

GHOST GEAR LEGISLATION ANALYSIS



ACKNOWLEDGEMENTS

The report was made possible by generous contributions of time and expert knowledge from many individuals and organizations.

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GGGI

The Global Ghost Gear Initiative (GGGI) is the only cross-sectoral alliance dedicated to solving the problem of abandoned, lost, or otherwise discarded fishing gear (ALDFG) – widely referred to as “ghost gear” – around the world. The GGGI brings together more than 100 stakeholder groups, including 16 national governments as well as representatives from civil society, the private sector, public agencies, academia, intergovernmental organizations, and others from across the fishing industry to tackle ghost gear at a global scale. Since its founding in 2015, the GGGI has worked to implement a wide variety of preventative, mitigative and curative approaches to ghost gear, shaping fisheries management policy and building the evidence base around the prevalence and impact of this threat. In 2017, the GGGI developed the Best Practice Framework for the Management of Fishing Gear, which has been adopted by a range of seafood companies and in national and regional marine litter and fisheries management action plans. The GGGI has made meaningful change on the ground in fishing economies and communities, partnering with local fishers to remove ghost gear in places like the Gulf of Maine, Panama City, and the South Pacific. The GGGI has been hosted by Ocean Conservancy since 2019. Learn more at www.ghostgear.org.

OCEAN OUTCOMES

Ocean Outcomes (O2) is a global non-profit that envisions a future with healthy aquatic ecosystems, a plentiful and profitable wild seafood supply, and thriving fishing communities. O2 specializes in innovative and scalable fishery and aquaculture improvement projects and is advancing a comprehensive sustainability model that evaluates tracks, and incentivizes improvement of fisheries’ social, financial, and environmental performance. O2 also provides expert services to partners with aligned missions, including strategic analysis, fishery and aquaculture assessments, and design and facilitation of stakeholder engagements and capacity building workshops.

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WWF is one of the world’s largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries.

WWF’s mission is to stop the degradation of the planet’s natural environment and to build a future in which humans live in harmony with nature, by conserving the world’s biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

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1. INTRODUCTION

Abandoned, lost or otherwise discarded fishing gear (ALDFG), also known as ghost gear, consists of any fishing gear that is lost in marine environments. Ghost gear is considered to be the most deadly form of plastic debris to marine wildlife¹. A recent study, attempting a global estimate of rates of fishing gear loss developed from mostly Northern Hemisphere sources, estimated that 5.7% of all fishing nets, 8.6% of traps and pots, and 29% of all fishing lines used globally are abandoned, lost or discarded into the environment². At least 46% of the Great Pacific Garbage Patch is made of fishing gear³.

The **Global Ghost Gear Initiative (GGGI)** is the only cross-sectoral alliance dedicated to solving the problem of abandoned, lost, or otherwise discarded fishing gear (ALDFG) – widely referred to as “ghost gear” – around the world. The GGGI brings together more than **100 members** from numerous stakeholder groups, including 15 national governments as well as representatives from civil society, the private sector, public agencies, academia, intergovernmental organizations, and others from across the fishing industry to tackle ghost gear at a global scale. Since its founding in 2015, the GGGI has worked to implement a wide variety of preventative, mitigative and curative approaches to ghost gear, shaping fisheries management policy and **building the evidence base** around the prevalence and impact of this threat.

In 2017, the GGGI developed the **Best Practice Framework for the Management of Fishing Gear (BPF)**, the only comprehensive guide on fishing gear management practices for 10 stakeholder categories across the seafood supply chain. The aim of the BPF is to provide practical guidance to stakeholders on how to prevent, mitigate and cure gear loss, and it has been adopted by a range of seafood companies and in national and regional marine litter and fisheries management action plans. In 2018 and 2019, the GGGI partnered with FAO (Food and Agriculture Organization of the United Nations) to conduct a **series of capacity building workshops** around the world on the implementation of the BPF, reaching more than 190 stakeholders from 61 countries. The GGGI also continues to build the evidence base for ghost gear through data collection through its Ghost Gear Reporter App and its **online global data** portal, which houses the largest collection of ghost gear data in the world. The GGGI has developed and implemented more than **17 solution projects worldwide**, all of which take into consideration local context and drivers for ghost gear focused on prevention, mitigation and cure. These projects have made meaningful change on the ground in fishing economies and communities, through efforts including: surveying fishers in Jamaica, Grenada and the Solomon Islands; trialing gear marking and tracking techniques in **Indonesia** and **Vanuatu**; supporting end-of-life net recycling initiatives in **Alaska** and **Peru**; and partnering with local fishers to remove ghost gear in **Myanmar**, the **Gulf of Maine**, **Panama City**, and Vanuatu.

The World Wildlife Fund (WWF), with a mission to conserve nature and reduce threats to biodiversity, has been a key partner in tackling ghost gear issues, globally and within regional offices. WWF is an active member of GGGI, for instance participating in the GGGI/FAO led regional workshops in Vanuatu and Indonesia aimed at preventing and reducing ghost gear. In addition **WWF Poland** and **WWF Germany** were instrumental in the development and completion of the regional **MARELITT Baltic project**, and in 2002, **WWF Australia** developed an identification key for ghost nets found on the shores of the Arafura Sea (Hamilton et al. 2002).

To further progress on ghost gear prevention and mitigation, particularly at regulatory levels, WWF and GGGI commissioned **Ocean Outcomes (O2)** to research best examples of legislation that can drive implementation of ALDFG best practice and develop recommendations of key components of effective legislation that could help guide ALDFG policy outreach strategies moving forward. This report describes the approach to and results from the requested research, including associated context (e.g. enabling conditions) and key takeaways, and provides recommendations on how legislation and related instruments might be used to help drive best practice with regard to fishing gear management, and to minimize ALDFG and its impacts.



2. PROJECT CONTEXT

This section describes how we contextualized the project, i.e. the conceptual approach for organizing the foundational information upon which we built our analysis.



2.1 OVERVIEW

Ghost gear falls into three major categories; abandoned, discarded, and lost; which have different underlying causes and hence different potential measures for addressing them (Fig. 1).

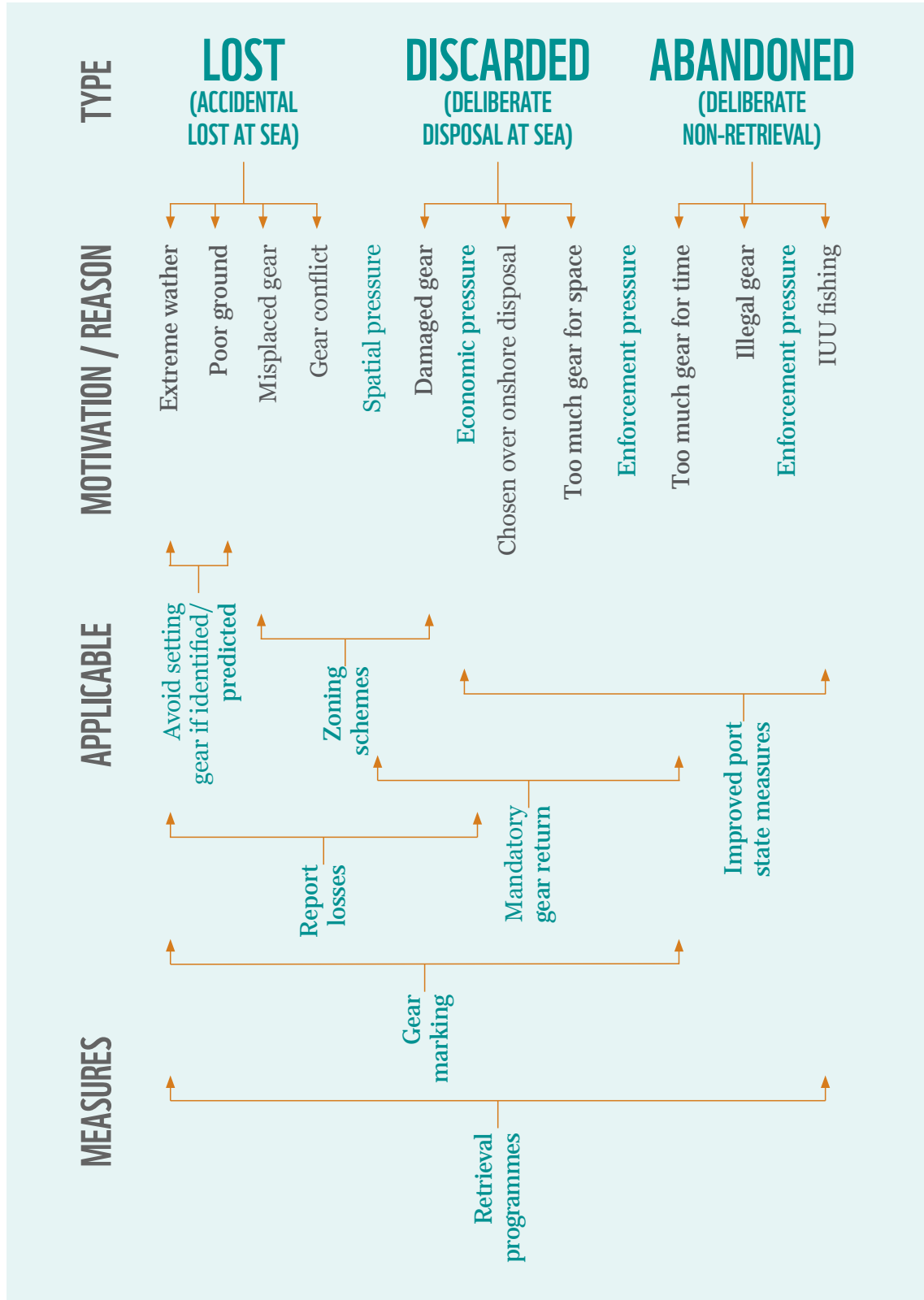


Figure 1. Types of ghost gear, their causes, and applicable measures to address them. Source: Macfadyen et al. (2009).

**TO EFFECTIVELY
IMPLEMENT THESE
STRATEGIES,
THERE MUST BE
AN ENABLING
ENVIRONMENT
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INCENTIVES
AND ETHICAL
MOTIVATION.**

These measures are primarily implemented via legislation, regulations, and formal or informal codes of conduct, which are often supported by important monitoring, research and remedial actions. Such information has been used to develop key tools for supporting strategies to reduce and minimize ghost gear, notably the **GGGI Best Practice Framework for the Management of Fishing Gear (BPF)** and the **FAO Voluntary Guidelines for Marking of Fishing Gear (VGMFG)**.

To effectively implement these strategies, there needs to be an enabling environment consisting of an interconnected network of authorities, incentives, and ethical motivation. Authorities (what we subsequently refer to as the authorizing environment) can be pictured as a layered framework of international treaties and agreements, national and provincial legislation, policy mandates, and administrative law (e.g. rules and regulations). Enactment of these authorities requires a foundational awareness about the issue (i.e. education and ‘selling’ the need to solve a serious problem) along with the political will to do so. Voluntary measures such as fishery codes of conduct also can have an important authorizing dimension when they are designed and implemented in such a way that serves to normalize fishing behavior in alignment with regulatory norms.

In addition to this network of authorities, clarity of purpose, stakeholder outreach and supporting programs to assist practical implementation, and incentives provide essential enabling conditions to help promote successful outcomes of legislative and regulatory intent once adopted. For instance, clarity of laws and regulations is essential for creating stakeholder understanding and helping to ensure compliance. Stakeholders also develop trust regarding legislative intent when government entities conduct effective outreach and consider constituent input for practical implementation. Key examples of incentives include governmental investments in research and development, ecologically positive financial subsidies, market and reputational benefits for sustainable fisheries practice, and for small scale fisheries, related support for providing improved social and economic conditions for local communities. Successful incentives also require the support of education and awareness building, which are key to understanding the benefits of participation and compliance. While the focus of this analysis is the authorizing environment, we also endeavor to identify important enabling conditions necessary for successful legislative initiatives.



2.2 ELEMENTS OF THE AUTHORIZING ENVIRONMENT

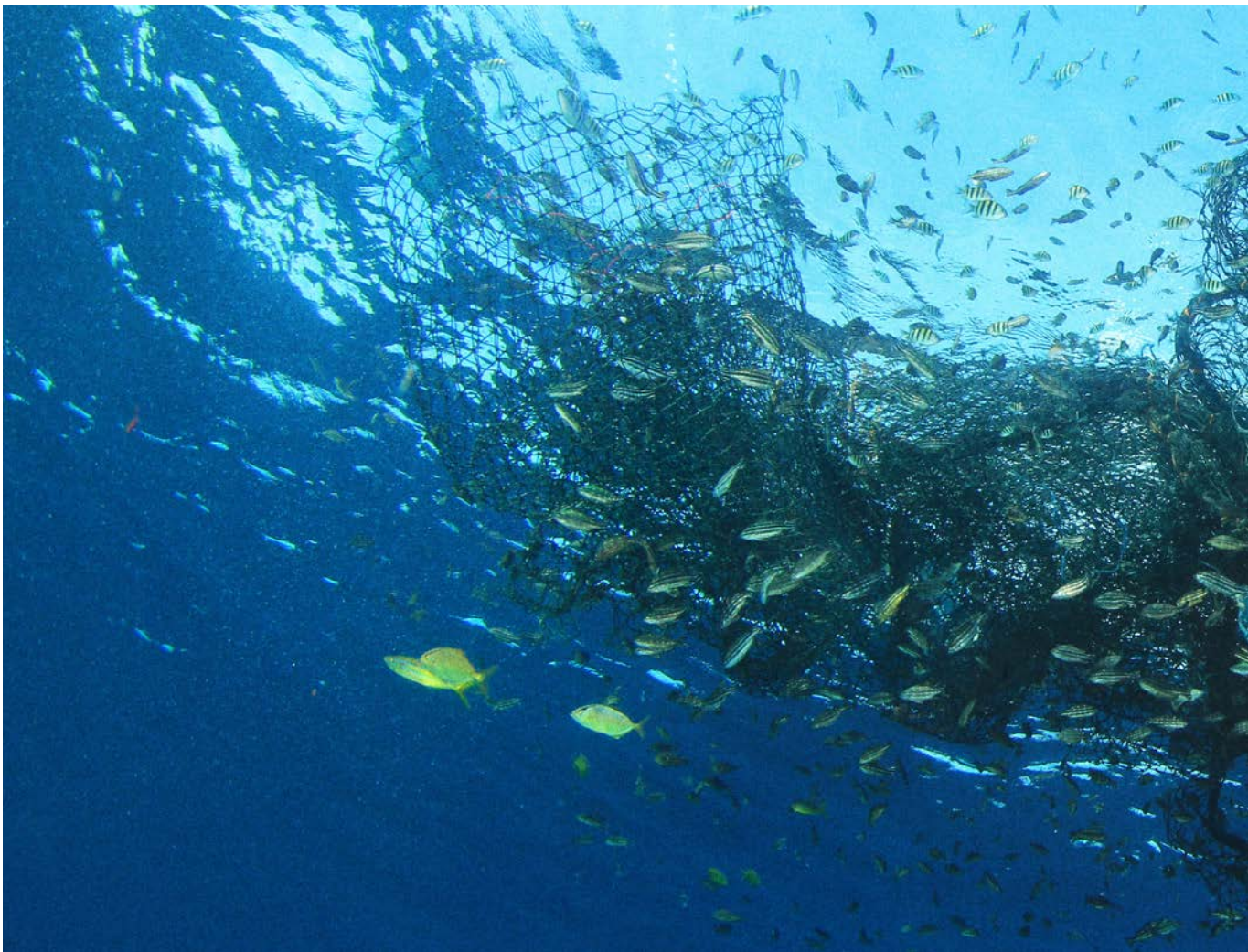
While the forms of governance at multinational, national and provincial scales vary widely across the world, especially in the context of how legislation and administrative law is established or labeled, authorizing environments share some basic elements, which we define below.

2.2.1 INTERNATIONAL INSTRUMENTS

INTERNATIONAL INSTRUMENTS INCLUDE AGREEMENTS, CONVENTIONS, VOLUNTARY GUIDELINES AND RESOLUTIONS.

International instruments include agreements, conventions, voluntary guidelines, and resolutions. International agreements, or treaties, are used by sovereign states and international organizations to govern issues that concern them. The parties to a binding agreement willingly assume obligations among themselves, and any party that breaches its binding obligations, in theory, can be held liable under international law. In technical terms, a treaty is a signed agreement between two or more parties, who will usually draft and execute the treaty. In contrast, a convention is a set of rules for the parties agreeing to the convention. Conventions tend to be broader in scope, covering more parties, and only come in force when a minimum number of parties agree to (i.e. ratify) the convention. Conventions are usually drafted and executed by an international body such as the FAO (Food and Agriculture Organization of the United Nations) or IMO (International Maritime Organization). International bodies can also issue voluntary guidelines and resolutions, which are typically non-binding.

In the context of fisheries and ALDFG, national and multinational legislation can often be driven by international agreements. While binding agreements certainly would be



expected to have more motivating force on legislation among participating states, voluntary mechanisms such as best practice guidelines and resolutions can similarly drive adoption of national legislation by particularly committed parties. We have therefore highlighted international instruments that play an important role in the overall authorizing environment to address ALDFG.

2.2.2 LEGISLATION

Legislative acts, or laws, originate from legislative government bodies such as a parliament, senate or assembly. Laws go through an established process to be passed or adopted and are enforceable and durable, with changes requiring amendment and/or judicial review. Legislation provides an important basis for authorizing regulatory actions to prevent and mitigate ALDFG issues. We have endeavored to present key examples of multinational, national and provincial legislation that could drive actions to reduce and minimize ALDFG, recognizing that these implementing actions can occur at varying governance levels related to where fisheries management authority lies (e.g. within overlapping Exclusive Economic Zones (EEZs), national EEZs or in-shore provincial waters).

2.2.3 RULES AND REGULATIONS, AND OTHER INITIATIVES

Rules and regulations, also known as administrative laws, essentially describe how legislative mandates and/or objectives will be met. Their implementation and adoption are therefore critical to achieving outcomes of legislation. Non-regulatory programs also contribute to legislative outcomes, for example through funding of research and development, outreach, education, and training.

Under this category, we reviewed a wide range of ghost gear strategies that, although not legislative in nature, are a key component of the enabling environment for implementing ALDFG measures. Our analytical premise is that legislation is one of multiple approaches to reducing and minimizing ALDFG, and thus we consider how legislation fits into the larger picture of driving scalable impacts.



3. APPROACH

In order to complete a holistic review of legislation and other policy instruments that have been used globally, we used a combination of desk-based analysis, selected expert interviews and a broad online survey. The intent was to obtain detailed insights from key experts already well-versed in relevant legislation, while also casting a wider net for additional expertise and knowledge of engaged stakeholders currently working to address ghost gear issues.



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3.1 EXPERT INTERVIEWS

We conducted 18 interviews with 21 experts, covering academia, non-governmental organizations, industry, government agencies, and independent consultancies. During these interviews, we discussed the role of legislation and policy mandates, important enabling conditions for effective legislation, and other key strategies for ALDFG. We provided the survey questionnaire as background, and some of these individuals provided survey responses, but our focus was on the particular knowledge and expertise of each expert in the context of legislation and other mandates within their immediate area(s) of expertise. As with the survey described below, in addition to locating additional sources of information for our research, our approach has been to incorporate non-attributed insights from these conversations into our analysis. A list of the experts we interviewed is provided in Appendix 1.

3.2 SURVEY

While the interviews provided an opportunity for in-depth discussion with key ghost gear experts, we also conducted an online survey to further identify relevant legislation and gain insight from other stakeholders globally, and particularly provided an enhanced ability to gather input from a broader and more diverse geographic area, including developing nation states. The survey (see Appendix 2) was designed with the following objectives:

- Engage past participants of various GGGI workshops and initiatives to continue their engagement and contribution to the ALDFG knowledge base;
- Locate additional key examples of existing legislation and policy mandates not identified in desk research and interviews;
- Query the effectiveness of existing mandates in driving ALDFG solutions;
- Gather ancillary information on the types of ALDFG strategies being implemented in various geographies, and;
- Probe views about the relative potential of various strategies to minimize and reduce ALDFG.



**THIS REPORT
INCLUDES
ANALYSIS OF
34 RESPONSES
FROM VARIOUS
STAKEHOLDER
CATEGORIES
(FIG. 2).**

We distributed the questionnaire digitally (using SurveyMonkey and PDFs) to approximately 225 potential respondents via targeted emails. Additionally, GGGI and O2 included a link to the survey in their respective e-newsletters to facilitate collection of additional responses. This report includes analysis of 34 responses from various stakeholder categories (Fig. 2), 16 of which came from government, and representing perspectives from 24 different countries (Fig. 3). The survey yielded roughly 15 additional region-specific examples of legislation and other relevant instruments to supplement our interviews and desk-based review, some of which are described in more detail below.

In addition, the survey provided an opportunity to assess the effectiveness of those instruments and query relevant stakeholders on other means of addressing the issue of ghost gear, both current and prospective. We highlight additional information related to these findings in Section 8 below.

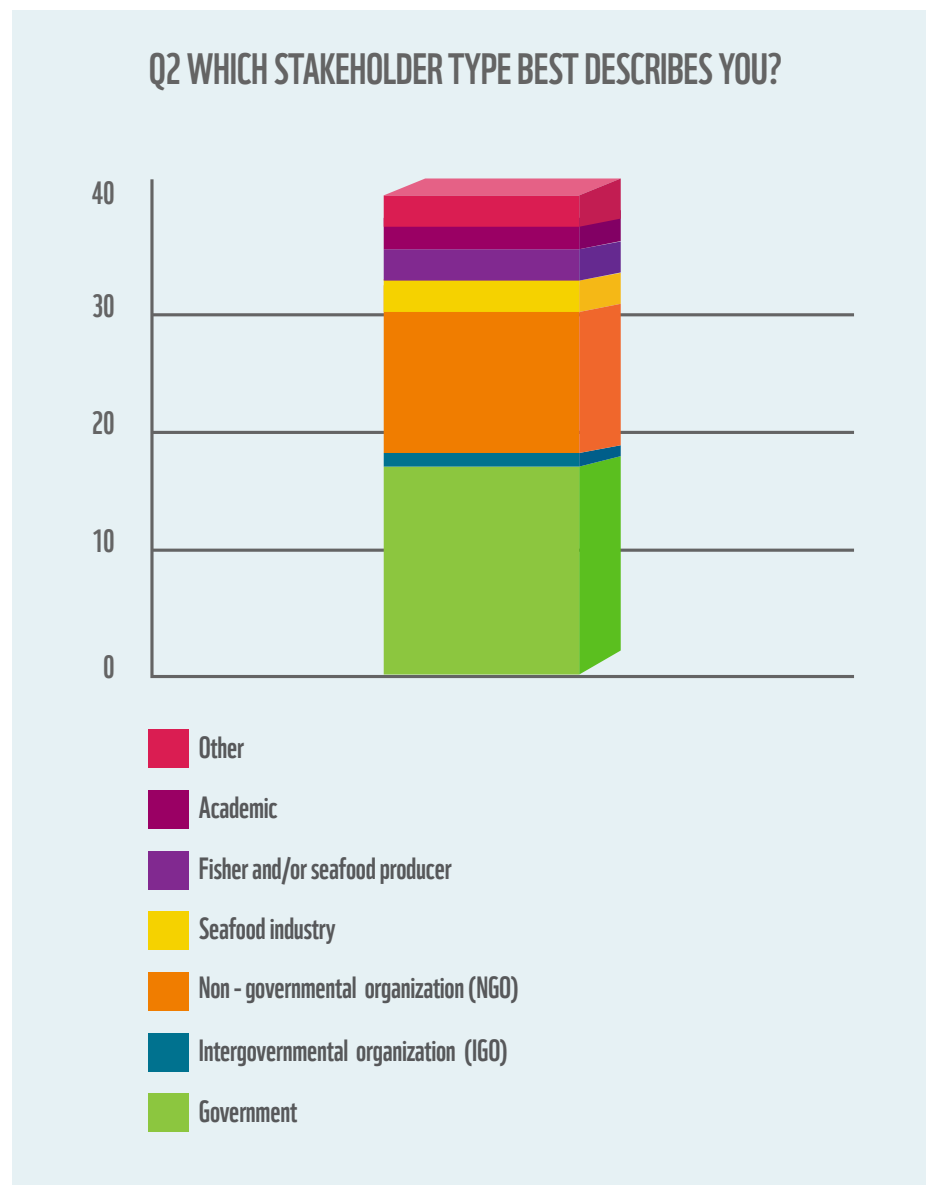


Figure 2. Distribution of ALDFG survey respondents by stakeholder category.

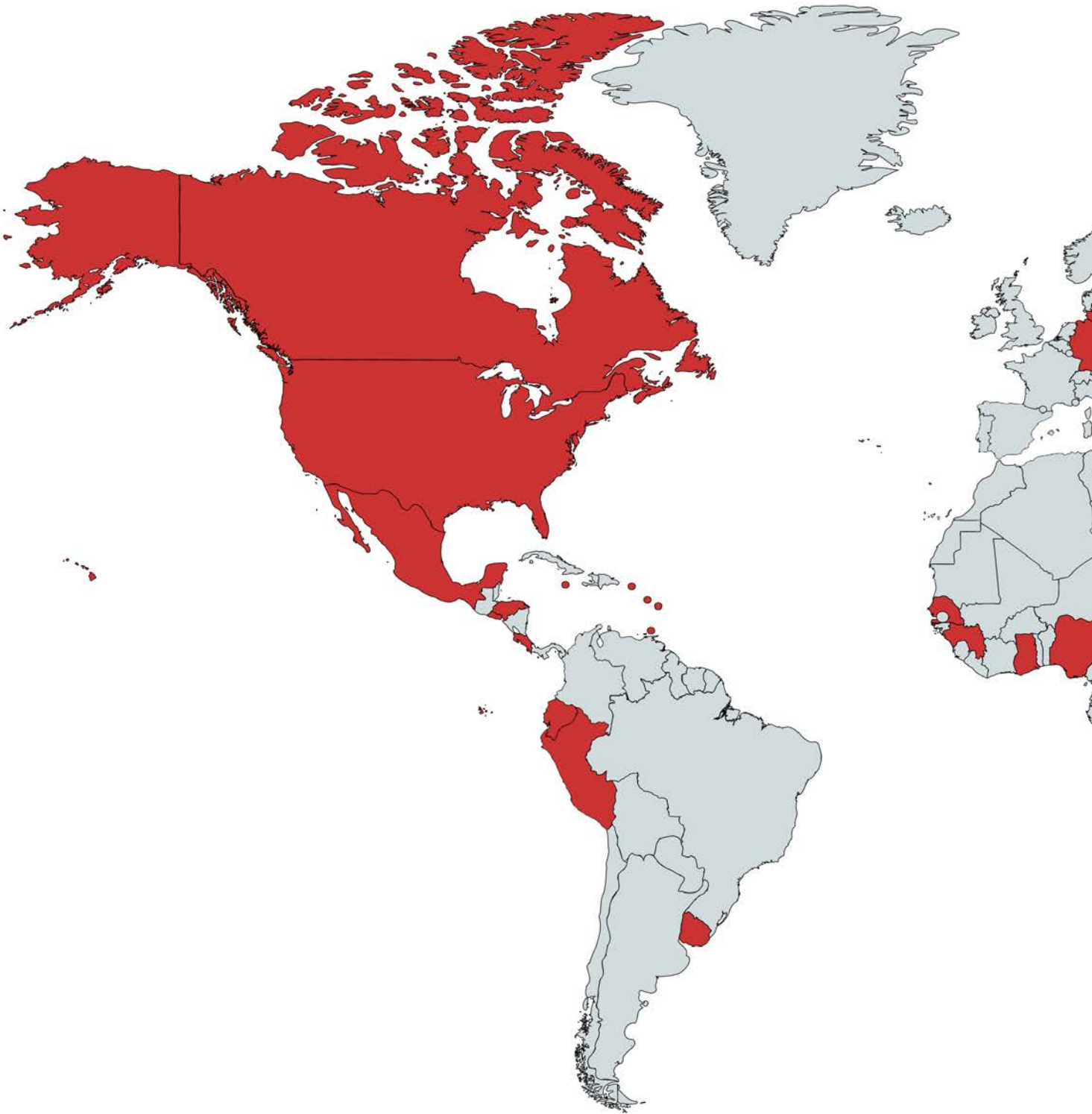




Figure 3. Countries from which responses to June 2020 WWF-GGGI ghost gear survey were received for this analysis - note: some areas/regions well-represented such as Caribbean are difficult to see in this figure.



4. KEY INTERNATIONAL AGREEMENTS RELEVANT TO ALDFG

This section provides summaries of key international agreements with some relevance to ALDFG management. For additional detail, please see Appendix 3, which includes a spreadsheet listing key examples of legislation, international agreements, conventions, and guidelines.





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4.1 INTERNATIONAL AGREEMENTS AND CONVENTIONS

Key international agreements and conventions relevant to addressing ALDFG include the:

- International Convention for the Prevention of Pollution from Ships (1973) as modified by the Protocol of 1978 (MARPOL 73/78), Annex V (Regulations for the Prevention of Pollution by Garbage from Ships)
- United Nations Convention of the Law of the Sea of 10 December 1982 (UNCLOS)
- Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Straddling Stocks Agreement; 2005)
- Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA; 2009)
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention), modernized as the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Protocol)

THE PSMA IS IMPORTANT HERE AS ITS GOAL IS TO PREVENT, DETER AND ELIMINATE IUU FISHING THROUGH THE ADOPTION AND IMPLEMENTATION OF EFFECTIVE PORT STATE MEASURES.

MARPOL and the London Protocol, which are complementary, emphasize the necessity of measures for regulating at-sea dumping and disposal. MARPOL Annex V (Section 2.2) in particular requires fishing vessel operators to record and in many cases report the discharge or loss of fishing gear.

UNCLOS is a much broader convention, with a larger number of signatory parties, that covers multiple aspects of international cooperation and fisheries management. Among these is a section that defines international rules and national legislation to prevent, reduce, and control pollution of the marine environment (UNCLOS Part XII, Section 5). The Straddling Stocks Agreement for implementing certain provisions of UNCLOS and Article 5(f) specifies that signatories “minimize pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, (hereafter referred to as non-target species) and impacts on associated or dependent species, in particular endangered species, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost-effective fishing gear and techniques.”

Illegal, Unreported and Unregulated (IUU) fishing is particularly relevant to ALDFG because it is a leading cause for abandoning gear (to avoid detection and enforcement action; Fig. 1). The PSMA is important here as its goal is to prevent, deter and



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**IN ADDITION,
MARPOL
REQUIREMENTS
HAVE THE
POTENTIAL TO BE
MORE ROUTINELY
AMENDED.**

eliminate IUU fishing through the adoption and implementation of effective port state measures. The PSMA provides guidance on vessel and gear inspections, and describes consequences for vessels that have engaged in IUU fishing.

All these agreements have the overarching potential for underpinning and motivating legislative action related to ALDFG by the signatory parties. One unique feature of MARPOL 73/78 is that it has direct linkage to implementing regulations and enforcement capability through IMO, such as through port state compliance mechanisms, whereas implementation and enforcement of other international fisheries agreements typically do not have similar mechanisms of a centralized nature, not to mention that many relevant fishery agreements, as noted in Section 4.2, are non-binding, voluntary arrangements. In addition, MARPOL requirements have the potential to

be more routinely amended, for instance with potential action taken and implemented as rapidly as within six months once amendments and terms have been agreed by member states, which does require additional time.

Nonetheless, MARPOL still has some ambiguity with respect to certain fishing gear provisions. For instance, Annex V's implementation guidelines (Section 1.7.8) exempt certain fishing gear such as FADs (fish aggregating devices), traps and static nets from being considered garbage or accidentally lost under the presumption of an intent they will be later retrieved, which may not be an accurate presumption for drifting FADs, especially if they drift outside the active fishing area. There is also some ambiguity and lack of general agreement about what size vessels must comply with MARPOL provisions, which is relevant to the agreement's utility in helping addressing fishing gear loss for non-industrial scale fisheries.

4.2 NON-BINDING GUIDELINES AND RESOLUTIONS

Key non-binding international agreements relevant to addressing ALDFG include the:

- FAO Code of Conduct for Responsible Fisheries (CCRF; 1995)
- International Guidelines on Bycatch Management and Reduction of Discards (2011)
- International Plan of Action to Prevent, Deter and Eliminate Illegal Unreported and Unregulated Fishing (IPOA-IUU; 2001)
- FAO Voluntary Guidelines on the Marking of Fishing Gear (VGMFG; 2019)

**A REVIEW BY
GILMAN (2015)
DESCRIBES
INTERNATIONAL
MANAGEMENT
IN PLACE FOR
ALDFG, INCLUDING
RFMO MEASURES,
AND MAY SERVE
AS A USEFUL
REFERENCE.**

The CCRF (Section 7.2.2) incorporates provisions from the Straddling Stocks Agreement's Article 5(f). It also specifies that fishing gear should be marked so that gear owners can be readily identified (Section 8.2.4) and further that "(s)tates should cooperate to develop and apply technologies, materials and operational methods that minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned gear" (Section 8.2.4).

FAO's International Guidelines on Bycatch Management recommend that States and RFMOs (regional fishery management organizations) consider measures to address the impact of pre-catch losses and ghost fishing on living aquatic resources (Section 8.1). The IPOA-IUU is a voluntary instrument developed to help implement provisions of the CCRF that includes requirements for marking vessels and gear in accordance with internationally recognized standards (Paragraph 47.8).

These conventions provide useful language and guidance that can be adopted by nations developing legislation and regulations relating to fishing gear management. The GGGI BPF, while not an international guidance document vetted through a formal FAO process, was developed with international stakeholder review and is another important resource for informing such regulations, particularly from a practical implementation standpoint.

4.3 UNIQUE CASE OF RFMOS AND CMMS

Regional Fisheries Management Organizations (RFMOs) are international bodies consisting of nations that share a practical and/or financial interest in managing fish stocks in a specific geographic area of international waters. They are established by international agreements. ALDFG is of multi-national interest in these forums given the magnitude of impacts occurring at cross jurisdictional scales. Further, because ghost gear can drift large distances these impacts can be transferred to a variety of areas within national waters.

RFMOs can adopt resolutions, recommendations and conservation and management measures (CMMS) that obligate the parties to consider or take implementing actions, and CMMS often represent binding agreements to do so. Such actions can include the need for national level legislation and/or regulation, though national implementation sometimes can be delayed by within country processes, and there are no simple enforcement mechanisms typically available.

It was not within the scope of this report to review RFMO management with regard to ALDFG, but we note that some examples of CMMS relevant to ghost gear exist. For example, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) has a conservation measure (10-01) that requires fishing gear to be marked. A review by Gilman (2015) describes international management in place for ALDFG, including RFMO measures, and may serve as a useful reference.

A few of the experts we interviewed noted some limitations of RFMOs inherent in their multinational nature, often limited resources and their normal desire to reach unanimous agreement on CMMS. Furthermore, as noted above, national legislative or regulatory action required to implement CMMS can be delayed and their effectiveness can be impacted by a variety of enabling conditions and implementation capacities.



5. REVIEW OF EXISTING LEGISLATION RELATED TO ALDFG

Legislation can be used to specifically mandate policies and actions to address ALDFG, examples of which we review in Section 5.1. Alternatively, legislation can be used to establish broad fishery management authorities or laws, components of which could include ALDFG, or in some cases, simply enable and guide regulatory approaches that have multiple sustainable fisheries objectives and outcomes that contribute to ALDFG solutions. Examples of these are provided in Section 5.2. Both types of legislative approaches can have similar effects, although implications for authority overlaps (e.g. between government departments) may differ, which we address in the discussion section below. The example highlights presented here are drawn from a larger list of legislation we reviewed that is contained in Appendix 3.



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5.1 ALDFG SPECIFIC LEGISLATION

There appear to be few examples of stand-alone legislation that specifically focus on ALDFG. The main examples that emerged from our research were from the United States of America (US).

5.1.1 MARINE DEBRIS ACT - US

HELP IDENTIFY,
DETERMINE
SOURCES OF,
ASSESS, REDUCE
AND PREVENT
MARINE LITTER
AND ITS ADVERSE
IMPACTS ON
THE MARINE
ENVIRONMENT
AND SAFETY OF
NAVIGATION.

The US has a national law specifically aimed at reducing marine debris: **the Marine Debris Research, Prevention, and Reduction Act of 2006**, reauthorized and amended via the Save our Seas Act of 2018 (Public Law No: 115-265; hereafter referred to as the Marine Debris Act). The main goal of the Marine Debris Act was to establish a program within the federal fisheries management body (NOAA; the National Oceanic and Atmospheric Administration) and the US Coast Guard to “help identify, determine sources of, assess, reduce, and prevent marine debris and its adverse impacts on the marine environment and navigation safety.” NOAA’s role is to administer the **Marine Debris Prevention and Removal Program** (Marine Debris Program), which has components for monitoring, removal, and prevention of marine debris; and reduction and prevention of gear loss (Marine Debris Act, Section 3). Outreach and a grants program are included as part of implementation efforts. Under the act, the role of the US Coast Guard is to take actions to reduce violations of and improve implementation of MARPOL Annex V and the Act to Prevent Pollution from Ships, the latter being the US law for implementing MARPOL.

The Marine Debris Act demonstrates some key considerations for developing targeted ALDFG legislation. It references relevant international instruments, defines the roles of different government agencies, and provides specific guidance for implementing debris prevention and reduction efforts, which are administered through the Marine Debris Program. Importantly, funding for the program has been sustained for more than ten years. Since its implementation, the program has raised awareness, **achieved removal of thousands of tons of marine debris**, and supported relevant scientific research.

One significant limitation to the Marine Debris Program is that its efforts are largely voluntary. There is also some limitation to its scope because it deals with gear only after it has become derelict, and its outcomes have tended to be more weighted toward ALDFG removal than core prevention.

5.1.2 LAWS FOR SHELLFISH POTS - WASHINGTON, US

ALDFG-specific laws that are more limited in scope are sometimes enacted at regional levels. For example, in 2002, Washington state in the US adopted a law (**Senate Bill 6313**) for the purpose of developing safe, effective methods to remove derelict fishing gear, eliminating regulatory barriers to gear removal, and discouraging future losses of fishing gear (Bowling 2016). **Washington Law RCW 77.12.865** requires state departments to publish guidelines for the safe removal and disposal of derelict fishing gear. **Washington Law RCW 77.12.870** requires creation of a database of known derelict fishing gear and shellfish pots, and reporting guidance for fishers who lose fishing nets (reporting required) and shellfish pots (reporting encouraged).

Outcomes of these laws have been mixed, according to experts we interviewed. In particular, mandates for recording/reporting lost gear have not been completely successful. Washington has a ‘no fault’ reporting system, where reporting gear loss carries no penalty if done at the time of loss. Penalties are applied for failure to report, for instance when lost gear is discovered and traced back to an owner who did not report

WASHINGTON HAS A “NO-FAULT” REPORTING SYSTEM, WHERE REPORTING OF GEAR LOSS CARRIES NO PENALTY IF DONE AT THE TIME OF THE LOSS.

the loss. Under this type of system, fishers should have little reason to not report gear loss. However, some fishers feel overburdened with regulations and/or do not have a sufficient level of trust in regulatory outcomes, resulting in lower than expected reporting rates. Nonetheless, the passing of these laws serves as a solid foundation for development of more targeted regulatory efforts.

5.2 BROAD AUTHORIZING LEGISLATION WITH REFERENCES TO MANAGEMENT OF FISHING GEAR OR MARINE DEBRIS

For most nations that have enacted ALDFG mandates, mandates are embedded within broader fisheries legislation. We describe three illustrative examples below.

5.2.1 MARINE LIVING RESOURCES ACT - NORWAY

Norway is commonly cited as an example of a nation that has developed robust legislation and management actions for ALDFG, particularly through a fisheries management lens. Norway’s ALDFG legislation is contained within the **Marine Living Resources Act** (2008), the main law governing fisheries management. The act includes three sections that specifically address ALDFG, as shown below.

- **Section 17 Loss of gear**

Anyone that loses gear or cuts it adrift has a duty to search for the gear. The Ministry may grant exemptions from the duty to search for gear. The Ministry may adopt regulations relating to reports of gear that is lost or found, including information on what gear was lost and where.

- **Section 28 Prohibition on leaving objects in the sea**

It is prohibited to dump gear, moorings and other objects in the sea or leave such objects unnecessarily in the sea or on the seabed if they may injure marine organisms, impede harvesting operations, damage harvesting gear or endanger vessels. Anyone that acts in contravention of the first paragraph has a duty to clear up or remove the objects in question. The Directorate of Fisheries may order such clearing up or removal.

In the event of failure to comply with orders issued under the second paragraph above, the Directorate of Fisheries may implement any necessary measures at the expense and risk of the party responsible. The costs of such measures are enforceable by execution proceedings.

- **Section 29 Salvage of gear and catches**

Anyone that salvages gear that has drifted away, been lost or been abandoned, including dories and other equipment, shall report this to the owner as soon as possible. The Ministry may adopt regulations on reporting of the salvage of gear that has drifted away, been lost or been abandoned, including on what has been salvaged and where it was found.

Anyone that salvages gear is entitled to a reward. The reward shall be fixed in accordance with custom or what is considered to be reasonable. The amount of the reward may not exceed the value of what was salvaged.

A salvaged catch accrues to the salvager. If the value of the catch considerably exceeds the reward payable, the latter may be wholly or partly remitted.



The release of salvaged property may not be required before the reward and costs have been paid. When the reward and costs have been paid, the salvor has a duty to release the property that has been salvaged. The owner has a duty to accept the salvaged property if it is reasonable for the salvor to require this after the salvaged articles have been secured.

The Ministry may adopt regulations on the salvage of gear.

These references within the Marine Living Resources Act identify roles and responsibilities and provide a basis for further development of regulations and sanction for non-compliance. The language is more targeted than that used in some of the other examples we reviewed, which in some cases simply used language from international instruments, such as the following from the Straddling Stocks Agreement: “[States shall] minimize pollution, waste, discards, catch by lost or abandoned gear,”

5.2.2 THE COMMON FISHERIES POLICY - EU

The **Common Fisheries Policy** (CFP) is the main law governing management of fishing fleets and conservation of fish stocks in the European Union (EU), and the policy can be translated into associated mandates in the form of EC Council regulations and directives, which both are types of legislative acts. EC Council regulations are binding and must be applied in their entirety across the EU, while EC directives establish goals that all EU countries must achieve. In either case legislative intent is implemented via national legislation and regulations of EU member countries, such as the Coastal Fisheries Regulations (Küstenfischereiverordnungen) of Germany’s coastal states.

Two European Commission’s (EC’s) Council regulations relevant to ALDFG have been adopted. **EC Council Regulation No. 1224/2009** (Article 48) requires fishers to retrieve lost gear or, if retrieval fails, to report the loss within 24 hours of the retrieval attempt to the national authority who has licensed the fishing vessel. **EC Council Regulation No 404/2011** (Articles 9 through 12) contains rules for marking ‘passive gear’ and beam trawls.

Despite the fact that regulations have been developed, lost gear does not appear to be regularly reported in most EU countries. In the case of Germany, losses at sea are often unintentional, and lack of reporting by fishers relates to fear of possible cost liability for subsequent lost gear retrieval. Another problem is that loss reports are made to a federal institution (“BLE”) with limited executive authority in the coastal states, and the institution’s responsibilities for retrieval, including financial responsibility, are unclear. These factors contribute to lack of compliance with the regulatory requirement.

Another key EU example is its **Directive on Port Reception Facilities for the Delivery of Waste from Ships** (2019/883; PRF Directive), which requires that all EU ports provide reception facilities for the waste generated by all sea-going vessels, following MARPOL requirements but focusing more on ports than vessels. Upon adoption of the directive, member states have two years to ensure their national laws are in compliance.



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5.2.3 GHOST GEAR FUND - CANADA

Under the current fishery regulatory regime, Canada has expanded all commercial fishing gear licenses to include conditions that require reporting of lost gear within 24 hours, and reporting of any gear retrieved. This will allow for targeted retrieval efforts and more robust analysis of the ghost gear issue in Canada. The new licensing conditions represent a strong step towards improving management of ALDFG in Canada, but there are challenges associated with addressing ghost gear in Canada:

- Although Canada has ‘no fault’ reporting in place, the mandatory lost gear licensing conditions may be viewed as an enforcement tool by some fishers who are worried about being charged, and thus the Canadian government has been making efforts to engage fishers on this topic through more of a stewardship lens, supporting ethical motivation for responsible gear management.
- The current Canadian fisheries regulatory and licencing regimes are prescriptive in terms of types, quantities and identification of fishing gear that a fish harvester can have on board their vessel and/or fish. While these measures were intended to ensure compliance with quotas and allocations, they impede the ability of a harvester to retrieve gear during open fishing seasons. An assessment of current regulatory tools is currently underway to ensure that any potential impediments to addressing and reducing ghost gear domestically are identified and addressed. Current retrieval efforts are licensed and limited to closed fishing seasons until these impediments are addressed.

Canada’s primary initiative for addressing ALDFG is its **Sustainable Fisheries Solutions and Retrieval Support Contribution Program (Ghost Gear Fund)**. Authority for this program is through the Canadian **Wrecked, Abandoned or Hazardous Vessels Act** (S.C. 2019, c. 1; WAHVA), which aims to protect the environment by regulating abandoned or hazardous vessels and wrecks in Canadian waters. Under this law, a ‘wreck’ is defined as “equipment, stores, cargo or any other thing that is or was on board a vessel and that is sunk, partially sunk, adrift, stranded or grounded, including on the shore.” ALDFG has been interpreted as a “wreck”, and as such, WAHVA is being used as the legislative instrument for regulating ALDFG retrieval and disposal during closed fishing seasons.

In addition to legislative and regulatory tools, the Canadian fishing industry is committed to the achievement of sustainability in marine and freshwater fisheries, and has therefore developed the **Code of Conduct for Responsible Fishing Operations** as an essential step in pursuit of this objective and includes an expectation (guideline 2.8) for fish harvesters to ‘make every effort to retrieve lost fishing gear, reporting all lost gear’.

The background of the page is a photograph of a rocky coastline. In the foreground, there are dark, choppy waves. To the right, a rugged rock face extends into the water, with several seabirds perched on it. The birds have white bodies with dark wings and heads. A large, semi-transparent teal rectangle is overlaid on the left and center of the image, containing the text.

**6.
KEY EXAMPLES OF
RULES, REGULATIONS
AND ACTIONS
IMPLEMENTING
LEGISLATIVE INTENT**



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6.1 RULES AND REGULATIONS - ADMINISTRATIVE LAW

There are numerous examples of rules and regulations for implementing fishing gear management that provide a direct or indirect link to addressing ALDFG. While a review of regulations is not a focus of this report, it is useful to understand the essential role that they typically play in implementing legislative mandates. An informative list of administrative law references relevant to ALDFG is provided in Appendix 3. Many relate to direct management of fishing gear, particularly in terms of gear marking and retrieval. Some representative examples follow.

- The Costa Rica Institute of Fisheries and Aquaculture Agreement 115 includes gear marking and reporting requirements.
- California Fish & Game Code, Div. 6, Part 3, Ch. 3, Article 1 (§ 8601.5) outlines detailed requirements for marking set nets or set lines, reporting their loss and consequences for failing to comply.
- Norway's Regulations Relating to Sea-Water Fisheries implement portions of its Marine Living Resources Act related to ALDFG (see discussion below).
- Namibia's Regulations Relating to the Exploitation Of Marine Resources (2001) outline requirements for the marking of fishing gear (Annexure O) and addresses potential discard of fishing gear and other non-biodegradable objects at sea (Section 23).
- Sri Lanka's Fishing Gear Marking Regulations No. I of 2015 contain 21 sections that specify detailed gear marking requirements.
- Indonesia's National Regulation: 1. Presidential regulation (Peraturan Presiden) No. 83 (2018) provides an example of regulations that fall under the lens of general waste and debris management, focusing on at-sea waste. It discusses a strategic action plan to reduce solid waste output by 70 percent between 2018 and 2025 (Purwendah and Periani 2019).

Again, Norway provides leading examples within its 'Regulations Relating to Sea-Water Fisheries,' which include a requirement for persons to search for gear that they lose or cut adrift, and if not possible to retrieve the gear, to immediately report its loss to the Coast Guard (Section 78). Discoveries of lost gear also need to be reported. Fishers using fixed gears and float lines must report to the Coast Guard when and where they set and haul their gear (Sections 30, 57). The locations of set gear are posted on a website, which allows other vessels in the area to avoid the gear and subsequent entanglement. This system helps reduce gear conflict and prevent gear loss.

**IN ADDITION,
AT THE
INTERNATIONAL
LEVEL, GGGI HAS
ESTABLISHED
AN EXTREMELY
EFFECTIVE
AND GROWING
NETWORK THAT
IS ESSENTIAL TO
ADDRESS ALDFG.**

As with Washington state in the US and Canada, Norway has ‘no-fault’ reporting of gear loss. In addition, fishers pay a tax that partially covers the cost of annual, government-led retrieval of ALDFG at sea. If fishers lose less gear, this cost will be reduced, increasing incentives to minimize loss. Anecdotally, there does not yet appear to be evidence of a decreasing trend in quantities of lost gear, in part because most gear loss is unintentional. Nonetheless, our interviews identified a finding that unreported lost gear is now a rarer occurrence than it used to be.

6.2 OTHER INITIATIVES

All of the experts we interviewed recognized that non-regulatory initiatives and plans of action can be extremely important for tackling ALDFG issues. This appears particularly true in at least two cases: (1) where relevant fundamental legislation is limited, or is in the process of being enacted; and (2) where opportunities exist to scale actions and positive impacts from cross-regional coordination. We list some initiatives in Appendix 3 for reference, with the **MARELITT Baltic project** (EU), the **Sustainable Fisheries Solutions and Retrieval Support Contribution Program** (aka Ghost Gear Fund; Canada), and the **Clean Nordic Oceans** network (Åland, Denmark, Faroes, Finland, Greenland, Iceland, Norway, Sweden) being particularly noteworthy regional examples. Additionally, at an international scale, GGGI has established an extremely effective and growing network instrumental to tackling ALDFG as an international priority, with the network providing valuable learning and technical support for partners on the ground. Examples of action plans for addressing ALDFG, which operate at varying geographic scales from fisheries to regions, include the **Puget Sound Lost Crab Pot Prevention Plan**, the **Baltic Sea Blueprint**, Indonesia’s **National Plan of Action for Marine Plastic Debris Management** and Australia’s **Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia’s coasts and oceans** (2018). The latter two plans are examples with broader marine debris scope, within which ALDFG represents one component.





**7.
BROAD
MARINE
PLASTICS
LEGISLATION
AND POLICY
MANDATES**

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THE OSPAR COMMISSION RECENTLY RELEASED A REPORT OUTLINING THE CHALLENGES AND SOLUTIONS FOR THE DESIGN AND RECYCLING OF FISHING GEAR, WHICH ALSO PROVIDES GUIDANCE FOR IMPLEMENTING EPR SCHEMES.

Most of the agreements, legislation, regulations and other initiatives described above approach the problem of ALDFG through a fisheries management lens. Yet there has been growing interest, from a broader plastics and marine debris control standpoint, to consider and promote management strategies that fall outside the realm of traditional fishery management controls. These interests importantly include promoting a circular plastics economy concept and extended producer responsibility throughout the entire life cycle of fishing gear.

The most forward-thinking example of progressing these ideas can be found in Europe. In 2019, following development of **An EU Action Plan for the Circular Economy** and **A European Strategy for Plastics in a Circular Economy**, the EU adopted **Directive 2019/904 on the reduction of the impact of certain plastic products on the environment** (SUP Directive). The objective is to prevent and reduce impacts of single use plastics on the environment by promoting circular approaches that prioritize sustainable and non-toxic reusable products and re-use systems, thereby reducing waste generation. Both the SUP Directive and previously described PRF Directive have a much broader intent than ALDFG, but fishing gear represents a key component of marine plastic waste. The SUP Directive requires that member states establish EPR (extended producer responsibility) schemes whereby producers of fishing gear containing plastic cover the costs of its subsequent end-of-life collection as well as the cost of associated awareness raising efforts that highlight the need for development and availability of re-usable alternatives, re-use systems and waste management options. The Directive also requires the European Commission to request development of a harmonized standard relating to the circular design of fishing gear containing plastics by the European Standards Organization (ESO).

A number of activities and research have been launched to support implementation of the SUP Directive. For instance, the EU has commissioned development of methods to support its intent to adopt two implementing acts related to the monitoring and reporting of fishing gear (produced and collected as waste), as well as other plastic waste collected in the nets during normal fishing operations. The OSPAR Commission recently published a report describing challenges and solutions for design and recycling of fishing gear, that also provides guidance for implementing EPR schemes (OSPAR 2020). And in February 2020, an **international multi-stakeholder workshop**, co-sponsored by OSPAR and CEFAS (Centre for Environment Fisheries and Aquaculture Science), was held to develop information and recommendations to support ESO's ultimate development of the harmonized standard mentioned above.

WWF Norway has been advocating national action that would accelerate meeting minimum requirements of the EU directives and commissioned a recent analysis of the status and potential of EPR as part of a true circular economy for plastics (Deloitte 2020). The report included analysis of responsible sourcing of more recyclable materials, improved supply chain traceability, gear end of life management, and also contained a number of proposed strategies, including specific recommendations for improving the legal framework in Norway.



8. DISCUSSION

Our research provided an overall picture of how international agreements, legislation and regulations can interact to address ALDFG issues. Once adopted, international agreements motivate participating states to develop or amend national laws, and can facilitate development of legislation by providing basic guidance. In turn, legislation provides policy objectives and mandates for developing regulations. Legislation can also establish regulatory or non-regulatory programs (e.g. Canada's Ghost Gear Fund) to implement actions for achieving desired outcomes.

The discussion is structured into two major sections, one viewed through a fisheries lens and one through a plastics and marine debris lens. We begin first with the role/importance of legislation in the overall enabling environment, before describing some considerations for developing legislation relating to ALDFG.



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8.1 FISHERIES DIRECTED ALDFG LEGISLATIVE STRATEGY

8.1.1 ROLE AND EFFECTIVENESS OF FISHERIES LEGISLATION IN ADDRESSING ALDFG

A critical point emphasized in many of our expert interviews is that legislation to address ALDFG is essential. It establishes necessary authorities and policy guidance to take needed action. At the same time there is almost a uniform understanding that legislation by itself cannot be effective - a mix of enabling conditions and well designed implementation strategies are key. Specific experience in Norway and the EU has been very instructive in this regard.

Norway perhaps provides the most developed example of ALDFG related authorities, mandates and regulatory requirements incorporated into its national fisheries legislation and associated fishing rules. This includes general authorities and rules to regulate the design, marking, use and tending of gear, as well as more specific ALDFG provisions (described earlier) that guide lost gear reporting, gear dumping, and lost gear salvage. There is a requirement to report fishing activity locations in real time that is available on a publicly available website, which has served to avoid gear conflict between passive and actively fished gear, and the national government oversees a broad derelict gear retrieval program annually. But the success of these efforts occurred over a period of 20-30 years and required significant outreach and engagement with fishers involving awareness building around the issue, their development of trust with government managers, and resources and programs to support implementation to avoid unintended consequences and provide value to fishers' operations. There is currently a high level of compliance with requirements supported by monitoring, incentives and enforcement when needed.

The effectiveness of implementing more limited ALDFG provisions in the EU's CFP by member states is viewed at a much lower level than the Norwegian experience. Awareness, while having notably grown in some areas like Germany, is not uniform, and required reports of gear loss appear to be quite limited. Trust levels with fishers are not sufficiently high to counter fears of the possible cost consequences of reporting gear loss, given the expense of retrieval by professional divers and lack of institutional funding or some form of insurance pool to support it.



FINALLY, IN SOME REGIONS IUU FISHING IS SIGNIFICANT AND A LARGE CAUSE OF LOST GEAR, WHICH CAN UNDERMINE AN OTHERWISE COHERENT LEGISLATIVE STRATEGY FOR ALDFG.

The initial experience with new national level licensing requirements to report lost gear in Canada is pointing to the same needs - awareness, trust building and incentives are key to building compliance, with monitoring and evaluation essential for providing operational value to fishers, and enforcement playing a supporting role in a program designed to promote stewardship.

Interestingly, very few survey respondents felt that current legislative and policy mandates have been more than 'somewhat effective' at driving ALDFG solutions within their regions (Fig. 4). Our review would suggest several factors likely involved in this result. First, at a global scale there is a paucity of ALDFG legislation, legislative elements or even implementing rules. Gear marking, which serves a wider variety of fishery management needs, may be the most commonly used or required element, as suggested in the survey (Fig. 5), but gear marking is only one component - albeit essential as a mitigative action - in the overall ALDFG toolkit. Our interviews also would suggest that the relatively low level of fisher engagement, awareness building, resourcing, development of incentives, monitoring and enforcement all contribute to a view of ALDFG legislation not being particularly effective due to lack of insufficient enabling conditions and implementation support. Additionally, legislation takes significant time to enact, both to build the case for development and to go through the legislative process. Finally, in some regions IUU fishing is significant and a large cause of lost gear, which can undermine an otherwise coherent legislative strategy for ALDFG. Again this reinforces an important dimension of needed enforcement.

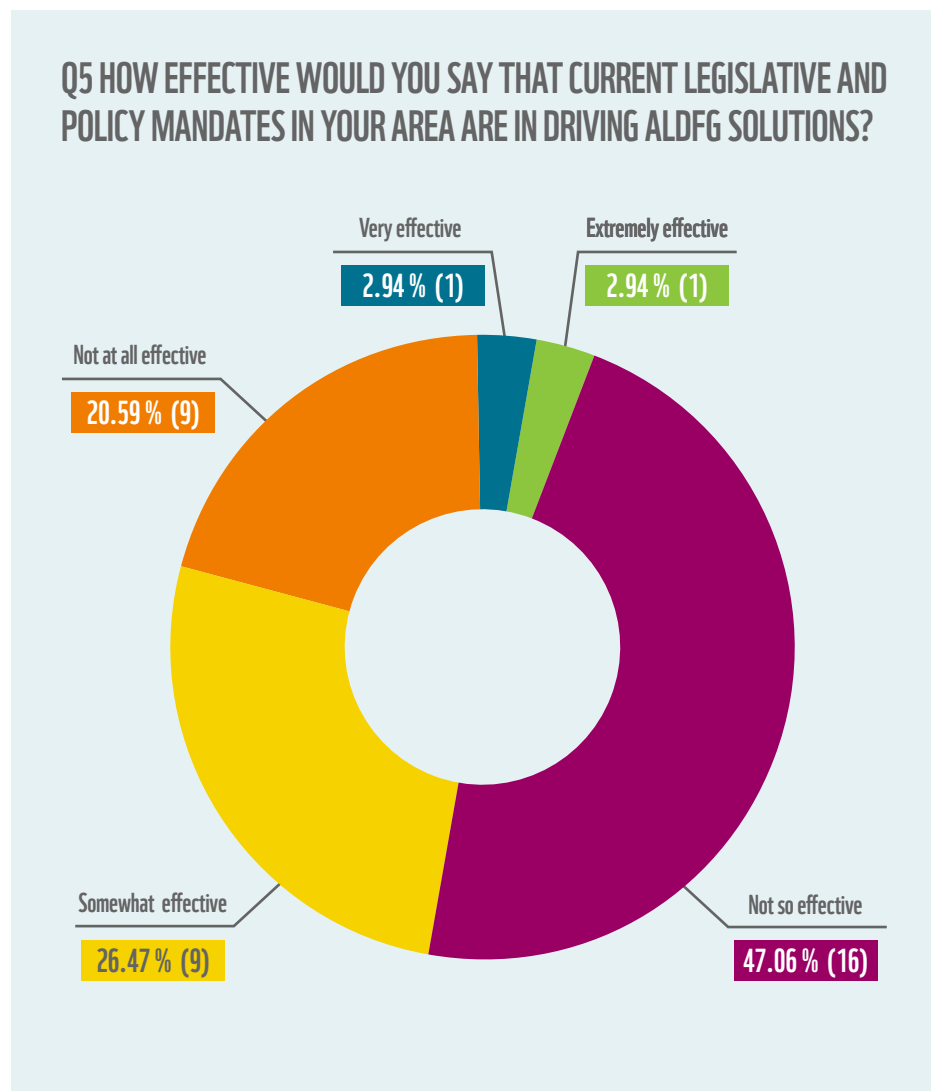
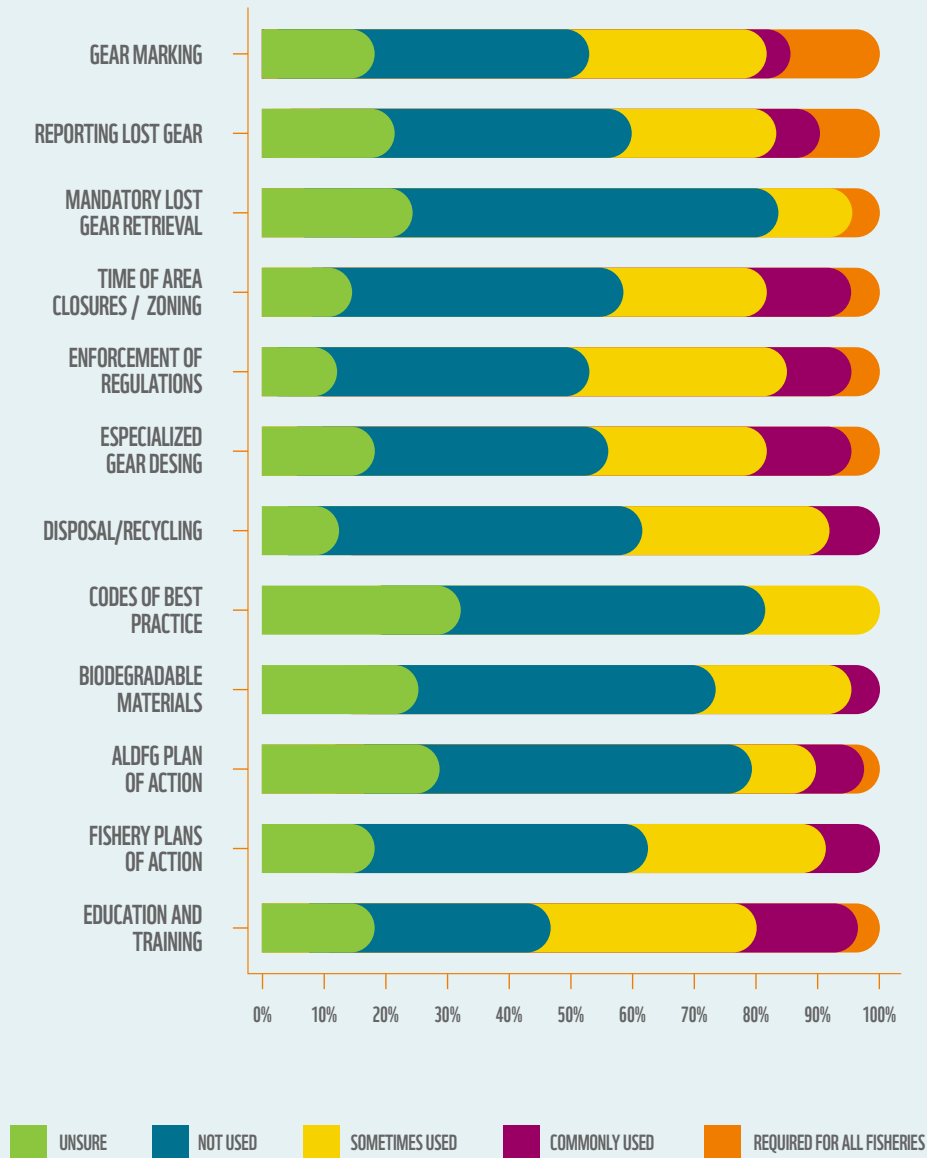


Figure 4. Perspectives on the effectiveness of existing legislation according to survey respondents.

Q6 TO WHAT EXTENT ARE THE FOLLOWING ALDFG SOLUTION STRATEGIES USED/IMPLEMENTED IN FISHERIES IN YOUR REGION:



8.1.2 KEY ELEMENTS OF ALDFG LEGISLATION AND REGULATORY FRAMEWORK

There is no ‘one size fits all’ model legislation for ALDFG that could be implemented on a broad scale, simply due to vast differences in governance, fisheries management system approaches and their existing infrastructure and status. While legislation and effective implementing rules and strategies are essential, specific legislative needs should be determined by a gap analysis (see further discussion below) of what is missing from the ALDFG toolkit in a given regional, national or provincial setting, with a logical starting reference being GGGI’s BPF (and FAO’s complementary VGMFG). Here again we are looking first through a fisheries lens at ALDFG strategies that would be implemented by fisheries management entities working with

fishers and fishery organizations.

At the same time, there are important elements of legislation and regulatory frameworks that are important to comprehensively address ALDFG to help ensure that best practice outcomes can be achieved. We outline some key elements below in Table 1.

Table 1. Key elements of regulatory frameworks and legislation to address ALDFG.

FOUNDATIONAL REGULATORY ELEMENTS AND FRAMEWORK CONSIDERATIONS	
FISHERY MANAGEMENT AUTHORITIES TO LICENSE FISHING ACTIVITIES	Basic management components such as vessel registration and fishing permits, which establish ownership responsibility, are needed to regulate fisher activity and gear usage. Gear marking and lost/retrieved gear reporting requirements, for instance, require individual accountability to be effective, and connecting these as a stewardship responsibility associated with the permission to fish can be an effective approach. Having in place licensing authorities under relevant fishery management entities is essential.
MONITORING, EVALUATION AND ENFORCEMENT	While all features of an effective fisheries management system to ensure sustainability will be important for ensuring ALDFG best practice outcomes, we highlight monitoring, evaluation and enforcement as explicit legislative provisions to ensure their implementation in an ALDFG context. While developing a stewardship approach with fishers is key to durable ALDFG outcomes, a component of enforcement capacity is extremely important to help ensure compliance, working in concert with fisher peer systems (e.g. fishery cooperatives) and codes of best practice.
FUNDING	Implementation cannot be effective unless sufficiently resourced - a durable strategy and delivery system is needed, which could take advantage of ideas such as shared government-industry investment and linkage to broader marine debris reduction initiatives.
OUTREACH AND AWARENESS BUILDING	While not typically built into fisheries legislation, awareness and trust building with fishers is critical for ensuring effective outcomes. One of the strengths of the US Marine Debris Act reviewed above is a priority on this type of engagement and appropriation of resources to support it. NGOs and specialist agencies can be quite effective at supporting outreach.
COORDINATING MECHANISMS	As a multi-sectoral issue, ALDFG usually falls under the purview of different governmental entities and/or departments, such as fisheries, environmental, and enforcement. There are likely to be at least some competing interests and/or a lack of clarity between entities and their existing mandates, so these should be considered when developing legislation. In the European Union, proposed legislation must undergo an impact assessment to identify inter-departmental tensions, avoid unintended consequences, and ensure that adequate resources are available to address these issues and other implementation requirements. It is also important to consider how new laws or amendments may interact with existing legislation, and how commitments at the international level translate to national, regional, or local levels. Proposed legislation should explicitly include provisions for the anticipated need to clearly define various implementation authorities, along with expectations for coordination and integration where needed.
IMPLEMENTATION STRATEGIES	Implementation strategies are essential for promoting compliance and achieving legislative intent. At the fisher level, these include the need for outreach, awareness building, and incentives for creating economic and stewardship values. These values can be individual, such as from the practical standpoint of answering the question “what’s in it for me?” but they could also be generated through economic and social incentives that accrue benefits to the local community, which can be important drivers for change in small scale community-based fisheries. At the broader institutional level, system capacity to effectively collect, share and evaluate is an essential component for implementing legislative requirements for lost gear reporting requirements, including designing efficient gear retrieval efforts and adapting strategies to minimize loss.

SPECIFIC ELEMENTS PERTAINING TO LEGISLATION AND REGULATIONS

CLEAR PURPOSE, OBJECTIVES AND DEFINITIONS	Clarity is of course key for establishing legislative intent, ensuring that legislative provisions are appropriately designed to meet that intent, and to help avoid unintended consequences. Clear definition of terms is always essential. Clarity and coherence of purpose also can be an important part of outreach and awareness building associated with the legislation. Awareness and acceptance by fishers of the problem, purpose and need is an essential starting point for building trust and supporting implementation.
PROHIBITING DUMPING OF GEAR AT SEA	In most cases fishers have no desire to discard gear at sea. However, if gear is inexpensive, is damaged and cannot be repaired or repurposed, and/or no responsible disposal options (e.g. port side reception facilities) are readily accessible, discards can occur. Additionally, IUU activities heavily contribute to this problem. Thus basic prohibitions need to be enacted, along with some thought to creating enabling conditions and implementation strategies that promote compliance, such as readily accessible disposal facilities for end-of-life fishing gear..
PROVISIONS FOR GEAR MARKING, GEAR RETRIEVAL, REPORTING OF LOST GEAR, AND REPORTING OF LOST GEAR RECOVERED	Of the legislation examples we discussed during our interviews, this ‘family’ of requirements was the most common foundation of important fishery management authorities specifically related to ALDFG. Gear marking is normally required via regulations under common general fisheries authority to manage gear and create individual accountability for its use. Requirements to: (1) attempt lost gear retrieval and (2) report loss if unsuccessful are essential for both minimizing loss and optimizing retrieval, by providing information on the locations and causes of loss, while also helping define any gear loss ‘hot spots’ or conditions. Reporting gear recovered is essential for understanding net loss of gear in a fishery. Such data also helps quantify gear loss, which is essential information for implementation of potential EPR schemes.
DEFINED ROLES AND RESPONSIBILITIES OF FISHERS AND ORGANIZATIONS - REPORTING AND RETRIEVAL	While these features are more typically addressed in administrative rulemaking to implement legislation, thinking ahead to answering questions such as ‘who is responsible for retrieving lost gear’, ‘where can it be disposed of’, and ‘to whom and how do fishers report gear loss,’ are important for testing assumptions about effective implementation paths, avoiding unintended consequences and ensuring that sufficient resources will be allocated.

8.1.3 ‘STRUCTURAL APPROACH’ FOR DEVELOPING ALDFG LEGISLATION

Stand-alone legislation or embedded legislative amendments

As for structural approaches, it is important to carefully consider how filling gaps in needed legislative authority and policy intent related to ALDFG may intersect existing fishery management authorities. One question is whether it is better to develop new, stand-alone legislation (such as the US Marine Debris Act) or amend existing legislation to address ALDFG. One benefit of stand-alone legislation is that the objective will likely be clear and directly supported by the articles contained therein. However, this approach has not often been used thus far within the realm of ALDFG, perhaps because it requires more dedicated effort and time to enact new laws. Further, significant existing fisheries and shipping waste management authority already exists that provides the basis for managing fishing gear, which undoubtedly explains why most of the ALDFG legislation examples we identified were embedded within broader fishery or waste management laws.

This latter approach is not inherently less effective, especially if the amendments are developed thoughtfully. That said, in many cases, these embedded references currently use limited and general language, which may not serve to establish and reinforce a clear priority for minimizing ghost gear issues. This also can leave space for interpretation when developing regulations to uphold the laws, which allows for flexibility but may hinder achievement of outcomes. Regardless of the approach, effectiveness of implementation strongly depends on supporting instruments including regulations.

The practical reality is that addressing ALDFG requires use of many existing gear management authorities and tools. So amending and strengthening established mandates and authorities where they exist to address needed

**THE PRACTICAL
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ADDRESSING
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USE OF MANY
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MANAGEMENT
AUTHORITIES AND
TOOLS.**

gaps is probably the most logical approach within this ‘fisheries lens’. This may help avoid creating overlapping and potentially conflicting regulatory

authorities or competing silos where new non-regulatory approaches in one organization do not have a straightforward path for implementation in a regulatory context. Canada’s ‘Ghost Gear Fund’ case study is one where a key amendment for national licensing requirements has created some visible priority for tackling ALDFG within the country’s fisheries management authority and is leading to a coordinated initiative across regions with the potential for driving significant change. This could be an effective ‘recipe’ for embedding ALDFG requirements in a visible and comprehensive manner within the existing fishery management system, and driving systemic focus and solutions, especially if they were combined with a mandate to implement new measures through specific ALDFG fishery plans of action for key fisheries, as was described for the Puget Sound Lost Crab Pot Prevention Plan.

Other considerations

Several of our expert interviews noted that framing ALDFG solutions through the benefits derived from reducing marine debris was likely to generate more positive engagement by fishers than framing actions through a regulatory response, such as a mandate to reduce bycatch and marine mammal entanglements. We have already highlighted the importance of enabling conditions for achieving effective legislative outcomes, in this case building stakeholder interest and trust in driving development of solutions. Debris reduction is easy to market as a public benefit, as no one benefits from debris. It would be advisable to take advantage of this when developing ALDFG strategies, both broadly and for legislation specifically.

Additionally, we note the opportunity to coordinate and scale solutions across regions and jurisdictions with shared interests in tackling ALDFG. As noted in Section 6.2, the Clean Nordic Oceans network and The MARELITT Baltic project both provide excellent examples of such initiatives to share lessons learned. They also highlight the thought that legislative actions taken in one jurisdiction could have limited effectiveness if ALDFG strategies and lessons are not coordinated across shared ocean spaces. The Indonesia-Australia area specifically comes to mind as an area where ghost gear drifts across jurisdictions and creates the need for regional solutions.

Thus when thinking about use of gap analyses and related plans of action to identify needed ALDFG actions (legislative and otherwise) the geographic scale of issues, impacts and solutions is an important consideration even when choosing the scope of the plan of action itself (e.g. fishery specific, national, or regional). GGGI can be an effective partner in developing international solutions as they have demonstrated an effective ability to scale ALDFG solutions globally. For example, they have replicated fisher survey designs from the South Pacific in the Caribbean, and implemented end-of-life recycling in Nigeria based on programs originally developed in Chile.

8.1.4 LEGISLATION IN RELATION TO OTHER ALDFG STRATEGIES

In designing the online survey we felt it might be informative to query respondents on what ALDFG strategies they felt might have the highest priority in their region of expertise as one possible indicator of the relative importance of legislation compared to other approaches. Certainly, conclusions from the survey may be limited by the number of respondents, but we found it interesting that there was not a wide degree of separation among the average rankings of importance. With that said, enforcement of existing regulations, new or amended legislation, governmental plans of action, fishery plans of action, and new fishery regulations were the highest ranked strategies (Fig. 6).

This result perhaps is not surprising for at least two reasons. First, respondents from the governmental sector were most highly represented in the survey, and these strategies might be reflective of a fishery management focus. Second, these strategies seem to have the natural capacity to support each other in promoting outcomes at larger scales. It is interesting that the survey respondents viewed legislation as having limited effectiveness in addressing ALDFG (Fig. 5), yet still placed a relatively high importance on it in relation to other strategy choices. This potentially confirms one of the discussion points above, that a suite of integrated implementing strategies and enabling conditions are needed for effective legislative outcomes, while legislation is still considered to be a fundamental underpinning for ALDFG strategies.

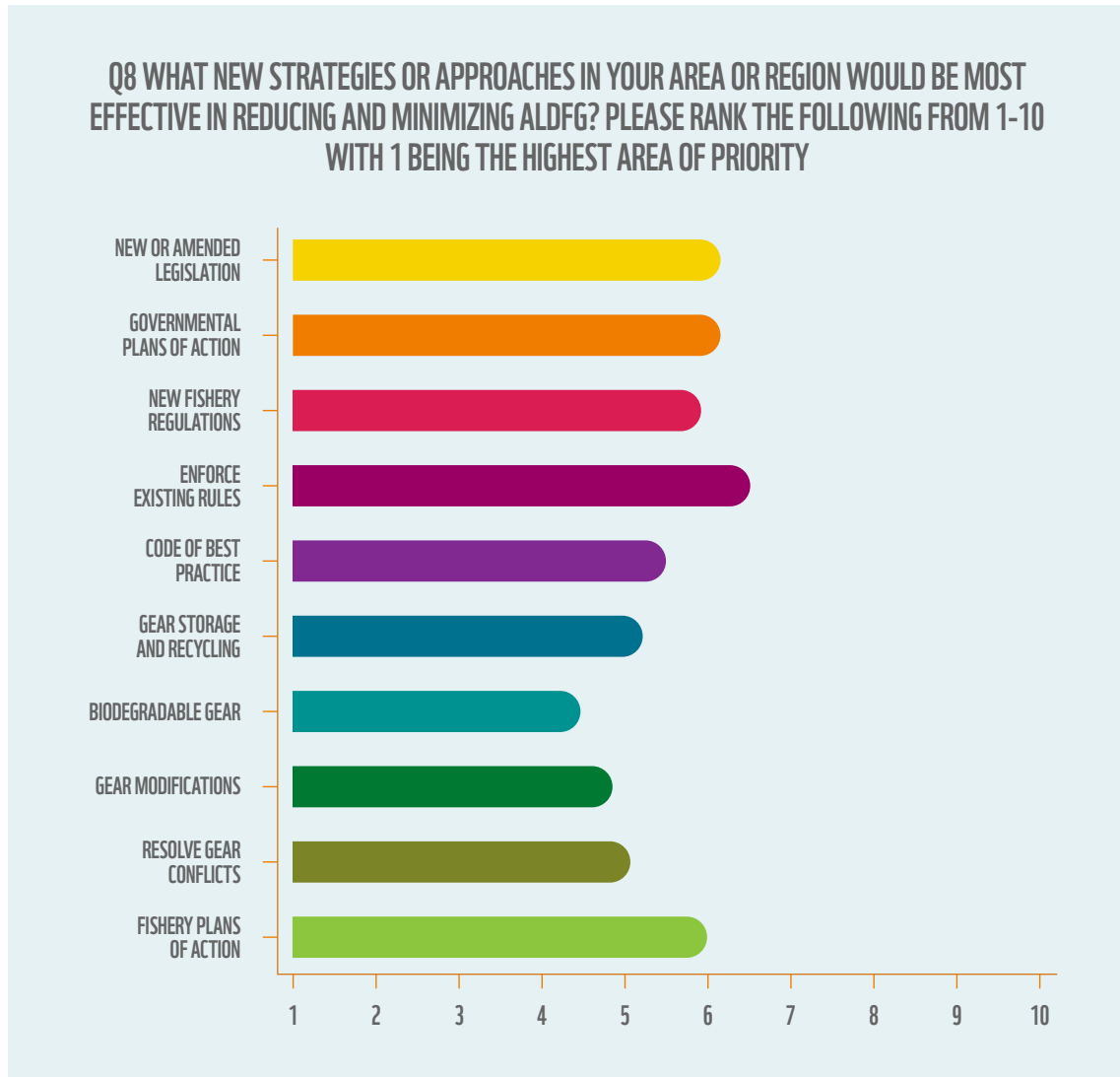


Figure 6. Distribution of highest ranked priority areas, from survey respondents.

8.2 PLASTICS - MARINE DEBRIS FOCUSED ALDFG LEGISLATIVE STRATEGY

Where Section 8.1 focused on ALDFG through the fisheries lens, Section 8.2 focuses on potential legislation (or binding international agreements) through a plastics lens. The two streams have obvious connections, especially in the context of life cycle monitoring of materials production, gear manufacture, and gear use and recycling. However, these areas are not likely to be implemented through fishery management legislation. The ideas described below are extremely important complements to traditional fishery management approaches.

8.2.1 CIRCULAR ECONOMY AND EXTENDED PRODUCER APPROACHES

The ideas for these approaches were described in Section 7, as exemplified by initiatives in Norway and through early stages of implementation in conjunction with the EU's SUP Directive. One useful question to consider might be the appropriate scale at which to tackle these approaches. Because of global markets and supply chains related to the manufacture of fishing gear, there is obvious logic to not tackle and duplicate efforts on a country by country basis, unless using such an approach to test alternative concepts. In that case Norway's forward-thinking policy development and adoption there, as well as the EU Directive and the recent OSPAR report (2020), might be considered leading experiments and important issue framing that could advance global best practice.

In the context of WWF Norway's strategy we found the following specific recommendations from Deloitte (2020) to be particularly informative in terms of an approach to changes in Norway's legislative framework:

- Strengthening the reporting requirements for the producers and PROs to ensure control over the amount of plastic packaging put on to market and recycled;
- The legal framework for EPR should be extended to include all products containing plastic put on the market;
- Clear definition of the actors that are subject to the EPR regulations. The legal framework should ensure that the producers with the most influence on product design are held responsible for the products they put on the market;
- Introduction of requirements for modulating fees according to the true lifecycle costs;
- Ensuring that the EPR schemes cover the full costs related to collection, transport, sorting and recycling;
- Ensuring that the EPR schemes cover of the costs of plastic littering;
- Introduction of regulations that incentivize closed loops for different plastic waste streams.

There is an open question as to how well EPR related requirements for fishing gear containing plastics fit within broad single use plastic initiatives, e.g. with regards to achieving best fit and focus. For instance, end-of-life fishing gear has unique characteristics that require special consideration. Some fishing nets can weigh 20,000 pounds or more, making storage, transport and logistics within an EPR program for fishing gear vastly more challenging than for other single use plastics - a reality that GGGI, WWF and others have highlighted in consultations with the EU.

Nonetheless, circular approaches and EPR are a definite step in the right direction and merit encouragement. Considerable research is needed to develop circular design standards and EPR requirements for fishing gear. As an example, the OSPAR-CEFAS sponsored workshop (Section 7) recommendations identified needs for new material designs to improve recyclability, mapping of the fishing gear supply chain, and inventory of member states' fishing gear volumes to scope practical recycling demands.



9. RECOMMENDATIONS

This section contains other general recommendations for developing legislative and regulatory strategies for addressing ALDFG.



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9.1 CAREFULLY DETERMINE THE NEED FOR NEW OR AMENDED LEGISLATION

We suggest that the GGGI/WWF networks use thorough planning tools, appropriate to the geographic scale of intended action and governance circumstances, to determine where available ALDFG resources might be best applied. Specifically in the context of this analysis, we recommend starting with a structured gap analysis to: (1) judge whether legislation is a current limiting factor in driving needed change, and if so, (2) identify where gaps exist, to help guide the purpose and specific focus of possible legislation. Such gap analyses would benefit from the use of GGGI's Best Practice Framework to evaluate what practices are in place, and whether new authorities or policy mandates would be needed to enable and motivate essential outcomes.

From a fisheries perspective, many jurisdictions probably have sufficient legislative authority to manage fishing gear and other important dimensions of fishing privileges and activities in order to address gaps in ALDFG best practice. In these cases, pursuit of new or modified fishery regulations, typically adopted through administrative law, has the distinct advantage of a likely quicker adoption and outcome, particularly considering that new or amended legislation still requires regulatory and other action in order to be implemented. The priority need for a legislative approach would be indicated when gap analyses indicate that underlying authorities and/or policy mandates are insufficient to implement ALDFG solutions.

9.2 DEVELOP PLANS OF ACTION BASED ON GAP ANALYSES

Gap (or limiting factor) analyses to evaluate the need for new or amended legislation also provide the opportunity for identifying a full range of potential strategies needed to drive ALDFG solutions. This approach also provides a strong foundation for building plans of action, whether that be at fishery specific, national, regional or international scales. In cases where new or amended legislation is needed, these plans of action can be especially helpful in identifying the complementary implementation strategies/actions, resources and collaborative partnerships needed to ensure successful outcomes. One specific example of implementing this approach, which also combined awareness raising and capacity building around GGGI's BPF and FAO's VGMFG, was a series of four interactive, regional workshops conducted by GGGI and FAO in 2019 in Vanuatu, Indonesia, Senegal and Panama (FAO 2020).

9.3 CONSIDER BASIC ELEMENTS OF ALDFG LEGISLATION IN STRATEGY DEVELOPMENT

While we review and describe several important examples of ALDFG elements in relevant legislation (see Section 5), our analysis suggests that no comprehensive ALDFG legislation exists that can serve as a model for governments to implement in a 'plug and play' sense. As noted in the discussion, this is partly due to the fact, at least in the fisheries context, that authorization to manage gear and associated fishery measures important for addressing ALDFG are embedded in broader fisheries legislation, which would make comprehensive stand-alone ALDFG legislation somewhat redundant in many cases. With that said, we offer specific suggestions for key elements of legislation in Section 8.1.2 (Table 1), which draw on key legislative examples reviewed as well as the expert interviews. These elements are likely important to a successful legislative strategy, and we recommend that they be used in conjunction with the gap analysis recommendations in Sections 9.2 and 9.3, in order to draft specific legislative proposals and successfully advocate them.

9.4 STRIVE FOR OPTIMAL NICHE FITS WHEN IMPLEMENTING ALDFG STRATEGIES

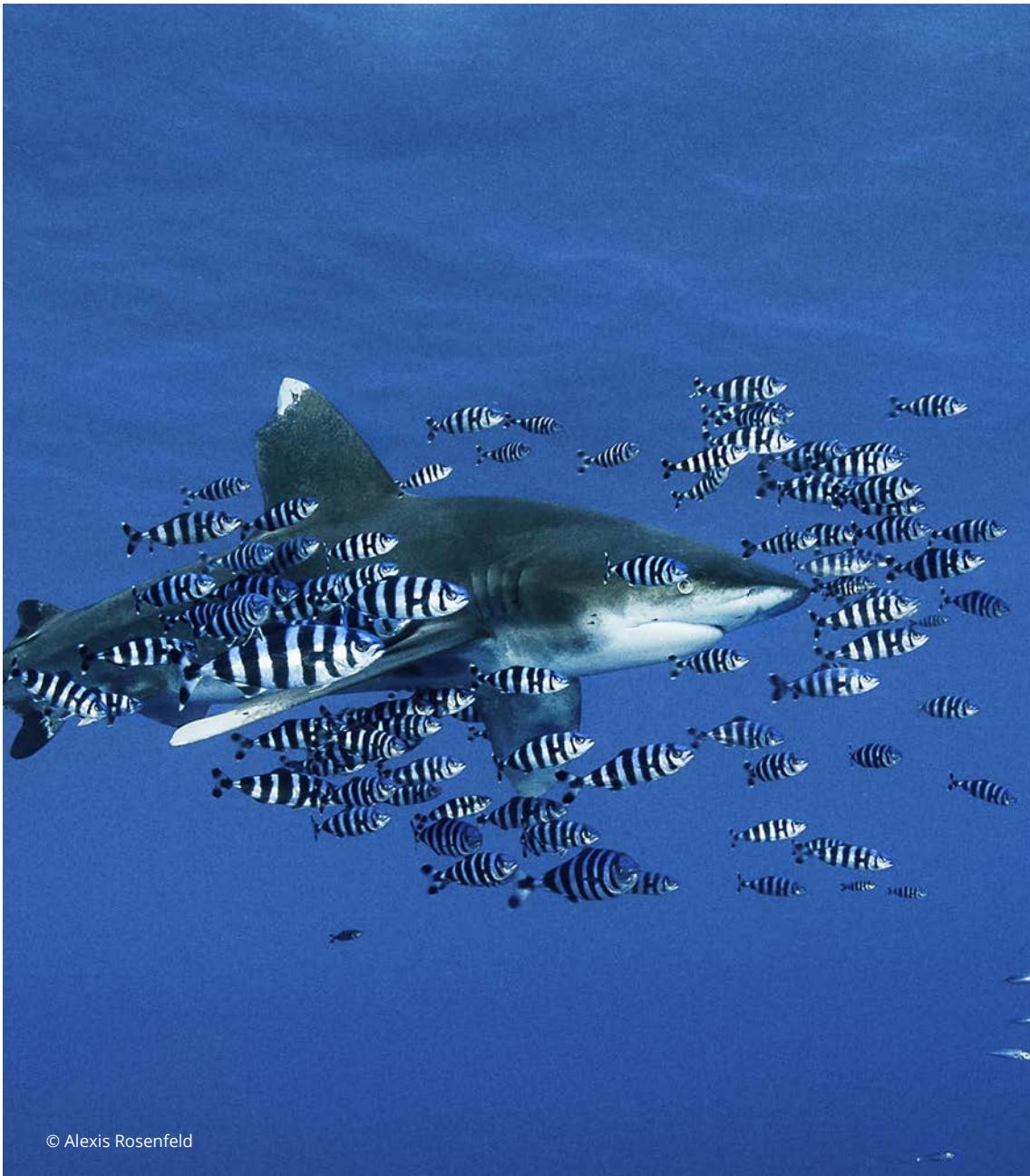
A number of organizations share interests in effectively and efficiently scaling impacts in achieving ALDFG solutions. We believe that these shared interests can be best served by finding optimal niches among various organizations/offices, playing to respective strengths, actively recognizing the importance of partners and supporting their roles, and closely collaborating. Examples of this general idea include:

- Continue and increase support of GGGI in order to strengthen and expand its development of a strong network for development and sharing of best practice in implementing ALDFG solutions. GGGI has established an extremely effective and growing network instrumental to tackling ALDFG as an international priority. The network provides valuable capacity for partners on the ground, such as through local WWF offices. Larger organizations like WWF, which have a keen mission interest in ALDFG, are in a key position to provide expanded resources and other support to help ensure GGGI's capacity to maintain and grow its role and impact.
- Organizations that have special expertise in local fishery settings (e.g. WWF's unique network of country offices, government fishery management entities and smaller NGOs) have essential capacity and opportunity to lead solutions on the ground and on the water, at local and regional scales. If local organizations employ the gap analysis and plan of action approach (as tested by the GGGI in numerous workshops), they have the potential to strategically advance ALDFG solutions using GGGI's set of tools to achieve best practice outcomes. This could include assisting and supporting interested fishery stakeholders to incorporate specific ALDFG measures into fishery improvement project (FIP) and MSC (Marine Stewardship Council) certification action plans.



10. ACKNOWLEDGEMENTS

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11.

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12.
APPENDICES

Appendix 1. ALDFG experts interviewed for this report.

NAME(S)	ORGANIZATION OR AFFILIATION	INTERVIEW DATE
DR. PINGGUO HE	University of Massachusetts and FAO	15 May 2020
INGRID GISKES	GGGI and FAO	21 May 2020
DR. DARIAN MCBAIN	Thai Union	1 June 2020
MARINA PETROVIC	Department of Fisheries and Oceans Canada	3 June 2020
DR. GIANNA MINTON	WWF International	3 June 2020
AIMÉE LESLIE	WWF Peru	3 June 2020
TIM HUNTINGTON	Poseidon Aquatic Resource Management Ltd.	4 June 2020
STEVE MORRISON	National Oceanic and Atmospheric Administration, Marine Debris Program (US)	4 June 2020
DR. ERIC GILMAN	Pelagic Ecosystems Research Group	4 June 2020
JOAN DRINKWIN KYLE ANTONELIS	Natural Resources Consultants, Inc.	4 June 2020
DR. KIRSTEN GILARDI	University of California Davis; GESAMP member	4 June 2020
LOWRI PRICE SIMON ROWE MICHAEL WOODEN	OceanWatch Australia	4 June 2020
ARJAN VAN HOUWELINGEN	World Animal Protection	5 June 2020
FREDRIK MYHRE	WWF Norway	8 June 2020
FREDRIK HAAG	International Maritime Organization	8 June 2020
DEMI FOX	National Oceanic and Atmospheric Administration, Marine Debris Program (US)	9 June 2020
GJERMUND LANGEDAL	Norway Directorate of Fisheries; Clean Nordic Oceans	10 June 2020
DR. ANDREA STOLTE	WWF Germany	19 June 2020

Note: the following appendices are provided as separate documents.

Appendix 2. PDF version of online survey.

Appendix 3. Spreadsheet listing key examples of legislation, international agreements, conventions, and guidelines.

Appendix 4. Summary results of online survey.

13. ENDNOTES

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**GHOST GEAR IS A GLOBAL
PROBLEM THAT REQUIRES
A COORDINATED GLOBAL
RESPONSE. JOIN GGGI
AND WWF IN THE FIGHT
AGAINST GHOST GEAR.**



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