# **FFAW Lost Gear Retrieval Project Report**

# Year 3





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# ACKNOWLDGEMENTS

FFAW acknowledges the retrieval efforts of the following chartered captains and crew. Without their knowledge of the area and fishing/retrieval expertise, this project would have been impossible. We thank captains Baxter Stokes, Neil Chubbs, and Alton Rumbolt from 2J, and captain Troy Hardy from 3Pn.

FFAW also thanks all Harbour Authorities for their aid and expertise in handling and disposing of gear. Thank you to Roy Mangrove (St. Lewis), Baxter Turnbull (Charlottetown), and Melton Keeping (Burnt Islands).

# INTRODUCTION

Abandoned, lost, or discarded fishing gear (ALDFG) is a worldwide issue and a threat to marine environments. To combat ALDFG issues in Canada, the Department of Fisheries and Oceans implemented the Ghost Gear Fund in 2020, whose primary goal is to reduce the amount of fishing gear in the ocean. The Fish, Food and Allied Workers union (FFAW) availed of this fund in 2020, completing a two-year project in March of 2022. Almost 18 tons of fishing gear was recovered over the course of the project, with gear retrieval locations including southern Labrador, and the west and south coast of Newfoundland.

Building on this success, FFAW's 2022-2023 project initially focused on known lost gear retrieval sites in Labrador. Before the cod moratorium, there were several seasonal fishing communities in southern 2J. In the Spring of the year harvesters would travel from their permanent residences to Labrador to fish then return home in the Fall of the same year. Gear was be left in the temporary community and stored on wharves or in sheds. After the moratorium, the fishing gear, wharves and sheds were abandoned. With the cod fishery closed, most harvesters did not have the means to collect their fishing gear, leaving it, along with their temporary residences, abandoned.

In some of these abandoned communities collapsing wharves have deposited abandoned gear in harbours, which can then be carried by current and weather out into the wider ocean. Preventing more abandoned gear from entering the ocean is crucial and was key objective of the 2022-2023 FFAW Lost Gear Retrieval Project. Consequently, the FFAW lost gear retrieval team spent 15 days in southern 2J removing abandoned gear from seasonal communities and the adjacent waters.



Figure 1: Abandoned 2J seasonal fishing community



Figure 2: Abandoned 2J seasonal fishing community

The 2022-2023 FFAW Lost Gear Retrieval Project also focussed on the southwest coast of Newfoundland. Weather is a common factor in gear loss both in Newfoundland and Labrador and worldwide. Communities on the south and southwest coast were damaged by Hurricane Fiona in September of 2022. The effects of Hurricane Fiona were devastating to many communities in these regions, causing significant damage to Newfoundlanders homes and businesses. Harvesters were affected as well, with many losing gear that was stored on wharves. Entire sheds filled with gear were lost in the storm. Efforts to retrieve gear lost as a result of Hurricane Fiona was focused in the community of Burnt Islands.

Four captains and crews spent 230 hours over 26 days recovering gear in 2J and 3Pn as part of the 2022-2023 FFAW Lost Gear Retrieval Project. More than 30 tons of gear was retrieved from communities in southern Labrador and on southwest coast of Newfoundland (Fig. 3).

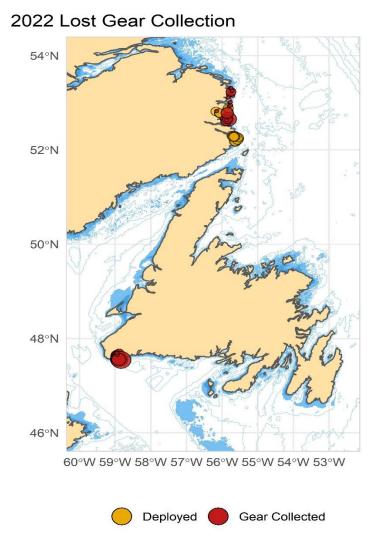


Figure 3: Locations of lost gear retrieval efforts in 2J and 3Pn in 2022-2023

## **PRE-RETRIEVAL**

#### **AREA SELECTION**

The project returned to 2J because, although 12 days were spent in 2J in 2021, there was still considerable amounts of lost gear in the region. In 2021, the FFAW lost gear retrieval team recorded lost gear coordinates for future retrievals. Additionally, two of the harvesters who participated in the 2022 retrieval efforts had participated the previous year and, thus, were familiar with the locations of ALDFG. Also, learning from our experience retrieving gear in 2021 in southern Labrador, the team was better able to plan for the substantial travel time between retrieval sites and the closest port.

The FFAW lost gear retrieval team also participated in the clean up of lost gear and the aftereffects of Hurricane Fiona in 3Pn. Retrieval sites were chosen based on discussions with harvesters in 3Pn, 3Ps and 4R. Further retrieval site selection was coordinated with other retrieval teams in the area, with FFAW prioritizing communities and areas affected by Hurricane Fiona that had not been the focus of other teams' efforts. Therefore, FFAW retrieval efforts in 3Pn were focused in Burnt Islands Harbour.

There were 15 gear retrieval days in Labrador, based out of St. Lewis and Charlottetown, and 11 gear retrieval days in 3Pn focussed in the community of Burnt Islands.

#### **STORAGE SITES**

During FFAW retrieval activities, coastal communities serve as activity bases, and where gear is unloaded and temporarily stored. To be considered as an activity base, communities' Harbour Authorities (HAs) must be part of the Small Craft Harbours (SCH) program. Activity bases were also chosen based on proximity to gear locations, availability of facilities, and ability to unload and store gear.

To unload gear from a vessel onto the wharf, for example, requires the use of some sort of crane or loader. The gear is then transported to a temporary storage area, building or container at a secure site. Most harbours used a jib crane to transfer gear, while it was stored at fenced in yards, and in sea cans and fish tubs.

#### **CHARTER SELECTION**

Eligibility criteria for harvesters wanting to apply for this project included: a Level II Fish Harvester certification; presence of a winch/hauler to pull up any located gear; residence in a local community; registration with the Professional Fish Harvesters Certification Board; a minimum vessel size of 34'11"; and the ability to qualify for an experimental licence with DFO. Example application forms are included in Component D, in the supporting documentation file.

The charter was advertised electronically on a variety of platforms; the FFAW website, FFAW Facebook, FFAW Twitter and through Nation Builder, which sent emails to all FFAW members in targeted regions.

Charter advertisements included a description of the opportunity and a link to charter application on the FFAW website.

FFAW Staff Representatives and Inshore Council Members who were also advised on the opportunity, who helped ensure that all harvesters interested in the project had the opportunity to apply. Similarly, HAs were advised of the opportunity who helped distributed the application among harvesters in their homeport.

Candidates were then selected through a random draw once the application deadline had passed. Applicants were drawn by an officiant outside of FFAW, usually a member of the Professional Fish Harvesters Certification Board. Draws were conducted in the presence of three individuals; the officiant, an observer from outside the FFAW organization, and the FFAW ghost gear project coordinator. Upon accepting the charter, harvesters were required to complete and submit a contract.

#### PARTNERSHIPS

FFAW also had the opportunity to share information and work together with other gear retrieval teams. The NunatuKavut Community Council (NCC) was also retrieving ghost gear retrievals in 2J in 2022. The NCC and FFAW retrieval teams retrieved gear from many of the same areas allowing the teams to collaborate and coordinate retrieval efforts.

There may be future gear retrieval opportunities, such as in 3Pn, allowing retrieval teams to coordinate efforts and aid each other in gear retrieval.

### GEAR

#### GRAPNEL

Repairs were made to the grapnels used in 2021-2022 for 2022-2023 project. Two different types of grapnel were manufactured. The first, shown in Figure 4 was built and repaired by Classic Machine Shop, located in Conception Bay South. The other grapnel (Fig. 5) was designed by NL welder Garry Reid.



Figure 4: Grapnel hauling up debris

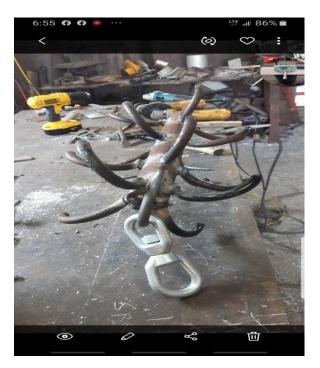


Figure 5: Alternate grapnel

#### UNDERWATER CAMERA AND SLED

The Poly-Solid underwater camera, seen below, was used in 2022-2023, as it was effective for locating lost gear in previous FFAW retrievals. The camera was designed for use in both commercial fisheries and scientific research. For 2022-23 retrievals, two different sleds were used to house the camera (Fig. 6 and Fig. 7), with the second sled manufactured in Fall 2022 and used in gear 3Pn retrievals.



Figure 6: Poly-Solid underwater camera



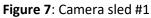


Figure 8: Camera sled #2

#### GOPRO

The FFAW Team also used a GoPro Hero 8, with underwater housing, in the 2022-2023 project. The GoPro could be used up to depths of almost 200 feet. It provided an effective alternative to the Poly-Solid camera, particularly in shallower waters because of its ease of use in comparison to the Poly-Solid camera.

#### ROPE

Rope used for the project had been purchased the previous year for past gear retrievals. In total, six coils (600ft) of  $\frac{3}{7}$  Dan-Strong rope and part of a seventh were used to cover anticipated retrieval depths. The rope was used for both the grapnel and sled/camera combo.

# **RETRIEVAL METHODOLODY**

#### LICENCING

Prior to commencing any retrieval activities in a location, harvesters had to complete and submit an application form (Appendix B), which was used to apply for a Section 52 licence from Fisheries and Oceans Canada. A Section 52 Licence is required for any experimental, educational, scientific, or public display activity. Licences were issued to FFAW are under the purview of science and education, stating the project objective to "locate, retrieve and return to shore lost fishing gear". Although FFAW was the licence holder in all cases, chartered captains were delegated to undertake retrieval activities on behalf of FFAW. One licence was required for each division (one each for 2J and 3Pn). All completed applications and licences (plus amendments) are included in the Supporting Documentation.

Another pre-retrieval requirement was the completion of a Ghost Gear Post-Retrieval Plan form (Appendix B). The form provided an outline of the steps in the retrieval process, this included a required plan for the storage, transportation, recycling/repurposing, and disposal of any retrieved gear (tagged or untagged). Multiple GG Post-Retrieval Plan forms were required per division; one for each harbour/homeport. The documents were provided to both the DFO Ghost Gear and Small Craft Harbour Coordinators. Retrieval could not begin until the form was approved by both. All completed post retrieval forms can be found in the Supporting Documentation.

#### RETRIEVAL

Once all licenses had been received and forms approved, FFAW retrievals began. Charter days were very weather dependant, and captains had final say on whether a retrieval trip would take place. Safety was stressed above all, and high winds could make an operation unsafe. The weather factor was mitigated somewhat in 2022-23 however, by the fact retrievals occurred in near shore areas, and protected harbours.

FFAW techs accompanied most retrievals. On trips where an FFAW tech was present, it was their responsibility to transport and use retrieval gear, as well as record coordinates and retrieved gear. Gear brought onto vessels included the underwater camera and sled; the GoPro Hero 8 Black; multiple grapnels; rope; an immersion suit and life jacket; a personal locator beacon; a laptop and cell phone; a ghost gear project flag; and multiple data forms. These data forms included a Deployment form and a Retrieved Gear form, all included in Appendix B (filled forms can be found among Supporting Documentation). The "Deployment" form contained information on camera and grapnel deployments, recording the starting and ending position of each deployment, as well as whether was gear was detected during the deployment and if successfully retrieved. The "Retrieved Gear" form was used when gear was retrieved, marking the location, gear type, weight, amount, length, condition and presence of bycatch species.

On 8 of the 26 retrieval days, experienced harvesters did retrieve on their own. No camera was used during these trips as harvesters targeted specific known gear locations. They were still required to map routes, record gear location coordinates, and note any retrieved gear, although not all data forms were filled during these trips.

Before beginning retrievals, the chartered harvester or FFAW tech first informed the HA contact of their intent to retrieve that day. It was a requirement that the HA be contacted at least 4 hours prior to landing upon the retrieval of any gear as well.

As in 2021-22, retrievals were an alternating mix of reconnaissance and retrieval, although there was more of a focus on the latter this year. Much of the gear was visible in shallow water or on the shore line, meaning there was less need to search for gear. If reconnaissance was needed, the underwater camera, GoPro or grapnel would be used to survey an area. In all instances of reconnaissance, vessel speed was usually less than 1 knot. In waters of depth less than 200 feet, the GoPro was used. For any depth greater than 200 feet the underwater camera or grapnel were used to survey. Videos taken by the GoPro and underwater camera were then analyzed for the presence of gear. Videos were analyzed on the underwater camera via use of a phone app, GKCam. Utilizing the WiFi capabilities of the camera, the tech would review the recorded video on his phone, usually in 10 minute segments. Any positive gear identification could then be cross referenced with the recorded routes, and retrieval attempted. While the tech was reviewing video, the grapnel would be used to continue surveying an area.

A big aid to gear recovery in 2022-23 retrievals was the use of a speedboat. Much of the gear in both 2J and 3Pn was located in shallow water or on the shoreline, areas unable to be accessed by larger vessels. Through the use of a speedboat harvesters were able to safely hook into gear and then allow the larger vessel to drag it aboard. Alternatively, some gear was able to be collected temporarily in the speedboat and transported back to the larger vessel.

#### **RECOVERED GEAR**

When gear was recovered, it was transported from the vessel to the wharf via jib crane or loader. The gear was initially sorted on the basis of whether it was tagged or re-usable. Usability was determined by charter captains and participating HAs. Although the gear could potentially be stored for up to 45 days, most tagged and usable gear was returned to the owner upon landing or within a couple of days. This was also true of unusable gear, which was often transported directly to a dump site upon landing.

At the wharf, FFAW technicians also inventoried and estimated the weight of the gear regardless of usability or tag status. This info was then recorded and passed on to the FFAW project coordinator who entered all recovered gear data into the Fisheries and Oceans Canada online gear reporting system. All retrieved gear is listed in Table 1 in Appendix A.

# RESULTS

For each harvester, charter time, as well as survey time using both cameras (underwater and GoPro) and grapnel, was recorded. In 2022-23, time spent towing for gear using the grapnel and camera was, in general, much lower than in 2021-22. This was primarily due to the location of gear. In both 2J and 3Pn, gear was primarily found in shallow waters and onshore. It was possible to locate gear, in most cases, without the use of camera or blind grapnel tow.

Overall survey time was also limited by the amount of time needed to travel from port to an area of gear retrieval. One of the areas surveyed in 2J, for example, was located approximately 50KM from the Charlottetown port. This has been an issue in 2J retrievals especially, as the gear is often found at abandoned fishing sites and communities, far from the closest port. Retrievals are summarized below in Table 1.

Table 1: Lost gear tow summary

Vessel Name	Division	# Charter Days	# Tows	Total Tow Distance (m)	Average Tow Distance (m)
Walley Marie	2J	7	10	4347.35	869.47
Labrador Legacy	2J	4	8	177688.89	29614.81
Beachside Cruiser	2J	4	25	359074.28	14362.97
Shirley Ann III	3Pn	11	37	53125.38	1770.85

# **RETRIEVAL REPORT – 2J**

In total, there were 15 days of retrieval in Labrador. Retrievals out of Charlottetown were conducted by Baxter Stokes, captain of the Walley Marie, and Neil Chubbs, captain of the Labrador Legacy. Mr. Stokes completed 7 retrieval days (September 8-11 and October 26-28), while Mr. Chubbs completed four days of retrieval (September 12-15). The four days of retrieval out of St. Lewis (September 19-22) were completed by Alton Rumbolt, captain of the Beachside Cruiser. 12 of the 15 charter days were accompanied by FFAW Gerald Mercer. The final 3 days of charter in October were completed solo by captain Baxter Stokes.

In Charlottetown, a sea can was rented for the temporary storage of all recovered gear. In St. Lewis, a fenced in yard at a DFO satellite office was the planned storage site. All gear recovered in Charlottetown was returned to harvesters or transported to the local dump site to be burned later in the Fall. No gear was recovered during St. Lewis retrievals.

Primary areas of gear retrieval for 2J included Punch Bowl, Occasional Harbour, and Snug Harbour (Fig. 8). Most of the retrievals were near or on-shore.

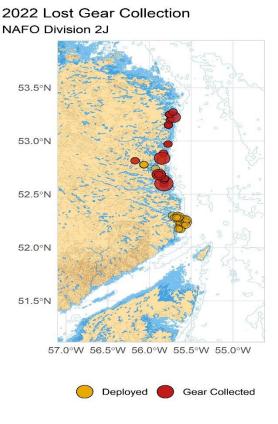


Figure 8: Areas of gear retrieval in 2J

### Charlottetown

Charter Hours: 100 hours, 8 minutes	Grapnel Hours: 1 hour, 53 minutes
Gear Recovered (kgs): 23,417	Camera Hours: 1 hour, 49 minutes

All gear collected during Charlottetown retrievals was shoreline or shallow water gear, with nothing being collected at a depth greater than 5 meters. Gear retrieval locations on September 8<sup>th</sup>, 9<sup>th</sup> and 11<sup>th</sup> by Baxter Stokes were targeted based on observations from the previous year. Mr. Stokes, who was conducting the first four days of retrieval, had retrieved gear the previous year as well, and noted gear that he was unable to pick up in 2021 for future retrievals. Most of the gear collected during these charters was from Occasional Harbour, an area of heavy retrieval activity in 2021 as well. Almost 16,000lbs of gear was retrieved over these three days, including 11 cod traps, 4 gillnets, 1 salmon net and more than 2000 feet of rope (Fig. 9 and 10). Some of the cod traps collected were in good shape, but unfortunately, this type of gear is no longer used. Of note, one of the nets located on shore contained a deceased sea otter and Canada goose.





Figure 9: Recovered gear on the Wally Marie Figure 10: Gear being hauled up on the Wally Marie

As mentioned above, most gear was found along the shoreline and in shallow water, necessitating the use of a speedboat to access. Figure 11 shows a harvester hooking into gear on a collapsed wharf in Occasional Harbour. A hook from the winch on the main vessel was transferred by speedboat to the wharf and attached to gear. The larger vessel was then able to drag the gear and haul it onboard.



Figure 11: Gear being hooked near a collapsed wharf in Occasional Harbour

September 10<sup>th</sup> was spent retrieving in Triangle Harbour (Fig. 12 and 13), an area northeast of Charlottetown. 9,000lbs was collected in total, including 3.5 cod traps, and a gill net and salmon net (Fig. 14 and 15). The gear retrieved was primarily gear found on the shore line and included almost 2800 feet of rope. During these trips (September 8-11), surveys were also conducted at locations near Square Island.



Figure 12: Triangle Harbour

Figure 13: Triangle Harbour



Figure 14: Recovered gear from Triangle Harbour

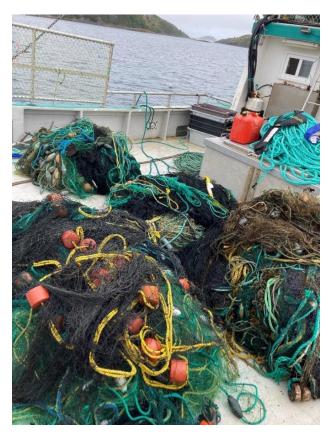


Figure 15: Recovered gear from Triangle Harbour

Mr. Stokes also made a 3-day charter (October 26-28) without being accompanied by an FFAW tech, steaming to a southern 2J area called the Punchbowl. Given the distance to the Punch Bowl from Charlottetown (50Km approximately), the harvesters spent the entire two nights and three days at sea, unloading all gear collected only on the final charter day.

Gear was retrieved from Penney's Harbour, the Punchbowl, and near Hare Island and Pinsent's Arm during the 3-day trip. In all, more than 16,000lbs of gear and 18,000 feet of rope were recovered, including 26 gillnets, 5 cod traps, 7 herring nets, 3 seal nets and 2 salmon nets (Figs.16-19).

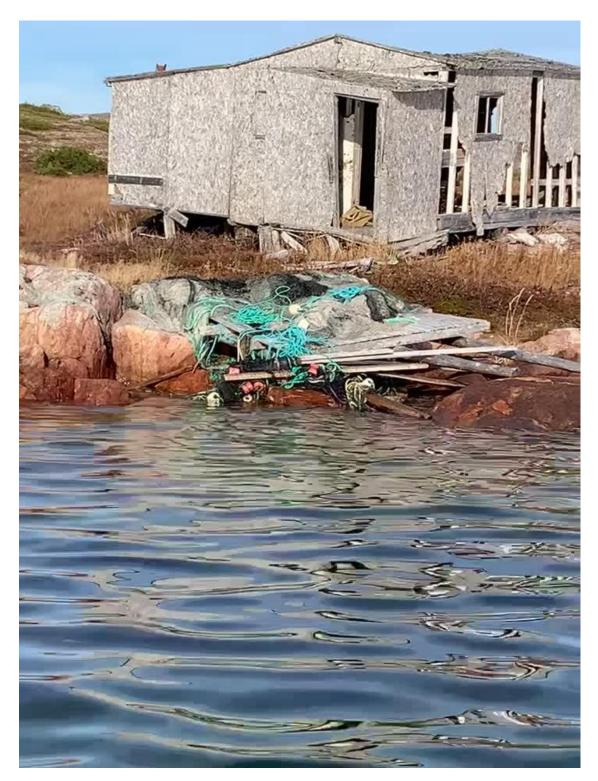


Figure 16: Collapses wharf and gear in southern 2J

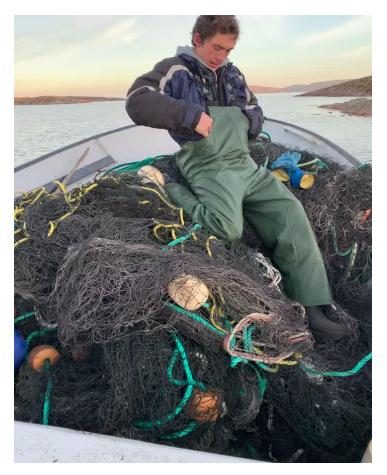


Figure 17: Loading a speedboat with shoreline gear in southern 2J



Figure 18: Dragging gear, southern 2J

Figure 19: Collected gear, Charlottetown wharf

Harvester Neil Chubbs and crew recovered gear from September 12-15, also steaming out of Charlottetown. Retrievals on September 12<sup>th</sup> and 13<sup>th</sup> occurred in Snug Harbour, with an unknown number of gillnets totalling 2,500lbs, including 250 feet of rope, recovered on the 13<sup>th</sup> (Fig. 20). Snug Harbour was an approximately 4-hour steam from Charlottetown, so Captain Chubbs and crew remained overnight in Snug Harbour on the 13<sup>th</sup>.



Figure 20: Retrieved gillnets from Snug Harbour

Venison Tickle was the target area on the 14<sup>th</sup> and accessed on the return trip from Snug Harbour. It was a site of significant gear retrieval as 8,400lbs of gear was recovered, comprised of four cod traps and 700 feet of rope (Fig. 21). Most gear was recovered from Venison Tickle, but two cod traps that could be collected in future retrievals were noted. On the 15<sup>th</sup> the area close to Charlottetown was surveyed and one seal net weighing 75lbs was recovered.



Figure 21: Cod traps recovered near Charlottetown

During trips out of Charlottetown, the camera was deployed multiple times but no gear was found. What was evident during these trips was the many abandoned communities that existed between Charlottetown and the Punch Bowl. Houses and wharves in some cases were clearly dilapidated, but houses and gear would sometimes appear functional from a distance. Some of the cod traps were seemingly untouched by the elements. Even after laying exposed on wharves for decades, there was no sign of sunburn or degradation.

St. Lewis	
Charter Hours: 40 hours, 19 minutes	Grapnel Hours: 7 hours, 17 minutes
Gear Recovered (kgs): 0	Camera Hours: 3 hours, 36 minutes

Retrievals were planned to begin on September 18<sup>th</sup> for St. Lewis but were delayed due to weather. 4 total days (September 19-22) were spent surveying for gear by Captain Alton Rumbolt and crew out of St. Lewis. No gear was recovered during these trips. Areas surveyed included Battle Harbour, Henley Harbour, and Double Islands.

## **Retrieval Report – 3Pn**

Charter Hours: 89 hours, 10 minutes

Gear Recovered (kgs): 5,480.8

Grapnel Hours: 15 hours, 47 minutes Camera Hours: 1 hour, 24 minutes

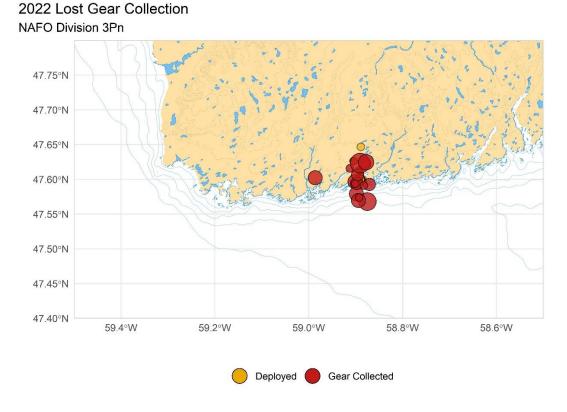


Figure 22: Areas of gear retrieval in 3Pn

Retrieval activities in 3Pn occurred between November 27-30 and December 6-7 of 2022, as well as between March 13-17. There were 11 days of retrieval in total and all were completed by captain Troy Hardy and crew. 10 days of retrieval activity were concentrated in Burnt Islands Harbour, with an 11<sup>th</sup> near Isle Aux Morts.

Given the shallow waters of Burnt Island Harbour, gear was primarily retrieved using a speedboat and then unloaded onto the Burnt Islands wharf. Gear was not stored but instead directly returned to harvesters or transported to the Port Aux Basques landfill at the end of each day. In instances where gear was returned, harvesters would often point out the locations of gear and then wait on the wharf when Mr. Hardy returned to shore. Additionally, there were no temporary storage options near the Burnt Islands wharf aside from a small bin for bait liner waste.

In total, approximately 12,000lbs of gear and 4500 feet of rope was recovered, including more than 50 pots/traps, 23 nets, 10 anchors/grapnels, multiple dragger twins, and other assorted gear such as a seine, trawl, and scallop drag (Figs. 22-26). Most gear was transferred to the local waste facility in Port Aux Basques, but a number of lobster pots were returned to harvesters.



Figures 22 and 23: Recovered gear near Burnt Islands



Figure 24: Recovered unusable gear being transported to a waste facility in Port Aux Basques



Figures 25 and 26: Recovered gear near Burnt Islands

Low camera survey hours were partly due to the location of the gear, which was found in shallow water and on the shoreline. Also, no tech, and therefore no camera or grapnel, accompanied Captain Hardy for 6 of the 11 retrieval days. Burnt Island retrievals were also highlighted by bycatch (Figs. 27 and 28), with 14 lobsters being released from gear, in addition to a number of smelt. In all instances, there were openings allowing lobster to enter and exit the gear. In some, it had appeared that lobster had began using gear for shelter.



Figure 27: Troy Hardy and crew holding up bycatch



Figure 28: Bycatch in Burnt Island

# **Responsible Disposal**

Discussions with harvesters in Labrador over the past two years has highlighted a lack of recycling and disposal options in NL. No recycling facilities exist within the southern coastal 2J area that are capable of handling the large amounts of gear retrieved. Additionally, disposal options are limited; disposal in nearby waste facilities/dumps means burning or burying the gear.

Shipping the gear outside of Labrador is an option, but one that is costly, both in dollars and potential environmental impact. Also, there is a lack of temporary and permanent gear storage options in most communities.

3Pn had similar issues with remoteness and the cost of shipping, exacerbated by the impacts of Hurricane Fiona. Although large towns such as Corner Brook and Stephenville are relatively close to Port Aux Basques, no viable gear recycling options existed in either. Much like in Labrador, the closest recycling plant capable of handling the gear resides in either St. John's or Halifax.

Also prevalent in both areas is the lack of temporary or transitional storage. Many communities do have areas where could be stored, but these are open fields, and not secure. Community gear piles do exist in some communities on a small scale, but they are only composed of reusable rope/gear. One harvester in Charlottetown when interviewed suggested using fish tubs as a temporary storage option. This is potentially a good option for a smaller amount of gear storage, and a container that is prevalent in most communities. It is also a much cheaper option than a sea can, which was used as storage for Charlottetown retrievals.

Two other suggested options were the building of a storage shed/building near the wharf or the purchase of a mobile storage trailer. Both options would provide a large amount of space, but would be costly, and beyond the financial means of most SCH in NL. Purchasing a storage trailer for the FFAW specifically could have also been an option, at least providing temporary storage for the FFAW ghost gear project.

# Challenges

### **Pre-Retrieval**

#### Weather

Weather is likely the single most influential factor determining gear retrieval success or failure. The process of safely hauling up gear via grapnel can be complicated, requiring calm days with little wind. After hooking into gear, it can be difficult to tell the size, length and amount. Use of the camera and sled also requires calm water and weak winds. Even retrieving visible shoreline gear can be tricky without calm weather, as retrievals occur using smaller, less stable speedboats.

In 2J, gear retrievals started late in 2022. Weather starts to "turn" in Labrador in August/September most years, and retrieval attempts in the area in 2021 were often delayed due to weather. This was not as much of an issue for 2022 with its run of unexpectedly good weather. Although not without its hazards, most gear in 2022 was also retrieved in shallow water or from shorelines. This lessened the unpredictability of the retrieval as harvesters were aware of the size and amount of gear they were recovering.

In 3Pn weather was also less of a factor early, as most retrievals occurred in the shelter of Burnt Islands Harbour. Retrievals started late however (November), and by mid December, weather was noticeably shifting. During the winter season (late December-early March) it was impossible to safely retrieve any gear. The final days of retrieval therefore, were completed in March once weather improved.

Given the unpredictability of NL weather, especially in a marine environment, there will always be challenges in completing projects. This can be alleviated somewhat by starting projects in June/July, when there is a better probability of mild seas and calm winds. This unfortunately creates other potential conflicts due to those months being a period of significant fishing activity in most areas. In 3Ps for example, the lobster fishery is an important and valued fishery, running from April to early July.

#### Fishing

The aforementioned fishery start dates conflict with gear retrievals as it would stand to reason that most gear would be lost in areas where there is fishing activity. This would have been more of an issue in 2021 than 2022, but conflicts still could have occurred during the unloading of gear at wharves. Harvesters unloading their catch would take precedence over gear unloading. Also, enlisting charters would be much more difficult during this time period with harvesters engaged in their own commercial activity.

#### Harbour Selection

Harbours selected for the project were required to be part of the SCH program, which made retrieval in some cases more complicated. These SCH locations aren't necessarily close to areas of gear loss. This is compounded by the fact not all SCH are capable of taking on lost gear as well. To meet the minimum requirements harbours were required to have a space for storage, access to freshwater to clean recovered gear, and a hoist/jib crane/loader capable of transporting gear from vessel to wharf. Also needing to be considered is SCH availability due to construction or the aforementioned fishing activity.

An example of this issue this year would be the town of Black Tickle. Harvester Baxter Stokes undertook some retrievals in an area called the Punch Bowl, an area whose closest harbour was Black Tickle. Black Tickle was neither in the SCH program or capable of taking on lost gear, which meant a 50km trip to and from the SCH of Charlottetown.

Another issue is the shallowness of some harbours. Garnish in 2021, and Burnt Islands this year had harbours with shallow depths. Larger vessels, or vessels with larger draws are unable to land in these instances. This limits who can apply for gear retrievals. Retrieval activities would ideally occur with larger

vessels for safety reasons, but these same vessels are sometimes unable to unload at selected ports due to shallow harbours.

### Retrieval

#### Retrieval Equipment

Both grapnel types used were effective in hooking into and hauling gear in 2022 retrievals. During blind tows, however, grapnels could hook onto the sea bottom, breaking or bending prongs. Additionally, it was often also hard to tell if a grapnel had hooked into a heavy or large amount of gear, or onto the sea bottom.

The underwater camera, while effective, was not able to be viewed in real time. This made retrieval a more time-consuming process as videos would only be viewed after bringing the camera to the surface.

The sled used in 2J was often an issue as well, as it would occasionally get stuck on the ocean floor. It also would rise in the water column at vessel speeds greater than 1 knot. An alternative sled was designed for 3Pn which was smaller and heavier. The same issues were not experienced with the newer sled, although it was used less than 2 hours during 3Pn surveys.

#### Steam Distance

The time spent steaming to an area of gear loss was a huge limiting factor in retrievals. Especially in 2J, areas of known gear loss were a day's steam in some cases from the closest port. This was less of an issue for 3Pn retrievals which occurred primarily in Burnt Islands Harbour. Future retrievals in areas such as La Poile or Petites may require spending multiple nights in or near these communities, however.

#### **Post-Retrieval**

#### Storage

As discussed above, the primary issue after retrieving gear were issues of storage. Most harbours do not have even a temporary storage option for gear-related debris. Even for those that do, these options are often inadequate. Burnt Islands, for example, has a bin for bait liners and other fishing gear debris, but it requires unloading very often (Fig. 29).



Figure 29: Bait liner waste being transported to a waste facility in Port Aux Basques

# **Future Plans**

One ongoing FFAW project is the creation of a disposal database, outlining current disposal/recycling options in the province. Outreach is still occurring and includes not just regions where retrieval occurred in 2022-23, but in 2020 and 2021 as well. This project has also been expanded to include temporary/permanent storage options in each area, and will eventually be included on a ghost gear page on the FFAW website. This site already includes a map showing areas of gear retrieval and a description of the project, but will also need to be updated with 2022-23 retrieval activities.

Presentations on the work of the FFAW ghost gear project and the importance of reporting lost gear have also begun and will continue throughout the year. Two presentations have been completed so far; one in St John's (November 3, 2022) to an audience of approximately 40 harvesters and another in Port Hope-Simpson Labrador (May 18, 2023), to an audience of 11 harvesters. Future presentations will occur in 3Pn and other parts of Labrador. A copy of the presentation is included in the Supporting Documentation.

Further plans include presentation of the work during World Oceans Day activities, Union Forum articles and a ghost gear report released to the public and available on the FFAW website this summer.

Overall, it was another successful year of gear retrieval for FFAW, as more than 200 pieces of gear totalling more than 60,000lbs was recovered. Reports from harvesters in 2J indicate that most shoreline and visible shallow water gear has been collected. Future retrievals in the region are still required, but should focus on deeper water gear, gear likely only identified through the use of camera, sonar or ROV.

In 3Pn, on the other hand, considerable amount of gear was lost due to the impacts of Hurricane Fiona. FFAW spent almost all 11 days of retrieval in one small harbour near Burnt Islands, yet did not retrieve all gear from the harbour. Much more gear retrieval work needs to be done in this region.

# Appendix A:

#### Table 1: Retrieved Gear

Homeport	Date	Start Latitude	Start Longitude	End Latitude	End Longitude	Gear	Amount	Useable	Disposed/Returned
Charlottetown	08-Sep	52 38.077	55 49.613	52 38.077	55 49.613	Gillnet	1	N	Disposal
Charlottetown	08-Sep	52 35.923	55 49.613	52 35.923	55 49.613	Cod Trap	1	N	Disposal
Charlottetown	08-Sep	52 35.927	55 49.613	52 35.927	55 49.613	Cod Trap	6	N	Disposal
Charlottetown	08-Sep	52 35.927	55 49.613	52 35.927	55 49.613	Salmon Leader	1	N	Disposal
Charlottetown	09-Sep	52 35.927	55 49.613	52 35.927	55 49.613	Cod Trap	1	N	Disposal
Charlottetown	09-Sep	52 35.927	55 49.613	52 35.927	55 49.613	Cod Trap	1	N	Disposal
Charlottetown	09-Sep	52 35.927	55 49.613	52 35.927	55 49.613	Cod Trap	1	N	Disposal
Charlottetown	10-Sep	52 50.286	55 50.987	52 50.286	55 50.987	Salmon Nets + Header	1	N	Disposal
Charlottetown	10-Sep	52 50.286	55 50.987	52 50.286	55 50.987	Cod Traps	3.5	N	Disposal
Charlottetown	10-Sep	52 50.286	55 50.987	52 50.286	55 50.987	Gillnets	1	N	Disposal
Charlottetown	11-Sep	52 38.962	55 49.229	52 38.962	55 49.229	Gillnets	2	N	Disposal
Charlottetown	11-Sep	52 38.916	55 49.111	52 38.916	55 49.111	Cod Trap	1	N	Disposal
Charlottetown	13-Sep	52 53.068	55 50.089	52 53.068	55 50.089	Gillnets	?	N	Disposal
Charlottetown	14-Sep	52 58.239	55 46.728	52 58.239	55 46.728	Gillnets	2	N	Disposal
Charlottetown	14-Sep	52 58.239	55 46.746	52 58.239	55 46.746	Gillnets	2	N	Disposal
Charlottetown	15-Sep	52 48.880	56 10.403	52 48.880	56 10.325	Seal Net	1	N	Disposal
Charlottetown	26-Oct	53 08.945	55 46.422	53 08.945	55 46.422	Cod Trap	1	N	Disposal
Charlottetown	26-Oct	53 08.849	55 46.406	53 08.849	55 46.406	Cod Trap	1	N	Disposal
Charlottetown	26-Oct	53 08.980	55 46.472	53 08.980	55 46.472	Cod Trap	1	N	Disposal
Charlottetown	27-Oct	53 11.870	55 45.165	53 11.870	55 45.165	Cod Trap	1	N	Disposal
Charlottetown	27-Oct	53 14.962	55 45.678	53 14.962	55 45.678	Gillnets	2	N	Disposal
Charlottetown	27-Oct	53 16.288	55 43.095	53 16.288	55 43.095	Gillnet	1	N	Disposal
Charlottetown	27-Oct	53 13.421	55 42.621	53 13.421	55 42.621	Herring Net	2	N	Disposal
Charlottetown	27-Oct	53 13.421	55 42.621	53 13.421	55 42.621	Gillnet	1	N	Disposal
Charlottetown	27-Oct	53 15.011	55 45.618	53 15.011	55 45.618	Cod Trap	1	N	Disposal
Charlottetown	28-Oct	52 41.053	55 53.395	52 41.053	55 53.395	Gillnets	19	N	Disposal
Charlottetown	28-Oct	52 41.053	55 53.395	52 41.053	55 53.395	Seal Nets	3	N	Disposal
Charlottetown	28-Oct	52 41.053	55 53.355	52 41.053	55 53.355	Herring Nets	5	N	Disposal

Charlottatown	20 Oct	52		52		Colmon	2	N	Disposal
Charlottetown	28-Oct	52 41.053	55 53.355	52 41.053	55 53.355	Salmon Nets	Z	IN	Disposal
Charlottetown	28-Oct	52 41.053	55 53.351	52 41.053	55 53.351	Gillnet Header	3	N	Disposal
Burnt Islands	27-Nov	47 35.873	58 53.344	47 35.872	58 53.340	Net	1	N	Disposal
Burnt Islands	27-Nov	47 35.873	58 53.344	47 35.872	58 53.340	Rope	N/A	N	Disposal
Burnt Islands	27-Nov	47 35.873	58 53.344	47 35.872	58 53.340	Anchor + Mooring Rope	1	N	Disposal
Burnt Islands	28-Nov	47 35.872	58 53.370	47 35.800	58 53.248	Lobster Pots	4	Y	Returned
Burnt Islands	28-Nov	47 35.872	58 53.370	47 35.800	58 53.248	Grapnels	4	Ν	Disposal
Burnt Islands	29-Nov	47 36.021	58 53.361	47 36.021	58 53.361	Lobster Pots	2	N	Disposal
Burnt Islands	29-Nov	47 35.873	58 53.361	47 35.873	58 53.361	Mackerel Nets + Rope	8	N	Disposal
Burnt Islands	29-Nov	47 35.873	58 53.361	47 35.873	58 53.361	Halibut Gear	3	N	Disposal
Burnt Islands	29-Nov	47 35.800	58 53.248	47 35.800	58 53.248	Herring Nets	2	N	Disposal
Burnt Islands	29-Nov	47 35.800	58 53.248	47 35.800	58 53.248	Anchor	2	N	Disposal
Burnt Islands	29-Nov	47 35.800	58 53.248	47 35.800	58 53.248	Lobster Pots	7	Ν	Disposal
Burnt Islands	29-Nov	47 35.800	58 53.248	47 35.800	58 53.248	Lobster Pots	10	Y	Returned
Burnt Islands	29-Nov	47 35.800	58 53.248	47 35.800	58 53.248	Lobster Pots	3	Y	Returned
Burnt Islands	29-Nov	47 35.800	58 53.248	47 35.800	58 53.248	Lobster Pots	2	Y	Returned
Burnt Islands	30-Nov	47 35.869	58 53.371	47 35.869	58 53.371	Lump Nets	3		Disposal
Burnt Islands	30-Nov	47 35.907	58 53.282	47 35.907	58 53.282	Lobster Pots + Rope	4	Y	Returned
Burnt Islands	30-Nov	47 35.907	58 53.282	47 35.907	58 53.282	Lobster Pots	4	Y	Returned
Burnt Islands	30-Nov	47 36.019	58 53.382	47 36.019	58 53.382	Herring Nets	2	N	Disposal
Burnt Islands	30-Nov	47 35.900	58 53.596	47 35.900	58 53.596	Dragger Twin	1	N	Disposal
Burnt Islands	30-Nov	47 35.850	58 53.630	47 35.850	58 53.630	Rope	1	N	Disposal
Burnt Islands	06-Dec	47 35.952	58 53.361	47 35.765	58 53.249	Net		Ν	Disposal
Burnt Islands	06-Dec	47 35.952	58 53.361	47 35.765	58 53.249	Pot		N	Disposal
Burnt Islands	06-Dec	47 35.952	58 53.361	47 35.765	58 53.249	Anchor Mooring		Ν	Disposal
Burnt Islands	06-Dec	47 35.952	58 53.361	47 35.765	58 53.249	Rope		N	Disposal
Burnt Islands	08-Dec	47 35.952	58 53.361	47 35.765	58 53.249	Net		N	Disposal
Burnt Islands	08-Dec	47 35.952	58 53.361	47 35.765	58 53.249	Pot		N	Disposal
Burnt Islands	08-Dec	47 35.952	58 53.361	47 35.765	58 53.249	Anchors	2	N	Disposal
Burnt Islands	08-Dec	47 35.952	58 53.361	47 35.765	58 53.249	Trawl		N	Disposal

Burnt Islands	08-Dec	47 35.026	58 58.432	47 34.948	58 58.58	Seine		N	Disposal
Burnt Islands	08-Dec	47 35.026	58 58.432	47 34.948	58 58.58	Net		N	Disposal
Burnt Islands	08-Dec	47 35.026	58 58.432	47 34.948	58 58.58	Pot		N	Disposal
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Тгар	9	N	Disposal
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Тгар	2	Y	Returned
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Тгар	2	Y	Returned
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Grapnel	1	Y	Returned
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Dragger Twin		N	Disposal
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Net		N	Disposal
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Trawl	1	Y	Returned
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Trawl	1	N	Disposal
Burnt Islands	13-Mar	47 35.853	58 53.338	47 35.9	58 53.338	Rope		N	Disposal
Burnt Islands	14-Mar	47 35.977	58 53.338	47 35.998	58 53.101	Trap		N	Disposal
Burnt Islands	14-Mar	47 35.977	58 53.338	47 35.998	58 53.101	Scallop Drag	1	Y	Returned
Burnt Islands	14-Mar	47 35.977	58 53.338	47 35.998	58 53.101	Rope		N	Disposal
Burnt Islands	14-Mar	47 35.977	58 53.338	47 35.998	58 53.101	Net		N	Disposal
Burnt Islands	15-Mar	47 35.845	58 53.22	47 36.015	58 53.28	Troll		N	Disposal
Burnt Islands	15-Mar	47 35.845	58 53.22	47 36.015	58 53.28	Net		N	Disposal
Burnt Islands	16-Mar	47 35.951	58 53.360	47 35.998	58 53.101	Trap	1	N	Disposal
Burnt Islands	16-Mar	47 35.951	58 53.360	47 35.998	58 53.101	Troll	1	Y	Returned
Burnt Islands	17-Mar	47 35.853	58 53.338	47 35.95	58 53.258	Trap	1	N	Disposal
Burnt Islands	17-Mar	47 35.853	58 53.338	47 35.95	58 53.258	Net		N	Disposal
Burnt Islands	17-Mar	47 35.853	58 53.338	47 35.95	58 53.258	Rope		N	Disposal

# **APPENDIX B: Applications and Forms**

Section 52 Licence:

### APPLICATION FOR EXPERIMENTAL, SCIENTIFIC, EDUCATIONAL, OR PUBLIC DISPLAY LICENCE

Please allow a minimum of 14 working days for application to be processed and licence to be issued. *Please Print* 

Section 1 To be completed by Applicant

1.1	Name of Company/ Individual/Organization:			1.2	F	IN:		
1.3	Address:			1.4	P	Postal Code:		
1.5	Contact Person:		1.6	т	elephone #:			
1.7	Fax Number:			1.8	E	Email:		
1.9	Purpose for requesting the licence: (include the overall purpose of the request, and	l the	Please check one or m	oro Ca	+00	nony of Poquest		
	specific objectives. Objectiv must be linked to one or mo the required categories.)		Experimental	🗆 Scie	enti			
1.10	Is this experiment / works requirement under the Fisheries Act Section 35(2 a Fisheries Act Authorizat	2) and		Yes	5	No		
1.11	Location of Activity Please supply map: Please Note: If applicant is to o Torngat Mountains National Par determine if an access permit of permits before commencing fish	k Reserve r licence i	e) or the Nunatsiavut Land s required. All applicants r	Claim a	rea	, you must contac	t the appr	opriate Agency to
1.12	Date of Activity:	-						
1.13	Identify the species affect and number to be killed, o caught and released:							
1.14	If biological sampling is required, list the type of sampling to be conducted	1:						
	Type of gear to be used, amount & Method of Colle	ection:						
1.15	NOTE:		Electrofishing ripening/m an electrofisher, after Sep when used late on the yea September 15 may not be	otember ar, i.e. s	r 15 spav	i, can do extreme o wning. Requests f	damage to	o future populations
1.16	Name(s) of Designates:							
1.17	If applicable, Vessel Name Vessel Registration Number(VRN):							
1.18	Were you issued a similar licence in the past 3 years If yes, what was the Licen	s? ce #:						
1.19	Is this request an amendr to a licence already issue the current year?			1.20		If yes, what Licence Nu		

1.21	Other Details/Comments: (attach separate sheet if necessary)		
1.22		n salt water or freshwater? se complete attached "Application for a Species at Risk Permit".	
1.23	Will you be using gillnets, longlin	nes, otter trawls or traps? Yes No	
1.24	(MR)? Yes No	e within a Marine Protected Area (MPA) or within a Marine Refu s Marine Planning and Conversation Branch or Fisheries Management Plan Application.	•
1.25	Will your proposed activities dist related to disturbance, please ref <u>mammiferes/section38/index-eng</u> If yes, please complete the "Appl located online at: <u>https://www.dfc</u>	urb marine mammals? Yes <u>No</u> For information of the second s	
1.26	Applicant's Signature: (Please type name / date if emailing)		

Return to: Experimental Licences, Regional Licencing Unit Fisheries & Oceans Canada PO Box 5667 St. John's NL A1C 5X1 or EMAIL: <u>experimentallicenses@dfo-mpo.gc.ca</u>

### Post-Retrieval Plan:

# **Ghost Gear Post-Retrieval Plan**

[insert licence holder]

Whereas under the *Wrecked*, *Abandoned or Hazardous Vessel Act* (WAHVA), abandoned, lost, or otherwise discarded fishing gear is considered a "wreck", that the Minister, on reasonable grounds, believes imposes a "hazard" as that term is defined under WAHVA;

THEREFORE, the Department of Fisheries and Oceans (DFO) and the aforementioned licence holder agree to the following retrieval plan to support the licence holder's stated activities under the conditions set out below, and those of its licence under section 52 of the *Fishery (General) Regulations (FGR)*.

For the purposes of this document, secure storage is defined as:

"An area that is secured by lock and key, managed and accessible only by identified personnel. For example, a locked container or compound that can securely store tagged gear is considered secure storage".

Additional security measures, such as the installation of surveillance cameras, may be necessary in cases where the risk of theft or damage to Small Craft Harbours (SCH)/Harbour Authorities (HA) equipment or facilities is considered high.

Upon issuance of this post-retrieval plan, the licence holder agrees to assume the following responsibilities for [insert site authority name, organization name and location address (s)]:

- 1. When planning retrieval activities, contacting the site authority and request permission to land retrieved gear and use facility equipment (insert equipment type, e.g., hoist, storage compound) at the wharf and pay associated fees. Proof of adequate liability insurance will need to be provided to the [insert site authority name, organization name ]prior to starting any activity.
- 2. While conducting retrieval at sea, flying a flag identifying the vessel as one conducting ghost gear related activities.
  - a) Flags must be obtained through the Regional Ghost Gear Coordinator and must be returned within 3 months of retrieval operations being completed, unless otherwise discussed with the Coordinator.
  - b) Flags are the responsibility of the licence holder and are only to be used when conducting retrieval work as authorized under a s.52 licence.
- 3. When conducting retrieval at sea, contacting site authority (insert name and phone number) 4 hours prior to landing to ensure they are present during the unloading/separation of retrieved gear and to provide access to the secure storage area.
- 4. Bringing all retrieved fishing gear to shore and sorting gear that requires storage from gear that does not require storage. Gear requiring storage includes any gear that is **tagged** and **usable\***. Any gear that is untagged or unusable does not require storage and can therefore be redistributed, recycled, or disposed.
  - a) Transporting all usable and identifiable tagged gear to the aforementioned location once it is brought to shore [include "as detailed in your Contribution Agreement" if applicable].
  - b) Transporting and redistributing/recycling/disposing of all gear not requiring storage to [include specifics for disposal/recycling/reuse or refer to CA][ This clause can be removed totally for projects operating under GG Fund that have this information detailed in their CA].
- 5. Storing and organizing all usable tagged gear at the secure storage site [if storage is at a SCH location include: in consultation with Harbour Authority]. Any requests for

changes to the storage location must be approved by the Regional Ghost Gear Coordinator [insert contact information here].

- 6. Coordinating the return of usable tagged gear once owners have been identified by DFO. The licence holder is **not authorized** to return tagged gear to owners without first receiving approval from the Marine Mammal Hub [or Regional Ghost Gear Coordinator] [insert contact information here]. [Remove this clause for agreements with Harbour Authorities established through SCH as the HA is responsible for the return of gear].
- 7. Once gear has been returned to owner or ownership has been relinquished, sending a status update with the associated gear information to the DFO Hub at DFO.LostandRetrievedGear-EnginsPerdusRecupere.MPO@dfo-mpo.gc.ca. [Remove this clause for agreements with Harbour Authorities established through SCH as the HA is responsible for the return of gear].
- 8. As instructed by DFO, and within [timeframe] transporting any tagged gear that is unclaimed, relinquished, or whose owner cannot be determined to an appropriate site for [Insert that which applies (e.g., recycling, repurposing, redistributing, or disposing of at landfills)]. [include details of disposal plan (e.g., # of disposal bins at harbour, identification of agreement with recycling facility)]. Tags on gear that do not meet the criteria for secured storage must be removed from gear prior to any redistribution.
- 9. Clearing any materials (untagged gear, garbage, etc.) from the site, as agreed upon by DFO and/or the site authority, within [timeframe] of all gear being removed. [remove/modify if not applicable].
- 10. Providing confirmation that the site has been returned to its original condition and receiving sign-off from the site authority, or other agreed upon confirmation after cleanup, to the Regional Ghost Gear Coordinator [remove if not applicable].

\*Usable: Do you think the fishing gear can be reused or repaired by the owner? If yes, put it in secure storage. If not, treat it as a non-tagged gear.

Please review this document in its entirety, confirm your agreement below acknowledging the terms outlined above and return to the Regional Ghost Gear Coordinator:

Reviewed and approved by: [PROPONENT NAME] Reviewed and approved by [NAME OF SCH REGIONAL GHOST GEAR COORDINATOR] Date of agreement: [DATE]

Appendix: [List of relevant contacts: GG Coordinator, HA or site contact, etc.].

Appendix:

# **Contact Information**

Contact role	Name	Email	Phone number
DFO Ghost Gear			
Coordinator			
DFO Small Craft			
Harbour Coordinator			
Harbour Authority			

# **Deployment Form:**

			Dep	loyment		
DD/N	IM/YY:		Homeport:		Vessel:	
Capta	in:		Crew:		ALDFG Storage Location:	
Depai Time:						
	-		Return Time:			
G/C	Start time	End Time	Start Position	End Position	Gear Detection? Position/Time?	Retrieval Successful?

ľ				

Comments:

# **Retrieved Gear Form:**

\_\_\_\_\_

### **Retrieved Gear**

Return Time:\_\_\_\_\_

DD/MM/YY:\_\_\_\_\_ Captain:

Homeport:\_\_\_\_\_ Crew:\_\_\_\_\_\_

\_\_\_\_\_

Vessel:\_\_\_\_\_ ALDFG Storage Location:

Departure Time:\_\_\_\_\_

Position (lat/long)	Gear Type	Amoun t	Weight (lbs)	Length (ft)	Condition	Bycatch Sp.?	Amount ?	Dead/Aliv e?

Comments:\_\_\_\_