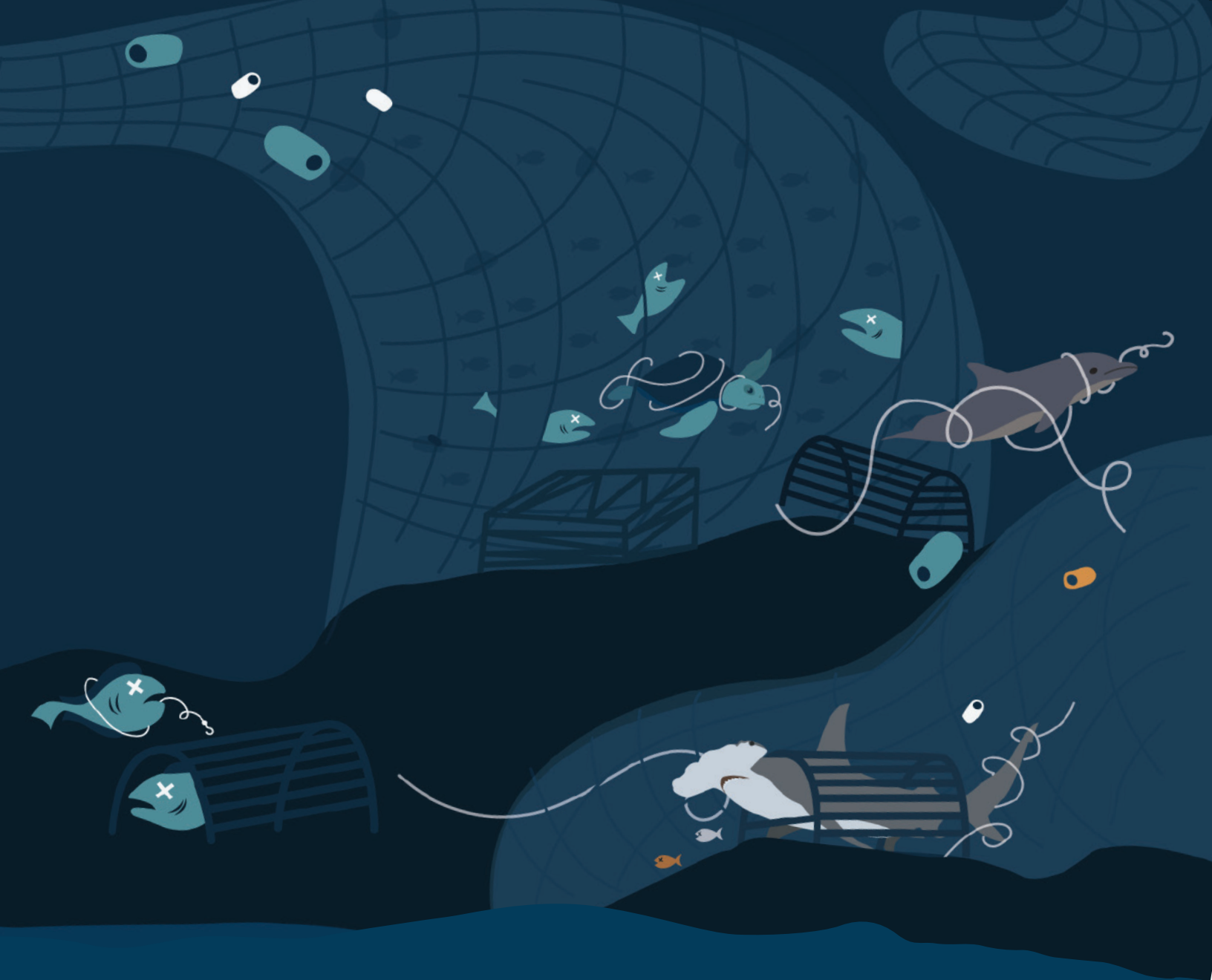


Abandoned, Lost, and Otherwise Discarded Fishing Gear (ALDFG) in the Wider Caribbean



BRIEF FOR POLICY MAKERS



GCFI GULF AND CARIBBEAN
FISHERIES INSTITUTE



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Acknowledgements

Prepared for the GCFI by Tricia Lovell.

Funding for this work was provided via the Fisheries and Oceans Canada Ghost Gear Fund CA No. 22-04-208.

Abandoned, Lost, and Otherwise Discarded Fishing Gear in the Wider Caribbean

BACKGROUND

Abandoned, lost, and otherwise discarded fishing gear (ALDFG) refers to any device or component of a device used in the capture, subsequent capture, or aggregation of marine organisms that becomes derelict and is no longer under the control of the fishing vessel or fisher. ALDFG may be either deliberately abandoned at sea, accidentally lost, or deliberately released without an intention or attempt at retrieval. In the context of the Wider Caribbean region, where fisheries are categorised as multi-gear and multi-species, derelict gear or ALDFG may derive from traps/ fish pots, hook and line gear, seine nets, gill nets, and trawl nets, casitas, and Moored Fish Aggregating Devices (mFADs).

ALDFG is perhaps the most dangerous form of marine litter as it is designed to capture, ensnare and/or entrap marine life. The associated impacts of ALDFG are many and it is of growing concern to the sustainability of global fisheries (Richardson et al 2019). Derelict gear can scar the seafloor, entangle marine life including many endangered species, smother or damage reef systems, may pose a hazard to navigation, and result in deleterious socio-economic impacts to fishers and the fishing sector. Socio-economic impacts associated with ALDFG result not only from the direct losses and the need to replace gear but also from the potential declines in fish stocks as gear may continue to capture marine organisms including commercial species long after becoming derelict. For instance, derelict fish traps may retain their capture function for as long as two years or more depending on the durability of materials used in constructing the gear (Vadziutsina and Reira, 2020).

GLOBAL DRIVERS OF ALDFG

Like other forms of marine litter, the accumulation of derelict fishing gear may result from both transboundary and local sources. Further, the drivers of ALDFG may be due to environmental factors, fisheries management failures, and can be conflict related or due to operational errors or procedures on board vessels.

The **environmental conditions** under which fishers operate may result in ALDFG. Tides, currents and strong winds, may lead to the loss of both active (designed to chase and capture target species) and passive (designed to stay in one place and have target species approach) gear. Severe weather events have resulted in significant trap losses in Caribbean islands over the years.

Overcrowding on fishing grounds may create **conflicts**, resulting in gear becoming entangled, lost, and abandoned. The non-separation of active and passive gear may result in the severing of anchoring or marker lines, while fishing in high traffic areas may lead to marker buoys, lines, and other gear being cut by passing vessels.

IUU fishing is a major driver of ALDFG and **failings in national fisheries management** frameworks including weak enforcement of gear management rules and/or absence of gear marking schemes, may increase the likelihood of gear abandonment.

Operational errors on board vessels (e.g. equipment failures or improper storage) may lead to gear loss during deployment, retrieval, or in transit to and from fishing grounds. Fishers may also be forced to abandon gear due to safety reasons.



ALDFG AND THE WIDER CARIBBEAN

The GCFI and partners have been undertaking critical research in the Caribbean to gather baseline data on ALDFG. This coupled with independent research has provided a growing understanding of the drivers, scope, scale, and impact in the Caribbean.

What are the sources of ALDFG in the Wider Caribbean?

Like other forms of marine litter, ALDFG in the Caribbean originates not only from local fisheries but is transboundary, as derelict gear may drift through the region on the prevailing currents and has been observed in association with Sargassum mats (Courtene-Jones et al 2021, Lovell 2023). Among the most frequently encountered forms of ALDFG by divers in Antigua and Barbuda and Dominica were fish traps, polypropylene net fragments, line fragments, ropes, Fish Aggregating Device components, monofilament gill nets, and buoys (Lovell 2023). ALDFG may result from on-board fishing operations and shore-based activities (e.g. recreational line fishing). With the growing reliance on mFADs, many of which are privately owned, there is an increased likelihood that surface components may break free of their anchors.

What are the main drivers of ALDFG and fishing gear loss in the Wider Caribbean?

Fisher surveys in Montserrat and Belize revealed that poor weather was the most common causes of trap and gill net loss. A recent study in Antigua and Barbuda, and Dominica also had similar findings. The top identified drivers of trap loss in were:

Environmental	Conflict	Operational	Management
Weather	Gear Conflict	Operator Error	Vandalism
Strong Current	Vessel Traffic	Lost Surface Markers	
Drifting out of Range			
Snagging			

Data Source:
 Antonelis et al (2021);
 Antonelis et al (2022), Lovell (2023)

In the case of both Montserrat and Dominica, the continued use of fabricated trap markers from used plastic bottles is a concern and could be a significant driver of trap loss in both islands. Markers made from plastic bottles may be more easily severed, can be difficult to see by navigating vessels and may become submerged if not airtight. Top identified drivers of net loss in Montserrat were snagging on benthic obstructions, strong currents, damage or dragged away by large animals, faulty gear, and poor weather (Antonelis et al 2022).

THE MANAGEMENT OF ALDFG IN THE WIDER CARIBBEAN: KEY CHALLENGES AND OPPORTUNITIES FOR IMPROVED GOVERNANCE

Challenges to the Effective Governance of ALDFG in the Wider Caribbean

As a global challenge, ALDFG stands at the nexus of fisheries management, environmental governance, maritime transport, and solid waste management. The legal regime for ALDFG governance in the Caribbean region is relatively weak, largely fragmented, and relatively ad hoc. Many of the legal provisions outlined in national fisheries laws were not designed for the management of ALDFG but as broad fisheries management measures aimed at conserving fish stocks. This notwithstanding the technical gear measures codified in the national legislation of many countries in the region may provide avenues for remediating the impact of derelict fishing gear and reducing the likelihood of ghost fishing.

The strength of national laws can only be effective if they are accompanied by robust fisheries management systems and effective enforcement regimes. For many Caribbean countries, fisheries management bodies are plagued by a lack of human, financial, and technical capacity to effectively enforce fisheries rules. This coupled with the fact that for many governments the issue of ALDFG has traditionally not been prioritized, presents a major challenge towards achieving improved governance across the region. Through its ongoing work, the GCFI and GPML-Caribe have been actively engaging local fishers in a number of Caribbean islands to raise the awareness about this issue among their peers.

Improving the Management of ALDFG in the Wider Caribbean

In collaboration with the Global Ghost Gear Initiative (GGGI), the GCFI and GPML-Caribe have developed a regional action plan for the improved management of ALDFG in the Caribbean region. This plan builds on global best practice and has been guided by regional consultations with key stakeholders. The Best Practice Framework adopts a risk-based approach, taking account of the broad range of gear types utilized in the region's fisheries. The risk assigned to gear types are based on likelihood of loss and associated impacts. Proposed measures may be implemented to prevent, mitigate or remediate, ALDFG in the Wider Caribbean.

The plan, as designed, presents an

overarching framework, which can be adapted nationally, taking account of local drivers and characteristics of the fishing sector. The plan complements existing regional instruments that have been developed for the management of marine litter and broader marine conservation, including the Regional Marine Litter Action Plan, Regional Marine Litter Strategy, the Cartagena Convention and its Protocols.

While both the Regional Strategy and Action Plan largely focus on land-based sources of marine litter, both recognise the risks posed by ALDFG to marine environment. The promotion of fishing gear removal programmes, implementation of ALDFG centred research, and the delivery of specialized ALDFG centred education programmes aimed at fishers are among the key recommendations promoted by the strategy and action plan. These recommendations are in line with the proposed ALDFG regional action plan which have also set priorities for improved fisher education, derelict gear identification, and removal programmes along with a host of other gear-specific recommendations. Operationalization of the Regional Action Framework can assist countries in national implementation of the regional marine litter action plan and strategy.

Operationalizing the Regional Framework

Owing to the inherent heterogeneity of the region's fishing sectors, operationalization of the regional framework can best be achieved through national stock-taking and review and adaptation of the plan to align with local conditions. Such national processes should

involve a broad range of stakeholders including all fisheries actors, waste management bodies, port authorities and maritime transport bodies. Successful operationalisation of the plan will require a clear understanding of the national fishing sectors of each island and local drivers of gear loss. A three-step approach is proposed herein to aid in national implementation of the regional framework.

1 A national risk assessment exercise will aid in gaining an understanding of local circumstances as it relates to ALDFG. Through fisher interviews and/or national stakeholder workshops (which may include a diverse range of stakeholders including waste management bodies and maritime agencies), fisheries managers may gain insight into the local drivers of fishing gear loss as well as their associated likelihood and risk.

2 Legislative and policy review will aid fisheries managers in identifying key gaps in ALDFG related legislation, assess policy coherence across various sectors, and identify weaknesses in the management regime.

3 The development of a national ALDFG management plan should be guided by the national risk assessment exercise, proposed legislative reforms identified in the legal and policy review, and the best practice guidance provided in regional framework documents. It should also align with policy directives codified in regional marine litter policies.

Predictive ALDFG Modelling; A Critical Tool for Improved Management

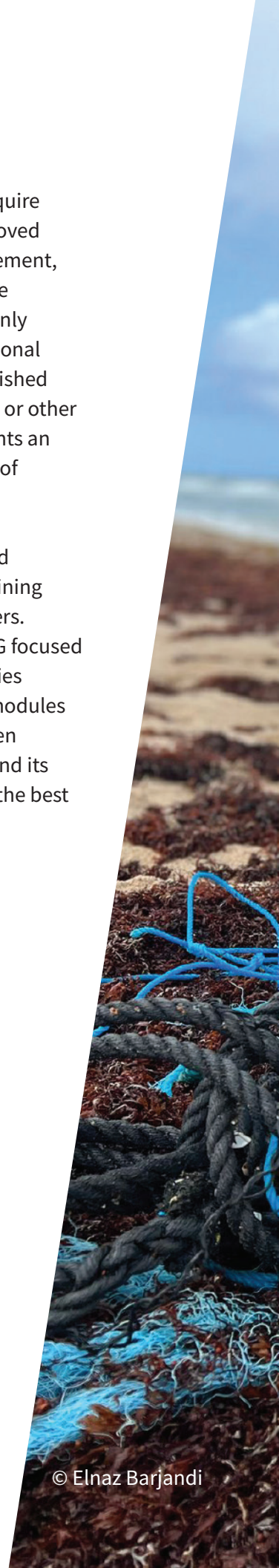
Use of predictive modelling techniques can aid countries in identifying areas with the highest potential for gear loss based a probability mapping analysis. This approach provides an opportunity for fisheries managers to achieve a baseline understanding of the ALDFG risk for national fisheries and can provide guidance on where to apply resources for further in-depth assessments of ALDFG including visual surveys of the underwater environment.

RECOMMENDATIONS TO REGIONAL POLICY MAKERS

The enactment of measures to reduce, manage and mitigate the impacts of ALDFG should form a crucial part of national fisheries management systems. This should also include measures for improving the management of gear that has reached its end of life. Understanding local drivers, identifying fisheries specific priorities, and reviewing gaps in the existing fisheries management systems are crucial steps for achieving improved management. For governments that wish to prioritise ALDFG governance within their fisheries management systems, the three-pronged approach outlined above for the operationalization of the best practice framework is recommended.

Achieving improved governance will require the enactment of mechanisms for improved coordination of fisheries, waste management, environmental protection, and maritime sectors. This should be prioritized not only by national governments but at the regional level. For governments that have established national ocean governance committees or other relevant intersectoral bodies this presents an opportunity for achieving coordination of ALDFG governance.

Countries like Antigua and Barbuda, and Dominica have established fisheries training programmes aimed at commercial fishers. The development and delivery of ALDFG focused modules should be prioritized by fisheries authorities. The development of such modules can be aided by resources that have been developed by the GCFI, GPML-Caribe, and its partners, FAO, and the GGGI (including the best practice framework).



REFERENCES

- Antonelis, K., and Drinkwin, J. (2021). Predictive modeling of abandoned, lost, or discarded fishing gear in Belize. Available at: <https://www.gcfi.org/gpml-caribe/resources/> [Accessed March 27, 2023].
- Antonelis, K., Drinkwin, J., Shipley, M., and Heller, C. (2022). Predictive model identifying locations of fishing gear loss or accumulation in Montserrat. Available at: <https://www.gcfi.org/gpml-caribe/resources/> [Accessed March 27, 2023].
- Courtene-Jones, W., Maddalene, T., James, M. K., Smith, N. S., Youngblood, K., Jambeck, J. R., et al. (2021). Source, sea and sink—A holistic approach to understanding plastic pollution in the Southern Caribbean. *Science of the Total Environment* 797. doi: 10.1016/j.scitotenv.2021.149098. GESAMP (2021). Sea-based sources of marine litter. London Available at: <http://www.gesamp.org/publications/sea-based-sources-of-marine-litter> [Accessed September 27, 2022].
- Lovell, T. 2023 [In Press]. Understanding the Drivers, Scale and Impact of Abandoned, Lost and Otherwise Discarded Fishing Gear in Small-Scale Fisheries: An Eastern Caribbean Perspective. *Front. Mar. Sci.* 10:1139259. doi: 10.3389/fmars.2023.1139259
- Richardson, K., Hardesty, B. D., and Wilcox, C. (2019). Estimates of fishing gear loss rates at a global scale: A literature review and meta-analysis. *Fish and Fisheries* 20, 1218–1231. doi: 10.1111/faf.12407.
- Vadziutsina, M., and Riera, R. (2020). Review of fish trap fisheries from tropical and subtropical reefs: Main features, threats and management solutions. *Fish Res* 223. doi: 10.1016/j.fishres.2019.105432.



Fisheries and Oceans
Canada

Pêches et Océans
Canada