

An underwater photograph of a coral reef. The water is clear blue, and the reef is covered in green and yellow coral. Numerous small, striped fish are swimming around the reef. In the background, a large, rounded rock formation is visible under a bright sky.

GGGI 2021 ANNUAL REPORT

The logo for the Global Ghost Gear Initiative, consisting of a white, stylized, curved line that forms a partial circle.

GLOBAL
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Government of the Netherlands: Ministry of Economic Affairs and Climate Policy; Ministry of Infrastructure and Water Management

Government of Norway: Ministry of Climate and Environment

Government of the United Kingdom: Center for Environment, Fisheries and Aquaculture Science (Cefas); Department for Environment, Food and Rural Affairs (Defra)

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David S. Safianoff

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Martha and Christopher Flanders

River Birch Fund

Wildebeest Fund

REPORT DEDICATION—AUDREY MEALIA



Photo Credit: Joel Baziuk

This report is dedicated to our dear friend and colleague, Audrey Mealia, Global Deputy Program Director—Wildlife at World Animal Protection. Audrey had been ill for some time, fighting a long battle with cancer. She overcame it the first time, but sadly could not overcome it a second time and passed away in October 2021.

Audrey was instrumental in the early days of the Global Ghost Gear Initiative (GGGI), believing in the unique strength of the platform and the importance of bringing different stakeholders together to solve the global challenge of abandoned, lost and otherwise discarded fishing gear (ALDFG).

She worked especially hard to form the first GGGI Steering Group and to bring the private sector to the table to catalyze change.

Audrey's Instagram account says: "It's not what you look at, it's what you see." She had an unparalleled gift for seeing potential in people, strategies, and approaches. She was not only an animal whisperer, but a people whisperer, too. We at the GGGI owe her a debt of gratitude for helping to make the GGGI what it is today: the leading global platform for addressing ALDFG. We are deeply saddened by her passing. She will be dearly missed.

GLOSSARY OF TERMS

A-BPF—Best Practice Framework for the Management of Aquaculture Gear

AIS—automated identification system

ALDFG—abandoned, lost or otherwise discarded fishing gear

APEC—Asia-Pacific Economic Cooperation

API—application programming interface

CARICOM—Caribbean Community

C-BPF—Best Practice Framework for the Management of Fishing Gear

COFI—UN Committee on Fisheries

CRFM—Caribbean Regional Fisheries Mechanism

EAC—GGGI Expert Advisory Council

EC DG MARE—European Commission Directorate General for Maritime Affairs and Fisheries

EM—electronic monitoring

EOL—end-of-life (gear)

EPR—Extended Producer Responsibility

ETP—endangered, threatened, and protected (species)

FAD—fish aggregating device

FIP—fisheries improvement project

FMIG—Seafish Fisheries Management and Innovation Group

GCFI—Gulf and Caribbean Fisheries Institute

GESAMP—United Nations Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection

GFW—Global Fishing Watch

GGGI—Global Ghost Gear Initiative

GLP—GloLitter Partnerships Project

IMO—International Maritime Organisation

IORA—Indian Ocean Rim Association

ISSF—International Seafood Sustainability Foundation

IUCN—International Union for the Conservation of Nature

IUU—illegal, unregulated and unreported (fishing)

NANCI—North American Net Collection Initiative

Norad—Norwegian Agency for Development Cooperation

OECD—Organisation for Economic Co-operation and Development

OSPAR—Oslo/Paris Convention, 1992

SAIC—Scottish Aquaculture Innovation Centre

SDG—United Nations Sustainable Development Goal

SIOTI—Sustainable Indian Ocean Tuna Initiative

SUPs—Single-use plastics

UNDP—United Nations Development Programme

UNEP—United Nations Environment Programme

UN FAO—United Nations Food and Agriculture Organisation

UAV—unoccupied aerial vehicle

VGMFG—Voluntary Guidelines for the Marking of Fishing Gear

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MEET THE GGGI TEAM



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PREFACIO

LA SALUD DEL OCÉANO Y EL BIENESTAR HUMANO ESTÁN INTRÍNICAMENTE RELACIONADOS; EN CONSECUENCIA, NECESITAMOS ESTRATEGIAS AMBICIOSAS Y EFICIENTES PARA PROTEGER EL OCÉANO QUE PROVEE PARA TODOS NOSOTROS. LAS INICIATIVAS TRANSSECTORIALES SON FUNDAMENTALES PARA LOGRARLO. Por ello, todos debemos contribuir a impulsar una nueva agenda de acción oceánica que nos permita alcanzar una economía azul. Es hora de dejar de dañar el océano y comenzar a mirarlo por lo que realmente representa: nuestro mejor aliado para mejorar el bienestar de nuestra gente, aumentar la seguridad alimentaria y combatir eficazmente el cambio climático.

México, como país megadiverso y promotor activo de soluciones multilaterales para enfrentar los desafíos ambientales, reconoce la importancia de combatir la contaminación marina por artes de pesca abandonadas, perdidas o descartadas (ALDFG o “redes fantasma”).

A un año de suscribirnos a la Iniciativa Global contra Redes de Pesca Fantasma (GGGI, por sus siglas en inglés), junto a representantes del gobierno federal, academia, sociedad civil y sector privado, hemos impulsado actividades para la capacitación de pescadores en la recuperación y disposición adecuada de artes fantasma en Bahía de Banderas, México. También hemos logrado un progreso significativo en el mapeo de ubicaciones clave de redes fantasma a lo largo de las costas del Pacífico y el Golfo de México de nuestro país, y esperamos tener un primer modelo de mapa predictivo para esto pronto.

En 2022, año internacional de la pesca y la acuicultura artesanal, seguiremos impulsando

acciones que nos permitan transitar hacia una economía azul sostenible. Buscaremos desarrollar nuestro plan de acción nacional de gestión de redes fantasma de una manera sólida, participativa e inclusiva. También apoyaremos el desarrollo de talleres de capacitación para promover e implementar el Marco de Buenas Prácticas para el Manejo de Artes de Pesca (C-BPF) en nuestro país en beneficio de las autoridades federales y locales, pescadores y otros posibles actores relevantes.

El camino hacia un océano saludable, limpio y vibrante es largo y sinuoso. México, con su extenso litoral y vasta Zona Económica Exclusiva, tiene muchos desafíos por enfrentar. Principalmente, aquellos que son relativos a empoderar a las propias comunidades costeras, para que sean ellas quienes preserven el bienestar de sus áreas marinas circundantes; y en segundo lugar, lograr una comunicación efectiva entre el gobierno nacional y los gobiernos subnacionales, la sociedad civil y otros actores relevantes, integrándolos a todos en un proceso participativo.

Este es el tiempo para que gobiernos decididos entiendan que el océano es fundamental para la transformación y el bienestar de su gente, y realicen acciones concretas que nos permitan alcanzar nuestra ansiada meta de tener un océano y planeta saludables.



MARTHA DELGADO
Subsecretaria para
Asuntos Multilaterales y
Derechos Humanos
Secretaría de
Relaciones Exteriores

FOREWORD

OCEAN HEALTH AND HUMAN WELLBEING ARE INTRINSICALLY RELATED; CONSEQUENTLY, WE NEED AMBITIOUS AND EFFICIENT STRATEGIES IN ORDER TO PROTECT THE OCEAN THAT PROVIDES FOR US ALL. CROSS SECTORIAL INITIATIVES ARE FUNDAMENTAL TO ACHIEVE THIS. Accordingly, we must all contribute to promote a new ocean action agenda that allows us to achieve a blue economy. It is time to stop harming the ocean and start looking at it for what it really represents: our best ally to improve the well-being of our people, increase food security and effectively combat climate change.

Mexico, as a megadiverse country, and an active promoter of multilateral solutions to fight environmental challenges, recognizes the importance of combating marine pollution from abandoned, lost or discarded fishing gear (ALDFG or “ghost gear”).

One year after signing on to the Global Ghost Gear Initiative (GGGI), together with representatives from the federal government, academia, civil society, and private sector, we have promoted activities for the training of fishermen in the recovery and adequate disposal of ghost gear in Bahía de Banderas, Mexico. We have also made significant progress in mapping key locations for ghost gear along the Pacific and Gulf of Mexico coastlines of our country, and are expecting to have a first predictive map model for this soon.

In 2022, the international year of artisanal fisheries and aquaculture, we will continue

promoting actions that will allow us to transition to a sustainable blue economy. We will seek to develop our ghost gear national action plan in a robust, participatory, and inclusive manner. We will also support the development of training workshops to promote and implement the Best Practice Framework for the Management of Fishing Gear (C-BPF) in our country for the benefit of federal and local authorities, fishers, and other possible relevant actors.

The road to a healthy, clean and vibrant ocean is long and rocky. Mexico, with its extensive coastline and large Exclusive Economic Zone, has many challenges yet to face. Primarily, empowering the coastal communities themselves, so that they are the ones to preserve the well-being of their surrounding marine areas; and secondly, to achieve effective communication between the national government, subnational governments, civil society, and other relevant actors while integrating all of them into a participatory process.

It is time for determined governments that understand that the ocean is fundamental for the transformation and well-being of their people to take concrete action that allow us to achieve our long-awaited goal of having a healthy ocean and a healthy planet.

MARTHA DELGADO
Undersecretary for Multilateral Affairs and
Human Rights
Ministry of Foreign Affairs

1

GHOST GEAR— A GLOBAL THREAT

In a world full of division and during increasingly uncertain times, the ocean continues to connect us all. All life was born from the ocean, and all life is dependent upon it. We are reliant upon the ocean in ways we have only just begun to understand in recent years. From regulating our climate to providing food security and economic prosperity, the ocean is the lifeblood of our blue planet. However, the ocean is increasingly under threat from myriad sources. Climate change. Ocean acidification. Loss of biodiversity. Plastic pollution. And of course, abandoned, lost and discarded fishing gear (ALDFG or “ghost gear”). The list goes on. But while it may seem like these challenges are insurmountable, it is important to remember that progress is being made, action is being galvanized, and solutions are being implemented. This report details the successes of the Global Ghost Gear Initiative (GGGI) and its members over the last year, despite a world in upheaval and the continuation of the COVID-19 pandemic.

GHOST GEAR AND THE G7

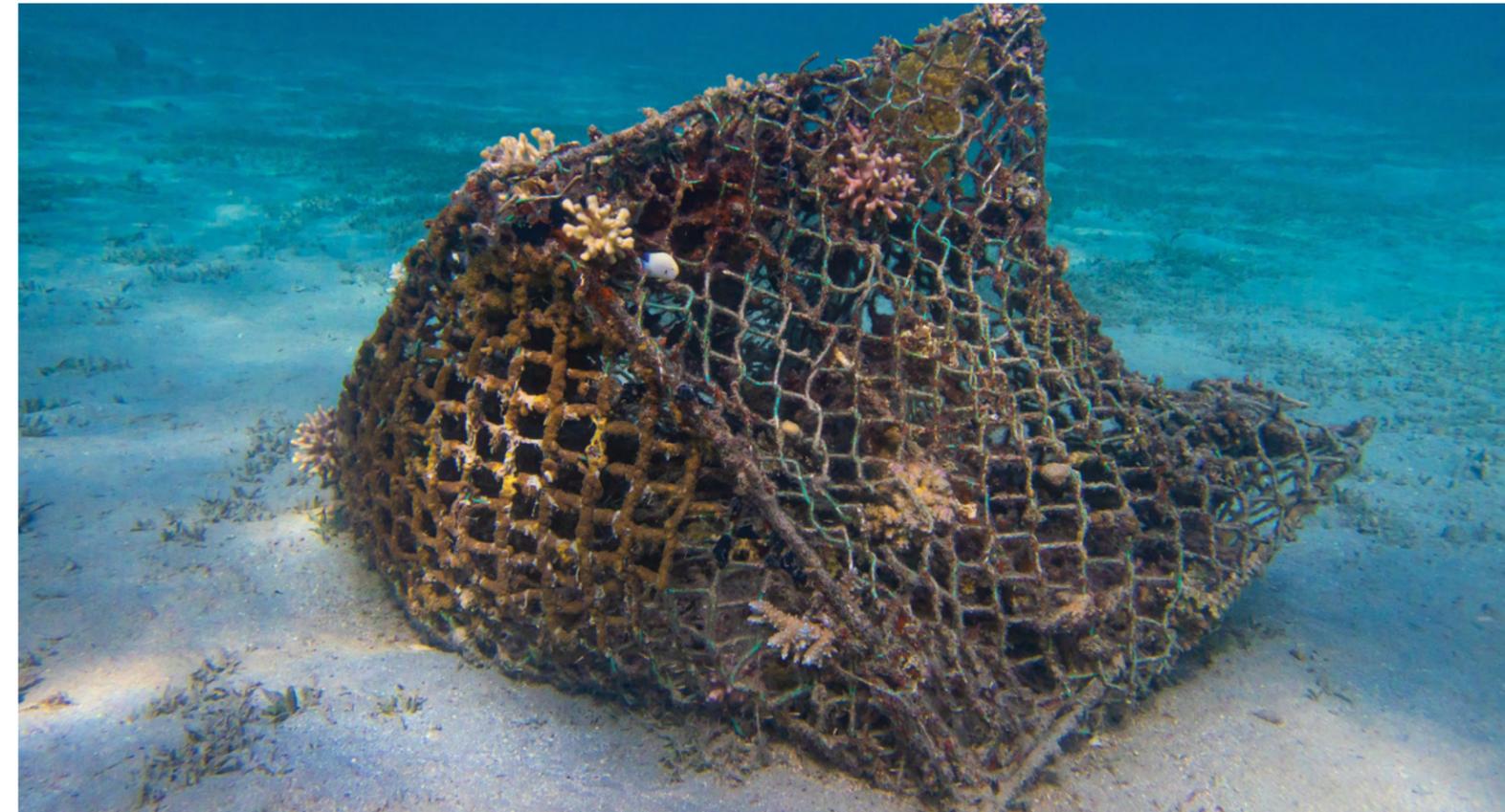
Five years ago, in 2016, ALDFG was rarely discussed at the highest international levels. Research on the topic was relatively sparse, and the focus of the marine debris space was squarely on single use plastics (SUPs). Now in 2021, a mere five years later, ALDFG has been elevated to the G7 agenda. The Organisation for Economic Co-operation and Development (OECD), in consultation with the GGGI and the United Nations Food and Agriculture Organization (UN FAO),

produced a policy paper titled “[Towards G7 Action to Combat Ghost Fishing Gear](#)” as a background document for G7 Climate and Environment Ministers under the G7 Presidency of the United Kingdom. This marks the first time that ALDFG has been officially discussed at such a high level.

Several recommendations were put forth for how G7 Nations can address the issue, including:

- Leveraging and promoting further international cooperation;
- Implementing circular economy principles in the fishing gear life cycle;
- Coordinating research efforts and development of gear and supply chain risk assessments;
- Marking fishing gear to facilitate reporting, retrieval, and traceability;
- Implementing gear collection infrastructure to ensure sound management of end-of-life gear; and
- Encouraging additional countries to join the GGGI.

The GGGI is the world’s largest collective impact alliance dedicated to addressing ALDFG and the global thought leader in the ALDFG space. It is the key organization under which the international community can unite to solve this global challenge, and it is the organization best suited to help implement these recommendations and drive lasting solutions to this critical ocean issue.



CONTINUED GLOBAL EFFORTS

Over the last year, there has been an increased focus on preventative solutions to ALDFG over the long term. Removal work, while certainly necessary in critically sensitive habitats or in regions where there are interactions with endangered, threatened, and protected (ETP) species in particular, is expensive and often dangerous work. This increased focus on prevention has taken several forms, including an increased focus on reporting gear loss, as with the Government of Canada’s [new online gear loss reporting system](#); the revision of the GGGI Best Practice Framework for the Management of Fishing Gear (C-BPF) and the launch of the GGGI Best Practice Framework for the Management of Aquaculture Gear (A-BPF); and the expansion of the [GGGI data portal](#). There has also been a focus on solutions for end-of-life (EOL) gear in the form

of port reception facilities, recycling programs, and extended producer responsibility (EPR) mechanisms to support such initiatives. This is clearly demonstrated with the mandate from the European Commission that all European Union Member States implement their own [EPR program for fishing gear by 2025](#). In recycling news, PLASTIX Global, in collaboration with DFS, Randers Reb, and epsotech, created the world’s [first-ever maritime rope made from recycled net and rope](#).

On the research front, Wageningen University & Research based in the Netherlands released a new report on the contribution of net cuttings to marine debris in the Arctic and North-East Atlantic oceans. Net cuttings, which primarily consist of small to medium sized offcuts of rope and net produced during net repairs conducted on vessels at sea, can pose a hazard to shipping in addition to the

ecological impacts often related to ALDFG. [The study](#) found that most of the fishing-related debris washing up on beaches in the surveyed areas—the Netherlands, Svalbard, Scotland, Iceland, and Greenland—was likely the result of net repairs being done at sea on trawl vessels. The study provides several recommendations, including improving the collection of these materials on board and improving port-side waste reception facilities. The study links closely to a [best practice guide](#) to reduce marine litter from net cuttings waste that was issued by KIMO International in 2020.

Also in 2021, the government of Australia released a [\\$14M AUD ghost gear plan](#) focused on projects to directly address the challenge of ghost nets and marine debris littering northern Australian waters and beaches. In addition, the government of Canada made a renewed commitment to its Ghost Gear Fund, [adding \\$10M CAD in 2021](#) to the original \$8.3M CAD to fund ALDFG-related projects domestically and internationally.

NEW RESEARCH PROVIDES SOME ANSWERS ... AND MORE QUESTIONS

ALDFG is widely recognized as the most harmful form of marine debris¹. This is not surprising as ALDFG is purposely designed to catch aquatic life and, depending on the gear type, is exceedingly efficient at doing so whether it is under human control (actively deployed) or whether it is lost. ALDFG is unquestionably one of the most uniquely impactful sources of marine debris and a significant threat to fish stocks, global food security, fisher livelihoods, aquatic ecosystems, and the health and prosperity of coastal communities. However, despite the harm caused by ALDFG, there remains no firm and universally accepted scientific estimate of the

amount of fishing gear lost in the world's ocean, rivers, and lakes.

Some attempts have been made to quantify the issue. A 2009 United Nations technical paper estimated that fishing gear likely constituted approximately 10% of all marine debris by mass^{*2}. Though it was not directly stated by the authors, This number has been extrapolated by others and has been commonly reported as some 640,000 tonnes of gear lost each year, though the paper's authors did not directly state that. As Richardson et al outlined in detail in 2021, this number is problematic and the reality is more complicated³. In short, the 640,000 tonnes figure is predicated on being 10% of the then-accepted figure of 6.4 million tonnes of marine debris entering the ocean annually. However, the original source for the 6.4 million tonnes figure is from a 1974 American Academy of Sciences paper that actually gives its own estimate of ~1,000 tonnes of fishing gear lost annually⁴. Authors of the 2009 UN paper also clearly state in their report that there is no scientifically accepted number for the amount of gear entering the ocean each year, nor was there enough research done at the time of their report to commit to an accurate predictive number.

If the estimate of ~10% of marine debris being ALDFG is accurate (which also seems unlikely given the UN technical paper's authors' own sentiments on how challenging it is to come up with an accurate percentage estimate, and given the disparity of estimates outlined below), then we must also consider updated estimates of the amount of debris entering the ocean each year when trying to determine ALDFG's contribution to the global marine debris load. A 2020 study estimated that 19–23 million tonnes entered the ocean in 2018⁵, which would suggest the amount of ALDFG entering the ocean annually would be closer to 1.9–2.3 million tonnes if the 10% estimate is accurate. Importantly,

no such claim is being made here about the total volume of fishing gear entering the ocean; rather, this simply illustrates the extent of the uncertainty when attempting to answer this question. Other studies have suggested that between 46%⁶–70%⁷ of the floating microplastic in the five ocean gyres is likely ALDFG when measured by mass. While not ubiquitous to the entire ocean, these percentages are much higher than 10%. Similarly, estimates of the proportion of fishing gear washing up on shores varies significantly: approximately 27% (by count)⁸ of beach debris in Europe, and as much as 50% (by mass)⁹ of beach debris in British Columbia, Canada is composed of fishing related items.

On the other end of the spectrum, a 2021 study suggested that the amount of fishing gear entering the ocean was approximately 48,000 tonnes annually¹⁰. While far short of the often quoted 640,000 tonnes figure deriving from the 2009 study referenced above, this figure was entirely based on industrial trawl, long line, and purse seine fisheries using automated identification system (AIS) data from Global Fishing Watch (GFW), so is not giving a holistic view of total gear loss across all fisheries around the globe. Some crucial considerations missing from the 2021 study when looking at the broad global context include: 1) not considering gear types apart from industrial trawl, long line, and purse seine; 2) not considering gillnets, fish aggregating devices (FADs), and traps and pots, all of which make up the top three most likely gear classes to be lost according to the GGGI Best Practice Framework for the Management of Fishing Gear (C-BPF); 3) not considering smaller commercial and artisanal fisheries; and 4) relying entirely on predictive modeling with no ground truthing to verify the models. That said, the study contains important and interesting data, and it represents another critical piece of information for solving this global puzzle.

Working group 43 of the UN Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection's (GESAMP) is dedicated to building a

broader understanding of sea-based sources of marine litter. However, in 2021 the working group attempted to synthesize the existing literature on this issue and found there was insufficient data¹¹. In short, although some attempts have been made to quantify the amount of gear lost each year, the resulting numbers vary widely and no global consensus has been achieved. Although the UN FAO is actively carrying out a study on global gear loss rates to attempt to estimate how much gear is lost each year, the study will take several years to complete. Although there are no universally accepted estimates of the amount of gear already in the ocean or the amount of gear lost each year, the general consensus is that ALDFG is a significant concern for our ocean and aquatic environments.

More research about the economic impacts of ALDFG has also come to light. A 2021 study by the government of Greenland suggests that 5% of total catch in Greenland's waters—worth approximately 60 million DKK (~\$9.2 million USD)—is lost to ALDFG annually¹².

It is worth highlighting that in addition to ALDFG being an issue of concern for marine environments, there has been an increased focus in recent years on the ALDFG issue in freshwater fisheries as well, such as the in world's great lakes and rivers. The 2019 [Sea to Source: Ganges river expedition](#) found ALDFG to be a significant source of aquatic plastic pollution along the length of the river, and found entanglement risk was considerable for the endangered three-striped roof turtle and the Ganges river dolphin. Significant anecdotal evidence indicates ALDFG issues in other fresh water systems including the Fraser River in Canada, the North American Great Lakes, Lake Victoria in Africa, and the Caspian Sea in Asia.

Although progress is being made on research about ALDFG, much more research is needed to fully understand the extent of the ALDFG problem and its effects on aquatic life and habitats, global food security, and the economy.

* The actual word used in the technical paper was “volume” in this instance, but we have confirmed with one of the primary authors that this reference is synonymous with “mass”.

2

KEY ACHIEVEMENTS IN 2021

- 1 LAUNCHED THE NANCI PROJECT**
The GGGI launched its signature North American Net Collection Initiative (NANCI) project that focuses on providing collection and recycling solutions for EOL gear, data collection, and the promotion of trilateral action on ALDFG between Mexico, the United States, and Canada.
- 2 BUILT THE STRUCTURE FOR THE GGGI GLOBAL DATA PORTAL 2.0 FOR RELEASE IN 2022**
The infrastructure for version 2.0 of the GGGI Global Data Portal was built for an official 2022 launch, providing a robust platform with standardized data sharing agreements and allowing for increased public access to data for research purposes.

- 3 REFRESHED THE BEST PRACTICE FRAMEWORK FOR THE MANAGEMENT OF FISHING GEAR (C-BPF)**
The original C-BPF (released in 2017) was refreshed for the first time in June 2021 with new research, new case studies, an updated risk assessment for gear classes, updated companion fact sheets, and a cleaner and more user-friendly layout.
- 4 LAUNCHED THE BEST PRACTICE FRAMEWORK FOR THE MANAGEMENT OF AQUACULTURE GEAR (A-BPF)**
With aquaculture projected to soon overtake wild capture fisheries as the most important source of fish worldwide, we recognized the need for a best practice framework dedicated to aquaculture operations, and we launched the framework in August 2021.

- 5 DEVELOPED A DRAFT REGIONAL BEST PRACTICE FRAMEWORK FOR APEC TO BE LAUNCHED IN 2022**
At the request of APEC, we began development of a BPF tailored to the APEC region, building on the global guidance offered in the C-BPF and applying it to APEC economies.
- 6 DRAFTED AN ALDFG ACTION PLAN FOR THE CARIBBEAN REGION TO BE LAUNCHED IN 2022**
In collaboration with the Gulf and Caribbean Fisheries Institute (GCFI) and the Caribbean Regional Fisheries Mechanism (CRFM), we developed a draft ALDFG action plan for the Caribbean region, which included feedback from Caribbean stakeholders.
- 7 PRODUCED NEW TRAINING VIDEOS INCLUDING BEST PRACTICES FOR GEAR CATEGORIES IDENTIFIED IN C-BPF AND DATA PORTAL 2.0 FUNCTIONALITY**
We developed a series of short, illustrative training videos on the relative ALDFG risks associated with the gear classes identified in the C-BPF, with the videos for use in workshops, training sessions, and other purposes.
- 8 PRODUCED ALDFG LEGISLATION ANALYSIS**
In collaboration with Ocean Outcomes (O2) and the World Wildlife Fund (WWF), we produced a report detailing various legislation options for addressing ALDFG around the world, with the options including case studies and recommendations for next steps.
- 9 HELD MULTIPLE ALDFG CAPACITY BUILDING VIRTUAL WORKSHOPS**
The GGGI hosted and/or participated in ALDFG virtual workshops with stakeholders from Belize, Grenada, Jamaica, Maine, Mexico, Rhode Island, Sri Lanka and Vanuatu.

- 10 ICELAND JOINED GGGI AS 18TH MEMBER GOVERNMENT**
At the March 2021 International Symposium on Plastics in the Arctic and Sub Arctic Region, the Icelandic government joined the GGGI as its 18th member government.
- 11 DEVELOPED A TRAINING TOOLS SUITE AND A COMPANION GUIDE FOR THE A-BPF FOR RELEASE IN 2022**
In collaboration with Chronos Sustainability, we developed a suite of online companion tools for the A-BPF, inspired by a similar set of tools we co-developed with Chronos for the C-BPF in 2019.
- 12 GGGI ANNOUNCED AS A STRATEGIC PARTNER TO THE IMO-FAO GLOLITTER PARTNERSHIPS PROJECT**
The GGGI, as a strategic partner to the [GloLitter Partnerships Project](#), will bring global experience and a comprehensive network to facilitate the implementation of the global components of the project.
- 13 CO-AUTHORED A POSITION PAPER ON EPR FOR FISHING GEAR**
The GGGI collaborated with the International Union for the Conservation of Nature (IUCN), the United Nations Environment Programme (UNEP), the Ellen MacArthur Foundation, and Searious Business to draft a [position paper for extended producer responsibility \(EPR\) for fishing gear](#).
- 14 COLLABORATED ON EUROPEAN STANDARDS ON CIRCULAR DESIGN OF FISHING GEAR**
The GGGI was confirmed as a liaison organization for the European standards body [CEN-CENELEC Technical Committee 466](#) to provide input into the development standards for sustainability, circularity, and life cycle management of fishing gear.



3

JOANNA TOOLE LEGACY



2021 JOANNA TOOLE GHOST GEAR SOLUTIONS AWARDEES

In 2021, thanks to the generous support of [World Animal Protection](#) and the [Government of Norway](#) with additional support from the [Joanna Toole Foundation](#), we were able to extend our Joanna Toole Ghost Gear Solutions Award, which was first introduced in 2020 to honor GGGI Cofounder, United Nations worker, and former World Animal Protection campaigner Joanna (Jo) Toole, 36, whose life was tragically taken in the March 2019 Ethiopian Airlines crash.

The 2021 awardees were [Blue Ocean Gear](#), [Zoological Society of London](#), [Coastal Restoration Society](#) and the [Myanmar Ocean Project](#).

BLUE OCEAN GEAR

The goal of this grant is to prevent ghost gear loss in the regions around St. Paul Island, Alaska through Smart Buoy tracking technology, community outreach, and the establishment of best practices for gear loss prevention. In 2021, Blue Ocean Gear provided 24 Smart Buoy devices to the Central Bering Sea Fishermen's Association (CBSFA), with 16 delivered to St. Paul Island, Alaska and the remaining eight delivered to vessels from the CBSFA that fish out of Dutch Harbor, Alaska. As COVID restrictions prevented travel to the island, Blue Ocean Gear provided fishers in both locations with remote training sessions on the proper deployment of the Smart Buoys. Project partner Veronica Padula with the Aleut Community of St. Paul Island (ACSPI) facilitated the training sessions, and a training video was also made to provide to users with a reference tool if personal training was not available.

Due to COVID-19, the Aleut fishing community on the island decided not to fish commercially in 2021, and only limited fishing occurred on a subsistence basis. Therefore, the focus of the 2021 deployments was on the two larger vessels fishing out of Dutch Harbor in the Aleutian golden king crab fishery and the halibut fishery near St. Matthew Island. Blue Ocean Gear and ACSPI held debrief sessions with the skippers of the vessels who provided positive feedback and suggested that the buoys could be useful in the black cod fishery as well. Smart Buoys were tested briefly in the St. Paul fishery (there's a photo of this in the design package), but no useful data was obtained due to the limited activity of the fishery that year.

For the deployments with the golden king crab fishery, the Smart Buoys moved up to 900m each day, indicating significant movement on the lines. This is typical in these regions of Alaska. With strong tides often pulling gear underwater, fishers use extra line length to keep their gear on the surface as long as possible. Gear was observed to be submerged and resurfaced many times (up to 12 times in two weeks, sometimes for multiple days at a time). For the

longline halibut fishery, gear was set for less than 12 hours each time, then hauled on deck.

Skippers involved in the testing provided the following feedback:

- The Smart Buoys were easy to use.
- The smart phone app was useful, as internet was available onboard their vessels.
- The buoys would be useful in the black cod trap fishery, as the gear is set for longer periods of time and many vessels transit through the gear and drag through it, causing gear loss.
- The buoys would be useful in deepwater (greater than 200 fathoms) due to the extra scope on the line.
- For 2022, the fishing community on St. Paul Island decided again not to have a commercial fishery, but fishers will test the buoys in the subsistence-level fishing they do around the island.
- Skippers requested buoy position updates of 30 minutes or faster during hauling. Note: At the time of the testing, this was not possible, but it has since been implemented in updated versions of the buoy software.

ZOOLOGICAL SOCIETY OF LONDON

The Zoological Society of London's project entitled "Feasibility of Establishing Ghost Net Collection and Recycling on the Ganges River" will assess the feasibility of establishing the first-ever ghost net collection and recycling system on the Ganges River in India to mitigate the impact of discarded fishing gear on threatened wildlife, particularly the Ganges River dolphin. Due to significant challenges surrounding COVID-19 in India, project activities were delayed into 2022.

ZSL will adopt an inclusive and equitable approach to net recycling under the Net-Works™ Initiative, co-created by ZSL and Interface. Net-Works™ began



Photo Credit: Coastal Restoration Society

in the Philippines as a community-based model with the aim of redesigning global supply chains to replenish the ocean and tackle poverty in the most marginalized and biodiverse parts of the world. ZSL will embed the principles of Net-Works™ and apply a modified approach to develop a net recycling scheme along the Ganges River. The project consists of four main objectives:

1. Identify priority fishing communities along the Ganges River which are suitable to set up a viable net recycling program based on existing scoping criteria and site visits to potential collection communities. Sites will be determined based on the potential for significant environmental and socio-economic impact and the viability of a long-term business model.
2. Conduct fieldwork in conjunction with the Wildlife Institute of India (WII).
3. Identify training partners to assist local communities with net collection and setting up recycling program.
4. Identify potential buyers for collected net material using existing partners, contacts, and networks.

We look forward to providing further updates about the outcomes of this project in 2022.

COASTAL RESTORATION SOCIETY

Coastal Restoration Society (CRS), which is based in Canada, works closely and collaboratively with Indigenous communities and Canadian Provincial and Federal governments as well as with maritime professionals and environmental scientists to establish sustainable, long-term solutions for a healthy environment and a thriving economy. CRS works across several areas, including ALDFG and derelict vessel removal, emergency petroleum spill response, aquatic invasive species monitoring and control, large pelagic species assessment and monitoring, and aquaculture support. Since 2018,

CRS has completed eighteen large-scale industrial remediation projects in Nuuchahnulth territories on Vancouver Island, Canada, including shoreline cleanups, removal of derelict vessels, aquaculture remediation, and community revitalization.

As part of this project, CRS will conduct territorial rehabilitation through the removal and responsible disposal of marine debris within the First Nation Traditional Territory of Clayoquot Sound, British Columbia. Working in partnership with First Nations communities, this project seeks to amplify awareness of impacts presented by ALDFG and offer space to build environmental connections and

community. Activities include identifying areas of high levels of ALDFG that can safely be removed, removing ALDFG from these areas where it is safe to do so, and working with local recycling and disposal centers to ensure the proper recycling, upcycling, or disposal of any recovered material.

MYANMAR OCEAN PROJECT

The Myanmar Ocean Project (MOP) was founded in 2018 by SCUBA diver Thanda Ko Gyi to raise awareness about ocean conservation in Myanmar and to find solutions to protect the marine environment from harm caused by human activity,



Photo Credit: Shin Arunrugstichai



Photo Credit: Shin Arunrugstichai

including impacts from ALDFG. In collaboration with the GGGI, MOP has successfully conducted surveys and cleanup expeditions across the Myeik Archipelago, produced [Myanmar's first comprehensive ALDFG report](#), supported local community engagement, and removed nearly two tons of ALDFG from sensitive coral reefs.

For this project, MOP is conducting interviews with fishers in the region to gather data to better understand gear loss in Myanmar. This data will be

analyzed to identify ALDFG hotspots and understand the life cycle of gear in the region from purchase through to end-of-life. The data also will contribute to ongoing efforts to estimate the amount of gear lost each year around the world. In addition, the survey findings will feed into the creation of educational materials to raise awareness amongst fishers and the public about ALDFG and its impacts on the local marine environment and species in order to help prevent gear loss in the future.

GLOLITTER PARTNERSHIPS GRANT RECIPIENTS

The GloLitter Partnerships (GLP) Project, funded by the Norwegian Agency for Development Cooperation (Norad) and led by the International Maritime Organization (IMO) in partnership with the UN FAO and Ocean Conservancy, created the Joanna Toole GloLitter Partnerships Grant. The grant is in recognition of the late Joanna Toole, who was tragically killed when Ethiopian Airlines Flight 302 crashed en route to Nairobi on March 10, 2019. Joanna was a rising star in the environmental community, fighting against the impacts of ghost gear around the globe in her roles as an FAO fisheries project manager and as co-founder of the GGGI. This grant helps to ensure that Joanna's legacy lives on, and that her passion and dedication to improving the health of the ocean for the people and animals that depend on it will continue to be an inspiration for us all.

In 2021, three grants were awarded to the Jamaica Environment Trust (JET), Eracoma, and Association for Women Working in the Maritime Sector in Eastern and Southern Africa (WOMESA)—Kenya Chapter.

JAMAICA ENVIRONMENT TRUST

The Jamaica Environment Trust (JET) was formed in 1991 by a group of citizens concerned about the state of Jamaica's natural environment. It is a nonprofit organization based in the Kingston and St. Andrew area, but it carries out projects that are implemented all over Jamaica.

Key aims of this project are to identify through consultations with fishers and other key stakeholders areas of accumulated gear where removal activities can be safely conducted, and to remove approximately 1,000 pounds of ALDFG and plastics from Kingston Harbor beaches and from reefs around the cays within the Palisadoes-Port Royal Protected Area (P-PRPA).

A waste characterization exercise will be performed from each cleanup site to determine the main types and sources of waste and ALDFG found in the target areas. The team will also conduct consultations with fishers and other stakeholder groups to determine the main causes and sources of ALDFG in the region.

Following on from these activities, JET will host educational seminars with fishers and other stakeholders about the impacts of ALDFG on the marine environment and on people's livelihoods, identify preliminary solutions that can be implemented to reduce ALDFG, and present results of these activities to the Jamaica National Fisheries Authority (NFA).

ERACOMA

ERACOMA is an environmental research, conservation, and management organization made up of a team of environmental managers and conservationists with expertise and experience in environmental research and management. Based in Nairobi, Kenya, it is a leading provider of environmental research and consulting and sustainability-related services.

The key aim of this project is to establish and map major sources and hot spots for ALDFG losses, accumulation, and impact areas along the Kenyan coast. To gain baseline data on ALDFG in the region, focus group discussions, interviews, and field observations will be implemented in the six major regions of the Kenyan coastline (Kwale, Mombasa, Kilifi, Malindi, Tana River, and Lamu). Stakeholders to be engaged include fishers, beach management units, hoteliers, tourists, sailors, beachgoers, and local resource managers from target governmental groups (Kenya Wildlife Service, Kenya Fisheries Department, Kenya Coast Guards, and Kenya Marine and Fisheries Research Institute) and nongovernmental groups (WWF-Kenya, Ocean Conservancy, Diani Turtle Watch, and Watamu Turtle Watch) in each region. GPS and Arc GIS mapping

will be used to ground-truth information and data gathered during this project.

Once hot spots are identified, ERACOMA will conduct cleanups to remove ALDFG and other marine debris from shorelines and from underwater in identified hotspots, utilizing community members in each location. Community training programs on waste separation, recycling, and upcycling opportunities will also be carried out, and opportunities will be explored to collect and sell ALDFG to recycling facilities that can accept various materials. ERACOMA will also identify approximately 20 volunteers representing youth and females in the communities who will be trained to sort and separate plastic waste, rubber, and glass for reuse, recycling, and sale to industry.

Community outreach will also be done, focusing on liaising with fishing communities and enhancing public awareness on ALDFG and other debris management initiatives through workshops, lectures, promotional printed materials, social media, stakeholder websites, hotels, beach management unit offices, and local television and radio stations.

ASSOCIATION FOR WOMEN WORKING IN THE MARITIME SECTOR IN EASTERN AND SOUTHERN AFRICA (WOMESA)

The Association of Women Managers in the Maritime Sector in Eastern and Southern Africa (WOMESA), was initiated by the International Maritime Organization (IMO) and launched in December 2007, in Mombasa,

Kenya, under IMO's program on the Integration of Women in the Maritime Sector (IWMS). WOMESA Kenya, which was launched on March 26, 2010 in the port city of Mombasa, is the first national chapter of the association. WOMESA has been at the forefront in advocating for the empowerment of women in the maritime sector through various channels, such as lobbying for women to be employed in the sector.

This project consists of several objectives. The first is to strengthen beach management unit (BMU) capabilities with an emphasis on ALDFG management in key sites of Kilifi County, Kenya (including Mtwapa, Kilifi Central, Kurwitu, Wesa, Shela, and Ngomeni). To do this, WOMSEA will work to customize recommendations in the UN FAO's Voluntary Guidelines for the Marking of Fishing Gear (VGMFG) and in the C-BPF to local conditions on the ground. Based on these recommendations, WOMSEA will work with the County Assembly of Kilifi and relevant BMUs to establish pilot centers for marine pollution control, management, and emergency response in Kilifi County to strengthen the capacity of BMUs and to facilitate cooperation between neighboring BMUs to combat ALDFG and marine pollution.

An assessment of ALDFG in selected areas will also be undertaken, focusing on measures for the prevention, mitigation, and remediation of ALDFG. Further, a survey of existing approaches to ALDFG management in target areas of Kilifi County, Kenya will be performed, as will as an assessment of the magnitude and correlation of the presence of ALDFG in areas where gear marking is not used.

In addition, WOMSEA will partner with the Kilifi government and the Ministry of Environment and Natural Resources to set up a new recycling plant for the recovery of ALDFG. Also, with the participation of local BMUs and community members, WOMSEA will organize cleanups of targeted areas and the restoration of identified sites.

We are proud to support these critical projects as part of Joanna Toole's legacy.

2021 JOANNA TOOLE INTERN

Natalie MacDonald joined the GGGI team as our second annual Joanna Toole Intern, supported by OceanCare, Ocean Conservancy and the Joanna Toole Foundation. Natalie is from Reading, Massachusetts, just north of Boston, and she holds a Bachelor's degree in Marine Affairs and Natural Resource Economics from the University of Rhode Island. In the past, Natalie served as a volunteer with the New England Aquarium and assisted with whale watch tours conducted by Boston Harbor Cruises. Natalie loves marine mammals, especially humpback whales.

In the first half of her internship, Natalie spent three months with our partners at the [Center for Coastal Studies](#) in Provincetown, Massachusetts, completing the field component of her internship and seeing the impacts of ghost gear firsthand. Natalie joined the GGGI team from November 2021 through February 2022, digging deep into intersecting facets of protecting our ocean's resources with a focus on ALDFG and assisting with some of our ongoing research. We're very grateful for Natalie's flexibility as the COVID-19 pandemic meant our intern position was once again a virtual one. However, with her help, we were able to make the internship another success. We wish Natalie all the very best in what is sure to be a very bright future.





GGGI MEMBERSHIP AS OF DEC 31, 2021

MEMBERS

MEMBERS* (122)

- Aldi
- Aquaculture Stewardship Council
- Archipelago Marine Research Ltd.
- Austral Fisheries
- Axiom Cycling Gear
- Blue Cycle
- Blue Marine Foundation
- Blue Ocean Gear
- Blue Ventures
- Bracenet
- Bumble Bee Seafoods
- Bureo
- Calao Africa
- Cape Breton Environmental Association
- Centre for Sustainable Design
- Cet Law
- CIDCO
- Claire Potter Design
- CLS Group
- Coastal Restoration Society
- Commercial Fisheries Research Foundation
- Co-op UK
- CNR-ISMAR (project GHOST)
- Commonwealth Scientific and Industrial Research Organisation
- Cornwall Seal Group Research Trust
- CSR Geosurveys Ltd.**
- Darden Restaurants
- Dolphin Swim Club
- Ecotrust Canada
- Emerald Sea Protection Society
- Enaleia
- Erub Arts
- Fathoms Free
- Fauna & Flora International**
- Fish21
- Fisheries Institute of Sao Paulo State (Lost Fishing Gear Project)
- Fiskevegn AS
- Fourth Element

Frabelle (PNG) Ltd.

- Friend of the Sea
- Fundy North Fishermen's Association
- Ghost Diving Foundation
- GhostNets Australia
- Gorgan University of Agricultural Science and Natural Resources
- Gulf of Maine Lobster Foundation
- GWR Polymers Ltd.
- Hawai'i Pacific University
- Healthy Seas Initiative
- Humpback Whale Institute
- Iceland Foods Ltd.**
- Innerspace Exploration Team
- Innovative Coating Solutions Inc. (I-Coats)
- Italian National Institute for Environmental Protection and Research
- Jealsa Rianxeria Group
- Joseph Robertson
- KIMO International
- Lidl UK
- Local Independent Sea Anglers
- Manta Caribbean Project
- Mare Nostrum
- Marks & Spencer
- Monterey Bay Diving

MRAG Ltd.

- Myanmar Ocean Project
- Natural Resources Consultants Inc.
- Neptune's Army of Rubbish Cleaners
- Nestlé
- Nomad Foods
- Northern Prawn Fishery
- Northwest Straits Foundation
- Ocean Brands
- OceanCare
- Ocean Conservancy
- Ocean Legacy Foundation
- Ocean Outcomes
- Ocean Wise
- Odyssey Innovation Ltd.
- ORCA
- Pacific Islands Development Forum
- PADI AWARE Foundation
- Parley for the Oceans
- Patuakhali Science and Technology University

- Pelagic Data Systems Inc.
- Pesquera Azul Norge AS
- Pew Charitable Trusts
- Plastix
- Poseidon Aquatic Resource Management Ltd.**
- Red Lobster
- ResqUnit
- Sainsbury's
- Satlink
- Save the Med Foundation
- Seafood Matter

- Sealcentre Pieterburen
- Sea-Farms Ltd.**
- Sea Mammal Education Learning Technology Society**
- Sea Pact
- Secretariat of the Pacific Regional Environment Programme
- Stand Out For Environmental Restoration Initiative
- Steveston Harbour Authority
- Surfers Against Sewage
- Surfrider Foundation Hawai'i Region
- Tangaroa Blue Foundation
- T. Buck Suzuki Environmental Foundation
- The Marine Mammal Center

- Teem Fish Monitoring Inc.
- Tengah Island Conservation
- Tesco
- Thai Union Group PCL
- TierraMar
- Titan Maritime**
- Tri Marine
- TUNACONS
- Uganda Junior Rangers**
- University of California, Davis
- University of Victoria School of Environmental Studies
- Valpak Ltd.**
- Waitrose & Partners
- Watamu Marine Association
- Work Dynamics, Inc.**
- World Animal Protection
- World Wildlife Fund
- World Wise Foods

GOVERNMENTS (18)

- Canada
- Dominican Republic
- Iceland
- Independent State of Samoa
- Kingdom of Belgium
- Kingdom of the Netherlands
- Kingdom of Norway
- Kingdom of Sweden
- Kingdom of Tonga
- Mexico
- Montserrat
- New Zealand
- Republic of Palau
- Republic of Panama
- Republic of Vanuatu
- Tuvalu
- United Kingdom of Great Britain and Northern Ireland
- United States of America

KEY AFFILIATES (4)

- European Commission Directorate General for Maritime Affairs and Fisheries (EC DG MARE)
- OSPAR Commission
- United Nations Environment Programme (UNEP)
- United Nations Food and Agriculture Organization (UN FAO)



*New members are shown in bold.

5

ICELAND JOINS THE GGGI

At the March 2021 International Symposium on Plastics in the Arctic and Sub Arctic Region, the Icelandic government announced it had joined the GGGI. In doing so, Iceland became the 18th government to officially support the Initiative.

According to the Iceland Ocean Cluster, Iceland's ocean economy—including fisheries, seafood processing, ocean technology, aquaculture, and related service sectors—generates nearly one-third of the country's GDP. With an exclusive economic zone of over 290,000 square miles (754,000 square

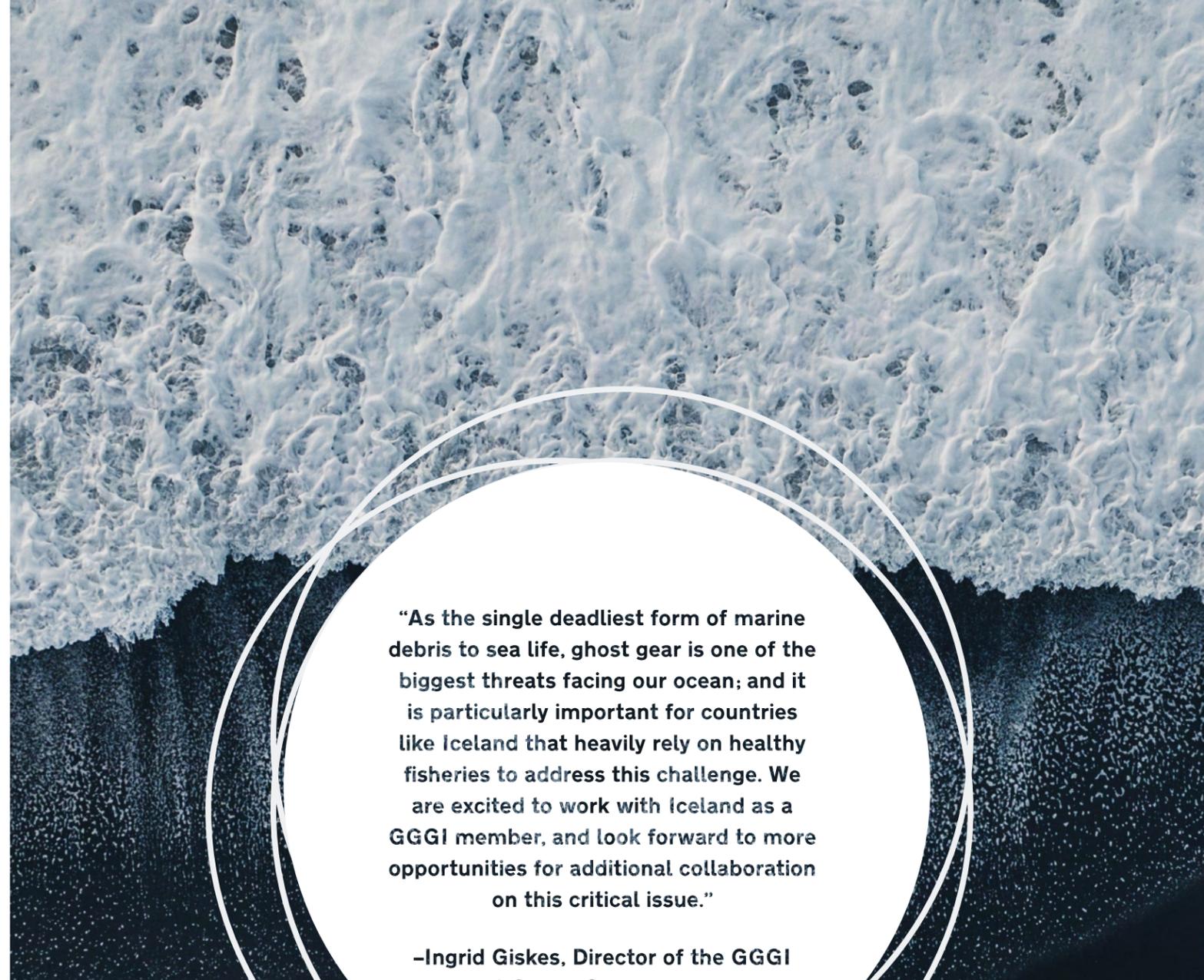
kilometers, or roughly seven times the island's area), Iceland has the opportunity to make an outsized impact on the issue of ghost gear.

Iceland has expressed support for the UN FAO's Voluntary Guidelines for the Marking of Fishing Gear (VGMFG) and it is mandatory in Iceland to attempt to retrieve fishing gear when lost, and to report the details of the lost gear to the coast guard if retrieval is not possible.

We are delighted to welcome Iceland into the GGGI, and we look forward to working together on this critical ocean issue.



"Iceland is pleased to join this broad spectrum of stakeholders and wishes the GGGI well in its important work," said Gudlaugur Thór Thórdarson, Iceland's Minister for Foreign Affairs in his opening remarks at the Arctic Symposium. The event, which was being hosted by Iceland, examined the unique challenges plastic pollution poses to the Arctic region, from shipping and tourism to microplastics and ghost gear.



"As the single deadliest form of marine debris to sea life, ghost gear is one of the biggest threats facing our ocean; and it is particularly important for countries like Iceland that heavily rely on healthy fisheries to address this challenge. We are excited to work with Iceland as a GGGI member, and look forward to more opportunities for additional collaboration on this critical issue."

-Ingrid Giskes, Director of the GGGI at Ocean Conservancy.

6

WORK STREAM UPDATES

BUILDING EVIDENCE DATA PORTAL 2.0

The launch of the GGGI global data portal version 1.0 in 2017 marked the first time that it was possible to display disparate data sets on ALDFG simultaneously in one place to gain a broad understanding of the ALDFG picture across the globe. With more than 300,000 ALDFG data records, the portal quickly became the largest collection of ALDFG data on earth. However, the portal could

only show the presence of positive data points where data collection had occurred and where data existed, and there were significant gaps where datasets did not exist. There remained large areas of the world where research had not yet been conducted. As such, the portal was considered to represent a partial picture of the ALDFG situation around the world, and it was not meant to be a representative record of all ghost gear on earth or that has ever been found. However, the very

existence of the portal made it possible to create a data framework to allow for the collection of high quality and more useful data sets from many different data contributors, which previously had not been possible.

The overall goals of data portal 1.0 were to:

- Increase ease of data submission;
- Develop an ideal data card as a reference point for organizations gathering data on ALDFG;
- Build a flexible database that could accommodate disparate data sets including any records that partially fulfilled our “ideal” record;
- Establish partnerships that could unify the data sets that already existed; and
- Promote the creation of new partnerships and data sets.

In March 2018, at the 6th International Marine Debris Conference (6IMDC), we launched the Ghost Gear Reporter App. This companion tool to the portal allows for the submission of single records of ALDFG, whether lost or found, directly to the GGGI data portal by scientists, research organizations, fishers, and citizen scientists alike. While data portal 1.0 was ground-breaking at the time, it did not allow data to be downloaded or otherwise used for research purposes. Rather, version 1.0 was a proof of concept to demonstrate that the collection, amalgamation, and display of disparate data records from organizations around the world was possible in order to gain further insight into the magnitude of the ALDFG challenge.

In 2020, we laid the groundwork for, and began the initial design of, data portal 2.0, with a focus on integrated data sharing agreements which could allow for data collected in the data portal to be accessed for research purposes. The goal has been to fulfill the original vision for the data portal, which

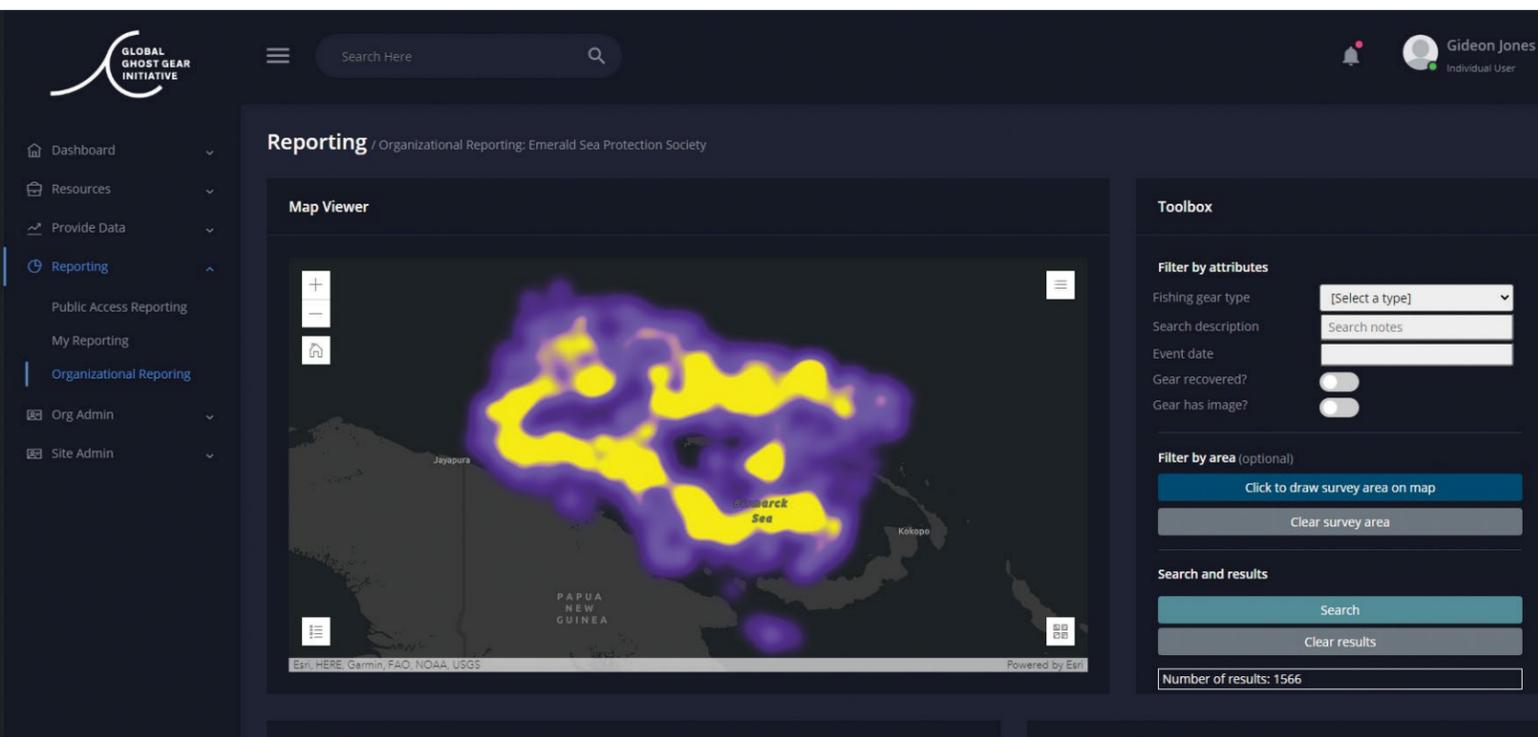
is for it to be an accessible, globally recognized, and up-to-date hub for data on ALDFG, including data from as many data sets as possible, to empower further research on this issue.

In 2021, we completed work building data portal 2.0, which includes numerous improvements:

- Integrates the new data sharing agreement directly into the online portal;
- Allows data contributors to define the level of shareability for each data set at the time of upload;
- Supports organization and individual logins to allow interaction with user-specific data;
- Includes a suite of new interactive and custom reporting tools;
- Integrates with ArcGIS to allow for high resolution data on a map view;
- Allows users to retrieve data instantly within a user-drawn shape on a map view;
- Includes several new Application Programming Interfaces (APIs), expanding the possible integration and data transfer with other platforms in the future.

The GGGI Ghost Gear Reporter App has also been updated. It now includes the ability to log in using the same credentials as with the data portal if desired, to track individual projects and contributions on a per-user basis.

Our focus in 2022 will be onboarding new data partners to get more data into the portal and to have as much of that data publicly accessible as possible for research purposes. As part of the portal, we will also be building a resource library, which will house links to ALDFG-related academic papers, news articles, reports, and so forth to further make the GGGI data portal the one-stop shop when it comes to all things ALDFG data-related.



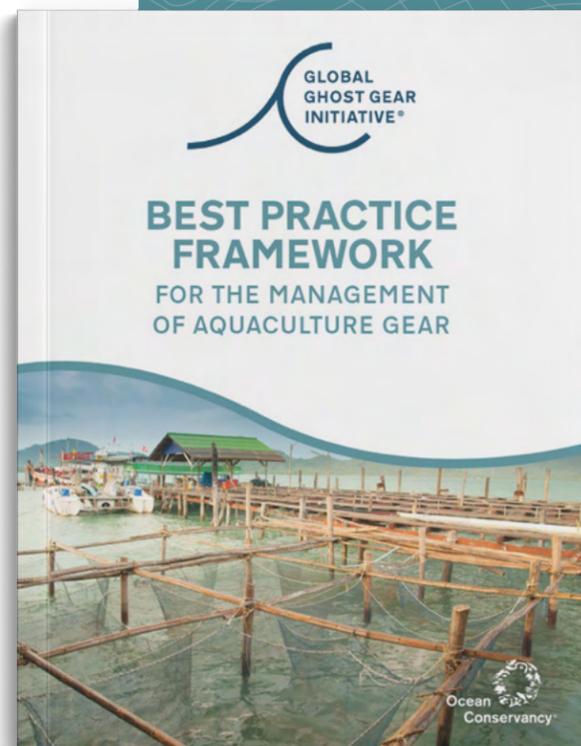
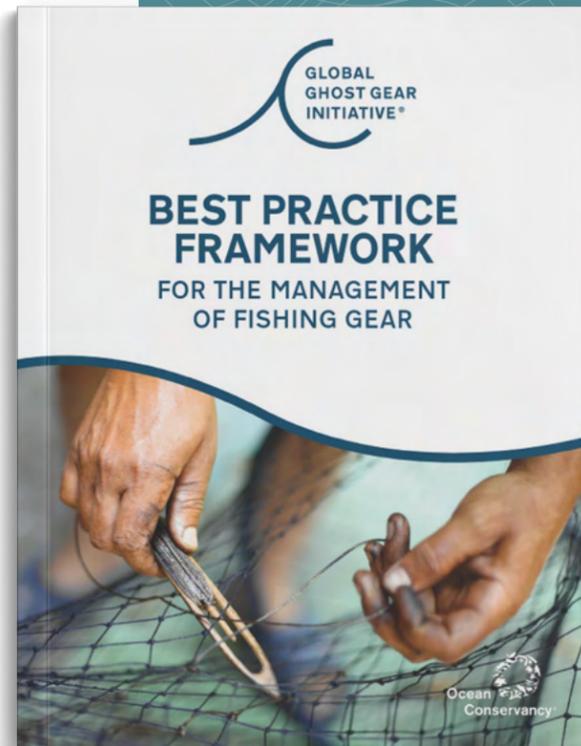
DEFINING BEST PRACTICE AND INFORMING POLICY

REFRESHED THE BEST PRACTICE FRAMEWORK FOR THE MANAGEMENT OF FISHING GEAR (C-BPF).

In 2017, the GGGI released the Best Practice Framework for the Management of Fishing Gear (BPF), the first and only practical guidance document focused on preventing, mitigating, and remediating the loss of fishing gear throughout the seafood supply chain. However, to keep it up to date with the latest science, data, technology, and case studies, the GGGI consulted with experts within the GGGI membership and with the original BPF primary author, Tim Huntington of Poseidon Aquatic Resources Management, to give the framework a thorough update and refresh.

The refreshed Best Practice Framework for the Management of Fishing Gear for wild capture fisheries (C-BPF) is fundamentally very similar to the 2017 original. However, the refreshed version incorporates new research, technology, and data produced and developed since the framework's initial release, and it combines the original set of three documents that made up the original BPF into one document. We have also tweaked the gear risk assessment based on feedback from various stakeholders and with new research. We also have added two new stakeholder groups to the framework itself: International Development and Funding Agencies, and Municipality Councils and Authorities. In addition, the C-BPF has been redesigned with ease of use in mind, and it includes a more clearly laid out organizational structure and color-coded page tabs for each of the 12 stakeholder groups the C-BPF addresses.

Because the likelihood, impact, and causes of ALDFG are highly context-specific based on fishery and geography, the C-BPF is designed to be a starting point for establishing best practices dealing with the relative risks of each gear type in relation to ALDFG. The C-BPF remains the gold standard for guidance documents focused on preventing ghost gear, and



it has been referenced widely, including in research papers, United Nations workshops, and OECD/G7 reports, and by seafood certification bodies such as the Responsible Fishing Vessel Standard, Friend of the Sea, and the Marine Stewardship Council.

LAUNCHED THE BEST PRACTICE FRAMEWORK FOR THE MANAGEMENT OF AQUACULTURE GEAR (A-BPF).

In August 2022, we officially launched our Best Practice Framework for the Management of Aquaculture Gear (A-BPF) to complement the refreshed Best Practice Framework for the Management of Fishing Gear (C-BPF). The A-BPF is the first document of its kind that provides comprehensive guidance to aquaculture stakeholders about the best ways to prevent and mitigate the effects of gear loss and plastic pollution from the aquaculture industry.

Aquaculture is the world's fastest growing food producing sector, with an expected growth of 37% by 2030 over 2016 rates¹³. Though global losses of gear from aquaculture are likely lower in volume than from capture fisheries, it is still a significant issue, and the growth of aquaculture means that changes made in that sector can have an outsized impact for our waters. Debris from decommissioned coastal aquaculture sites has been a major source of marine debris in many areas, including Greece, Canada, and South Korea.

Gear loss from aquaculture occurs for several reasons, including low-level losses through routine farming operations; extreme weather; inadequate planning and management; and intentional discard where other options are limited, oversight is sparse, and costs for proper disposal are high. The A-BPF contains practical guidance for 11 stakeholder categories across the aquaculture industry—including gear manufacturers, aquaculture operators, and seafood companies—about how to address these challenges.

DRAFT CARIBBEAN REGIONAL ACTION PLAN

Managing ALDFG is essential to ensuring the future sustainability of fisheries across the Caribbean region and safeguarding people's livelihoods and food security. The Caribbean Regional Action Plan to Prevent ALDFG (Caribbean RAP) provides strategic guidance for a coordinated approach to managing ALDFG across the region through a variety of relevant best practices across prevention, mitigation, and remediation strategies. However, the Caribbean is a geographically and geopolitically highly complex region. It encompasses 35 countries, including 27 island states, some of which are politically independent states while others are overseas territories of France, the Netherlands, United Kingdom, and United States of America. Due to this complexity, creating an action plan that addresses all of the local particularities of each individual State, which have come to light through our engagement in the Caribbean over the last few years, is not feasible.

Accordingly, the GGGI has taken the approach that this regional action plan will set out the main considerations around the gear types used in the Caribbean region, utilizing the [GGGI's Best Practice Framework for the Management of Fishing Gear \(C-BPF\)](#) as a guide and with feedback from the [CRFM](#), the [GCFI](#), and their respective networks. A series of recommendations are suggested that can then be adapted accordingly at the local or country level based on local circumstances, and the recommendations in this first iteration of the regional action plan should be considered as such. Discussions with the CRFM have indicated that there may be an opportunity to develop the action plan further beyond the scope of the draft Caribbean RAP, and to potentially introduce the plan's more general recommendations in a more binding version or versions directed at individual member states, potentially developed in partnership with the [Caribbean Community \(CARICOM\)](#), which is a grouping of 20 Caribbean countries (15 Member States and five Associate Members).

CARIBBEAN PORT RECEPTION FACILITIES REPORTS

Just as insufficient waste management is a primary cause of plastic pollution from land-based sources, inadequate waste collection due to the lack of port reception facilities can prevent proper disposal for end-of-life fishing gear. The GGGI conducted an assessment identifying gaps and opportunities for the disposal of end-of-life gear and ALDFG in the Caribbean region broadly, and the GGGI also prepared an additional report on the end-of-life options in Belize in particular. With the reports' results indicating that in most cases in the Caribbean, recycling options for end-of-life gear are not feasible, key recommendations in the reports were to encourage reuse and other options appropriate for the Caribbean context.

The Caribbean region is highly complex, which makes implementing efficient and effective fishing gear disposal facilities in a systematic and coordinated way across the Caribbean region a significant challenge. The GGGI's assessment of gear disposal facilities across the Caribbean region identifies that there are currently no formal facilities available for fishers to responsibly dispose of end-of-life gear. To date, limited, if any, dedicated disposal or recycling facilities exist at the local, national, or regional levels. Broadly speaking, there is little to no information available regarding the quantity of end-of-life gear generated per season or the fate of that gear. This is by no means unique to the Caribbean region, but it is an important finding and an essential first step toward evaluating solutions for end-of-life gear and identifying the most appropriate disposal options. With transportation costs so high between countries, it is not currently economically viable to build a central recycling facility that can handle fishing gear; nor is it economically feasible to ship high-value raw materials such as polyamide, polyethylene, and polypropylene to other countries for processing. Additionally, there is not

yet enough data regarding the amounts of end-of-life gear being generated or the rates at which gear is lost. There is clearly more research to be done on this subject, and we hope to further this work in the future to provide clear pathways for end-of-life gear in the Caribbean and elsewhere.

DIVE PROTOCOL SURVEY REPORT—CARIBBEAN

The GGGI developed a broad gear retrieval protocol which includes a proposed standardized system for retrieving ALDFG that is submerged underwater across the Caribbean region. It is critical to consider local situations and conditions before, during, and after any retrieval operation. This is of particular importance for the Caribbean region because it is so highly complex and diverse across different Caribbean countries and island states, with differences including permitting requirements for gear removal, local biota, and gear types used. The protocol also provides a basic framework for CRFM member states to adapt and incorporate into national marine litter plans, UN Sustainable Development Goal (SDG) 14.1 commitments, and the UN FAO Committee on Fisheries' (COFI) 32 commitments regarding gear retrieval.

It should be noted that this is a suggested standardized protocol for removing gear based on best practices. The GGGI is not a scuba diving training organization, and the proposed protocol does not serve as a training certification.

ALDFG LEGISLATION ANALYSIS

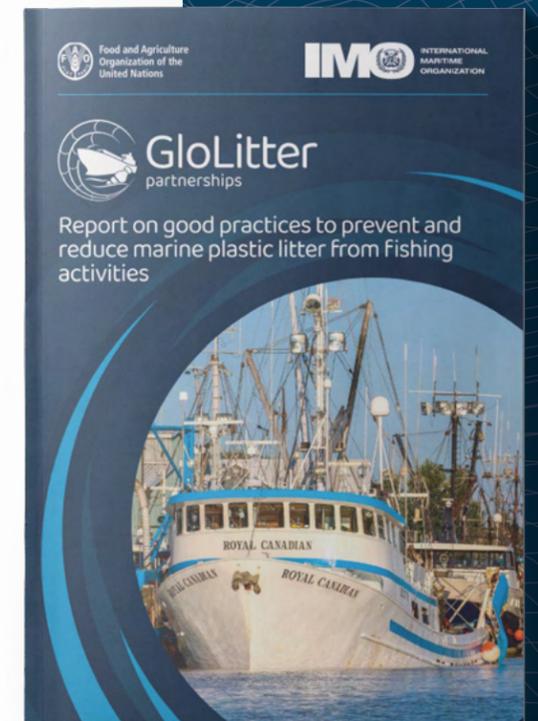
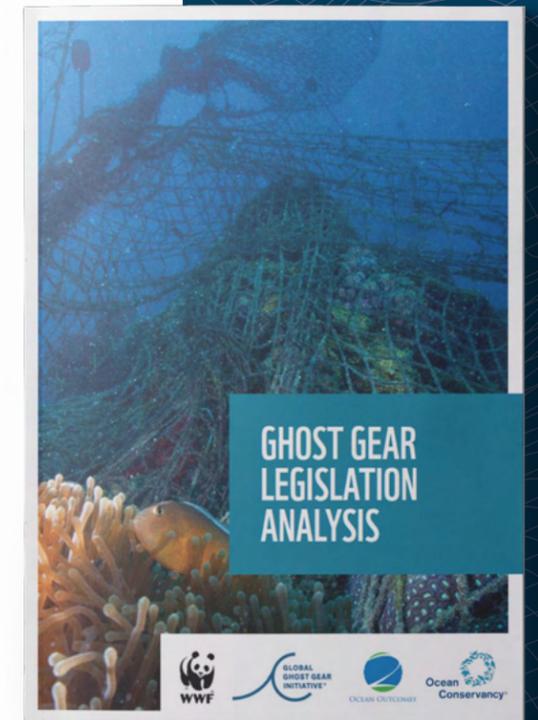
The GGGI, in partnership with World Wildlife Fund (WWF) and Ocean Outcomes, released a new "Ghost Gear Legislation Analysis" report. The report, which includes expert interviews and a quantitative survey, examines existing government legislation and policies used to tackle ALDFG and provides recommendations for more effective action.

A survey of 34 ghost gear stakeholders—including 16 government entities—across 24 different countries found that most methods for preventing gear loss outlined in the GGGI's Best Practice Framework are not actively being used. Among stakeholder respondents, 67% indicated that existing policy and legislation in their area are ineffective. The report noted that the most common type of gear prevention policy utilized was gear marking, with roughly half of respondents reporting that this technique is used in their country. The least commonly used policies were mandatory lost gear retrieval and national ghost gear action plans.

GGGI member governments have taken significant action on ALDFG; and they have participated in dedicated workshops, presentations, and capacity building activities. The report showcases model practices through case studies, including laws for shellfish pots in Washington (USA), the Marine Living Resources Act in Norway, the Common Fisheries Policy in the EU, and the Sustainable Fisheries Solutions & Retrieval Support Contribution Program (Ghost Gear Fund) in Canada. During the UK's 2021 host year of the G7, ghost gear as a transboundary plastic pollution issue was placed firmly on the G7 agenda. Tackling ALDFG requires a coordinated cross-border approach, and we need more countries to take concrete action.

FAO GLOLITTER REPORT

The GGGI is a strategic partner for UN FAO's GloLitter programme, supporting the project's goals and objectives to assist developing countries in reducing marine plastic litter from the maritime transport and fisheries sectors. GloLitter is implemented by IMO and UN FAO thanks to initial funding from the Government of Norway via the Norwegian Agency for Development Cooperation (Norad). In 2021, the GGGI produced a report providing an overview of the status of fishing-related marine plastic debris, focusing specifically on ALDFG and evaluating its



impact and contribution to the broader marine plastic issue. The report supports phase I of UN FAO's component of the UNJP/GLO/051/IMO project, Activity 1.1.2, under the GloLitter partnership.

Using the categories identified by the Global Ghost Gear Initiative's Best Practice Framework for the Management of Fishing Gear (C-BPF), the report presents ten case studies that exemplify

key good practices for the prevention, mitigation, and remediation of ALDFG. Based on the good practices identified in the case studies, as well as the broader global context of the ALDFG problem, the report then offers a series of recommendations, including mechanisms and elements that can be implemented by GloLitter participating countries and all those aiming to prevent, mitigate, and remediate ALDFG.



CATALYZING AND REPLICATING SOLUTIONS GGGI SIGNATURE PROJECTS

GGGI Signature Projects are flagship projects of the GGGI portfolio. GGGI Signature Projects are proposed and led by GGGI leadership/staff with broader support from the Ocean Conservancy team and are developed to meet specific objectives within the overall GGGI strategy.

NORTH AMERICAN NET COLLECTION INITIATIVE (NANCI)

NANCI, led by the GGGI, is the first-ever transboundary initiative to prevent ghost gear in the coastal waters of the western United States, Mexico, and Canada. The GGGI, along with the Government of Mexico and several local non-profit organizations (including [WWF Mexico](#), [Pronatura Noroeste](#), [Manta Caribbean Project](#), [Wildcoast](#), and [Bureo Inc.](#)), and supported by a grant from the U.S. National Oceanic and Atmospheric Administration's (NOAA) Marine Debris Program, the Builders Initiative, and a diverse set of funders, have come together to tackle ALDFG in a holistic way under the NANCI project.

Mexico is one of the world's 17 "megadiverse" countries and one of the top 15 countries with the largest coastlines. As such, it is not surprising to learn that there is a significant amount of ALDFG in Mexico's waters. Results from the first multi-institutional ALDFG removal program in the vaquita marina area, which launched in 2016, showed that more than 1,300 nets were removed from the Northern Gulf of California (Sea of Cortez) as of 2020.

North America's Pacific coast overall is home to several commercially important fish species and supports a diverse marine economy in the United States, Canada, and Mexico. In 2020, [Mexico alone recorded 1.7 million metric tons in total fish catch](#), the [third-highest](#) amount in Latin America. This impacts the income for 300,000 people in Mexico who are directly involved in fishing, and it contributes to meeting UN FAO's goal of a world

without hunger and malnutrition. However, 42% of Mexico's population lives in poverty, which makes addressing ghost gear pertinent to people's livelihoods and food security. Eliminating ghost gear as the most harmful form of marine plastic debris requires a targeted and holistic approach across prevention, mitigation, and remediation.

The goals of the project include:

- Developing knowledge of ghost gear in Mexico, including through fisher surveys and predictive models for ALDFG along the Pacific and Atlantic coasts of Mexico;
- Facilitating the development of an ALDFG action plan for Mexico based on the GGGI C-BPF and tailored to Mexico's specific social, political, ecological, and economic context;
- Promoting trilateral collaboration between the GGGI member governments of Canada, Mexico, and the United States, recognizing that ALDFG is a cross-cutting international issue;
- Removing ghost gear from critical habitats in Mexico, supporting a healthy ecosystem, and building capacity and technical expertise among local NGOs to continue removal work in the future;
- Transforming end-of-life fishing nets into high-value consumer goods via Bureo's Net Positiva program, including establishing a net collection hub in Ensenada, Mexico

In 2021, together with our local and international partners, we conducted research on the volume of end-of-life fishing gear in Mexico, reached key fisheries stakeholders willing to get involved in the net collection and recycling program, and developed a predictive model to identify areas with high ALDFG potential in the Pacific and the Atlantic waters of Mexico. The Government of Mexico and the GGGI co-hosted a virtual roundtable, which brought together 57 national and regional stakeholders to discuss collaborative action on ghost gear as part



Photo Credit: Ingrid Giskes

of Mexico's commitment to the High-Level Panel for a Sustainable Ocean Economy. The event aimed to raise awareness about the scope and impact of ghost gear in Mexico and to begin identifying gaps and opportunities for building capacity within the Mexican government to address ghost gear.

Together with UN FAO, we trained our NGO partners in Mexico on conducting fisher surveys (to be carried out in 2022) to refine the predictive model and contribute to a global study on gear loss. We also worked with the Government of Mexico to identify its needs and lay the groundwork for a regional ALDFG action plan for Mexico to be further developed in 2022. We will also foster trilateral collaboration on

ghost gear between the United States, Canada, and Mexico, hoping to expand future iterations of this project in these three countries as well as in the Latin American and Caribbean community.

Looking ahead to 2022, we will continue to work with our project partners to operate a fishing gear collection hub in Ensenada and work with local fishers to collect and process end-of-life nets for recycling. We will also conduct fisher surveys in all coastal Mexican states to evaluate ghost gear impact, organize fisheries stakeholder workshops to raise awareness and promote training on best practices for gear management and for gear loss prevention, detect and remove ghost gear from sensitive habitats; and track

results of the mapping and removal work via the GGGI Ghost Gear Reporter App and global data portal. This will support a healthy ecosystem, raise awareness about ghost gear with local fishers and communities, and provide capacity building and technical expertise for locals on the ground to continue these efforts.

CARIBBEAN PROJECT

Fisheries in the Caribbean represent a way of life for tens of thousands of people, most of whom are involved in small-scale fisheries. In addition, the wider fisheries industry economically and socially supports millions of people in the region. ALDFG can have considerable impact on local commercially harvestable fish populations and the marine ecosystem in general in the Caribbean.

The GGGI held initial conversations with fish harvesters in the region via two virtual workshops carried out by the GGGI in July 2021 in Jamaica and Belize respectively and a follow up virtual workshop in the margins of the GCFI) conference in November 2021. These conversations indicate that the increased

frequency and intensity of major storm systems passing through the region, which are undoubtedly an effect of climate change, is a major cause of gear loss in the region. Coordinated action is essential to prevent, mitigate, and remediate the ghost gear issue in the Caribbean region to ensure the future sustainability of harvestable fish populations and the livelihoods of those who depend upon them, and the overall health of the ecosystem.

The GGGI has been engaging in the Caribbean since 2018, having been an observer and giving presentations on ALDFG at the CRFM annual meetings in Montserrat in 2018 and St. Kitts in 2019. The GGGI currently has several work streams ongoing in the Caribbean in collaboration with GGGI partners consisting of:

- Gathering data on the causes and rates of gear loss in Caribbean fisheries in Jamaica, Grenada, and Belize via fisher surveys;
- Creating predictive models on likely locations for ALDFG based on these surveys as well as



Photo Credit: Daniel Schwapp



Photo Credit: Daniel Schwapp

- fisheries effort and atmospheric/bathymetric/oceanographic data overlays;
- Trialing gear marking and recovery technology in Jamaica;
- Assessing end-of-life gear reception facilities in ports;
- Performing a clean up of a Jamaican beach including ALDFG debris;
- Performing unoccupied aerial vehicle (UAV) surveys of near shore areas to determine the presence of gear to determine the presence of gear and to inform a custom gear detection and machine learning algorithm;
- Facilitating ALDFG workshops based on the GGGI C-BPF in Belize and Jamaica and in the margins of the GCFI 74 conference to facilitate reciprocal learning with fishers and find effective local solutions;
- Using information gathered from the activities above, drafting a regional action plan for the Caribbean to address ALDFG; and
- Collaborating with Cefas UK to test a checklist for a parametric insurance product being developed by Cefas for the World Bank: the trial involves incorporating the GGGI BPF into the checklist to encourage gear recovery ahead of major storm events in order to reduce gear loss and provide countries with lower premiums for natural disaster insurance.

In 2021, the GGGI held three virtual capacity building workshops for fishers in Jamaica, Belize, and the wider Caribbean region at GCFI 74 to educate fishers and fisheries managers in the region about the effects of ALDFG and to promote effective strategies for ALDFG prevention, mitigation, and remediation based on the GGGI C-BPF. These workshops were also excellent opportunities to learn more about the levels of awareness of ALDFG issues from Caribbean fishers and about the primary causes of gear loss, which varied significantly from country to country, even when gear and harvesting species were similar or the same.

In addition, we tested two gear loss prevention/mitigation technologies in Jamaica. Twenty-three Smart Buoy devices by Blue Ocean Gear and 96 Resqunit devices are being tested in Jamaica's spiny lobster fishery, where the devices are attached to Antillean Z-traps. Our primary partner on the ground, the Jamaica National Fisheries Authority (NFA), distributed the gear to trusted fishers across the island in parishes representing the full range of marine conditions on all coasts. During the trial, NFA is collecting feedback from fishers on the efficacy of each technology.

We also conducted UAV surveys in near-shore coastal environments in two locations around Jamaica to detect ALDFG, specifically Antillean Z-traps used for catching spiny lobster. The UAV flights were performed by David Schwapp of [Schwapp Technical Laboratories](#) (STL) using a methodology developed by Dr. Sol Milne. This continues our work from Myanmar in 2019, with images from the UAVs being used to develop and train

a machine learning program to detect ALDFG from aerial imagery. Initial analysis by Dr. Milne indicates that the machine learning model can recognise active as well as derelict traps with 80.86 % accuracy. Including additional images can improve the accuracy, and it is something we will look to do in 2022.

VANUATU PROJECT

The GGGI continued its collaboration with the Vanuatu Environmental Science Society (VESS) and the Vanuatu Fisheries Department to retrieve ALDFG from identified hotspots, pilot innovative tracking technologies, create a predictive model of ghost gear hotspots, and build the regional capacity for implementing best practices for gear management.

Because of variation in tides, Vanuatu's anchored fish aggregating devices (aFADs) are exposed to submersion periods of varying duration and depth. Previous gear tracking technologies piloted in this region were not designed for anchored fishing gear and could not



Photo Credit: Christina Shaw, Vanuatu Environmental Science Society

withstand periods of submersion at depth. New ‘Smart Buoy’ devices from Blue Ocean Gear were piloted by the Vanuatu Fisheries to determine whether the devices were viable for reducing aFAD loss. Additional training was provided by Collect Localisation Satellites (CLS) for the deployment and monitoring of their tracking devices. Unfortunately manufacturing and shipment of these devices was delayed due to the Covid 19 pandemic, and so the pilot phase will be conducted in a future iteration of the project.

VESS conducted snorkel surveys of multiple sites where ALDFG had been reported. These verification surveys informed the creation of a model that predicts where gear loss is most likely to occur. The verification surveys and predictive model informed gear retrieval efforts undertaken by VESS in hotspots around the country. Data collection efforts from this project contributed to the global database housed by the GGGI’s data portal.

Vanuatu Project activities are supported through funding from the Government of Canada’s

Sustainable Fisheries Solutions and Retrieval Support Contribution Program (Ghost Gear Fund). These activities build on the GGGI’s past efforts in the region, which began in 2017.

GULF OF MAINE PROJECT

During a gear retrieval off the coast of Portland, Maine, the GGGI and the Gulf of Maine Lobster Foundation (GOMLF) removed more than 4,000 pounds of lost and abandoned fishing gear, consisting primarily of lobster traps, gillnets and rope. Some of the tags on removed lobster pots were 18 years old, indicating just how long the gear had been lost underwater. Maine, known for its commercial lobster fishery, produces more than 80% of all lobster caught in the United States.

This gear retrieval is part of GGGI’s ongoing collaboration with GOMLF in the region. The GGGI hosted a two-day virtual workshop on best practices for the management of fishing gear and on relevant case studies, with presentations by GOMLF, the Center for Coastal Studies (CCS), Oceanswide, and

the Commercial Fisheries Research Foundation (CFRF). A similar workshop was also hosted for stakeholders in nearby Rhode Island.

GOMLF also targeted end-of-life fishing gear in the region by hosting a gear drive for fishers to dispose of their end-of-life gear. The drive resulted in the recycling and disposal of 11,420 pounds of gear, including 115 old traps. Additionally, GOMLF lent support to Oceanswide, a Maine-based NGO which recycles and repurposes end-of-life lobster traps using a homemade “trap crusher.” Volunteers remove bricks and aluminum rings from donated lobster traps and crush them for recycling at a nearby steel plant. This effort led to the recycling of 436 lobster traps—totaling 19,620 pounds.

This project highlights the collaborative nature of the GGGI model: through virtual training and building partnerships with local NGOs, this project helped establish trust with fishers and raise awareness about gear management best practices to significantly improve marine habitats and support the productivity of one of the most economically important industries in the region.

As this project continues, efforts to identify hotspots for lost gear and removal will expand over the Canadian border into the Bay of Fundy. Additional workshops on best practices will be held with fishers in both Canada and the US, and we will be working with NOAA to meet the ALDFG goals outlined in its regional marine debris action plan for the Gulf of Maine.

The Gulf of Maine project is supported by a grant from NOAA’s Marine Debris Program, 11th Hour Racing, and Ocean Conservancy.

INDONESIA

The GGGI has been working in Indonesia since 2017, and this project is a continuation of that engagement. Led by the Government of Indonesia’s Ministry of Maritime Affairs and Fisheries (MMAF) in collaboration with the GGGI, the objective of this latest phase of the project is to pilot solutions for the

full fishing gear lifecycle to reduce, retrieve, reuse, and recycle ghost gear, and to explore a circular economy blueprint that could be developed for end-of-life fishing gear in Indonesia.

The project consists of four key objectives:

- Identify evidence about ghost fishing with reference to the GGGI C-BPF;
- Remove ghost fishing gear in collaboration with local stakeholders;
- Improve port waste reception facilities where possible;
- Explore innovative approaches for the recycling of end-of-life gear and ALDFG.

The MMAF has continued to engage with several relevant stakeholders, including provincial and district governments, fishing port authorities, fishing net manufacturers, and recycling companies, who form part of the project team. Stakeholders will be involved in relevant project components in line with the GGGI C-BPF. The MMAF has also been working to connect with several companies in Bandung, Indonesia that can accept fishing nets and gear for recycling, in the hope the companies can participate and join the team on this project.

To expand engagement and exposure of this work, GGGI Director Ingrid Giskes joined a number of Indonesian Government representatives as an invited keynote speaker to discuss the impacts of ALDFG on sustainable fishing during the Indian Ocean Rim Association’s (IORA) webinar on “Developing Awareness Program and Mitigation Against Marine Debris Impacts Towards Sustainable Fisheries in IORA” on November 10, 2021. More than 70 people attended the webinar via Zoom, with many more joining via the live stream on YouTube. The webinar provided an opportunity to present the GGGI’s work undertaken to date in Indonesia. The GGGI’s work in Indonesia started with trialling fishing gear marking in Indonesian small-scale fisheries.



Photo Credit: Josh Swan—Media Northeast



The GGGI's involvement has led up to this current phase of work, which includes piloting gear marking options at the manufacturer-level, implementing gear recycling and gear retrieval activities, and developing economic and policy blueprints to address ALDFG that could potentially be adopted by multiple provinces within Indonesia.

PACIFIC NORTHWEST

Beginning in late 2021, and building on the significant survey and removal work already done in the Pacific Northwest in Washington State, U.S.A., the focus of this project is to document and understand the nexus between derelict fishing nets (mostly gillnets), protected species and their habitat (including Bocaccio rockfish, Yelloweye rockfish, Chinook salmon, Hood Canal Summer shum salmon, and Green sturgeon), and essential fish habitats in the Washington Salish Sea (WASS). Fisher surveys from tribal and non-tribal fishers will also be performed to assess the causes and frequency of gear loss in the WASS. Based on this information, a series of side-scan sonar surveys and derelict gear removals will be conducted with a focus on deepwater critically sensitive habitats for rockfish specifically. Additionally, an analysis will be performed about the effectiveness of the

Reporting, Response, and Retrieval (RRR) program for newly lost nets, which was developed by the Northwest Straits Foundation to prevent harm from lost fishing nets.

The survey work began in late 2021 and the remaining objectives will be completed in the first half of 2022.

GGGI SMALL GRANTS

The GGGI Small Grants Program was officially launched in January of 2021. This program has been long requested by GGGI members as a way to support the work of grassroots organizations going back to the initial GGGI launch meeting in London in 2015. . With financial support of the Government of Norway and the Lenton PARKS Foundation, and logistical support of the Ocean Conservancy International Coastal Cleanup (ICC) team, which has been running a small grants program for its members for several years, the GGGI is delighted to offer what we intend to be an annual small grant process for GGGI members only. The Small Grants program offers a way for organizations in need of seed funding (maximum \$30,000 USD) to finance small but impactful projects, focusing on prevention, mitigation, and/or recovery of ALDFG with a goal toward creating demonstrable impact and lasting systemic change.

In 2021, the GGGI received 17 applications for a total of \$494,818 for projects spanning 8 countries across Eastern Europe, North America, Southeast Asia, sub-Saharan Africa, and Western Europe. Project focus areas were relatively evenly spread across the GGGI pillars of prevention, mitigation, and remediation. Applications were reviewed by the GGGI leadership as well as by members of the GGGI Expert Advisory Council (EAC). After a very tough round of review, five projects were selected to be funded as outlined below.

ANGLERS NATIONAL LINE RECYCLING SCHEME

The UK-based Anglers National Line Recycling Scheme (ANLRS), which is run on a voluntary basis and which has been a member of the GGGI since 2018, has made significant progress in many of its activities in 2021. Its Recover, Research, Reduce & Recycle 2021 project, which is funded by the GGGI Small Grants Program, has seen 38 coastal based pipe bins installed along sections of the Sussex and Dorset Coasts. These bins are used for the collection of both lost recreational and commercial ghost gear, and the response from local beach users, beach clean groups, and anglers has been very positive. In the first nine months of the year-long project, which covers only 27 miles of the south coast of England, more than one metric tonne of commercial net and rope debris has been recovered along with 287,000m of recreational fishing line. All the materials recovered, including rope and marine encrusted

plastics, are being recycled by the scheme's UK-based recycling partner ReWorKed. We look forward to seeing the final results in early summer 2022.

The ANLRS now has more than 600 line recycling bins around the UK in tackle shops, on coastal angling locations, around freshwater fisheries, and even on sites such as Royal Society for the Prevention of Cruelty to Animals (RSPCA) wildlife centres. In a little more than three years since its launch, the scheme has collected and recycled, more than 21,000,000m of fishing line and more than 12,000 single use plastic spoons. Recently, in collaboration with ReWorKed, Waterhaul, and DNA Baits, the first polarized fishing glasses made from recycled recreational fishing line and commercial nets have been developed and will be on sale in 2022.

In the coming year, working in partnership with the Angling Trust, the scheme has exciting projects that will



Photo Credit: Anglers National Line Recycling Scheme

see another 100 pipe bins distributed on major river catchments around the UK. A coastal project based around the Sunderland area of the north east coast of England is also being launched after funding has been secured from an international marine insurance company. The coastal project will see 15 more bins being supplied to coastal locations where volunteers will manage the collection of plastic marine debris. The project also plans to install a recycling bin in a commercial port to assist commercial fishers to dispose of their damaged nets in an environmentally responsible manner. The insurance company has also helped fund a project where the ANLRS and Sussex Wildlife Trust are organizing the recycling of more than 5 tonnes of monofilament gillnet from a southeast fishing port in the UK.

HAWAI'I PACIFIC UNIVERSITY

Hundreds of tonnes of ALDFG washes ashore in the Hawai'iian archipelago annually. The Hawai'i Pacific University Center for Marine Debris Research (CMDR) has been removing ALDFG from shorelines and coral reefs to identify the sources and quantify the damage to coral reef habitats.

To accurately quantify coral damage, the state of the reef before it was impacted must be known. Partnering with the Hawai'i Institute of Marine Biology (HIMB), The Nature Conservancy, and Makanakai Marine Services, with funding from the GGGI Small Grants Program, CMDR has used photogrammetry, which is the process of taking overlapping photos of a structure to create a 3-D model, to capture the "before" state of more than 3,250 ft² of coral reef in a



Photo Credit: Gulf of Maine Lobster Foundation

Photo Credit: Rachel Sandquist—CMDR



zone at high-risk for ALDFG strikes. CMDR surveys this region in Kāne'ōhe Bay on windward O'ahu monthly to detect and remove ALDFG strikes. When ALDFG strikes this region in the future, CMDR will remove it and take "after" images to quantify the damage to coral reefs and their recovery over time.

The GGGI funding has also supported CMDR's 89 days of surveillance and removal of 1,200 kg of marine debris on Hawai'i's shorelines and nearshore waters. The quantity and frequency of ALDFG strikes are relatively low in comparison to past years. For unknown reasons, much less marine debris washed onto Hawai'iian shorelines in 2021 than in past years. However, CMDR stands ready for ALDFG when it inevitably returns. Using data and experience gathered through the above activities, CMDR continues to search for support to continue the detection, removal, and research for the prevention of ALDFG impacts in Hawai'i. To continue this work, a proposal was submitted for a 2022 NOAA Marine Debris Removal Grant, which included generous matching funds from Ocean Conservancy. The grant

would increase CMDR's capacity to remove 100 tonnes of ALDFG over two years from deep water or from reefs.

GULF OF MAINE LOBSTER FOUNDATION

In June 2021, the Gulf of Maine Lobster Foundation, based in Kennebunk, Maine, Monterey Bay Diving, based in Monterey Bay, California, and fisherman and diver Jim Buxton, based in Portland, Maine, completed a cross-country collaboration to use side-scan sonar to attempt to identify ALDFG in Casco Bay, Maine.

The team spent three full days in June 2021 using Monterey Bay Diving's Edge Tech 4125 side-scan sonar unit to scan an area of approximately 20 square miles where there could be potential large masses of fishing gear. In 2019, with the help of side-scan sonar, the same team had found and removed a 20,000 pound ball of gear, which was the largest single recovery on a GGGI project to date. The goal during the 2021 project was similar: to use the side-scan sonar to identify locations where gear was present and mark those locations for future recovery efforts.



Photo Credit: Teem Fish

Whenever a possible ALDFG site was visualized on the sonar, Buxton dove into the water to visually confirm what was on the ocean bottom. A significant area of Casco Bay was covered with the side-scan sonar surveys, however this time the team was not able to locate another large mass of tangled gear. The team identified many locations that have lost lobster traps, steel cable, and tires and while they were not the targets the team was looking for, it is valuable information to use for future recovery efforts.

TEEM FISH

To facilitate the reporting of lost and found crab gear in fishing grounds in British Columbia, Canada, Teem Fish is developing a near real-time gear tracking software application that can be added to the existing e-logbook in use by the Area A Dungeness Crab fleet. Teem Fish is developing the software and providing training for harvesters to test the software will ensure information is reported more accurately, consistently, and in a much more timely manner across the fleet, and in accordance with new lost gear reporting requirements from the Department of Fisheries and Oceans, Canada (DFO) and to reduce the amount of derelict gear in the water.

Ecotrust Canada and the Area A Crab Association operate an [existing annual lost gear retrieval program](#) in British Columbia. Each year, a commercial vessel operates for a limited number of days during the fishery's softshell closure to collect lost gear from the fishing grounds. The development of this software application would allow for the recording of a greater amount of higher quality data that would then be available closer to real-time to maximize the effort at sea of the vessel dedicated to collecting lost gear.

In 2021, our software development partners at Pinpoint Earth, a Snap Group company, created a beta version of a lost gear reporting app. This app runs on the same tablets that are used as part of the fleet's upgraded electronic monitoring system

to reduce wheelhouse clutter and to make use of the app easier and more routine. The initial version of the app was designed as a means for harvesters to report lost gear electronically outside of the e-logbook implementation and roll-out. This was done to accommodate the timelines connected to the Department of Fisheries and Oceans (DFOs) release of crab technical specifications for e-logbooks and the associated develop and approval process. After demonstrating this first version of the app to our in-house technicians and to the fleet, several user interface and overall 'ease of use' changes were sent back to the software development team.

Because lost gear reporting is now a federal requirement in Canada, we are collaborating with a certified Canadian e-logbook provider to accomplish two things. First, it will provide to the fleet e-logbook software that includes all lost gear reporting requirements and that sends the lost gear details to DFO and also to a third party-managed database for

use by the annual gear retrieval program. Second, we are working with the fleet to determine if and how a stray or lost gear 'encounter' form may be used to help quantify the number of traps that the fleet was keeping from becoming ghost gear each season.

ENALEIA

Enaleia, based out of Athens, Greece, is a social enterprise dedicated to the sustainable use of the marine environment sustainable. In 2016, Enaleia created Greece's first professional fishing school with the aims of training younger generations in the fishing sector by providing a high-quality, eco-friendly, and ethical education; creating new jobs; and ensuring that professional fishing will survive into the future. Enaleia aims to empower and motivate all generations of fishers to collect plastic, including ALDFG, from the sea. The UN Environment Program selected Enaleia as one of the top five best initiatives in Europe for 2020 for its positive impact



Photo Credit: Teem Fish



Photo Credit: Enaleia

on the environment. Enaleia's Small Grant project had three key aims: 1) collection of gear directly from fishing trawlers whenever fishers renew their gear; 2) training and capacity development among fishers regarding the impacts of ALDFG to the environment and their livelihoods; and 3) retrieval of lost gear from the seafloor.

Enaleia engaged with more than 700 fishers and 170 fishing trawlers at the ports of Rimini, Ancona, Cattolica, and Cesenatico, making considerable progress toward increasing awareness of ALDFG management in the Emilia-Romagna Region. To achieve this, Enaleia established relationships with local stakeholders (fishing associations, local authorities, and so forth) to help ensure the project's long-term impact. In addition, Enaleia collected more than 25,000 kg of ALDFG from fishing trawlers during the trawlers' annual renewal periods (1–2 times per year). In addition, in collaboration with the same trawlers Enaleia established the groundwork for the trawlers to collect ALDFG from the bottom of the Mediterranean Sea. The recovered ALDFG was properly stored, weighed, and sorted in portside warehouses to be transported to certified recycling partners in Italy, the Netherlands, and Spain where ALDFG would be put into the circular economy for the creation of new sustainable products.

The project also achieved significant international recognition. In September 2021, Enaleia Co-Founder and Director Lefteris Arapakis received the title of "Ambassador for the Mediterranean Coast" by the United Nations Environment Programme's Mediterranean Action Plan. Crucially, Enaleia has managed to make cleanup and prevention practices an integral part of its fisher partners' daily activities, and fishers understand that the viability of their profession depends on implementing sustainable techniques to protect the marine ecosystem from ALDFG and other plastic pollution.

GGGI ENDORSED PROJECTS

The GGGI project endorsement process aims to identify ALDFG solution projects from organizations around the world, conduct no-cost expert review of submitted projects via the GGGI Expert Advisory Council (EAC), and ultimately provide an official letter of endorsement from the GGGI to successful project applicants. This letter of endorsement can be used by project applicants to secure funding for their project from sources outside the GGGI.

Odyssey Innovation, a long-time GGGI member, has been implementing solutions to prevent further ocean plastic pollution by offering support to the fishing community, beach clean groups, governmental bodies, and so forth through various free sustainable incentives. One such solution is the Odyssey Innovation's Net Regeneration Scheme, which is the third global project to be endorsed through the GGGI's revised endorsement process. The Net Regeneration Scheme currently is the only active scheme in the UK that offers free net recycling solutions of polyethylene trawl, nylon, and other plastic generated and recovered by the fishing industry. Everything that can be recycled in the UK is recycled locally while specialist recyclers in Europe are involved with more problematic materials. To date, the scheme supports the ambitions of more than 60 stakeholders (companies, harbors, fishers, and charities) to adopt a best practice approach to waste disposal which is fully traceable and [award-winning](#).

Throughout the years, and thanks to the support of several grants, Odyssey Innovation has been able to invest in the appropriate infrastructure (skips, bins, salaries, marketing, and logistics) to scale its operations that were once restricted to a few harbors in Cornwall, UK. To date, there are three large skips, which are located at Exeter City Council, Trevisker Garden Centre, and Newlyn, and the skips are supplemented by 15 large wheelie bins, all of which community members can use free of charge.



A strategic long-term partnership with Exeter City Council's Materials Recovery Facility (MRF) has also broadened Odyssey Innovation's horizons by providing excellent collections services, state-of-the-art premises with facilities for processing and storing vast amounts of waste, and most recently a part-investment in an industrial shredder to produce a marine plastic granulate which is now for sale and is being used in products such as kayaks, body surfing handplanes, tote boxes, and recycling bins. To date, Odyssey Innovation has successfully recovered and/or diverted more than 200,000 kilograms of plastic

from landfills and incineration and from entering into the marine environment; all of the recovered or diverted plastic have been recycled successfully.

The Net Regeneration Scheme was also selected as a major data providing partner in the EU Interreg project 'INdIGO' while also winning a government tender to carry out recycling schemes across Wales. It was selected by BVRio from 214 recycling ventures around the world to initiate a plastic credits scheme, and it also was consulted by MRAG and the European Commission to assist in developing a framework for extended producer responsibility schemes.



GGGI COMMUNICATIONS

Throughout an unpredictable year, our team sought to position the GGGI as the go-to source on ghost gear. This resulted in several major communications victories. Throughout the year, the communications team supported the release of numerous GGGI knowledge products, including the updated [Best Practice Framework for the Management of Fishing Gear \(C-BPF\)](#), the newly released [Best Practice Framework for the Management of Aquaculture Gear \(A-BPF\)](#), and the [Ghost Gear Legislation Analysis](#), earning media coverage in outlets such as [E&E](#), [Seafood Source](#), and [Seafood News](#). GGGI experts were also quoted in [Smithsonian Magazine](#), [SaltWire](#), and [the Retail Times](#). Further details on some of these highlights are included below.

ALDFG DIGITAL CAMPAIGN: KNOW YOUR ALDFGS

In 2021, the GGGI, with support from the Ocean Conservancy digital team, ran our first public-facing digital campaign about ALDFG. This educational campaign, called “Know Your ALDFGs,” was comprised of a quiz, blog, Facebook live, and multiple social media posts, and the campaign resulted in 122,710 total impressions

across platforms. The ALDFG quiz was taken by 2,161 individuals and the [Do You Know Your ALDFGs’ blog](#) had 211 views. The ALDFG Facebook Live with GGGI Program Manager Jackie McGarry and Ocean Conservancy Senior Manager for Digital Campaigns Robyn Stegman had a 19% engagement rate, which is significantly higher than the average 8–12% rate. Clearly, there is significant public interest about the issue of ALDFG and a desire to learn more. We will look for more opportunities to create live stream events, webinar-style videos, and so forth in the future.

CBS NEWS SPOT

In September 2021, a production crew from CBS This Morning joined the GGGI, the Gulf of Maine Lobster Foundation (GOMLF), and local fishers for a gear removal event off the coast of Portland, Maine. The resulting CBS news segment showcased the coordinated removal of nearly 4,000 pounds of gear and featured interviews with GGGI Program Manager Jaclyn McGarry, GOMLF Director Erin Pelletier, and local lobsterman and diver Jim Buxton. CBS is the most popular television network in the United States, and its morning show averages upwards of two million viewers each day. Not only did the segment air on CBS nationally, but it was also picked

up by a dozen local affiliate stations across the United States, resulting in more than 2.4 million total broadcast views.

“WATER WE DOING” PODCAST

The Aquatic Biosphere Project hosts a podcast series called “[Water We Doing](#),” which explores all manner of topics about water, including environmental sustainability issues. Hosted by David Evans, the podcast reached out to the GGGI and to GGGI member Emerald Sea Protection Society (ESPS) in 2021 to talk about ALDFG and its impacts on the marine environment. The podcast interviewed GGGI Associate Director Joel Baziuk and [ESPS’s](#) Bourton Scott and Ally Stocks.

MORGAN STANLEY’S “AT SCALE” PODCAST

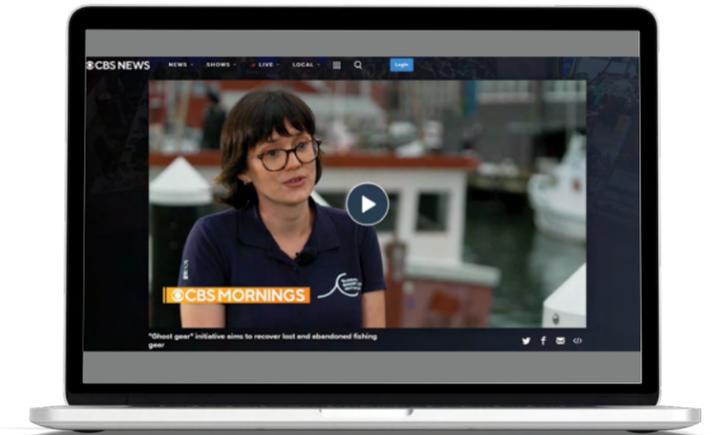
GGGI Director Ingrid Giskes and GOMLF Director Erin Pelletier joined Morgan Stanley’s “[At Scale: a Sustainability Podcast](#)” podcast to discuss working together to address ALDFG. Podcast Host Audrey Choi takes a closer look at things that might seem ordinary or little known, but that have a big impact the world around us. On the episode on “[Solving for Ghost Gear](#),” the podcast takes a deep dive look at ALDFG and how to enable lasting change to prevent gear loss.

“THE GOOD PROBLEM” PODCAST

Hosted by Leigh Matthews, “[The Good Problem](#)” is a podcast focusing on “unpacking the sticky art of doing good”, as she puts it. Leigh sat down with GGGI Director Ingrid Giskes to talk about ALDFG, the harm that it causes, and how we can all do more to help address this global challenge.

TEAM SEAS

2021 also marked a major campaign milestone for Ocean Conservancy. In late October, YouTube creator



MrBeast launched the Team Seas campaign. Team Seas aimed to raise \$30 million USD to remove 30 million pounds of trash from our ocean by targeting river, beach, and ocean cleanups, including ALDFG. MrBeast is one of the most popular YouTubers in the world, and the campaign received significant traditional and social media attention. The [Team Seas launch video](#) alone garnered 54 million views.

GGGI IN THE MEDIA

- E&E: [Study finds government action lagging on discarded fishing gear](#)
- Seafood Source: [Global Ghost Gear Initiative report provides recommendations for government action](#)
- Seafood News: [GGGI’s New Best Practice Framework for the Management of Aquaculture Gear \(A-BPF\)](#)
- Retail Times: [Iceland joins Global Ghost Gear Initiative \(GGGI\), to protect marine life from and discarded fishing gear](#)
- The Grocer: [Iceland joins alliance to tackle ‘ghost’ fishing gear abandoned at sea](#)
- Waste360: [Ghost Fishing Gear Gains International Attention and Who’s Doing What to Recover it](#)

OUTREACH AND EVENTS

G7 EXPANDED FUTURE OF THE SEAS AND OCEANS TECHNICAL WORKING GROUP (VIRTUAL: MARCH 4, 2021)

GSI PRESENTATION ON A-BPF (VIRTUAL: MARCH 23, 2021)

GGGI VIRTUAL CORPORATE ROUNDTABLE (VIRTUAL: MARCH 24, 2021)

GGGI ALDFG VIRTUAL WORKSHOP: SRI LANKA (VIRTUAL: MARCH 24, 2021)

ABIDJAN CONVENTION AND SUSTAINABLE SEAS TRUST WEBINAR (VIRTUAL: APRIL 13, 2021)

GGGI Director Ingrid Giskes presented on a webinar hosted by the Abidjan Convention and Sustainable Seas Trust on Tuesday, April 13th. The webinar was aimed at developing best practice regional action plans for plastic waste, with a focus on the African context. Ms. Giskes discussed the role of

addressing ALDFG specifically when developing regional action plans for plastic waste. Also, Kirsten Gilardi, a GGGI Expert Advisory Council Member and chair of the United Nations Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) working group 43 on sea-based sources of marine litter, presented the final report from the [GESAMP Working Group 43](#) during the webinar.

SEAFISH FISHERIES MANAGEMENT AND INNOVATION GROUP PRESENTATION (VIRTUAL: APRIL 13, 2021)

On April 13, 2021, GGGI Associate Director Joel Baziuk participated in a Seafish Fisheries Management and Innovation Group (FMIG) presentation focused on effective fishing gear selectivity and reducing the capture of non-target species through use of advanced technology. This remains a key issue for the UK fishing fleet and for the wider seafood supply chain. Presentations looked at knowledge transfer and the good practice that has been developed through UK selective

gear trials. Presentations also looked at the latest on-board technical innovations, highlighting GGGI members Blue Ocean Gear, Resqunit, SMELTS, and Teem Fish. The presentations were added to the Seafish website as PDFs, and links were circulated to the FMIG mailing list of around 750 individuals.

UNITED NATIONS DEVELOPMENT PROGRAM (UNDP) WEBINAR SERIES “LET’S TALK PLASTICS: SESSION 10: GHOST GEAR” (VIRTUAL: APRIL 14, 2021)

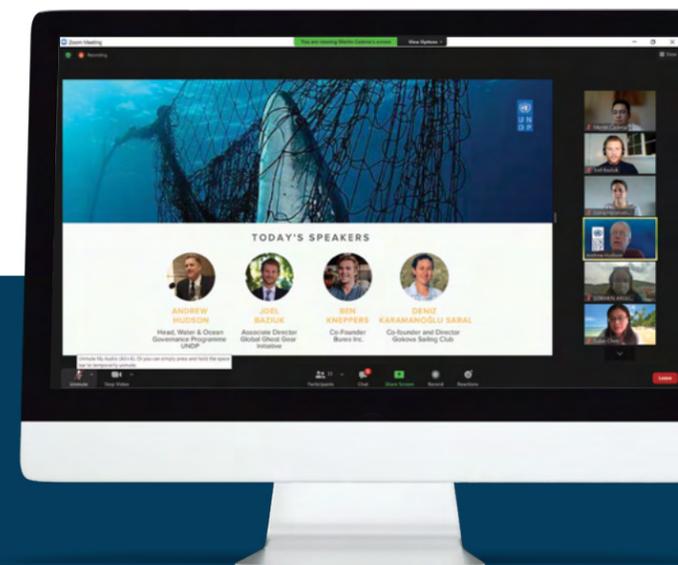
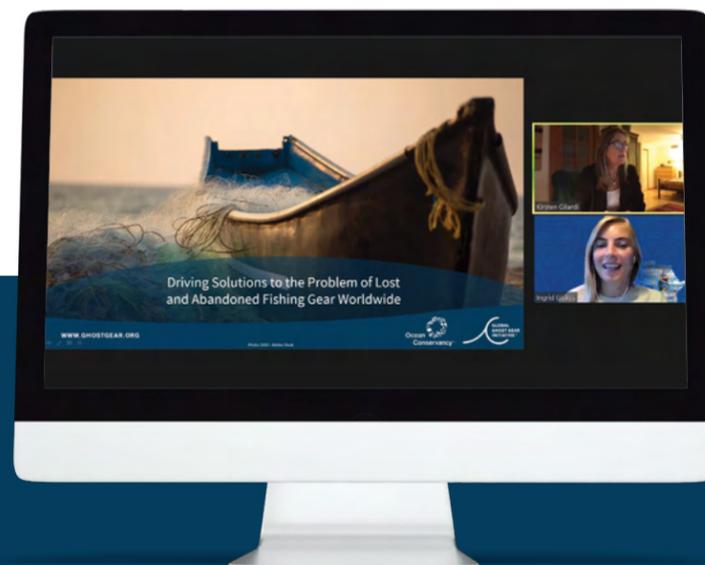
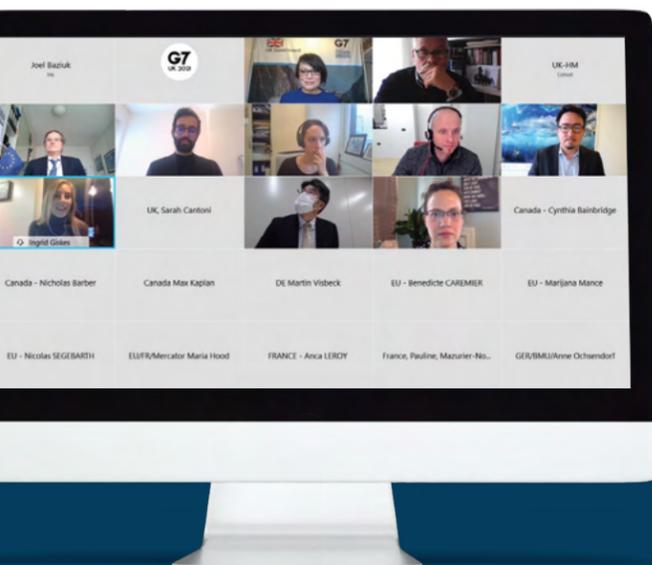
GGGI Associate Director Joel Baziuk Ben Kneppers from Bureo, and Deniz Karamanoğlu Saral from the Gokova Sailing Club made presentations on UNDP’s webinar series, “[Let’s Talk Plastics—Session 10: Ghost Gear](#)” on Wednesday, April 14th. The presentations were followed by a panel discussion moderated by UNDP.

GHOSTNET FEASIBILITY STUDY FOR NORTHERN AUSTRALIA STAKEHOLDER WORKSHOP (VIRTUAL: MAY 12)

UNITED NATIONS HIGH-LEVEL THEMATIC DEBATE ON THE OCEAN AND SUSTAINABLE DEVELOPMENT GOAL 14: LIFE BELOW WATER (VIRTUAL: JUNE 1, 2021)

The GGGI was pleased to participate in the United Nations high-level thematic debate on the ocean and Sustainable Development Goal 14: Life Below Water, which was hosted by the president of the General Assembly on Tuesday June 1, 2021, at United Nations Headquarters in New York. With the support of the Governments of Portugal and Kenya—which are co-hosts of the [2nd United Nations Ocean Conference](#)—as well as H.E. Mr. Peter Thomson, the special envoy of the secretary-general for the ocean, the high-level debate also served to generate momentum for the UN Ocean Conference, which had been scheduled to occur in Lisbon in 2021 but was pushed to 2022 due to the COVID-19 pandemic.

GGGI ALDFG VIRTUAL WORKSHOP: JAMAICA (VIRTUAL: JULY 7-8, 2021)



MID-ATLANTIC MARINE DEBRIS SUMMIT (VIRTUAL: JULY 21, 2021)

On July 20–22, 2021, the [Mid-Atlantic Marine Debris Summit](#) brought together policymakers, researchers, businesses, and the public to explore current trends in marine debris; new science on marine debris impacts; and new technology, policies, and initiatives to prevent and reduce marine debris. The session was moderated by Christy Kehoe, Mid-Atlantic regional coordinator for NOAA's Marine Debris Program. GGGI Program Manager Jackie McGarry was one of the speakers at the event, presenting on the GGGI's three-pillar philosophy to addressing ghost gear: build evidence, define best practice and inform policy, and catalyze and replicate solutions. Ms. McGarry also shared a number of the tools in the GGGI suite of resources, including the GGGI C-BPF.

GGGI ALDFG VIRTUAL WORKSHOP: BELIZE (VIRTUAL: JULY 21, 2021)

GGGI MEDITERRANEAN VIRTUAL ROUNDTABLE (VIRTUAL: JULY 27, 2021)

On July 27, 2021, the GGGI hosted a virtual ALDFG roundtable event focused on GGGI members in the Mediterranean region. The goal of the roundtable was to bring together GGGI members in this region to share knowledge on current ghost gear-related work and to identify gaps and opportunities for collaboration. The event featured an overview of the GGGI's regional approach to cooperation on ghost gear; lightning talks from CLS, Enaleia, Gorgan University, Healthy Seas, ISPRA, Mare Nostrum, Ocean Care, and Satlink; and breakout and roundtable discussions on gaps, opportunities, and developing a regional approach for collaboration. Although this was the first roundtable the GGGI has had for GGGI members of a specific region, the feedback was very positive, and we hope to hold similar events in the future to further facilitate regional cooperation on ALDFG.

GGGI ALDFG VIRTUAL TRAINING WORKSHOP: VANUATU (VIRTUAL: AUGUST 10, 2021)

GGGI ALDFG VIRTUAL WORKSHOP: MAINE (VIRTUAL: AUGUST 23–24, 2021)

IUCN WORLD CONSERVATION CONGRESS VIRTUAL EVENT FOR THE LAUNCH OF AN EPR POSITION PAPER (VIRTUAL: SEPTEMBER 4, 2021)

The event officially launched a position paper on extended producer responsibility (EPR) for fishing gear co-authored by the GGGI, the International Union for the Conservation of Nature (IUCN), UNEP, the Ellen MacArthur Foundation and Searious Business. At the event, GGGI Associate Director Joel Baziuk gave a virtual presentation on the importance of EPR as a potential tool to help prevent ALDFG and ensure that fishing gear can be effectively recovered and put back into the plastics value chain.

GGGI ALDFG VIRTUAL WORKSHOP: MEXICO (VIRTUAL: SEPTEMBER 14, 2021)

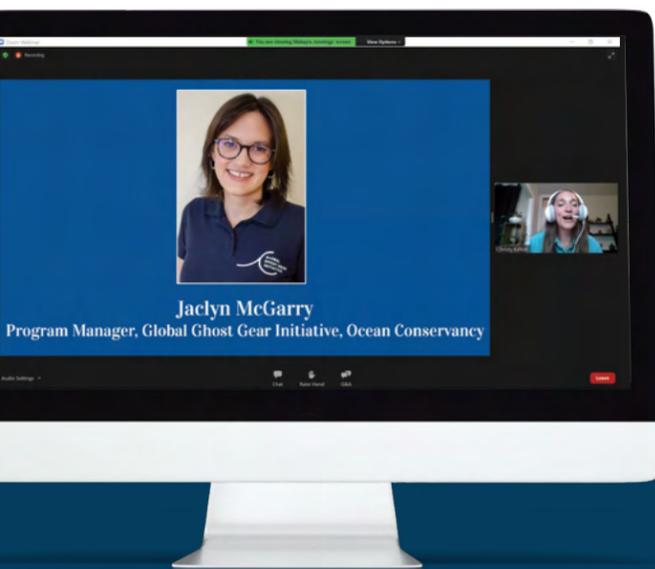
GGGI ALDFG VIRTUAL WORKSHOP: RHODE ISLAND (VIRTUAL: SEPTEMBER 21, 2021)

SCOTTISH AQUACULTURE INNOVATION CENTRE (SAIC) PRESENTATION ON A-BPF (VIRTUAL: SEPTEMBER 23, 2021)

GGGI ALDFG VIRTUAL WORKSHOP: CARIBBEAN FISHER FORUM (VIRTUAL: NOVEMBER 8, 2021)

INDIAN OCEAN RIM ASSOCIATION'S (IORA) WEBINAR ON DEVELOPING AWARENESS PROGRAM AND MITIGATION AGAINST MARINE DEBRIS IMPACTS TOWARDS SUSTAINABLE FISHERIES IN IORA (VIRTUAL: NOVEMBER 10, 2021)

GGGI ALDFG PANEL DISCUSSION: CARIBBEAN FISHER FORUM (VIRTUAL: NOVEMBER 12, 2021)



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GGGI MEMBER HIGHLIGHTS

THAI UNION WORKPLAN UPDATE AND SURVEY RESULTS

As one of the largest seafood companies in the world, Thai Union recognized that it could leverage its position in the global industry to drive positive change and encourage others in the seafood sector to reduce the amount of ghost gear in the ocean. In 2018, it joined forces with the GGGI to address ALDFG and published the first dedicated work plan to set clear, measurable goals for ALDFG. Given delays in implementing aspects of the work plan due to COVID-19, the timeline was extended from the end of 2020 to the end of 2021. Activities completed in 2021 include:

Improved fish aggregating device (FAD) approaches adopted by Fishery Improvement Projects (FIPs). Thai Union aligned its two tuna purse seine FIPs in the eastern Atlantic Ocean and Indian Ocean with its ALDFG efforts, using the GGGI C-BPF and the UN FAO's VGMFG. Additionally, in line with the International Seafood Sustainability Foundation (ISSF) improved conservation measures, the FIP participants have improved FAD construction using only non-entangling materials and testing biodegradable materials. These bio-FADs are made with natural materials such as bamboo and cotton. In contrast, traditional FADs are constructed of plastic and other materials that can persist in and impact the marine environment. These alternative materials reduce the likelihood of entanglement of

sensitive species and impacts on sensitive habitats such as coral reefs. The FIPs acknowledge that more needs to be done to improve FAD management and FAD use in the Atlantic and Indian Oceans.

- Increased capacity of the Indian Ocean FAD Watch initiative. Thai Union was involved in the expansion of the FAD Watch initiative to recover lost drifting Fish Aggregating Devices (dFADs) and prevent strandings and damage to sensitive habitats within selected islands of the Seychelles archipelago. This was achieved through the efforts of the Sustainable Indian Ocean Tuna Initiative (SIOTI) FIP, of which Thai Union is a founding member. The number of large-scale purse seine vessels involved in the project increased from 8 to 42. Through the initiative, fishing vessel owners supply the satellite tracking data and alerts for their dFADs to local conservation partners when a dFAD enters an approximately three-nautical-mile buffer zone around five Seychelles islands (Aride, Alphonse, Desroches, Silhouette, and Farquhar). Project partners are then able to intercept and retrieve the dFAD, prevent potential stranding, and arrange for its disposal and recycling.
- Completed an initial survey on gear loss and recovery in Thai fisheries. In May of 2021, Thai Union published the results of [its ALDFG survey](#), aimed at quantifying gear loss and understanding its causes, as well as identifying possible solutions



Photo Credit: Thai Union

for end of life gear in the Thai fishing sector. The survey improved the company's understanding of the management of ALDFG by 36 purse seine and trawler vessels, including the main causes of gear loss, the approximate quantities of gear loss, and the presence or absence of locally accessible recycling facilities at identified sites in the Gulf of Thailand. The report also included recommendations for future projects to address ALDFG-related challenges identified in Thailand. Thai Union is now exploring additional projects to understand which incentives could drive change in the prevention and the recovery of lost gear.

- Promoted and raised global awareness of the issue through new initiatives. In March 2021, Thai Union participated in the GGGI-hosted workshop on "Driving Progress on Ghost Gear within the Seafood Sector," collaborated with the GGGI on

the release of media articles to highlight ALDFG, and provided feedback for the GGGI toward the development of the Best Practice Framework for the Management of Aquaculture Gear (A-BPF). Thai Union published its [ALDFG survey report](#) as well as multiple [blogs describing the work it has completed](#).

Now, four years after the development of its initial work plan, Thai Union can point to its progress on the issue of ALDFG and greater understanding of the associated drivers in portions of its supply chain. At the same time, Thai Union recognizes that still more work can be done to build on these efforts. As such, Thai Union is now evaluating the achievements of its original work plan to inform the development of a second phase of the work plan moving into 2022 and beyond that would continue to magnify its impact on ALDFG.

BUMBLE BEE

The Bumble Bee Seafood Company is a global seafood company producing canned tuna, salmon, and other seafoods. Bumble Bee joined the GGGI in 2018, and in 2020 the company launched its *Seafood Future* platform, a bold set of commitments designed to protect and nurture the ocean and those who depend on it for their livelihood. Included in its set of commitments is a partnership with the GGGI on ghost gear prevention work in Indonesia. Specifically, the company committed funding toward phase three of the GGGI's Ghost Gear Prevention, Retrieval, and Net Recycling Project in Indonesia, where the abundance of ALDFG and the contribution to the ghost gear problem by illegal, unregulated, and unreported (IUU) fishing has led to targeted efforts to address ALDFG in this region.

The first two phases of this work were initiated by the GGGI, the Indonesian Ministry of Marine Affairs

and Fisheries in 2017, and the UN FAO, funded by the Dutch Government. This work focused on gillnet fisheries because of the prevalence and potential ghost fishing impact of this particular fishing gear in Indonesian waters. The project assessed the practical and economic feasibility of various gillnet marking options in Indonesia in two pilot locations. This phase of the project was crucial in informing the development of the Voluntary Guidelines on the Marking of Fishing Gear, as well as informing the UN FAO/GGGI Regional Workshop in Bali in 2019.

The third phase focuses on the marking of fishing gear at the manufacturer level, exploring fishing gear recycling opportunities in Indonesia, and removing lost or discarded fishing gear from sensitive marine habitat and fishing grounds. Phase three of the project launched in June, 2020 and, with the generous support of The Bumble Bee Seafood Company, will continue through June, 2023.

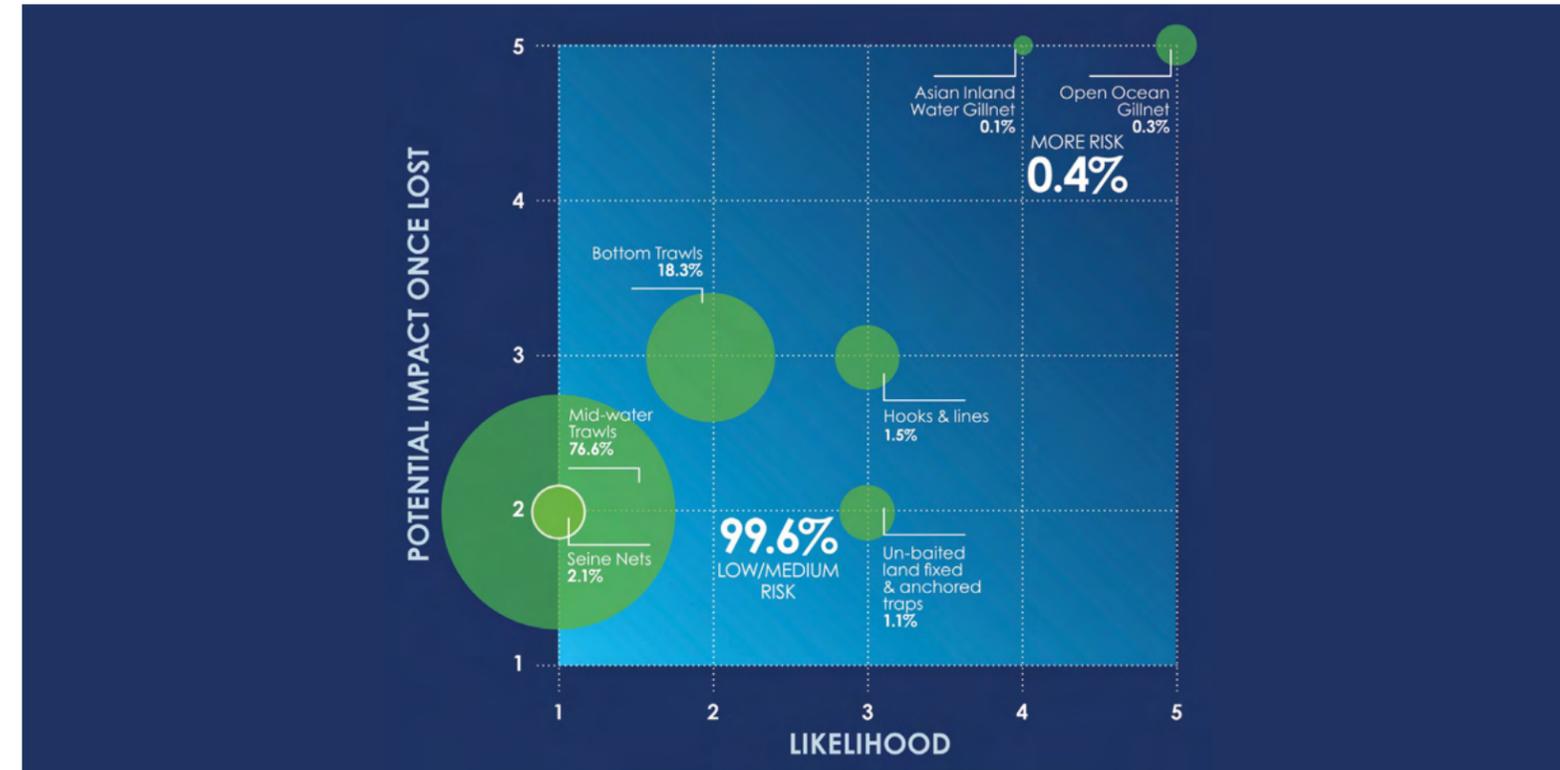


Figure 1. ALDFG Risk Analysis for Nomad Wild Capture Fish & Seafood Procurement by Gear Type and Volume.



Photo Credit: Fishing Technology Center—Semarang Directorate General of Capture Fisheries Ministry of Marine Affairs and Fisheries

NOMAD FOODS

RISK ANALYSIS OF POTENTIAL GEAR LOSS BY GEAR TYPE IN NOMAD FOODS' WILD CAPTURE FISHERIES

In recent years, the problem of lost, abandoned, and otherwise discarded fishing gear has become a well-known issue associated with ocean pollution. Nomad Foods continues to demonstrate leadership within the industry as an ally to its suppliers, driving solutions and improvements for the health of marine ecosystems, and reducing the risk of gear loss in its supply chain.

Nomad Foods joined the GGGI in April 2020. As Europe's leading frozen food company and the world's largest buyer of certified wild caught white fish, the company recognises its responsibility in helping address the issue of ALDFG.

Nomad Foods voluntarily translated the GGGI Reporter App into seven European languages—Danish, Dutch, Finnish, German, Italian, Norwegian, and Swedish—so local communities could use it more effectively. Following this, Nomad Foods worked with the GGGI to apply the Best Practice Framework for the Management of Fishing Gear (C-BPF) Risk Assessment*

*The C-BPF Risk Assessment Tool is unique in that it narrowly focuses on supporting the GGGI's audience to address lost fishing gear. The tool is not intended for use as an overall fisheries sustainability tool; rather, it is a preliminary risk assessment tool for identifying potential vulnerability to gear loss with specific gear classes relative to one another.

Tool to the company's supply chain to review potential vulnerabilities regarding ALDFG.

In late 2021, Nomad Foods completed the first phase of its assessment by evaluating how susceptible the fisheries from which it sources were to gear loss. During the process, the company built upon the GGGI's Risk Assessment Tool by incorporating an additional, complementary metric to expand its analysis. While the C-BPF Risk Assessment analyzes ALDFG by gear classification to measure a) the likelihood of gear loss and b) the impact once lost at a global level, Nomad Foods' additional assessment also measured the proportion of its procured fish volume by each fishing gear classification.

The analysis found that 78.7% of the fish sourced for Nomad Foods is caught by mid-water trawls or by free-school purse seine nets, both of which have a relatively low likelihood of gear loss and a low impact when gear is lost, in accordance with the C-BPF Risk Assessment Tool. An additional 18.3% of its fish is caught by bottom trawl, which is also at the lower end of the C-BPF risk assessment table in terms of ALDFG likelihood and impact. By completing this analysis, Nomad Foods was able to understand that approximately 99.6% of the fish it sources is at a low to low/medium risk of gear loss.

In the second phase of this analysis, Nomad Foods will develop a strategy, in partnership with the GGGI, to address the 0.4% of its fish supplies that are potentially more susceptible to gear loss. This will initially focus on gillnet usage in its supply chain, both in Turkish inland waters and by open ocean gillnet fisheries in the Atlantic Ocean.

The company is now looking to host workshops in 2022 to gather insights on higher-risk gear classes (predominantly gillnets) and will then use those findings to facilitate improvements where possible with its suppliers, with the end goal of mitigating the risk of gear loss in associated fisheries.

ITHACA PROJECT: HEALTHY SEAS, GHOST DIVING, ENALEIA

In 2020, George Lilas, a local diver and passionate environmentalist, publicized photos of an abandoned fish farm wreaking environmental havoc on Ithaca, an island in Greece that is famous for being the home of King Odysseus of Homer's "Odyssey". In response, the marine conservation organisation [Healthy Seas](#) mobilized all its forces, together with partners and fellow GGGI members [Ghost Diving](#) and [Enaleia](#), to engage volunteers, local authorities, and sponsors that wanted to help restore the pristine beauty of the area. The project—the largest one for Healthy Seas and for the team to date—kicked off on June 8, 2021, World Oceans Day, and lasted until June 16, 2021.

An aquaculture company that had gone bankrupt in 2012 had left behind fish farm cages and other equipment endangering marine life as well as maritime traffic. In September 2020, Ianos, a rare hurricane-like storm, caused tons of equipment from the abandoned fish farm to break loose and be carried away, only to be found later floating on the surface of the sea and laying on the seabed and on surrounding beaches. This including industrial plastic pipes, nets, nylon ropes, concrete blocks, plastic buoys, and large pieces of rusted metal.

Over a period of 8 days, a team of 45 people, including 14 international volunteer technical divers from Ghost Diving, worked to remove the rings, pipes, and nets. An additional team of volunteers focused on the beaches, some of which were knee-deep in expanded polystyrene pellets from floatation that had spilled onto the beaches. Overall, 76 tons of debris were removed from the sea, coastline, and four beaches on the southwestern part of the island. Local divers from Greece provided support to the cleanup operations, lifting smaller items from the seabed. Heavy metal structures that were found on the seabed were removed by commercial divers and a working

barge. Overall, the team recovered 5 tons of fishing nets, 32 tons of metal, and 39 tons of plastic, including 150 bags full of polystyrene foam beads, which were collected via an industrial vacuum cleaner refitted using a volunteer's mesh bag as a filter.

Besides the positive impact this project has had on the natural environment, it is also a shining example of cooperation and community involvement. Healthy Seas hosted a public event at the main square to inform locals about the project, and 75 children took part in educational activities aimed at raising awareness about ALDFG.

It took 6 months of preparations to organize logistics and bring together project partners, without whom

this project could not have been accomplished. Sustainable fishing startup Enaleia was the principal Greek partner for the project, having a leading role in the coordination of the operations on the field. Marine biologist Erik Wurz, working for Wageningen University and a member of the Ghost Diving team, conducted scientific research to assess the interaction of the nets with the marine environment by performing seabed surveys in multiple locations in close proximity to the cleanup site. The entire project was documented through photos and videos.

Healthy Seas continues to be a best practice example for the circular economy, where waste is a resource. Nets recovered during the project were cleaned and sorted before being transported to a collection point



© Cor Kuyvenhoven | GHOST DIVING

near Athens. Most of the net was PA6 (nylon6) and will be regenerated by Aquafil, together with other nylon waste, into ECONYL® yarn, the basis for many sustainable products such as socks, swimwear, activewear, accessories, and carpets. Other types of ghost nets were also recovered from the area and were given to GGGI member [Bracenet](#) to upcycle into handmade products. Enaleia facilitated the integration of the remaining marine plastics and scrap metals into the circular economy.

Hyundai Motor Europe provided funding for the project, which was also supported by many other partners, including Ghost Diving, Enaleia, Kefalonia Fisheries, the Hellenic Coast Guard, Odyssey Outdoor Activities, Aquatic Scuba Diving Club, Scubalife, the Municipality of Ithaca and Prefecture of Ionian Islands, Kosamare, and the Ionian Environment Foundation. The project was conducted under the Auspice of the Hellenic Ministry of Maritime Affairs.

ESPS RECOVERY PROJECT UNDER PHOENIX NET LOFT IN FRASER RIVER

The City of Richmond, British Columbia recognized World Oceans Day, June 8, 2021, by becoming one of the first cities in North America to tackle the emerging issue of ghost gear. The City of Richmond, in partnership with Scott Construction and the nonprofit organization and GGGI member Emerald Sea Protection Society (ESPS), coordinated a project to remove decades of deposited fishing gear from the Phoenix Net Loft building footprint on the city's Steveston waterfront.

The Phoenix Net Loft was a heritage structure built in the early 1950s as a facility to store, clean, and repair fishing nets. Decades of activity resulted in considerable deposits of fishing nets underneath the structure, some partially buried in the silty bottom of the Fraser River.

Over five days, ESPS divers trained in ghost gear removal executed a large-scale shore-based retrieval, first carefully extracting the nets with hand spades and a portable capstan, then lifting out the prepared debris bundles with a 40-ton crane positioned on land. The total weight of debris recovered was 29,260 kg (64,507 lbs). Overall, ESPS estimates that 90% of the synthetic fishing gear, consisting of various types of gillnet and seine net, was recovered from the site. As the intertidal zone consisted of a significant layer of fine silt, clay, and mud in areas up to 1m, ESPS discovered that only 25% of the recovered fishing gear was visible, and the remaining 75% was buried under the surface in the fine silt. Other materials found partially buried in the intertidal zone were steel cables, bottles, wood, and long lines.

Due to the extreme fouling of the net and a Department of Fisheries and Oceans requirement to not add silts to the river, ESPS was not able to clean the net on site and was therefore unable to recycle the gear. Instead, the gear had to be loaded into a skip on-site via a large crane, and it would have been too costly and difficult to remove for cleaning afterwards. However, a test portion (approximately 200 lbs) of the net was recovered and transported to the Ocean Legacy Foundation recycling facility to be processed and recycled, and this will inform future disposal opportunities.

This removal project was a rare opportunity to perform a cleanup in such an environment and to document the gear types found, volume and condition of recovered material, equipment required for shore-based retrievals along the Fraser River, and the effect on the river ecosystem. Lessons learned will help inform future clean up projects under similar structures that were once integral to historic fishing operations on waterfronts.

ANNUAL MEETING

2021, as with 2020 before it, was an extremely challenging year for many people around the world. The COVID-19 pandemic continued to rage unchecked and residual damage to human health and livelihoods was catastrophic in many places. In light of this, we made the difficult but necessary decision to postpone the GGGI Annual Meeting into 2022 when, hopefully, travel becomes more feasible and we can gather together in person once again. In the meantime, however, we continue to be amazed by the incredible work being done by GGGI members around the world for the good our ocean, lakes and rivers, and the life within them. Our sincere thanks to all of our members for continuing to support the GGGI. We greatly look forward to being able to see you all again when travel becomes safer.



Photo Credit: Joel Baziuk

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LOOKING AHEAD

As we all continue to evolve to life in an ever-changing world, and throughout all of the upheaval we as a species have experienced in the last few years in particular, one thing remains constant: the ocean needs our help. The next few years will be critical. It will be up to us as a global community to decide whether we have the collective will and drive to make the changes necessary to preserve the fragile global ecosystems with which we are so intrinsically connected. The evidence is incontrovertible: we are at the cusp of unprecedented and potentially catastrophic global environmental changes, and the time for action is now.

Still, all is not lost, and good work is consistently being done, including on ALDFG, as evidenced in this report and by all of the individuals and organizations working together to try to solve this global issue. The GGGI continues to be the global thought leader in the ALDFG space, bringing together stakeholders from around the globe—across governments, academia, NGOs, the fishing industry, and the private

sector—to collectively and collaboratively meet this global challenge. We are incredibly impressed by our 124 member organizations and 18 supporting governments and the incredible work being carried out by our membership and affiliates. We could not do this without you, and we are ever grateful for your continued support for the GGGI.

It may seem that the choices we make and the things we do are too small to have an impact on such large issues. However, in making positive choices to do good in this world, we absolutely can change the future. As Ryunosuke Satoro Akutagawa said, “Individually, we are one drop. Together, we are an ocean.” The GGGI comes from humble beginnings but is now the leading global authority on ALDFG. There is still a long way to go, but we have come a very long way indeed from the initial seeds of an idea first discussed in Ljubljana in 2014 and launched in London in 2015. Together, we will continue to build evidence, define best practice and inform policy, and catalyze and replicate solutions to the global challenge of ALDFG.

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REFLECTIONS FROM GGGI MEMBERS

Thank you for your continued support and bringing everyone together! Cleaning up the ocean on your own can be daunting but knowing there are other people doing the same also give us strength and motivation to keep going!

—Thanda Ko Gyi,
Myanmar Ocean Project

Our membership with the GGGI has opened doors for our company and our work has benefited from the knowledge and experience of the GGGI partners we’ve met along the way.

—Joan Drinkwin, Natural Resources Consultants

The GGGI has been critical in bringing ALDFG to the attention of governments across the globe. This has assisted in bringing about programs to support community organizations that have been instrumental in advancing the capacity to address the impacts of ghost gear on a much greater scale

—Lillian Mitchell, Fundy North Fishermen’s Association

The work of the GGGI is vitally important to ensure the continued wellbeing of the marine environment and the inhabitants therein by promoting world-wide awareness of the state of our oceans and providing a meeting place for a collaboration of like-minded organizations from around the world with the same desire to save our waters and the vast marine life who inhabit them.

—Darlene Norman-Brown,
Assistant Director, Fundy North Fishermen’s Association

GGGI is essential to drive solutions focused action on a global issue and to raise awareness of diverse stakeholders from Government officials to artisan fishers and everyone in between

—Sue Sayer, Cornwall Seal Group Research Trust

GGGI is a powerhouse, making waves of change to improve the ocean environment. We are thankful for the networking and collaborations!

—Dr. Jennifer Lynch,
co-director of the Center for Marine Debris Research at Hawaii Pacific University

GGGI has connected us to people across the world who are interested in making art from marine debris

—Lynette Griffiths,
Erub Arts

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ENDNOTES

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- ⁵ <https://www.science.org/doi/10.1126/science.aba3656>
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The GGGI is the world's only cross-sectoral alliance committed to driving solutions to the problem of lost, abandoned and otherwise discarded fishing gear worldwide.