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Feasibility of a Lost Fishing Net Reporting, Response, and Retrieval Program in British Columbia

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Acknowledgements

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Introduction

This report summarizes a feasibility assessment for the implementation of a rapid response and retrieval program designed to reduce impacts of newly lost fishing nets in British Columbia. The assessment included an initial characterization of the current communications, response, and retrieval capacity related to reported nets lost during active fishing or lost nets encountered in marine waters. It includes recommended communications, response, and retrieval procedures to facilitate rapid retrieval of fishing nets lost or encountered.

Abandoned, lost, and discarded fishing gear (ALDFG), including fishing nets, causes negative impacts to marine animals and marine habitats and causes safety hazards to navigation (GESAMP, 2021; Global Ghost Gear Initiative, 2021; Hong et al., 2017; National Oceanic and Atmospheric Administration Marine Debris Program, 2016; NOAA, 2015). In 2019, Canada announced significant investment in reducing and preventing the harm caused by ALDFG through the introduction of the \$8.3 million Sustainable Fisheries Solutions and Retrieval Support Contribution Program (SFSRSP) (Government of Canada, n.d.).

Natural Resources Consultants (NRC) is a fisheries consulting firm with extensive experience managing ALDFG prevention, research, and retrieval projects, including significant experience in the U.S. Washington portion of the Salish Sea as well as previous experience retrieving ALDFG from British Columbia marine waters. Natural Resources Consultants received funding through the Department of Fisheries and Oceans (DFO), Canada SFSRSP (CA No. 20-08-028/010) to assess the feasibility of developing a program to rapidly respond to and retrieve reported lost commercial fishing nets in British Columbia.

Fisheries in Canada are managed by the Department of Fisheries and Oceans (DFO). The region is divided into 48 Pacific Fishery Management Areas (PFMAs) that provide boundaries within which the fisheries are managed, and several sub-areas exist within the PFMAs. DFO manages the commercial, recreational, and aboriginal communal fishing activities through openings and closures of fishing effort in these areas. There are five major commercial fisheries in the Pacific Region of Canada; salmon, crab, herring, prawns, and groundfish.

This report focuses on the feasibility of responding to reports of lost fishing nets, particularly gillnets, because gillnets are widely documented to pose the greatest risk of ghost fishing (continuing to catch target and non-target species after gear is lost) (Breen, 1990; Gilman, E., Chopin, F., Suuronen, P. & Kuemlangan, 2016; Global Ghost Gear Initiative, 2021; Uhlmann and Broadhurst, 2015). British Columbia's salmon and herring fisheries use gillnets, seine nets, and troll gear. Salmon gillnetters typically fish in terminal areas, near coastal rivers and inlets. By regulation, gillnets cannot be longer than 375 m long, and net depths are restricted to either 60 or 90 meshes, depending on the fishery. This typically equates to net depths of approximately 6 m to 17 m deep. Seine nets typically fish further from shore than gillnets, with net depths ranging from 20 m to

80 m deep depending on fishing areas. The west coast commercial herring fishery includes the roe fishery, which is a limited access fishery with 252 seine licenses and 1,267 gillnet licenses.

There are no definitive estimates of how many nets are lost in British Columbia, but anecdotal information and communications with fishers and fisheries managers indicate that net loss does occur, but loss rate is low. Usually, when a fisher does lose control of their net, they are able to retrieve it themselves (Carlson, 2015). Lost net surveys and retrieval operations have documented dozens of lost gillnets in the Prince Rupert area and in other areas of British Columbia, such as in Barkley Sound and the Fraser River (Antonelis et al., 2018; Antonelis and Drinkwin, 2021; Drinkwin and Antonelis, 2022; Northwest Straits Foundation and Natural Resources Consultants, 2011). When gillnets are lost, they can cause tremendous damage. One lost Canadian gillnet that drifted into U.S. waters was reported and retrieved by on-call dive retrieval teams who documented a river otter and three harbor seals drowned in the net.¹

Evidence points to vessel traffic conflicts, bottom obstructions, and strong tides as the leading cause of gillnet loss in Southern British Columbia (Carlson, 2015). Locations of retrieved nets off of reefs and shipwrecks support the influence of bottom obstructions on net loss in British Columbia (Antonelis et al., 2018; Drinkwin and Antonelis, 2022; Natural Resources Consultants, 2016).

The DFO currently requires fishers to report lost fishing gear, including lost fishing nets. Recovery of lost fishing gear is not required, however. While most fishers do try to recover their lost gear, sometimes that is not possible. No organization or agency is responsible for retrieving lost fishing nets that have been reported as lost in marine waters of British Columbia.

In the U.S. Washington portion of the Salish Sea the Puget Sound Newly Lost Net Reporting, Response and Retrieval (RRR) Program has successfully reduced harm from newly lost fishing nets since 2012. The RRR program was designed with an understanding that fishing net loss is uncommon but is inevitable even in well-managed fisheries. Essential components of the program include:

- Online and telephone reporting system
- Immediate response to system reports
- A network of partners with on-the-water presence
- On-call ALDFG diver removal teams
- Established ALDFG disposal/recycling networks

In 2012, the Washington Department of Fish and Wildlife (WDFW) required commercial fishers to report lost fishing nets to WDFW within 24 hours of loss. Failure to report lost

¹ Data from the Puget Sound newly lost net Reporting, Response and Retrieval Program and the Washington Derelict Gear Database.

fishing gear can result in a penalty fine. Most treaty tribes require their fishers to report lost nets also. Coincidentally with this mandate the Northwest Straits Foundation (NWSF) received funding from the WDFW and Department of Natural Resources in 2012 to develop and pilot a Reporting, Response, and Retrieval (RRR) Program to respond to and retrieve newly lost nets reported by fishermen to prevent the re-accumulation of derelict fishing nets in the Washington Salish Sea. Natural Resources consultants (NRC) was hired to design the program and is currently managing response to all reports and retrieval of lost fishing gear. In partnership with the NWSF, NRC has documented all reports of lost nets. The program includes outreach to licensed non-tribal and tribal fishermen in Puget Sound to encourage reporting (Northwest Straits Foundation, 2015).

The RRR program includes three components which must work smoothly to ensure newly lost nets are removed as quickly as possible to minimize negative impacts of lost nets and to prevent lost nets from reaccumulating in the Washington portion of the Salish Sea:

- Reporting – Fishers and others report lost or found nets through an online system, telephone, and by personal communication. Reports received over the telephone by NWSF, NRC, or WDFW, are entered into the online system, triggering a notification email to NRC personnel. Online reports also generate an entry into the Washington Derelict Fishing Gear Database (WADGDB).
- Response – NRC receives reports through email or by personal telephone communications and verifies that reports are lost nets. Verification includes discussions with person who reported the loss, mobilizing field team to verify or engaging partners on the water (e.g., WDFW enforcement personnel) to verify the reported net. Verification information is noted in the WADGDB and confirmed nets are verified as ‘reported’ in the database.
- Retrieval – NRC mobilizes on-call dive removal teams if needed. Occasionally, NRC personnel coordinate removal with other entities, such as WDFW enforcement personnel or tribal fisheries officers. All removed gear data is documented in the WADGDB.

The RRR program received 124 reports of presumed lost fishing gear in the WASS from 2012-2021. Of the 124 reports, 74 (60%) were verified as newly lost nets and 63 (85%) of those nets were removed. Fifty-six (56) (80%) of those removed nets were gillnets. The remaining 7 removed nets included three aquaculture nets, two purse seine nets, and two trawl nets. Of the 124 reports, 50 (40%) were actually not lost fishing gear or remain unverified with their location unknown. Some reports from the public were actually legal fishing gear that the reporter thought was lost.

Reports were received from fishers, the public, tribal and WDFW resource managers, and other agencies (Department of Natural Resources, Bureau of Land Management, etc.). Reports from non-fishers included several fishing gear types other than nets (i.e., shellfish pots, aquaculture gear) as well as materials that were determined not to be derelict and/or fishing gear at all (i.e., erosion control netting, blankets, active fishing

gear). We found 90% of reports from agency personnel were verified lost fishing gear and of those, 86% were successfully removed. We found 77.4% of reports from private citizens were verified lost fishing gear and 56% were successfully removed. Reports from fishers were 100% verified as lost gillnets but still only 57% were successfully removed.

There are some recent examples of reports of lost fishing nets in British Columbia that highlight the need for a systematic response in the province. During a 2017 project to retrieve lost fishing nets from the North Vancouver Straits region, retrieval contractors received a report from the DFO Salmon Managers of a newly lost gillnet between Lasqueti and Texada Islands in the Strait of Georgia. The lost net was reported to DFO by a representative of a regional First Nation, who had received the original report from the fisher who had lost the net. Despite the fact that the contractors had vessel and diver capacity to retrieve the lost gillnet, they were working within a geographic area proscribed by their marine scientific research permit and were unable to respond to this net (Antonelis et al., 2018).

In 2022 a drifting trawl net was reported by regional DFO C&P personnel to the regional Ghost Gear program lead. The net was drifting in a kelp bed and there was threat of marine mammal entanglement. The Ghost Gear program regional lead sent out a call for assistance to Ghost Gear Fund Partners, which was responded to by the Coastal Restoration Society (CRS). Subsequently, the CRS mobilized their partner T'Sou-ke First Nation marine team to remove the net, which had washed ashore in Esquimalt. DFO C&P personnel assisted. It was a one day smaller operation, and cost approximately \$5,000 (including disposal), which was paid from the Ghost Gear program national funds, despite there being no dedicated funding specifically for newly lost net report retrieval.

There was a localized program in Area 23 (Barkley Sound) where the owners of a local recreational diving charter company (Rendezvous Dive Adventures) retrieved lost fishing nets that were reported to them. These divers had retrieved seven lost gillnets from 2010 through 2017. In 2015, reporting of lost gear became a part of the license conditions with the regional DFO Resource Manager including formal Fishery Notices for Chinook a request to fishers to notify local DFO managers or patrol vessels to report abandoned, lost, or entangled gear because a local diver had volunteered to remove the nets at no charge (Fisheries and Oceans Canada, 2020). This information changed in the 2021 Fishery Notice for Chinook as the DFO had recently implemented mandatory reporting of lost gear to DFO within 24 hours of returning to port. Specific requirements for lost gear reporting were implemented and the Fishery Notice did not reference the availability of a volunteer diver willing to retrieve lost gear (Fisheries and Oceans Canada, 2021).

Methods

Feasibility was assessed for three program components: reporting, response, and retrieval. Information was gathered through online research and through 25-30 informal telephone calls and video conferencing meetings with contacts in British Columbia. Covid 19 travel restrictions prohibited in-person meetings.

Prior to each meeting/call, an RRR facts sheet was provided, and a synopsis of the feasibility assessment project was provided in an email.

Meetings generally followed a standard agenda. First the project and feasibility assessment was explained. Then a brief presentation or synopsis of the Puget Sound RRR program was provided. During the course of the meeting, the following questions were answered:

1. What processes are currently in place in BC that could serve similar functions of reporting, response, retrieval?
2. What vessels of opportunity are out on the water regularly?
3. What vessel capacity exists for quick responses to reports for verification or removal?
4. What capacity exists for mobilizing divers for removal?

Meetings were held with representatives from ports and harbour authorities, DFO, Coast Guard, First Nations, nongovernmental organizations, and dive charter operators. Detailed call notes were kept and referred to during subsequent characterization of current reporting, response, and retrieval capacity and during development of recommendations.

Assessing feasibility and capacity

The assessments used a basic flow chart with tasks associated with reporting, response, and retrieval, based on the Puget Sound RRR program (Figure 1).

Reporting

Three existing reporting systems were identified during feasibility:

- DFO lost fishing gear reporting process
- DFO radio room and ORR (Observe, Record, Report) line
- Canadian Coast Guard operations centre/marine pollution line

The current DFO lost gear reporting system is an online platform where fishers are required to report any lost gear at the end of their fishing trips. It is a repository for locations of lost gear. It is not designed as a real-time lost gear reporting system as fishers are allowed to report at the end of their fishing trip. Likewise, lost gear reporting data is not retrieved immediately upon entry. The data portal accepts data for all gear types from all fisheries. There is also an additional component whereby ALDFG survey and retrieval data can be entered from non-fishers. The information is housed in a central repository and managed by DFO personnel in Ottawa. Lost gear reports are not released automatically to regional contacts. Data is shared with regional partners and with retrieval practitioners upon request (with appropriate confidentiality parameters).

The DFO radio room accepts calls and emails directed to the ORR line. The radio room is monitored 24 hours/day (with limited exceptions). It accepts reports of fisheries violations, marine mammal entanglements, and other pollution observations. It is available to the public as well as fishers and agency personnel. For emergency response, such as a marine mammal entanglement sighting, radio personnel immediately notify DFO entanglement response personnel cellphones via electronic notification. Reports of ALDFG to the ORR have been forwarded to the DFO Ghost Gear Fund regional coordinator.

The Canadian Coast Guard marine pollution line is also monitored 24 hours/day. Its mandate is to deal with ship source pollution such as mystery oil sheens and hydrocarbons. Currently, their mandate does not include ghost gear. They have coordinated with Transport Canada to respond to drifting hazards to navigation, such as loose docks. Conversations with the superintendent for regional operations indicate that the capacity to bring on additional reporting mandates or response mandates is limited.

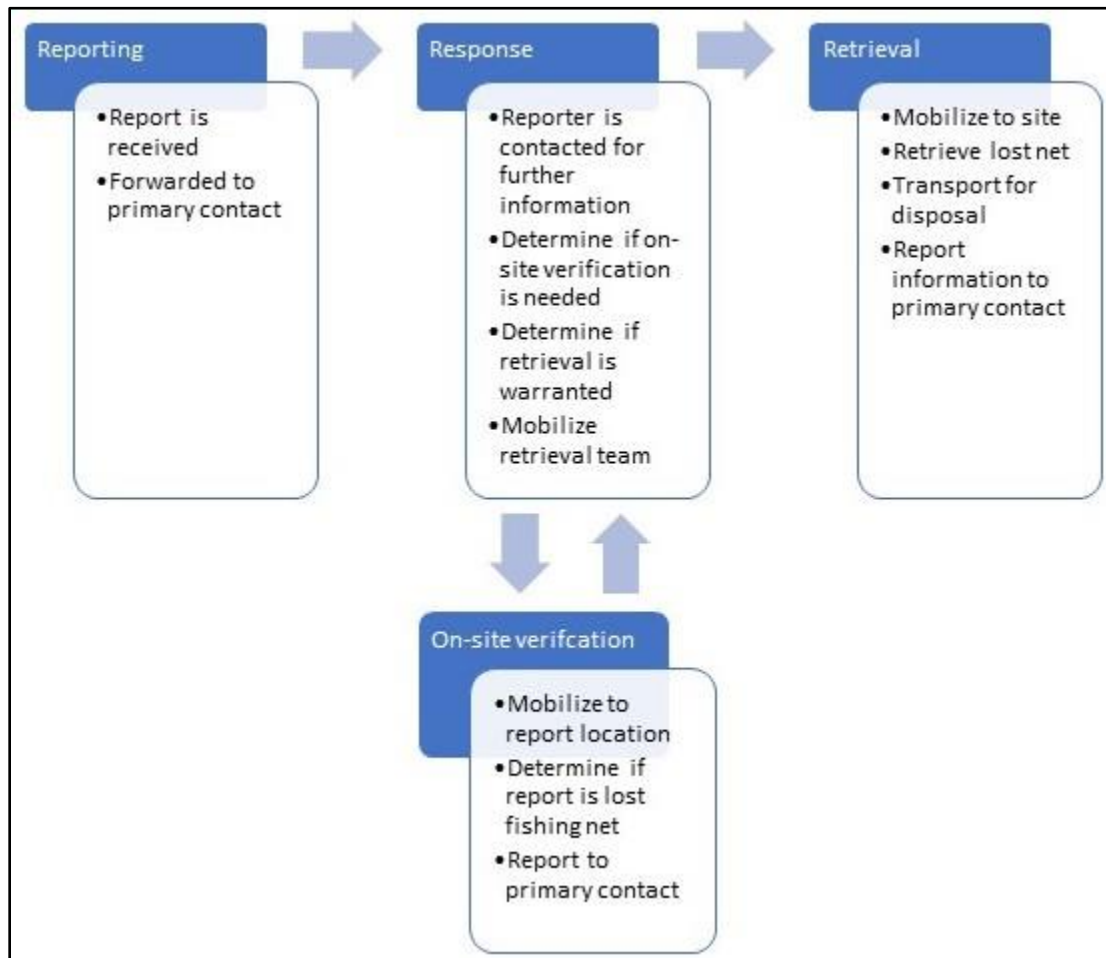


Figure 1. Basic flow chart of reporting, response, and retrieval process

Response

The response process generally includes two key roles: primary contact and on-site verification team.

Primary contacts are responsible for facilitating all aspects of the process after reports are forwarded to them from a reporter or reporting system. The primary contact is responsible for three key decisions during the process:

- Determining if the report could be a lost fishing net
- Determining if the report requires on-site verification
- Determining if immediate retrieval is needed

Sometimes, on-site verification is not needed if the primary contact deems the report is complete enough to determine that the report is a lost fishing net. For example, if a fisher reports that they lost their own net there would be no need for on-site verification.

The on-site verification team can verify a newly lost net report and communicate conditions to the primary contact. Together, they can determine whether a net should be retrieved or not. Sometimes the on-site verification team can also retrieve the net. Sometimes they mark the net location with a buoy or move the net to a different location for easier retrieval. It is not imperative that the on-site verification team also be capable of retrieving the net.

To assess the capacity for a primary contact for a RRR program in British Columbia and for on-site verification of lost net reports, we considered current available reporting system processes and current on-water capacity.

The lost fishing gear reporting process collects information in a central hub managed from Ottawa. Reports from the system are provided to regional Ghost Gear Program leads on a weekly basis. There is currently no further response responsibility.

The DFO ORR reporting system generally forwards reports to appropriate regional DFO Conservation and Protection (C&P) personnel for response. These personnel have primary responsibility for fisheries enforcement and respond to other types of reports as capacity allows. This response would generally include responding to reports of lost fishing nets, especially if the report indicates that the net is harming habitat, fisheries, or causing navigation hazards.

Likewise, the Coast Guard marine pollution line involves response from the Coast Guard under certain circumstances spelled out in their mandate.

The capacity for on-site verification of lost fishing net reports was assessed in terms of:

- Vessel availability
- Regional presence

- Nexus to reporting systems

Throughout British Columbia there are networks of vessels responsible for law enforcement, spill response, and public safety. Below is a short list of potential partners who could be enlisted for on-site verification:

- DFP Marine Patrol Program and C&P boats operate in all regions and could be mobilized to verify lost net reports. There is a direct nexus to the DFO ORR line.
- DFO dive teams are trained in investigations and could be mobilized to verify submerged nets. They are not trained in salvaging ALDFG, however, and would not be able to retrieve the gear.
- West Coast Marine Response has vessels based out of Prince Rupert and Nanaimo to respond to oil spills. There is an indirect nexus to the DFO ORR line and the Coast Guard marine pollution line.
- Coast Guard aerial surveillance helicopters fly the coast daily and have life boat stations. The helicopters could help visually verify lost net reports and if the report is near a lifeboat station, the lifeboats could also be mobilized to verify the report. There is a direct nexus to the Coast Guard marine pollution line.
- First Nations Guardian Watchmen could be available to verify lost fishing net reports in their area of responsibility just as they now respond. Currently there are close relationships with some DFO regional offices.
- Port authorities have vessels that patrol their areas of responsibility and assist with search and rescue. They have close relationships with some DFO regional offices.
- The royal Canadian Mounted Police has coastal teams that patrol the outlying village and provide police services.

For all of the above mentioned on-site verification vessels, staff capacity and mandates are particular concerns. No organization or agency is currently mandated to respond to or retrieve reported lost fishing nets.

Retrieval

Retrieval capacity was assessed based on the known availability of vessels that could support dive operations. Retrieval of newly lost gillnets often requires diving capabilities. In addition, retrieval often requires specialized vessels with hydraulic lifting capacity and deck space to handle retrieved nets. Of the vessels considered in the on-site verification assessment, only Coast Guard vessels are fully equipped to lift/haul lost gear onboard. However, none of the vessels are designed as dive platforms.

- DFO C&P vessels will sometimes retrieve ALDFG from the surface if it is floating. Regional offices do have some capacity for this work and can call in contractors when they need assistance in emergencies.
- DFO dive teams operate off of dive platforms, they are not trained in salvaging ALDFG, and would not be able to retrieve the gear.

- Coast Guard vessels can be enlisted but usually with advanced notice. They are large and have good lifting and hauling capacity but are not ideal dive platforms.

British Columbia has a robust commercial diving industry that includes salvage divers, scientific divers, and divers experienced in aquaculture equipment maintenance. There are many private contractors with vessel capacity and diving certification that could be called into service to retrieve newly reported lost fishing nets. Required commercial dive certification includes training in search patterns, use of lift bags, and safety and is adequate to qualify divers to retrieve ALDFG. Additionally, In 2021, a dozen divers participated in an ALDFG specialty dive retrieval training in Campbell River. However, none of these contractors are currently under contract to retrieve newly reported lost fishing nets.

Recommendations

Recommended British Columbia Reporting, Response and Retrieval Program Structure

We recommend that a newly lost net reporting, response, and retrieval program be established in British Columbia for the purpose of reducing harm from newly lost fishing nets. We recommend a three-year pilot program be initiated and evaluated yearly and adjusted as needed to ensure adequate and timely reporting, response, and retrieval. After three years, DFO should evaluate the entire program to determine if the program should continue.

We recommend the program reporting be integrated into the established DFO ORR telephone and email reporting system managed through the DFO radio room and that fishers and the public are notified of same. We recommend that protocol be established to forward all reports of newly lost fishing nets received to the program prime contact. Fishers, especially, should be directed to report any lost fishing nets to the ORR immediately after loss in addition to their current requirement to report them through the reporting portal after their fishing trip.

We recommend the responsibility of prime contact be placed with the Ghost Gear regional program. While it is recognized that most agency personnel have full workloads already, the Ghost Gear regional program is the most logical choice for prime contact responsibility and can work cooperatively with other DFO personnel and contractors to ensure that all newly lost net reports are responded to rapidly and retrieval is accomplished when needed.

We recommend that a Request for Standard Agreement (RFSA) list be developed for lost net verification and retrieval. A RFSA is a formal process whereby contractors are selected to be put on a list of approved contractors to be called up for specific services when needed. Potential contractors include organizations with adequate vessel capacity for retrieval operations and professional dive teams experienced in ALDFG/salvage diving.

We recommend a budget item be set aside for verification and retrieval of newly lost fishing nets available to pay contractors on the RFSA list for lost net retrieval services. Initially, we recommend a budget of \$10,000 be set aside for this purpose as a pilot project. Budget to be re-evaluated annually.

It is important to note that this recommended budget reflects an understanding that fishing net loss is uncommon, but that newly lost nets pose disproportionate risk to species and habitats. Other ALDFG, such as aquaculture gear, shellfish traps, and older lost fishing nets, generally do not present the same risks. Furthermore, some ALDFG, such as aquaculture gear that might represent navigational hazards, could be removed through other programs focused on navigational hazards. And retrieval of ALDFG that is not newly lost can be accomplished through the existing Ghost Gear Fund program.

Program Operations Description (see Figure 2)

Reporting system: DFO ORR telephone and reporting system managed from DFO radio room 24 hours/day. All reports related to newly lost fishing nets should be forwarded to the Ghost Gear program regional lead and also to the regional DFO office.

Response: The Ghost Gear regional lead coordinates with the regional DFO office on response. First, the report information should be verified by contacting the reporter. A determination is made as to whether on-site verification is needed and whether DFO personnel have capacity to conduct this verification or whether a contractor should be called up from the RFSA.

After the report is verified either through follow up with the reporter and possible on-site verification, a determination is made as to whether the reported net should be retrieved.

Retrieval: The Ghost Gear regional lead determines who should conduct the retrieval. Priorities for retrieval are:

- DFO personnel conduct the retrieval if they have capacity, and the retrieval is feasible from their vessels.
- Contractor from the RFSA conducts the retrieval.

The Ghost Gear regional lead coordinates any necessary DFO C&P presence during contractor-led retrieval operations and also assists contractor identify appropriate secure storage and disposal for retrieved gear.

Supporting tasks (Figure 3):

- Ghost Gear Program establish account for response and retrieval
- GG Regional Program Lead
 - Develop an RFSA list for contracted verification and retrieval teams
 - Keep a program narrative log of RRR

- Keep spreadsheet of RRR data
- Enter RRR data into DFO Ghost Gear reporting portal
- DFO C&P, and Fisheries publicize newly lost net reporting to ORR (fishers, public)
- DFO ORR radio room establish protocol to forward lost net reports to GG Regional Program Lead

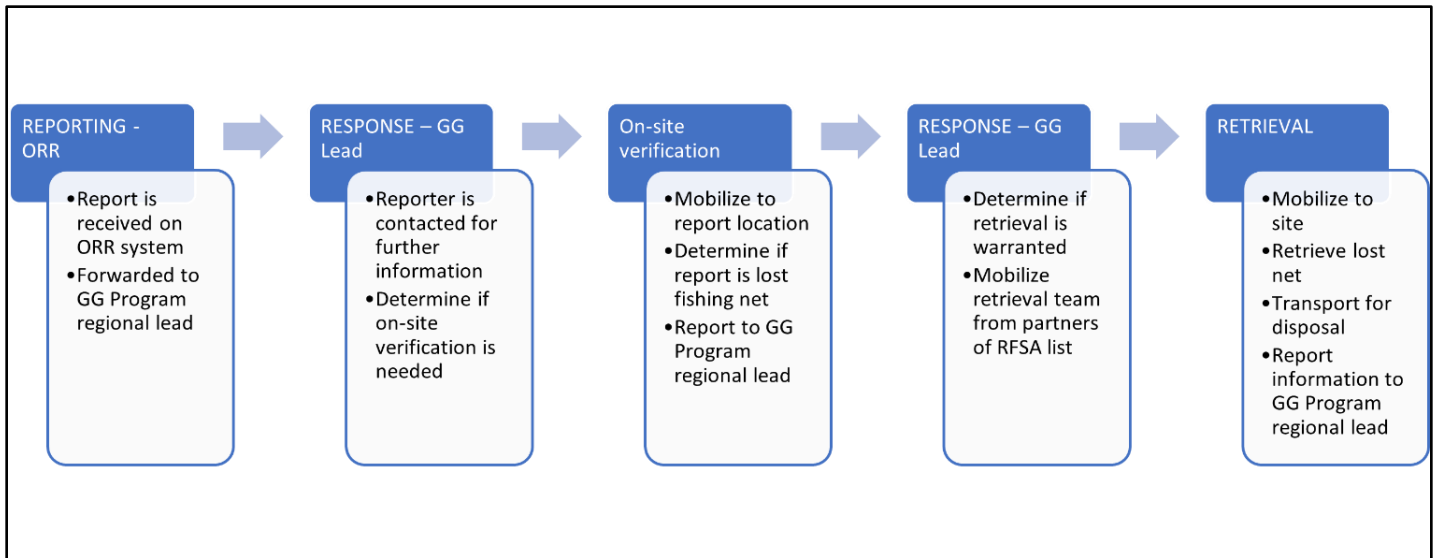


Figure 2: RRR Program operations flow

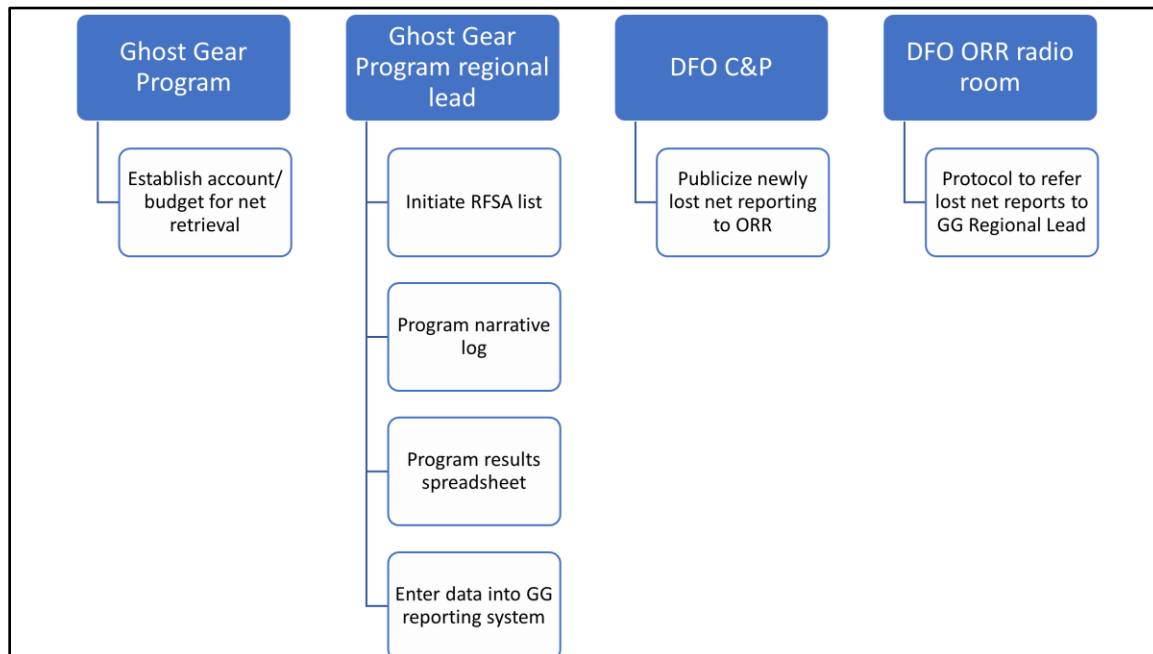


Figure 3: RRR Program supporting tasks and responsible parties

Other options considered but not recommended

Create a new reporting option similar to that in operation in the Puget Sound RRR program run by a neutral nongovernmental organization. While this option works well in the Puget Sound program, there are existing systems that fishers are familiar with in British Columbia. Creating a brand new system was not deemed necessary.

Establish the Coast Guard marine pollution line as the primary reporting system for newly lost nets. This option was not recommended as the marine pollution line is not currently used widely by the public and it was deemed that DFO ORR line had a stronger nexus with fishers.

Establish regional DFO office as leads for receiving reports and facilitating response and retrieval. This option would involve a dispersed management structure for the program that, in a pilot stage, might not result in consistent response to reports. Additionally, while C&P has primary fisheries enforcement mandates, the Ghost Gear Program is focused exclusively on ALDFG.

Rely entirely on existing vessels of opportunity for on-site verification. We determined that current capacity for on-site verification of reporting lost nets might not be adequate as no parties currently have this activity in their mandate. However, it is clear that many agencies are willing to assist when they have the capacity to do so. We therefore recommended that there be an option to enlist an RFSA list when needed.

Rely entirely on existing vessels of opportunity for retrieval. Current capacity for retrieval of newly lost nets, which could include diving operations, was deemed inadequate at present.

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