



environmental  
investigation  
agency

Ocean

## Cultivating Plastic

Part 5 - Preventing plastic  
pollution in the fisheries and  
aquaculture supply chain

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## ABOUT EIA

We investigate and campaign against environmental crime and abuse.

Our undercover investigations expose transnational wildlife crime, with a focus on elephants and tigers, and forest crimes such as illegal logging and deforestation for cash crops like palm oil. We work to safeguard global marine ecosystems by addressing the threats posed by plastic pollution, bycatch and commercial exploitation of whales, dolphins and porpoises. Finally, we reduce the impact of climate change by strengthening and enforcing regional and international agreements that tackle climate super-pollutants, including ozone depleting substances, hydrofluorocarbons and fossil fuels.

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**Front cover:** Ghost gear is considered the most harmful of marine debris.

**Above:** Pollution from aquaculture is also of significant concern, including plastic pollution from mismanagement and deliberate discharge of equipment.

## CONTENTS

Introduction	4
State of knowledge: Lack of data, mismanagement and high level of disposability as drivers of pollution	4
Summary of impacts	6
Examples of current policy frameworks and voluntary initiatives that address ALDFG	7
Role of the UK grocery retail sector in combatting fisheries and aquaculture plastic pollution	7
UK grocery retailer survey	8
UK grocery retailer survey responses	8
Survey summary	10
Recommendations for UK grocery retailers	11
References	12

# Introduction

Plastics have become ubiquitous in both wild-capture fisheries and aquaculture. Both are recognised as contributing to terrestrial and aquatic plastic pollution.

For example, through the use of bags and sacks for transportation, irrigation and feed tubes, insulating crates, floats, buoys, fish aggregation devices, nets, ropes, traps and enclosures, as well as general waste.

The Food and Agricultural Organisation of the United Nations (FAO) has defined fisheries and aquaculture products as belonging to the broader category of

agricultural plastics, or agriplastics. The FAO global estimate of fishing gear usage in fisheries and aquaculture is 2.1 million tonnes, which is an extrapolation based on limited data on plastics that enter the sea from this sector (an underestimate as it does not include waste fishing gear disposed of on land)<sup>1</sup> and 1.1 million tonnes of abandoned, lost and discarded fishing gear (ALDFG).

## State of knowledge: Lack of data, mismanagement and high level of disposability as drivers of pollution

An important factor that results in fisheries and aquaculture plastic pollution is the high level of mismanagement and disposability of products used in both industries.

Plastics used in fisheries and aquaculture production contribute hundreds of thousands of tonnes of ALDFG per year globally.<sup>2</sup> Due to a lack of mandatory reporting requirements, there are no global data on waste fishing or aquaculture gear disposed of on land (end of life or EOL), which has its own environmental and human health impacts, so this number is likely to be an underestimation, given that no cross-referencing between usage and gear disposed of on land can take place.

It is estimated that 5.7 per cent of all fishing nets (an estimated 2,962.9 km<sup>2</sup> of gillnets; 75,048.65 km<sup>2</sup> of purse seine nets; 217.78 km<sup>2</sup> of trawl nets), 8.6 per cent of all traps (an estimated 25 million pots and traps) and 29 per cent of all lines (an estimated 739,582.8 km of mainlines, 15,570,273 km of branchlines and 14 million hooks) are lost in the world's oceans each year.<sup>3</sup> The median estimate for plastic gear lost during the use of industrial trawl, purse-seine and pelagic longline fisheries was 48.4 kt, which excludes abandoned and discarded gear.<sup>4</sup>

Using the rate of plastic waste discarded from aquaculture production in Norway and applying it to the total production volume of the north-east Atlantic yields a result of more than 50,000 tonnes of plastic waste entering the marine environment.<sup>5</sup> Despite gear loss being a widespread issue, the impact of ghost gear has largely not been quantified in economic terms, particularly for the aquaculture industry.<sup>6</sup>

This is exacerbated by the fact that fishing products have a high rate of disposability and short life spans. For example, gillnets begin to degrade after just 200 hours<sup>7</sup> and gillnets and longlines have an operational life between 1-3 years,<sup>8</sup> meaning these gears need regular replacement and also suggesting the amount of gear needing safe and accessible disposal is incredibly high.

The likelihood of gear loss can depend on a complex interaction of factors. These include spatial and operational pressures, such as gear conflict and weather conditions, in addition to economic pressures that disincentivise onshore disposal, lack of available disposal facilities and the presence of illegal, unreported and unregulated (IUU) fishing.<sup>14</sup>

Accurate estimates on the extent of pollution are further compounded by the fact that global data on how much of each fishing gear type is produced or used each year has significant knowledge gaps.<sup>15</sup> Landed catch per gear type is one possible proxy that can be referred to, given global data available, and combining this data with the likelihood of loss would suggest that the two highest priority gear types for research and prevention of ocean plastic leakage are gillnets and bottom trawls.<sup>16</sup> However, care should be taken considering the differences in catch rate per unit of effort across different gear types.



## Cast study: Norwegian programme to retrieve lost fishing gear

While some territories have ALDFG obligations, including the UK<sup>9</sup> and the EU,<sup>10</sup> Norway is one of the few countries in the world which has an official programme to systematically retrieve lost fishing gear.<sup>11</sup>

Such detailed data is rarely available elsewhere in the world as there is no globally applicable requirement to report lost fishing gear or undertake retrieval efforts. In Norway, commercial fishing vessels  $\geq 28$  metres are required to report incidents involving the loss of gear and parts to the Coast Guard. Reporting includes gear details and geographical coordinates to facilitate retrieval operations.

An analysis, published in 2020, was undertaken of typical Norwegian fishing gears which estimated that commercial fishing in Norway contributed about 380 tonnes per year of plastics from lost fishing gears and parts. This is about two per cent of the estimated mass of plastic stock of Norwegian fishing gear of 18,413 +/- 3,676 tonnes. Gillnets, longlines and traps are the main contributors to ALDFG in the ocean due to gear design, practice and

ground deployment. It is evident that longlines and pots have higher chances of loss upon deployment. Indeed, about 4-7 per cent of total longlines and traps/pots owned by the Norwegian fishing fleet ends up in the ocean every year. Gillnets are the primary source of derelict gears. Although only 1-2 per cent of total gillnets are reportedly lost upon deployment, the quantity of gillnets used by commercial fishers exceeds most other gears.<sup>12</sup>

Of the plastic equipment used in aquaculture, 25,000 tonnes are discarded in Norway each year. This consists mainly of float collars and plastic pipes, but also fishing nets, feed hoses and ropes. This is equivalent to approximately 0.18 kg of discarded plastic per tonne of harvested catch.

In total, about 4,000 tonnes of plastic fishing waste was estimated to be collected in Norway annually, of which 55 per cent was sent for recycling (outside of Norway), 24 per cent was landfilled and 21 per cent was incinerated for energy recovery.<sup>13</sup>

**Above:** Norway is one of the largest seafood exporters in the world.



## Summary of impacts

Fishing and aquaculture gear result in safety and economic impacts, entanglement of marine species and plastic pollution.

**ALDFG results in both safety and economic impacts** – ALDFG, both from fisheries and aquaculture, causes navigational hazards, such as through propeller entanglement, blights the coastal landscape and impacts communities and tourism when it washes ashore, costing millions in clean-up costs each year.<sup>17</sup> There are also economic impacts due to lost fishing time, damaged gear and contaminated catch, to give just a snapshot of the broader financial implications of gear mismanagement.<sup>18</sup>

**Once lost, gear often continues to entangle and kill marine species** – also known as ghost fishing. Ghost fishing is most problematic in gillnets, entangling trammel nets and other passive fishing gear types, where the capture process relies on the movement of organisms into the gear. Used worldwide primarily by coastal, artisanal small-scale fisheries, about one-fifth of global marine fisheries landings comes from gillnet and trammel net fisheries.<sup>19</sup> After gillnets, traps, pots and fish aggregation devices (FADs), used widely in commercial fisheries, have the highest risk of being lost and causing impact, while bottom trawls, purse seines and midwater trawls are considered low risk.<sup>20</sup> There is no reliable estimate of the number of global marine species deaths from ALDFG, but estimates suggest hundreds of thousands being bycaught each year.

Ghost fishing not only results in death, but also leads to suffering and injury of fresh water and marine species through entanglement, ingestion and contamination.<sup>21</sup> Sub-lethal and lethal impacts result in drowning, predation, compromised feeding, malnutrition, starvation, debilitation, disease and reduced

reproduction, growth and longevity.<sup>22</sup> Fishing gear, including ALDFG, can also damage important habitats, such as coral reefs,<sup>23</sup> rocky outcrops<sup>24</sup> and the seabed.

**Microplastics pose a risk to marine life and human health**<sup>25</sup> – Seafood contamination from microplastics is a potential risk for human consumption. Microplastic release could be traced to specific fishing activities and results suggest that fishing nets and ropes have a higher microplastic emission potential than fishing lines.<sup>26</sup> Fishing gear is predicted to make up 55 per cent of floating macroplastic in the north-east Atlantic.<sup>27</sup> It has been estimated that about 208 tonnes of microplastics are produced annually from the Norwegian fishery. Globally, this sums to 4,622 tonnes annually.<sup>28</sup> Based on conservative estimates, more than 300 million microplastic particles (mostly <1 mm) could be released annually to the oceans through marine aquaculture alone. Fishmeal is both a source of microplastics to the environment and directly exposes species for human consumption to these particles.<sup>29</sup>

Eliminating and preventing plastic pollution from fisheries and aquaculture not only supports efforts to reduce ghost fishing, but also prevents unintended bycatch, suffering of marine species, damage to habitats and microplastics in the environment and food chain. More detailed information on the impacts of ALDFG are available.<sup>30</sup>

**Above:** Fishing and aquaculture gear cause entanglement, death and injury. The plastic from discarded gear can also break down into microplastics causing further significant issues.

# Examples of current policy frameworks and voluntary initiatives that address ALDFG

Current regulatory approaches to dealing with ALDFG are fragmented at best.

The UK has produced guidance on the marking of fishing gear, retrieval and notification of lost gear.<sup>31</sup> Regulation of single-use plastic is devolved within the UK, with measures implemented in England,<sup>32</sup> Scotland<sup>33</sup> and Wales.<sup>34</sup>

In the EU, the Port Reception Facilities<sup>35</sup> (PRF) and Single-Use Plastics<sup>36</sup> (SUP) Directives should address the full lifecycle of plastics in fishing gear to prevent loss and promote end-of-life collection, reuse and recycling.<sup>37</sup> The 2019 introduction of the PRF Directive should reduce costs for fishers to bring waste gear ashore, accelerate appropriate waste management and introduce Extended Producer Responsibility for fishing gear, which should in turn incentivise better design and management. The SUP Directive bans commonly littered single-use plastic items that constitute significant levels of marine litter.

Other existing tools include non-governmental schemes such as Kimo's Fishing for Litter<sup>38</sup> and fisheries certification bodies and eco-labels. For instance, the Marine Stewardship Council (MSC) Standard was updated to include measures for ALDFG in 2022 and is to be explicitly considered in each assessment.<sup>39</sup> The Global Ghost Gear Initiative (GGGI) is a cross-sectoral alliance of stakeholders dedicated to preventing ghost gear. The GGGI has produced a best practice framework (BPF) for the management of fishing gear<sup>40</sup> and aquaculture gear.<sup>41</sup> A database has been developed to guide the allocation of resources for ALDFG management interventions, including compliance monitoring.<sup>42</sup>

Regional Fisheries Bodies (RFBs) and Regional Seas Conventions (RSCs) provide infrastructure for fisheries

management. While in theory each RSC should already have or be developing a marine litter action plan that includes fishing gear, these are at different stages of maturity and, without a comprehensive global ALDFG strategy, are not mutually reinforcing nor wholly effective. Of the 12 adopted regional action plans on marine litter and four under development, only the plan for the Mediterranean currently contains binding measures, with the others being simply voluntary in nature.<sup>43</sup>

The existing global governance framework to address fishing gear requires significant improvement.<sup>44</sup> Despite efforts of the International Maritime Organisation (IMO), FAO and others, governance is fragmented and incomplete. The FAO adopted the Voluntary Guidelines for the Marking of Fishing Gear (VGMFG) in 2018<sup>45</sup> to provide guidance to member states on gear marking within a broader fisheries management programme to address ALDFG. IMO has been considering mandatory requirements on the reporting of lost fishing gear to be presented for adoption in 2024 and potential mandatory gear marking via amendments to MARPOL Annex V,<sup>46</sup> but appetite is limited and ambition remains relatively low.

To ensure a shift from incremental to a systemic change away from the use of plastics in fishing and aquaculture, the legally binding global plastics treaty being developed under the UN Environment Assembly presents an opportunity to include fishing gear as a dedicated programme of work that catalyses a global ALDFG strategy, thus working to close the policy gaps and coordinate efforts.<sup>47</sup>

## Role of the UK grocery retail sector in combatting fisheries and aquaculture plastic pollution

The UK grocery retail market for fish and fish products is the largest of all sectors in the UK and was worth £4.2 billion in 2021, which equates to more than 425,000 tonnes of seafood.<sup>48</sup>

Overall, in 2021 the UK produced 216,790 tonnes of farmed fish, landed 413,993 tonnes of fish and imported 1,187,995 tonnes into the UK (43 per cent wild-caught, 37 per cent farmed and 20 per cent undefined).

The top countries from which the UK imported seafood included China, Norway, Iceland, Ecuador, Vietnam and Sweden – all with differing national regulatory

requirements with regards to fisheries, aquaculture and ALDFG. Given the global supply chains involved in sourcing seafood for the UK falling outside of UK jurisdiction, and the market presence of the UK grocery retail supply chain, the buying power and responsibility of UK grocery retailers in fisheries and aquaculture practices cannot be overstated.

# UK grocery retailer survey

In 2018, EIA and Greenpeace UK undertook the first of three comprehensive surveys to measure the top 10 UK grocery retailers' plastic use to gain a better understanding of how UK supermarkets are planning to address the plastic pollution crisis and to track progress towards their commitments and targets.

Within these three surveys undertaken between 2018-20, EIA and Greenpeace UK also surveyed actions grocery retailers were taking across their supply chain, including with regards to plastic use in the fisheries sector.<sup>49</sup> Following a hiatus in our survey during the COVID-19 pandemic, in 2023 EIA sought to gain a deeper understanding on the initiatives in place related to agriplastics, including fishing gear, and reached out to retailers with an expanded range of questions covering this area. A summary of survey responses with regards to fishing gear are outlined in this briefing.<sup>1</sup> All yearly responses relate to actions taken in the previous calendar year or nearest 12-month reporting period.

In the absence of clear global regulatory guidance on how to combat the risks related to plastic pollution in fishery (and aquaculture) supply chains, EIA asked

retailers what types of actions were being taken in their operations to reduce these risks. In particular, we were keen to measure participation in initiatives such as the GGGI, as well as the translation of commitments made in this and other spaces into sourcing policies.

The GGGI's BPFs for fisheries and aquaculture are the only holistic frameworks which provides practical actions for every part of the plastic fishing gear and aquaculture value chains to address ghost gear. These are publicly available resources and were developed in consultation with industry, governments and NGOs. We also sought information about specific initiatives undertaken with suppliers to address ALDFG. The questions were included to better understand the level and evolution of knowledge of this issue within the sector and the scaling of practical response efforts.

<sup>1</sup>Iceland has withdrawn from participation, so the data provided reflects the remaining nine major grocery retailers in the UK

## UK grocery retailer survey responses

Results reflect the responses received from the top nine UK grocery retailers. Responses included in this brief are from Aldi, Asda, Co-op, Lidl, Marks and Spencer, Morrisons, Sainsbury's, Tesco and Waitrose.

As outlined in Table 1, there has been a steady increase in the number of retailers working with fishery suppliers on the reduction and responsible management of fisheries-related plastic waste, from 2018-20 and in 2023. By 2020, all nine retailers were working with fishery suppliers.

In 2020, the survey was expanded to include a question to understand which UK retailers have a sourcing policy addressing ALDFG and related best practices. As outlined in Table 2, there was an increase from six to seven retailers from 2020 to 2023. Tesco and Asda are the only retailers without such a policy.

In 2018, only four retailers responded that they were members of GGGI (see Fig. 1). This increased to seven in 2019 and 2020 and reduced to six in 2023. Morrisons was no longer a member of GGGI in 2020 and 2023, but responded that it is supportive of the scheme and in the development of its fish sourcing policy it assessed the GGGI BFP, including incorporating risk scores for each fishing gear class as part of its risk assessment process.

Membership of GGGI alone does not mean that retailers are comprehensively working to tackle fisheries plastic

pollution. To further explore efforts that retailers are undertaking to tackle plastic in the fisheries supply chain, additional questions were asked in 2020 and 2023. Surveys provided blank boxes for retailers to detail their efforts. To encompass the free-ranging responses, these have been summarised, grouped into eight categories and are provided in Figure 2.

Generally, UK supermarkets have increasingly undertaken a variety of fisheries measures in their sourcing policies. For example, some retailers have been developing reusable alternative solutions to polystyrene packing boxes and some are influencing policy through membership of forums such as the Global Tuna Alliance.

In 2023, retailers report taking measures such as conducting internal risk assessment to highlight areas in the supply chain that require further work with a view to implementing solutions, undertaking research to evaluate how effectively different interventions prevent gear being lost and/or abandoned at sea, collaborating with regional and global NGOs to clean up and recycle old gear and maintaining a requirement that records of how fishing waste material is disposed of at port be retained.

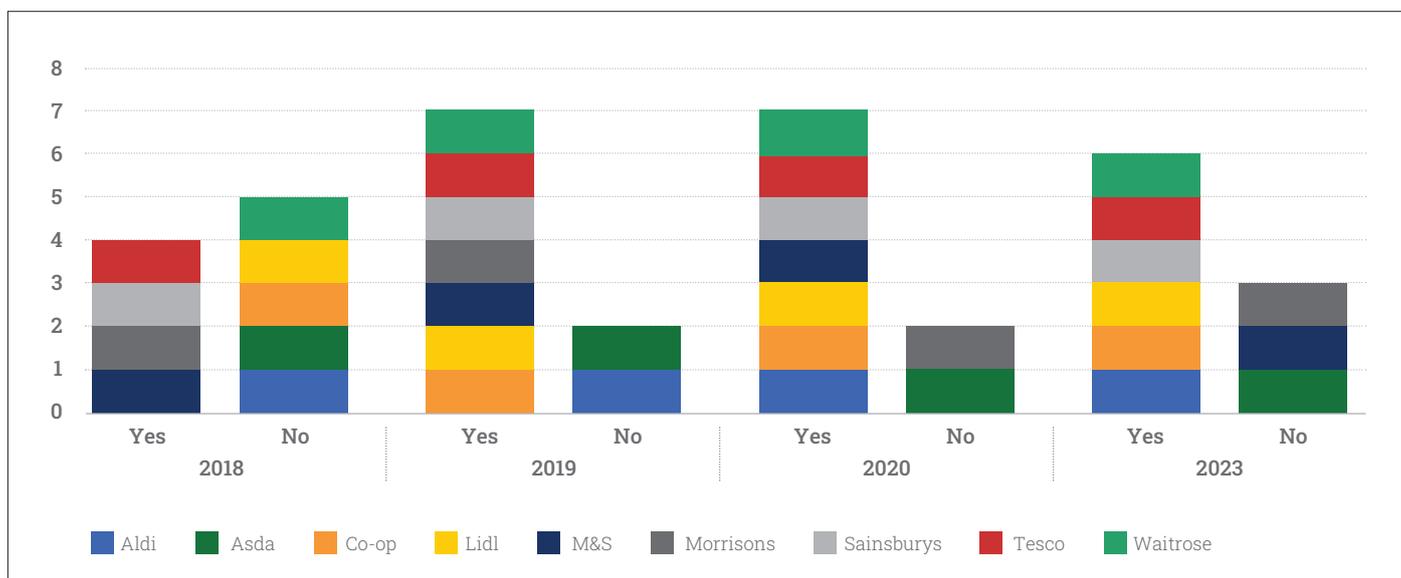
**Table 1:** UK retailers working with fishery suppliers on the reduction and responsible management of fisheries-related plastic waste, from 2018-20 and in 2023

Retailer	Year			
	2018	2019	2020	2023
Aldi	0	0	1	1
Asda	0	1	1	1
Cooperative	1	1	1	1
Lidl	1	1	1	1
M&S	1	1	1	1
Morrisons	1	1	1	1
Sainsburys	1	1	1	1
Tesco	1	1	1	1
Waitrose	1	1	1	1
<b>Total</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>9</b>

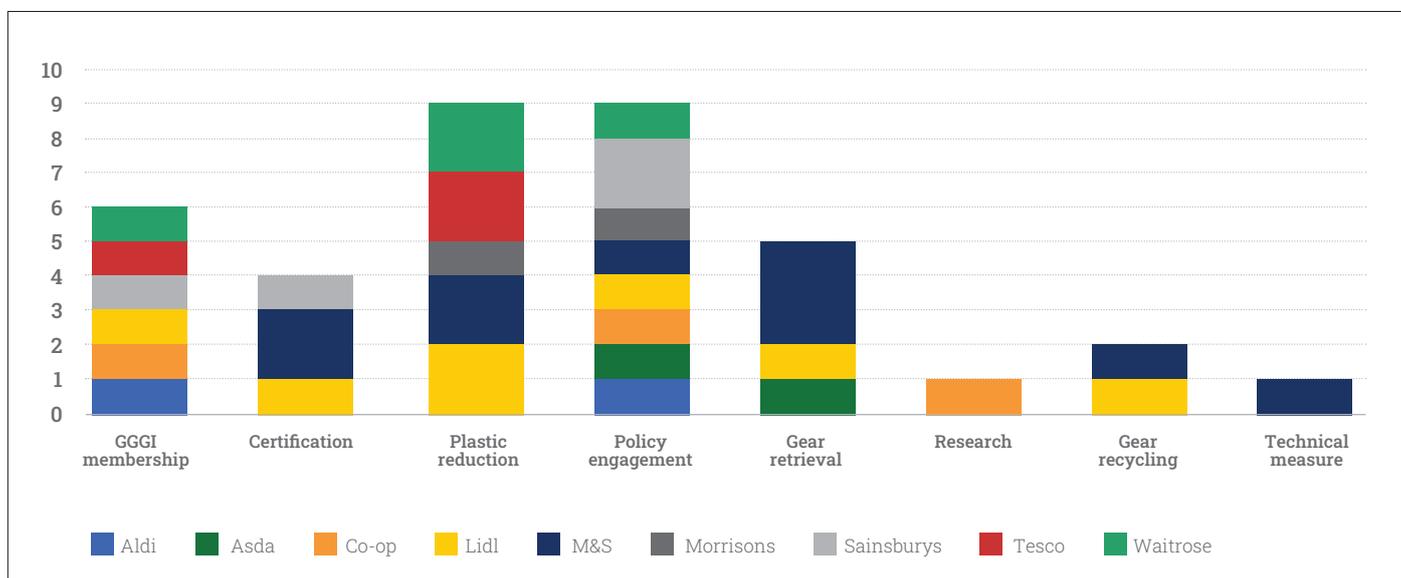
**Table 2:** UK retailers with sourcing policy addressing Abandoned, Lost, Discarded Fishing Gear and related best practices, in 2020 and 2023

Retailer	Year	
	2020	2023
Aldi	0	1
Asda	0	0
Cooperative	1	1
Lidl	1	1
M&S	1	1
Morrisons	1	1
Sainsburys	1	1
Tesco	0	0
Waitrose	1	1
<b>Total</b>	<b>6</b>	<b>7</b>

**Figure 1:** UK retailers that are members of the Global Ghost Gear Initiative, from 2018-20 and in 2023



**Figure 2:** Summary of grouped questionnaire responses provided by retailers in 2023



## Survey summary

There is still much more retailers can and should do to make meaningful strides towards elimination of plastic pollution and mismanagement of gear in seafood and aquaculture supply chains.

By 2020, all nine retailers were working with fishery suppliers on the reduction and responsible management of fisheries-related plastic waste. By 2023, seven out of nine UK retailers had a sourcing policy addressing ALDFG and related best practices. Since the surveys began in 2018, GGGI membership increased from four to seven and then reduced from seven to six in 2023. However, despite Morrisons no longer being a member of GGGI, it actively follows the GGGI best practice

guidance for fisheries within its sourcing policy. UK retailers have put a range of measures in place to begin to tackle plastic fisheries pollution in recent years.

Nevertheless, there is still much more retailers can and should do to make meaningful strides towards elimination of plastic pollution and mismanagement of gear in seafood and aquaculture supply chains.

# Recommendations for UK grocery retailers

Action will be most effective if a system wide perspective is adopted and undertaken collectively.

Please work with us to ensure every effort is taken to prevent unnecessary plastic usage and pollution in the marine environment, including from fisheries and aquaculture.

To this end, the following recommendations are made:

- make it a requirement in sourcing policy for suppliers to implement the FAO Voluntary Guidelines for the Marking of Fishing Gear and GGGI Best Practice Frameworks for wild capture and aquaculture in operations
- encourage producers and supply chains to shift from incremental to systemic change away from the use of plastics in fishing and aquaculture, including the development of alternative gear types, reducing overall volumes of plastic used in operations, using gear free from toxic coatings, the phasing out of single-use plastics and harmful plastics such as expanded polystyrene bait boxes and buoys and pursuing circular design for fishing gear
- take steps for prevention, mitigation and remedial solutions for plastic pollution at each stage of the fisheries supply chain and set quantitative, timebound targets and indicators for all actions identified
- encourage and work with government authorities to provide infrastructure for appropriate (accessible, affordable with no special fee) gear disposal as standard, promoting gear collection, recycling, repair and reuse – and prevent gear going to landfill, dumping or burning
- to improve effective management, encourage collection of complete information on production and usage rates per gear type (particularly static nets) and the volumes returned to port as waste to better quantify the contribution of different gear types to ocean plastic pollution in operations
- actively support inclusion of gear loss in sustainability criteria by fishery certification bodies.<sup>50</sup> Certification bodies and eco-labels should help develop robust, internationally agreed criteria on ALDFG and assist with mainstreaming it through knowledge-transfer and capacity-building to ensure compliance
- join or maintain membership of the Global Ghost Gear Initiative in combatting sea-based sources of plastic pollution and only source from suppliers which implement GGGI best practice guidance within their operations
- actively support efforts for the legally binding global plastics treaty being pursued under the UN Environment Assembly to include plastic fishing and aquaculture gear as a dedicated programme of work.

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