data reporting and quality check for fishing gear placed on the market & waste gear collected (Tasks 3 & 5)*
- PRF Directive Reporting: monitoring data methodologies, reporting format & quality check for passively fished waste (Task 5)*

*The tasks set out in the ToR combine elements of SUP Directive and PRF Directive reporting requirements. This report structure reflects the individual Directive requirements as we have found that, while there could be some overlap in terms of monitoring data (e.g. ports reporting on waste fishing gear and passively fished waste collected), there are also several differences, making a presentation per Directive most logical. The same quality report format is proposed for both Directives.

1.1 Definitions

The following definitions are used throughout the report to inform the scope and approach to monitoring and reporting. Wherever possible, the definitions set out in the directives and other EU legislative acts are used.

Definitions used in the SUP Directive:

Article 3(4): '***Fishing gear***' means any item or piece of equipment that is used in fishing or aquaculture to target, capture or rear marine biological resources or that is floating on the sea surface, and is deployed with the objective of attracting and capturing or of rearing such marine biological resources.

Article 3(5): **'*Waste fishing gear*'** means any fishing gear covered by the definition of waste in point 1 of Article 3 of Directive 2008/98/EC*, including all separate components, substances or materials that were part of or attached to such fishing gear when it was discarded, including when it was abandoned or lost.

*Article 3.1 of 2008/98/EC: '**waste**' means any substance or object which the holder discards or intends or is required to discard.

[5] Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment.

[6] Directive (EU) 2019/883 on port reception facilities for the delivery of waste from ships, amending Directive 2010/65/EU and repealing Directive 2000/59/EC.

Article 3(6): ***'Placing on the Market'*** *(POM)* means the first making available of a product on the market of a Member State;

Article 3(7):; 'Making available on the market' means any supply of a product for distribution, consumption or use on the market of a Member State in the course of a commercial activity, whether in return for payment or free of charge;

Definitions given in the PRF Directive:

Article 2(4): ***'Passively Fished Waste'*** means waste collected in nets during fishing operations;

Other terms used in this report:

'End of Life' *(EOL)* gear is 'waste fishing gear' that is retired from use. It is distinguished from other types of waste fishing gear because EOL gear is likely to be less polluted and less entangled than ALDFG and consequently more suitable for recycling / re-use. It may be stored and transferred directly back to gear producers or waste collectors. Therefore, MS monitoring reporting on waste fishing gear collected should not focus solely on port reception facilities.

'ALDFG' means Abandoned, Lost or Discarded Fishing Gear (e.g. in Macfadyen et al, 2009[7]). Passively Fished Waste is likely to include ALDFG, i.e. gear from other vessels that is landed by a vessel delivering PFW into port reception facilities.

1.2 Scope

The definitions and requirements set out in the two directives have implications for the scope of the monitoring and reporting. These are clarified below and represent the working assumptions in developing the reporting formats.

1.2.1 SUP Directive

- ***Commercial and recreational gear:*** *the definition of 'fishing gear' is not limited to commercial fishing gear only. Producers of recreational gear are supposed to be covered under the scope of the SUP Directive.*

- ***Freshwater and marine environments****: The SUP Directive makes repeated reference to marine litter, the marine environment and marine biological resources. Most gears produced could be used in either freshwater or marine settings. Gear could be only considered outside the scope of the SUP Directive if that gear is specific to freshwater [e.g. associated with raceways]. It is up to the Member States to establish who are the producers falling within the scope of the SUP Directive.*

- ***Landlocked countries:*** *the Directive does not exempt landlocked countries from reporting or from establishing EPR schemes, but they are exempted from establishing national minimum collection targets for waste fishing gear (Art.8.8). Landlocked MS*

[7] http://www.fao.org/3/i0620e/i0620e00.htm#Contents

could report that gear is placed on the market, but if they only export, it should be part of the reported imports by traders in those MS receiving the gear.

1.2.2 PRF Directive

Article 3 of the PRF Directive states that the directive applies to all ships[8] and all ports.

- **Fishing vessels**

Article 3.2 states that 'Member States shall take measures to ensure that, where reasonably possible, ships which do not fall within the scope of this Directive deliver their waste in a manner consistent with this Directive.

Article 7.3. The operator, agent or master of a ship which falls within the scope of Directive 2002/59/EC shall before departure, or as soon as the waste delivery receipt has been received, electronically report the information contained therein in that part of the information, monitoring and enforcement system referred to in Article 13 of this Directive, in accordance with Directives 2002/59/EC and 2010/65/EU.

Directive 2002/59/EC, establishing a Community vessel traffic monitoring and information system '*shall not apply to fishing vessels…of less than 45m*'. This means that while the delivery of waste should occur irrespective of size, electronic reporting of that waste to the European Maritime Safety Agency (EMSA) SafeSeaNet system is not required for more than 99.5% of the EU fleet.

- **Fishing ports**

Article 5.1 states that Member States shall ensure that an appropriate waste reception and handling plan is in place and has been implemented for each port (…)'.

Article 5.3 states 'Where required for reasons of efficiency, the waste reception and handling plans may be developed jointly by two or more neighbouring ports in the same geographical region, with the appropriate involvement of each port, provided that the need for and availability of port reception facilities are specified for each port.'

Article 7.2 states that the requirements set out in the first subparagraph shall not apply in small ports with unmanned facilities or that are remotely located provided that the Member State where such ports are located has notified the name and location of those ports electronically in that part of the information, monitoring and enforcement system referred to in Article 13.

Article 13.3 requires Member States to ensure the information listed in the Waste Handling Plans (Article 5.2) is made available electronically through SafeSeaNet.

Annex 1 sets out the requirements for Waste Reception and Handling Plans, stating that these <u>may</u> include: (d) a description of methods for recording the amounts of waste delivered by ships.

The above text of the PRF Directive indicates that (a) not all fishing ports may have a Waste Reception and Handling Plan (WRHP) and (b) the information reported to

[8] With the exception of any warship, naval auxiliary or other ship owned or operated by a State and used, for the time being, only on a government non-commercial basis;

SafeSeaNet is that contained within the plan. This may include how the port records waste amounts, but not the data itself.

1.3 Study approach

A core team of consortium partners led on the delivery of each of the six tasks set out in the ToR:

1. Overview of existing reporting obligations
2. Taxonomy of fishing and aquaculture gear
3. Reporting format & guidelines for gear placed on the market
4. Calculation methods for waste fishing gear collected and passively fished waste
5. Reporting format & guidelines for waste fishing gear collected and passively fished waste
6. Stakeholder Workshop

These tasks were supported by information from Member State (MS) reporters covering all 22 coastal Member States[9].

Member State reporters contributed in the following stages:

a. provide a list of stakeholders within the MS and which they intend to engage with (completed for inception);
b. report on existing relevant reporting schemes including existing taxonomies and how waste is calculated and verified by MS as per questions and reporting forms (for interim);
c. consult with selected stakeholders on proposed reporting to gain early feedback on proposals in advance of the stakeholder workshop. Contacts will take place either in person or by phone, taking account of the allocation of time and travel budgets (for final).

MS reporters provided responses to questions relating to current arrangements and expected implementation of the SUP and PRF Directives (see inception report) based on interviews with MS authorities and other stakeholder groups (gear producers, users, collection scheme operators, NGOs). Responses were then reviewed by the core team to ensure that information collected is sufficient, accurate and clear and that supporting documentation is provided where available.

1.4 Consultation

1.4.1 Data collection phase

The task leads consulted with a range of EU stakeholders (European Commission staff, NGOs and sector representatives). Task leads also participated in a number of relevant workshops in 2020, which served as a useful opportunity for data collection:

- Re-imagining Fishing Gear in a Circular Economy (Advisory Councils workshop, 28 Jan)
- Implementation of measures foreseen under the EU Directives related to waste fishing gear & passively fished waste (DG MARE workshop, 18 Feb)

[9] The UK is also included as its experiences in relation to such monitoring and reporting are a useful contribution to the knowledge base.

- Challenges & Solutions to Circular Fishing Gear Design (OSPAR/MRAG workshop in DG MARE, 19/20 Feb).
- Implementation of SUP Directive (DG ENV workshop, 25 Feb)

MS reporters conducted consultations at MS level via face to face or telephone interviews. The priority consultations were with the public authorities responsible for implementing the SUP and PRF Directives. Consultations were also held with the other stakeholder types identified, with two from each category consulted wherever possible. **Annex 8** provides tables listing those consulted.

The majority of MS reporters achieved reasonable engagement with public authorities to discuss current and future monitoring and reporting. There were a number of challenges due to the varied institutional arrangements both within and between Member States. MS governments had not always identified which departments or other public authorities will be responsible for the implementation of each Directive at the time of consultation. In most, MS responsibility for the SUP Directive lies with a different department to the PRF Directive. And In some MS, responsibility for fishing gear-related aspects of the SUP lies with a different department to the rest of the SUP Directive, which is often with those responsible for other EU waste Directives. Similarly, with regards to the PRF, responsibility for fishing ports is sometimes the responsibility of a different department to other commercial ports. The level of co-ordination between departments was found to be highly variable.

Some MS authorities felt ill-equipped to answer the questions as they had no experience of the subject and would not speculate on how the Directives could be implemented in their MS. They awaited further instructions from the Commission before determining their approach. The consultation process was in some instances an awareness-raising exercise. Despite the various challenges, all 23 MS reports were received to help identify what existing monitoring and reporting is in place as well as how stakeholders envisage the monitoring and reporting required under the two directives could be arranged in their Member State. The findings are summarised in section 2.2 of this report.

1.4.2 Reporting phase

The Covid-19 crisis led to significant changes to the original plan for consulting on draft reporting formats. Instead of a physical workshop in Brussels, where MS authorities would be invited to attend (task 6), several presentations were made to web-based meetings. This included presentations to the Waste Expert group established for the SUP Implementation and the ESSF Waste from Ships Sub-group. This enabled stakeholders to seek clarifications and provide feedback on the draft formats.

The team also delivered two webinars on the 12th and 13th May focused on reporting under the SUP Directive and PRF Directive respectively. The Commission steering group confirmed that these webinars effectively replaced the workshop requirements set out in the ToR as they achieved the same objective; to share suggested reporting formats with stakeholders and receive their feedback.

A report on the webinars, including a summary of stakeholder comments and queries, and an analysis of the survey responses is provided in **Annex 9**. Public Authorities from seventeen Member States also submitted comments to the Commission either directly or via the project team.

Revisions to the draft reporting formats were made in response to stakeholder feedback received and the latest versions are presented in this report. Further clarifications have also been provided throughout this report (e.g. within section 1.1 on definitions and section 1.2 on scope) in response to requests for clarifications from stakeholders.

2.0 Overview of reporting requirements

2.1 Analysis of relevant EU Legislative acts and reporting schemes

This section reviews the reporting obligations related to the implementation of the SUP and PRF Directives and the reporting obligations for other waste streams under EU regulations.

2.1.1 Relevant legislative acts for the implementation of the SUP and PRF Directives regarding fishing gear

2.1.1.1 SUP Directive

The **SUP Directive** (EU) 2019/904 includes the following provisions regarding fishing gear containing plastic:

The Commission shall:

- by 3 July 2020, the Commission shall adopt implementing acts laying down the format for reporting data on fishing gear containing plastic placed on the market and on waste fishing gear collected in the Member State each year (Art. 13d);
- request the European standardisation organisations to develop harmonised standards relating to the circular design of fishing gear to encourage preparing for re-use and facilitate recyclability at end of life (Art. 8);
- review the data provided by MS and publish a report on the results (Art. 13);
- by July 2027, carry out an evaluation of the implementation of the SUP Directive, and if appropriate, set binding quantitative consumption reduction targets and binding collection rates for waste fishing gear (art.15).

Member States shall:

- establish Extended Producer Responsibility (EPR) schemes for fishing gear containing plastic and MS shall ensure that a producer established on its territory, which sells fishing gear containing plastic in another MS appoints an authorised representative in that MS (Art. 8);
- set a national minimum annual collection rate of waste fishing gear containing plastic (for MS with marine waters) (Art. 8);
- report to the Commission on fishing gear containing plastic placed on their market and on waste fishing gear collected, including on abandoned or lost fishing gear[10] (Art. 8 and 13) and accompany the data with a quality check report (Art. 13);
- ensure that the producers of fishing gear containing plastic cover the costs of separate collection, transport and treatment of waste fishing gear as well as the cost of awareness raising measures (Art. 8);
- Implement awareness raising measures about the availability of re-usable alternatives, re-use systems and waste management options and about the impact of littering or other inappropriate waste disposal of fishing gear containing plastic on the environment (Art. 10);

[10] Definitions under Art. 3 of the SUP Directive: 'waste fishing gear' means any fishing gear covered by the definition of waste in point 1 of Article 3 of Directive 2008/98/EC, including all separate components, substances or materials that were part of or attached to such fishing gear when it was discarded, including when it was abandoned or lost.

2.1.1.2 Control Regulation

Under the **Control Regulation**, Council Regulation (EC) No 1224/2009, Article 48 specifies that when a Community fishing vessel has lost a fishing gear, or part of it, the master of the vessel shall inform the competent authorities of its flag MS, which shall inform the competent authorities of the coastal MS, with:

- The identification of the fishing vessel;
- The type of lost gear;
- The time when the gear was lost;
- The position where the gear was lost;
- The measures undertaken to retrieve it.

Fishing vessels less than 12 meters long may be exempted if they operate exclusively in their flag MS territorial waters and never go at sea for more than 24 hours.

All fishing vessels above 10 meters long are required to fill in a fishing logbook (Art. 14.1) and fishing vessels above 12 meters long are required to record and transmit their logbook by electronic means (Art. 15). Art. 14.2 of the Regulation on the minimum mandatory information to be contained in the logbook does not mention information on lost gear. However, Annex XII of the Implementing Regulation (EU) No 404/2011 establishing detailed rules for the implementation of the Control Regulation includes requirement to report lost gear in the logbook.

Under the proposal for the revision of the Control regulation COM(2018) 368 final, Article 14 of the Control Regulation is revised to include lost gear in the fishing logbook and the MS should provide the information to the Commission upon request (revised Art. 48). The proposal also includes the removal of the current derogation for vessels < 12m to carry on board the necessary equipment for the retrieval of lost gear.

2.1.1.3 PRF Directive

The **PRF Directive** (EU) 2019/883 on port reception facilities for the delivery of waste, which applies to all fishing vessels and all ports of the Member States normally visited by ships falling within the scope of the Directive specifies that:

Member States shall ensure that:

- the port reception facilities have the capacity to receive the types and quantities of waste from ships normally using that port (Art. 4)
- the port reception facilities allow for the management of the waste from ships in an environmentally sound manner in accordance with Directive 2008/98/EC and other relevant Union and national waste law, in particular MS shall ensure separate collection to facilitate reuse and recycling of waste from ships in ports (Art. 4). The MARPOL Convention[11] recommends separate collection for non-recyclable plastics and plastics mixed with non-plastic garbage, which includes fishing nets and lines, but not necessarily separate collection for fishing gear.

[11] Cf. 2017 Guidelines for the implementation of the Annex V of the MARPOL Convention (International Convention for the Prevention of Pollution from Ships) on the Prevention of Pollution by Garbage from Ships, entered into force 31 December 1988.

- The information from the advanced waste notification, waste delivery receipts and exemption certificates is reported electronically as part of the information, monitoring and enforcement system (i.e. SafeSeaNet) (Art. 13)[12].

The PRF operators or port authorities shall:

- Complete and provide a waste delivery receipt (Art. 7 and Annex 3) upon waste delivery for all fishing vessels, including quantities in m^3 of fishing gear and quantities in m^3 of passively fished waste. Small ports with unmanned facilities or remotely located can be exempted if the MS has notified the name and location of those ports electronically[13];

Operators or masters of ships falling under Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system (*i.e.* fishing vessels with a length of 45 metres or more[14]) shall:

- Provide advance waste notification (Art. 6), which should be reported electronically as part of SafeSeaNet, Annex 2 of the Directive provides the standard format for the advance notification form, which includes a separate line to report on fishing gear (waste to be delivered in m^3, maximum dedicated storage capacity in m^3, amount of waste retained on board in m^3, port at which remaining waste will be delivered, estimated amount of waste to be generated between notification and next port of call in m^3);
- Report information contained in waste delivery receipts electronically before departure or as soon as the waste delivery receipt is received, as part of the SafeSeaNet system (Art. 7);

Masters of all fishing vessels shall:

- Deliver all the waste carried on board in accordance with the relevant norms laid down in the MARPOL convention (*i.e.* all waste fishing gear should be disposed in the relevant port reception facility as discharge at sea is prohibited) (Art. 7);
- Make available on board waste delivery receipts for at least two years (Art. 7).

2.1.2 Reporting obligations under the EU waste legislation

2.1.2.1 Waste Framework Directive

The following obligations regarding the implementation of EPR schemes set under the **Waste Framework Directive** (Art. 8.5) shall apply to the EPR schemes falling under the scope of the SUP Directive:

The Commission shall organise exchange of information between Member States and the actors involved in extended producer responsibility schemes on the practical

[12] In line with the scope of Directive 2002/59/EC, this only applies to fishing vessels with length of 45 meters and over.

[13] As of February 2020, there has been no notification of such ports by MS. At EU level it can be assumed that only a marginal share of commercial fishing vessels land in such ports, but some assessment may be necessary at national level.

[14] According to 2019 STECF data, vessels with length over 40 meters represent less than 1% of all fishing vessels. These are pelagic vessels that in general will already manage EoL gear, and are unlikely to deliver much waste fishing gear or passively fished waste into port.

implementation of the scheme (cf. general minimum requirements of the EPR under Art. 8a of the Waste Framework Directive).

Under those minimum requirements, Member States shall:

- define the roles and responsibilities of the relevant actors,
- set waste management targets,
- ensure that a reporting system is in place to gather data on the products placed on the market,
- ensure equal treatment of producers,
- implement waste prevention measures,
- ensure that producers or organisations representing them are in capacity to implement the EPR scheme;
- ensure that the financial contributions paid by producers cover the relevant costs for the EPR scheme (costs of separate waste collection, transport and treatment, costs of providing adequate information to waste holders, costs of data gathering and reporting), take into account the durability, reparability, re-usability and recyclability of individual products (*i.e.* that there is an incentive to produce more durable, reparable, re-usable, recyclable products), that they do not exceed the normal costs of waste management services and that they are established in a transparent way;
- establish adequate monitoring and enforcement;
- ensure a regular dialogue between relevant stakeholders (producers as well as other stakeholders);
- inform the public.

Producers or organisations implementing the EPR scheme on behalf of the producers shall make publicly available information about the attainment of the waste management targets.

2.1.2.2 Specific Waste Streams

The reporting obligations under the following other waste streams have been analysed to identify standard reporting schemes and their applicability in the context of waste fishing gear and passively fished waste:

- Batteries and accumulators
- End of Life Vehicles
- Packaging and Packaging Waste
- Waste Electrical and Electronic Equipment (WEEE)
- Municipal waste (no EPR but reporting obligations defined under the Waste Framework Directive).

The **main reporting obligations** identified are:

For producers or organisations representing them under EPR schemes:

- Be registered under a register of producers;
- Make publicly available information about the attainment of the waste management targets;
- Provide information on ownership and membership, their financial contribution per unit sold or per tonne of product placed on the market and on the selection procedure for waste management operators;
- Provide data on the products placed on the market;
- Provide data on the weight, nature and origin of the waste ;

For Member States:

- Report on measures implemented
- Report on quantitative indicators and targets set in the EU regulations (e.g. products put on the market, collection rates, waste generated, waste re-used, levels of recycling);
- Set up national registries and database (e.g. WEEE, Batteries, Packaging and waste packaging)

For the Commission:

The Commission reviews the data and publishes an assessment report on "the organisation of the data collection, the sources of data and the methodology used in MS as well as the completeness, reliability, timeliness and consistency of that data". All the Directives also require the Commission to draw up early warning reports to the European Parliament and the Council on the progress towards the attainment of the targets, and towards the implementation of measures and requirements provided by the Directives, sometimes accompanied by proposed revisions to the relevance assessment of targets.

The figure below summarises the main reporting obligations for producers, MS and the Commission.

The EU legislation generally defines **how the data should be calculated and reported on**. The legislation can authorise specific data collection methods for determining waste generation and collection: surveys, administrative reporting, statistical estimations, waste analysis, data from waste operators, data from municipalities, data from extended producer responsibility schemes, electronic registries (Regulation for waste statistics, WEEE Directive, Packaging waste Directive, End-of-life vehicles Directive[15]). When the data collection method is not specified, MS are required to report on how the data has been collected to calculate the collection rate (e.g. Battery Directive).

Figure 1: Main reporting obligations under the EU waste legislation

In order to **monitor compliance with the requirements of the EU Directives**, MS must report the data electronically, generally within 18 months of the end of the reporting year (each calendar year) to the Commission. The tool required for the transmission can be an electronical database (packaging waste Directive), an electronical register (WEEE

[15] Commission Decision No 2005/293/EC.

Directive), electronic transmission (WPD, Batteries Directive), a questionnaire (end-of-life vehicles Directive, WPD targets monitoring). The data on quantitative targets and data under the waste statistics regulation are sent directly to Eurostat, while implementation report are sent to DG ENV. Data are generally accompanied by detailed quality check reports, which informs on data collection methods, quality control, traceability, coverage, degree of precision and estimations procedures of the data.

Annex 4 provides a table detailing the main reporting obligations by waste stream, with requirements in terms of calculation methodologies, data collection reporting formats and frequency.

Calculation methodologies for products placed on the market:

Calculation methods to estimate the quantity of products placed on the market generally rely on producer data or on apparent consumption:

- Under the **Batteries Directive**, MS shall base their calculation of annual sales of portable batteries and accumulators "on collected data or statistically significant estimates based on collected data" but the sources and data collection methods are not specified in the EU legislation.
- Under the **Packaging and Packaging Waste Directive**, the quantities of packaging placed on the market is considered to be equivalent to the quantities of packaging consumed and should be calculated based on the apparent consumption in the MS: quantity produced + imported – exported, with a breakdown by broad category of material. The legislation does not specify the data source to be used.

The **WEEE Directive** requires MS to calculate the average weight of EEE placed on their market in a given year based on the information provided by producers of EEE or their authorised representatives, according to their reporting obligations. But in case the data is unavailable or incomplete, MS can also use the apparent consumption method[16]. In that case, the legislation requires to use 'PRODuction COMmunautaire' (PRODCOM) and COMEXT[17] data and specifies the codes to be used. More complex calculation methods may also be used. For instance, under the **Waste Framework Directive** it is possible to calculate the levels of food waste based on socio-economic indicators that reflect the amount of food production at different stages of the supply chain: Food production in agriculture, fishery and hunting, production of processed food (based on PRODCOM data), turnover of food retailers, turnover of restaurants and food services, household disposable income.

Calculation methodologies for waste generated and collected:

Among EPR schemes, calculation methodologies for waste generation and or/collection are very diverse, however, the quantities of waste generated is generally estimated based on the quantities of products put on the market:

[16] Apparent consumption is calculated as "production + imports - exports." The calculation does not take into account stocks because those data generally are not available.

[17] The Eurostat Reference Database for International Trade in Goods.

- The **Packaging Directive** for instance, allows to approximate the packaging waste generated in a MS as "equal to the amount of packaging placed on the market in the same year within that Member State".
- The **WEEE Directive** provides an equation to calculate the total quantity of WEEE generated in a MS in a given year, based on the amount of EEE placed on the market of that MS in the preceding years and an estimation of the corresponding product lifespan.
- Under the **Batteries Directive**, the quantity of waste generated does not have to be reported on but in order to set quantitative targets on the collection rate, the quantities of products collected in a given year are compared to the quantities of products put on the market in that same year as well as during the preceding two years, as shown in the table below.

Data on collected waste is generally gathered from **waste operators**, for instance:

- For **municipal waste**, the generated amount (in tonnes) by a given MS must be obtained directly from establishments or undertakings managing waste, ideally through electronic registries but other methods are also allowed (administrative data, sampling surveys, data from waste operators, data from municipalities or data from EPR schemes, when they have been established).
- The **End-of-life vehicles scheme** also relies on the national treatment facilities declarations of their input (certificate of destruction) to calculate the most accurate total number of end-of-life vehicles in a given MS.

2.1.2.3 Implications for Fishing Gear EPR schemes

When EPR schemes are established, **producers are responsible for the collection, transport and treatment of waste** and so a Fishing Gear EPR Scheme should therefore be able to provide information on the quantities of waste fishing gear collected.

The analysis of EPR schemes' implementation shows that **data quality issues** must be taken into account when designing the fishing gear reporting system. As regards statistics on packaging and packaging waste, Eunomia's study (2017)[18] and the previous Expra study (2015) show that the **MS apply diverse methodologies** when estimating the amount of packaging placed in the market, that often result in a high level of uncertainty on the accuracy of the data. **Missing data, high variability from year-to-year and extreme values** are frequently observed. When the compiled statistics from producers ultimately rely on surveys or studies that are not conducted annually, the intermediate years data are interpolated based on assumed projections or from small studies. The study recommends establishing a **common calculation methodology**, to request reporting from producers of packaging every year, and to ensure all producers are audited on their production, even those that are exempted by the scheme (e.g. small businesses) in order to collect more comprehensive data.

The **lack of clearly defined criteria for accuracy in the estimates** is also highlighted regarding the WEEE treatment calculation[19]. Different reviews identify the same **need for harmonisation** among MS in the data format, structure and frequency of reporting for

[18] Final Implementation Report for Directive 94/62/EC on Packaging and Packaging Waste: 2013 – 2015 (Eunomia, 2018) and Analysis of Eurostat packaging recycling data a study of the years 2006-2012 (Expra).

[19] Study on harmonisation of the format for registration and reporting of producers of Electrical and Electronic Equipment (EEE) to the national register and on the frequency of reporting, (Trasys, 2016).

producers under the analysed Directives. For instance, the Trasys' final report on EEE's Directive (2016) proposes to **standardise the reporting frequency** of EEE producers to the National register on a quarterly basis, with a reporting on the 30th of the month following the respective quarter and to specify additional mandatory information on the weight of EEE (categories and types of EEE are detailed in the format proposed).

Finally, a general observation from Eunomia's study (2017)[20] is the **lack of legally binding requirements for the structure and content of quality reports** in the various EPR schemes, and a need for more **consistent definitions** between different reporting obligations under the waste Directives. The analysis of waste statistics shows that improvements rely on an iterative process with a progressive harmonisation of data collection and calculation methods.

The requirements to be set out in the implementing acts for the monitoring and reporting of fishing gear should therefore include common calculation methodologies, requirements on the frequency of reporting, verification procedures and quality reporting. Draft reporting formats are presented in sections 5 and 6 of this report and in **Annexes 1 and 2** with the draft Quality Report format in **Annex 3**.

2.1.3 Assessment of relevant data available at EU level

2.1.3.1 Data on products placed on the market

One possible existing data source to estimate the type and quantity of **fishing gear put on the market** in MS is by using the **Eurostat datasets**, especially the PRODOCOM dataset: sold production, exports and imports by PRODCOM list (NACE Rev. 2) - annual data (DS-066341).

In the PRODCOM nomenclature, several product codes are likely to include fishing gear (ropes, cordage, nets, fishing line and other tackle, etc). However, codes corresponding to cordage, ropes, etc. may include many products not dedicated to fishing activities and codes corresponding to angling tackle are likely to include mostly fishing gear for recreational fisheries. Thus, there are **only two codes** clearly specified as being dedicated to fishing activities only:

- *13.94.12.35 Made-up fishing nets from yarn of man-made fibres (excluding fish landing nets);*
- *13.94.12.53 Made-up nets from twine, cable or rope of nylon or other polyamides (excluding netting in the piece produced by crochet, hairnets, sports and fishing nets).*

The first code may correspond to gill and trammel nets (yarn of synthetic fibres) type, whereas the second code may correspond to trawl nets type (twine of synthetic fibre).

The corresponding codes in the Comext data are:

- *56081120 Made-up knotted fishing nets of twine, cordage, ropes or cables, of man-made textile mater//xcl. Landing nets)*
- *56081180 Made-up knotted fishing nets of yarn, of man-made textile materials (excl. Those of twine,//landing nets)*

Using the apparent consumption formula, as used for other EPR schemes (i.e. quantity of products placed on the market = production + imports – exports), gives the values shown

[20] A comprehensive review of gaps and weaknesses and key priority areas for improvement in the EU waste statistics : final report – Study (Eunomia, 2017).

in table 1. This results in some values that are not thought to accurately reflect the amount of gear placed on the market in many MS: some have negative values, including the major fishing nation of Spain, others have relatively high values (including Lithuania, which is home to one of Europe's largest plastic recycling facilities and receives EoL nets from across Europe), while many show no production despite there being significant gear companies operating.

Table 1 PRODCOM data for 'Made-up fishing nets…' (2017, in kg)

Member State	Quantity Imported (a)	Quantity Produced (b)	Quantity Exported (c)	Apparent Consumption (a + b – c)
France	1,179,600		99,500	1,080,100
Netherlands	92,800		76,200	16,600
Germany	263,500	0	321,500	-58,000
Italy	365,300	645,108	881,300	129,108
United Kingdom	661,600	0	43,000	618,600
Ireland	57,700	0	0	57,700
Denmark	535,500	0	149,000	**386,500**
Greece	409,000		80,400	328,600
Portugal	146,400	655,424	792,500	9,324
Spain	2,061,400		3,458,000	-1,396,600
Belgium	15,400	0	92,400	-77,000
Luxemburg	1,400	0	0	1,400
Sweden	46,300	0	1,200	45,100
Finland	129,900	0	6,900	123,000
Austria	5,200	0	100	5,100
Malta	16,700	0	0	16,700
Estonia	241,900	569,000	103,300	707,600
Latvia	188,700	0	132,500	56,200
Lithuania	126,800	885,588	77,200	**935,188**
Poland	50,000	0	600	49,400

Czechia	5,900	0	600	5,300
Slovakia	31,800		155,900	-124,100
Hungary	1,800	0	600	1,200
Romania	25,400	0	0	25,400
Bulgaria	65,600	0	25,400	40,200
Slovenia	16,600	0	9,000	7,600
Croatia	21,900	0	16,900	5,000

Source: PRODCOM

The use of PRODCOM data has **several limitations**:

- Representativity and/or coverage rate of national surveys providing national data to PRODCOM for such small sub-sectors with limited number of companies.
- Confidentiality issues for production data when only a small number of companies are involved at national level in assembling gear.
- Risk of double counting by summing imports and production as most of imports are considered to be used as raw material for manufacture/assembling.
- Other fishing gear elements made of plastic such as ropes and cordage, buoys and floats (those on the trawl nets headline for instance), lines, etc. are not taken into account as no specific code exists in the nomenclature.
- End-of-life nets traded for recycling purpose are assumed to be included under these headings (as evidenced by high quantities in Lithuania compared to scale of industry), risking double-accounting.

According to the ADEME study (2018)[21] carried out on the French market, most nets used in fishing gear (trawl nets, gill nets, trammel nets, etc) put on the market in France are actually manufactured in extra-EU countries (especially China), imported, and assembled by a few local companies[22], which creates the **risk of double-counting** when summing up imports and production. The ADEME study suggests that the situation is comparable in most other of EU fishing countries. In the study, all imports (based on COMEXT data) are considered to be put on the market in France and exports are not deducted (as these could mainly correspond to end-of-life gear). The result (1,200 t/year) was confirmed to be realistic by the industry, but the **methodology may not be completely replicable** in other MS, as it depends on the organisation of the industry and the nature of the products actually included in imports and exports. Over 40% of the fishing gear put on the market in France, for instance, comes from intra-EU trade, so the assumption that exports are mainly end-of-life gear will not hold for all MS.

[21] PECHPROPRE – Préfiguration pour la mise en place d'une filière volontaire de gestion des engins de pêche usagés, 2018.

[22] For calculating the amount of nets put on the market in France, the ADEME only included the code corresponding to made-up fishing nets from yarn of man-made fibres, as the figures of imports for this code corresponded to the estimate made by interviewed sector stakeholders 1 200 tonnes).

2.1.3.2 Data on waste fishing gear & passively fished waste

According to the new PRF Directive, the European Maritime Safety Agency (EMSA) will receive data on volumes (expressed in m^3) of waste fishing gear and passively fished waste disposed of by fishing vessels over 45 meters in length in port facilities[23]. However, there are some important **limitations** identified with this source of data:

- The reporting will only be mandatory for a small proportion of fishing vessels (those over 45m in length, which represent 33% of the total Gross Tonnage in 2018, but less than 0.5% of the number of fishing vessels);
- MS reporting under the PRF Directive is focused on commercial ports and data from small fishing ports may not be included (the proportion is unknown, but an example from Greece is that of 1,006 fish landing points, only 57 ports are obliged to submit Waste Reception and Handling Plans)
- There is no standard methodology to convert volumes of waste fishing gear or passively fished waste into weight, which is generally the most appropriate unit for EPR schemes.

2.1.3.3 Implications for SUP and PRF data requirements

Under the PRF Directive, there is a distinction between the obligation to deliver all waste to port reception facilities (which applies to all vessels, irrespective of size) and the obligation to report waste (which applies to vessels over 45m in length, as defined by the 2002/59[24]) in terms of both, advanced notification and reporting electronically to Safeseanet. The Safeseanet database does not therefore capture the great majority of waste fishing gear and passively fished waste, which is from vessels below 45m in length that have no obligation to report under the PRF Directive.

However, Art.7 of the PRF does set out an obligation on port reception facility operators or port authorities to provide a waste delivery receipt (format given in Annex 3 of the PRF Directive), which includes amount (in m^3) of waste fishing gear and passively fished waste delivered. Consultation with port operators suggests this is not standard current practice, but if comprehensively followed, it would provide a method of calculating waste fishing gear and passively fished waste collected in ports.

The revised Control Regulation should allow to provide data on lost and abandoned gear for all fishing vessels through logbooks records, but this does not provide information on weight of waste gear or passively fished waste.

The possibility to expand the Safeseanet and e-logbook reporting schemes to include relevant data for the implementation of the SUP and PRF Directives as regards information on fishing gear is still under investigation. However, the limitations indicated above suggest that such an expansion would be difficult to implement.

To determine the total amounts of waste fishing gear collected for SUP purposes (and so calculate recovery rate), the waste fishing and aquaculture gear that is not collected in a port or at another collection point would still have to be accounted for by other means.

[23] The agreed time plan between Commission and Member States is to implement technical changes SafeSeaNet (SSN) in December 2021 at central SSN level, and in Q1 2022 on the Member States national systems side.

[24] DIRECTIVE 2002/59/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 June 2002 establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC.

2.2 Analysis of relevant data and reporting schemes at national level

The data collection in MS shows that only few MS have already collected information related to fishing gear put on the market, waste fishing gear and passively fished waste, as shown in the following table. In 11 MS (BG, ES, FR, IE, IT, LT, LV, NL, PL, SE, UK) some data could be identified for at least one of the items below, but in the other 12, no relevant data has been identified.

Table 2: Feedback from MS data collection on data available at national level (out of 23 coastal MS)

Is the following data available in your MS?	No. of MS stating they have some data	No. of MS stating they have data at national level
Data on fishing gear placed on the market?	3	3
Data on aquaculture gear placed on the market?	3	2
Data on passively fished waste ?	7	5
Data on EoL fishing gear?	4	3
Data on the disposal of fishing gear?	3	3
Data on the disposal of passively fished waste?	3	2
Data on recycling of fishing gear?	3	1
Data on recycling of other plastic waste landed in ports?	2	1

Source: Feedback from MS reporters

2.2.1 Available data on products placed on the market

Only one MS out of 23 reported having specific monitoring of gear producers or manufacturers in place, beyond the data already collected through national business statistics, annual returns, customs data and returns, or through EU statistical collection (PRODCOM). In Latvia, the national regulation adopted to tackle illegal fishing includes an obligation to be registered before being authorised to sell fishing nets. It does not apply to exports and gear made for own use. Operators must be registered either as trader or as manufacturer. As of the beginning of 2020, 37 companies have registered as traders of fishing gear, and none as a manufacturer.

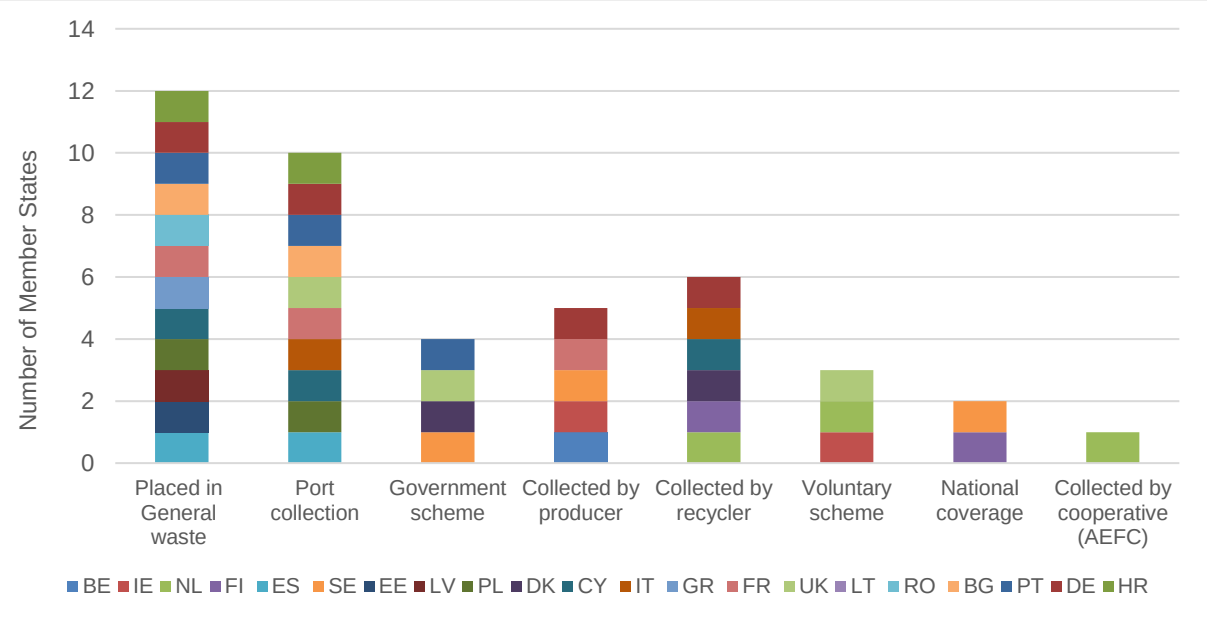
Data on fishing gear placed on the market (including aquaculture gear) have been collected in France, Italy, Latvia and Spain. The data collection methods vary and the results are likely to be hardly comparable. The annual industrial products survey (which feeds into PRODCOM) is mentioned as a source for fishing gear placed on the market in Spain only. In Latvia, data are collected through a quarterly mandatory survey that feeds into a register on the circulation of fishing nets managed by the State Environmental Service. The register covers both gear from the fishing and from the aquaculture sector and data are accessible online (Excel tables). In France, the quantity of fishing gear put on the market has been estimated through a pilot study aiming to prepare the establishment of the EPR, based on interviews with the key actors of the sector and customs data on imports. The data collected only cover the fishing sector and are accessible online in a PDF

report[25]. In Italy, data were also collected through a pilot study on waste management in ports carried out by a FLAG and only cover the mussel production in Emilia-Romagna. Data were collected through a survey targeting mussel producers, recycling companies and public authorities.

2.2.2 Feedback on waste fishing gear

Waste fishing gear is managed in a variety of ways, but close to half the MS indicate that although ports do provide collection facilities, most is placed in the general waste schemes and sent to landfill. Separate collection facilities in ports were reported only in four MS (ES, IT, FR and DE). There are only four MS (SE, DK, UK, PT) which have reported a government type scheme for the collection of waste fishing gear generally through MARPOL Annex V Directive. There are many examples of NGO schemes that collects the gear directly from fishermen, although the main destination in most cases is landfill. There are very few examples of schemes in MS in which producers or recyclers collect, recycle and repurpose waste fishing gear. The current management of waste fishing gear by MS is shown below (Figure 2).

Figure 2: Collection of waste fishing gear

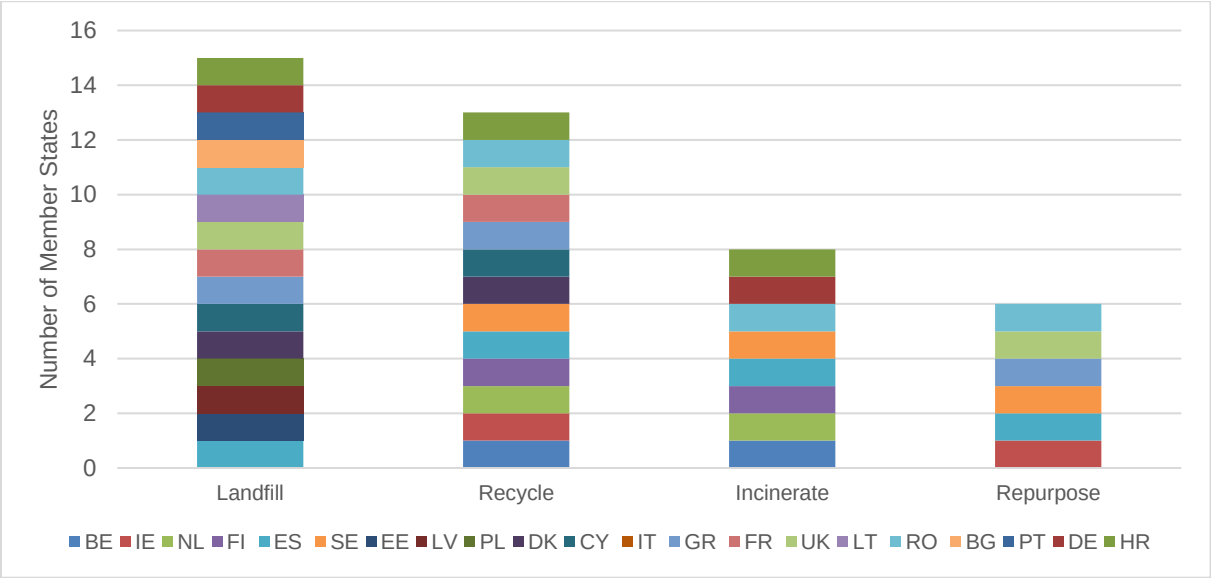


Source: Feedback from MS reporters.

Very few MS could to quantify the proportion of waste gear collected that went to disposal or further treatment. The most common destination for waste fishing gear (mentioned by around 60% of the MS) was landfill; slightly fewer reported that some goes to recycling; and a quarter mentioned re-purposing of waste gear (Figure 3). End of Life (EoL) gear is passed directly to recyclers/gear suppliers or through NGO collection schemes, not via port reception facilities. Around half the EoL gear collected is destined for recycling. This is a higher recycling rate for EoL gear than for the waste fishing gear collected in ports, which is most likely to go to landfill and incineration (or it goes into general waste which may also go to landfill or incineration).

[25] PECHPROPRE - Préfiguration pour la mise en place d'une filière volontaire de gestion des engins de pêche usages, GUEGUEN Mathilde, Coopération Maritime ; Bernard LE MOINE, Elsa VINUESA, CPA ; Karine MAIGNAN. Août 2018.

Figure 3: Destination for waste fishing gear



Source: Feedback from MS reporters

The destination of waste fishing gear is similar to passively fished waste (Figure 4). Some of the Fishing for Litter schemes implemented in several MS provide a specific collection facility for waste fishing gear. These have proved to be acceptable to fishermen even though the majority of nets collected still go to landfill.

Several barriers to the collection and treatment of waste fishing gear were identified by stakeholders. The first barriers relate to the difficulty to collect waste fishing gear, mainly because of:

- The lack of separate collection facilities in ports or inadequate collection facilities;
- The lack of economic incentives for fishermen to supply waste fishing gear (for instance two MS reported higher fees for vessels that bring waste gear into port facilities);
- The lack of nationally coordinated schemes to collect EOL gear.

Other barriers are related to the difficulty to recycle waste fishing gear or components of waste fishing gear, because of:

- The lack of sorting of different plastics/components (including high labour costs, lack of staff to sort)
- Insufficient volumes of variety of plastics to be cost effective
- Too much fouling to remove for recycling plants to take
- Higher cost of recycling compared to landfill (including cost of sorting and cost of transport to recycling facility which can be prohibitive)
- The market for plastics is saturated/no market
- The lack of recycling facilities in the country
- The lack of public awareness

The main barriers reported were the lack of separate collection facilities in ports, the difficulty and the cost to separate the different components and plastics to enable waste treatment operations, as well as the absence of nationally coordinated schemes.

In relation to aquaculture gear, four MS do not have a marine aquaculture industry or it is very small (SE, EE, LV, BG). In MS with a more significant aquaculture industry, it was reported that nets used tend to have a longer life span than fishing nets and that most EoL gear are placed in the general waste and sent to landfill or recycled. However, some large operators do have contracts with net suppliers to receive EoL nets for repair or replacement.

Good practices relating to the monitoring and reporting of waste fishing gear through existing schemes can be grouped as follows:

- National reporting schemes for full coverage
- One body responsible for the national reporting scheme
- Register of producers with a central database and annual reporting of data
- Provision of suitable storage and sorting facilities
- A system of identifying the owner of the gear
- Developing collaborative mechanisms from regional to national scales
- Developing collaboration between users and producers for reporting purposes

The responsible management of EoL gear and the collection of waste fishing gear in ports both contribute to the objective of reducing the amount of waste fishing gear that ends up in the marine environment. However, in terms of the circular economy, the objective should be to promote an increase in reusing and recycling EoL gear in a managed way through direct engagement between user and supplier/collector and reduce the amount that ends up as waste fishing gear within port reception facilities.

In terms of data availability, data on EoL fishing gear can be provided in France, the UK and Sweden at national level. In France data were collected through a survey targeting fishermen for the pilot study PECHPROPRE[26]. However, some limits on the reliability of extrapolations are highlighted in the study. In the UK, the information is collected though a mandatory annual survey, but only covers vessels over 100GT (the reporting is implemented under the OSPAR Convention). In Sweden, the data are collected through an annual survey, specifically on waste fishing gear and EoL fishing gear, which also includes data on disposal and recycling of fishing gear.

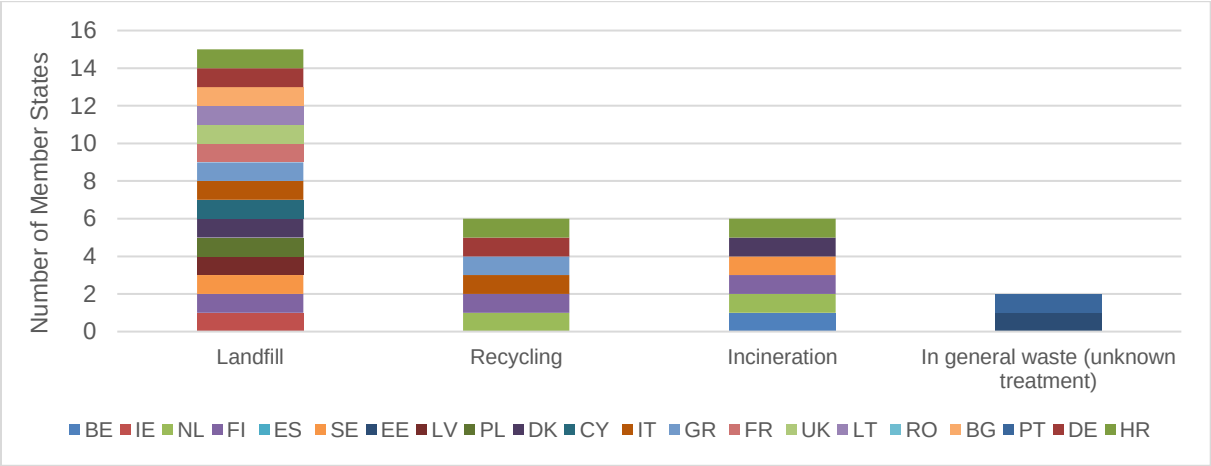
In addition, the Netherlands and the UK reported regular data collection from recycling companies that include data on waste or EoL fishing gear. Some data may also exist at local or regional level (e.g. in Italy) as a result of pilot studies, although stakeholders reported that quantitative data is often difficult to collect and does not always allow reliable extrapolations.

2.2.3 Feedback on passively fished waste

Waste from ships is currently monitored by port or harbour authorities through MARPOL Annex V. Most MS send the waste from fishing vessels to landfill through the general waste collection system from the ports and passively fished waste is generally managed the same way.

[26] PECHPROPRE - Préfiguration pour la mise en place d'une filière volontaire de gestion des engins de pêche usages, GUEGUEN Mathilde, Coopération Maritime ; Bernard LE MOINE, Elsa VINUESA, CPA ; Karine MAIGNAN. Août 2018.

Figure 4: Destination of passively fished waste



Source: Feedback from MS reporters.

Availability of data is better for passively fished waste than for waste fishing gear. Seven MS reported having data on passively fished waste (BE, FR, IE, IT, PL, UK, LT), at national level for five of them (BE, IT, FR, UK, LT). Lithuania relies on waste delivery receipts (under the PRF Directive) provided by port administrations. In the Netherlands, in Ireland and in the UK (South West), data comes from Fishing For Litter Initiatives, which include surveys or reporting from collection contractors in ports or recyclers. In Bulgaria, Italy and Poland, data have been collected through pilot studies and ad-hoc surveys.

Regardless of the nature of the data collection (regular mandatory reporting scheme or voluntary project), the port authorities and companies in charge of the waste collection are the main data providers. The data however is generally either not publicly available or only through ad-hoc reporting.

2.2.4 Feedback on the implementation of EPR schemes

In terms of good practice from other EPR schemes relating to monitoring, several MS suggesting a national scheme with one agency (specifically a not for profit organisation) is preferable with responsibility for:

- Organising the scheme
- Managing a national register of producers
- Developing a confidential reporting structure with each type of company having a unique code.
- Promoting the EPR scheme to producers and users

Targets should be set and regular reporting is considered to be important to enable full data on gear placed on the market to be collected and analysed. Any costs to the end user (fishermen) should be minimal or non-existent to ensure cooperation.

3.0 Fishing and aquaculture gear taxonomy

3.1 Overview of the different gear placed on the EU market

This section reviews the different types of gear used by fishing and aquaculture operators in the Member States. For each type of gear, the main characteristics are detailed in technical fiches elaborated on the basis of a common template presented in the inception report. Gear fiches presented in **Annex 5** contain the technical details of each gear, with identification of the plastic content in the gear itself and in the ancillary equipment used to operate the gear.

3.1.1 Fishing gear

At an international level, the FAO International Standard Statistical Classification of Fishing Gear (ISSCFG rev. 1, 2013) provides a classification of all types of fishing gear for statistical purpose. The ISSCFG is the gear nomenclature adopted by the EU for submission of information on gear used by the different fishing vessels listed in the EU Fishing Fleet Register. ISSCFG is also the reference for gear declarations through the EU Electronic Reporting System.

The full ISSCFG lists 60 different fishing gear likely to be found worldwide. However, an analysis of the gear declared as main gear or as secondary gear in the EU Fishing Fleet Register shows that only 24 different gear types are declared as being used by EU fishing vessels. These 24 different fishing gear types have been considered as being the gear population on which the taxonomy should be based with one addition to include Fish Aggregating Devices (FADs) not currently included in the ISSCFG but relatively widely used by some EU fishing vessels in their drifting or moored forms.

The relative importance of the use of the different fishing gear has also been estimated to provide a preliminary overview of the gear the most used by EU fishing vessels, and hence, an overview of the fishing gear that are likely to be the most concerned by the SUP and PRF Directives. The relative importance of fishing gear has been approached through an analysis seeking to establish the gear the most declared in the EU Fishing Fleet Register in terms of number of vessels. In terms of weight, the perspective may be different with trawl gear generally significantly heavier than gill nets for example.

The results of the overview of the different fishing gear placed on the EU market, and of their likely importance based on the number of vessels having declared to use them is shown in the next table by decreasing order of importance. According to the table, four fishing gear types (set gillnets, trammels nets, set longlines and pots) are reported to be used by 75% of the number of EU vessels. These four most common gears plus single bottom trawls, purse seines, handlines and towed dredges are reported to be used by 93% of the number of EU fishing vessels. These eight fishing gears plus beam trawls, combined gillnets-trammel nets, drifting longlines, drift gillnets, beach seines, midwater trawls and trolling lines are reported to be used by 99% of the total number of EU fishing vessels.

Table 3: List of fishing gear reported to be used by EU fishing vessels in the EU fishing fleet register

Fishing gear name	Number of vessels	% total	Cumulative
Set gillnets (anchored)	30 255	37%	
Trammel nets	11 451	14%	50%
Set longlines	11 196	14%	64%

Pots	8 806	11%	75%
Single boat bottom otter trawls	7 164	9%	83%
Purse seines	3 421	4%	87%
Handlines and hand-operated pole-and-lines	2 597	3%	90%
Towed dredges	2 117	3%	93%
Beam trawls	805	1%	94%
Combined gillnets-trammel nets	785	1%	95%
Drifting longlines	732	1%	96%
Drift gillnets	652	1%	97%
Beach seines	588	1%	97%
Single boat midwater otter trawls	552	1%	98%
Trolling lines	437	1%	99%
No gear reported	185	0%	99%
Twin bottom otter trawls	184	0%	99%
Hand dredges	144	0%	99%
Hand dredges	113	0%	99%
Encircling gillnets	97	0%	99%
Harpoons	91	0%	100%
Danish (anchor) seine	89	0%	100%
Midwater pair trawls	84	0%	100%
Bottom pair trawls	81	0%	100%
Boat-operated lift nets	53	0%	100%
Scottish seine	33	0%	100%
Surrounding nets without purse lines	25	0%	100%
?	164	0%	100%
Total	82 779		

Table 4: List of fishing gear taxon used in the EU and their relative importance*

Gear category	Standard Abbreviation	Name	Link to fiche in Annex 5
Surrounding nets	PS	Purse seines	PS fiche
	LA	Surrounding nets without purse lines	LA fiche
Seine nets	SB	Beach seines	SB fiche
	SSC	Scottish seine	SSC fiche
	SDN	Danish (anchor) seine	SDN fiche
Trawls	TBB	Beam trawls	TBB fiche
	OTB	Single boat bottom otter trawls	OTB fiche
	OTT	Twin bottom otter trawls	OTT fiche
	PTB	Bottom pair trawls	PTB fiche
	OTM	Single boat midwater otter trawls	OTM fiche
	PTM	Midwater pair trawls	PTM fiche
Dredges	DRB	Towed dredges	DRB fiche
	DRH	Hand dredges	DRH fiche
Lift nets	LNB	Boat-operated lift nets	LNB fiche
Gillnets and entangling nets	GNS	Set gillnets (anchored)	GNS fiche
	GND	Drift gillnets	GND fiche
	GNC	Encircling gillnets	GNC fiche
	GTR	Trammel nets	GTR fiche
	GTN	Combined gillnets-trammel nets	GTN fiche
Traps	FPO	Pots	FPO fiche
	FWR	Barriers, fences, weirs, etc.	FWR fiche
Hook and lines	LHP	Handlines and hand-operated pole-and-lines	LHP fiche
	LHM	Mechanized lines and pole-and-lines	LHM fiche
	LLS	Set longlines	LLS fiche
	LLD	Drifting longlines	LLD fiche
	LTL	Trolling lines	LTL fiche
FAD	FAD*	Fish Aggregating Devices	FAD fiche

*relative importance based on number of vessels in the EU fleet using the gear (see table 3).

3.1.2 Aquaculture gear

The EU aquaculture sector generates some 85,000 jobs and 1.25 million tons of healthy sustainable food every year. It is estimated that there are circa 12,500 aquaculture enterprises in the EU-28. The EU aquaculture sector essentially consists of three major subsectors, with different history and characteristics: (i) marine finfish; (ii) marine shellfish; and (iii) freshwater finfish farming. Crustaceans and seaweed are also farmed in the EU, but these activities have been developed on a smaller scale. The value of European aquaculture production reached EUR 4.4 billion in 2016 . Over 74% of this value is attributable to finfish, whereas molluscs accounted for 23.7% of the overall EU aquaculture production value in 2016[27].

Unlike fishing gear, there is no internationally agreed classification of aquaculture gear. Compared to aquaculture in the tropics, the temperate aquaculture carried out in the EU takes place in relatively few culture system types. An analysis of aquaculture production data reported through the DCF (see table below) suggests that the majority of EU aquaculture is produced in seven main systems.

Table 5: EU aquaculture production (tonnes) by gear type (2012 - 2016)

Gear type	2012	2013	2014	2015	2016	Average
Cages / pens	416,476	449,775	467,195	560,443	593,585	497,495
On & off bottom culture	418,937	393,911	340,675	351,634	357,478	372,527
Rafts	237,851	229,099	190,041	247,384	253,311	231,537
Tanks and raceways	231,432	183,148	131,329	147,791	154,387	169,618
Long line	108,842	131,467	94,602	135,285	150,809	124,201
Ponds	67,812	84,346	78,519	101,777	9,753	68,442
Hatcheries & nurseries	27,200	10,681	7,836	8,762	16,808	14,258
Other	66,498	57,680	51,978	80,770	27,072	56,800
Grand Total	**1,575,048**	**1,540,108**	**1,362,175**	**1,633,847**	**1,563,204**	**1,534,876**

Source: DCF

In terms of scope, this study covers aquaculture hatchery, nursery and on-growing infrastructure only, with on-farm equipment (e.g. feeding, grading and harvesting systems, as well as consumables such as hand nets, feed bags[28], etc) being excluded. The study will cover both land-based as well as inter-tidal and sub-tidal systems in all EU marine waters.

Cages (also called pens) produce around a third (32%) of EU aquaculture production, mainly in marine waters. Now mainly made of plastic (mainly HDPE, see gear fiches for details), these facilities are by far the biggest user of plastic in the aquaculture sector.

The bottom culture of shellfish is the second biggest form of aquaculture (24%) and can be subdivided into two main forms, **off bottom culture** where the shellfish is elevated away from the bottom substrate by either plastic bags on steel trestle or on wooden

[27] Scientific, Technical and Economic Committee for Fisheries (STECF) - Economic Report of the EU Aquaculture sector (STECF-18-19).

[28] Feed bags are often cited as an important component of aquaculture waste. In the past this was undoubtedly true, but most farms now use bulk feed delivery, storage and on-farm dispersal.

'**bouchot' pole** or is directly laid on the bottom substrate and is essentially grown without any *in situ* infrastructure and is harvested using traditional fishing gear (e.g. dredges).

Shellfish are also reared on **suspended ropes** hanging below rafts and floating longlines. Rafts and floating longline are two important shellfish production types, both depending upon suspending plastic-based ropes that collect and grow-on bivalves in coastal waters. Like cages / pens, they also rely on an extensive network of mooring ropes and buoys that use high levels of plastics.

Most land-based fish farms use **tanks and raceways** at some point in their production cycle, especially during the hatchery / nursery stages, but also for grow-out. Most tanks are plastic or fibreglass, as is the extensive supporting supply / effluent pipe network. Tanks and raceways are developed in a land based controlled environment with chances of losing anything in the marine environment being very low. **On this basis, aquaculture gear solely used in tanks and raceways systems is not included in the scope of the SUP Directive.**

A more traditional approach to land-based farming takes place in **earthen ponds**. These have relatively little plastic components, although farms in sandier soils may have plastic or synthetic rubber liners to reduced seepage, as well as using predator nets to protect against piscivorous birds and animals. There are few examples of artificial earthen ponds used to rear marine species. However, marine plastic pollution from ponds has been reported by Finland. **Based on this feedback, we keep aquaculture earthen ponds in gear group falling under the scope of the SUP Directive.**

Based on these different types of aquaculture activities, **six different aquaculture gear taxa** have been identified and further described in technical gear fiches as follows.

Table 6: Aquaculture gear taxa utilised in the EU within the gear definition of SUP Directive

Name	Link to fiche in Annex 5
Cages / pens	Cage fiche
Plastic bags (Shellfish off bottom culture)	Off bottom fiche
Bouchot pole (Shellfish off bottom culture)	Bouchot fiche
Suspended ropes (shellfish longlines)	Suspended ropes fiches
Pond culture	Pond fiche

Table 7: Aquaculture gear taxa utilised in the EU but not within the gear definition of SUP Directive

Name	Link to fiche in Annex 5
Tank culture	Tank fiche

3.2 Proposed classification of gear

The main constraints applying to a proposed classification of gear are as follows:

- It must be simple and readily accessible to the different entities that will have to report gear quantities under the SUP and PRF Directives, some of them being gear specialists (e.g. gear suppliers) and some of them not being necessarily gear specialists (e.g. waste collectors, producer responsibility organisations, port authorities, Member State authorities).

- The proposed classification should include all separate components, substances or materials that were part of or attached to such fishing gear as suggested by the definition of waste in point 1 of Article 3 of Directive 2008/98/EC.

- Reporting on gear collected as waste must be at least comparable to the reporting on gear placed on the market because it forms part of the mass balance approach. In this way it will be possible to define collection targets and monitor their achievement.

On the above basis, two classifications were elaborated during the early stages of the project. The main difference between the two proposed classifications was that in one version, buoys, floats and ropes were included in a level-2 category under a level-1 category for other plastic gear, while in the second version, buoys, floats and ropes were considered as a full level-1 category. The rationale for proposing a distinct level-1 category for buoys, floats and ropes was that these items are used in most maritime sectors, creating potential statistical issues to reconcile quantities of waste fishing gear through a mass balance approach when comparing quantities placed on the market and quantities of waste collected. The two versions have been submitted to stakeholders during the webinar held 12th and 13th May 2020 (see section 1.4.2) and a clear majority of them selected the version of the classification including a distinct level-1 category for buoys, floats and ropes. Additional comments received on the classification further established a need to define the term twine for the sake of clarity, and to provide a level-2 category to include a distinct category for monofilament lines.

The proposed final classification taking into account stakeholders' feedback is detailed in the table and figure below. The classification presented provides a single classification for fishing and aquaculture gear. It has been verified that all core or ancillary elements of fishing and aquaculture gear included in the various gear fiches prepared fit in the proposed classification.

Note that for the purpose of this classification, the term 'twine' covers all twines, strings, lightweight ropes etc. whether they consist of one filament (monofilament) or multiple filaments that are twisted or braided together to form a single multi stranded twine[29].

[29] For operators of the fishing gear sector consulted in the frame of this study, 'twine' is a general term that covers multi and monofilament. In certain non-specialised dictionaries, twine is defined as 'consisting of two or more strands'. The definition of twine we propose reflects how the term is understood in the fishing sector, i.e. including monofilament.

Figure 5 Organogram of fishing and aquaculture gear categorisation

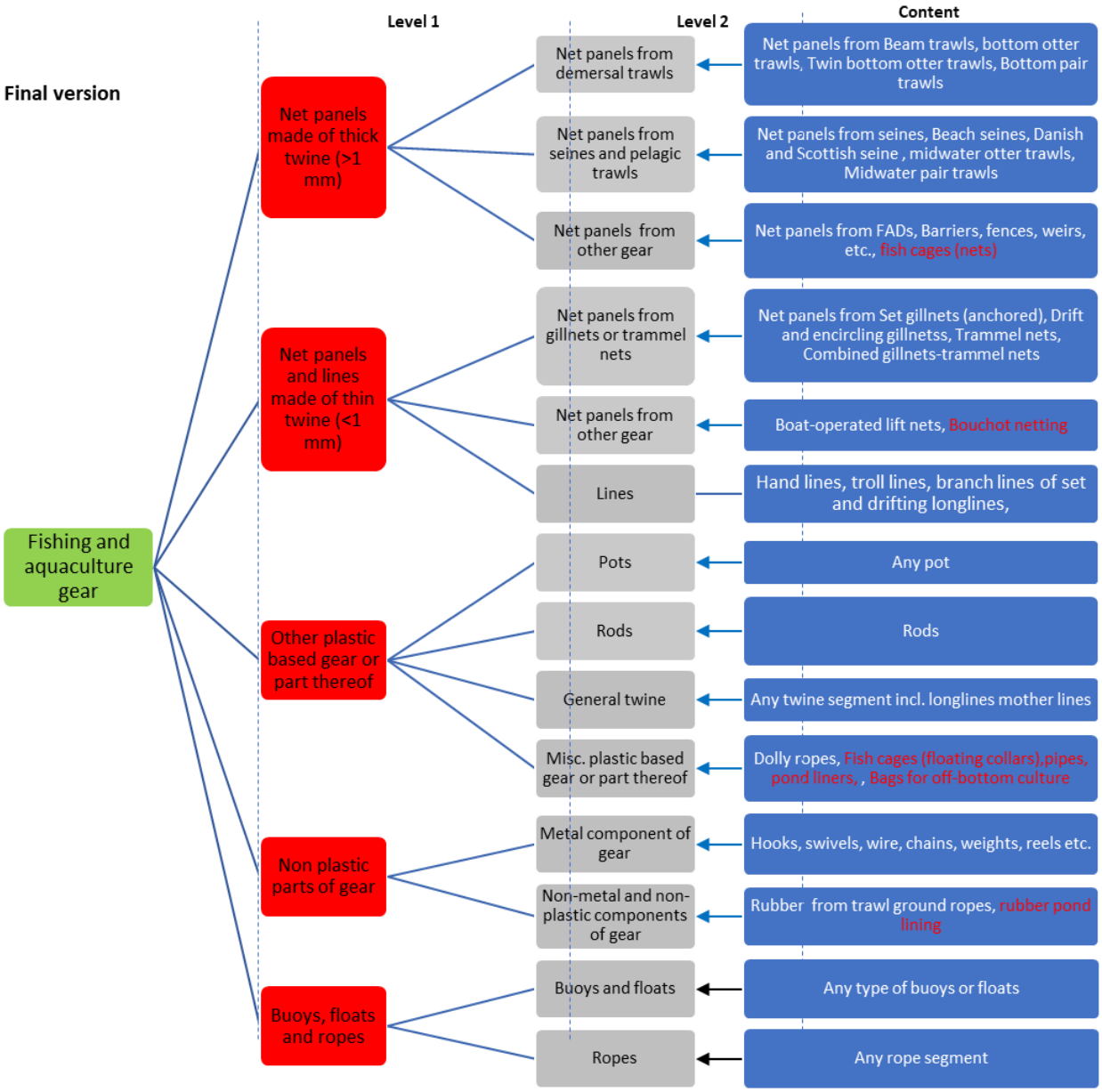


Table 8: Final version of the proposed classification of fishing and aquaculture gear

Level 1	**Level 2**	**What would fit in level 2 category**
1 Net panels made of thick twine (>1 mm)	1.1 Net panels from demersal trawls	*Net panels from beam trawls, single bottom otter trawls, twin bottom otter trawls, bottom pair trawls*
	1.2 Net panels from seines and pelagic trawls	*Net panels from purse seines, beach seines, Scottish and Danish seines, midwater otter trawls, midwater pair trawls*
	1.3 Net panels from other gear	*Net panels from FADs, lift nets, barriers, fences, weirs, etc.*, ***fish cages (nets)***
2 Net panels and lines made of thin twine (<1 mm)	2.1 Net panels from gillnets or trammel nets	*Net panels from set gillnets (anchored), drift and encircling gillnets, trammel nets, combined gillnets-trammel nets*
	2.2 Net panels from other gear	***Bouchot netting, predator protection (aquaculture)***
	2.3 Lines	*Hand lines, troll lines, branch lines of set and drifting longlines*
3 Other plastic based gear or part thereof	3.1 Pots	*Any pot*
	3.2 Rods	*Any rod*
	3.3. General twine	*Any twine segment incl. longlines mother lines*
	3.4 Misc. plastic-based gear or part of gear	*Dolly ropes,* ***Fish cages (floating collars)***, ***pipes***, ***pond liners, bags for off-bottom culture***
4 Non plastic parts of gear	4.1 Metal component of gear	*Hooks, swivels, wire, chains, weights, reels, etc.*
	4.2 Non-metal and non-plastic components of gear	*Rubber from trawl ground ropes,* ***rubber pond lining***
5 Buoys, floats and ropes	Buoys and floats	*Any type of buoys or floats*
	Ropes	*Any rope segment*

Note: bold for aquaculture gear

Comments and explanations

Level 1 category 1 (Net panels made of thick twine (>1 mm)) includes heavy nets panels generally used for towed fishing gear (e.g. bottom trawls, midwater trawls, beam trawls, purse seine) or in aquaculture (i.e. netting part of fish cages). We propose to divide this level 1 category into three level 2 categories:

- Level 2 category 1.1 Net panels from demersal trawls which generally include nets panels made of PE.
- Level 2 category 1.2 Net panels from seines and pelagic trawls which generally include nets panels made of PA, but not always with for example Danish seines and Scottish seines possibly made of PE net panels.
- Level 2 category 1.3 Net panels from other gear which would include any other type of thick mesh panels including aggregators from FADs, barriers used to trap fish (bluefin *madrague* for example) or net panels used to design fish cages. Plastic used in this level 2 category will include both PE and PA twine.

Level 1 category 2 (Net panels and lines made of thin twine (<1 mm) includes light net panels generally used for static gears (e.g. gillnets and trammel nets) or in aquaculture (i.e. the various pieces of netting used for Bouchot mussel culture). We propose to divide this level 1 category into two level two categories:

- Level 2 category 2.1 Net panels from gillnets or trammel nets to include nets panels from any of these two gears. Gillnets and trammel nets are generally made of PA. Whilst most gillnets are made of monofilament twine, trammel nets are made either with monofilament or multifilament. An option (not figured in the proposed classifications) could be to separate gillnets and trammel nets in two distinct level 2 categories. However, the distinction does not appear to add particular value.
- Level 2 category 2.2 Net panels from other gear to provide an entry in the classification to any other form of thin netting, like for example netting used to grow mussels on *bouchots*, or anti-predator nets used in aquaculture. Both PA and PE plastics are used.
- Level 2 category 2.3 Lines to include the different types of lines used for handlines, troll lines or to make the branch lines of set and drifting longlines. Most lines falling in this category are made of monofilament PA. However, other alternatives to standard monofilament PA lines have been introduced recently with lines made of copolymers or fluorocarbon, or a combination of the two materials.

According to consultations, the differentiation between heavy and light mesh panels is reasonably straightforward. Also, heavy netting is generally green or black and light netting white or red (with some exceptions). The 1 mm limit is proposed as an indicative benchmark based on feedback from gear specialists.

Level 1 category 3 (Other plastic based gear or part thereof) contains any plastic that is not a mesh panel. Unlike categories 1 and 2, it is a relatively broad category in which any plastic gear would fall including pots, fishing rods and general twine (including thick monofilament such as lines used to make up the mother lines of set and drifting longlines, as well as most plastic used in aquaculture (e.g. floating collars of fish cages and plastic bags used to grow shellfish). Four Level 2 categories are proposed:

- Level 2 category 3.1 Pots to accommodate any type of pots used in the fisheries sector in the classification There are many different types of pots used in the EU depending on target species (crustaceans, gastropods, fish) and different types of plastics are used (PE, PA and PVC mostly). Identification of pots is reasonably straightforward.
- Level 2 category 3.2 Rods to include any type of fishing rods, with contemporary rods usually made from fibreglass or carbon fibre. While most lines (pelagic longlines) are made of monofilament PA, some lines (e.g. trolling, bottom longlines) may include braided PE segments to increase resistance to wear.

- Level 2 category 3.4 General twine to include any twine segment used as core or ancillary element of the gear. PA twine is used for making up mother lines of longlines and various tights (lashing the netting to the ropes or for attaching floats or ground gear to the nets) and PE general twine used for net mending.
- Level 2 category 3.5 Misc. plastic-based gear or part of gear to include any plastic part of gear (e.g. dolly ropes) and aquaculture gears such as floating collars of cages, pipes, pond liners and other plastic from collected from pond aquaculture systems, and the plastic bags used to grow shellfish. Several types of plastic fall in this level 2 category (e.g. PE, PVC, PP, ABS, fiberglass).

Level 1 category 4 (Non plastic parts of gear) would contain all non-plastic parts of gear. We propose 2 Level 2 categories

- Level 2 category 4.1 Metal component of gear would include the metal components (e.g. lead from lead lines of nets, hooks, chains, swivels, reels, weights) used as core or ancillary elements of gear
- Level 2 category 4.2 Non-metal and non-plastic components of gear includes any non-metal and non-plastic element like rubber bobbins used for ground ropes of trawls or rubber liners of aquaculture ponds
- Level 2 category 3.3 Buoys and floats would include any type of buoys and floats used as core elements of gears (e.g. purse seine and gillnet floats, trawl headropes) or as ancillary elements of gear (e.g. buoys used as markers). Buoys and floats are made of a variety of plastics including EVA, PVC or PE.

Level 1 category 5 (buoys, floats and ropes) contain any buoy, float and rope used to retrieve or assemble gear. We propose 2 Level 2 categories:

- Level 2 category 5.1 buoys and floats to include any type of buoys and floats that include different types of plastic like EVA, PS, ABS or PVC.
- Level 2 category 5.2 Ropes to include any rope segment. Ropes are made a wide range of plastics including PA, PE, combination of HDPE and wire to HMPE.

3.3 Potential for recyclability

To better understand recyclability and reuse of fishing gear at the end-of-life, to identify existing challenges (legal, practical), solutions, best practices and technologies to design, reuse and/or recycle end-of-life fishing gear and to prepare a request to the European Standardisation Organisation, the Commission in cooperation with EASME has launched a study on Circular Design of Fishing Gear led by external contractors (MRAG *et al.*). The study is still ongoing at the time of writing of this report.

Experts from our team could attend an international multi-stakeholder workshop organised by MRAG in collaboration with CEFAS and OSPAR on 19 and 20 February 2020 in Brussels[30]. The main objective of the workshop was to identify recommendations for effective, useful and harmonised standards for the circular design of fishing gear in order to prepare a request to the European Standardization Organization and to feed into the work of OSPAR on the design and recycling of fishing gear.

Based on our understanding of the discussion held during the workshop, any plastic has the potential to be recycled. However, gear recyclability is affected by the following factors:

[30] See https://webgate.ec.europa.eu/maritimeforum/en/node/4486

- The mix of different plastics and other materials in the gear and its components: a gear may be made up of up to 700 mixtures of plastics and other materials;
- The ease of disassembly of the gear to separate the different plastic and non-plastic components into homogeneous lots before recycling;
- The need for cleaning (waste gear can be contaminated by organic and mineral material that need to be removed before recycling).

A fourth key factor in relation to waste collection systems has been raised by workshop participants who suggested that gear may be particularly difficult to recycle because of the logistics involved for a relatively small waste stream. However, this fourth key factor is specific to the contexts, large fishing ports being in a more favourable position than small fishing ports.

Based on the three main factors listed above (i.e. mix of plastic, ease of disassembly and need for cleaning), not including the factor linked to collection systems which is context-specific, an empirical multicriteria analysis has been carried out to try to classify the different fishing and aquaculture gear identified into three categories based on their potential for recyclability. The methodology for assessing recyclability is shown in **Annex 6**.

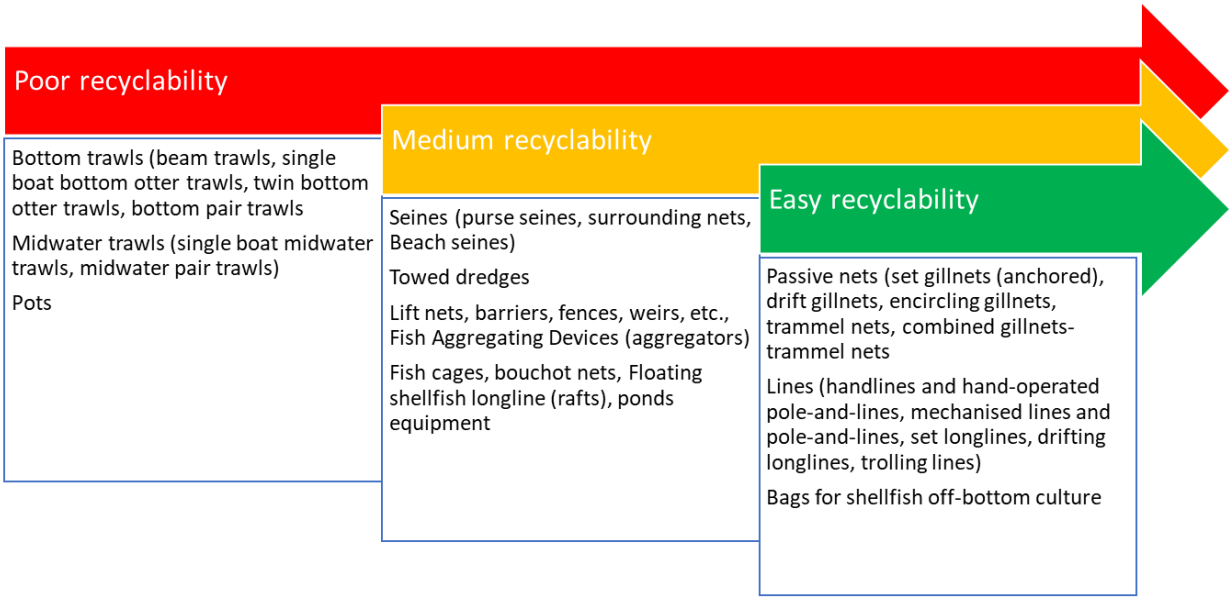
In summary, empirical assessment of potential for recyclability suggests that:

- All forms of bottom trawls are potentially difficult to recycle because they are often made of different plastics, are difficult to disassemble, and are often contaminated by mineral elements (sand and silt) that are trapped in their meshes. Pots are also potentially difficult to recycle for the same reasons with contamination underpinned by long soaking time.
- By contrast, passive nets (gillnets, trammel nets) and lines used with hooks (longlines, hand lines) are relatively easy to recycle due to low mix of different plastics in the gear, ease of disassembly and reduced need for cleaning.
- In between, seines and most shellfish aquaculture gear have a medium recyclability potential mostly as a result of difficult disassembly and need for cleaning in particular for aquaculture gear which stay a relatively long time in the water.

This assessment of potential for recyclability applies only to end of life gear. According to workshop participants, passively fished waste gear is generally not a candidate for recycling mainly as a result of relatively low cost, high level of contamination by organic and mineral elements, as well as heavy metals, depending on how long the lost gear stayed in the water.

Potential for recyclability of buoys, floats and ropes has not been assessed. According to workshop participants, many ropes are particularly difficult to recycle because of the mix of different plastic polymers, utilisation of metal (e.g. copper) and of chemical coating to increase resistance to wear and tear.

Figure 6: Grouping of fishing and aquaculture gear according to their potential for recyclability



Our assessment of the potential for gear recyclability is largely based on empirical considerations and the results should not be used to draw firm conclusions. The forthcoming report from the MARE / EASME study on the Circular Design of Fishing Gear is expected to provide more detailed information.

4. Methodology for calculating waste

4.1 Objective

This section of the report develops a methodology for calculating and verifying fishing gear placed on the market and waste fishing gear as defined in Section **Error! Reference source not found.**.

There are a number of aspects and assumptions to note in calculating waste fishing gear:

- Total gear in use is 'Placed on the Market' over several years.
- 'Placed on the Market' (PoM) is an annual input of gear.
- **Recovery rate (%) = Waste fishing gear collected / PoM per annum**[31]
- The collection of waste gear is based on total gear in use, but as different gear wears out at different rates, the amount entering a market and leaving the market as waste in any given year should be similar, unless activity levels vary significantly year to year.
- End of life gear that is kept in storage may be more likely to enter the waste collection system in the first years of any collection scheme as awareness of the scheme is raised, but the impact of stored gear entering the waste collection system should lessen over time.
- 'Passively fished waste' will contain gear from the MS, gear from other MS and non-fishing related waste. These different waste streams are difficult to distinguish so it is proposed this does not contribute to the calculation of recovery rate.

Currently the waste fishing gear and passively fished waste are often collected and mixed in port reception facilities. The PRF/ Directive requires these to be reported separately. The waste fishing gear component of passively fished waste is likely to be less suitable for recycling than EoL gear as it may be tangled, fouled and waterlogged.

Legislative requirements

The PRF Directive Article 8 (7) states that "Member States shall ensure that monitoring data on the volume and quantity of passively fished waste are collected, and shall report such monitoring data to the Commission. The Commission shall, on the basis of those monitoring data, publish a report by 31 December 2022 and every two years thereafter."

The SUP Directive requires Member States to monitor and report data on waste fishing gear collected in the Member State each year. Specifically, Article 13 (1) states that "Member States shall, for each calendar year, report to the Commission… data on fishing gear containing plastic placed on the market and on waste fishing gear collected in the Member State each year." This is related to the establishment of binding collection targets.

The SUP Directive states in paragraph (23) that "Member States should… introduce extended producer responsibility for fishing gear and components of fishing gear containing plastic to ensure separate collection of waste fishing gear".

Based on these legislative requirements it is noted that:

- Passively fished waste and waste fishing gear should be recorded separately; and
- The purpose of the data is to report and so monitor collection rates (rather than treatment rates).

[31] As per Section 1.2.1, gear that is specific to only freshwater use is considered outside the scope of the SUP Directive. If POM includes a significant proportion of dedicated freshwater gear (e.g. associated with raceways), then the MS may choose to adjust the recovery rate calculation to accommodate this proportion within the POM data.

4.2 How existing reporting schemes calculate waste

A range of mandatory and voluntary collection and reporting schemes were detailed by MS reporters; the extent to which these schemes calculate waste, and the methodology used, are summarized in this section.

4.2.1 Waste fishing gear

Harbour Authorities

In Denmark, waste fishing gear is currently managed by individual fishing ports and is grouped together with other passively fished waste. At a waste management area within the port, workers manually sort and separate the waste into the different components including metal, plastic etc. However, there is no information on the proportion of different components.

Clean' End of Life (EoL) fishing nets (e.g. trawl or gill nets) will often be collected free of charge by a recycling company (e.g. Plastix in Denmark).

In Spain, private waste management companies are contracted by the Port Authority to collect all waste and report monthly on the quantity (tonnes), which is published in an environmental declaration report. Where recycling is not possible/likely, the waste is amalgamated into general waste, and separated into material component (e.g. plastic waste) for transport to landfill or incinerator.

Voluntary collection schemes

In Cyprus, a voluntary scheme, named Euroturtles, operates from 3 Cypriot ports involving the collection of lost/discarded gear from the seabed by a team of divers, as well as provision of collection bins for waste fishing gear. This retrieved ALDFG and waste fishing gear is transported to an energy facility where it is weighed in bulk (kg) before being incinerated.

Recycle schemes

A French scheme, Fil & Fab, collects EoL polyamide nets (mostly gillnets) for recycling. Collectors weigh containers of nets collected and the recycling company registers both the weight received and weight actually recycled (after removal of any ropes, headlines, etc). This is a private scheme that does not formally report waste or recycling statistics.

4.2.2 Waste aquaculture gear

The definition of fishing gear in the directive includes aquaculture gear, which is usually subject to separate waste collection systems to fishing.

A few examples on aquaculture waste collection methods were provided through MS consultation, but no specific schemes were documented.

One large company (MOWI) described company-wide systems to manage their main waste gear sources. For example, 384 used nets were recycled in Europe across a 2-year period; in 2018, this equated to a total of 302,987 kg of fish farming nets which were upcycled by Aquafil into new products.

In Scotland, it is typical that the aquaculture company has a contract with the net producer who collects and stores aquaculture gear, recycling where possible. Similarly, in Greece, the aquaculture farm signs a contract with a registered service provider for collection, transport and processing of the waste.

In Denmark, it was noted that aquaculture nets often have anti-fouling coverage which make them non-recyclable and therefore destined for landfill.

In Ireland, the state's marine development board, BIM, runs a gear recycling initiative with a mobile shredder deployed to specific locations to break down various materials at the quayside into manageable volumes and this has included mussel farming barrels/floats.

A Finnish study on plastic waste from fishing and fish farming (Seppänen & Lappalainen, 2019) found that 'overall, the direct plastic loading of fish farming into the sea is estimated to be in the order of 22 to 38 tonnes per year, mostly from the construction of fish ponds and from net bags, but it did not detail the collection methods.

The MSC White Paper on marine litter and aquaculture gear waste (Huntington, 2019), highlights that gear and debris from aquaculture farms can enter the marine environment and contribute to ALDFG, which can subsequently be passively fished and collected at ports. A detailed calculation of plastic use and decommissioning rates in Norwegian aquaculture estimated through consultation between manufacturers and waste management companies, that 13,300 tonnes of aquaculture plastic waste was generated in 2011 (Sundt et al, 2014).

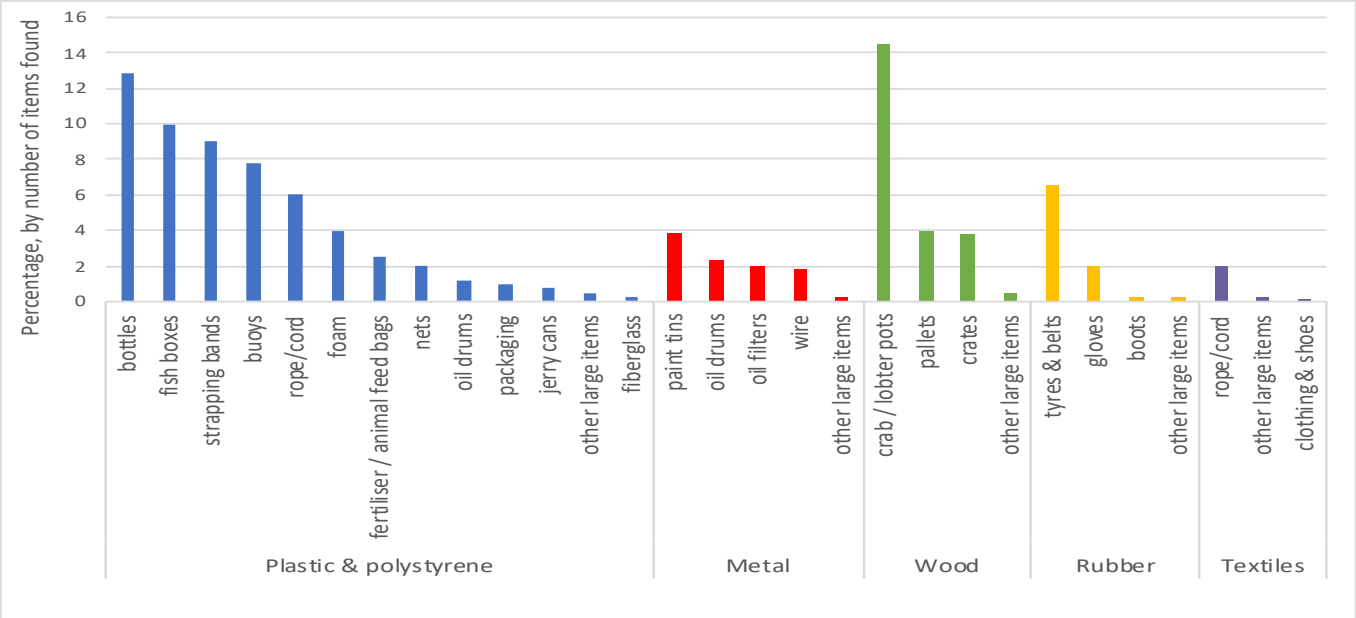
4.2.3 Passively fished waste

Voluntary collection schemes

Fishing for Litter (FFL) schemes operate across a number of member states including Ireland, UK, Netherlands, Germany, Spain and Belgium. FFL bags are provided to store waste that has been passively caught while fishing, including ALDFG from both fishing and aquaculture. These bags are deposited at the quayside of participating harbours, and moved by harbour staff to a dedicated skip for disposal.

For all countries involved in FFL, the total weight of waste collected via FFL is reported in total kg or tonnes by each port involved in the scheme, generally based on information provided by waste collector contractors. The material types and components found within FFL waste have been determined via *ad hoc* surveys and research undertaken on samples of the waste. While general materials and components within the FFL waste are consistent across the different schemes, the waste categorization is not consistent across the schemes. For example, Ireland's FFL separated the type / components of waste into the following categories: fishing gear, plastic, metal, wood, rubber, textiles, cardboard, special/irregular waste and unclassified combustibles. Fishing gear is recorded as a single category, then broken down by type: nets, ropes, lobster pots and rubber hosing. For comparison, the Scottish FFL categorisation is presented in figure 7.

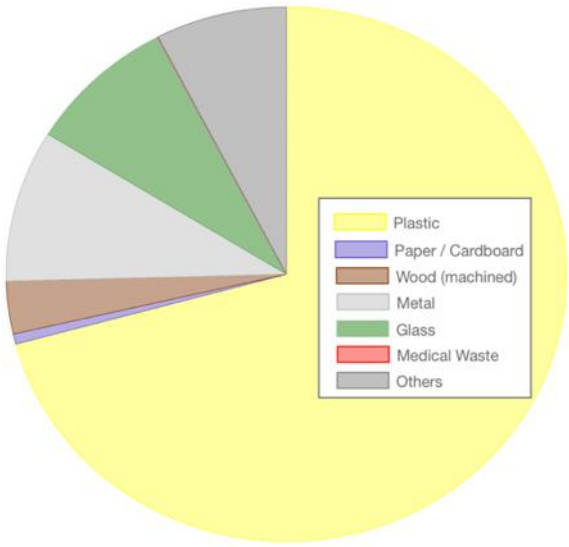
Figure 7. Items found by material type in the Scottish Fishing for Litter Scheme (FFL, 2017).



Mares Circulares is an international scheme collecting passively fished waste across 15 ports in Spain and Portugal. Data collection is via monthly surveys using a form developed by the Technical Group on Marine Litter (TGML) established under the MSFD framework. Reporting is verified through cross-checking reports by waste managers at each port. Passively fished waste is recorded under the following categories: plastic, paper/cardboard, wood, metal, glass, medical waste, sanitary waste and other.

Data is available online through an interactive graphical database, presenting data for each port involved in the scheme (see Figure 8 for an example from Puerto d'Andratx)

Figure 8. Passively fished waste recorded at Puerto d'Andratx (Marnoba, 2020)



Surveys / research

The MEDITS trawl survey programme involves 16 research institutes across 10 member states (including France, Greece, Italy, Spain, Slovenia, Croatia, Malta and Cyprus) that record marine macro litter from bottom trawl surveys. Waste is reported by 9 main categories related to material class (plastic, rubber, metal, glass and ceramic, cloth (textile)/ natural fibres, wood processed (palettes, crates, etc), paper and cardboard, others, unspecified) and 27 sub-categories related to source and main litter findings. The waste is reported by number of items and used to generate geographic density indices of plastic reported in items per km^2, which enables the identification of specific hot spots.

The ABBACO project in Naples is focused on marine habitat restoration and also involved a marine macro litter survey. Large benthic litter items were examined onboard the survey vessel, with smaller items stored for laboratory analysis. Items were weighed with a digital fishing scale (in grams), measured in length (in cm ranges), and subsequently divided according to material (cotton, glass, metal, nylon, paper, plastic, pottery, concrete, rubber, synthetic fibre, and man-made wood) and source (either land- or sea-based putative origin). Data was evaluated based on the number of items/km^2 and kg/km^2 of trawl survey.

4.3 Options for calculating waste

This section proposes options for calculating waste, including, categorization into material and gear components, units of measurement (weight, volume, surface area), conversion factors and verification procedures.

4.3.1 Categorization of waste

Categorization is important to ensure consistency of data entry and the production of a dataset that is comparable within each member state (e.g. at port level) and across all Member States. Different levels of categorization are possible, depending on the waste stream (waste gear or passively fished waste), the level of detail recorded at port, by voluntary schemes or by waste management facilities.

The categorization proposed links with the taxonomy of gear presented in the previous section, as well as reporting formats developed. The categorization of waste is presented in the tables below. It is important that the level of categorization does not create a disincentive to responsibly dispose of the waste or accurately record waste data, nor should it create additional administrative burden. Yet, it should be designed to capture the most detailed data possible for those schemes recording comprehensive information. The categorisation is therefore in two levels, which reflects the mandatory and voluntary reporting requirements being developed.

Table 9 Categorisation of waste fishing gear by material type

Material type			
Level 1	Plastic	Metal	Rubber
Level 2	• Polypropylene • Polyethylene • Polystyrene • HMPE • Nylon • Other	• Steel • Aluminium • Lead	N/A

Table 10 Categorisation of waste by fishing and aquaculture gear component

Fishing gear component					
Level 1	Net: thick twine >1mm	Net & line: thin twine <1mm	Other plastic parts	Non-plastic parts	Buoys, floats & ropes
Level 2	• Net panels from demersal trawls • Net panels from seines and pelagic trawls • Net panels from other gear	• Net panels from gillnets or trammel nets • Net panels from other gear	• Pots • Rod • General Twine • Other plastic based gear	• Metal component • Non-metal and non-plastic components	• Buoys & floats • Ropes

Table 11 Categorisation of passively fished waste by components

Passively fished waste components						
Level 1	Plastic	Metal	Rubber	Wood	Textiles	Other
Level 2	• Nets • Buoys • Fish boxes • Rope/cord • Bottles • Packaging • Strapping bands • Foam • Jerry cans • Oil drums • Fibreglass • Fertilizer/animal feed bags Other large items	• Oil drums • Wire • Paint tins • Oil filters • Other items	• Gloves • Tyres & belts • Boots • Other items	• Fishing pots • Crates • Pallets • Other items	• Rope • Clothing & shoes • Other items	• Glass • Medical waste • Sanitary waste • Other items

4.3.2 Units of measurement

The potential units of measurement for assessing the quantity of waste are: mass (tonnes) or volume (m^3).[32]

The ability to record waste by mass depends on the infrastructure available at the point of waste management. For example, ports may not have suitable weighing facilities, but waste management might be contracted to private waste operators that can subsequently provide this data after collecting and sorting the waste.

Where mixed-waste skips are collected and delivered directly to landfill, recording the weight of the waste may not be possible. However, the total volume of each skip / container is known, as is the number of containers collected. Sampling can then allow the proportion of components to be estimated and the volumes converted into mass. Recognising the different technologies and infrastructure available at waste reception facilities, the decision trees allow for data in mass (tonnes) and volume (m^3), with the volume subsequently converted to mass.

Waste fishing gear is recorded in tonnes to allow comparison with gear placed on the market and determination of the recovery rate. This aligns with how the quantity of waste is recorded (i.e., in tonnes) when assessing recovery rates of other European EPR schemes, such as tyres, packaging, batteries etc.

Passively fished waste is also generally reported by mass (tonnes), but the PRF Directive Annex 3 reporting is in volume (m^3) which is the norm for other waste streams, including liquid, reported. The PRF Directive requires Member States to report the volume and quantity of passively fished waste to

[32] Some estimates of marine litter such as beach cleans use 'items per m^2 ', which is referenced in the SUP Impact Assessment. This is feasible where items are of relatively standard dimensions (e.g. drinks bottles, cigarette buts, cotton buds, carrier bags), but not for calculating waste fishing gear, which is often in pieces and may consist of several component parts.

the Commission. It is therefore proposed that for PRF Directive reporting of passively fished waste both volume (m3) and weight (tonnes) are reported, using appropriate conversion factor and these would be detailed in the accompanying Quality Report.

4.3.3 Conversion factors

The decision trees utilize conversion factor methodology at three points:

- To convert volume (V) to ☐ mass (m); $m = \rho V$

Where ρ is the density of the material (kgm^{-3}), m is mass or weight (kg) and V is the volume (m^3). This conversion would require sampling of the container to determine/estimate the proportion of each material.

[See table in Annex 7 for average densities per plastic type]

- To convert gear type (netting, buoys etc) to ☐ material components (plastic types)

[see gear fiches (Annex 5) for proportion of plastic type per gear component.]

- To convert waterlogged and/or heavily fouled gear to ☐ weight of clean gear: divide the mass of gear by a factor

[conversion factor to be determined – recording state of gear required, i.e. wet/dry, dirty/clean].

4.3.4 Verification procedure

Verification procedures are recommended at two stages:

- At the data determination stage, to cross-check data entry. This could be via random sampling, or by cross-checking waste handling operators data with port entered data; and

- At the national data compilation stage, to ensure double counting of data has not occurred. This should be in the form of a database check, to sense-check data entries. This could be via random sampling, or via specific calculations undertaken annually to verify double-counting has not occurred e.g. by checking monthly and annual patterns in data to identify any outliers.

4.4 Decision trees for calculating waste

The suggested approach to calculating & verifying POM, waste fishing gear and passively fished waste are presented as decision trees. These account for varying levels of detail being available, and show where conversion factors would be applied to produce comparable datasets across each data stream. Three decision trees have been developed:

- Fishing gear placed on market (POM) (Figure 9);
- Waste fishing gear (Figure 10); and
- Passively fished waste (Figure 11).

Figure 9. Placed on market decision tree

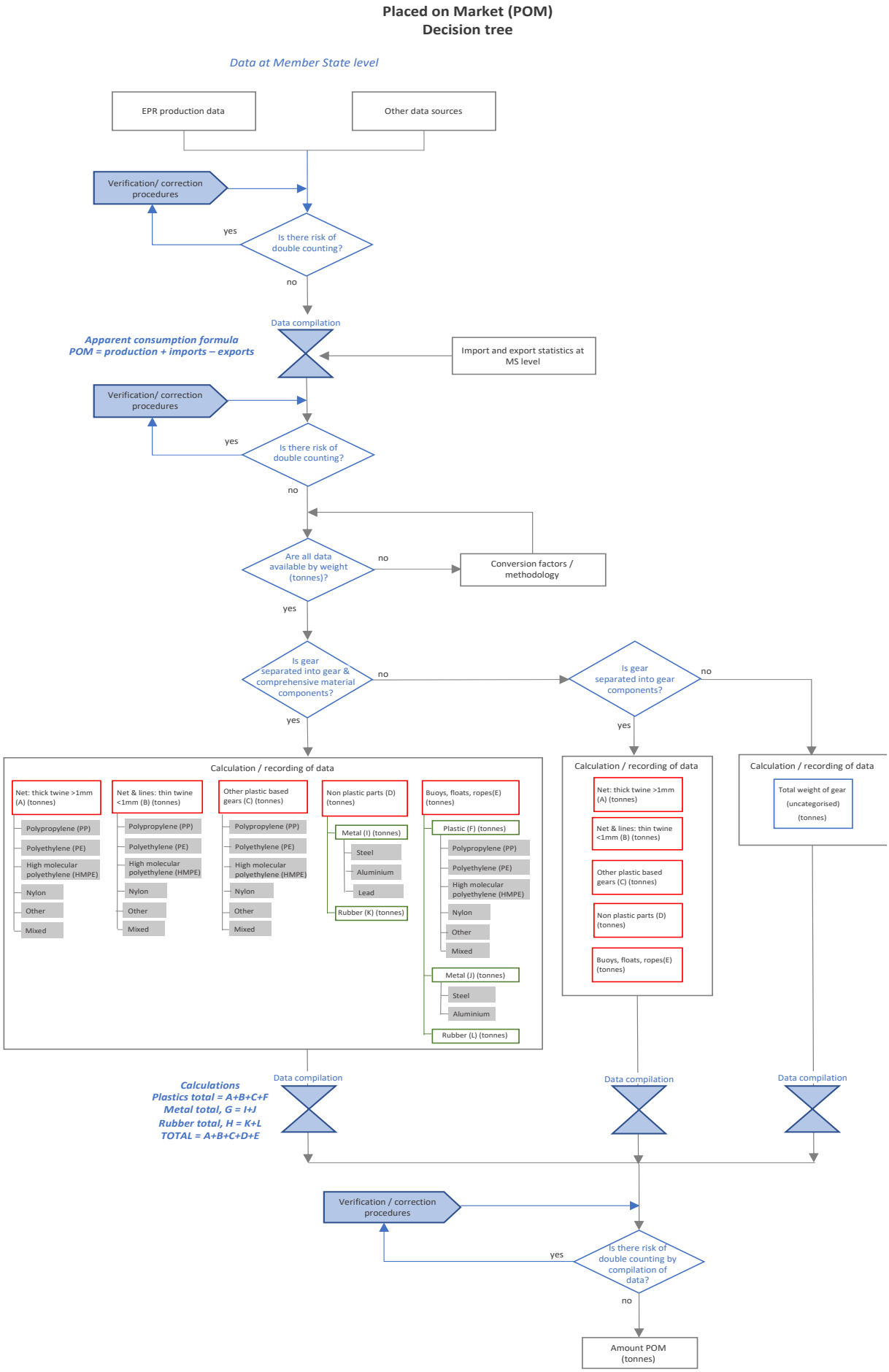


Figure 10. Waste fishing gear decision tree

Waste fishing gear (aquaculture & fishing gear) Decision tree

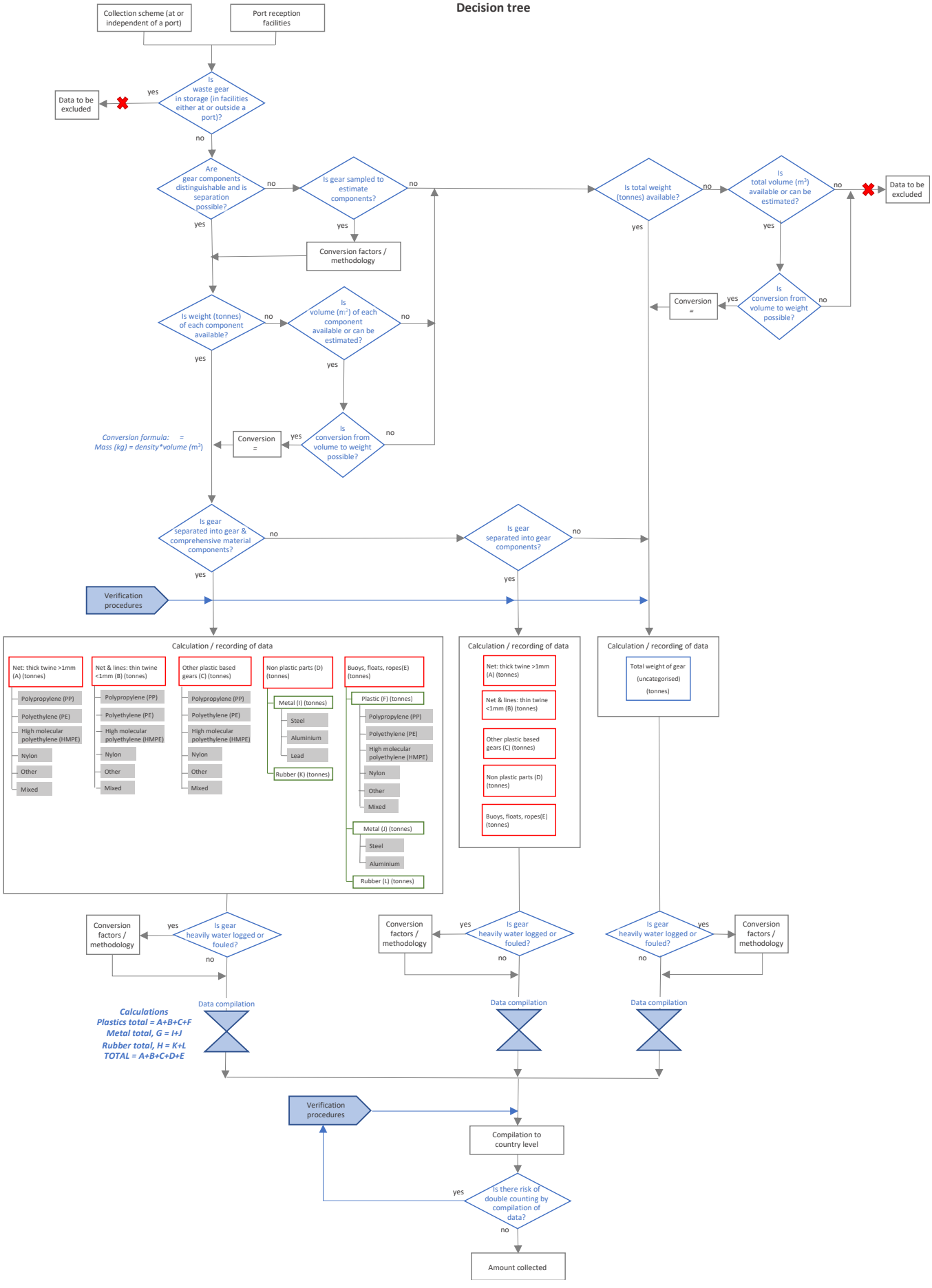
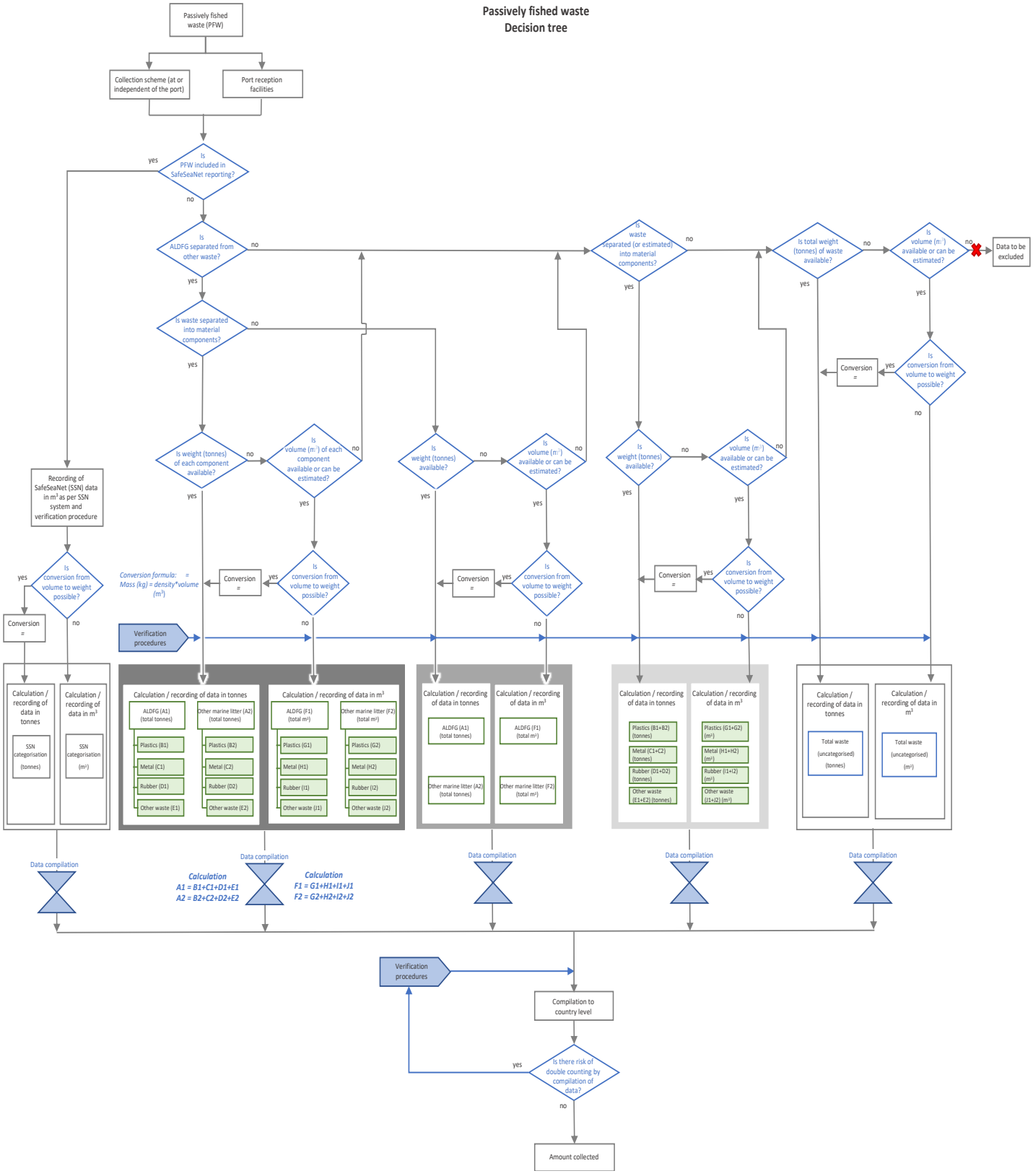


Figure 11. Passively fished waste decision tree



5. SUP Directive Reporting format

5.1 Introduction

Reporting on fishing gear containing plastic placed on the market and on collected waste fishing gear is an obligation under the SUP Directive 2019/904 (Art. 8(8)):

'Member States shall monitor fishing gear containing plastic placed on the market of the Member State as well as waste fishing gear containing plastic collected and shall report to the Commission in accordance with Article 13(1) of this Directive with a view to the establishment of binding quantitative Union collection targets.'

Reporting on fishing gear placed on the market should be comparable to the reporting on waste fishing gear collected to allow the calculation of the recovery rate. In this way it will be possible to set collection targets in the future and monitor their achievement.

The proposed reporting format distinguishes three types of data, with increasing level of detail, as presented in table 12. All data is to be reported in tonnes.

Table 12 Types of data reported under the SUP Directive

Type	Mandatory / voluntary	Description	Cell shade below
1	Mandatory	Total weight of fishing gear containing plastic (placed on the market or waste fishing gear collected)	White
2	Voluntary - aggregate	Weight by gear component: netting of Ø <1mm twine, netting of Ø >1mm twine, other plastic components, non-plastic components, buoys-floats-ropes	Light grey
3	Voluntary - detailed	Weight by type of material (different types of plastics and metals)	Light grey

5.2 Reporting format

The format for reporting is presented in Table 13. The letters in the cells show which cells are related and how the totals are calculated if voluntary data are collected or estimated.

The mandatory reporting requirement is to provide total gear placed on the market in tonnes and total waste fishing gear collected, also in tonnes.

The MS reports will be composed of two tables, identical in structure. One table will be completed for fishing gear placed on the market and another table will be completed for waste fishing gear collected.

Depending on the possibilities of the national data collection system, only type 2 or both type 2 and 3 of the voluntary data can be provided by the MS. It is noted that during the consultation process various respondents (often with NGO background) pleaded for as detailed reporting as possible. The details would provide information about possibilities for recycling and potential for circular design.

Each Member State is responsible for its own data collection and monitoring, but the method should be consistent with the Eurostat Manual on Waste Statistics[33], allowing collation and comparison across European Member States.

Table 13 Proposed reporting fishing gear placed on the market & waste fishing gear collected (tonnes)

	Total fishing gear containing plastic (tonnes)	Net panes made of thick twine (Ø >1mm)	Net panes and lines made of thin twine (Ø<1mm)	Other plastic based gear or parts thereof	Non-plastic parts of gear[34]	Buoys, floats, ropes
Total	A+B+C+D+E	A	B	C	D = I+K	E = F+J+L
Plastics total	A+B+C+F	A	B	C		F
- Polypropylene (PP)						
- Polyethylene (PE)						
- High Molecular Polyethylene (HMPE)						
- Nylon						
- Other						
- Mixed						
Metals total	G = I+J				I	J
- Steel						
- Aluminium						
- Lead						
Rubber total	H = K+L				K	L

Notes:

a. *White cells: The mandatory total should be based on clearly defined data calculation methods.*
b. *Light grey cells: Voluntary data can be estimated e.g. by using conversion factors, to divide the totals into the proposed categories. These conversion factors should be based on empirical studies. The values of the conversion factors, their justification and reference to the source should be provided in the quality report (Section on Metadata).*
c. *Black cells: data not required.*

5.3 Data validation

Validation of the calculation of the weight of the fishing gear placed on the market can be done with an independent estimate of the annual quantity of gear acquired by fishing vessels and aquaculture farms. Such estimates can be developed in an *ad hoc* study on weight of acquired fishing gear per

[33] https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-RA-13-015

[34] This may regard metal weights, rubber rollers, escape devices / grids, etc.

homogenous category of vessels and aquaculture farms and the average life span of each gear type. By relating this information to the total population of gear users (i.e. number of vessels per segment, number & size of farms by production type as reported annually within the Data Collection Framework (EU Regulation 1004/2017)), it is possible to annually estimate the total weight of acquired fishing gear.

The order of magnitude of the two values (gear placed on the market and estimated acquired gear) should be comparable, although it will not be identical for a variety of reasons (e.g. changes in composition of the sector, changes in gear construction leading to change in its life span, direct user imports that may not be fully accounted for, etc.).

The calculation of the weight of fishing gear placed on the market can also be validated b

- Coherence of time series: large fluctuations from one year to next are unlikely, unless clear justification can be provided;
- Visits to a representative sample of the surveyed companies to assess their declaration;
- Accountants' declarations or reports.

Validation of the calculated total weight of waste fishing gear collected can be done with an independent estimate of the weight of fishing gear expected to be disposed of by vessels and aquaculture farms per annum. These estimates can be calculated from an *ad hoc* study on the average weight of fishing gear disposed of per vessel segment and farm production system and its average life span. The study could also analyse the practices of fishing companies to deal with waste fishing gear. With this information, related to the populations (i.e. number of vessels and farms per segment, as reported annually within the Data Collection Framework (EU Regulation 1004/2017)), it is possible to calculate and annually update the approximate weight of fishing gear which has reached the end of its economic and technical life, i.e. which is likely to be disposed of by the fishing and aquaculture companies.

The weight of waste gear collected and the weight of disposed fishing gear will not be identical for a variety of reasons (e.g. changes in composition of the sector, changes in gear construction leading to change in its life span, stored gear being collected, disposal of gear by foreign vessels). However, the order of magnitude of the two values (waste fishing gear collected & annual disposal estimate) should be comparable.

The calculations can be also validated by:

- Coherence of time series: large fluctuations from one year to next are unlikely, unless clear justification can be provided;
- Visits to a representative sample of the surveyed companies to assess their declaration;

5.4 Quality reports

The suggested format for the quality report is presented in **Annex 3.**

It follows the **Eurostat 'ESS handbook for quality reports'[35],** which assists National Statistical Institutes and Eurostat in meeting the Code of Practice standards by providing recommendations for preparing comprehensive quality reports for the full range of statistical processes and their outputs.

[35] https://ec.europa.eu/eurostat/documents/3859598/10501168/KS-GQ-19-006-EN-N.pdf

The purpose of the data quality report is to describe how the data are collected and to allow an assessment of its quality in a comprehensive manner, following the practice developed by Eurostat.

This is a required reporting output as it will give details on the methods used, including any conversion factors and assumptions applied.

A separate quality report should accompany each MS report submitted as there will be different methodologies to report.

6. PRF Directive monitoring DATA methodologies & reporting format

6.1 Introduction

The PRF directive (2019/883) aims at *improving the availability and use of adequate port reception facilities and the delivery of waste to those facilities* (Article 1). It applies to waste from ships of all seagoing vessels (with limited number of exceptions) and related ports.

'*Waste from ships' means all waste, including cargo residues, which is generated during the service of a ship or during loading, unloading and cleaning operations and which falls within the scope of Annexes I, II, IV, V and VI to MARPOL Convention, as well as passively fished waste.*

Reporting on passively fished waste is an obligation under the PRF Directive, Article 8(7):

'Member States shall ensure that monitoring data on the total volume and quantity of passively fished waste are collected and reported to the Commission'.

An Implementing Act that will define monitoring data methodologies for PFW is required for the following reasons:

- MARPOL Annex V defines 11 types of garbage, specifying also fishing gear. However, it does not contain a category which would be suitable for addressing PFW. PFW is by definition a mixture of variety of materials and it must not be interchanged with the category 'fishing gear' in Annex V.
- Fishing vessels collect PFW and the PRF directive applies to all fishing vessels and related ports.
- The obligation to provide information about PFW in the advance waste notification, required under MARPOL, applies only to vessels >45m.
- The obligation to report the information in the waste delivery receipt electronically also applies only to vessels >45m. As of mid-2018, less than 1%[36] of EU fishing vessels were subject to the MARPOL related obligations.

Article 13 of the PRF Directive on 'Reporting and exchange of information' sets out the requirements to submit electronic receipts and the information set out in Waste Reception and Handling Plans (WRHP) to SafeSeaNet.

SafeSeaNet will not receive data on the amounts of PFW delivered by all fishing vessels in all ports. Additional data monitoring is required to ensure that data on the amounts of PFW is adequately captured. However, there is no current requirement for passively fished waste to be reported by fishing vessels, for example in electronic logbooks and planned revisions to the Control Regulation[37] are not expected to include this as a requirement.

It is therefore necessary to undertake data monitoring of PFW to enable the volume and quantity of passively fished waste to be collected and reported to the Commission.

6.2 Monitoring data methodologies

It is recognized that different MS and ports within MS develop procedures to deal with PFW dependant on the need, available technologies and space as well as existing legislation setting out the responsibilities of the partners in the waste stream chain: fishing vessels, port authorities, reception and recycling companies and municipalities. The monitoring of landed quantities of PFW should be

[36] 256 EU fishing vessels out of more than 82,000 vessels in the EU fleet.

[37] Commission proposal (2018) 368 amending EC Reg. 1224/2009.

incorporated in those procedures to avoid excessive administrative burden, but should be to a standard to enable collation and comparison at national and EU level.

Each MS is responsible for setting up its own method for data collection. The chosen method should be consistent with the Eurostat Manual on Waste Statistics[38], which is in line with the Waste Statistics Regulation[39] to allow collation and comparison across Member States. Chapter 3 of the Eurostat Manual lists four different methods which Member States can use to collect the necessary data:

- surveys;
- administrative or other sources;
- statistical estimation procedures;
- a combination of the above methods.

The data should be collected in a manner consistent with one of these methods as described in the Eurostat Manual. It should be reported annually to the Commission by the national authority responsible for compilation of the PFW data, based on the reporting format proposed below. This should be accompanied by a Quality Report[40].

All information should be digitally stored, allowing extraction of totals (volume and weight) of PFW (mandatory data) and if feasible also extraction of the voluntary data, specified in the reporting format.

6.3 PRF Directive Reporting format

The proposed reporting format on passively fished waste distinguishes three types of data, as presented in table 14. All data to be reported in weight (tonnes) and volume (m^3).

Table 14 Types of data on passively fished waste reported under the PRF Directive

Type	Mandatory / voluntary	Description	Cell shade below
1	Mandatory	Total weight and volume of all passively fished waste (PFW).	White
2	Voluntary - aggregate	Weight and volume of Abandoned, Lost and Discarded Fishing Gear (ALDFG) and of 'other marine litter'.	Light grey
3	Voluntary - detailed	Weight and volume by type of material (plastics, metals, rubber and other)	Light grey

The proposed reporting format is presented in the table 15. The letters in the cells show which cells contain identical values and how the totals are calculated if voluntary data are collected or estimated.

Depending on possibilities of the national data collection system, only type 2 or both type 2 and 3 of the voluntary data can be provided by the MS. It is noted that during the consultation process various

[38] https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-RA-13-015

[39] Regulation (EC) No. 2150/2002 https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32002R2150

[40] Consistent with the Eurostat Handbook on Quality and Metadata Reports. https://ec.europa.eu/eurostat/documents/3859598/10501168/KS-GQ-19-006-EN-N.pdf

respondents (often with NGO background) pleaded for as detailed reporting as possible. The details would provide information about possibilities for recycling and potential for circular design.

Table 15 Proposal for reporting on passively fished waste (tonnes and m3)

	Total weight (tonnes)	ALDFG (tonnes)	Other marine litter (tonnes)	Total volume (m3)	ALDFG (m3)	Other marine litter (m3)
Total	A1+A2	A1=B1+C1+D1+E1	A2=B2+C2+D2+E2	F1+F2	F1=G1+H1+I1+J1	F2=G2+H2+I2+J2
Plastics	B1+B2	B1	B2	G1+G2	G1	G2
Metals	C1+C2	C1	C2	H1+H2	H1	H2
Rubber	D1+D2	D1	D2	I1+I2	I1	I2
Other waste	E1+E2	E1	E2	J1+J2	J1	J2

Notes:

a. The mandatory numbers on total weight and volume of passively fished waste will be based on a census or representative samples of fishing ports or relevant waste collectors consistent with the Eurostat Manual on Waste Statistics.
b. Voluntary data can be estimated, e.g. by using conversion factors, to divide the totals into the proposed categories. These conversion factors should be based on empirical studies. The conversion factors, their justification and the reference to the source should be provided in the quality report (Section on Metadata).

6.4 Data validation

Figure 11 presents a 'decision tree' setting out how data on the PFW could be collected and monitored. Based on the local circumstances, it should monitor two types of information to capture PFW data:

- Names of PFW data providers (responsible stakeholders / waste stream partners);
- Document flows between the PRF data providers. It must be ensured that the documents contain information on either volume (m3) and/or weight (tonnes or kg) of PFW.

The MS responsible authorities should collate the above information to enable the total amount of PFW to be reported. Data provided to the MS authority can be validated by:

- Coherence of time series: large fluctuations from one year to next are *a-priori* unlikely, unless an explicit justification can be provided;
- Sampling of reception facilities for passively fished waste at a representative sample of ports
- Checks at waste collection companies to assess their declaration re. passively fished waste.

6.5 Quality reports

The suggested format for the quality report is presented in **Annex 3.**

It follows the **Eurostat 'ESS handbook for quality reports'[41],** which assists National Statistical Institutes and Eurostat in meeting the Code of Practice standards by providing recommendations for preparing comprehensive quality reports for the full range of statistical processes and their outputs.

The purpose of the data quality report is to describe how the data are collected and to allow an assessment of its quality in a comprehensive manner, following the practice developed by Eurostat.

This is a required reporting output as it will give details on the methods used, including any conversion factors and assumptions applied.

A separate quality report should accompany each MS report submitted as there will be different methodologies to report.

[41] https://ec.europa.eu/eurostat/documents/3859598/10501168/KS-GQ-19-006-EN-N.pdf

ANNEX 1 SUP DIRECTIVE REPORTING FORMAT FOR FISHING GEAR

The proposed reporting format distinguishes three types of data, with increasing level of detail, as presented in table A. All data is to be reported in tonnes.

Table A Types of data reported under the SUP Directive

Type	Mandatory / voluntary	Description	Cell shade below
1	Mandatory	Total weight of fishing gear containing plastic (placed on the market or waste fishing gear collected)	White
2	Voluntary - aggregate	Weight by gear component: netting of Ø <1mm twine, netting of Ø >1mm twine, other plastic components, non-plastic components, buoys-floats-ropes	Light grey
3	Voluntary - detailed	Weight by type of material (different types of plastics and metals)	Light grey

The format for reporting is presented in Table B. It should be reported annually to the Commission by the national authority responsible for compilation of the SUP data, based on the reporting format proposed below. This should be accompanied by a Quality Report[42]. The letters in the cells show which cells are related and how the totals are calculated if voluntary data are collected or estimated.

The mandatory reporting requirement is to provide total gear placed on the market in tonnes and total waste fishing gear collected, also in tonnes.

The MS reports will be composed of two tables, identical in structure. One table will be completed for fishing gear placed on the market and another table will be completed for waste fishing gear collected.

Each Member State is responsible for its own data collection and monitoring, but the method should be consistent with the Eurostat Manual on Waste Statistics[43], allowing collation and comparison across European Member States.

[42] Consistent with the Eurostat Handbook on Quality and Metadata Reports. https://ec.europa.eu/eurostat/documents/3859598/10501168/KS-GQ-19-006-EN-N.pdf

[43] https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-RA-13-015

Table B Proposal for reporting fishing gear placed on the market and waste fishing gear collected (tonnes)

	Total fishing gear containing plastic (tonnes)	Net panes made of thick twine (Ø >1mm)	Net panes and lines made of thin twine (Ø<1mm)	Other plastic based gear or parts thereof	Non-plastic parts of gear[44]	Buoys, floats, ropes
Total	A+B+C+D+E	A	B	C	D = I+K	E = F+J+L
Plastics total	A+B+C+F	A	B	C		F
- Polypropylene (PP)						
- Polyethylene (PE)						
- High Molecular Polyethylene (HMPE)						
- Nylon						
- Other						
- Mixed						
Metals total	G = I+J				I	J
- Steel						
- Aluminium						
- Lead						
Rubber total	H = K+L				K	L

Notes:

d. White cells: The mandatory total should be based on clearly defined data calculation methods.
e. Light grey cells: Voluntary data can be estimated e.g. by using conversion factors, to divide the totals into the proposed categories. These conversion factors should be based on empirical studies. The values of the conversion factors, their justification and reference to the source should be provided in the quality report (Section on Metadata).
f. Black cells: data not required.

[44] This may regard metal weights, rubber rollers, escape devices / grids, etc.

ANNEX 2: PRF DIRECTIVE MONITORING DATA METHODOLOGIES AND REPORTING FORMAT FOR PASSIVELY FISHED WASTE

Monitoring Data Methodologies

Each MS is responsible for setting up its own method for data collection. The chosen method should be consistent with the Eurostat Manual on Waste Statistics[45], which is in line with the Waste Statistics Regulation[46] to allow collation and comparison across Member States. Chapter 3 of the Eurostat Manual lists four different methods which Member States can use to collect the necessary data:

- surveys;
- administrative or other sources;
- statistical estimation procedures;
- a combination of the above methods.

The data should be collected in a manner consistent with one of these methods as described in the Eurostat Manual. It should be reported annually to the Commission by the national authority responsible for compilation of the PFW data, based on the reporting format proposed below. This should be accompanied by a Quality Report[47]. The suggested format for the quality report is presented in **Annex 3.**

All information should be digitally stored, allowing extraction of totals (volume and weight) of PFW (mandatory data) and if feasible also extraction of the voluntary data, specified in the reporting format.

Reporting Format

The proposed reporting format on passively fished waste distinguishes three types of data, as presented in table A. All data to be reported in weight (tonnes) and volume (m^3).

Table A Types of data on passively fished waste reported under the PRF Directive

Type	Mandatory / voluntary	Description	Cell shade below
1	Mandatory	Total weight & volume of all passively fished waste (PFW).	White
2	Voluntary - aggregate	Weight and volume of Abandoned, Lost and Discarded Fishing Gear (ALDFG) and of 'other marine litter'.	Light grey
3	Voluntary - detailed	Weight and volume by type of material (plastics, metals, rubber and other)	Light grey

[45] https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-RA-13-015

[46] Regulation (EC) No. 2150/2002 https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32002R2150

[47] Consistent with the Eurostat Handbook on Quality and Metadata Reports. https://ec.europa.eu/eurostat/documents/3859598/10501168/KS-GQ-19-006-EN-N.pdf

The proposed reporting format is presented in the table B. The letters in the cells show which cells contain identical values and how the totals are calculated if voluntary data are collected or estimated.

Table B Proposal for reporting on passively fished waste (tonnes and m3)

	Total weight (tonnes)	ALDFG (tonnes)	Other marine litter (tonnes)	Total volume (m3)	ALDFG (m3)	Other marine litter (m3)
Total	A1+A2	A1=B1+C1+D1+E1	A2=B2+C2+D2+E2	F1+F2	F1=G1+H1+I1+J1	F2=G2+H2+I2+J2
Plastics	B1+B2	B1	B2	G1+G2	G1	G2
Metals	C1+C2	C1	C2	H1+H2	H1	H2
Rubber	D1+D2	D1	D2	I1+I2	I1	I2
Other waste	E1+E2	E1	E2	J1+J2	J1	J2

Notes:

a. *The mandatory numbers on total weight and volume of passively fished waste will be based on a census or representative samples of fishing ports or relevant waste collectors consistent with the Eurostat Manual on Waste Statistics.*
b. *Voluntary data can be estimated, e.g. by using conversion factors, which allow totals to be divided into categories. These conversion factors should be based on empirical studies. The conversion factors, their justification and reference to the source should be provided in the Quality Report.*

ANNEX 3: QUALITY CHECK REPORTS

A quality check report (QCR) should accompany the Member State reporting on fishing gear placed on the market and waste fishing gear collected under the SUP Directive (reports 1 & 2 below).

A separate quality check report should accompany the Member State reporting on passively fished waste under the PRF Directive (report 3 below).

To meet EU standards for reporting on statistical quality, it is proposed to follow the approach proposed in the Eurostat 'European Statistical System handbook for quality reports'[48]. Annex 2 of the handbook provides detailed descriptions and clarifications on the issues which the quality report should contain.

Objectives of the QCRs

The objective of the quality check report is to provide information on:

1. Data collection methodology
2. Data quality, including timeliness and accuracy
3. Application of the definitions
4. Data collection processes, including the scope and validation
5. Reasons for significant changes in reported data between years

Structure of the QCRs

The QCRs follow the same basic structure:

1. General information
2. Description of the parties involved in the data collection
3. Description of methods used
4. Accuracy of data
5. Confidentiality
6. Dissemination: main national websites and publications
7. Metadata

[48] https://ec.europa.eu/eurostat/documents/3859598/10501168/KS-GQ-19-006-EN-N.pdf

Report 1. Fishing Gear Placed on the Market

1. **General information**

Member State:	
Organisation submitting the data:	
Contact person name:	
Email:	
Phone number:	
Reference year:	
Delivery date / version:	
Link to data publication by the Member State (if any):	

2. **Description of the parties involved in the data collection**

Name of institution	Description of key responsibilities

Add rows if needed

3. **Description of methods used**

Specification of methods and sources

Data collection methods / Source of data	Mandatory data (method/source: yes/no)	Voluntary data (optional) (method/source: yes/no)
Administrative reporting (census)		
Surveys (census or sampling)		
Trade statistics (e.g. using Prodcom or Comext data)		
Extended Producer Responsibility (EPR) scheme		
Gear producers / traders		
Other (specify)		

Include reference number between brackets in cells answered 'yes', e.g. yes (1).

Add specific explanations in table below for cells which were answered 'yes', using the reference numbers.

Ref. no	Further explanation / description

Add rows if needed

Specification of conversion factors

If conversion factors [49] have been used to estimate voluntary data, please specify those conversion factors in the table below.

	Total fishing gear containing plastic (tonnes)	Net panes made of thick twine (Ø >1mm)	Net panes and lines made of thin twine (Ø<1mm)	Other plastic based gear or parts thereof	Non-plastic parts of gear	Buoys, floats, ropes	Total per type of material
Total	**Mandatory value**						
Plastics total							
- Polypropylene (PP)							
- Polyethylene (PE)							
- High Molecular Polyethylene (HMPE)							
- Nylon							
- Other							
- Mixed							
Metals total							
- Steel							
- Aluminium							
- Lead							

[49] A conversion factor is an arithmetical multiplier for converting a quantity expressed in one set of units into an equivalent expressed in another.

Rubber total		[redacted]			
Total per gear component					

4. **Accuracy of the data**

Statistical surveys regarding quantity of fishing gear placed on the market

Scope of the survey	Year	Statistical units	Percentage of population surveyed	Data (t)	Confidence level	Error margin	Adjustments from the survey year to the current year	Other details

Add rows for each survey used.

Add specific explanations in table below by numbering / referencing above cells.

No	Further explanation / description

Add rows if needed

Main accuracy issues

Description of main issues affecting the accuracy of data, including errors related to sampling, coverage, measurement, processing and non-response. Description of estimates used.

No.	Accuracy issue	Further explanation / description
1	Sampling	
2	Coverage	
3	Measurement	
4	Processing	
5	Non-response	

6	Estimates	
7	Other (specify)	

Add rows if needed

Differences from previous year's data

Significant methodological changes in the calculation method for the current reference year, if any (please include in particular retrospective revisions, their nature and whether a break-flag is required for a certain year).

No.	Further explanation / description

Add rows if needed

Data verification

	Cross-check (yes/no)	Time-series check (yes/no)	Audit (yes/no)	Verification process (yes/no)
Mandatory data				
Voluntary data				

Additional information about the methods, including the combination of methods used

	Detailed description of methods for verification
Mandatory data	
Voluntary data (optional)	

5. Confidentiality

Specify by numbered item how confidentiality has been ensured.

No.	Description

Add rows if needed

Confidentiality issues related data publication

Indicate what if any data should not be published and give a justification to withhold its publication.

No.	Description

Add rows if needed

6. Dissemination: main national websites and publications

Topics to be listed below are related to data dissemination.

No.	List of websites, documents, publications

Add rows if needed

7. Metadata

List of documents related to data collection methodology, data processing and quality control.

Topic	Document exists (yes/no)	Reference to the document (title, year, weblink if applicable)
Data collection		
Data processing		
Quality control		

Report 2. Waste fishing gear collected

1. **General information**

Member State:	
Organisation submitting the data:	
Contact person name:	
Email:	
Phone number:	
Reference year:	
Delivery date / version:	
Link to data publication by the Member State (if any):	

2. **Description of the parties involved in the data collection**

Name of institution	Description of key responsibilities

Add rows if needed

3. **Description of methods used**

Specification of methods and sources

Data collection methods / Sources	Mandatory data (method/source used: yes/no)	Voluntary data (optional) (method/source used: yes/no)
Administrative reporting (census)		
Surveys (census or sampling)		
EPR		
Ports		
Waste processors		
Gear processors / traders		
Other (specify)		

Include reference number between brackets in cells answered 'yes', e.g. yes (1).

Add specific explanations in table below for cells which were answered 'yes', using the reference numbers.

Ref. no.	Further explanation / description

Add rows if needed

Specification of conversion factors

If conversion factors [50] have been used to estimate voluntary data, please specify those conversion factors in the table below.

	Total fishing gear containing plastic (tonnes)	Net panes made of thick twine (Ø >1mm)	Net panes and lines made of thin twine (Ø<1mm)	Other plastic based gear or parts thereof	Non-plastic parts of gear[51]	Buoys, floats, ropes	Total per type of material
Total	**Mandatory value**						
Plastics total							
- Polypropylene (PP)							
- Polyethylene (PE)							
- High Molecular Polyethylene (HMPE)							
- Nylon							
- Other							
- Mixed							
Metals total							
- Steel							

[50] A conversion factor is an arithmetical multiplier for converting a quantity expressed in one set of units into an equivalent expressed in another.

[51] such as metal weights, rubber rollers, escape devices / grids, etc.

- Aluminium		[redacted]			
- Lead					
Rubber total					
Total per gear component					

4. **Accuracy of the data**

Statistical surveys regarding quantity of waste fishing gear collected

Scope of the survey	Year	Statistical units	Percentage of popula-tion surveyed	Data (t)	Confidence level	Error margin	Adjustments from the survey year to the current year	Other details

Add rows for each survey used.

Add specific explanations in table below by numbering / referencing above cells.

No	Further explanation / description

Add rows if needed

Main accuracy issues

Description of main issues affecting the accuracy of data, including errors related to sampling, coverage, measurement, processing and non-response. Description of estimates used.

No	Accuracy issue	Further explanation / description
1	Sampling	
2	Coverage	

3	Measurement	
4	Processing	
5	Non-response	
6	Estimates	
7	Other (specify)	

Add rows if needed

Differences from previous year's data

Significant methodological changes in the calculation method for the current reference year, if any (please include in particular retrospective revisions, their nature and whether a break-flag is required for a certain year).

No	Further explanation / description

Add rows if needed

Data verification

	Cross-check (yes/no)	Time-series check (yes/no)	Audit (yes/no)	Verification process
Mandatory data				
Voluntary data				

Additional information about the methods, including the combination of methods used

	Detailed description of methods for verification
Mandatory data	
Voluntary data (optional)	

5. **Confidentiality**

Specify in numbered items how confidentiality of the has ensured.

No	Description

Add rows if needed

Confidentiality issues related data publication

Indicate which data should not be published and why.

No	Description

Add rows if needed

6. **Dissemination: main national websites and publications**

Topics to be listed below are related to data dissemination.

No	List of websites, documents, publications

Add rows if needed

7. **Metadata**

List of documents related to data collection methodology, data processing and quality control.

Topic	Document exists (yes/no)	Reference to the document (title, year, weblink if applicable)
Data collection		
Data processing		
Quality control		

Report 3. Passively Fished Waste

1. **General information**

Member State:	
Organisation submitting the data:	
Contact person name:	
Email:	
Phone number:	
Reference year:	
Delivery date / version:	
Link to data publication by the Member State (if any):	

2. **Description of the parties involved in the data collection**

Name of institution	Description of key responsibilities

Add rows if needed

3. Description of methods used
Specification of methods

Data collection methods / Sources	Mandatory data (method/source used: yes/no)	Voluntary data (optional) (method/source used: yes/no)
Administrative reporting (census)		
Surveys (census or sampling)		
EPR		
Ports		
Municipalities		
Waste processors		
Other (specify)		

Include reference number between brackets in cells answered 'yes', e.g. yes (1).

Add specific explanations in table below for cells which were answered 'yes', using the reference numbers.

No	Further explanation / description

Add rows if needed

Specification of conversion factors

If conversion factors [52] have been used to estimate voluntary data, please specify those conversion factors in the table below.

	Total weight (tonnes)	ALDFG (tonnes)	Other marine litter (tonnes)	Total volume (m3)	ALDFG (m3)	Other marine litter (m3)	Total by material
Total	**Mandatory ***			**Mandatory***			
Plastics							
Metals							
Rubber							
Other waste							
Total by type							

* If total volume (m3) was derived from total weight (tonnes) or vice versa, indicate the used coefficient in the appropriate mandatory cell.

[52] A conversion factor is an arithmetical multiplier for converting a quantity expressed in one set of units into an equivalent expressed in another.

4. **Accuracy of the data**

Statistical surveys regarding weight and volume of passively fished waste

Scope of the survey	Year	Statistical units	Percentage of popula-tion surveyed	Data (t)	Confidence level	Error margin	Adjustments from the survey year to the current year	Other details

Add rows for each survey used.

Add specific explanations in table below by numbering / referencing above cells.

No	Further explanation / description

Add rows if needed

Main accuracy issues

Description of main issues affecting the accuracy of data, including errors related to sampling, coverage, measurement, processing and non-response. Description of estimates used.

No	Accuracy issue	Further explanation / description
1	Sampling	
2	Coverage	
3	Measurement	
4	Processing	
5	Non-response	
6	Estimates	
7	Other (specify)	

Add rows if needed

Differences from previous year's data

Significant methodological changes in the calculation method for the current reference year, if any (please include in particular retrospective revisions, their nature and whether a break-flag is required for a certain year).

No	Further explanation / description

Add rows if needed

Data verification

	Cross-check (yes/no)	Time-series check (yes/no)	Audit (yes/no)	Verification process
Mandatory data				
Voluntary data				

Additional information about the methods, including the combination of methods used

	Detailed description of methods for verification
Mandatory data	
Voluntary data (optional)	

5. **Confidentiality**

Specify in numbered items how confidentiality of the has ensured.

No	Description

Add rows if needed

Confidentiality issues related data publication

Indicate which data should not be published and why.

No	Description

Add rows if needed

6. **Dissemination: main national websites and publications**

Topics to be listed below are related to data dissemination.

No	List of websites, documents, publications

Add rows if needed

7. **Metadata**

List of documents related to data collection methodology, data processing and quality control.

Topic	Document exists (yes/no)	Reference to the document (title, year, weblink if applicable)
Data collection		
Data processing		
Quality control		

ANNEX 4: MAIN REPORTING OBLIGATIONS FOR MS BY WASTE STREAM

Waste stream	Information to be reported on	EU requirements			
		Calculation methodology	Data collection	Reporting formats	Frequency
Batteries	Collection rates	Collection rate in year 3 = 3* Collection in year 3/(Sales in year 1+ Sales in year 2+Sales in year 3) **Sales in year n=The weight of portable batteries and accumulators placed on the market** in the territory of the Member State in the year concerned, excluding any portable batteries and accumulators that have left the territory of that Member State in that year before being sold to the end-users	Annual sales should be based on data collected or statistically significant estimates. Data collection should be detailed in the annual report.	Electronic reports including data and methodology sent to Eurostat	Yearly, within 18 months of the end of the reporting year for which the data are collected
	Levels of recycling and recycling efficiencies	Detailed methodologies to calculate recycling efficiencies using the mass of output fractions accounting for recycling and the mass of input fractions entering the batteries recycling process are provided under Reg. (EU) No 493/2012.	Mandatory reporting from recyclers to MS (no later than 5 months after the end of the calendar year) following a reporting format established under Reg. (EU) No 493/2012.		
Packaging and waste packaging	Quantities of packaging waste generated for each broad category of material	Tonnage of waste produced + Tonnage of waste imported - Tonnage of waste exported. **Packaging waste generated in a Member State may be deemed to be equal to the amount of packaging placed on the market in the same year within that Member State**	No EU requirement	Electronic reports and quality check reports based on the table and report formats from Implementing	Yearly, within 18 months of the end of the reporting year for which the

Waste stream	Information to be reported on	EU requirements			
		Calculation methodology	Data collection	Reporting formats	Frequency
	Quantities of packaging waste recycled and quantities recovered for each broad category of material	The weight of recovered or recycled packaging waste shall be the input of packaging waste to an effective recovery or recycling process. If the output of the sorting plant is sent to effective recycling or recovery processes without significant losses, it is acceptable to consider this output to be the weight of the recovered or recycled packaging waste	Data is to be obtained directly from establishments or undertakings managing waste. The use of electronic registries is recommended but surveys, including those based on sampling methodologies are authorised. In that case, they have to be carried out at regular, specific intervals and be based on a representative sample. Estimates may be used for packaging materials occurring in small quantities.	Decision 2019/665 sent to Eurostat	data are collected
	Quantities of packaging placed on the market for the first time for each broad category of material	**Tonnage produced + Tonnage imported - Tonnage exported**	No EU requirement		
	Quantities of reusable packaging placed on the market for the first time by broad category of material	The Commission should examine by 31 December 2024 the feasibility of setting quantitative targets on reuse of packaging, including the calculation rules	No EU requirement		
	Consumption of lightweight plastic carrier bags (since 2018)	Two authorised methodologies: 1. Methodology by numbers : total number placed on the market, or number of bags calculated on the basis of the revenues from mandatory taxes + number of bags exempt from taxes 2. Methodology by weight: total weight placed on the market, or weight of bags calculated on the basis of the revenues from mandatory taxes + weight of bags exempt from taxes	Data on total number or weight of lightweight plastic bags placed on the market or exempt from taxes should be collected from economic operators placing those bags on the market.		

Waste stream	Information to be reported on	EU requirements			
		Calculation methodology	Data collection	Reporting formats	Frequency
Waste electrical and electronic equipment (WEEE) Directive	Quantities and categories of EEE placed on the market	The quantity shall be calculated on the basis of the information provided by producers of EEE, or their authorised representatives. If not possible, the weight of EEE placed on the market in the year concerned can be estimated on the basis of data on domestic production, imports and exports of EEE.	Data should be obtained either from producers of EEE or from PRODCOM if estimated. Producers or their authorised representative shall keep records on categories and quantity by weight of EEE; quantity by weight of waste of EEE separately collected, recycled recovered and disposed of. Treatment facilities are identified as they are required to obtain permits. At national level, based on Annex III of Reg. 2019/2193, the calculation of EEE placed on the market may rely on different sources (e.g. census/national statistics/reporting obligations for business or certified business units/agencies/associations/surveys of waste composition/specific impact assessments that national law may have, and relevant regulations).	Electronic reports and quality check reports based on the table and report formats from Commission Decisions 2005/369 and 2019/2193 sent to Eurostat	Yearly, within 18 months of the end of the reporting year for which the data are collected
	Quantities of WEEE generated	The quantity of WEEE shall be calculated on the basis of the amount of EEE placed on the market of that Member State in the preceding years, and the corresponding product lifespan estimated on the basis of a discard rate per product (Detailed formula in Annex II of Reg. 2017/699).			
	Quantities and categories of WEEE collected, prepared for re-use, recycled and recovered	Details on what should be taken into account in the weight of treated waste for the different categories is specified in Reg. 2017/2193.			
End-of-life Vehicles Directive	Total vehicle weight	The total vehicle weight (W1) shall be calculated as the sum of the individual vehicle weights (Wi)	The total number of ELV and the total vehicle weight (W1) shall be calculated on the basis of certificates of destruction issued by authorised treatment facilities.	Electronic reports and quality check reports based on the table formats from Commission Decisions 2005/293 sent to Eurostat	Yearly, within 18 months of the end of the reporting year for which the data are collected
	ELV by waste category and waste management operation	Details on definitions and calculations of the different waste categories (de-pollution and dismantling of the different components, shredding of ferrous and non ferrous materials) and of the different management operations (reuse, recycling, recovery) are provided under Commission Decision 2005/293.	MS are free to decide on the data collection methods (e.g. surveys, national statistical institutes, administrative sources, responsible producer schemes).		
Municipal waste	Recycling rates	MS can use four different calculation methods to assess the attainment of their targets in terms of recycling rates (Recycling rate of paper, metal, plastic and glass household waste; Recycling rate of household and similar waste; Recycling rate of household waste; Recycling waste of municipal waste). Except for calculation method 4, which is based on the annual data on municipal waste, as reported to Eurostat, MS shall explain how	The use of electronic registries to record data on municipal waste is encouraged. Data should be collected from establishments or undertakings managing waste but different data collection may be used (e.g. surveys, administrative sources, statistical estimation procedures). When	Data on municipal waste are collected via a subset of the Eurostat / OECD Joint Questionnaire. Member States also	Yearly, within 18 months of the end of the reporting year for which the

Waste stream	Information to be reported on	EU requirements			
		Calculation methodology	Data collection	Reporting formats	Frequency
		the amounts generated and recycled have been calculated (Commission Decision 2011/753). Detailed calculation methodology is provided for separated and recycled bio-waste and for recycled metals separated after incineration of municipal waste (Commission Decision 2019/1004).	using surveys, they shall be carried out at regular, specific intervals and be based on a representative sample. In order to calculate waste generated by category, sorting analysis of household waste may be used.	have to report to the Commission on their targets based on the format provided in Commission Decision 2019/1004 (tables and quality check reports).	data are collected

ANNEX 5: DETAILED STANDARDISED DESCRIPTION OF GEAR

Note that all illustrations used in the fiches are extracted from SEAFISH (UK) library (www.seafish.org) or from FAO website (http://www.fao.org/fishery/geartype/search/en) . They are copyright free.

When alternative sources have been used, the references of the documents are cited.

Table 16: List of fishing gear taxa utilised in the EU

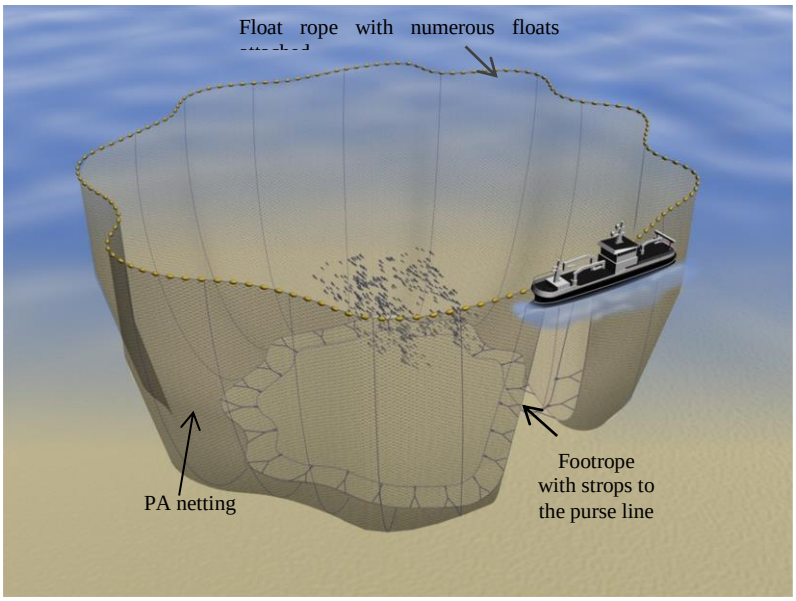
Gear category	Standard Abbreviation	Name	Link to fiche
Surrounding nets	PS	Purse seines	PS fiche
	LA	Surrounding nets without purse lines	LA fiche
Seine nets	SB	Beach seines	SB fiche
	SSC	Scottish seine	SSC fiche
	SDN	Danish (anchor) seine	SDN fiche
Trawls	TBB	Beam trawls	TBB fiche
	OTB	Single boat bottom otter trawls	OTB fiche
	OTT	Twin bottom otter trawls	OTT fiche
	PTB	Bottom pair trawls	PTB fiche
	OTM	Single boat midwater otter trawls	OTM fiche
	PTM	Midwater pair trawls	PTM fiche
Dredges	DRB	Towed dredges	DRB fiche
	DRH	Hand dredges	DRH fiche
Lift nets	LNB	Boat-operated lift nets	LNB fiche
Gillnets and entangling nets	GNS	Set gillnets (anchored)	GNS fiche
	GND	Drift gillnets	GND fiche
	GNC	Encircling gillnets	GNC fiche
	GTR	Trammel nets	GTR fiche
	GTN	Combined gillnets-trammel nets	GTN fiche
Traps	FPO	Pots	FPO fiche
	FWR	Barriers, fences, weirs, etc.	FWR fiche
Hook and lines	LHP	Handlines and hand-operated pole-and-lines	LHP fiche

	LHM	Mechanized lines and pole-and-lines	LHM fiche
	LLS	Set longlines	LLS fiche
	LLD	Drifting longlines	LLD fiche
	LTL	Trolling lines	LTL fiche
FAD	FAD*	Fish Aggregating Devices	FAD fiche

Table 17: List of aquaculture gear taxa used in the EU falling under the gear definition of SUP Directive

Name	**Link to fiche**
Cages / pens	Cage fiche
Plastic bags (Shellfish off bottom culture)	Off bottom fiche
Bouchot pole (Shellfish off bottom culture)	Bouchot fiche
Suspended ropes (shellfish longlines)	Suspended ropes fiches
Pond culture*	Pond fiche

Gear sector: FISHERIES	
Gear group: SURROUNDING NETS	
Gear code: PS	Gear name: Purse seine
Gear description: A purse seine is a large net used to surround a shoal of pelagic fish. Once shot, the bottom of the net is drawn together by hauling in a long wire called the 'purse line' to form purse seine into a huge cup shape of netting just below the surface of the water with the targeting fish inside. The net is gradually hauled onboard the vessel and the catch taken onboard the vessel.	



Purse Seine as the hauling stage is started.

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
The whole net	*PA*	*85%*	*2*
Float rope and floats	*PA*	*10%*	*2*
Floats	*EVA*	*5%*	*7*

Replacement rate	
Gear component	Replacement rate (year^{-1})
The net	*2-3*
Float rope	*2-3*

Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
floats	Ethylene vinyl acetate (EVA)	*7*
Purses line (if made from synthetic materials)	*PA/PE*	*2*

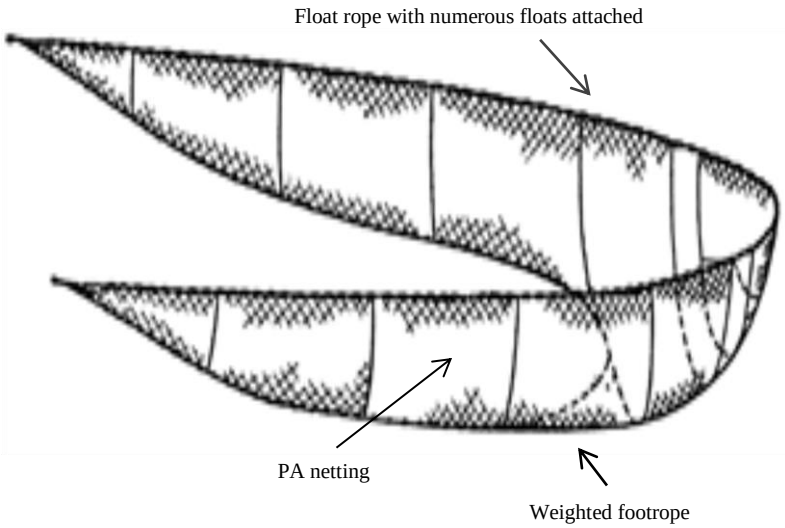
Comments

Floats are a relevant plastic component in this fishing method because of the vast amount of floatation on the headline. Some of the larger nets will have as many as 2500 floats on them, each float weighing in the region of 1 kilo. The larger nets will use a wire for the purse line but the smaller vessels will be using a nylon/polypropylene rope) At present recycling possibilities for EVA are very limited.

In some of the pelagic fisheries the purse seine gear may be used on a seasonal basis therefore may not need replacing for many years. If used throughout the year it will need replacing much sooner. When the netting has come to the end of its many of the floats on the gear may recycled for use on another net.

The nets are generally made with black PA netting and due to the relative simplicity that PA can be recycled several net making companies already have recycling procedures for the used PA material.

Gear sector: FISHERIES	
Gear group: SURROUNDING NETS	
Gear code: LA	Gear name: Surrounding nets without purse lines
Gear description: Surrounding nets are similar to purse seines but do not have the running purse line to close off the bottom of the net. The net is designed with the footrope shorter than the headline so that the bottom of the net closes up as the net is hauled.	



Surrounding net (Lampara net) ready to be hauled

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
The whole net	*PA*	*85%*	*2*
Float rope and floats	*PA*	*10%*	*2*
Floats	*EVA*	*5%*	*7*
Replacement rate			
Gear component		Replacement rate ($year^{-1}$)	
The net		*2-3*	
Float rope		*2-3*	
Ancillary equipment containing plastic			
Designation		Plastic type	Recyclability (RIC)
floats		Ethylene vinyl acetate (EVA)	*7*

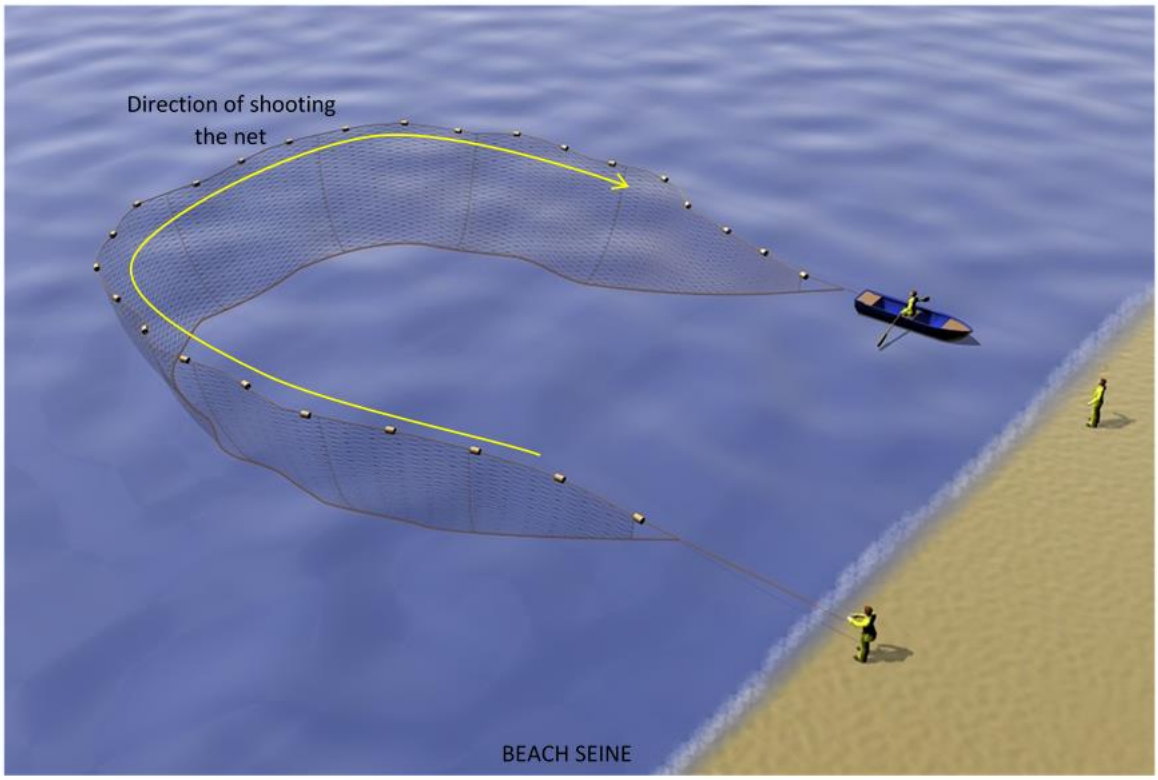
Comments

Floats are a relevant plastic component in this fishing method because of the vast amount of floatation on the headline. The headline is often almost completely covered with floats to keep the net on the surface. These floats are usually made of Ethylene vinyl acetate (EVA), at present recycling possibilities for EVA are very limited.

When the netting has come to the end of its many of the floats on the gear may recycled for use on another net.

The nets are generally made with black PA netting and due to the relative simplicity that PA can be recycled several net making companies already have recycling procedures for the used PA material.

Gear sector: FISHERIES	
Gear group: Seine Nets	
Gear code: SB	Gear name: Beach Seine
Gear description: This is a long low net that is shot from the shoreline by hand or with a small boat. It is shot in a semi-circular shape to encircling fish living close to the shoreline then gradually hauled by hand from both ends, back onto the beach. The headrope with floats on is designed to stay on the surface with the netting suspended beneath it right down to or close to the seabed.	
Illustration of gear taxon :	



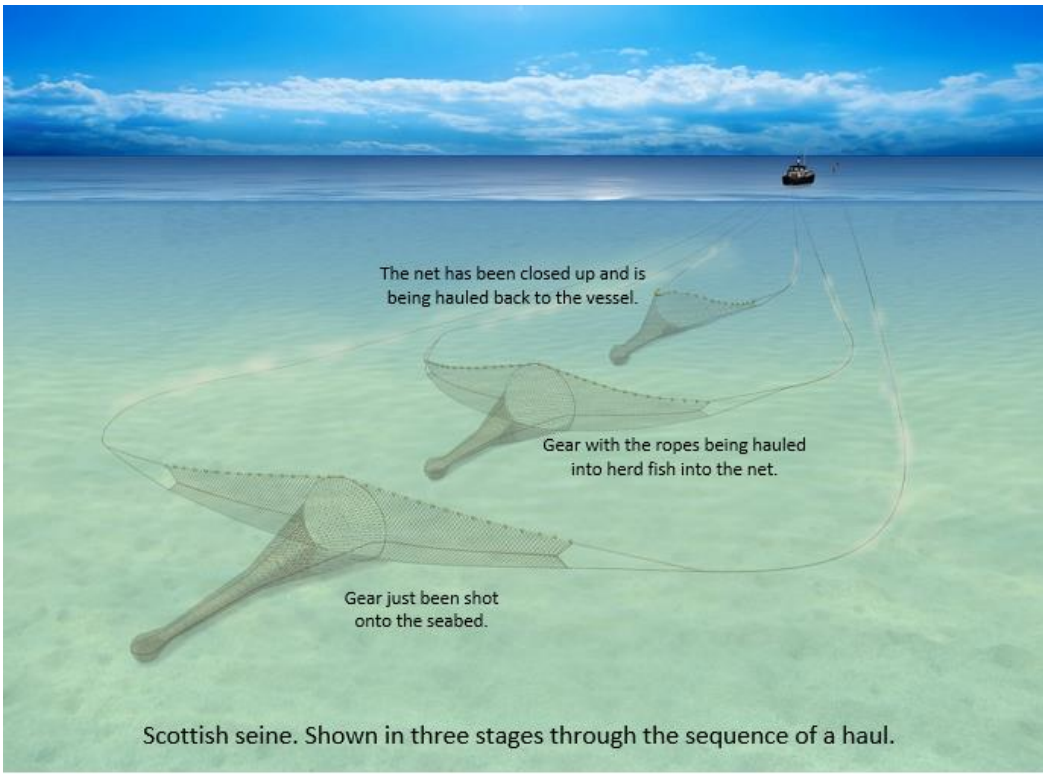
Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Body of the net	*PA*	*85%*	*2*
Headrope / footrope.	*PA*	*15%*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})

Netting	*3*	
Head rope / footrope	*3*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability
Floats	*EVA or PS (polystyrene)*	*7 / 6*
Wing end ropes	*HDPE*	*2*
Comments Beach seine as a result of its simplicity and low cost, is often operated in a small, artisanal basis. The target species is often small pelagic fish that shoal up close to the shore. They are usually constructed using soft twisted nylon twines but in some fisheries, they may uses PE netting.		

Gear sector: FISHERIES	
Gear group: Seine Nets	
Gear code: SSC	Gear name: Scottish Seine
Gear description: Scottish seine is also referred to as Fly dragging or Fly shooting. In Scottish seine a net, similar to a lightweight trawl, is shot on the seabed. It has very long weighted ropes on each side and the whole gear is shot so that it lays on the seabed in a large rounded triangular shape. The ropes are gradually hauled in, trailing over the seabed to herd the fish in towards the net, eventually falling back into the net as it is hauled to the boat. In Scottish seine the vessel uses its engine power to maintain station as the gear is hauled towards it.	

Illustration of gear taxon:



Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability
The body of the trawl	*HDPE*	*85%*	*2*
The cod end of the net	*HDPE*	*10*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})
Body of the net	*3-4*
Cod end	*0.75 – 1.25*

Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability
Floats (floats will often be reused)	*PS (polystyrene) or ABS (acrylonitrile-butadiene-styrene)*	*6*
Headline and footrope	*HDPE*	*2*

Twine for lashing netting to the ropes etc (2-3 kilo)	*PA*	*2*

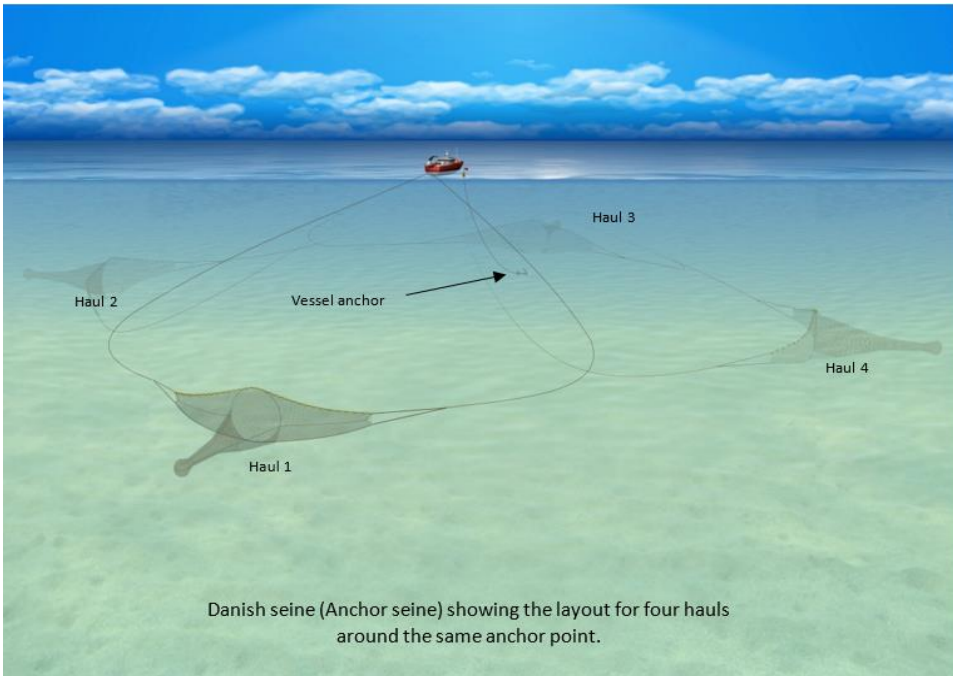
Comments

Seine nets in use today are almost all made from PE twines. The nets are similar to a trawl net but generally made from lighter twines. Traditionally seine nets had a natural rope (commonly referred to as a grass rope) footrope with lead rings on for fishing over soft sand and mud seabeds, this made them relatively simple for EOL dismantling and disposal of the gear. Nowadays as many skippers are venturing onto firmer seabeds many of the seine nets will be fitted with rubber disc ground gear which will add to the work needed at EOL

The headline and footropes are usually made using 'combination' rope. This is a combination of PE rope intertwined with strands of steel wire. This makes it difficult to separate for recycling at present. Today many vessels are opting for HMPE for headlines etc make them easier for recycling. Often the headlines will be made with HMPE that has already been reused from old HMPE trawl warps.

Generally seine nets are lighter made than trawls therefore easier for handling when it comes to EOL recycling.

Gear sector: FISHERIES	
Gear group: Seine Nets	
Gear code: SDN	Gear name: Danish Seine
Gear description: Danish seine is also known as Anchor Seine. In Danish seine a net, similar to a lightweight trawl, is shot on the seabed. It has very long weighted ropes on each side and the whole gear is shot so that it lays on the seabed in a large rounded triangular shape. The ropes are gradually hauled in, trailing over the seabed to herd the fish in towards the net, eventually falling back into the net as it is hauled to the boat. In Danish seine the vessel drops an anchor (hence the name anchor seine) at one end of the ropes and picks this up again after shooting all the ropes and the net, they then use the anchor to keep the vessel in position as they slowly haul in the ropes and haul the net back to the vessel. They will often shoot several hauls in different directions to cover different areas of seabed from the same anchor point.	
Illustration of gear taxon:	



Danish seine (Anchor seine) showing the layout for four hauls around the same anchor point.

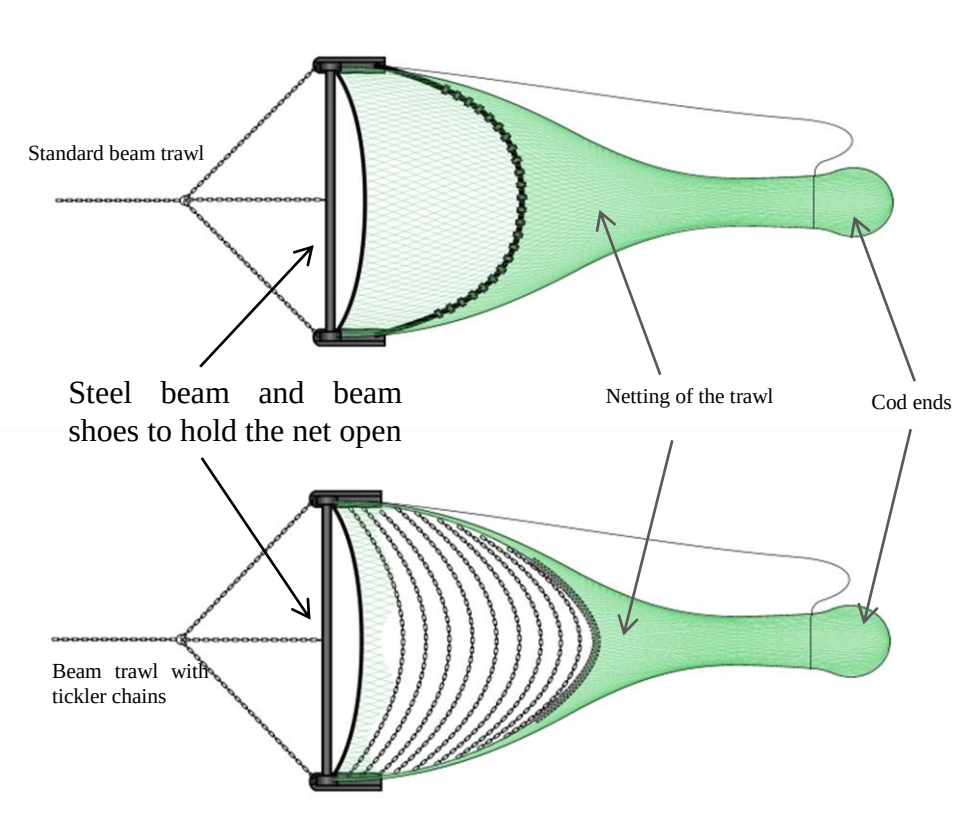
Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability
The body of the trawl	*HDPE*	*85%*	*2*
The cod end of the net	*HDPE*	*10*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})

Body of the net	*4-5*	
Cod end	*0.75 – 1.25*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability
Floats (floats will often be reused)	*PS (polystyrene) or ABS (acrylonitrile-butadiene-styrene)*	*6*
Headline and footrope	*HDPE*	*2*
Twine for lashing netting to the ropes etc (2-3 kilo)	*PA*	*2*
Comments Seine nets in use today are almost all made from PE twine. The nets are similar to a trawl net but generally made from lighter twines. Traditionally Danish seine nets had a natural rope (commonly referred to as a grass rope) with lead rings on as its only ground gear for fishing over soft sand and mud seabeds, this made them relatively simple for EOL dismantling and disposal of the gear. A few vessels may be using lightweight rubber disc footropes nowadays. Generally, seine nets are lighter made than trawls therefore easier for handling when it comes to EOL recycling.		

Gear sector: FISHERIES	
Gear group: TRAWLS	
Gear code: TBB	Gear name: BEAM TRAWLS
Gear description. A beam trawl is held open by a frame of a wood or steel beam, suspended above the seabed on beam shoes at each side. The net is towed behind this framework to target fish that live close to the seabed.	

Illustration of gear taxon



Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
The netting	*HDPE or PA*	*85%*	*2*
The cod end	*HDPE*	*10%*	*2*
headline	*HDPE*	*5%*	*2*

Replacement rate

Gear component	Replacement rate (year^{-1})
The netting	*1-3*
Cod end	*1*

Ancillary equipment containing plastic

Designation	Plastic type	Recyclability (RIC)
Frond ropes (dolly ropes)	*HDPE*	*2*
Flip up ropes	*HDPE* *PA*	*2*

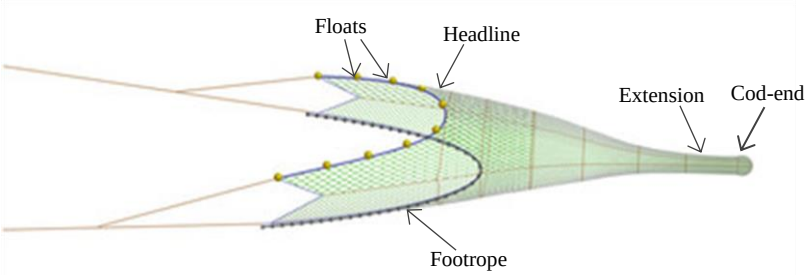
Comments

Many of the Belgian and the Dutch bean trawlers still use Nylon (PA) netting for their nets particularly in the southern English channel waters. UK vessel are all on PE as are some of the Dutch fleet particularly those working in the North Sea. There are various versions of beam trawls each one rigged to suit the particular seabed and target species. Because the net is worked close to the seabed the netting used is of heavy construction, often having sacrificial 'chafer' netting or 'frond' ropes attached to its underside to prevent damage to the net. These are attached to the underside of the trawl to minimise abrasion of the netting through contact with the seabed.

Some of the beam trawls will also have a fairly large plastic component in their 'flip up ropes'. These are a 'fence' like structure at the mouth of the net designed to prevent stones entering the trawl. They are made up of plastic (HDPE) pipes threaded onto lengths of combination ropes or PE /PA ropes. The combination is made up with HDPE rope with strands of wire rope through it (difficult to recycle). The PE / PA rope is made up from HDPE with strands of thick PA monofilament in the centre of each strand (difficult to recycle). Not all beam trawls will have this fitted.

The replacement rate for beam trawl varies tremendously with some boats replacing the gear after about 6-9 months, others manage to keep the same net for as much as three years. All depends what type of seabed they are working on.

Gear sector: FISHERIES	
Gear group: TRAWLS	
Gear code: OTB	Gear name: SINGLE BOAT BOTTOM OTTER TRAWL
Gear description: A cone shaped trawl that is towed on the seabed to target demersal fish. The mouth of the trawl is held open by a pair of trawl doors (otter boards). The net is predominately made from HDPE netting in various thicknesses. During construction the netting is lashed to the frame ropes (Headline, footrope and wing lines) usually with a nylon (PA) twine.	
Illustration of gear taxon :	



A Single Boat Bottom Otter Trawl

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
The body of the trawl	*HDPE*	*85%*	*2*
The cod end of the net	*HDPE*	*10*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})
Body of the net	*4-5*
Cod end	*0.75 – 1.25*

Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)

Floats (floats will often be reused)	*PS (polystyrene) or ABS (acrylonitrile-butadiene-styrene)*	*6*
Headline and footrope	*HDPE*	*2*
Chafing/ rubbing ropes	*PP*	*5*
Strengthening netting sections, lashing netting to the ropes etc	*PA*	*2*

Comments

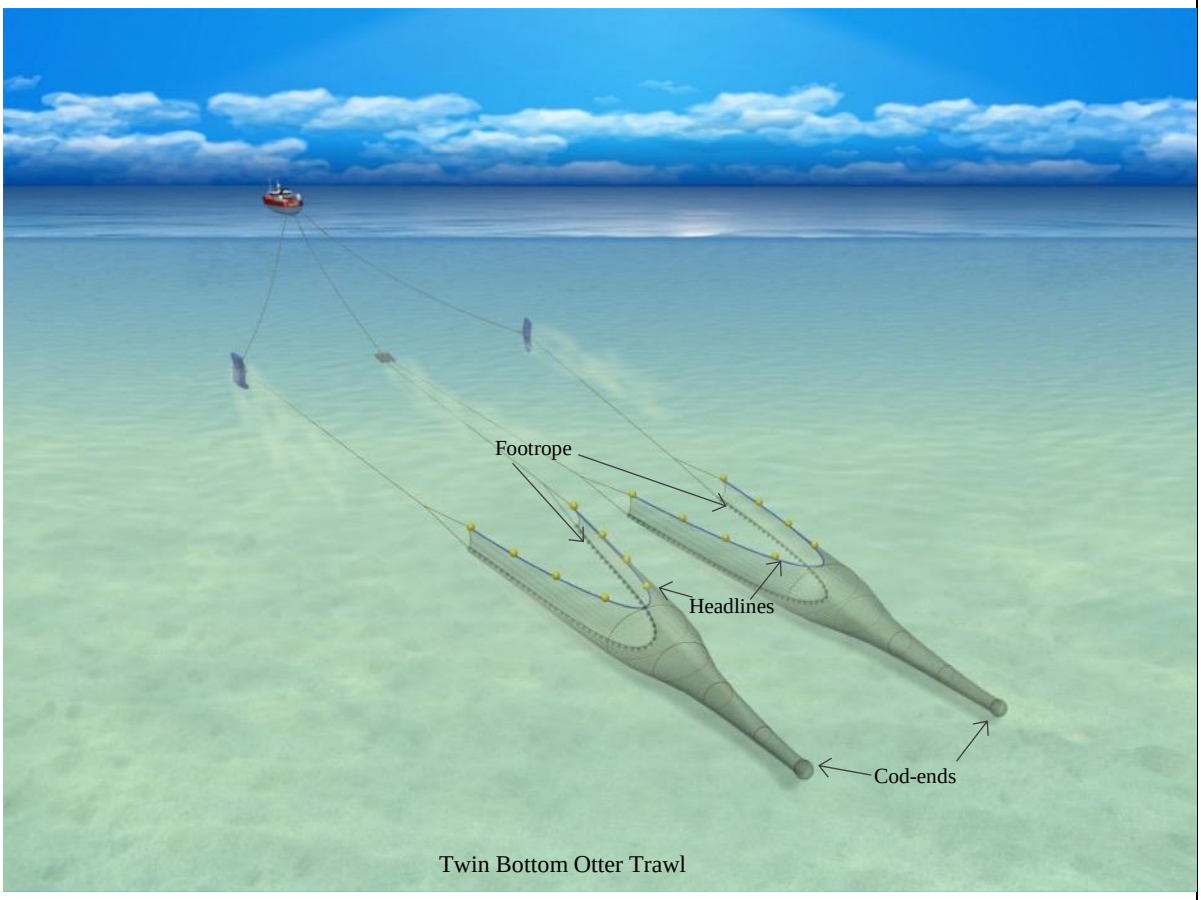
Almost all the netting in modern demersal trawls is made with PE. The thickness (therefore the weight) usually increases in the cod end and extension.

The headline and footropes are usually made using a combination rope. This is a combination of PE rope intertwined with strands of steel wire. This makes it difficult to separate for recycling at present.

The frame ropes (headline, footrope, wing lines etc) can be made from any strong rope often ranging from nylon (PA), Polyethylene, combination of HDPE and wire to HMPE (High Modulus PE)). Where HMPE is used, at the end of life for the trawl, it is often reused for other parts of the trawl gear.

Many headlines and footropes are wrapped with polypropylene rope to save wear and chafe on them from contact with the vessel and seabed.

Gear sector: FISHERIES	
Gear group: TRAWLS	
Gear code: OTT	Gear name: TWIN BOTTOM OTTER TRAWL
Gear description: A cone shaped trawl that is towed alongside a similar trawl to make them 'twin trawls'. Twin rig trawls are generally used to target fish and shellfish that live on or close to the seabed.	
Illustration of gear taxon :	



Twin Bottom Otter Trawl

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
The body of the trawl	*HDPE*	*85%*	*2*
The cod end of the net	*HDPE*	*10*	*2*
Replacement rate			

Gear component	Replacement rate (year^{-1})	
Body of the net	*3*	
Cod end	*0.75 – 1.25*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
floats	*PS (polystyrene) or ABS (acrylonitrile-butadiene-styrene)*	*6*
Headline and footrope	*HDPE/wire*	*none*
Strengthening netting sections, lashing netting to the ropes etc	*PA*	*2*

Comments

Twin bottom trawls are usually made with PE netting. The thickness (therefore the weight) usually increases in the cod end and extension.

The headline and footropes are usually made using a 'combination' rope. This is a combination of PE rope intertwined with strands of steel wire. This makes it difficult to separate for recycling at present. All the frame ropes (headline, footrope, wing lines etc) can actually be made from any strong rope often ranging from nylon (PA), Polyethylene, combination of HDPE and wire to HMPE (High Modulus PE). Where HMPE is used, at the end of life for the trawl, it is often reused for other parts of the trawl gear. There are regional differences in materials used to suit the particular fishery.

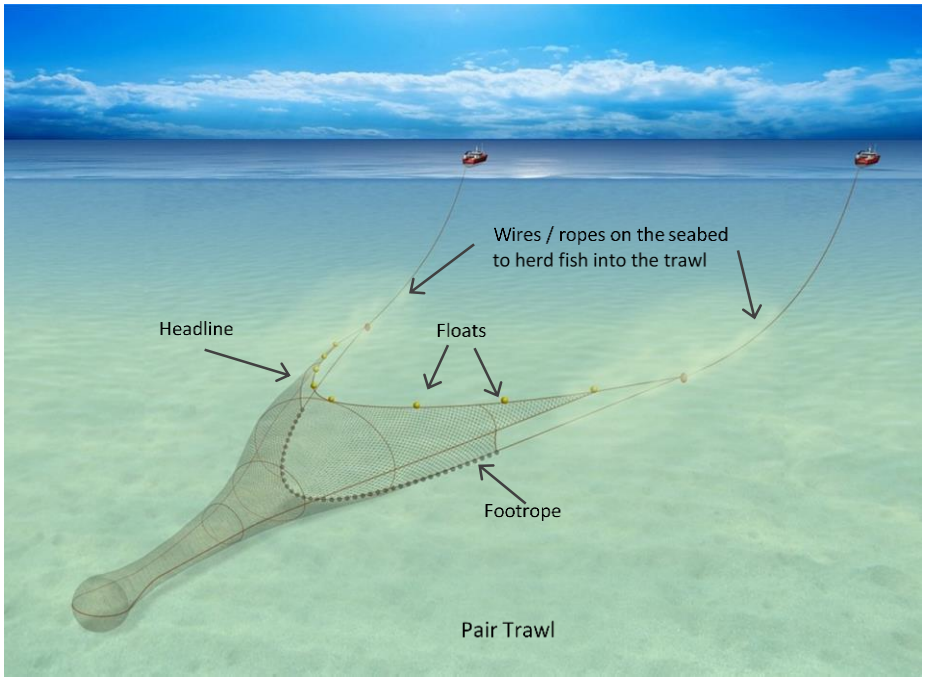
Many headlines and footropes are wrapped with polypropylene rope to save wear and chafe on them from contact with the vessel and seabed.

Because many of these nets are towed over muddy sea beds, the cod ends do not last very long as the netting gradually gets impregnated with mud and sand. This causes the meshes to shrink, often making them below minimum mesh size.

The whole of the bottom netting gets impregnated with mud and sand and this could be a problem when trying to recycle the netting.

These trawls are made to withstand the rigours of being towed along the seabed and a very robust in construction. Therefore dismantling at end of use can be a costly and time consuming exercise.

Gear sector: FISHERIES	
Gear group: TRAWLS	
Gear code: PTB	Gear name: BOTTOM PAIR TRAWL
Gear description: A cone shaped trawl that is towed between two vessels to target demersal fish on or close to the seabed. The net is predominately made from HDPE netting in various thicknesses. During construction the netting is lashed to the frame ropes (Headline, footrope and wing lines) usually with a nylon (PA) twine.	
Illustration of gear taxon :	



Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
The body of the trawl	*HDPE*	*85%*	*2*
The cod end of the net	*HDPE*	*10*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})
Body of the net	*4-5*

Cod end	*0.75 – 1.25*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Wires /ropes between net and trawl	*PE*	
Floats (floats will often be reused)	*PS (polystyrene) or ABS (acrylonitrile-butadiene-styrene)*	*6*
Headline and footrope	*HDPE*	*2*
Chafing/ rubbing ropes	*PP*	*5*
Strengthening netting sections, lashing netting to the ropes etc	*PA*	*2*

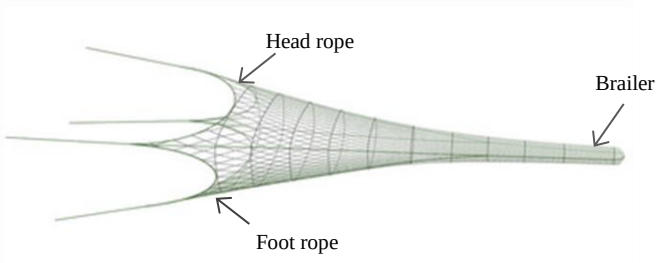
Comments

Almost all the netting in modern demersal pair trawls is made with PE. The thickness (therefore the weight) usually increases in the cod end and extension. The cables or wires between the vessel and the trawl are often made from a combination of PE rope and steel wire, the headline and footropes are usually made from a similar but lighter combination rope. This is a combination of PE rope strands intertwined with strands of steel wire. This makes it difficult to separate for recycling at present. This is particularly relevant in pair trawl due to the long lengths of this material used.

The frame ropes (headline, footrope, wing lines etc) can also be made from any strong rope often ranging from nylon (PA), Polyethylene, combination of HDPE and wire to HMPE (High Modulus PE). Where HMPE is used, at the end of life for the trawl, it is often reused for other parts of the trawl gear.

Many headlines and footropes are wrapped with polypropylene rope to save wear and chafe on them from contact with the vessel and seabed.

The vessels move forward through the water about 500metres apart with each towing one side of the trawl to keep it open horizontally. The actual net is very similar in design to a single otter trawl but is towed with 400 to 100 metres of cables between each boat and the net. The section of this cable closest to the trawl trails on the seabed slowly herding demersal fish into the path of the trawl. This enables the gear to sweep a much wider area of seabed than a single otter trawl.

Gear sector: FISHERIES	
Gear group: Trawls	
Gear code: OTM	Gear name: Single Boat Midwater Otter Trawl
Gear description: This is a cone shaped net that is towed in midwater to target pelagic fish. The trawl has very big meshes in the mouth getting smaller as it tapers towards the cod end. The net is towed by one boat using a pair of pelagic trawl doors to open the net.	
Illustration of gear taxon : 	

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Body of the net	*PA*	*75%*	*2*
Brailer	*PA*	*20%*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})
Body of the net	*5*
Brailer	*1*

Ancillary equipment containing plastic

Designation	Plastic type	Recyclability (RIC)
Headline	*PA /HMPE*	*2*
Footrope	*PA / HMPE*	*2*

Comments

Pelagic trawls have traditionally been made of Nylon (PA)

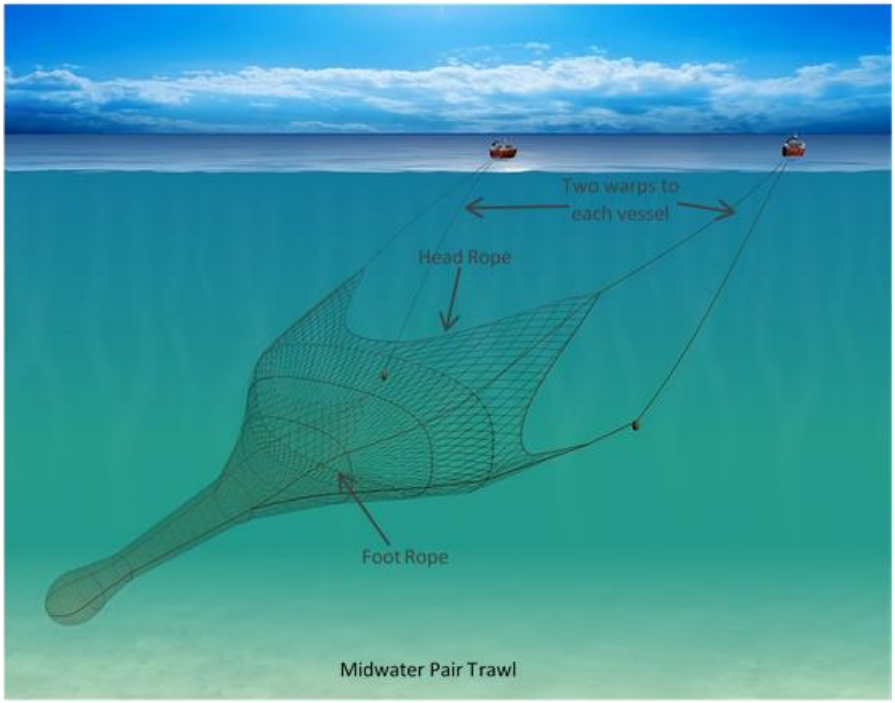
Modern self-spreading ropes used in the fore parts of the trawl may include PE twines.

Many pelagic fisheries are seasonal, therefore a net may last 5 -7 years but has only been fished for about 2 months of each year.

The brailer is a heavier section of smaller mesh to collect the catch in. Because of the extra wear and strain on this section it will be replaced more often than the whole net.

Gear sector: FISHERIES	
Gear group: Trawls	
Gear code: PTM	Gear name: Midwater Pair Trawl
Gear description: In this fishing method, one pelagic trawl, similar in shape to a single midwater trawl, is towed between two vessels to target pelagic fish. The net is towed in mid water and its height below the surface can be altered by changing the wrap length and / or the vessel speed.is a cone shaped net that is towed in midwater to target pelagic fish. The trawl has very big meshes in the mouth getting smaller as it tapers towards the cod end.	

Illustration of gear taxon :



Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Body of the net	*PA*	*75%*	*2*
Brailer	*PA*	*20%*	*2*

Replacement rate

Gear component	Replacement rate (year^{-1})
Body of the net	*5*

Brailer	*1*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Headline	*PA /HMPE*	*2*
Footrope	*PA / HMPE*	*2*

Comments

Pelagic trawls have traditionally been made of Nylon (PA) The netting is lashed to the headline and footrope with nylon (PA) twine.

Modern self-spreading ropes used in the fore parts of the trawl may include PE twines.

Many pelagic fisheries are seasonal, therefore a net may last 5 -7 years but may have only been fished for about 2 months of each year.

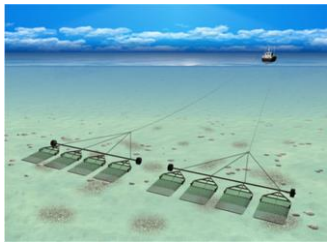
The brailer is a heavier section of smaller mesh to collect the catch in. Because of the extra wear and strain on this section it will be replaced more often than the whole net.

More easily recycled than many fishing gears as the entire net is usually in PA with minimum if any ground gear to remove. The end material will need less cleaning as the net should not have been on the seabed to get impregnated with sand and silt.

Gear sector: FISHERIES	
Gear group: DREDGES	
Gear code: DRB	Gear name: Towed dredges
Gear description: A rigid steel structure used to target shellfish. It usually has a collecting bag made of chain mail or netting or a mixture of these two. The only plastic content is the polyethylene netting on top of the collecting bag	

Illustration of gear taxon:

A scallop dredge showing the upper green netting cover.



Scallop dredges being towed 4 a side

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Topside of collection bag	*HDPE*	*4%*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})

Cover of collection bag	*0.5*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
None		
Comments There are many different styles of dredges. This is a king scallop dredge. Most dredges are of a similar design to this in that they have a rigid steel framework with a collection bag behind it. This bag is often made or partly made of plastic (PE) netting. The rest of the dredge being steel. The plastic content in most dredges is very small.		

Gear sector: FISHERIES	
Gear group: Dredges	
Gear code: DHR	Gear name: Hand dredges
Gear description: These are small lightweight dredges that are used to rake shellfish out of the seabed usually in intertidal areas. They can be as simple as a garden rake to bring the shells to the surface and they are then collected by hand or raked into a small hand net. Some are more complex rake like structures with a collecting bag that are dragged along the mudflats and may need two people to operate them. The rake would be of steel, the only plastic used in most fisheries would be a small section of netting for the collecting bag	
Illustration of gear taxon : Difficult to get a sensible picture. Each fishery has its own version of a rake to lift the shellfish to the surface.	

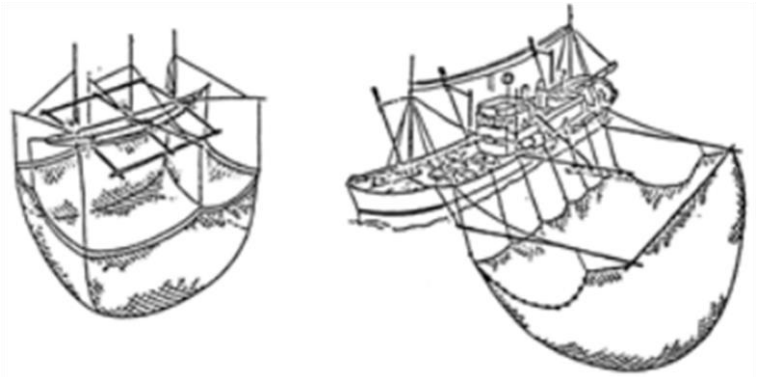
Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Small netting bag	*PA braided nylon*	*100%*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})
Small netting bag	*0.5 – 1.5*

Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Possibly plastic baskets for transporting shells in.	*PS*	*6*
Comments Not much plastic content in most hand dredges unless they have a netting bag behind the rake or for raking the shells into.		

Gear sector: FISHERIES	
Gear group: Lift Nets	
Gear code: LNB	Gear name: Boat-operated lift nets
Gear description: Lift nets consist of a horizontal panel of netting panel or a pyramids shaped with the opening facing upwards. These gears comprise of bag nets and blanket nets. The nets are submerged to a certain depth, left for a certain time to allow the bait or light to attract fish over the opening, then lifted out of the water. There are three main types, portable hand lift nets, shore operated lift nets and boat operated lift nets.	

Illustration of gear taxon :



Two types of boat operated lift nets

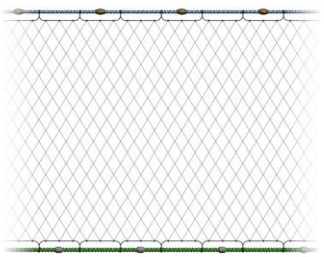
Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Netting	*PA or HDPE*	*95%*	*2*
Frame ropes	*HDPE*	*5%*	*2*

Replacement rate		
Gear component	Replacement rate (year^{-1})	
Netting	*2-4*	
Frame Ropes	*2-4*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Comments Lift nets are often used in small scale or artisanal fisheries. The material used for the netting will very much be what is available locally. The nets are usually using lights or bait to attract fish above them.		

Gear sector: FISHERIES	
Gear group: Gill Nets and Entangling Nets	
Gear code: GNS	Gear name: Set Gill Nets
Gear description: A gill net is a single panel of thin netting hung in the water like a curtain with a float line at the top and a weighted footrope or groundline at the bottom. The net is shot on the seabed or at a set distance above the seabed and kept in position by an anchor or weight at each end. Smaller vessels may use nets that are 100-300metres in length, larger vessels will use many kilometres of netting.	

Illustration of gear taxon :

A fleet of Gill Nets shot on the Seabed



Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Netting panels	*PA (monofilament)*	*70%*	*2*
Headrope / footrope.	*PA*	*15%*	*2*
Leaders and end ropes	*HDPE*	*15%*	*2*

Replacement rate

Gear component	Replacement rate (year^{-1})	
Netting	*0.75 - 1*	
Head rope / footrope	*3 -5*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Headrope with polystyrene pellets in the centre		*mixed*
Footrope with lead threaded through the centre		*mixed*

Comments

Most gillnets are made using nylon (PA) monofilament or multi monofilament netting. In some fisheries soft twisted nylon may still be used for the sheet netting. The relatively light weight netting is prone to damage just with everyday wear and tear therefore its common practice to replace the netting panels every 9 - 12 months. The headline and footrope are retained and may be used for as long as 5 years. Each time this is done there will be several kilos of lashing twine replaced.

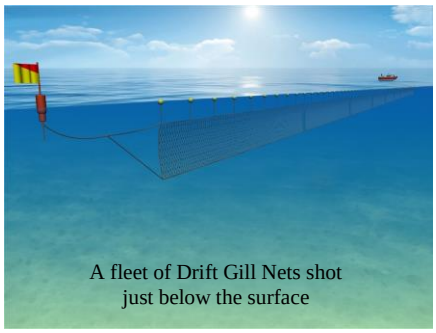
The headline can be braided nylon ropes with floats inserted in the centre or PE rope with floats attached. This will be in the region of 10 -16mm diameter.

The actual amount of PE in the end ropes will very much depend on the size of boat and the depth of water that the gear is fished in.

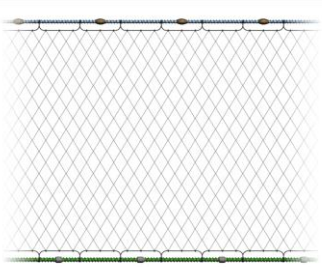
The footrope is generally a weighted rope, often braided nylon with a string of lead weights inserted through its length. Removing this lead can add extra work at its end of life disposal.

Gear sector: FISHERIES	
Gear group: Gill Nets and Entangling Nets	
Gear code: GND	Gear name: Drift Gill Nets
Gear description : A drift gill net is a single panel of thin netting hung in the water like a curtain maintaining this position by having a float line at the top and a weighted footrope or groundline at the bottom of the netting. A drifting gill net is rigged to float just below the surface or at a set distance below the surface and allowed to drift with the current to target pelagic fish. One end of the fleet of nets usually stays attached to the boat and the other has a large marker float on it.	

Illustration of gear taxon :



A fleet of Drift Gill Nets shot just below the surface



Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Netting panels	*PA (monofilament)*	*80%*	*2*
Headrope / footrope.	*PA*	*15%*	*2*
Leaders and end ropes	*HDPE*	*5%*	*2*

Replacement rate

Gear component	Replacement rate (year^{-1})
Netting	*1 - 2*

Head rope / footrope	*3 -5*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Headrope with polystyrene pellets in the centre	*PS*	*6*
Net floats	*EVA*	*7*
Marker buoys	*PVC*	*3*

Comments

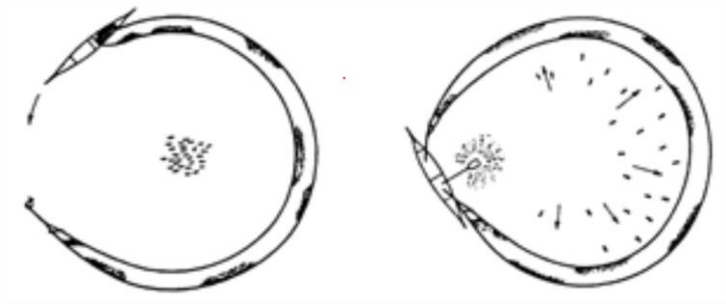
Most gillnets are made using nylon (PA) monofilament or multi monofilament netting. In some fisheries soft twisted nylon may still be used for the sheet netting. The relatively light weight netting is prone to damage just with everyday wear and tear therefore its common practice to replace the netting panels every 1 – 2 years depending on damage to the panels. The headline and footrope are retained and may be used for as long as 5. Each time this is done there will be several kilos of lashing twine replaced as well

The headline is often be braided nylon ropes with floats inserted in the centre or sometimes PE rope with floats attached. This rope will be in the region of 10 -16mm diameter.

The footrope is generally a weighted rope, often braided nylon with a string of lead weights inserted through its length. Removing this lead can add extra work at the gears end of life disposal.

Gear sector: FISHERIES	
Gear group: Gill Nets and Entangling Nets	
Gear code: GNC	Gear name: Encircling Gill Nets
Gear description : An encircling gill net is similar to other gill nets in that it is made up of a single panel of thin netting hung in the water like a curtain. In this fishery the net is shot in a circular shape, usually from a small boat.	

Illustration of gear taxon :



Layout of an encircling gill net.

Left- as the net is being shot around the shoal of fish.

Right-The other end of the net is picked up, the fish are encircled and they have started to scare the fish into the net

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)

Netting panels	*PA (monofilament)*	*80%*	*2*
Headrope / footrope.	*PA*	*15%*	*2*
Leaders and end ropes	*HDPE*	*5%*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})
Netting	*2-3*
Head rope / footrope	*3 -5*

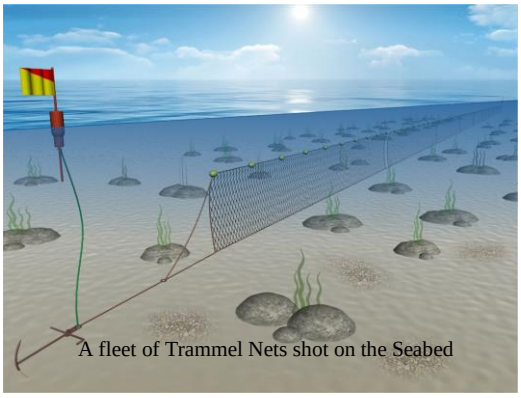
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Floats on the headline		*mixed*
Footrope with lead threaded through the centre		*mixed*
Plastic end floats		*mixed*

Comments

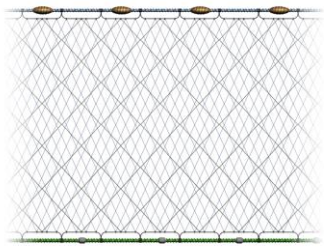
One end of the nets is shot away with a buoy on it, the vessel shoots the rest of the net as it encircles the shoal of fish and picks up the other end of the net. The fish are then chased into the meshes of the net and it will then be hauled. Originally these nets would have been made from soft twisted nylon and many of these may still be in use. Modern nets are more likely to be made with nylon monofilament or multi monofilament nets.

Gear sector: FISHERIES	
Gear group: Gill Nets and Entangling Nets	
Gear code: GTR	Gear name: Trammel nets
Gear description : Trammel nets are similar to gillnets but are made up of three layers of netting. The two outer layers of large mesh with a panel of smaller mesh sandwiched between them. As with gill nets they have floats on the head rope and a weighted footrope to hold the netting vertical in the water.	

Illustration of gear taxon :



A fleet of Trammel Nets shot on the Seabed



Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Netting panels	*PA (multi or monofilament)*	*70%*	*2*
Headrope / footrope.	*PA*	*15%*	*2*

Leaders and end ropes	*HDPE*	*15%*	*2*
Replacement rate			
Gear component		Replacement rate (year^{-1})	
Netting		*0.75 - 1*	
Head rope / footrope		*3 -5*	
Ancillary equipment containing plastic			
Designation		Plastic type	Recyclability (RIC)
Headrope with polystyrene pellets in the centre		*PS*	*6*
Net floats		*EVA*	*7*
Marker buoys		*PVC*	*3*

Comments

Nowadays most gillnets are made using nylon (PA) monofilament or multi monofilament netting. In some fisheries soft twisted nylon may still be used for the sheet netting. The two outer layers may be of different construction or material to the single inner layer.

The relatively light weight netting is prone to damage just with everyday wear and tear therefore its common practice to replace the netting panels every 9 - 12 months. The headline and footrope are retained and may be used for as long as 5 years. Each time this is done there will be several kilos of lashing twine replaced.

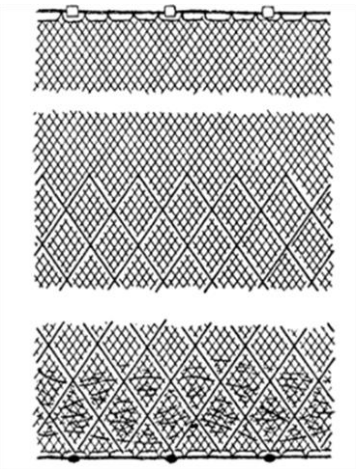
The headline can be braided nylon ropes with floats inserted in the centre or PE rope with floats attached. This rope will be in the region of 10 -16mm diameter.

The actual amount of PE in the end ropes will very much depend on the size of boat and the depth of water that the gear is fished in.

The footrope is generally a weighted rope, often braided nylon with a string of lead weights inserted through its length. Removing this lead can add extra work at its end of life disposal.

Gear sector: FISHERIES	
Gear group: Gill Nets and Entangling Nets	
Gear code: GTN	Gear name: Combined Gill Nets – Trammel nets
Gear description: This demersal gear consists of two sections, the upper section as a gillnet targeting higher swimming species, the lower section as a trammel net to target the species that live closer to the seabed. The gear follows the same format as other gill nets with floats on the head rope and a weighted footrope to hold the netting vertical in the water.	

Illustration of gear taxon :



Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Netting panels	*PA (monofilament)*	*70%*	*2*
Headrope / footrope.	*PA*	*15%*	*2*

Leaders and end ropes	*HDPE*	*15%*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})
Netting	*0.75 - 1*
Head rope / footrope	*3 -5*

Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Headrope with polystyrene pellets in the centre	*PS*	*6*
Net floats	*EVA*	*7*
Marker buoys	*PVC*	*3*

Comments

Most gill nets and trammel nets are made using monofilament or multi monofilament. The relatively light weight netting is prone to damage just with everyday wear and tear therefore its common practice to replace the netting panels every 9 - 12 months. The headline and footrope are retained and may be used for as long as 5 years. Each time this is done there will be several kilos of lashing twine replaced.

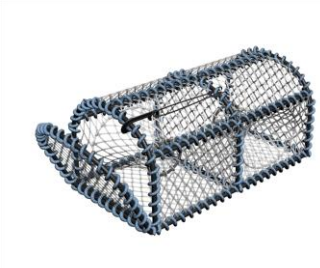
The headline can be braided nylon ropes with floats inserted in the centre or PE rope with floats attached. This rope will be in the region of 10 -16mm diameter.

The actual amount of PE in the end ropes will very much depend on the size of boat and the depth of water that the gear is fished in.

The footrope is generally a weighted rope, often braided nylon with a string of lead weights inserted through its length. Removing this lead can add extra work at its end of life disposal.

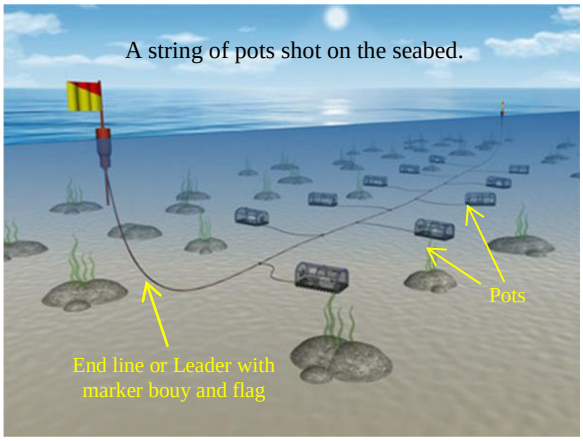
Gear sector: FISHERIES	
Gear group: Traps	
Gear code: FPO	Gear name: Pots
Gear description. Pots and traps are generally rigid structures into which fish, cephalopods or crustaceans are guided or enticed through funnels that make entry easy but from which escape is difficult. There are many different styles and designs, each one having been designed to suit the behaviour of its target species. Some pots are shot individually but more commonly in strings of anything from 4 to 100 pots.	
Illustration of gear taxon	

An inkwell style pot with a plastic entrance plastic frame and base (HDPE)



A nephrops pot wrapped with blue PE rope to minimise abrasion damage. The frame is of plastic coated steel covered with small mesh PE netting

'D' shaped pot often referred to as a 'creel' with two entrances and a parlour section.



A Plastic Whelk pot with a nylon (PA) netting entrance

Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
The netting	*HDPE*	*2-5%*	*2*
The frame (plastic frame)	*HDPE*	*30-50%*	*2*
Binding rope (if plastic)	*HDPE*	*8%*	*2*
Ropes and End lines(leader)	*HDPE*	*12%*	*2*
Replacement rate			
Gear component		Replacement rate (year^{-1})	
The netting and rubbing ropes		*2 - 4*	
Frame		*6 - 10*	
Ropes		*2 - 4*	
Ancillary equipment containing plastic			
Designation		Plastic type	Recyclability (RIC)
Pot Entrances(often made with PA netting)		*PA*	*2*
Marker buoys		*PVC*	*3*

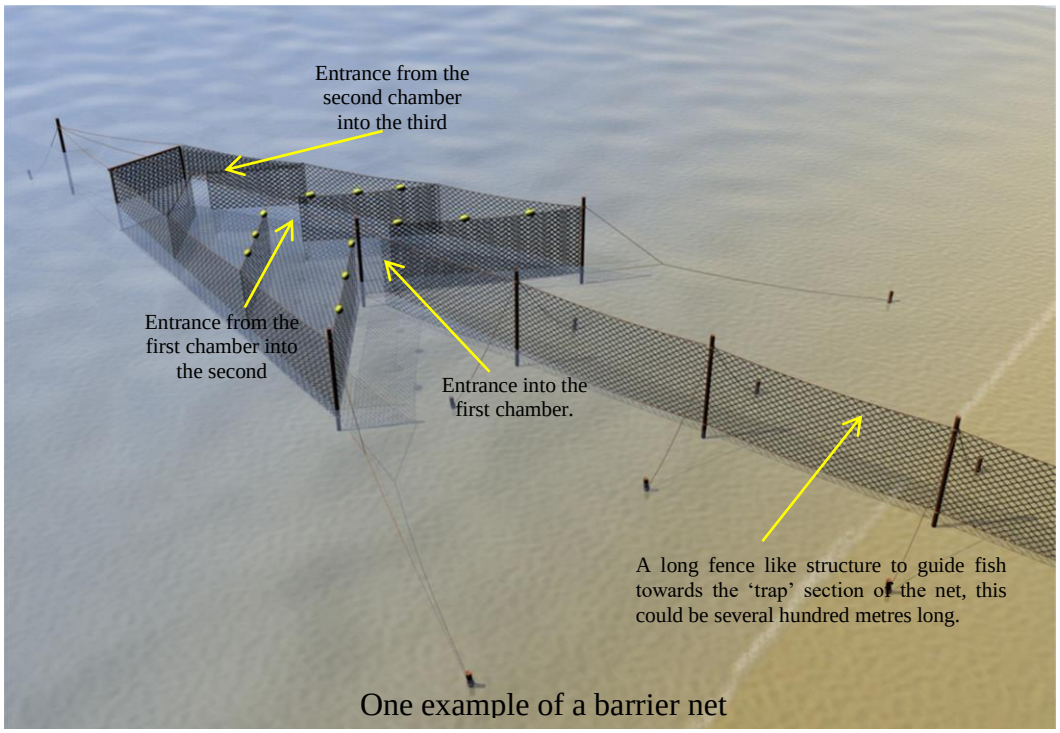
Comments

There are many different designs of pots used, each one evolved to suit the target species and each one with its own problems when it comes to end of life. Originally made from natural materials, all nowadays are made from a combination of steel and various forms of plastic and netting.

Inkwell styles tend to have a plastic (HDPE) base with an alkathene pipe frame (MDPE) covered with a double layer of HDPE netting. This is all protected from abrasion by wrapping the frame and base with either PE rope or more commonly strands of rubber. This results in a strong pot that lasts a long time but is very time consuming in dismantling it.

Other pots have their frame made from steel that is coated in plastic to prevent corrosion. Again covered in netting and wrapped with either PE rope or rubber strands.

Gear sector: FISHERIES	
Gear group: Traps	
Gear code: FWR	Gear name: Barriers, Fences, weirs, corrals, etc
Gear description: This group of traditional gears stared of by being made with stakes, branches, reeds etc which are all biodegradable. In some areas these materials are still used but often nowadays synthetic netting is used has been used instead of the natural products. These gears are usually fitted in tidal waters have a log 'fence' like structure to guide the fish into a narrow entrance into a large chamber. This leads them into one or two smaller chambers. All these chambers have an entrance that is easy to find and pass through but is difficult to find to escape from. The gears are usually set in one place for a whole season or for several months.	
Illustration of gear taxon :	



One example of a barrier net

Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Netting	*PA or HDPE*	*90%*	*2*
Frame ropes	*HDPE*	*5%*	*2*
Rigging ropes (stays etc)	*HDPE*	*5%*	*2*

Replacement rate

Gear component	Replacement rate (year^{-1})
Netting	*2-3*
Frame Ropes / rigging ropes	*3 -5*

Ancillary equipment containing plastic

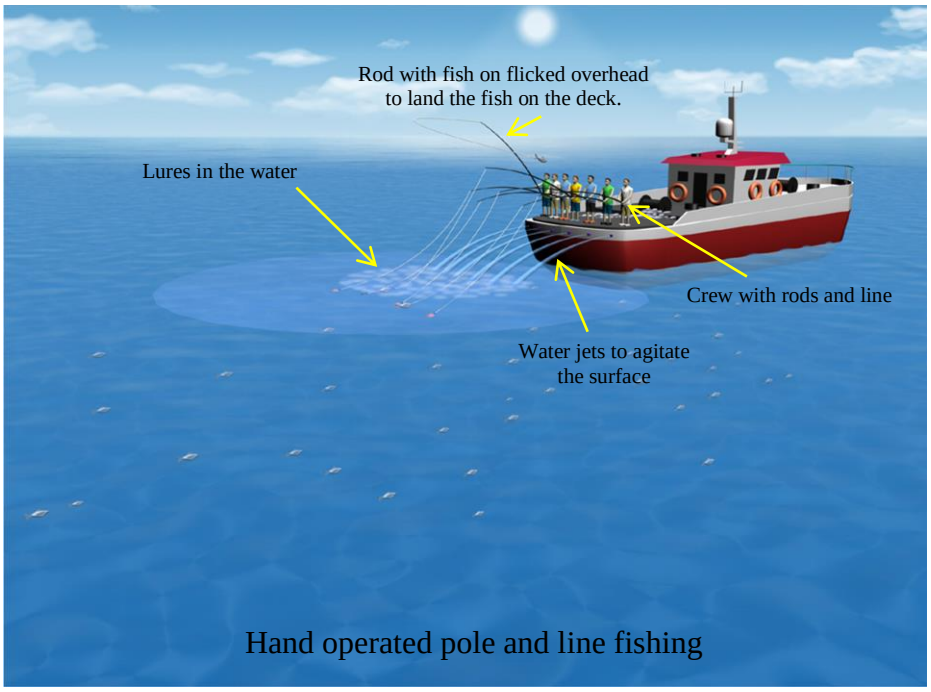
Designation	Plastic type	Recyclability (RIC)
There may be some plastic floats on some gears	*PS or EVA*	*6 / 7*

Comments

These gears are usually set from the shore to fish the intertidal area of estuaries and inland waters. This allows east access to remove catch as the tide ebbs. They are designed to target fish as they pass along the coast, either on a migratory route or route to regular feeding grounds. Largest example of traps in the EU are traps used to catch bluefin tuna when the migrate into the Mediterranean (known as *madragues*)

Gear sector: FISHERIES	
Gear group: Hooks and lines	
Gear code: LHP	Gear name: Handlines and hand-operated pole-and-lines
Gear description: Handlines may be used with or without a pole or rod. For fishing in deep waters the lines are usually operated using reels or frames to store the long length of line on. The bait may be artificial or natural. This gear type includes jigging with lines, operated by hand and used in small boats.	

Illustration of gear taxon :



Hand operated pole and line fishing

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Main line	*PA (monofilament) or braided HMPE or HDPE twine*	*95%*	*2*
Short side snoods or traces	*PA*	*5%*	*2*
Replacement rate			
Gear component		Replacement rate (year^{-1})	
Main line		*1 - 2*	
Snoods		*0.5 -1*	
Ancillary equipment containing plastic			
Designation		Plastic type	Recyclability (RIC)
Plastic lures		*various*	

Comments

Handlines come in many forms, some using rods, or poles, others operating the line by hand. Those used with some form of reel to store the line on will often use monofilament or braided HMPE line nowadays to minimise drag in the water. Those fisheries where the gear is still operated by hand will tend more towards polyethylene or nylon twines with a greater thickness to make them easier operated by hand.

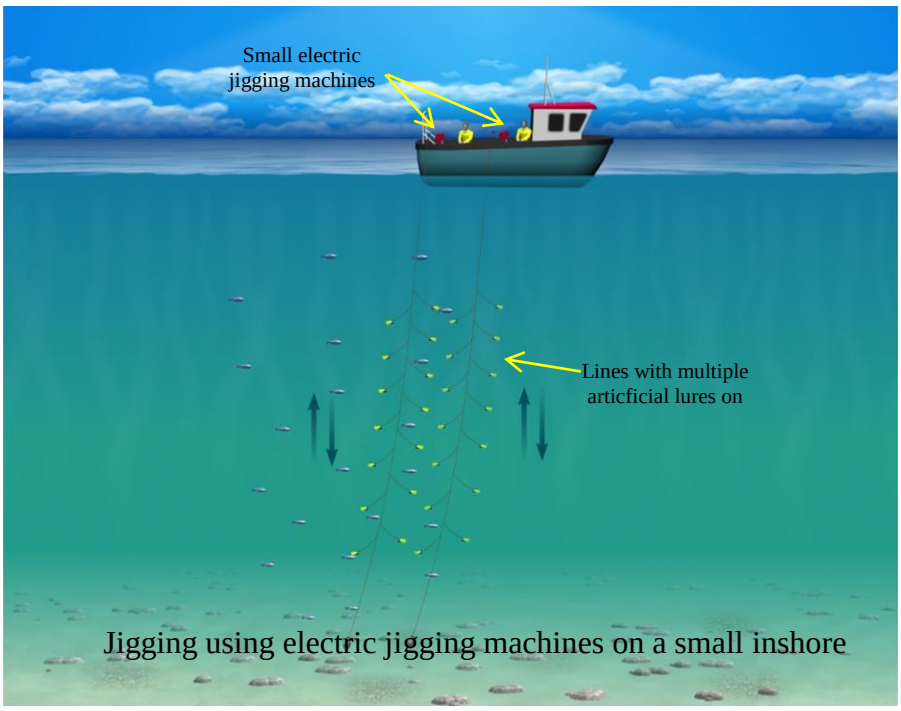
Some will use natural materials for bait but many use artificial lures to simulate small bait fish. These can be as simple as a bare shiny hook to multi coloured purpose built lures. The lures can be used individually or with multiple lures on one line. In some fisheries this can be as many as 20 lures on one line.

The lines should have a fairly long life but can be prone to lost by snagging on the seabed particularly if fishing close to the bottom over rough seabed.

The gear used in some of these fisheries can be very simple consisting of a simple line operated by hand or with a rod. Similar fisheries may well used mechanised lines for the same operation.

Gear sector: FISHERIES	
Gear group: Hooks and lines	
Gear code: LHM	Gear name: Mechanised lines and Pole and Lines
Gear description: Traditionally hand lines were worked by hand, but with the advent of compact electronic machinery for handing the lines many fisheries are developing into a mechanised hand line fishery. These can be used on all sizes of vessel. The introduction of compact jigging machines has resulted in even the very small vessels becoming mechanise. Pole -lines can also be mechanised, e.g. for tuna catching, with the pole movement being entirely automated.	

Illustration of gear taxon :



Jigging using electric jigging machines on a small inshore

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Main line	*PA (monofilament) or braided HMPE*	*95%*	*2*
Short side snoods or traces	*PA*	*5%*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})
Main line	*1 - 2*
Snoods	*0.5 -1*

Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Plastic lures	*various*	

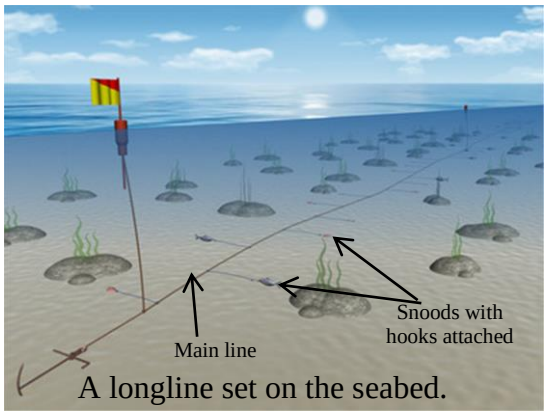
Comments

In the mechanised handlines it is common practice to use monofilament or braided HMPE for the main line.

Some may still use natural materials for bait but in the mechanised fisheries it is now more common to use artificial lures to simulate small bait fish. These can be as simple as a bare shiny hook to multi coloured purpose built lures. The lures can be used individually or with multiple lures on one line. In some fisheries this can be as many as 20 lures on one line.

The lines should have a fairly long life but can be prone to lost by snagging on the seabed particularly if fishing close to the bottom over rough seabed. In some of the mechanised fisheries there will be a reduction in life span of the main line due to the constant wear on the line when being hauled in and out and passing over pulleys etc.

Gear sector: FISHERIES	
Gear group: Hooks and lines	
Gear code: LLS	Gear name: Set Longlines
Gear description: Long lining can be used to target both pelagic and demersal fish with the lines being rigged and set at a position in the water column to suit the particular species. A basic long line consists of a long length of line, light rope or more common now is heavy nylon monofilament, the 'main line', this can be many miles in length depending on the fishery. To this main line, multiple branch lines with baited hooks on (snoods) are attached at regular intervals. This rig is set either on the seabed (demersal) or in midwater (pelagic) with a buoy at either end, and allowed to fish for a set period.	
Illustration of gear taxon :	

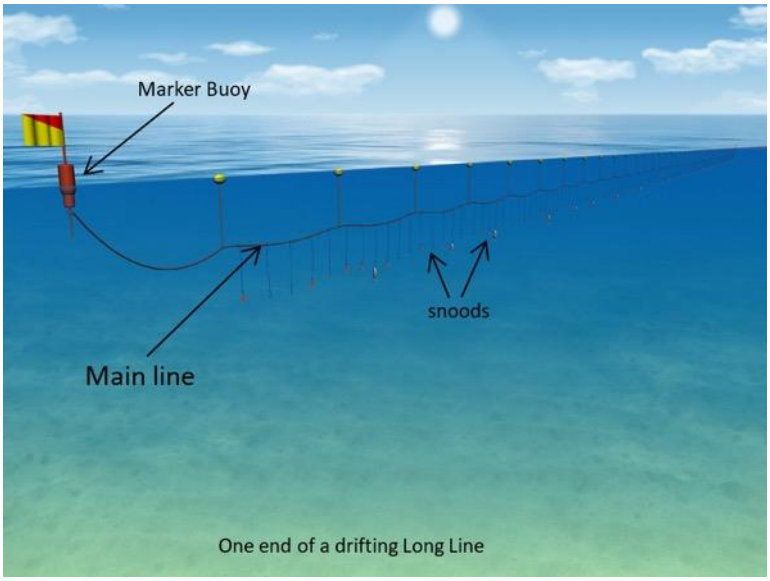


A longline set on the seabed.

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Main line	*PA (monofilament) or twisted PA*	*80%*	*2*
Snoods	*PA*	*15%*	*2*

Leaders and end ropes	*HDPE*	*5%*	*2*
Replacement rate			
Gear component		Replacement rate (year^{-1})	
Main line		*3 - 5*	
Snoods		*0.5 - 1*	
Leaders and end ropes		*1 -2*	
Ancillary equipment containing plastic			
Designation		Plastic type	Recyclability (RIC)
Marker buoys		*PVC*	*3*
Comments The larger vessels with automatic handling systems have moved on to monofilament main lines, many smaller vessels still work either twisted nylon for a main line or some of the newer PE /polyester combinations. Mostly the snoods will be of monofilament but some are still using the twisted nylon. One of the main problems with the lines is how easily it can snag on the seabed and break away from the vessel.			

Gear sector: FISHERIES	
Gear group: Hooks and lines	
Gear code: LLD	Gear name: Drifting Longlines
Gear description: This consist of a long main line, spaced along it are numerous snoods hanging down with baited hooks. The gear is shot in midwater often fairly close to the surface, its position being maintained by strops up from the mainline with floats at the top. The lines can be many kilometres long and are shot in open waters to target the larger pelagic fish. In some areas drifting lines may also be shot to hang vertically in the water column to target fish at different depths. The ends of the lines are marked on the surface with large buoys.	
Illustration of gear taxon :	

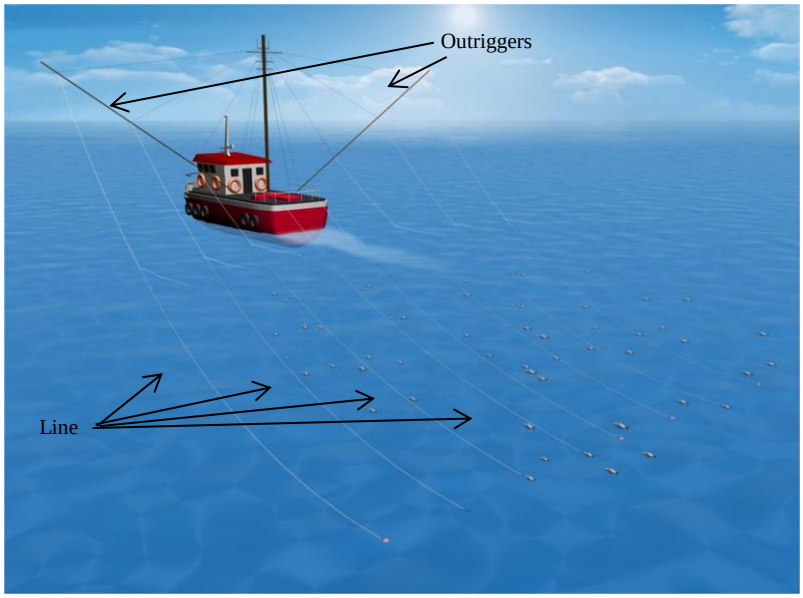


Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Main line	*PA (monofilament) or twisted PA*	*85%*	*2*
Snoods	*PA*	*10%*	*2*
Leader, end ropes, float ropes	*HDPE*	*5%*	*2*

Replacement rate	
Gear component	Replacement rate (year^{-1})

Main line	*3 - 5*	
Snoods	*1 - 2*	
Leaders and end ropes	*1 -2*	
Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Marker buoys	*PVC*	*3*
Comments The larger vessels with automatic handling systems have moved on to monofilament main lines, many smaller vessels still work either twisted nylon for a main line or some of the newer PE /polyester combinations. Mostly the snoods will be of monofilament but some are still using the twisted nylon.		

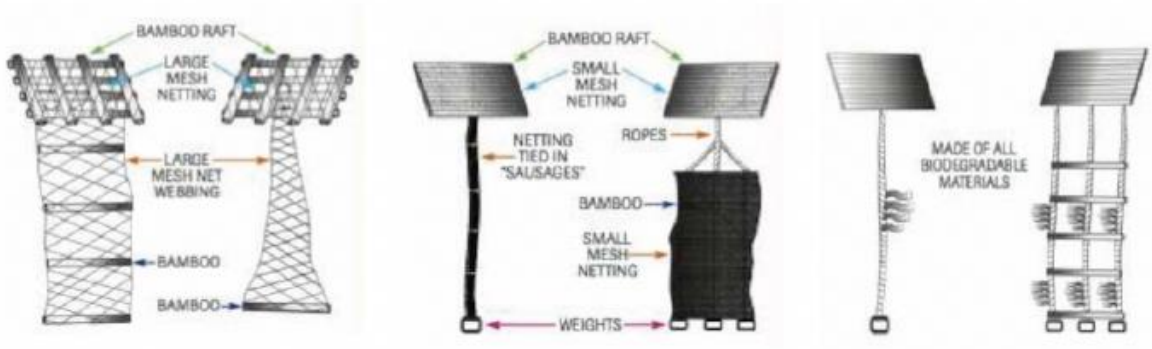
Gear sector: FISHERIES	
Gear group: Hooks and lines	
Gear code: LTL	Gear name: Trolling Lines
Gear description: Trolling is a method of fishing where the boat tows a line or lines with one or more hooks with a natural bait, or what is more common, an artificial lure on to target fish swimming in the upper layers of the water column. By using long outriggers from each side of the vessel they can work multiple lines astern of the boat. The lines are generally monofilament nylon but braided HMPE may also be used.	
Illustration of gear taxon :	



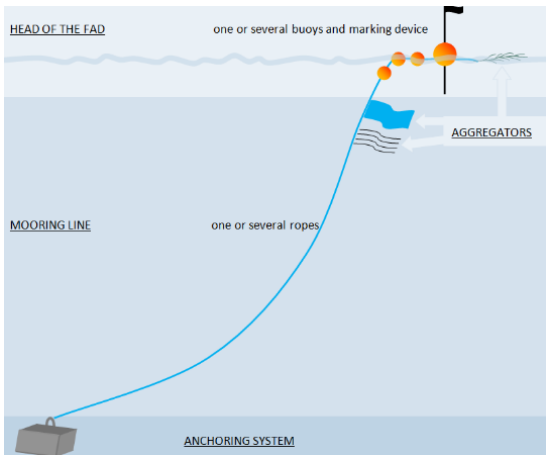
Trolling with eight lines.

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Main line	*PA (monofilament) or braided HMPE (PE)*	*100%*	*2*
Replacement rate			
Gear component		Replacement rate (year^{-1})	
Main line		*0.25 – 0.75*	
Ancillary equipment containing plastic			
Designation		Plastic type	Recyclability (RIC)
Comments Trolling is a fairly simple fishing gear from a end of life and recycling view in that only one material is used for the gear and can easily be replaced and dismantled at its end of life.			

Gear sector: FISHERIES	
Gear group: *none*	
Gear code: FAD	Gear name: Fish Aggregating Device (FAD)
Gear description : A fish aggregating device (FAD) is an artificial object anchored or drifting in the open ocean to attract fish. Fish attraction is ensured by aggregators hanged below the surface by buoys / rafts	



Examples of drifting FADs[(a)]



Example of a moored FAD [b]

Plastic content of gear and recyclability			
Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Aggregator (drifting FAD)	*Nylon (PA 6 HD)(1)*	*100%*	*PA*
Aggregator (moored)	*PE(2)*	*100%*	*2*

Replacement frequency	
Gear component	Replacement frequency (year^{-1})
Aggregator (drifting FADs)	*1 – 2*
Aggregator (moored FADs)	*0.5*

Ancillary equipment containing plastic		
Designation	Plastic type	Recyclability (RIC)
Mooring rope (moored FADs)	*PP (bottom floating rope)* *PA (surface sinking rope)*	
Surface buoys (moored FADs)	*PVC / EVA*	

Comments

(1) Meshed aggregators most used for drifting FADs are mostly pieces of reformed purse seine nets made of high tenacity nylon (PA 6)

(2) Aggregators used for moored FADs vary. Most frequent a pieces of reformed trawl gear made of PE and/or polypropylene strapping

Note that there is a trend now to use biodegradable material (=cotton) for the drifting FAD's aggregators.

RFMOs impose use on non-entangling FADs meaning that the pieces of netting used to assemble the raft are not used anymore.

References:

(a) ISSF (2015). Guide for non-entangling FAD

(b) CRFM et al. (2015) Manual of best practices in fisheries that use moored fish aggregating devices (FADs). CRFM Special Publication n°6

Gear sector: AQUACULTURE	
Gear group: Managed grow-out sites for organisms reared from fry, spat and juveniles[53]	
Gear code: n/a	**Gear name**: Poles, ropes and net bags for molluscs
Gear description : Shellfish (mainly bivalves such as mussels, oysters and scallops) farmed using structures resting on the seabed that keep the stock clear of the bottom. These structures are usually simple trestles but rely upon plastic bags to contain the shellfish and protect them from predators and adverse environmental conditions. These small-mesh bags are regularly turned and may be exchanged for those with larger meshes as the animals grow and periodic grading takes place.	

Illustration of gear taxon :

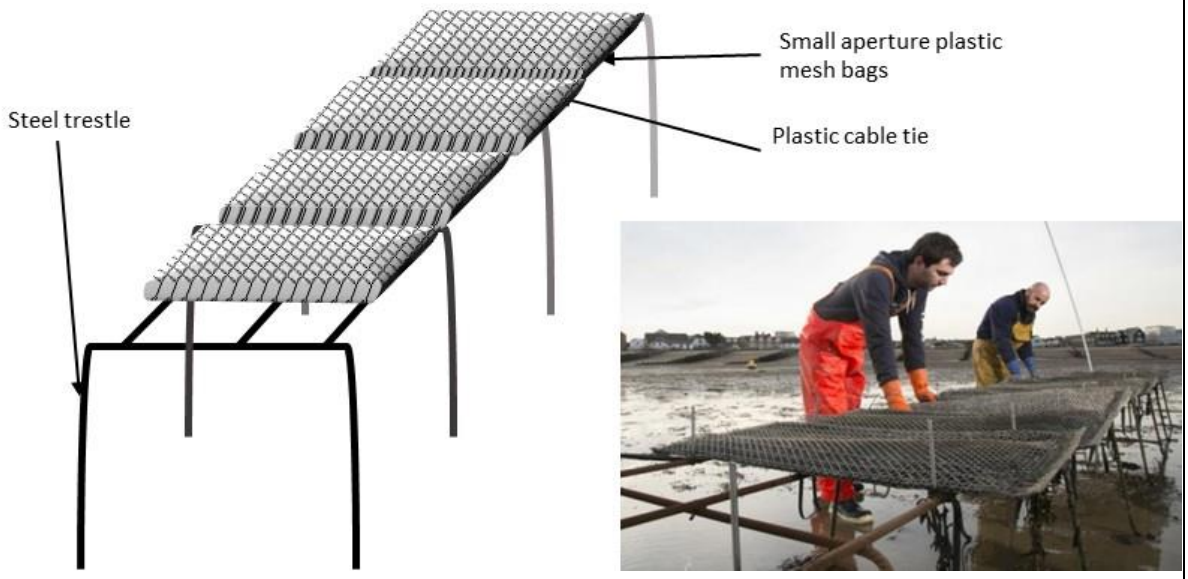


Photo: Marine & Risk Consultants, 2017[54]

Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Mesh shellfish bag	High density polyethylene (HDPE)	>99%	2
Cable tie	Nylon (PA)	<1%	7

Replacement frequency

Gear component	Replacement frequency (year^{-1})

[53] http://www.fao.org/3/a-bt964e.pdf

[54] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/697651/17UK1322_MCA_WhitstableOyster_NRA_-_Issue_02.pd.pdf

Mesh shellfish bag	1 – 5 years	
Cable tie	1 year	
Ancillary equipment containing plastic		
Designation	**Plastic type**	**Recyclability (RIC)**
None	None	none
Comments Oysters are grown from spat through to market size in bags on trestles. The bags are turned frequently, usually a minimum of low water on every spring tide, to promote even growth and prevent the build-up of seaweed, silt and other fouling on the bags. They are changed regularly to larger meshes, to allow grading, thinning, predator removal and to promote water flow. Sometimes wooden trays covered in mesh are used instead of bags.		

Gear sector: AQUACULTURE	
Gear group: Managed grow-out sites for organisms reared from fry, spat and juveniles	
Gear code: n/a	**Gear name**: Poles, ropes and net bags for molluscs
Gear description : Traditional method often employed on the Atlantic French coast to farm mussels. Wooden poles are driven into the inter-tidal zone and a mussel-spat encrusted rope strung in a spiral fashion. These ropes often threaded within a 'sock' of plastic mesh that protects the mussels from strong tides, currents and waves. The poles may also have a plastic cone or barrier at the base to prevent crabs from predating on the growing mussels.	

Illustration of gear taxon :

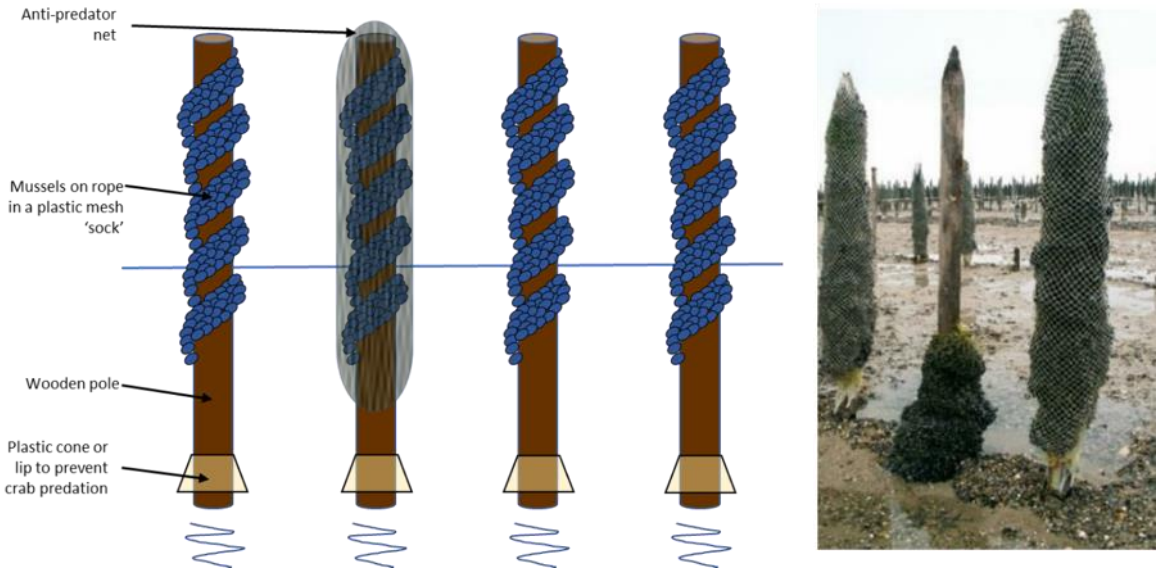


Photo: Hégron Macé *et al*, 2017 [55]

Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Mesh shellfish bag	Polypropylene (PP)	35%	5
	Polyethylene (PE)		2
	Nylon (PA)		7
Rope	Polypropylene (PP)	60%	5

[55] Hégron Macé, L., S. Moal, B. Thomas, T. Lefèvre, A. Raingué & L. Bélard (2017). Sous-produits et déchets plastiques des filières pêche, conchyliculture et algues en Normandie : Potentiels de valorisation en plasturgie. Report by SMEL, IVAMER & NaturePlast. 238 pp.

	Polyethylene Terephthalate (PET, PETE)		1
	Nylon (PA)		7
Anti-predator net	High density polyethylene (HDPE)	3%	2
	Polypropylene (PP)		5
Anti-crab guard	Polyethylene Terephthalate (PET, PETE)	2%	1

Replacement frequency

Gear component	**Replacement frequency (year^{-1})**
Mesh shellfish bag	1 - 2 years
Rope	1 – 2 years
Anti-predator net	1 – 2 years
Anti-crab guard	5 years

Ancillary equipment containing plastic

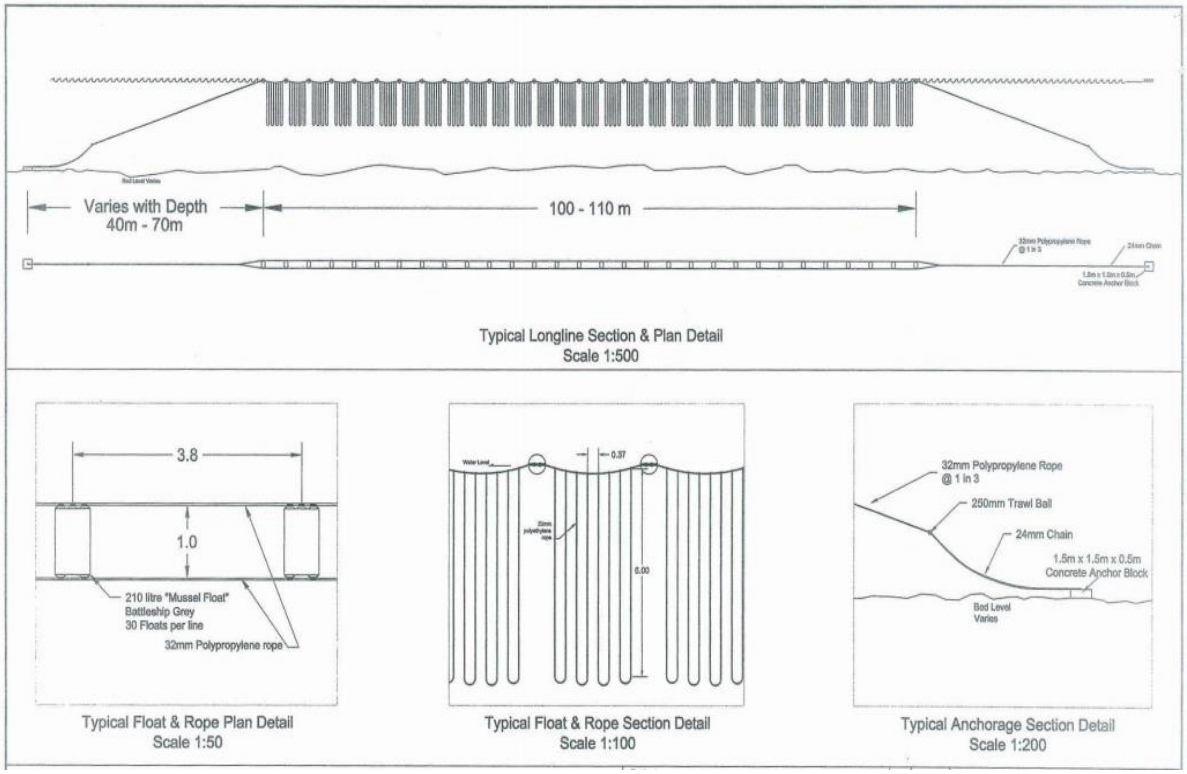
Designation	**Plastic type**	**Recyclability**
None	None	none

Comments

Mussels settle on ropes hung out horizontally in the water for a short period when spat are settling. Once seeded, these are then strung in a spiral fashion around a vertical pole. These are features common to rope-grown suspended mussels, but unlike these, bouchot mussels are 'trained' by tidal exposure to close tightly when out of water. They therefore have a much longer shelf-life than rope-grown mussels.

Gear sector: AQUACULTURE	
Gear group: Managed grow-out sites for organisms reared from fry, spat and juveniles[56]	
Gear code: n/a	**Gear name**: Poles, ropes and net bags for molluscs
Gear description : Shellfish (mainly bivalves such as mussels, oysters and scallops) farmed using 'collector' ropes suspended from a floating (buoyed) surface longline or raft. Long (6 – 10 m) loops of rope are suspended from a surface longline of around 100 m in length, which are usually arranged in groups of longlines in clusters, which are usually marked for navigational purposes. In Galicia in Spain the surface longlines are replaced by rafts. These have traditionally been made of wood but are being increasingly replaced with plastic.	

Illustration of gear taxon :



Source: Department of Agriculture, Food and the Marine (undated). Aquaculture Marine Shellfish Longlines. Available from https://www.agriculture.gov.ie/media/migration/seafood/aquacultureforeshoremanagement/aquaculturelicensing/shellfishlicences/cork/bantrybay/AQ598T553N6FastnetMusselsLtd280514.pdf

Plastic content of gear and recyclability

[56] http://www.fao.org/3/a-bt964e.pdf

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Raft (plastic)	High Density Polyethylene (HDPE)	73%	2
Ropes	Polypropylene (PP)	20%	5
	Polyethylene Terephthalate (PET, PETE)		1
	Nylon (PA)		7
Buoys	Polyethylene (PE) shell	5%	2
	Polystyrene foam (EPS) floatant	1%	6

Replacement frequency

Gear component	Replacement frequency (year^{-1})
Raft	10 - 15 years
Ropes	5 years
Buoys	10 - 15 years

Ancillary equipment containing plastic

Designation	Plastic type	Recyclability
Mussel socking[57]	Film polyethylene	2

Comments

Nursery rearing as well as grow-out can be accomplished on longlines. Trays, tube modules and bags or cages can be hung in deep water for nursery rearing of clams, oysters or scallops. Seeded lines or socks (with adequate predator protection) are commonly suspended from longlines. Scallops are frequently grown-out on sunken longlines, in suspended lantern nets, or ear-hung directly on a down-line.

Layout of a longline system depends on site characteristics. The most significant feature, from a security and stability perspective, is availability of shore to anchor one end of the

[57] Discontinuous longlines, with drop lines of 4.5m or so, most often use polyethylene socking, whereas the continuous longlines and mussel rafts most often use cotton socking or wrapping as socking material.

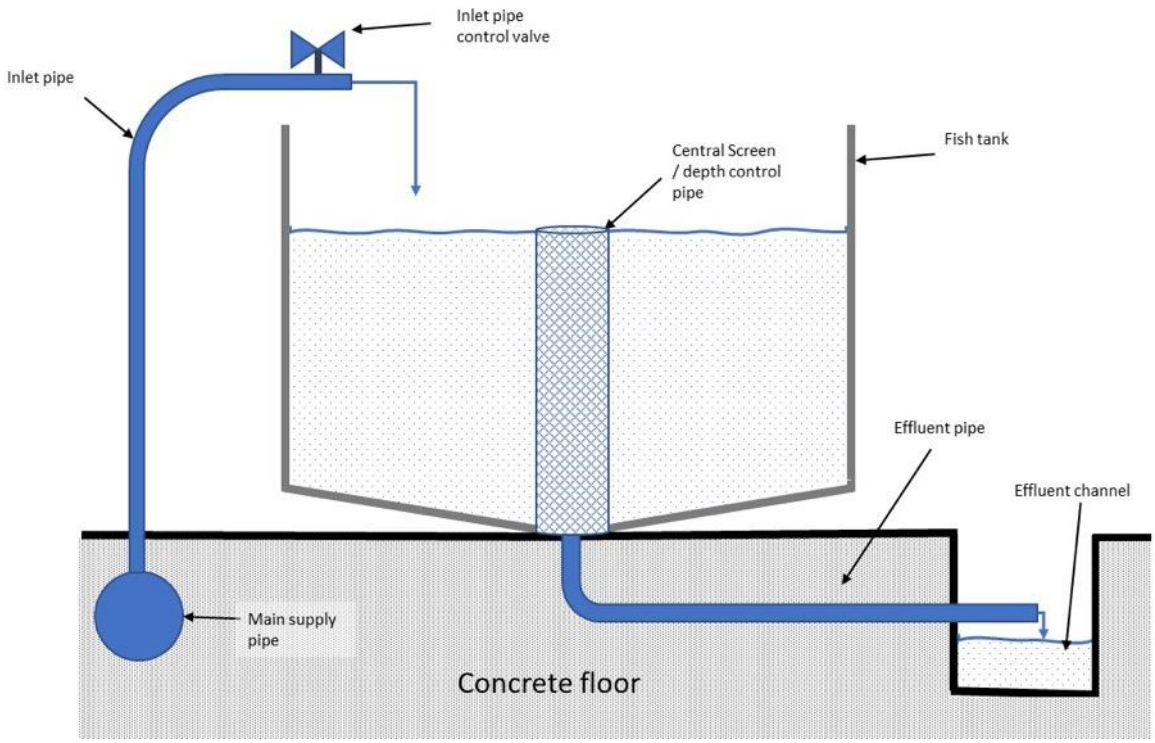
longline. In some locations, both ends can be fixed to the shore. Anchoring both ends in deep water may be done at sites where shore anchoring is not possible or desirable.

Rafts are traditionally made of wood but are being replaced with HDPE beams. Spanish manufacturer TEPSA state that this results in "*a much more flexible and light mussel raft which is more resistant to adverse sea conditions. In all the production obtained since its installation, the polyethylene mussel raft has proved to have 20% less cultivation loss (less shaking action on mussel ropes from waves) compared to other traditional wooden mussel rafts in its surroundings*"[58]. Raft systems must be securely anchored to prevent movement and/or drift. Rafts are usually roped together and securely tied at three points on each raft and then anchored at each end. Anchor ropes will sway in the currents and slacken at low tides.

[58] http://www.e-tepsa.com/floating-structures-aquaculture/?lang=en

Gear sector: AQUACULTURE	
Gear group: Managed grow-out sites for organisms reared from fry, spat and juveniles	
Gear code: n/a	**Gear name**: Tanks & Raceways
Gear description : Fish tanks are commonly made of plastic (HDPE or fibreglass) but can also be built from concrete and steel are frequently used in intensive aquaculture. A more recent development has been the incorporation of water filtration and re-use (termed as a 'recirculating aquaculture system' or RAS) that reduces the rate of water replacement. A raceway is a form of tank (often mainly made of concrete) with a long, linear configuration, a high water turnover rate, often used in a RAS system. Fish tanks and raceways depend upon a network of supply pipes, valves, screens and effluent pipes that are usually made of plastic.	

Illustration of gear taxon :



Plastic content of gear and recyclability

Gear component	Plastic type	Proportion weight	Recyclability (RIC)
Fish tank	High density polyethylene (HDPE)	35%	2
	Fibreglass		7

Pipework & valves	High density polyethylene (HDPE)	60%	2
	Polyvinyl Chloride (PVC)		3
	Acrylonitrile Butadiene Styrene (ABS)		7
	Polypropylene (PP)		5

Replacement frequency

Gear component	**Replacement frequency (year^{-1})**
Fish tank	10 - 15 years
Pipework & valves	5 - 10 years

Ancillary equipment containing plastic

Designation	**Plastic type**	**Recyclability**
None	None	none

Comments

Due to the ability to control water flow and quality, they are common holding facilities for hatcheries and nurseries but are also used for grow-out.

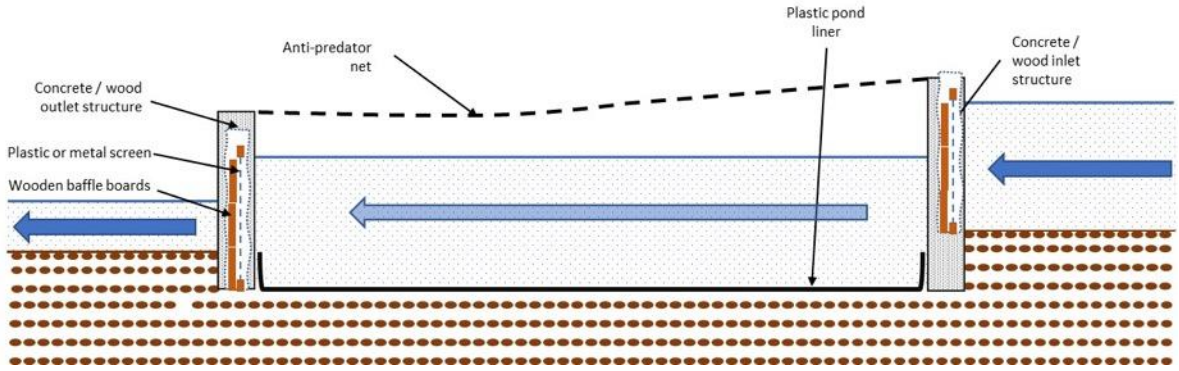
Gear sector: AQUACULTURE

Gear group: Managed grow-out sites for organisms reared from fry, spat and juveniles

Gear code: n/a	**Gear name**: Ponds

Gear description : Ponds are traditionally made of earth, but may have plastic pond liners, especially in sandier soils. Water inlets and outlets are usually concrete structures with baffle boards to control water levels but may have metal or plastic screens. Ponds may have an anti-predator net stretched over the top to keep piscivorous birds and mammals out of reach of the stock.

Illustration of gear taxon :



Plastic content of gear and recyclability

Gear component	**Plastic type**	**Proportion weight**	**Recyclability (RIC)**
Pond liner	High density polyethylene (HDPE)	35%	7
	Ethylene Propylene Diene Monomer rubber (EPDM). Derived from polyethylene (PE)		1
	Polyvinyl chloride (PVC)		7
Anti-predator net	High density polyethylene (HDPE)	3%	7
	Polypropylene (PP)		5

Replacement frequency

Gear component	**Replacement frequency (year^{-1})**

Pond liner (HDPE)	10 years
Pond liner (EPDM)	20 years
Pond liner (PVC)	5 years
Anti-predator net	5 years

Ancillary equipment containing plastic

Designation	**Plastic type**	**Recyclability**
None	None	none

Comments

Pond farming is a largely traditional, extensive form of aquaculture used for both finfish (e.g. cyprinids and salmonids such as rainbow trout) and crustaceans e.g. shrimp in coastal areas. Plastic use in pond farm structure is low, as most depend on the use of earth with a high clay content to reduce water leakage, but some may employ a plastic or rubber liner to reduce seepage, esp. in sandy soils.

ANNEX 6: METHODOLOGY FOR ASSESSING GEAR POTENTIAL FOR RECYCLABILITY

A scoring system has been used to assess gear potential for recyclability against three criteria as follows:

Recyclability criteria	Scoring scale
Mix of different plastics	1 (Low) to high (5)
Ease of disassembly	1 (easy) to 5 (very difficult)
Need for cleaning	1 (no need beyond desalting) to 5 (dirty, in depth cleaning needed)

Total score determines in which category the gear may be classified:

3 to 6 points: Easy recyclability

7 to 10 points: Medium recyclability

11 to 15 points: Poor recyclability

Results for each type of fishing and aquaculture gear is shown in the table below:

Gear	Mix of different plastics	Ease of disassembly	Need for cleaning	Score
Purse seines	2	3	2	7
Surrounding nets without purse lines	2	3	2	7
Beach seines	2	2	3	7
Beam trawls	5	5	5	15
Single boat bottom otter trawls	5	5	5	15
Twin bottom otter trawls	5	5	5	15
Bottom pair trawls	5	5	3	13
Single boat midwater otter trawls	5	5	2	12
Midwater pair trawls	5	5	2	12
Towed dredges	1	1	5	7
Boat-operated lift nets	3	3	2	8
Set gillnets (anchored)	2	2	1	5

Gear	Mix of different plastics	Ease of disassembly	Need for cleaning	Score
Drift gillnets	2	2	1	5
Encircling gillnets	2	2	1	5
Trammel nets	2	2	1	5
Combined gillnets-trammel nets	2	2	1	5
Pots	5	4	5	14
Barriers, fences, weirs, etc.	2	3	5	10
Handlines and hand-operated pole-and-lines	1	1	1	3
Mechanized lines and pole-and-lines	1	1	1	3
Set longlines	1	1	1	3
Drifting longlines	1	1	1	3
Trolling lines	1	1	1	3
Fish Aggregating device	2	3	5	10
Cages	3	2	4	9
Bags for off-bottom culture	1	1	4	6
Bouchot	3	2	4	9
Floating longline (rafts)	3	2	4	9
Tanks and ponds	2	4	4	10

ANNEX 7: AVERAGE PLASTIC DENSITIES

Table 18 Average densities for categories of plastic (kg/m3)

Plastic category & recyclability [1]	**Density (kg/m^3)** [2]	**Example gear uses** (see gear fiches in Annex 2)
Polyethylene Terephthalate (PET) 1	1,350	Ropes (e.g. net, culture lines or FAD mooring ropes)
High Density Polyethylene (HDPE) 2	955	Dyneema (Ultra-high molecular weight PE) Demersal Trawl nets (beam, bottom, pair) Fishing lines (longlines, rod & line) Pot nets and frames Dredge bags & shellfish culture bags Pond liner
Polyvinyl Chloride (PVC) 3	1,250	Marker buoys Pond liners
Low Density Polyethylene (LDPE) 4	930	FADs
Polypropylene (PP) 5	905	Ropes (e.g. net, culture lines or FAD mooring ropes)
Polystyrene (PS) 6	PS = 1,060 Expanded PS (EPS) = 20	EPS Floats Headrope contains EPS pellets Footrope may contain lead
Other 7 (except nylon – easy to recycle)	Nylon (PA) 1,150 Polycarbonate (PC) 1,210	PA Monofilament for lines and thin twine netting Pelagic trawl nets Seine nets Surrounding nets Cable ties FADs Not common in gear (marine glazing e.g. wheelhouse windows)

Source:
(1) https://www.which.co.uk/reviews/recycling/article/how-to-recycle-in-the-uk,
(2) www.engineeringtoolbox.com

ANNEX 8: STAKEHOLDERS CONSULTED

EU Level stakeholders

Organisation	Contact name	email
Regulators		
DG MARE	Alena Petrikovicova	Alena.PETRIKOVICOVA@ec.europa.eu
	Maris Stulgis	Maris.STULGIS@ec.europa.eu
	Iain Shepherd	Iain.SHEPHERD@ec.europa.eu
	Saba Nordstrom	Saba.NORDSTROM@ec.europa.eu
DG ENV	Anna Bobo-Remijn	Anna.BOBO-REMIJN@ec.europa.eu
	Olivier van den bergh	EPRs under waste directive
	Anna Cheilari	MSFD descriptor on marine litter
DG MOVE	Rikke Nielsen	Rikke.NIELSEN@ec.europa.eu
Eurostat	Hans Eduard Hauser	Hans-Eduard.HAUSER@ec.europa.eu
EMSA (Seafeseanet)	Maja Markovcic	Maja.MARKOVCIC@emsa.europa.eu
Industry representatives		
European Sea Ports Organisation (ESPO)	Sotiris Raptis	sotiris.raptis@espo.be
European Association of Plastics Recycling & Recovery Organisations (EPRO)	Peter Sundt	secretary@epro-plasticsrecycling.org
Plastics Recyclers Europe (PRE)	Antonino Furfari	antonino.furfari@plasticsrecyclers.eu
European Plastics Converters (EuPC)	Geofroy Tillieux	info@eupc.org
European Association of Rope, Twine and Netting manufacturers (Eurocord).	Philippe Verschueren, Koen Van Goethem	philippe.verschueren@eurocord.com koen.van.goethem@i-coats.be
NGOs		
Global Ghost Gear Initiative	Ingrid Giskes/Joel Baziuk	joelbaziuk@ghostgear.org
Seas at Risk	Frédérique Mongodin	fmongodin@seas-at-risk.org
	Marc Phillip buckhout	mpbuckhout@seas-at-risk.org
WWF	Andrea Stolte	andrea.stolte@wwf.de

World Animal Protection	Arian van Houwelingen	Houwelingen@worldanimalprotection.org
Coastwatch	Karin Dubsky	kdubsky@coastwatch.org
EIA	Christina Dixon	christinadixon@eia-international.org
Projects		
Blue Circular Economy	Stephen McCormack	stephenmccormack@wdc.ie
MARELITT Baltic	Vesa Tschernij	Vesa.tschernij@simrishamn.se
Plastic Blusters (Med)	Maria Cristina Fossi, Silvia Casini	plasticbusters@unisi.it
Circular Ocean (precursor to Blue Circular Economy)	Martin Charter	mcharter@ucreative.ac.uk
Fishing for Litter (KIMO)	Jan Joris Midavaine	

Member State stakeholders

Stakeholder category	Description
Gear Producers	*Article 3 (11) of the SUP directive - Gear manufacturers, assemblers, traders, wholesalers, importers of fishing and aquaculture gear (those who first place on the market fishing and aquaculture gear in their MS);*
Public authorities (SUP)	*Those who may be in charge of the implementation of measures foreseen under the Single Use Plastics Directive*
Public authorities (PRF)	*Those who may be in charge of the implementation of measures foreseen under the Port Reception Facilities Directive*
Port authorities or associations	*Those who will be required to provide (separate) collection facilities and report in relation to the SUP & PRF directives*
Gear users	*Fishing and aquaculture representatives*
Collection scheme operators	*Those running Fishing for Litter / End of Life / other waste collection schemes*
Waste collectors and recyclers	*Those collecting or receiving the waste fishing gear, aquaculture gear waste and passively fished waste*
Others	*Researchers, NGOs, consultants or anyone else that is involved*

(BE) Belgium

Stakeholder Category (1)	Organisation	Name	How consulted (2)
Public authority (SUP, PRF)	OVAM	Peter van de Dries	Phone / email
Gear producer	VVC Equipment	Kathy Simoens	Phone
Gear user	Rederscentrale	Jasmine Vlietinck	Phone / email

(BG) Bulgaria

Stakeholder Category (1)	Organisation	Name	How consulted (2)
Public authorities (PRF,SUP)	Marine administration, Varna	Suzan Kovach, Konstantin Stankovich,v.djambazov,Veneta Georgieva	Face to face
Public authorities (PRF,SUP)	MOEW	Galia Balusheva,A.Peychev.A.Toneva	Face to face (1), mail (2,3)
Gear users	Black Sea advisory council,	Yordan Gospodinoff	Face to face
Public authorities	National Agency for Fisheries and Aquaculture, Ministry of agriculture,Food and Forestry	Yordan Raev	Face to face
Public authorities	Varna municipalty	Desislava Georgieva	Face to face
Gear users	BG FISH fishery association	Yordan Gospodinoff	Face to face
Gear producer	Bilgin Sali	Bilgin Sali	Face to face
Port authorities/associations		Regional inspectorates	mail

(CY) Cyprus

Stakeholder Category (1)	Organisation	Name	How consulted (2)
Public Authorities (PRF)	Department of Fisheries and Marine Research (DFMR)	Marina Christofidou	Email/phone

Public Authorities (SUP)	Department of Environment	Nasia Dikigoropoulou	Face to face/email /phone
Port Authorities	Cyprus Ports Authority	Katerina Dokou	Face to face/email/phone
Waste collectors	VGN Sludge		Email/Phone
Waste collectors and recyclers	Skyra Vassas		Email/Phone
Gear Users	Levantina Fish - Cyprus Aquaculture President	Antonis Kimondis	Face to face/phone
Gear Prodcers / Gear Users	Psarokaika	Aristos Aristeidou	Phone
Others	Statistical Servise	Elina Toumpaki	phone
Others	Customs & Excise department	Rena Papantoniou	phone
Others	Akti NGO research centre	Demetra Orthodoxou	Face to Face/email/phone
Others	Oceanographic Centre	Yanna Samuel-Rhoads	Phone/email
Others	Cyprus Professional Fishers Association president	Christodoulos Charalampous	Phone

(DK) Denmark

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Gear Producers	Hvalpsund Net A/S	Consultant for Hvalpsund Net. Peter Poulsen	Telephone
Public authorities (SUP)	Ministry of Environment and Food	Pernille Cuisy Svensson	Personal
Public authorities (PRF)	Ministry of Environment and Food	Sofie Brandt Clausen	Personal

Public authorities (SUP)	Ministry of Environment and Food	Maria Bøje Petersen	Personal
Port authorities or associations	Hirtshals harbour	Ditte Gerstrøm Sørensen	Telephone
Port authorities or associations	Hanstholm harbour	Niels Clemensen	Telephone
Gear users	Danish fisher's association / Hirtshals fisher´s association	Chairman Niels Kristian Nielsen	Telephone
Collection scheme operators/ Waste collectors and recyclers	Plastix	CEO Hans Axel Sørensen	Telephone

(DE) Germany

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Public authorities (SUP)	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (BMU) (Federal Ministry for the Environment, Nature Protection and Nuclear Safety) (Referat WR II 8	Ms. Irina Heinz (not personally reached yet)	Email
Public authorities (PRF)	Bundesministerum für Verkehr und und digitale Infrastruktur (Federal Ministry of Transport and Digital Infrastructure), Referat WS 24	Ms. Hannelore Keim	Phone + Email
Public authorities (SUP and PRF, secondary responsibility)	Bundesministerium für Ernährung und Landwirtschaft (BMEL) (Federal Ministry for Food and Agriculture	Ms. Richarda Siegert-Clemens	Phone + Email
Public authorities (PRF)	Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz (NLWKN)	Ms. Kirsten Dau	Phone (longer call scheduled) + Email

Public authorities (PRF)	Ministerium für Energie, Infrastruktur und Digitalisierung Mecklenburg-Vorpommern, Referat Wasserverkehr und Häfen	Mr. Christian Hidde	Email
Public authorities (PRF)	Ministerium für Wirtschaft, Verkehr, Arbeit, Technologie und Tourismus Schleswig-Holstein	Mr. Hans Runge	Email, Phone
Others	Umweltbundesamt (German Environment Agency), Fachgebiet II 2.3 Meeresschutz	Ms. Stefanie Werner	Email, Phone (brief exchange only)
Gear users	Erzeugergemeinschaft der Deutschen Krabbenfischer GmbH (German Shrimp Producer PO)	Mr. Philipp Oberdörffer	Phone + Email
Gear Producers	Engel-Netze GmbH & Co. KG	Mr. Michael Engel	Phone + Email
Collection scheme operators	NABU - Naturschutzbund Deutschland e.V. (Operator of Fishing for Litter Project)	Mr. Nils Möllmann	Phone, written reply expected

(EE) Estonia

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Public authorities (SUP)	Ministry of the Environment	Agni Kaldma	Face to face
Public authorities (SUP)	Ministry of the Environment	Görel Grauding	Face to face
Public authorities (SUP, EPR)	Ministry of the Environment	Kerli Rebane	Email
Public authorities (PRF)	Ministry of the Environment	Rene Rajasalu	Phone
Public authorities (PRF)	Ministry of Economic Affairs and Communication	Katrin Andre	Phone

Port authorities or associations	Estonian Ports Association	Viktor Palmet	Email
Port authorities or associations	Port of Dirhami	Mart Vahtel	Phone
Gear users	Pärnumaa fisheries area (the FLAG)	Esta Tamm	Phone
Gear users	Saaremaa fisheries area (the FLAG)	Heino Vipp	Phone
Gear producers	Viitanet OÜ	Anneli Einman	Phone
Gear producers	Saarevõrk OÜ	Kalvar Ige	Phone
Waste collectors and recyclers	Estonian Waste Management Association	Margit Rüütelmann	Phone
Others	Keep the Estonian Sea Tidy Association	Marek Press	Phone

(EL) Greece

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Public authorities (SUP)	Ministry of Environment	Maragogiannis Konstantinos	Face to face
Public authorities	Ministry of Agriculture & Food, General Directorate Fisheries	Petrou Marina	Face to face
Public authorities (PRF)	Ministry of Maritime and Island Policy, Hellenic Coast Guard	Mytilinaios Ioannis	Face to face
Gear users	PEPMA	Psarrou Kleio	Phone
Gear users	PEPMA	Bountoukos Ioannis	Phone
Port Authority (OKAA)	Central Market and Fishery Organization (CMFO SA)	Katsiotis Vassilios	Face to face
Gear users	Calypso Seafood (mussel farm)	Theodorou Ioannis	Face to face

Gear users & Gear Producers	NIREUS SA / Proteus SA	Papacharisis Leonidas	Face to face
Gear Producers	Stamatiou Plastics	Stamatiou Kyriakos	Face to face
Gear Producers & Gear users	NIREUS SA / Proteus SA	Baulard Cecile	Phone
Collection scheme operators	Enaleia	Arapakis Lefteris	Phone
Waste collectors and recyclers	Plastikourgeio	Vargas Frank	Phone
Others	HCMR	Triantafyllou George	Face to Face
Others	HCMR	Pagou Popi	Phone

(ES) Spain,

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Gear Producers	SANTYMAR SA	Jennifer Martín Cabaleiro	Face to face
Gear Producers	GRUPO EURORED	Pancho Tourón	Face to face
Port authorities	AUTORIDAD PORTUARIA DE VIGO APV	Carlos Botana	Face to face
Port authorities	AUTORIDAD PORTUARIA DE CORUÑA APAC	Sebastián García Orro	Phone/Email
Port authorities	PORTOS DE GALICIA	Ángel Llorente de Mata	Phone/Email
Public authorities (PRF)	PUERTOS DEL ESTADO	Cristina Esteban	Phone/Email
Associations (*Fishing Gear users*)	COOPERATIVA ARMADORES DE VIGO ARVI	Edelmiro Ulloa	Face to face
Gear users	ARMADORA PEREIRA SA	Leopoldo Boado	Face to face
Associations (*Aquaculture Gear users*)	APROMAR Asociación Empresarial Acuicultura de España	Javier Ojeda	Phone/Email

Waste collectors and recyclers	GONZÁLEZ COUCEIRO SL	Francisco González	Face to face
Public authorities (SUP)	CONSELLERÍA MEDIOAMBIENTE-XUNTA DE GALICIA	Verónica Tello Barcia	Face to face
Public authorities (PRF)	MITECO Ministerio para la Transición Ecológica	José Luis González Serrano	Phone/Email
Others (RAP used tires)	SIGNUS (RAP used tires)	Isabel López-Rivadulla Sánchez	Phone/Email
Collection scheme operators	MARES CIRCULARES- Vertidos Cero Assotiation	Estibaliz López-Samaniego	Phone/Email

(FI) Finland

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Public authorities (SUP)	Ministry of Environment	Sirje Sten	Phone
Public authorities (PRF)	Ministry of Transport and Communications	Ville Rinkineva	Email
Others	Natural Resources Institute Finland	Eila Seppänen	Email

(FR) France

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Collection scheme operators	Fil & Fab	T. Desprez	Face to face
Gear Producers	Etablissements LE DREZEN (fishing)	F. Pauly	Phone
Gear Producers	Intermas Group (aquaculture)	C. Guyomar	Face to face

Gear users	Comité National de la Conchyliculture	B. Guillaumie	Phone
Others	IFREMER	F. Morandeau	Face to face
Others	Institut Recherche Dupuy de Lome	M. Deroiné	Face to face
Others	Synergie Mer et Littoral	L. Hegron-Mace	Face to face
Port authorities or associations	CCI Bretagne (port management)	P. Le Carre	Phone
Public authorities (SUP)	Direction de la Pëche Maritime et de l'Aquaculture	C. Delbecque	Phone
Public authorities (SUP)	Direction de la Pëche Maritime et de l'Aquaculture	M. Gras	Phone
Others	Coopération Maritime	M. Gueguen	Phone

(HR) Croatia

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Public authorities (SUP)	Ministry of Environmental Protection and Energy	Sanja Radović, Darko Horvat	Face to face
Others	Ministry of Agriculture, Department for Fisheries	Jelena Jerbić	Face to face
Waste collectors and recyclers	Cian d.o.o.	Matko Bašić	Phone
Port authorities or associations	Port Authority Dubrovnik	Dario Barbarić	Email
Gear users	Cromaris d.o.o.	Ana Peroš	Phone

Gear users	Cooperative of professional fishermen Mare Croaticum (fishing, aquaculture)	Daniele Kolec	Phone, email
Others	FLAG "Lostura"	Ivan Čupić	Phone
Gear users	Mišlov d.o.o.	Krstina Mišlov	Phone

(IE) Ireland

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
SUP Public Authority	DCCAE	Niamh NiFhlaithbheartaigh	telephone
		Darren Byrne	Telephone
		Sorcha Byrne	Telephone
PRF Public Authority	DAFM	Deirdre Coomey	telephone
Collection Scheme Operators	BIM	Catherine Barrett	Face to face
EPR Scheme operator	Repak ELT (End of Life Tyres)	Mark Gillick, Bill Collins	Telephone
Gear producer	Swan Net Gundry Group	Rodney O'Sullivan	Face to face
Gear user	ISWFPO	Patrick Murphy	Face to face
Port authorities	Castletownbere Harbour Authority (DAFM)	Cormack McGinley	telephone

(IT) Italy

Stakeholder Category (1)	Organisation	Name	How consulted (2)
Public authorities (SUP#1)	Ministry of Economic Development	Cinzia Tonci, Giuseppina Aurigemma	Email
Public authorities (SUP2- PRF)	Puglia Region	Gianfranco Grandaliano	Phone
Public authorities (SUP3- PRF)	Ministry of the Environment	Mariano Grillo, Sergio Cristofanelli, Serena Rossi	Phone/Email
Public authorities (SUP 4 - PRF	Emilia Romagna Region	Piergiorgio Vasi	Email
PORT authorities (1)	The Northern Tyrrhenian Sea Port Authority of the a	Calogero G. Burgio	Phone/Email
PORT authorities (2)	The Western Ligurian Sea Port Authority	Stefania Maggi	Phone/Email
PORT authorities (3)	The Central Tyrrhenian Sea Port Authority	Gennaro Cammino	Face to face/Email
Gear user #1	Confcoperative	Andrea Bartoli	Phone
Gear user #2	UILA PESCA	Massimiliano Sardone	Phone
Gear (longline) producer	Sealinestore	Giuseppe Tramati	Phone
Collection scheme operator #1: researcher	Consiglio Nazionale delle Ricerche-Institute of Polymers, Composites and Biomaterials (IPCB)	Mariacristina Cocca	Phone
Collection scheme operator #2: researcher	Consiglio Nazionale Ricerche-ISMAR Istituto di Scienze Marine-Arsenale	Nicoletta Nesta	Phone

Collection scheme operator #3: President of National Shellfish producers	AMA- Associazione Mediterranea Acquacoltori	Giuseppe Prioli	Phone
Others #1: Professor in Maritime Law	University of Trento	Alessio Claroni	Phone
Others #2: researcher	Italian National Institute for Environmental Protection and Research (ISPRA)	Tomaso Fortibuoni	Face to face/Email
Other #3:biologist	Coispa, Tecnologia & Ricerca	Maria Teresa Spedicato	email
Other #4:biologists	Anton Dohrn Zoological Station	Lucia Rizzo, Emilio Reginella	Phone
Other #5 - non-profit company for the tracking, collection, processing and final destination of end-of-life tyres	Ecopneus	Silvia Brunozzi, Giovanni Corbetta	Phone + Email

(LV) Latvia

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Public authority (SUP)	Ministry of Environmental Protection and Regional Development (MEPRD)	Tatjana Alekse (expert) Rudīte Vesere (Head of Department) Alda Ozola (Depoty State Secretary)	Face to face Face to face Face to face
Public authority (PRF)	MEPRD	Baiba Zasa (expert)	Phone
Public authority (PRF)	The Ministry of Transport	Andris Maldups (Director of Dep.)	Face to face

		Laima Rituma Aldis Zariņš	Face to face Face to face
Public authority (Fishing/aquaculture sector)	The Ministry of Agriculture	Normunds Riekstiņš (Head of Dep.)	Phone
Public authority (SUP, PRF – controls, reporting))	State Environmental Service (SES)	Evija *Šmite* (Head of Department) Janis Urtāns (expert – ports/Sea control) Aiva Mirošņika (expert – EPR) Atis Treijs (head of unit)	e-mail and phone e-mail and phone e-mail e-mail
Port authority	Liepaja Port	Kaspars Poņemeckis	Phone
Port authority	Ventspils Port	Daiga Mažrima	phone
Port authority	Riga Port	Vilis Avotiņš	phone
Port authority	Mersraga Port (small port)	Janis Budreika (chief manager)	phone
Pier operator/tenant (for fishing ships in Ventspils Port)	*BraDava, LtD*	Guntis Gailītis (board member)	phone
Gear users	Latvijan Fishermen Association (Latvijas Zivsaimnieku asociācija"	Juris Pētersons (fisherman) Oskaras Jankovskis (fisherman)	phone phone
Gear users	Latvian Fishermen Federation (Association) (*Latvijas Zvejnieku federācij*a)	Ēvalds Urtāns (fisherman)	phone

Gear users	Fishermen association of Kurzeme ("*Kurzemes Zvejnieku asociācija*")	Māris Stankēvičs (fisherman)	phone
Gear users			
Gear users			
Gear users (Small scale fisheries sector)	Fishing farm "Vilnis"	Juris Elsons (fisherman)	phone
Gear users (Small scale fisheries sector)	F/f Forele-AN	Aigars Neilands (fisherman)	phone
Waste collector/management	EkoOsta	Ivars Briedis	phone
Waste management	Association of waste management companies (LASUA)	Jānis Vilgerts (president of the association)	phone
Waste management	Municipality owned waste management company (responsible for all type of waste in Ventspils, incl.port and piers) "*Ventspils labiekārtošanas kombināts"*	Vilnis Krauze	phone

(LT) Lithuania

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Public authorities (SUP)	Ministry of Environment.	Institutional information, reply from team	Phone, email
Public authorities (SUP)	Environmental Protection Agency	Institutional information, reply from team	Phone, email
Public authorities (PRF)	Klaipeda state seaport authority	Institutional information, reply from team	Phone, email

Gear producers	Hampidjan Baltic		Phone, email
Gear users	UAB Bartzuve, AB Islauzo zuvis		Phone
Waste collectors and recyclers	UAB "Ortmeta"		Phone
Gear producers	Vonin Lithuania		Phone
Public authorities (PRF)	Fishery Service,	Institutional information	Phone
Other	Ministry of Agriculture	Institutional information	Phone

(MT) Malta

Stakeholder Category (1)	Organisation	Name	How consulted (2)
SUP Public Authority	Environment and Resource Agency	Giuseppe De Angelis, Senior Officer Thematic,	Video conference
		Maria Alonso Bomba, Environment Protection Officer	Video conference
		Tamara Micallef, Environment Protection Officer,	Video conference
	Ministry for Sustainable Development, Environment and Climate Change. Directorate for the Environment and Climate Change	Romina Sciberras, Manager	Video conference
		Calleja Henriette at MECP-OPS	Video conference
		Luca Lacitignola, Manager at the Office of the Permanent Secretary, MECP	Video conference
PRF Public Authority	Transport Malta (TM)	Captain David Bugeja – Chief Officer Ports and Yachting Directorate	Face to face interview

		Laura Sue Mallia - Senior Manager	Face to face interview

(NL) Netherlands

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Public authorities (SUP/PRF)	Min of Infrastructure and Water management (I&W)	Roos Bol (SUP/PRF) Ewoud Kuin (SUP/PRF) Tjeerk ter Veen (non-EPR waste streams) Arjen Brouwer (EPRs)	FtF FtF Phone Phone
Gear producers	VIC Den Oever	Sander Rijswijk	Phone
Gear producers	Maritiem	Erik de Graaf	Phone
Gear producers	Van Beelen	Caroline van Beelen	Phone
Gear users / association	VisNed	Pim Visser / Sarah Kraak	Phone
Waste collectors and recyclers	Suez	Martijn Kerkstra	Email
Collection scheme operators	Fishing for Litter project	Jan Joris Midavaine	FtF
Gear users	Cornelis Vrolijk	Auckje Koers	Phone
Gear users	Quotter	Kees Taal	FtF
Gear producers	Eurocord	Philippe Verschueren	Email
Other	Tauw	Report on EPR for fishing gear, 2018	Report prepared for I&W
Other	I&E	Data on waste collection	Database maintained by I&W

(PL) Poland

Stakeholder Category (1)	Organisation	Name	How consulted (2)
Public authorities (PRF)	Department of Maritime Economy, Ministry od Maritime Economy and Inland Navigation	Joanna Łyjak	Face to face
Public authorities (SUP)	Department of Fisheries, Ministry od Maritime Economy and Inland Navigation	Sylwester Włoch	Face to face
Public authorities (SUP)	Department of Waste, Ministry of Climate	Magdalena Reszka	Phone+ Email
Gear Producers	Baltic Net Sp. z o.o.	Krzysztof Stanuch	Phone + Email
Port authorities or associations	Port of Ustka	Hubert Bierndgarski	Phone
Collection scheme operators	WWF Poland	Sylwia Migdał	Phone
Collection scheme operators	Fundacja MARE	Olga Sarna	Phone
Waste collectors and recyclers	Zakład Unieszkodliwiania Odpadów	Jacek Turski	Phone

(PT) Portugal

Stakeholder Category (1)	Organisation	Name
Public authorities (SUP + PRF for fisheries)	DGRM	Mainland
Other – public utility having the concession of managing fishing landing ports and performing fisheries auctions	Docapesca	Mainland

Public authorities (SUP + PRF)	Regional Directorate of Fisheries Azores	Azores
Other – public utility having the concession of managing fishing landing ports and performing fisheries auctions	LotAçor	Azores
Public authorities (SUP + PRF for fisheries)	Regional Directorate of Fisheries Madeira	Madeira
Public authorities	Regional Directorate of Environment and Climate Change Madeira	Madeira
Port authorities or associations	APRAM	Madeira

(RO) Romania

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Gear Producers	SC Plase.Net S.R.L.	Costică Dobre	phone
Gear Producers	Plase Pescaresti SA Galati	Costică Dobre	phone
Public authorities (SUP)	Ministry of Environment, Waters and Forests, Waters Management Directorate	Ana Nistorescu	phone and emails
Public authorities (SUP)	Environmental Protection Agency Constanta	Simona Constantin	face to face
Public authorities (PRF)	National Company "Maritime Ports Administration" S.A. Constanta	Paul Ioncescu	phone and emails
Port authorities or associations	Romanian Naval Authority	Elena Sincan	phone
Gear users	National Agency for Fishery and Aquaculture, Maritime Directorate Constanta	Gabriel Popescu	phone and face to face

Others	Mare Nostrum NGO	Mihaela Candea	phone and email
Others	National Institute for Marine Research and Development "Grigore Antipa" Constanta	Eugen Anton Valodia Maximov	face to face

(SE) Sweden

Stakeholder Category (1)	**Organisation**	**Name**	**How consulted (2)**
Gear producers	FF Norden	Sixten Söderberg	Phone
Public authorities (SUP)	The Swedish Agency for Marine and Water Management	Lisa Bredahl Nerdal	Phone
Public authorities (PRF)	The Swedich Transport Agency	Stina Paulin	Phone
Port authorities or associations	Various		Phone
Collection scheme operators	FF Norden	Sixten Söderberg	Phone
Gear users (Aquaculture)	Matfiskodlarna	Daniel Wikberg	Phone
Gear Users (Fishery)	Sveriges Fiskares Producentorganisation (SFPO)	Fredrik Lindberg	Phone
Waste collectors and recyclers	Sweboat		Phone
Waste collectors and recyclers	Båtskroten.se		Phone
Waste collectors and recyclers	Sotenäs Symbioscentrum	Erik Gotsöyr	Phone

(SI) Slovenia

Stakeholder Category (1)	Organisation	Name	How consulted (2)
Public authorities (PRF)	Slovenian Maritime Administration	Tomo Borovničar, Lea Grubišić	Phone
Port authorities or associations / Waste collectors and recyclers	Javno podjetje Okolje Piran, d.o.o., Piran	Egon Štibilj	Phone
Port authorities or associations / Waste collectors and recyclers	Javno podjetje-Azienda pubblica Marjetica Koper, d.o.o.-s.r.l.	Teja Mahnič Skrt	Phone
Others	Ministry of Agriculture, Forestry and Food	Neža Sautet	Phone
Others	Inspectorate for Agriculture, Forestry, Hunting and Fisheries	Robert Smoje	Phone
Gear users	Prosub d.o.o.	Edi Germšek	Phone

(UK) United Kingdom

Stakeholder Category (1)	Organisation	Name	How consulted (2)
Public authority (SUP)	DEFRA	Emma Day	Phone/email
Public Authority (SUP)	DEFRA	Celia Rose Halifax	Phone/email
Public Authority (PRF) England	MCA	Lorraine Weller	Phone/email
Collection Scheme operator	Fishing For Litter	Clare Leverton	Phone/email
Public Authority (PRF) Scotland	SEPA	Morag Campbell	Phone/email
Public Authority (SUP)	EA	John Harvey	Phone/email
Port Authority	Brixham Harbour Authority	Adam Parnell (Harbour master)	Phone/email

Others	Seafish	Gus Caslake	phone
Gear Producer	Brixham Trawl maker	Darren Edwards	phone
Collection scheme operator (volunteer)	MMO/Torbay Recycling	Jessica Churchill-Bisset	Phone/email
Gear producer	Coastal Nets	Rod Barr	Phone
Gear users (Aquaculture)	Mowi	Georgina Wright	Email TBC
Waste Collection scheme recycler	Odessey Innovation	Rob Thompson	Email/phone/ tbc
	FFL Scotland	Faron	Email tbc
Gear users (Aquaculture)	Scottish Salmon Company	Paul Conty	Phone/email
Gear producers (Aquaculture)	W J Knox	Finlay Oban	Phone/email TBC
Waste Collection scheme (EPR)	Farm XS	Paul Webb	Phone/email
Public Authority	British Port Authority	Mark Simons (Policy), Richard Ballantyne (CEO)	Email/phone/TBC

ANNEX 9: REPORT OF STAKEHOLDER CONSULTATION WEBINARS

9.1 Introduction & Objectives

This report presents a summary of two webinars held on the 12th and 13th May 2020, which were replacements to the stakeholder workshop that could not be conducted due to Covid-19 restrictions.

A week in advance of the webinars for the SUP Directive reporting (12th May) and PRF Directive reporting (13th May), invitees were provided with background documents presenting the draft reporting and monitoring methodologies. An online survey was developed on surveymonkey.com to structure the stakeholder feedback. The link to this survey was provided to invitees and their feedback via the survey was encouraged.

The webinars were held on Microsoft Teams where the project team delivered Directive-specific Powerpoint presentations to the 60+ attendees at each 'live' event. The participants were encouraged to comment and ask questions via the chat box within MS Teams. An anonymised transcript of those comments and questions, along with the team response is provided in section 9.2 below.

A recording of the webinars was available via the same meeting link and the survey kept open for two weeks following the event to enable further review and feedback by stakeholders. Section 9.3 presents an analysis of the 40 stakeholder responses received via the survey.

The webinars achieved the same objective as the stakeholder workshop (Task 6 of the study ToR), which was to 'contribute to the stakeholder workshop with the outcomes of the study'. The ToR expected a broad range of stakeholders to participate in the workshop that was to be organised by the Commission via an estimated 50 participants. In this regard the webinars enabled a much larger selection of invitees, with the project team and the Commission steering group developing a list that ultimately exceeded 250 invitees. This included the majority of stakeholders listed in **Annex 8**, along with members of the relevant EU committees.

Some invitees shared the webinar link with other stakeholders. Ultimately the consultation reach was far greater than the original workshop would have achieved. It is also noted that with the majority of stakeholders required to work from home during the Covid-19 crisis, the webinar recordings allowed them greater flexibility and a longer timeframe for stakeholders to respond to the material.

9.2 Webinar Questions and comments

The following section presents the comments and queries received from the participants during the SUP and PRF Directive webinars. Responses to those comments are the views and interpretations of the project team, not necessarily the Commission.

9.2.1 SUP Directive webinar

Stakeholder Question/comment	Project Team Response
Scope	
EMSA: reporting only on ships above 45m length, where does 45m come from? usually it is 15m or 24m as far as I remember	The Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system only applies to fishing vessels above 45 m in length (Art. 2 of the Directive).
Is the opinion of the DG Mare such that the Directive should be applicable to all recreational gears such as metal lures, rods, reels, gears used to fish on ice etc. or to apply the Directive only to certain recreational gears comparable to commercial gears such as nets, trammels nets, traps, pots etc.	The Directive relates to all 'fishing gear containing plastic', no distinction between commercial and recreational gear is made. The categorisation proposed includes the gears containing plastic mentioned.
Producers can we say what or who is the designated producer	The SUP Directive defines producers. In practice, the list of designated producers will have to be established in each MS when setting up the EPR scheme.
Can you explain more which components of fishing gears are not taken into account?	All fishing gear containing plastic is included. Therefore plastic may not make up all of the total waste gear reported.
I mean in countries in which the plastic is used to make for instance locks for crab or similar, how will it be managed? Concerns are that: _ materials are often imported and then produced artisanaly. How to count for this ?	The MS will determine which producers are included, with the intention being that gear users and 'artisanal' gear producers (not trading gear) are not included as producers. Imports by traders should be within scope. The EPR scheme should determine if and how direct imports of gear components by users can be accounted for.
Can DG MARE confirm it will be mandatory for member states accept end of life fishing gear from other member states.	Under MARPOL and the PRF Directive, ports are required to have adequate waste reception facilities to receive the waste from all vessels: The indirect fee system set up under Directive (EU) 2019/883…provides a system for removing the incentive for ships to discharge their waste at sea, and ensures a right of delivery. It will be up to the MS to determine whether waste gear from foreign fleets be treated the same way as waste fishing gear from the national fleet.
Calculations	
Why working in m^3 instead of kg ??	Under the SUP Directive reporting will be done in weight (tonnes), but the information collected on waste fishing gears and passively fished waste through waste delivery receipts in ports, which is transmitted by MS to EMSA (European Maritime and

	Safety Agency) is collected in m^3 (cf. Annex 3 of the DIRECTIVE (EU) 2019/883). This source is expected to represent a very small proportion of waste fishing gear reported, but in such instances a conversion factor should be determined and applied to convert m^3 to tonnes.
Can you please explain a little more on what is meant by 'origin of waste'?	The terms nature and origin of waste are not defined explicitly in the Waste Framework Directive. The different waste categories have to be defined for each main stream, but for instance, for the eol vehicles, data has to be provided separately for waste coming from tyres, oil filters, large plastic components, etc.. Waste fishing gear (which includes aquaculture gear) may be collected from a variety of different locations, not just ports but direct from fishing companies and fish farms.
What about the re-sale (putting on the market for a 2nd time) -> sales of repaired or modified gear	This is to be determined by the EPR scheme – the extent to which repaired/modified gear is recorded as POM. Repaired or modified gear could still be considered as gear that is in use rather than as waste.
Is the second use - after repair - made by another business then the original producer resulting into a new producer of the fishing gear?	
Referring to my question we could have double or multiple recordings of the same gear retrieved recovered and reused.	
Where can I find the 25 fishing gear and 5 Aquaculture Systems? Are they listed in a directive?	See final report, annex 5.
What is the reason not to include ALDFG in the calculation? Also this material is once sold at the market	ALDFG can include historic lost gear and gear from foreign vessels, which are not therefore included in the total amount of gear recorded as placed on the market under a national EPR scheme. The recovery rate should reflect the % of the gear placed on the market that is recovered. Preventing gear loss and retrieving a vessel's own gear should be incentivised as this is preferable to retrieval of other's gear as ALDFG within passively fished waste.
How will foreign EOL gear landed in domestic ports be counted?	This is up to the Member State and how that gear is landed: if foreign gear is landed separately as waste fishing gear it may be included in the total amount of waste gear collected. This is preferable to landing it as passively fished waste. The EPR scheme operators should determine whether the amount of such material is sufficient to justify specific measures to recoup costs of collection and

	treatment. If it is landed as part of passively fished waste it will not be counted.
Do we know if member states are required to share collected data on fishing gear originated from other member states landed into their port facilities?	As above. There is no requirement to explore the 'nationality' of waste collected, but it may be in a MS interests to do so and share this information with other Member States.
Targets set will they take account of other member states gear landed in fellow member states when setting future targets?	
should the mandatory reporting divide into these 4-5 levels or only total weight all together?	Mandatory reporting is only the total, the division into the 5 proposed categories is voluntary.
Can you give us an example for calculation of fishing gear using other data sources?	One example for determining volumes of gear placed on the market is by using trade statistics. Volumes of waste fishing gear could be estimated by comparing fleet activity with gear replacement rates.
Please, give on example about how could made correction (related slide - calculation of fishing gear)	The decision trees in the report identify a number of points in the process at which verifications/corrections could be made. A correction could be made if verification identified an error. This could be from double-accounting or from input errors. These checks give an opportunity to go back to the source of the error, e.g. a producer submission, and make a check.
So the recovery rate is the collected divided by POM, how is embedded that the material is processed properly?	Assume this refers to treatment of waste. The Directive requires targets for recovery (the objective is to reduce marine litter) not for treatment.
Reporting	
How will Eurostat be able to distinct in quality?	All MS reports should be accompanied by a Quality Report that follows Eurostat principles in terms of information provided.
Who will be in charge of determining the polymer of the waste gear ?	It is expected that the waste collectors can determine the polymer to inform the (voluntary) data on plastic type. MS authorities responsible for reporting may look to verify this.
As there are by now no objectives for recovery including, what is the use od collecting information of the different plastic types?	Assume 'recovery' refers to onward treatment of waste. It is true no objectives are set in this regard and so the additional detail is only voluntary. Information on plastic types will help to inform processing capacity needs.
Why reporting and monitoring are based on the approach of legislation on packaging and packaging waste . What means that the	The basic principles are the same for all waste streams, they are based on the Waste Framework Directive. The legislation for reporting on packaging and waste packaging is the most recent one (2019) and takes into account the recommendations made

reporting will be adapted to the specificities of gear	in various reports on the quality assessment of waste data.
Will the report to the EC in June - be made available in the public domain	The report will be shared with the Member State authorities and DG MARE is exploring if and where the final report is to be made public.

Timing

It sounds like a lot of the reporting will be guided by the establishment of the EPR scheme. MS, however, are obliged to report before the schemes are established. Could this be difficult?	There is a gap between first expected data (for 2022 and the deadline for EPR scheme establishment. Surveys or other administrative methods may be required in advance of EPR scheme, but this information would also be important to inform EPR scheme set-up. Ultimately the setting up of the EPR system will facilitate the mandatory reporting by MS, but they are two separate things. This is why a variety of data collection methods are used for the reporting of other waste streams. MS report on municipal waste for instance even if there is no EPR scheme.
time frame again: when does this reporting start and when does the waste collection is required to start?	Article 13: Member States shall report the data and information electronically within 18 months of the end of the reporting year for which they were collected. The data and information shall be reported in the format established by the Commission in accordance with paragraph 4 of this Article. The first reporting period shall be the calendar year 2022.
The period of reporting: it is true that EPR schemes are to be established by end of 2024 but the reporting by the Member States could happen in mid-2024 (for reporting year 2022 - with 18 months period to report).	Same as above, reporting obligations of producers under an EPR scheme is one thing and reporting obligations of the MS to the Commission is another even if the data collected for the EPR scheme, when it is set up, can feed into MS reporting.
Since this weight measuring and reporting (f.e. considering current stock) will be basically new requirement: when this reporting is aimed or required to start so does it include current and past imports already in stock?	There is no mandatory reporting for producers at this stage. Under the EPR schemes, they will have further obligations, which will be defined at national level. The only mandatory reporting for MS will be the total weight of items placed on the market.
If the EPR scheme is to be set by the end of 2024, we cannot ask producers to begin with collecting data before this period	Producers will have to provide data to set up the EPR and they can be surveyed before the EPR is officially in place. Different sources can also be used alone or in combination with feedback from producers (statistics on industrial production, trade data, etc.)
for producers/importers: the mandatory reporting on items placed on the market will be the total weight only is this understanding correct?	

9.2.2 PRF Directive webinar

Stakeholder Question/comment	Project Team Response
Categorisation	
Other marine litter , must be more specific, must be listed	The voluntary data requirements enables 'other marine litter' to be listed by material type. They types of other marine litter are highly variable, making further categorization difficult. Studies could be undertaken to provide further detail.
Making a difference in reporting ALDFG and OMW is good in terms of measuring the effects of the SUP directive. However, it is hard to explain to the fishermen who voluntarily collect PFW. Reason being it is hard to differentiate operational fishing nets waste and ALDFG and next the origin of ALDFG. Some of it is from fishing activities, other is from commercial shipping (i.e. lines). Next, the more fishermen enrolled in FFL schemes the more ALDFG will be collected, since in the past it was more common to dump your waste at sea. Because of these reasons it could be hard to explain fishermen to collect ALDFG. An increase in collected ALDFG will give NGOs data to blame fishermen polluting the seas, while they are actually helping to clean the seas. Also with SUP, ALDFG is monitored separately. So best solution for fishermen not to get the blame is dump their fishing nets at sea again. What could be a stimulus for fishermen to bring in ALDFG and old fishing nets? Is it relevant to differentiate the two related to the directives?	Separate reporting of passively fished waste is required under the directive, not separation by the vessel. It is not a requirement for fishermen to differentiate ALDFG from other passively fished waste, only PFW from its own waste streams. However for the reasons you cite, it is ultimately in the vessels own interest (and to better achieve the recovery rate targets set for waste fishing gear) that its own waste gear is managed separately to PFW. With a combination of gear marking, no cost disposal and awareness-raising (via the EPR schemes), MS can create incentives for more waste gear to be collected and PFW to be landed. Reporting the amount of ALDFG in PFW can inform the EPR where there are issues in waste gear management/collection.
general question also concerning yesterday: is there clear distinction between fishing gear containing plastic and gear NOT containing plastic? So the mandatory reporting only total weight no matter plastic or not…. still little unclear to me if the weight to be mandatory followed/reported on total weight ONLY or are importers required to report plastic contents somehow...	There is a clear distinction made in the directive, which calls for 'fishing gear containing plastic' to be reported in terms of placed on the market and waste gear collected. It is therefore the total amount of gear that contains plastic. The amount of plastic in that gear can also be reported voluntarily via 'type of material' break down.
It should be kept in mind that if the waste is a tangled or very rusty it goes to the general waste and taken to waste disposal places... this might be a high proportion in some cases	This was a clear finding from the study: waste fishing gear collected at End of Life has more potential to be recycled than waste gear collected in ports.

Why has not been considered to also report on a voluntary basis the different items in addition to materials? This implies a lot of effort but may provide useful information	It is up to the MS what level of detail they go into and this could come from ad hoc studies. Increased detail results in increased cost and this detail is not a requirement of the directive.
Additional costs	
Separation of ALDSF from OML could be very expensive, it would be more convenient to aggreate or to ask only totals as mandatory .	The mandatory data is only the total PFW. The separate reporting of ALDFG and other marine litter is voluntary.
Seggregation of (passively fished) waste and its monitoring by waste processors is quite expensive (commercial organisations), How is this going to be paid for? Landing of waste might become more expensive	Separate reporting of passively fished waste is required under the directive, not separation by the vessel.
Landing of waste might become more expensive. The consequences of it might be reflected in higher prices of fishing ports fees, therefore fishermen could be subject to nonvoluntary extra costs resulting form the Directive. How to avoid that?	Article 8 of the PRF Directive addresses costs, proposing indirect fees to avoid disincentives to land waste and specifically on PFW: *(d) in order to avoid that the costs of collection and treatment of passively fished waste are borne exclusively by port users, Member States shall cover, where appropriate, those costs from the revenues generated by alternative financing systems, including by waste management schemes and by Union, national or regional funding available;*
In the case of outermost regions, many times waste is simply placed on the bins at the ports and taken away by the municipality.	This is the case in many ports, as note above the requirement is the reporting of the amount of waste not the onward treatment.
Approaches to Monitoring & Reporting	
From the results of your study, has separation of passively fished waste from general waste of the fishing vessel on board and during the landing/ disposal process been a practical issue?	It is common practice for the waste gear and PFW is mixed. The EPR under the SUP directive should encourage more attention to waste gear being collected. However the PRF only requires the reporting of PFW totals, not its separation by vessels.
if a MS undertook marine litter characterisation ... will there be a central point to review this offically and to recognise the local impacts of gear type in the fishing areas that might not nessarily be a source of the national fishing fleet?	Distinguishing PFW from waste gear collected in port will help to highlight this issue. Monitoring the waste gear collected (under the SUP directive) should highlight the extent to which it is made up of non-local gear. The EPR system can then respond to that situation. If the non-national waste is not collected as part of waste fishing gear, it is PFW and would not be a cost under the EPR scheme.
Which is the frequency and granularity that is expected for the reporting? Can you please clarifiy again about the frequency and granularity that is expected for the reporting? Thank you	It is proposed that annual reports are submitted by MS to the Commission using the proposed reporting format accompanied by a Quality Report, which the Commission then reports on every two years. It is up to MS how the data is monitored and how frequently it is reported to the MS authorities.

Calculation/recording of data in tones. Could you, please, give us an example for recording?	The distinction is made because the standard measure of PFW is by weight, but the PRF Directive asks for volume (as other waste streams are measured by volume – see Annex 3). We therefore propose that either can be recorded and then the alternative measure is derived from a calculation. The conversion factor is expected to come from empirical studies or directly from waste collectors, e.g. an 8 yard open maxi skip has $6m^3$ capacity and held 2 tonnes of waste.
on the basis of this scheme, if a MS compiled only the part relating to PFW wouldn't it be ok?	Yes – the only mandatory data is the total amount of PFW collected. This should be derived from monitoring data, not just from an estimate.
Sorry if this is very basic question. How is the volume usually measured? Is the material compacted before measuring?	The volume of the container used to store the waste, usually a skip. When considered full, it is removed by waste collectors and the tonnage reported back to the port.

Other questions and clarifications

What is the main collaborative role expected of the organizations of the [fisheries] sector in this action	Fishermen in vessels below 45m are not required to report PFW amounts to port authorities. However the fisheries sector is asked to engage with port & managing authorities to see that the landing of PFW is incentivized and facilitated.
Would it be possible to give guidance how much typical waste passively fished weights (and in m3) in order to built some harmonization between MSs reporting and to give guidance to the fisherman when they report passively fished waste.	As per above, most fishing vessels (below 45m) are not required to report PFW. The total amounts are expected to be derived from ports either directly or via waste collectors. Conversion factors need to be established through monitoring and empirical studies. It is expected that such guidance and comparison/harmonization between MS can be done when reporting is submitted.
Will small ports be included in the reporting scheme and if so, how (threshold for their size). E.g. a port with 5 ships and a barn for waste only.	All ports are included in the scope of the Directive, but small ports are exempted from some aspects such as waste handling plans: Small non-commercial ports which are characterized by rare or low traffic from recreational craft only may be exempted from paragraphs 1 to 4 if their port reception facilities are integrated in the waste handling system managed by or on behalf of the relevant municipality and the Member States where those ports are located ensure that the information regarding the waste management system is made available to the users of those ports. The Directive also suggests small ports could group together to provide (and report on) waste collected.

9.3 Analysis of survey responses

The following section presents an analysis of the forty (40) stakeholder responses received on the surveymonkey.com online survey by 1st June. Over 60% of respondents were public authorities, the intended workshop invitees. The larger number of public authorities responding to the questions in comparison to the other groups may have skewed the graphs displaying the combined data. The analysis was therefore extended to consider the responses from individual groups as shown in the graphs accompanying this summary.

The thirteen classifying themselves as 'others' included research institutes, not for profit organisation and an NGO coalition.

Q2 Which of the Directives do you work with?

The majority of respondent organisations worked with both Directives, although when considering the individual responses, the public authorities were split between working with both or just the SUP Directive (Figure 1). This further illustrates that different departments within public authorities may be responsible for each Directive.

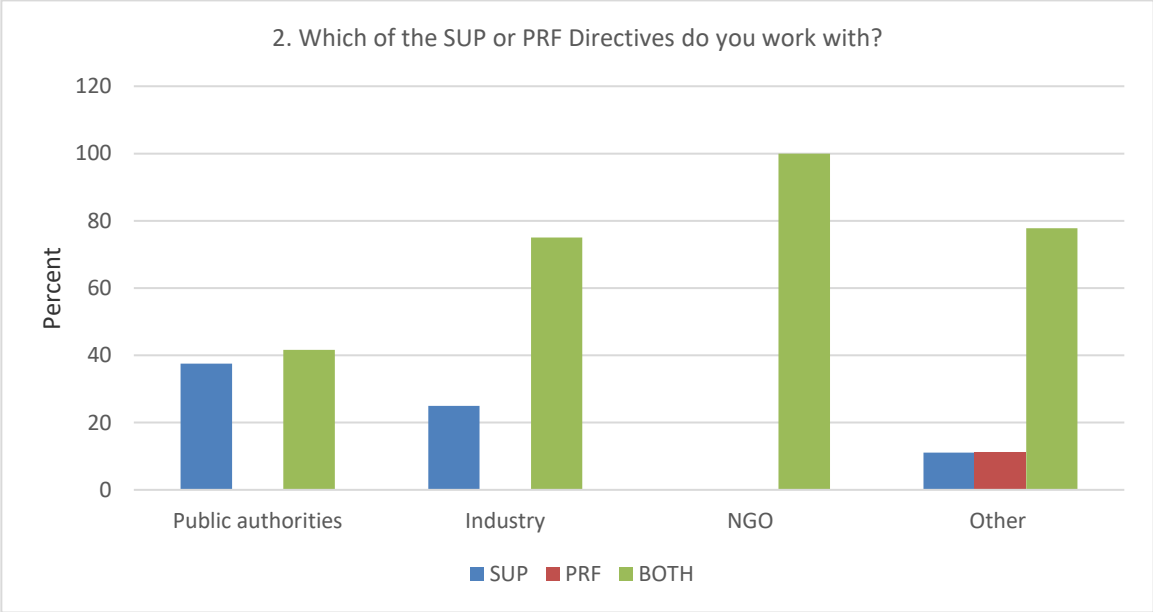


Figure 1 Individual responses to Question 2.

Q3 Overall, how well do you understand the reporting formats that we have suggested for the Directive(s) you work with?

The reporting formats were quite well understood overall although there were some comments on the complex nature of fishing gear in terms of the materials used and how reporting the different components could be very time consuming and open to misinterpretation. The NGO which is already familiar with reporting formats understood these very well (Figure 2). The mandatory reporting is on total weight of fishing gear sold although one comment noted that public authorities may not understand this and questioned whether or not the plastic component alone should be measured and reported. The timelines from each implementing act was seen to be a little confusing.

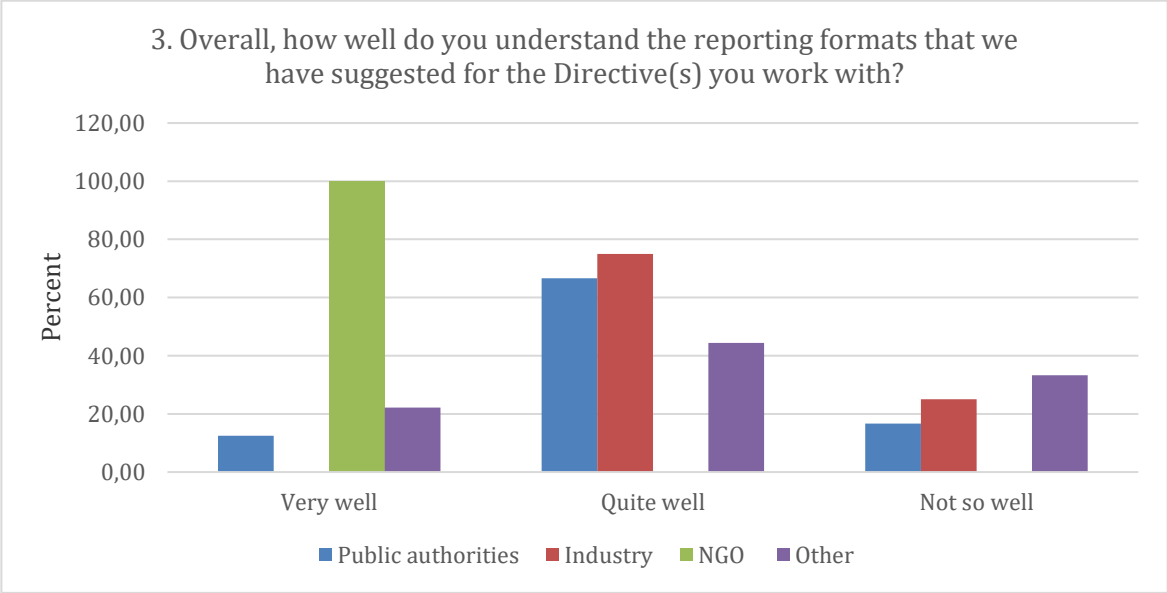


Figure 2 Individual responses to Question 3.

Q4 We described two versions of the fishing gear categorisation.Which version of do you prefer?

In terms of the preference for gear categorisation the overall response using combined data suggested that Version 2 with five categories (buoys, floats and ropes' as a separate category) was the most popular. However, when considering the individual responses there is a 50/50 split between Version 1 and 2 from industry. For public authorities the support is 50% for Version 2, 33% for 'don't mind' and 12.5% for Version 1 (Figure 3).

Comments regarding Version 2 included that with this version the separate category components could be segregated and reused for different applications therefore it would be important to distinguish them separately from fishing gear. This segregation would lead to better management although it was noted that plastic from different gear may have different lifespans and therefore potentially different environmental impacts.

The groups favouring Version 1 suggested that this would be a simpler version to use.

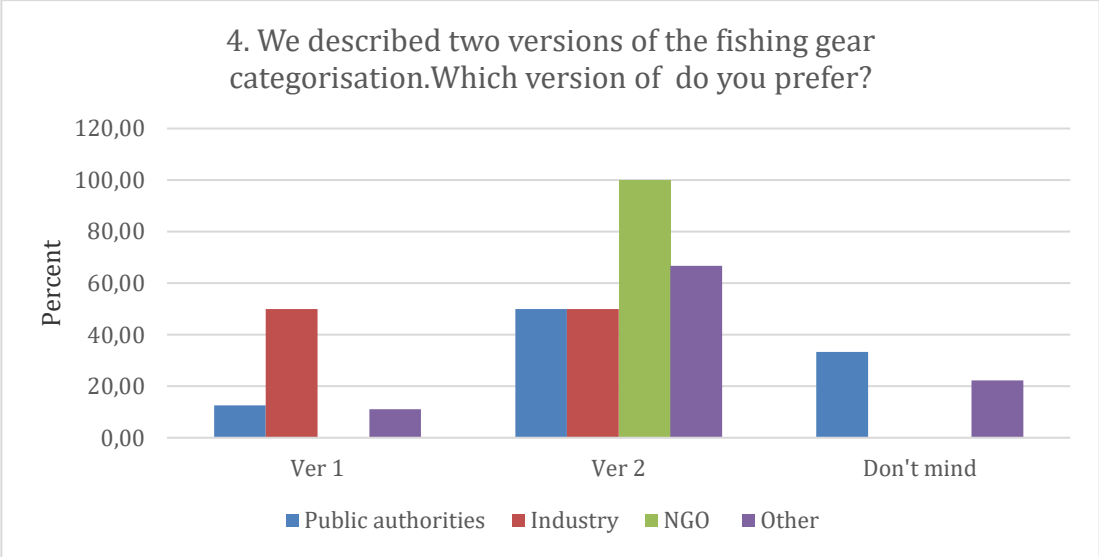


Figure 3 Individual responses to Question 4.

Q5 What level of reporting do you expect your Member State will provide?

The combined responses to question 5 indicated that the most favoured level of reporting would be mandatory (55%) followed by some voluntary (35%) and less than 10% completely voluntary.

The individual assessment (Figure 4) showed that not all public authorities were in agreement. Here 58% voted for 'mandatory' but 33% voted for some 'voluntary' level of reporting. Industry groups were split 50/50 between 'mandatory' and 'voluntary' and the 'Other 'category favoured 'mandatory' (67%) over 'some voluntary' (22%). The single NGO representative favoured 'some voluntary' measures.

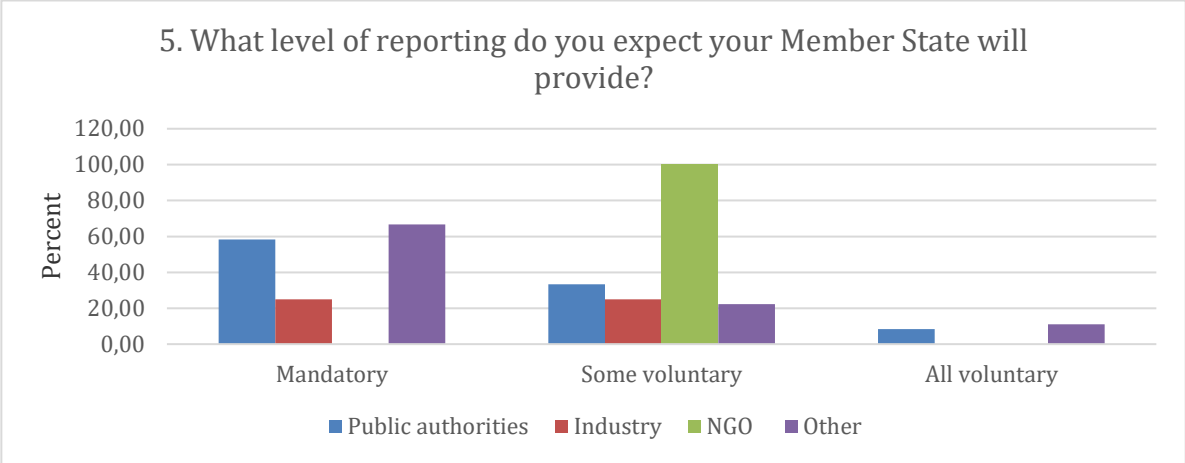


Figure 4 Individual responses to Question 5.

Q6 How easy will it be for your Member State to do the monitoring & reporting?

The overall view from combined resulted showed that the Member States (MS) would find the monitoring and reporting somewhat difficult to very difficult. Only 15% of the respondents thought it would be easy.

In the individual analysis public authorities indicated that the reporting and monitoring would be either' somewhat difficult' (45%) to 'very difficult' (37.5%). Only 16% of public authorities and 25% of the industry group thought the reporting and monitoring would be 'easy' and 25% of the industry groups thought this would be 'impossible' (Figure 5).

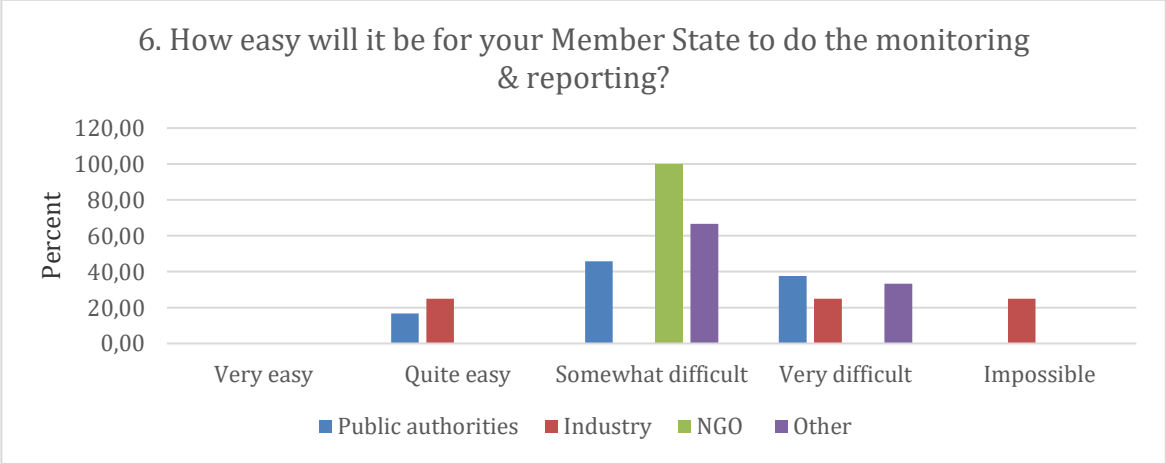


Figure 5 Individual responses to Question 6.

Q7 Do you agree that the quality check report provided by Member States should be compatible with Eurostat statistical requirements?

The majority (60%) of the combined responses indicated that there was agreement that the quality check report provided by MS should be compatible with EUROSTAT statistical requirements. The analysis of individual responses (Figure 6) showed that whilst the combined response showed a 'yes', public authorities were split between 54% agreement to 46% 'don't know'. Industry groups had 75% response of 'don't know' whereas both the NGO group and the 'Others' were far more in favour with a 'yes' response of 100% and 78% respectively. This may be a reflection of the level of familiarity of the use of EUROSTAT between groups.

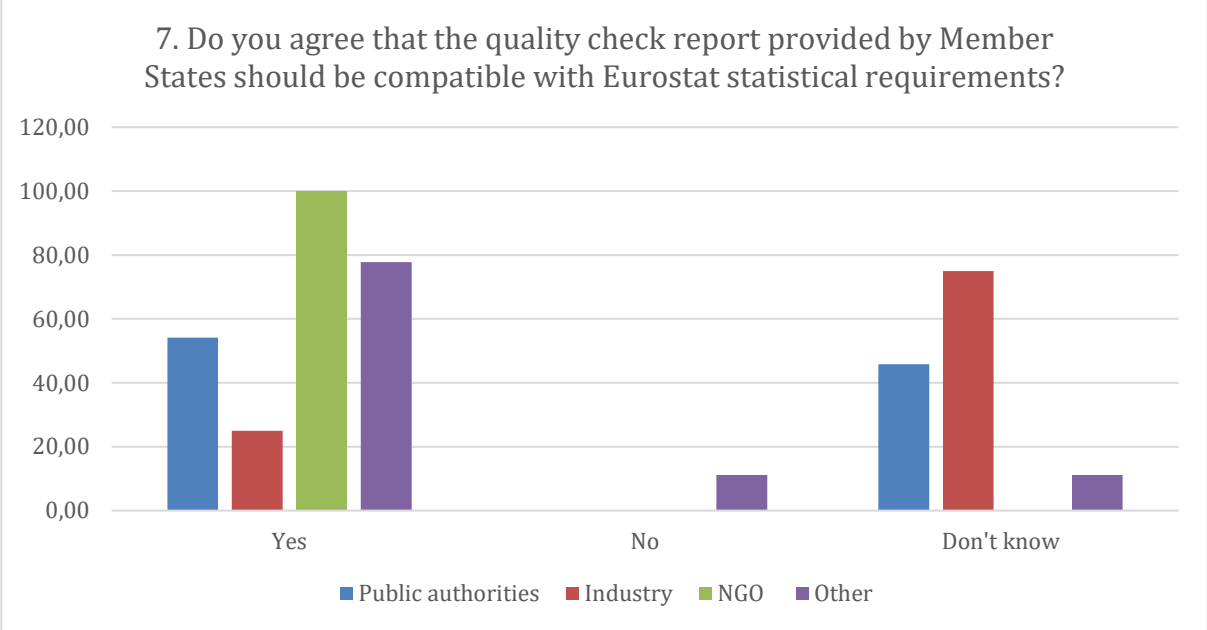


Figure 6 Individual responses to Question 7.

Q8 Do you have any other comments or questions about the draft monitoring and reporting requirements?

The survey asked for other comment about the draft monitoring and reporting requirements. These included:

- The data will improve over time once the systems are in place;
- Monitoring and reporting should be inline with examples from best practice already established e.g. Norway, Canada;
- How does producer responsibility fit into the reporting format. The fishing gear reporting period be should be after the EPR scheme are established in 2024;
- Small ports will have issues with reporting;
- Current schemes are not reporting volume or weight;
- MS should be required to return a joint plan on both directives and demonstrate a "customer journey" from the perspective of ports, data collections and port users so the MS have a more holistic approach;
- It needs to be mre simplified. Plastic or non-plastic;
- It is difficult to involve fishermen;
- There is a need to develop baseline to indicate what gears are included and which are not.

Requests for clarifications in the above comments are addressed in the main report and the tables in section 9.2

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EA-02-20-886-EN-N

doi: 10.2826/567796
ISBN: 978-92-9460-262-6

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