# The Cultural, Recreational and Commercial Importance of the Waters of Placentia Bay

## Component Study for the Environmental Impact Statement of the Placentia Bay Atlantic Salmon Aquaculture Project


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# Table of Contents

Page

# List of Figures

Page

# List of Tables

Page

# 1.0 Rationale/Objectives

This report and appendices form the Component Study on the *Cultural, Recreational, and Commercial Importance of the Waters of Placentia Bay* as required by the Final Environmental Impact Statement (EIS) Guidelines for the Placentia Bay Atlantic Salmon Aquaculture Project proposed by Grieg NL (NL DMAE 2018).

Placentia Bay is a deep, primarily ice free, south-facing bay on Newfoundland's south coast. The Bay and its many islands have long supported communities and a number of industries. While the fishery has been ongoing for hundreds of years, other types of industrial activity started in the late 1960s with the construction of a crude oil refinery and a phosphorus plant (now demolished) and continues today with a nickel processing and export facility, a ferry terminal, shipbuilding and offshore petroleum fabrication facilities, a crude oil transshipment terminal, and mussel/oyster aquaculture (Figure 1.1). In addition, there is tourism activity and associated recreational boating, and some seasonal use of previously vacated island communities. The entire Bay is characterized as an Ecologically and Biologically Significant Area (EBSA) (Templeman 2007). The salmon aquaculture project proposed by Grieg NL is of a different species and scale than previous aquaculture in Placentia Bay and, as such, it is of interest to consider it in the context of the ecology and human uses of the Bay.

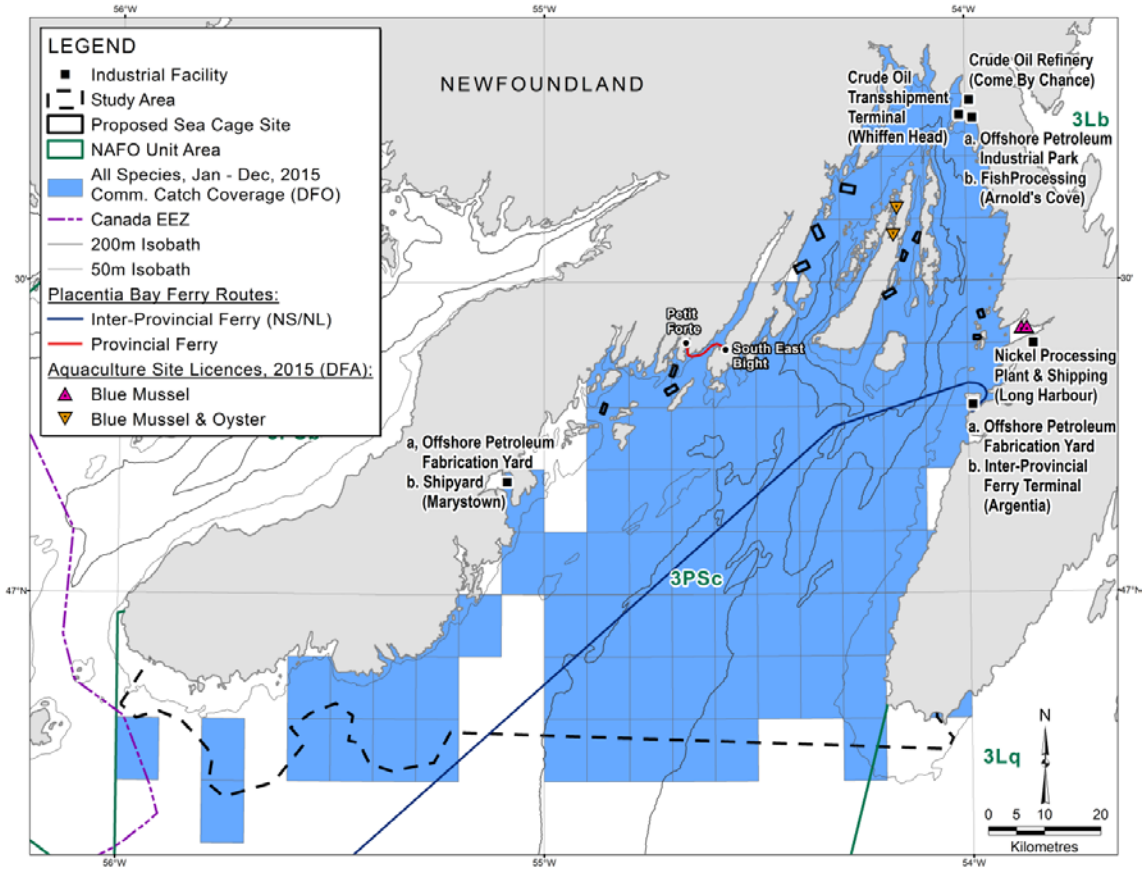



**Figure 1.1. Locations of industrial facilities and other commercial enterprises in Placentia Bay relative to the EIS Study Area and Grieg NL's proposed sea cage sites.**

## 1.1 EIS Guidelines

The EIS Guidelines (NL DMAE 2018) from the Committee appointed to manage the assessment of the proposed Grieg NL salmon aquaculture project under the NL *Environmental Protection Act* state that the Component Study shall provide "…a detailed description of the cultural, recreational and commercial usage of Placentia Bay, mitigative measures that will be undertaken to protect these uses from the potential effects of the project, and follow up monitoring that will be conducted to determine the effectiveness of mitigative measures and residual effects.

The component study will include, but not be limited to, a discussion of the following features:

a) fisheries;
b) tourism operators, outfitter camps, cabins, and recreational activities;
c) marine navigation (e.g., commercial and recreational boat traffic); and
d) unique sites or special features, environmentally sensitive areas, reserves or protected areas, conservation agreement lands, and habitat enhancement projects."

Given that a requirement of this Component Study is to identify mitigation measures and potential follow-up monitoring for effects of the Grieg NL Project, an overview of the Project is provided below.

## 1.2 Project Overview

The Placentia Bay Atlantic Salmon Aquaculture Project has two primary components: (1) a land-based Recirculating Aquaculture System (RAS) Hatchery located in the Marystown Marine Industrial Park and (2) sea cage sites located in the northern portion of Placentia Bay that will be used to grow the salmon to market size (Figure 1.2). The development of the Project, including Construction and Operations/Maintenance of the RAS Hatchery and sea farms, will undergo a phased approach before reaching peak production of seven million salmon per year. It is anticipated that the RAS Hatchery will be operational in Year 2 and reach full production capacity (i.e., steady state) in Year 6. The first harvest at peak production at the sea farms is anticipated to occur in Year 8.

At the RAS Hatchery, smolt will be grown to sizes ranging from 350–1,400 g and then will be transferred to a well boat and delivered directly to sea cage sites. Eleven sea cage sites will be located within four Bay Management Areas (BMAs), which have been established for biosecurity purposes. Three of the BMAs are planned for semi-annual production and one BMA is planned for seasonal production. The semi-annual and seasonal sea cage sites will each have a maximum of 12 and 6 sea cages, respectively. Each of these sea cages can hold 160,000 salmon. At peak production, there will be seven active sea cage sites with 78 sea cages in operation per year.

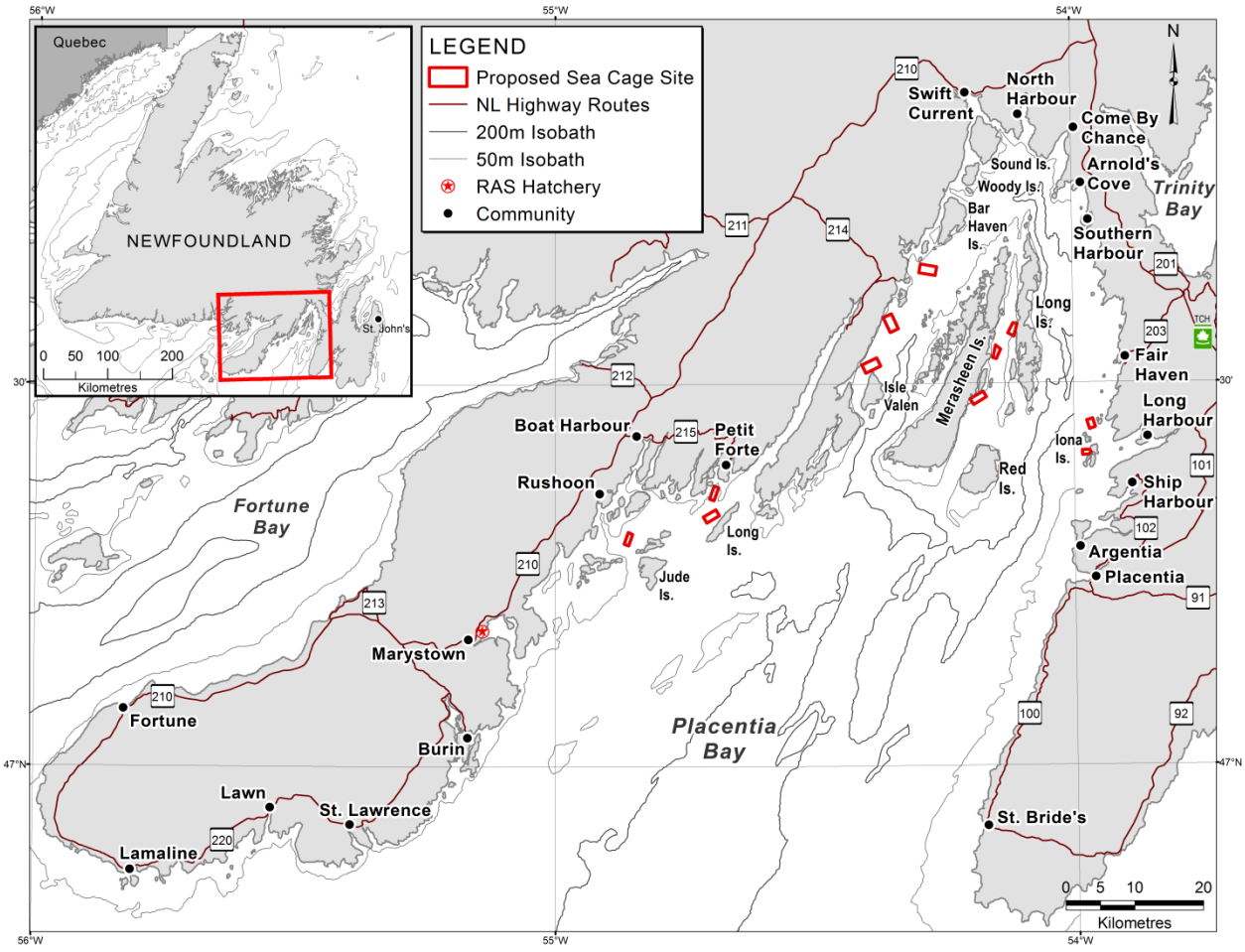



**Figure 1.2. Location of the proposed RAS Hatchery and sea cage sites in Placentia Bay.**

Each sea cage site will be attended by several vessels including a feed/accommodation barge, satellite feed barge, service vessel, crew vessel, and a work boat. Once salmon have reached market size they will be transferred to a dead hold vessel[1] and then onto to a third-party for processing.

Personnel working at the sea cage sites will be transported via dedicated crew vessels. Grieg NL anticipates one-week shifts at sea where personnel will live aboard the feed/accommodation barge. The crew change sites will have specific areas for embarkation to and disembarkation from the proposed sea cage sites, which is designed to avoid cross-contamination. Crew changes for the proposed sea cage sites in the Rushoon, Merasheen and Red Island BMAs will be conducted via the community wharf in Petit Fort, and via the community wharf in Long Harbour for the Long Harbour BMA (Figure 1.3).

[1] The dead hold vessel will be equipped with a compact containerized system for electrical stunning and killing/bleeding the salmon.

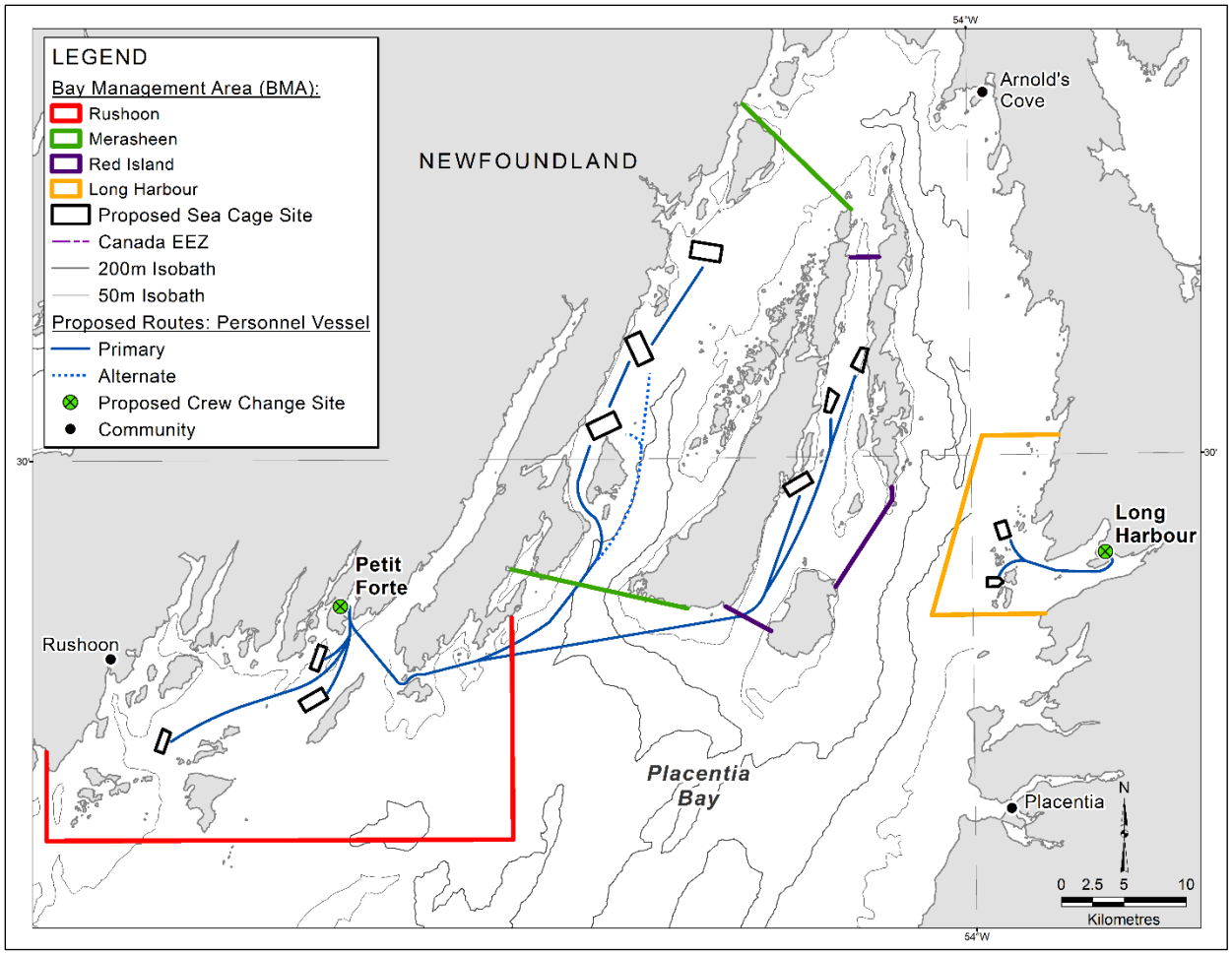



**Figure 1.3. Proposed vessel routes for crew changes for the Rushoon, Merasheen, Red Island and Long Harbour BMAs.**

Services and supplies for all BMAs will be provided using wharf facilities at two former Ocean Choice International (OCI) premises, one each in Marystown and Burin (Figure 1.4). One of the resupply sites will be designated "inflow" and the other "outflow" to prevent cross-contamination of clean/new equipment going to the sea cage sites and used equipment returning for cleaning and servicing. Additionally, the resupply site designated as outflow will receive waste (including ensilage) from the sea cage sites.

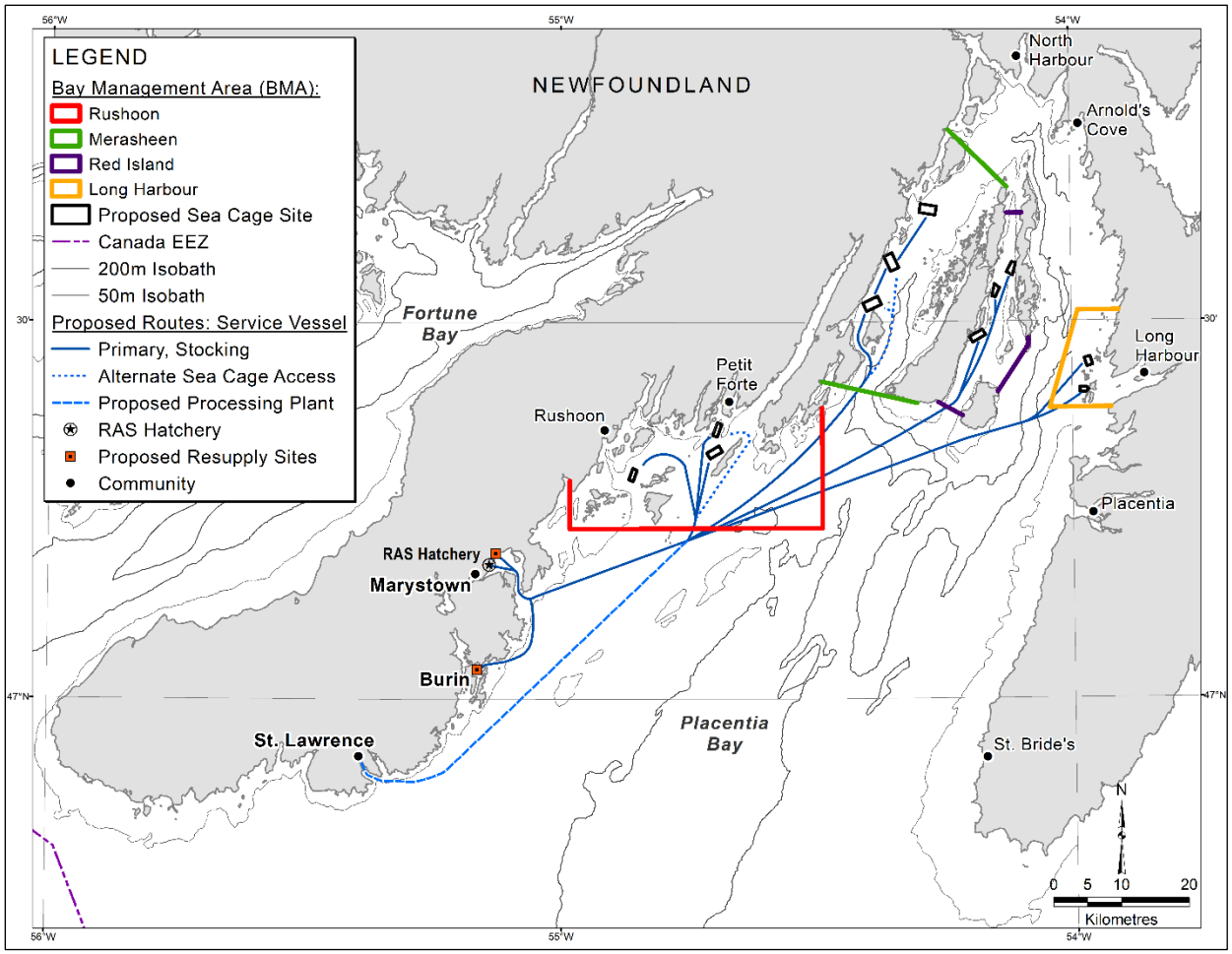



**Figure 1.4. Proposed service vessel routes for the Rushoon, Merasheen, Red Island and Long Harbour BMAs.**

## 2.0 Study Area

The boundaries of the Study Area correspond to those of the Placentia Bay Extension EBSA (DFO 2012a) (Figure 2.1). Within the Study Area, the focus of this Component Study is the specific locations proposed for sea cages as well as the coastal communities directly supporting the project, i.e., Marystown's industrial area where the RAS Hatchery will be located and the smaller communities that will provide access to and from the sea cages for crews and materials.

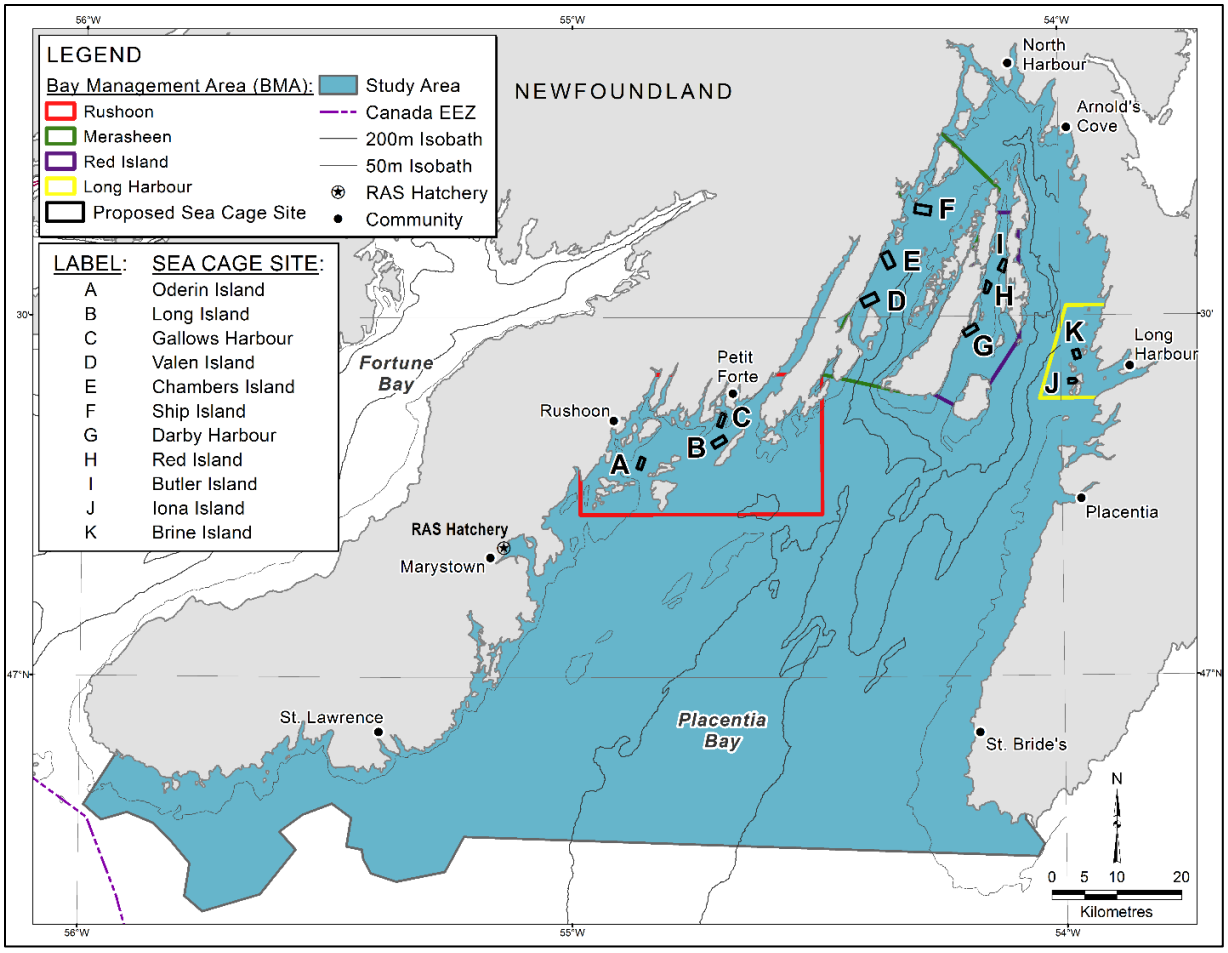



**Figure 2.1. The locations of the Study Area, Bay Management Areas, and proposed sea cage sites for Grieg NL's Placentia Bay Atlantic Salmon Aquaculture Project.**

# 3.0 Methodology

Information for this report has been drawn from federal, provincial and municipal government records, information and personnel; relevant academic and research documents; recent environmental impact assessments; the work of the Placentia Bay Integrated Management Planning Committee and the Placentia Bay Traffic Committee; discussions with fishers in the BMAs; and consultation with individuals, non-governmental organizations and community organizations. Specific sources are referenced in the relevant sections of this report. The desktop review provided both quantitative and qualitative information.

# 4.0 Study Outputs

## 4.1 Fisheries

Fisheries in Placentia Bay were previously described in Volume 4 of the Newfoundland and Labrador Refining Corporation Refinery Project EIS (NLRC 2007), and Volume 3 of the Vale

Inco Long Harbour Nickel Processing Plant EIS (Vale 2008). An overview of fisheries within the Study Area, based on information in NLRC (2007), Vale (2008) and new information, is provided below. This subsection describes the commercial fishery in the Study Area during 2010–2015 using the DFO Database and 2010–2016 using the Northwest Atlantic Fisheries Organization (NAFO) STATLANT21A database, historical commercial fisheries, aquaculture activity, recreational and indigenous fisheries, industry and scientific surveys, and seabird hunting.

### 4.1.1 Commercial, Recreational, and Indigenous Fisheries

#### 4.1.1.1 Information Sources

The primary fisheries data analyses use all DFO Atlantic Region's georeferenced landings data for 2010, as well as gridded cell landings for 2011–2015 (Table 4.1). These DFO datasets record domestic harvest landed in Canada. The 2010 data are georeferenced in two ways: (1) by latitude and longitude (degrees and minutes) of the gear set location; and (2) by NAFO Unit Area (UA) in which the catch was harvested. Georeferencing by latitude and longitude allows the mapping of specific harvesting locations. Areas farther from shore, generally fished by larger vessels, tend to have a greater proportion of their catches georeferenced than those closer to shore. Certain inshore species (e.g., lobster) are not georeferenced. While approximately 60% of the 2010 data have associated latitude and longitude information, virtually all of the data have a UA designation. The UA designation allows all the harvesting data to be tabulated according to these fisheries management areas. The data for 2011 and later are provided by DFO as annual ranges of catch weight and catch value quartiles within 6'x6' cells (i.e., 6 minutes latitude by 6 minutes longitude) (LGL 2015).

**Table 4.1. Summary of information sources for commercial fisheries data.**

| Data Source | Domestic/Foreign Fisheries | Temporal Period | Geographic Area | Spatial Resolution |
|---|---|---|---|---|
| DFO | Domestic | 2010–2015 | Study Area | Geo-referenced/3PSc (2010)<br>Gridded 6'x6' cells (2011+) |
| NAFO | Domestic/Foreign | 2010–2016<br>(1986–2016 for historical overview) | NAFO Div. 3Ps | NAFO Divisions |

NAFO catch weight data are used to describe domestic and foreign commercial fisheries within NAFO Division (Div.) 3Ps, within which the Study Area is located (Figure 4.1). The NAFO data were obtained from the STATLANT21A dataset for 2010–2016 (see Table 4.1). The STATLANT reporting system of questionnaires data is a long-standing standardized statistical inquiry for submission of national catch data to international fisheries agencies. Rather than being georeferenced, these STATLANT data are geographically resolved at the NAFO Division level only (LGL 2015).

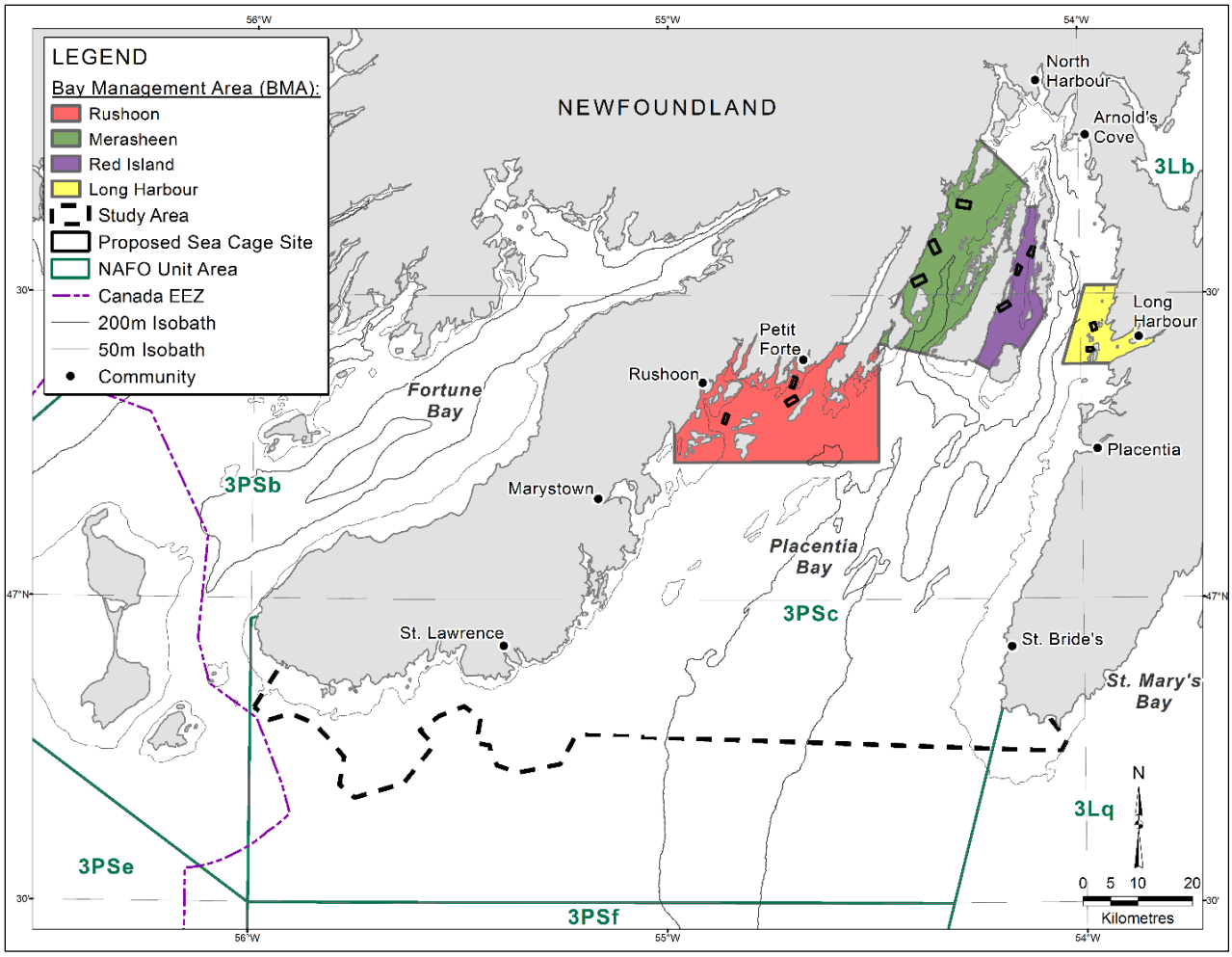



**Figure 4.1. Study Area in relation to regional fisheries management areas (NAFO Divisions and Unit Areas).**

The maps in this subsection show harvesting locations as points within the Study Area for 2010, based on the latitude and longitude DFO data. Since the data coordinates provided are those recorded in the vessel's fishing log and are reported in the DFO dataset by degree and minute of latitude/longitude, the position should be accurate to within approximately 925 m (0.5 nm) of the reported coordinates. The points are not "weighted" by quantity of harvest, but show where fishing effort was recorded. Such location data have proven to be particularly useful in understanding the likely location of gear concentrations and timing of fisheries in order to minimize potential conflict between the fishers and other marine users. DFO catch data for 2011 onwards, based on 6'x6' cells, are displayed as uniformly-coloured grid cells representing cells within which any level of harvesting was reported (LGL 2015).

The data primarily used to characterize the fisheries within this subsection are harvest catch weights (or catch weight quartile range codes for DFO data for 2011+). Catch value is used to demonstrate that some species have lower ranked catch weights but are highly ranked in terms of value.

Various stakeholder groups/individuals were involved in Project consultations related to fisheries. One purpose of the consultations was to gather both spatial and temporal information about fisheries and to determine any issues or concerns to be considered for the Project (Appendix A). Other sources used for this subsection include DFO species management plans and decisions, DFO stock status reports and other internal DFO documents, a previous EIS report for Placentia Bay (Vale 2008), and grey literature (e.g., FFAW|UNIFOR reports).

#### 4.1.1.2 NAFO Fisheries in Division 3Ps, 2010–2016

During the 2010–2016 period, commercial harvest catch weight within NAFO Div. 3Ps was dominated by Atlantic cod (*Gadus morhua*; 26% of total catch weight), snow crab (*Chionoecetes opilio*; 21%) and whelks (Buccinidae; 15%), followed by Atlantic herring (*Clupea harengus*; 7%), unidentified marine invertebrates (5%), American lobster (*Homarus americanus*) and sea scallop (*Placeopecten magellanicus*; 4% each), and Atlantic redfishes (*Sebastes fasciatus*; 3%). Canadian vessels accounted for 92% of the commercial catch weight reported for Div. 3Ps during 2010–2016, including harvesters from Newfoundland (87%), Nova Scotia/Bay of Fundy (3%) and the Maritimes (2%). Foreign vessels from St. Pierre et Miquelon accounted for the remaining 8% of the harvest.

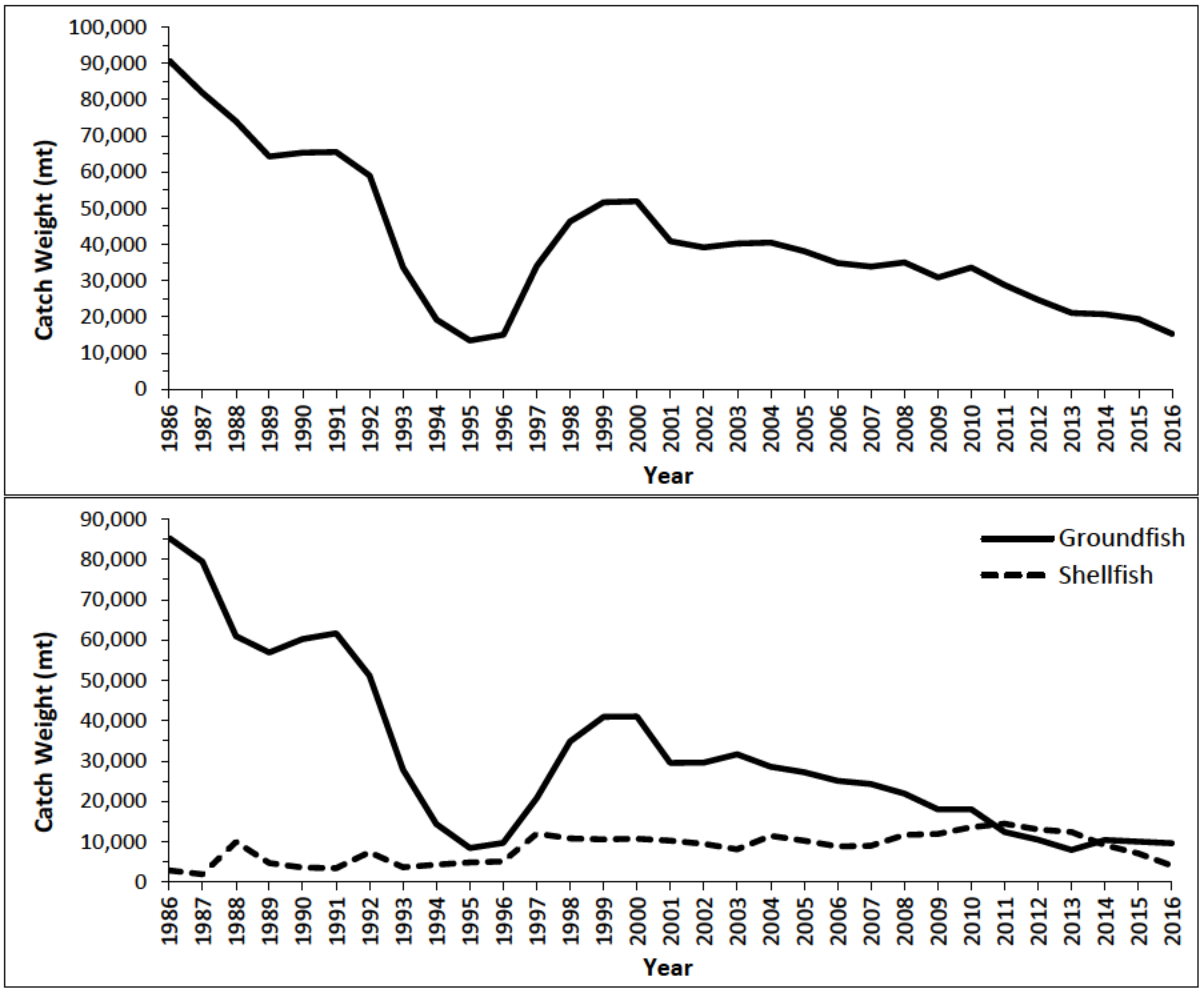
#### 4.1.1.3 Domestic Fisheries in the Study Area

The following subsection describes the commercial fisheries in the Study Area. Historical fishing activity in the Study Area during 1986–2016, including abundance data for historically principal species, is presented. Statistical summaries of the commercial catch data specific to the Study Area, including species' harvest, harvest locations, fishing gear types and harvest seasonality, based on the georeferenced latitude/longitude data for 2010 and annual gridded cell (6'x6') data for 2011–2015 are also provided. Harvest information within this subsection includes wild (i.e., non-aquaculture) captures within the Placentia Bay area only. Information relating to aquaculture fisheries is presented in a separate subsection below.

***Historical Fisheries, 1986–2016***

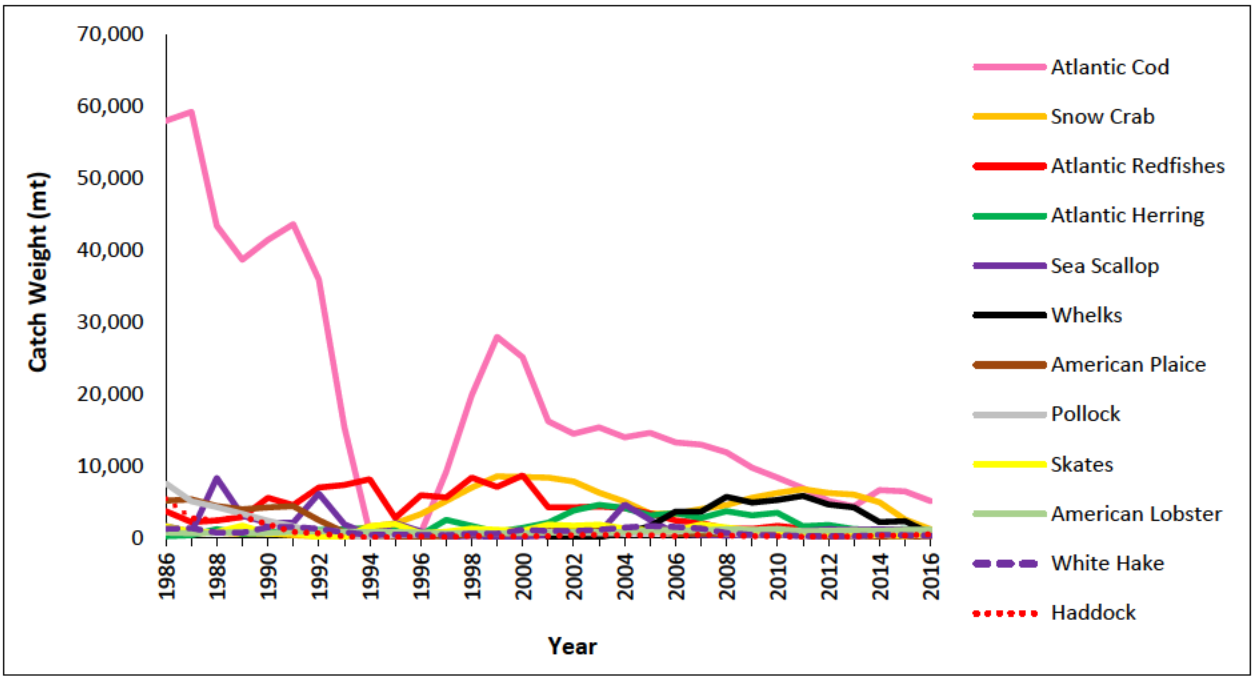
Commercial fisheries in many parts of Newfoundland and Labrador fisheries have undergone considerable changes over the last three decades, shifting in many locations from a groundfish-based to a shellfish-based industry (LGL 2015). Currently there is a shift back to a groundfish-based fishery (Figure 4.2). In the early 1990s, a harvesting moratorium was declared due to the collapse of several groundfish (i.e., demersal) stocks, resulting in the prohibition of directed fisheries for Atlantic cod and other groundfish species in most areas (Vale 2008; LGL 2015). The cod stock in NAFO Div. 3Ps was subject to a moratorium on all fishing from August 1993 to the end of 1996 (Rideout et al. 2017). Atlantic cod comprised ~50–70% of the annual catch weight within Div. 3Ps during 1986–1993, with other groundfish species such as Atlantic redfishes, American plaice (*Hippoglossoides platessoides*), pollock (*Pollachius virens*) and haddock (*Melanogrammus aeglefinus*) accounting for ~20% of the remaining total annual catch weight and snow crab for ≤1%. Immediately after the moratorium was declared, Atlantic cod harvests comprised only 5% of the annual catch weight, while the proportion of snow crab harvests increased to ~10–23%. During this time, catch weights of Atlantic redfishes increased

by ~30%. In 1997, a limited cod fishery was reinstated in NAFO UA 3PSc (i.e., Placentia Bay) under a strict management regime (Vale 2008). Since then, Atlantic cod and snow crab have been the principal species harvested in Div. 3Ps, accounting for approximately 50–75% of the total annual catch weight per year. Atlantic redfish catches have decreased since 1997 (Figure 4.3). During 2011–2013, shellfish (primarily snow crab and whelks) accounted for a greater proportion of the total harvest in Div. 3Ps than did groundfish. However, since 2014, this trend has reversed (primarily due to Atlantic cod) (Figures 4.2–4.3). During 2016, the commercial fishery harvest in Div. 3Ps was dominated by Atlantic cod (34% of total catch weight), followed by unidentified marine invertebrates (11%), snow crab (8%), Atlantic herring (7%) and American lobster (7%).



Source: NAFO STATLANT21A Data Extraction Tool.

**Figure 4.2. Historical catch weights for all species (top), and all groundfish and shellfish (bottom) in the commercial fisheries in NAFO Division 3Ps, all countries, 1986–2016.**

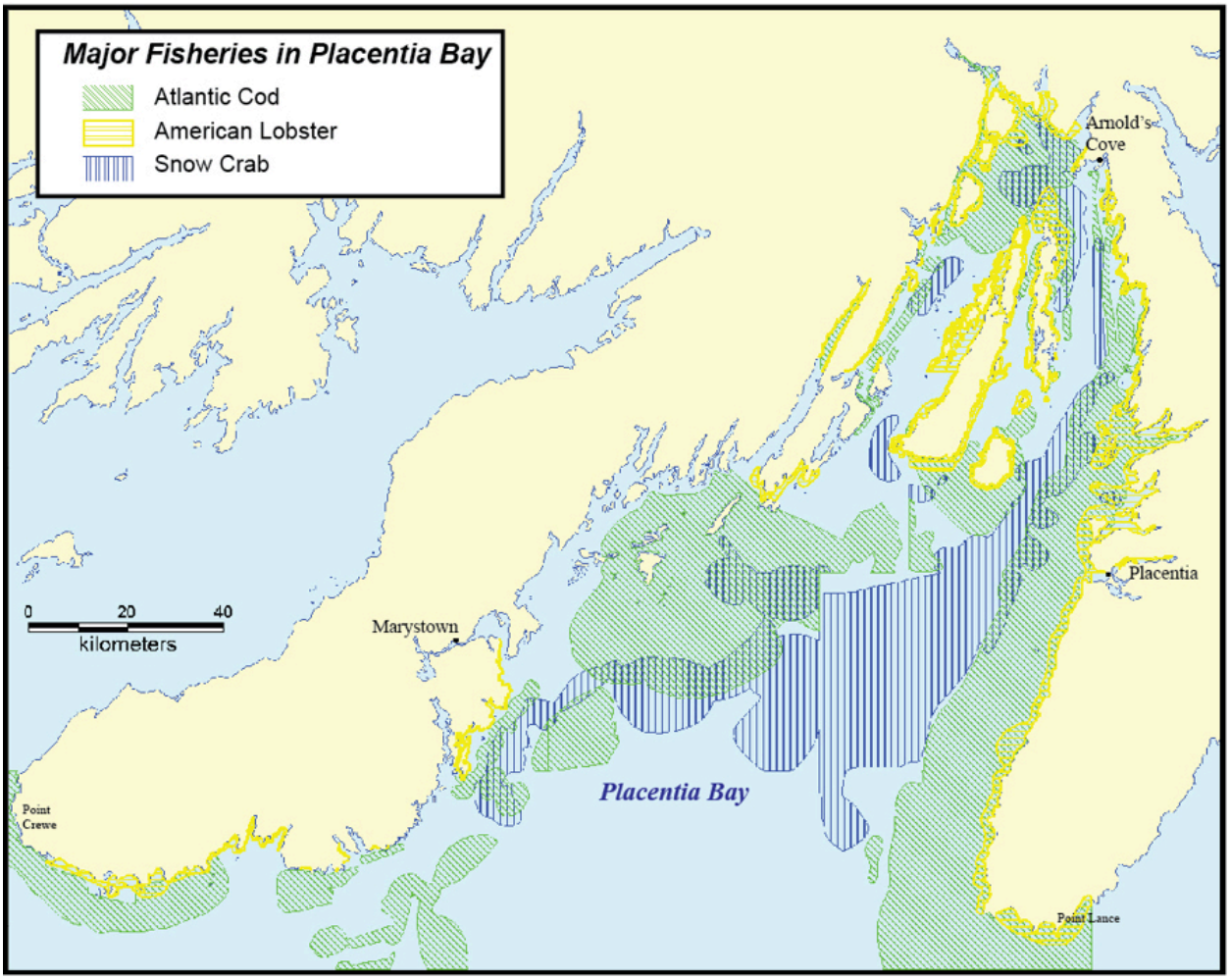



Source: NAFO STATLANT21A Data Extraction Tool.

**Figure 4.3. Historical catch weights for predominant species in the commercial fisheries in NAFO Division 3Ps, all countries, 1986–2016.**

During 1986–1995, harvest catch weight in Placentia Bay (NAFO UA 3PSc) declined by ~90%, from over 17,000 mt to ~2,000 mt. However, the landed value of the Placentia Bay commercial harvesting did not undergo a similar decline during this period due to the altered catch composition (predominantly high value species such as lobster, snow crab and lumpfish roe [*Cyclopterus lumpus*]) (Vale 2008). Despite a considerable decrease in total catch weight, the value of the fishery in Placentia Bay was only 8% less in 1995 (~$9,740,000) than in 1986 (~$10,634,000) (Vale 2008). Harvest value continued to increase in Placentia Bay, rising to over $18 million by 2002 (Vale 2008). The impact of the decline in the cod fishery was partially mitigated by a strong crab fishery and high crab prices prior to 2014, whereby "an active enterprise in Placentia Bay earned ~$53,000 from the crab fishery compared with just ~$10,000 from the cod" (between 2011 and 2014; FFAW 2016). Since 2014, the crab fishery has declined (see Figure 4.3), with the average inshore under 40' enterprise crab revenue of ~$35,000 during 2015 anticipated to decline to ~$10,000 (FFAW 2016).

Since 1996, DFO has been working with community groups to document coastal fisheries resources. This information has been collected through direct contact with individuals and stakeholders in coastal communities around the province, including Placentia Bay (DFO 2008). Knowledgeable people in communities in the Placentia Bay area were interviewed to identify areas where specific resources were known to occur. As a result, DFO was able to produce Community-Based Coastal Resource Inventories (CCRIs) and maps such as Figure 4.4, demonstrating the locations of major fisheries in Placentia Bay (DFO 2008).




Source: DFO (2008).

**Figure 4.4. Locations of major fisheries in Placentia Bay, based on Community-Based Coastal Resource Inventories (CCRIs).**

The fisheries, fisheries management and licencing regimes have evolved since the mid-1990s, particularly with respect to a fish harvesting rationalization strategy that reduced the number of participants in the harvesting sector, and a professionalization process which prescribes specific levels of experience and training required to be a professional fish harvester (Vale 2008). DFO also introduced the "core" harvesting enterprise designation, with restrictions placed on harvesters who are not part of such an enterprise (Vale 2008). An enterprise combining policy was developed in 2007 and implemented in 2008, allowing individual Independent Core (IC) enterprise holders to buy other IC licence holders (or Core licence holders) (DFO 2013). Any enterprise combining transaction must result in the removal of one IC (or Core) enterprise, a vessel registration and any duplicate species licences (DFO 2013). A buddy-up system was implemented for the <40' sector in the early 2000s, where two enterprise heads could be on board a vessel (DFO 2013). New entrants (as Core enterprise heads) to the <40' sector were permitted to either combine enterprises or buddy-up, but not both, for a five year period following the acquisition of a Core enterprise (DFO 2013). As of 2017, a combining policy for

NAFO Div. 3Ps permits three to one enterprise combining for the entire fleet, and combined enterprises in the 3Ps <40' fleet are permitted to buddy-up (DFO 2017a). In order to assist the inshore northern shrimp fleet in 3Ps deal with the impact of recent quota reductions, DFO considered temporary flexible harvest arrangements between enterprises for 2017 as a short-term option, and is working towards longer-term measures to increase opportunities for the remaining enterprises (DFO 2017a).

On 28 April 2017, the Fish, Food and Allied Workers Union (FFAW) held meetings with representatives for the fishing fleet in Placentia Bay and the 3Ps supplementary fleet to discuss the resource and economic difficulties affecting harvesters in that region during recent years (FFAW|Unifor 2017a). During these meetings, a variety of short- and long-term measures were discussed to ensure stable and sustainable futures for the region's harvesters and communities, including increasing the number of sea cucumber licences, securing a reasonable share of the valuable halibut stock, providing greater opportunities for the whelk fishery, and ensuring that the inshore fleet has exclusive access to the 3Ps cod quota once that quota decreases below 10,000 mt (FFAW|Unifor 2017a). DFO hosted a meeting for NAFO Div. 3Ps fishers in Placentia on 20 November 2017 to provide inshore harvesters and other interested stakeholders an opportunity to discuss concerns regarding the current inshore fisheries and to develop feasible solutions for these concerns (DFO 2017b).

### *Study Area Catch Analysis, 2010–2015*

Information on Study Area domestic harvests during 2010 are shown in Table 4.2, and during 2011–2015 in Tables 4.3–4.7. The total catch weight of commercial fisheries within the Study Area (NAFO UA 3PSc; see footnote in Table 4.2) during 2010 was 6,716 mt (Figure 4.5). In descending order of reported catch weight, the principal fisheries in 2010 were Atlantic cod (40% of the total catch weight) and snow crab (28%), followed by Atlantic herring (14%) and sea cucumber (13%). Snow crab and Atlantic cod also accounted for the majority of commercial harvest catch weight in the Study Area during 2011–2015. Other notable species harvested during 2010–2015 in the Study Area include lobster, sea scallop, American plaice and Atlantic herring. Aside from a slight increase in 2013, the sum of quartile catch ranges in the Study Area has steadily decreased since 2011 (Figure 4.5).

**Table 4.2. Study Area [a] annual catch weight and value by species, 2010.**

| Species | Quantity | | Value | |
|---|---|---|---|---|
| | mt | % of Total | $CAD | % of Total |
| Atlantic Cod | 2,674 | 40 | 2,652,313 | 27 |
| Snow Crab | 1,908 | 28 | 5,677,598 | 58 |
| Atlantic Herring | 917 | 14 | 180,561 | 2 |
| Sea Cucumber | 843 | 13 | 557,465 | 6 |
| Mackerel | 83 | 1 | 36,451 | 0.4 |
| Winter Flounder | 78 | 1 | 39,965 | 0.4 |
| Lobster | 60 | 1 | 437,663 | 4 |
| Whelk | 49 | 1 | 42,197 | 0.4 |
| American Plaice | 42 | 1 | 28,908 | 0.3 |
| Sea Scallop | 30 | 0.4 | 53,066 | 1 |
| Pollock | 19 | 0.3 | 10,027 | 0.1 |
| Skates | 5 | 0.1 | 1,393 | <0.1 |

| Species | Quantity | | Value | |
|---|---|---|---|---|
| | mt | % of Total | $CAD | % of Total |
| Redfish | 3 | <0.1 | 1,792 | <0.1 |
| Lumpfish Roe | 1 | <0.1 | 13,139 | 0.1 |
| White Hake | 1 | <0.1 | 1,363 | <0.1 |
| Yellowtail Flounder | 1 | <0.1 | 691 | <0.1 |
| Atlantic Halibut | 1 | <0.1 | 7,563 | 0.1 |
| Atlantic Haddock | 0.5 | <0.1 | 361 | <0.1 |
| Atlantic Rock Crab | 0.4 | <0.1 | 335 | <0.1 |
| Monkfish | 0.2 | <0.1 | 163 | <0.1 |
| Greenland Halibut | 0.1 | <0.1 | 199 | <0.1 |
| Witch Flounder | <0.1 | <0.1 | 20 | <0.1 |
| Sturgeon | <0.1 | <0.1 | 20 | <0.1 |
| Porbeagle Shark | <0.1 | <0.1 | 19 | <0.1 |
| **Total** | **6,716** | **100** | **9,743,271** | **100** |

Source: DFO Commercial Landings Database, All Atlantic Regions (2010).

[a] Georeferenced (latitude/longitude) data were not available within the DFO 2010 database for all or virtually all of the recorded harvest for Atlantic haddock, pollock, redfish, monkfish, Atlantic halibut, Greenland halibut, winter flounder, yellowtail flounder, witch flounder, skates, white hake, lobster, Atlantic rock crab, whelk, lumpfish roe, mackerel, porbeagle shark, sea cucumber and sturgeon; and for ~25-50% of records for Atlantic cod, snow crab, American plaice and mackerel. Therefore, catch quantity and value data are presented for NAFO UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).

**Table 4.3. Commercial catch weights and values in the Study Area, 2011 (values indicate the frequency of catch weight and value quartile codes [i.e., 1–4] attributed to each species).**

| Species | Catch Weight Quartile Code Counts [a] | | | | Catch Value Quartile Code Counts [b] | | | | Total Counts [c] |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| Snow Crab | 75 | 121 | 103 | 6 | 50 | 99 | 111 | 45 | 305 |
| Atlantic Cod | 61 | 52 | 14 | 0 | 91 | 32 | 4 | 0 | 127 |
| American Plaice | 6 | 24 | 3 | 0 | 16 | 15 | 2 | 0 | 33 |
| Sea Scallop | 22 | 1 | 0 | 0 | 22 | 1 | 0 | 0 | 23 |
| Redfish | 0 | 7 | 1 | 0 | 4 | 4 | 0 | 0 | 8 |
| Atlantic Halibut | 1 | 2 | 2 | 0 | 2 | 3 | 0 | 0 | 5 |
| Greenland Halibut | 2 | 1 | 1 | 0 | 3 | 1 | 0 | 0 | 4 |
| Winter Flounder | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 2 |
| Mackerel | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 2 |
| Monkfish | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| Pollock | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Atlantic Herring | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Skates | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| **Total – Counts** | **167** | **214** | **127** | **6** | **194** | **157** | **118** | **45** | **514** |
| **Total – Sum (Weight=1,000; Value=1,042)** | **167** | **428** | **381** | **24** | **194** | **314** | **354** | **180** | **-** |
| Lobster [d] | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 5 | 5 |
| **Total – Sum (Weight=20; Value=20)** | **0** | **0** | **0** | **20** | **0** | **0** | **0** | **20** | **-** |

Source: DFO Commercial Landings Database, All Regions (2011).

[a] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined). 2011 quartile ranges: 1 = 0 – 2,377 kg, 2 = 2,378 – 11,045 kg, 3 = 11,046 – 45,183 kg, 4 = ≥ 45,184 kg.

[b] Quartile ranges provided by DFO (Quartile ranges calculated annually by DFO based on total catch values in a given year, all species combined). 2011 quartile ranges: 1 = $0 – $7,281, 2 = $7,282 – $32,789, 3 = $32,790 – $126,294, 4 = ≥ $126,295.

[c] Total counts of the number of catch records per species; the total quartile range counts for catch weight and catch value are equal.

[d] Lobster harvests in the DFO Database are categorized by NAFO UA and are not georeferenced; quartile code counts are presented for UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).

**Table 4.4. Commercial catch weights and values in the Study Area, 2012 (values indicate the frequency of catch weight and value quartile codes [i.e., 1–4] attributed to each species).**

| Species | Catch Weight Quartile Code Counts [a] | | | | Catch Value Quartile Code Counts [b] | | | | Total Counts [c] |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| Snow Crab | 59 | 137 | 100 | 13 | 43 | 125 | 96 | 45 | 309 |
| Atlantic Cod | 85 | 41 | 5 | 0 | 114 | 17 | 0 | 0 | 131 |
| American Plaice | 9 | 11 | 0 | 0 | 17 | 3 | 0 | 0 | 20 |
| Sea Scallop | 11 | 1 | 0 | 0 | 12 | 0 | 0 | 0 | 12 |
| Redfish | 5 | 6 | 0 | 0 | 10 | 1 | 0 | 0 | 11 |
| Winter Flounder | 5 | 4 | 0 | 0 | 8 | 1 | 0 | 0 | 9 |
| Greenland Halibut | 4 | 5 | 0 | 0 | 7 | 2 | 0 | 0 | 9 |
| Pollock | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 3 |
| Iceland Scallop | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| Atlantic Halibut | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
| Skates | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Mackerel | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| **Total – Count** | **182** | **209** | **106** | **13** | **218** | **151** | **96** | **45** | **510** |
| **Total – Sum (Weight=970; Value=988)** | **182** | **418** | **318** | **52** | **218** | **302** | **288** | **180** | **-** |
| Lobster [d] | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 4 |
| **Total – Sum (Weight=16; Value=16)** | **0** | **0** | **0** | **16** | **0** | **0** | **0** | **16** | **-** |

Source: DFO Commercial Landings Database, All Regions (2012).

[a] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined). 2012 quartile ranges: 1 = 0 – 2,618 kg, 2 = 2,619 – 12,233 kg, 3 = 12,234 – 47,739 kg, 4 = ≥ 47,740 kg.

[b] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch values in a given year, all species combined). 2012 quartile ranges: 1 = $0 – $8,240, 2 = $8,241 – $35,022, 3 = $35,023 – $130,732, 4 = ≥ $130,733.

[c] Total counts of the number of catch records per species; the total quartile range counts for catch weight and catch value are equal.

[d] Lobster harvests in the DFO Database are categorized by NAFO UA and are not georeferenced; quartile code counts are presented for UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).

**Table 4.5. Commercial catch weights and values in the Study Area, 2013 (values indicate the frequency of catch weight and value quartile codes [i.e., 1–4] attributed to each species).**

| Species | Catch Weight Quartile Code Counts [a] | | | | Catch Value Quartile Code Counts [b] | | | | Total Counts [c] |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| Snow Crab | 94 | 148 | 119 | 12 | 79 | 120 | 145 | 29 | 373 |
| Atlantic Cod | 93 | 59 | 2 | 0 | 123 | 30 | 1 | 0 | 154 |
| Sea Scallop | 18 | 3 | 0 | 0 | 21 | 0 | 0 | 0 | 21 |
| American Plaice | 1 | 13 | 1 | 0 | 9 | 5 | 1 | 0 | 15 |
| Pollock | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 5 |
| Winter Flounder | 0 | 5 | 0 | 0 | 3 | 2 | 0 | 0 | 5 |
| Atlantic Herring | 2 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 4 |
| Redfish | 0 | 4 | 0 | 0 | 3 | 1 | 0 | 0 | 4 |
| Whelk | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| Greenland Halibut | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 2 |
| Skates | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| Atlantic Halibut | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Capelin | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |

| Species | Catch Weight Quartile Code Counts [a] | | | | Catch Value Quartile Code Counts [b] | | | | Total Counts [c] |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| **Total – Count** | **211** | **240** | **124** | **14** | **250** | **162** | **148** | **29** | **589** |
| **Total – Sum (Weight=1,119; Value=1,134)** | **211** | **480** | **372** | **56** | **250** | **324** | **444** | **116** | **-** |
| Lobster [d] | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 5 | 5 |
| **Total – Sum (Weight=20; Value=20)** | **0** | **0** | **0** | **20** | **0** | **0** | **0** | **20** | **-** |

Source: DFO Commercial Landings Database, All Regions (2013).

[a] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined). 2013 quartile ranges: 1 = 0 – 2,565 kg, 2 = 2,566 – 11,872 kg, 3 = 11,873 – 48,585 kg, 4 = ≥ 48,586 kg.

[b] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch values in a given year, all species combined). 2013 quartile ranges: 1 = $0 – $8,934, 2 = $8,395 – $35,699, 3 = $35,700 – $125,728, 4 = ≥ $125,729.

[c] Total counts of the number of catch records per species; the total quartile range counts for catch weight and catch value are equal.

[d] Lobster harvests in the DFO Database are categorized by NAFO UA and are not georeferenced; quartile code counts are presented for UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).

**Table 4.6. Commercial catch weights and values in the Study Area, 2014 (values indicate the frequency of catch weight and value quartile codes [i.e., 1–4] attributed to each species).**

| Species | Catch Weight Quartile Code Counts [a] | | | | Catch Value Quartile Code Counts [b] | | | | Total Counts [c] |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| Snow Crab | 116 | 107 | 75 | 8 | 87 | 116 | 82 | 21 | 306 |
| Atlantic Cod | 67 | 45 | 28 | 1 | 100 | 38 | 3 | 0 | 141 |
| Sea Scallop | 14 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 14 |
| American Plaice | 2 | 3 | 3 | 0 | 4 | 4 | 0 | 0 | 8 |
| Greenland Halibut | 1 | 2 | 3 | 0 | 3 | 3 | 0 | 0 | 6 |
| Atlantic Herring | 0 | 0 | 1 | 4 | 1 | 2 | 2 | 0 | 5 |
| Redfish | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 2 |
| Pollock | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 2 |
| Atlantic Halibut | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| Yellowtail Flounder | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| **Total – Count** | **201** | **157** | **114** | **14** | **210** | **167** | **88** | **21** | **486** |
| **Total – Sum (Weight=913; Value=892)** | **201** | **314** | **342** | **56** | **210** | **334** | **264** | **84** | **-** |
| Lobster [d] | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 3 |
| **Total – Sum (Weight=12; Value=12)** | **0** | **0** | **0** | **12** | **0** | **0** | **0** | **12** | **-** |

Source: DFO Commercial Landings Database, All Regions (2014).

[a] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined). 2014 quartile ranges: 1 = 0 – 2,421 kg, 2 = 2,422 – 10,786 kg, 3 = 10,787 – 42,872 kg, 4 = ≥ 42,873 kg.

[b] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch values in a given year, all species combined). 2014 quartile ranges: 1 = $0 – $8,851, 2 = $8,852 – $38,076, 3 = $38,077 – $140,695, 4 = ≥ $140,696.

[c] Total counts of the number of catch records per species; the total quartile range counts for catch weight and catch value are equal.

[d] Lobster harvests in the DFO Database are categorized by NAFO UA and are not georeferenced; quartile code counts are presented for UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).

**Table 4.7. Commercial catch weights and values in the Study Area, 2015 (values indicate the frequency of catch weight and value quartile codes [i.e., 1–4] attributed to each species).**

| Species | Catch Weight Quartile Code Counts [a] | | | | Catch Value Quartile Code Counts [b] | | | | Total Counts [c] |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| Snow Crab | 186 | 140 | 25 | 0 | 156 | 137 | 58 | 0 | 351 |
| Atlantic Cod | 77 | 52 | 12 | 1 | 114 | 27 | 1 | 0 | 142 |
| Sea Scallop | 23 | 6 | 0 | 1 | 27 | 3 | 0 | 0 | 30 |
| American Plaice | 4 | 8 | 1 | 0 | 11 | 2 | 0 | 0 | 13 |
| Greenland Halibut | 5 | 8 | 0 | 0 | 9 | 4 | 0 | 0 | 13 |
| Atlantic Herring | 0 | 0 | 3 | 6 | 3 | 6 | 0 | 0 | 9 |
| Iceland Scallop | 1 | 3 | 1 | 0 | 4 | 1 | 0 | 0 | 5 |
| Redfish | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 4 |
| Winter Flounder | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 3 |
| Atlantic Rock Crab | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Atlantic Halibut | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Bluefin Tuna | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| **Total – Count** | **300** | **222** | **43** | **8** | **332** | **182** | **59** | **0** | **573** |
| **Total – Sum (Weight=905; Value=873)** | **300** | **444** | **129** | **32** | **332** | **364** | **177** | **873** | **-** |
| Lobster [d] | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 5 | 5 |
| **Total – Sum (Weight=20; Value=20)** | **0** | **0** | **0** | **20** | **0** | **0** | **0** | **20** | **-** |

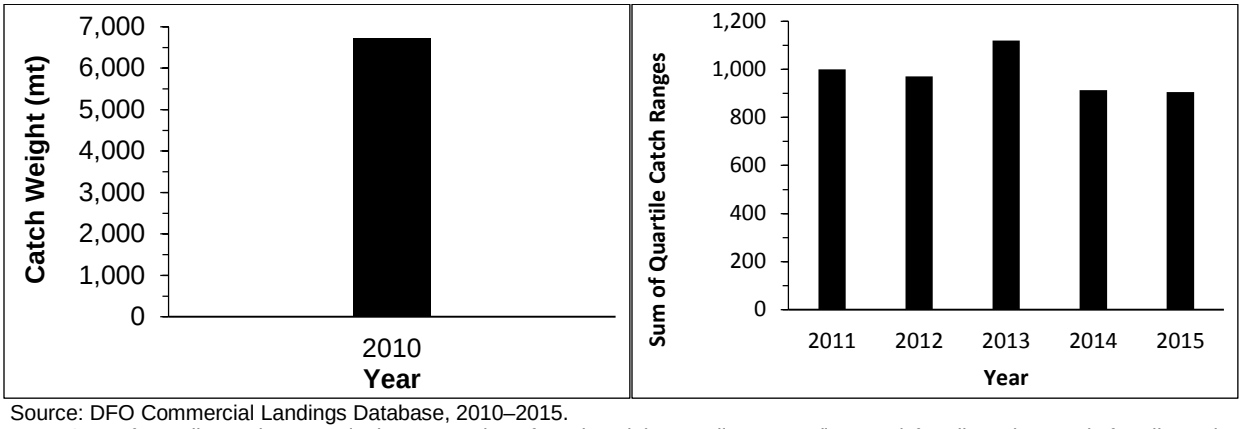
Source: DFO Commercial Landings Database, All Regions (2015).

[a] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined). 2015 quartile ranges: 1 = 0 – 2,253 kg, 2 = 2,254 – 9,535 kg, 3 = 9,536 – 40,703 kg, 4 = ≥ 40,704 kg.

[b] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch values in a given year, all species combined). 2015 quartile ranges: 1 = $0 – $9,539, 2 = $9,540 – $37,526, 3 = $37,527 – $134,094, 4 = ≥ $134,095.

[c] Total counts of the number of catch records per species; the total quartile range counts for catch weight and catch value are equal.

[d] Lobster harvests in the DFO Database are categorized by NAFO UA and are not georeferenced; quartile code counts are presented for UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).



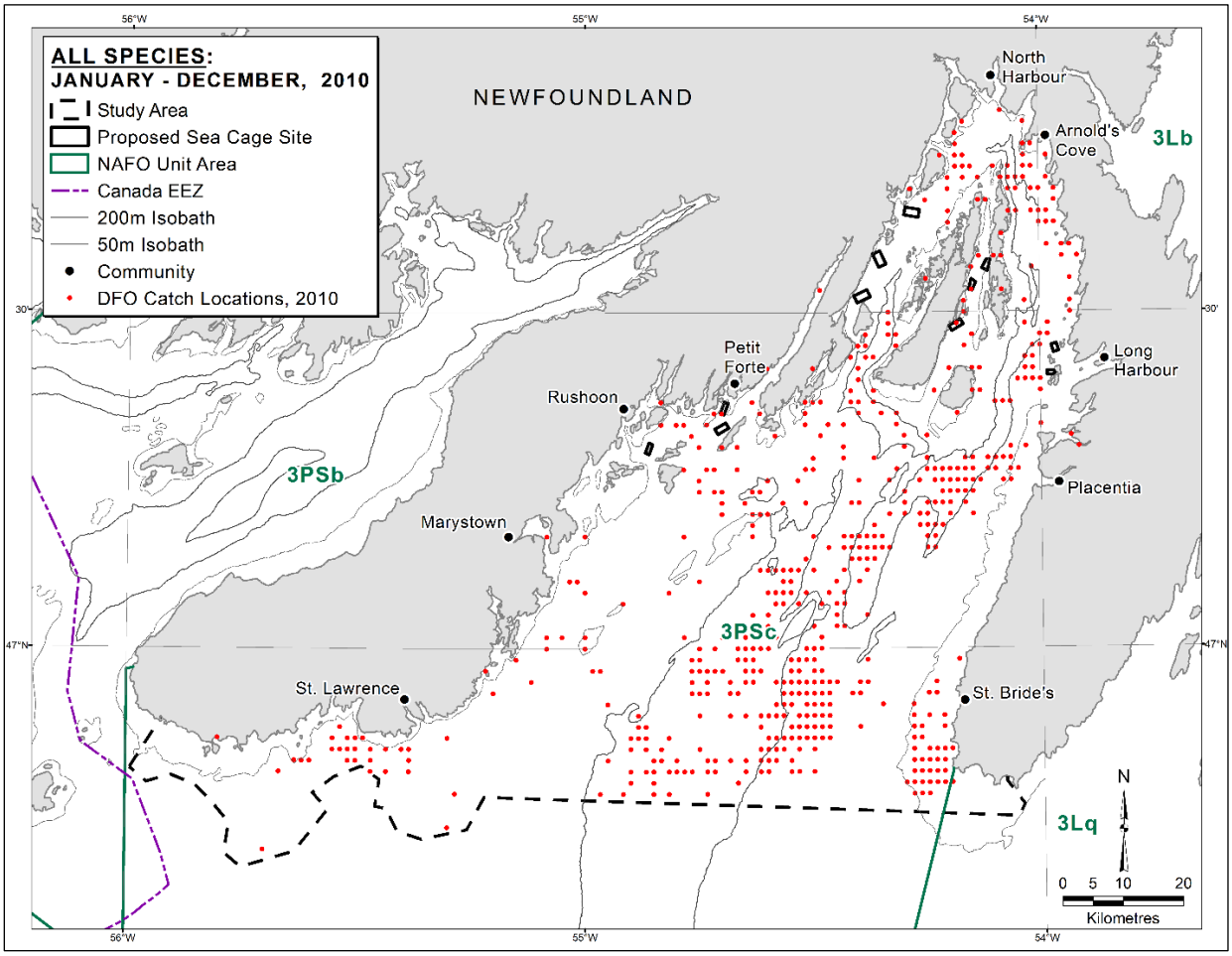

Source: DFO Commercial Landings Database, 2010–2015.

Note: Sum of quartile catch ranges is the summation of catch weight quartile ranges (i.e., 1–4) for all catch records for all species; the greater the sum of quartile catch range counts, the greater the catch weight for a given year.

**Figure 4.5. Total catch weight, 2010 (left), and annual total sum of catch weight quartile codes, 2011–2015 (right) (all species within the Study Area; all species within NAFO UA 3PSc for 2010).**

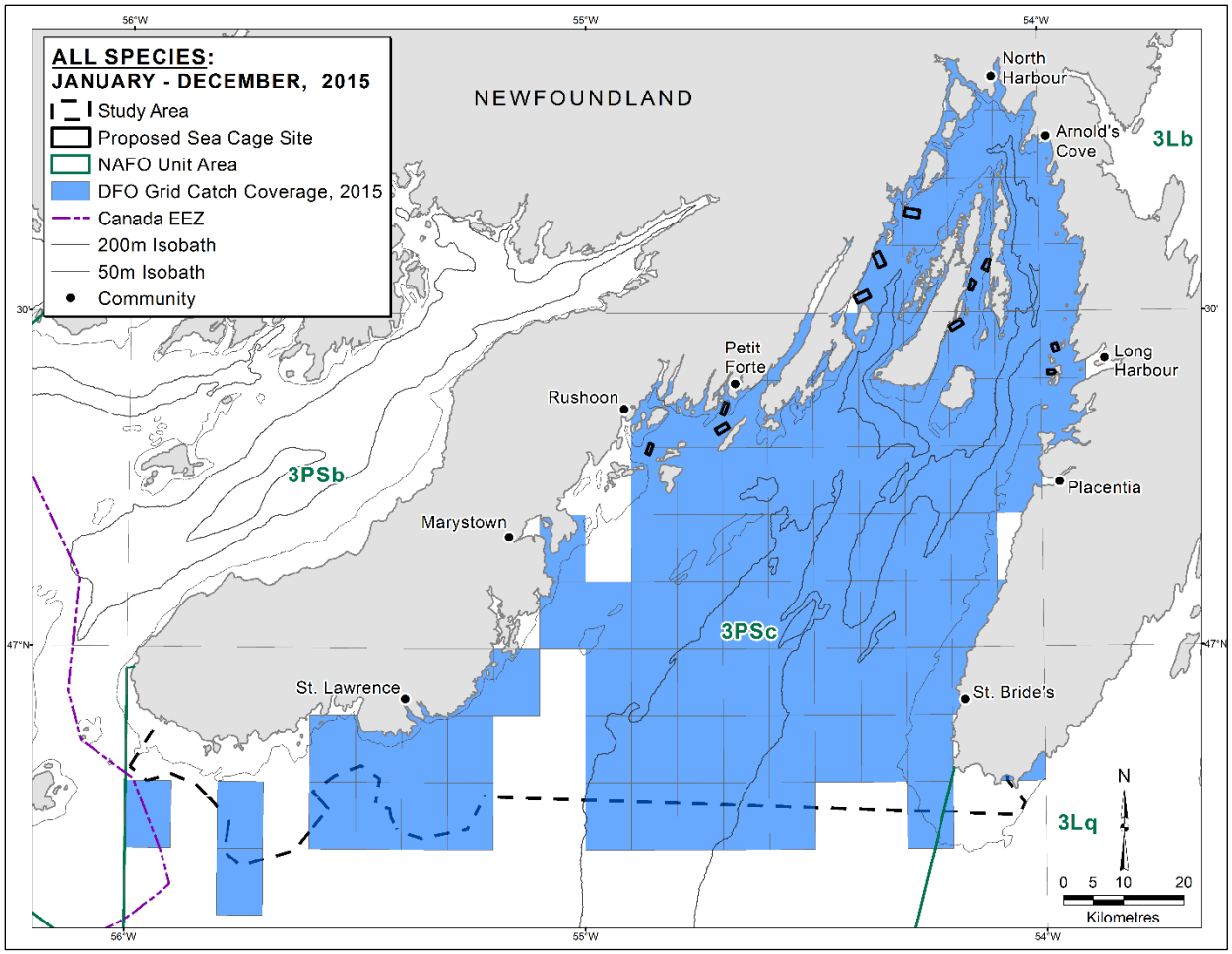
*Harvest Locations*

Georeferenced commercial fisheries harvest locations for all species during 2010 and gridded harvest locations (6'x6' cells) during 2015 are shown in Figures 4.6–4.7. The harvest locations within Placentia Bay of Atlantic cod, snow crab and lobster, based on data collected by DFO for CCRIs, are also presented in Figure 4.4. Fishers consulted during meetings in various communities within Placentia Bay during February 2018 (Appendix A) indicated areas in which they fish within the Rushoon and Merasheen BMAs. These areas were amalgamated for each BMA and are shown in Figures 4.8–4.9. Harvests occur throughout Placentia Bay, particularly in the central, eastern and northern portions of the Bay, including for Atlantic cod within and near the Valen Island proposed sea cage site in the Merasheen BMA. Lobster fishing locations are not georeferenced within the DFO Commercial Landings Database. Lobster is harvested nearshore, typically close to the community where the fisher lives (Vale 2008), along the southwestern, western, northern and eastern coasts of Placentia Bay, including within and/or in the vicinity of the Long Island and Gallows Harbour proposed sea cage sites in the Rushoon BMA (Figures 4.4 and 4.8–4.9).



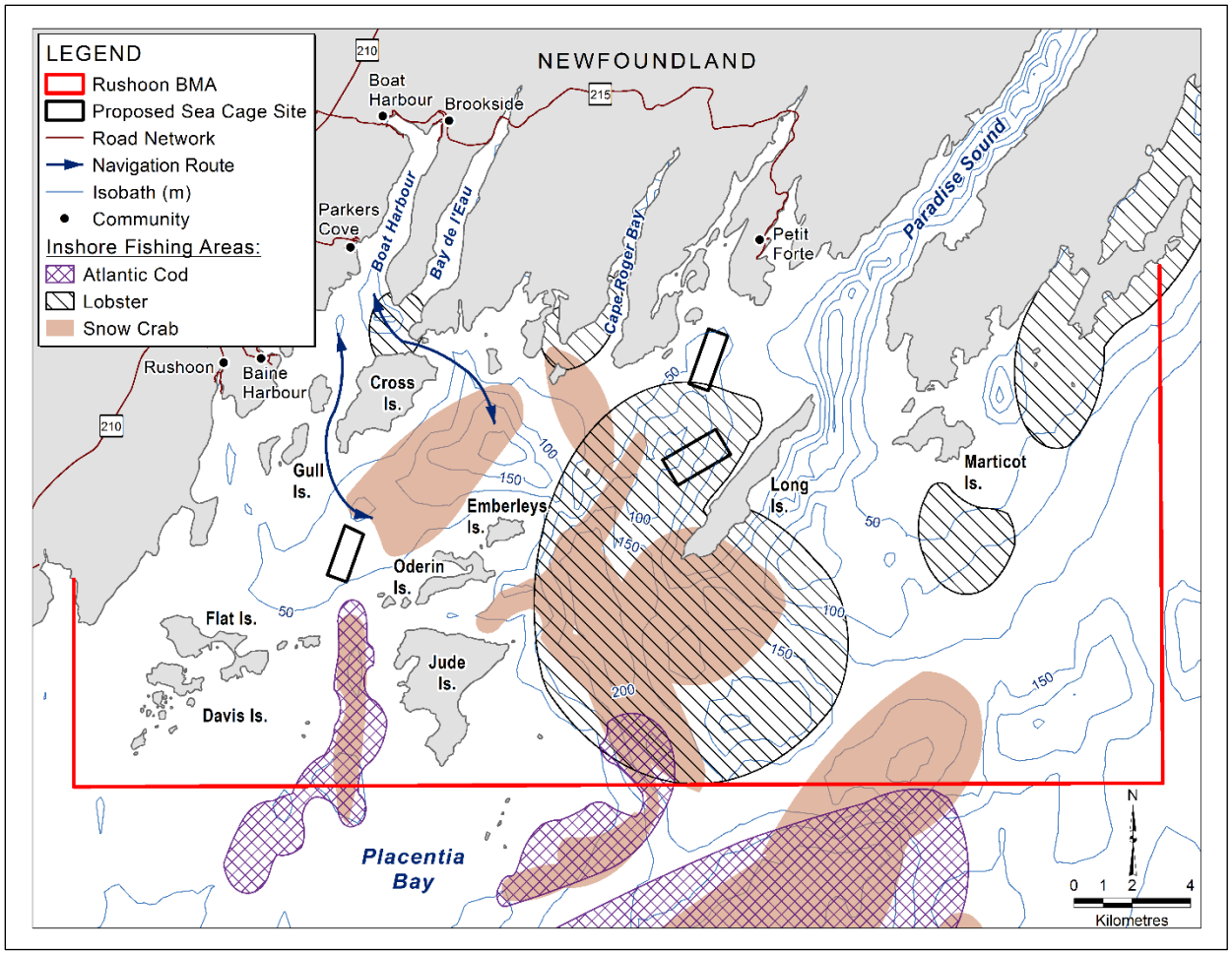

Source: DFO Commercial Landings Database, 2010–2015.

**Figure 4.6. Distribution of commercial harvest locations, all species, 2010.**



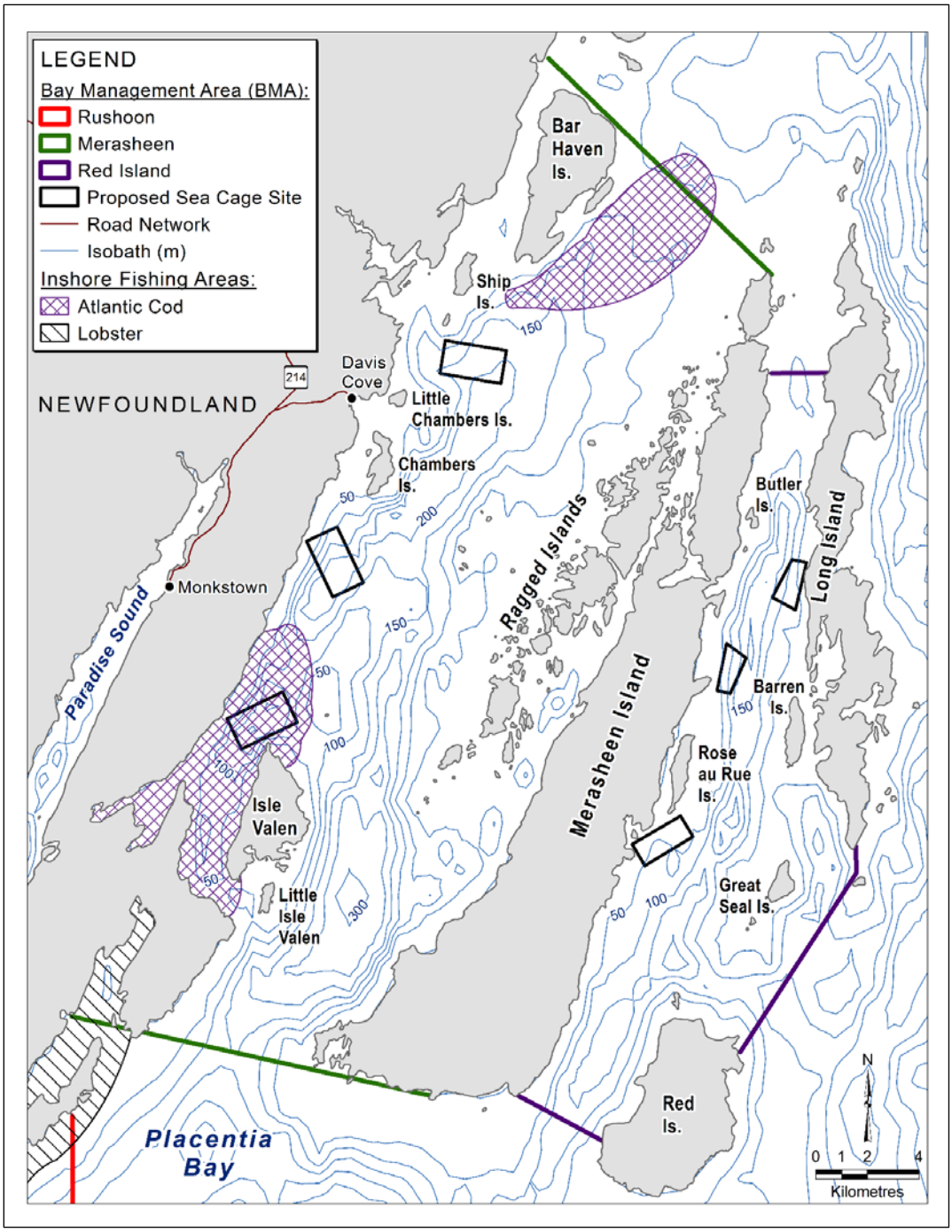

Source: DFO Commercial Landings Database, 2010–2015.

**Figure 4.7. Distribution of commercial harvest locations, all species, 2015.**




Source: Consultations with fishers, February 2018 (see Appendix A).

**Figure 4.8. Composite chart showing fishers' sketch of main fishing grounds and travel routes in the Rushoon BMA.**




Source: Consultations with fishers, February 2018 (see Appendix A).

**Figure 4.9. Composite chart showing fishers' sketch of main fishing grounds and travel routes in the Merasheen BMA and Red Island BMA.**

*Fishing Gear*

A variety of fishing gear types was used in the Study Area during 2010–2015. Snow crab, lobster, whelk and Atlantic rock crab were harvested using pots which also incidentally caught

several species, including redfish (Tables 4.8 and 4.9). Longlines were used to harvest Atlantic cod, with incidental catches of several other species including American plaice, redfish, Greenland halibut (*Reinhardtius hippoglossoides*) and flounders. Atlantic cod, Atlantic herring and mackerel (*Scomber scombrus*) were harvested using trap nets. Many species in Table 4.9 were harvested using gillnets, either as targeted or incidental catch. Seine nets were used to harvest small pelagic species, such as Atlantic herring and capelin (*Mallotus villosus*). Various demersal species were harvested using baited hand line, including Atlantic cod, American plaice, winter flounder (*Pseudopleuronectes americanus*), skates, redfish and Atlantic halibut (*Hippoglossus hippoglossus*). Bivalves were harvested using dredges, and bluefin tuna (*Thunnus thynnus*) were caught with electric harpoon. The sea cucumber drag was used to harvest sea cucumbers. Gillnets and pots (fixed gears) accounted for about 35% and 30%, respectively, of the total catch weight of all species in NAFO UA 3PSc during 2010. Sea cucumber drags and seines (mobile gears) each accounted for ~13% of the total catch weight during this same period. Overall, fixed and mobile gears accounted for ~71% and 29% of the total catch weight, respectively (Table 4.8).

**Table 4.8. Total Study Area [a] catch weight by gear type, 2010.**

| Species | Fixed Gear | | Mobile Gear | |
|---|---|---|---|---|
| | mt | % of Total | mt | % of Total |
| Atlantic Cod | 2,463 | 52 | 212 | 11 |
| Snow Crab | 1,908 | 40 | 0 | 0 |
| Atlantic Herring | 49 | 1 | 868 | 44 |
| Sea Cucumber | 0 | 0 | 843 | 43 |
| Mackerel | 83 | 2 | 0 | 0 |
| Winter Flounder | 77 | 2 | 0.3 | <0.1 |
| Lobster | 60 | 1 | 0 | 0 |
| Whelk | 49 | 1 | 0 | 0 |
| American Plaice | 42 | 1 | 0.2 | <0.1 |
| Sea Scallop | 0 | 0 | 30 | 2 |
| Pollock | 19 | 0.4 | 0 | 0 |
| Skates | 5 | 0.1 | <0.1 | <0.1 |
| Redfish | 3 | 0.1 | <0.1 | <0.1 |
| Lumpfish Roe | 1 | <0.1 | 0 | 0 |
| White Hake | 1 | <0.1 | 0 | 0 |
| Yellowtail Flounder | 1 | <0.1 | 0 | 0 |
| Atlantic Halibut | 1 | <0.1 | <0.1 | <0.1 |
| Atlantic Haddock | 0.5 | <0.1 | 0 | 0 |
| Atlantic Rock Crab | 0.4 | <0.1 | 0 | 0 |
| Monkfish | 0.2 | <0.1 | 0 | 0 |
| Greenland Halibut | 0.1 | <0.1 | 0 | 0 |
| Witch Flounder | <0.1 | <0.1 | 0 | 0 |
| Sturgeon | <0.1 | <0.1 | 0 | 0 |
| Porbeagle Shark | <0.1 | <0.1 | 0 | 0 |
| **Subtotal** | **4,762** | **100** | **1,953** | **100** |
| **Grand Total (mt)** | **6,716** | | | |

Source: DFO Commercial Landings Database, All Atlantic Regions (2010).

[a] Georeferenced (latitude/longitude) data were not available within the DFO 2010 database for all or virtually all of the recorded harvest for Atlantic haddock, pollock, redfish, monkfish, Atlantic halibut, Greenland halibut, winter flounder, yellowtail flounder, witch flounder, skates, white hake, lobster, Atlantic rock crab, whelk, lumpfish roe, mackerel, porbeagle shark, sea cucumber and sturgeon; and for ~25-50% of records for Atlantic cod, snow crab, American plaice and mackerel. Therefore, catch quantity and value data are presented for NAFO UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).

**Table 4.9. Summary of gear type used and timing of the commercial fishery in the Study Area [a], 2010–2015.**

| Species | Month Caught | | | | | | Gear Type | |
|---|---|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Fixed | Mobile |
| Atlantic Cod | Jan-Feb; May-Dec | Jan-Mar; May-Dec | Jan-Feb; May-Dec | Jan-Feb; May-Dec | Jan-Mar; May-Dec | Jan-Mar; May-Dec | Gillnet; Longline; Trap Net; Pot | Hand Line (baited) |
| Snow Crab | Apr-Jul | Apr-Jul | Apr-Jul | Apr-Jul | Apr-Jul | Apr-Jul | Pot | - |
| Atlantic Herring | Apr; Nov-Dec | Dec | - | Jan; Mar; Dec | Mar-Apr | Mar-Apr | Gillnet; Trap Net | Seine |
| Sea Cucumber | Jul-Nov | - | - | - | - | - | - | Sea Cucumber Drag |
| Mackerel | Aug-Oct | Aug-Sep | Aug | - | - | - | Gillnet; Trap Net | - |
| Winter Flounder | Jan-Feb; May-Dec | Jun-Jul | Jun-Jul; Nov-Dec | Jun-Jul; Nov-Dec | - | Jun; Aug; Nov | Gillnet; Longline | Hand Line (baited) |
| Lobster [b] | Apr-Jul | Apr-Jun | Apr-Jul | Apr-Jul | May-Jul | Apr-Jul | Pot | - |
| Whe k | Jun-Aug | - | - | Aug | - | - | Pot | - |
| American Plaice | Jan-Feb; May-Dec | May-Aug; Oct-Dec | May-Jul; Oct-Dec | Jan; Jun-Jul; Nov | Jun-Aug; Dec | Jan; Jul-Aug; Oct-Dec | Gillnet; Longline | Hand Line (baited) |
| Sea Scallop | Feb-Mar; Sep-Dec | Jan; Mar; Oct-Dec | Feb; Oct-Nov | Jun; Sep-Dec | Feb-Mar; Sep-Dec | Feb-Mar; Sep-Dec | - | Dredge |
| Pollock | Jan; Jul; Sep-Nov | Nov | Oct; Dec | Jan; Nov-Dec | Feb-Mar | - | Gillnet; Longline | - |
| Skates | May-Jul; Sep-Dec | Jun | Sep | Jul | - | - | Gillnet; Longline | Hand Line (baited) |
| Redfish | Jan-Feb; Jun-Dec | Oct-Dec | May-Jun; Oct-Dec | Jan; Nov | Jun; Sep | Oct-Dec | Gillnet; Longline; Pot | Hand Line (baited) |
| Lumpfish Roe | May-Jun | - | - | - | - | - | Gillnet | - |
| White Hake | Sep-Oct | - | - | - | - | - | Gillnet | - |
| Yellowtail Flounder | Jan; Jun-Oct | - | - | - | Jun | - | Gillnet; Longline | - |
| Atlantic Hal but | May-Dec | Jun-Jul | Jun-Jul | Jun | Jun | Jun | Gillnet; Longline | Hand Line (baited) |
| Atlantic Haddock | Jul; Sep-Dec | - | - | - | - | - | Gillnet; Longline | - |
| Atlantic Rock Crab | Sep | - | - | - | - | Aug | Pot | - |
| Monkfish | Jul; Sep-Oct | Sep | - | - | - | - | Gillnet | - |
| Greenland Hal but | Jun-Aug; Oct-Dec | May-Aug | May-Jul; Oct-Nov | Jun-Jul | Jun-Sep | Jan-Feb; Jun-Aug; Nov-Dec | Gillnet; Longline | - |
| Witch Flounder | May-Jul; Nov | - | - | - | - | - | Gillnet | - |
| Sturgeon | Nov | - | - | - | - | - | Gillnet | - |
| Porbeagle Shark | Sep | - | - | - | - | - | Gillnet | - |
| Iceland Scallop | - | - | Aug | - | - | Jun-Jul | - | Dredge |
| Bluefin Tuna | - | - | - | - | - | Nov | - | Electric Harpoon |
| Capelin | - | - | - | Jul | - | - | - | Seine |

Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

[a] Georeferenced (latitude/longitude) data were not available within the DFO 2010 database for all or virtually all of the recorded harvest for Atlantic haddock, pollock, redfish, monkfish, Atlantic halibut, Greenland hal but, winter flounder, yellowtail flounder, witch flounder, skates, white hake, lobster, Atlantic rock crab, whe k, lumpfish roe, mackerel, porbeagle shark, sea cucumber and sturgeon; and for ~25-50% of records for Atlantic cod, snow crab, American plaice and mackerel. Therefore, catch data for 2010 are presented for NAFO UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).

[b] Lobster catches are assigned to NAFO UAs, but not to 6'x6' grid cells within the DFO 2011–2015 database; therefore, harvest months for lobster are presented for NAFO UA 3PSc.

Mobile gear is typically towed by a fishing vessel while fixed gear is deployed and left by the fisher, typically anchored in place (Vale 2008). Fixed gears are typically deployed at a location for several days, sometimes set out over long distances (LGL 2016). Fixed gear fisheries, such as those utilizing gillnets or pots, are usually more site-specific than mobile fisheries, with fewer alternate fishing grounds available (Vale 2008). Fixed and mobile gear harvest locations in the Study Area during 2015 are shown in Figure 4.10.

Since April 2013, DFO provides gear tags for the Atlantic bluefin tuna fishery, and the fishing industry has the responsibility to obtain and pay for any gear tags required for use in other commercial fisheries (DFO 2017c). As per licence conditions, licence holders must attach a tag to their gear that has been obtained from a DFO-approved tag supplier (DFO 2017c). Multi-year tags may be metal or traditional polyurethane-type tags, and must be natural or white in colour (DFO 2017c). Single-year tags require a different colour each year. Within the Newfoundland and Labrador region, the 2018, 2019 and 2020 single-year tag colours will be yellow, purple and green, respectively (DFO 2017c).

*Harvest Seasons*

Total monthly catch weights during 2010 and the total sum of monthly catch weight quartile codes for 2011–2015 for all species within the Study Area are indicated in Figure 4.11 (within NAFO UA 3PSc for 2010; see footnote a of Figure 4.11). Harvests occur year-round in the Study Area, with the greatest catch weights during April–July, coinciding with the seasons for Atlantic cod, snow crab and lobster (see Table 4.9). Further details regarding the timing of the fisheries for key species in the Study Area are provided in the *Principal Species* and *Other Notable Species* subsections below. For management purposes, the seasons for harvesting species in the Placentia Bay region are provided in Table 4.10.

There is an annual closure of a cod spawning area for all vessel classes in northwestern Placentia Bay, north of Ship Island (DFO 2018a). During 2018, the cod spawning closure began on 1 January and will remain in effect until the fishery re-opens in May (DFO 2018a). In addition, a seasonal closure of the fishery for the 3Ps Atlantic cod stock occurs annually, typically from March to mid-May, to protect spawning aggregations (DFO 2018b).

A mandatory annual closure of the snow crab fishery occurs during August and September in Newfoundland and Labrador to protect soft-shell crabs. Outside of this two-month closure period, areas with a high incidence of soft-shell are closed to harvesting as required. A grid-based soft shell protocol was initiated in 2004 in Newfoundland and Labrador, in which localized areas are closed when the percentage of soft-shelled legal-sized snow crab catch exceeds 20% (DFO 2018c). Areas closed due to soft shell remain closed for the remainder of the fishing season (DFO 2018c).

The Study Area is within the northernmost portion of Lobster Fishing Area (LFA) 10 (see Figure 4.12 for map LFAs). Within LFA 10, harvesters are not permitted to retrieve fishing gear or possess lobsters during the initial 48-hour gear-setting period following the announced opening date (DFO 2017d).

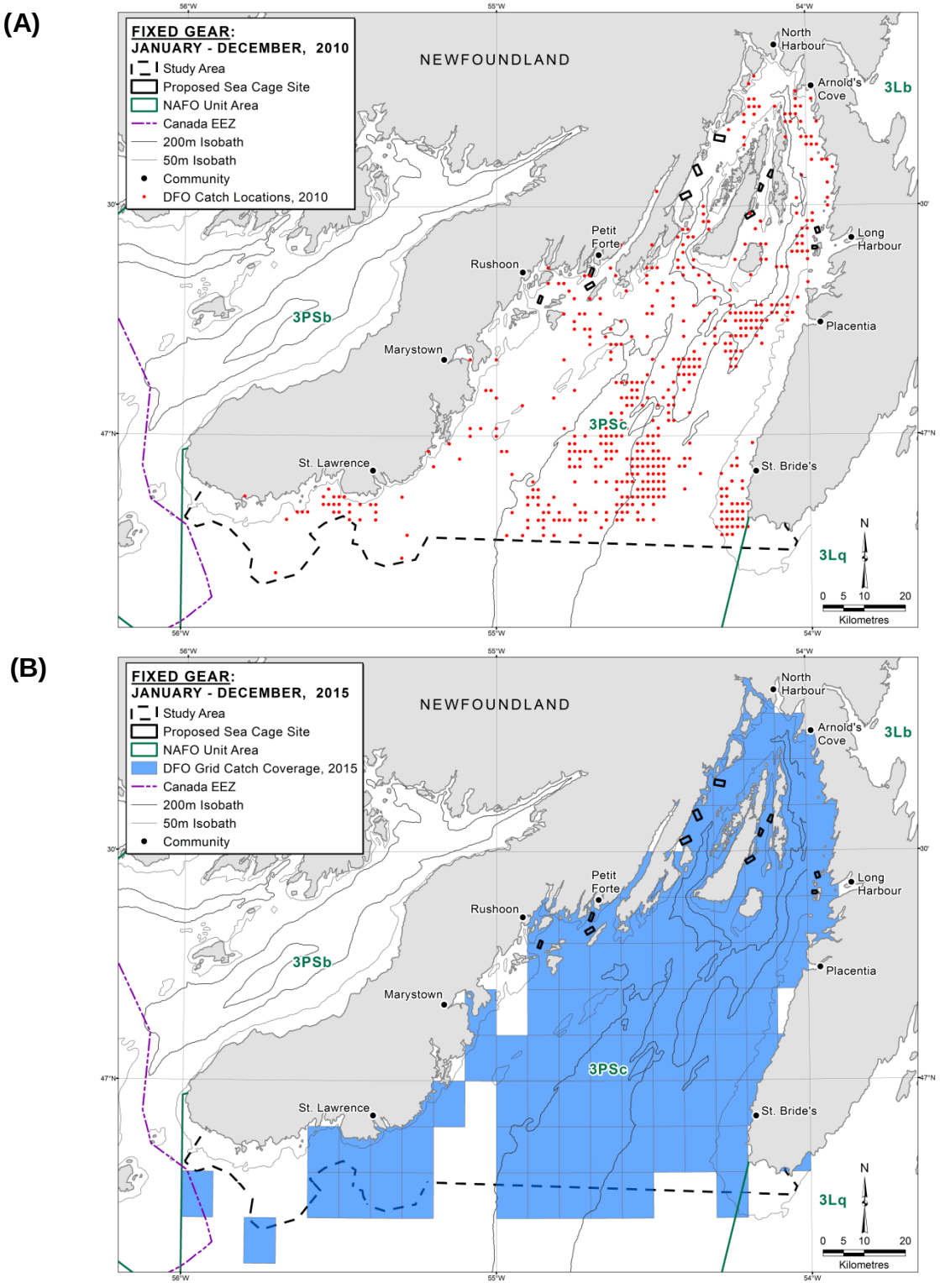
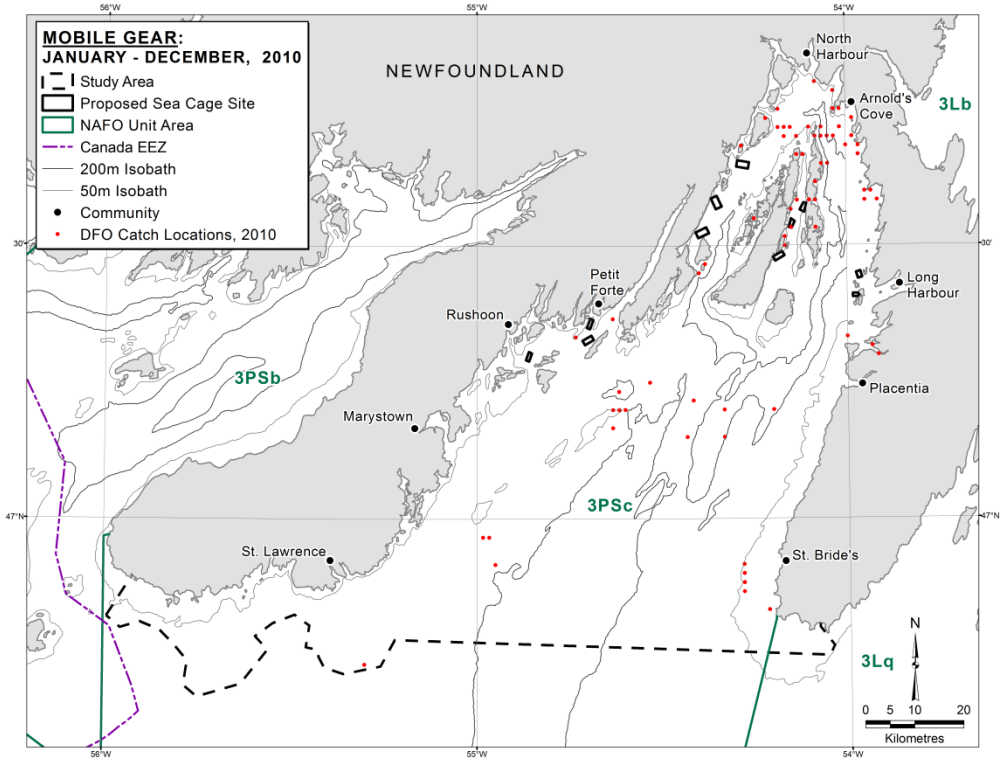
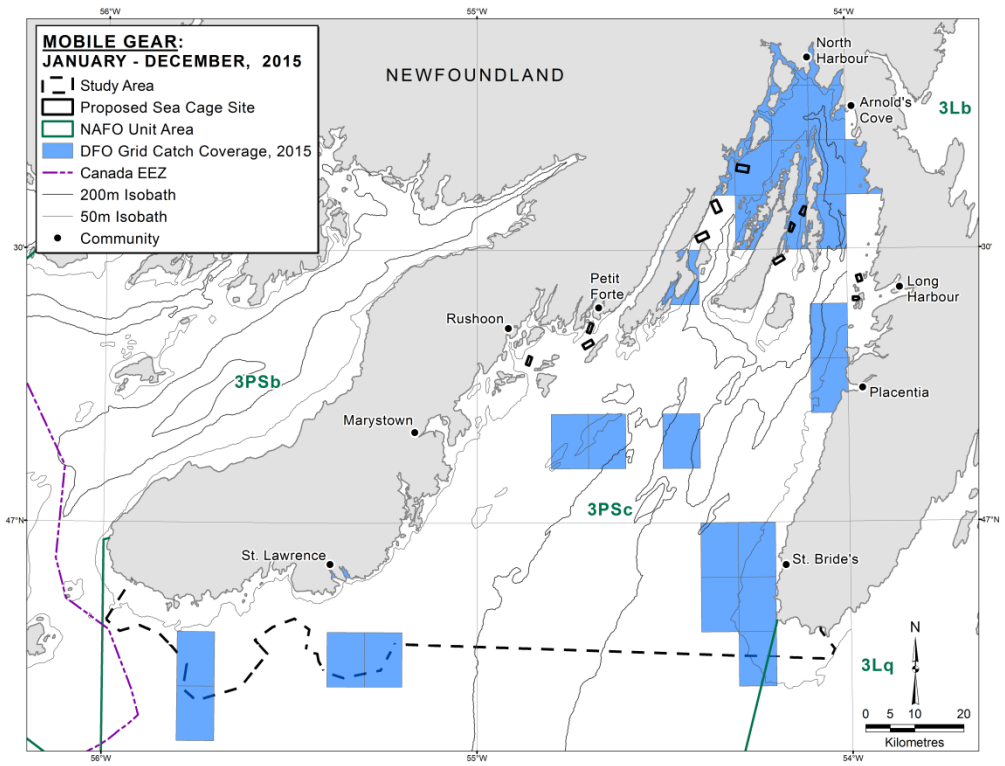



**Figure 4.10. Distribution of fixed gear [(A) in 2010 and (B) 2015] and mobile gear [(C) in 2010 and (D) in 2015] commercial harvest locations, all species.**

**(C)**

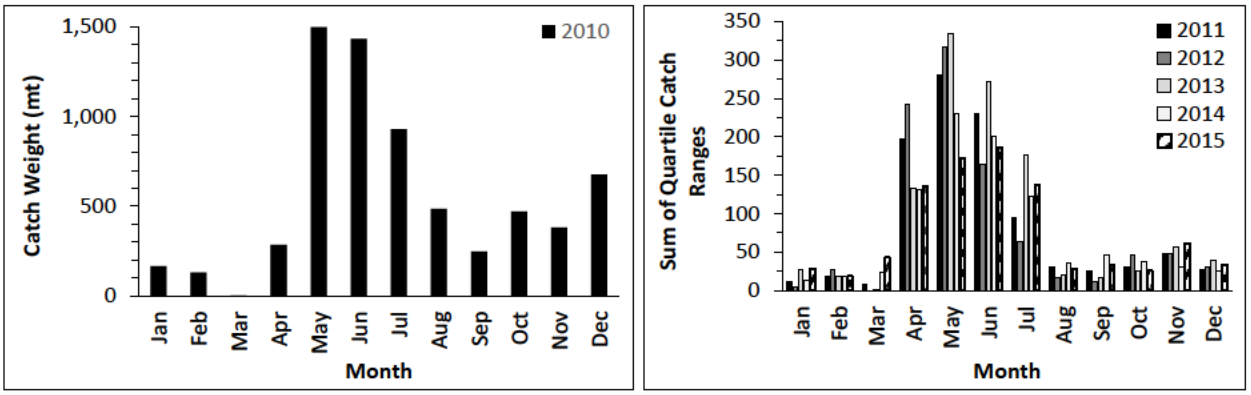



**(D)**




Source: DFO Commercial Landings Database, All Atlantic Regions (2010, 2015).

**Figure 4.10 (Continued). Distribution of fixed gear [(A) in 2010 and (B) 2015] and mobile gear [(C) in 2010 and (D) in 2015] commercial harvest locations, all species.**




Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

[a] Georeferenced (latitude/longitude) data were not available within the DFO 2010 database for all or virtually all of the recorded harvest for Atlantic haddock, pollock, redfish, monkfish, Atlantic halibut, Greenland halibut, winter flounder, yellowtail flounder, witch flounder, skates, white hake, lobster, Atlantic rock crab, whelk, lumpfish roe, mackerel, porbeagle shark, sea cucumber and sturgeon; and for ~25-50% of records for Atlantic cod, snow crab, American plaice and mackerel. Therefore, catch data for 2010 are presented for NAFO UA 3PSc, which includes the Study Area and a relatively small area immediately south of the Study Area (see Figure 4.1).

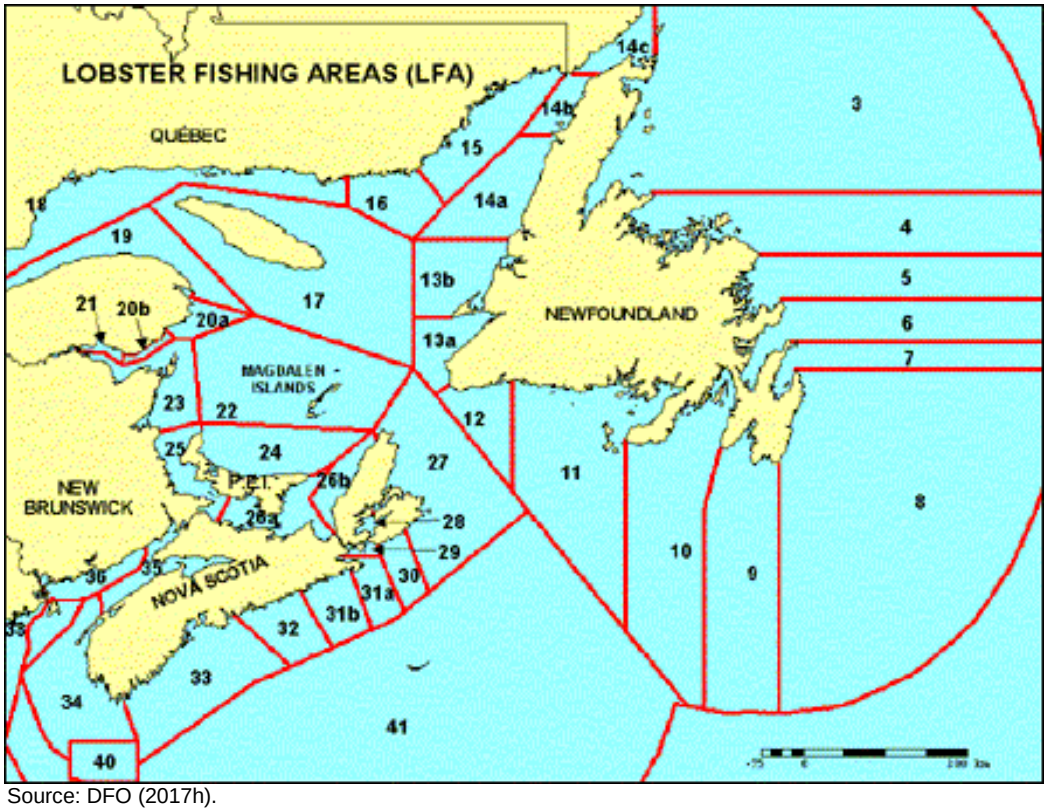
**Figure 4.11. Total monthly catch weight during 2010 (left) and total monthly sum of catch weight quartile codes, 2011–2015 (right) (all species within the Study Area [a]).**

**Table 4.10. Management harvest seasons for species in commercial fisheries in the Placentia Bay region. Note that seasons may close at any time if the season's Total Allowable Catch (TAC) has either been reached or nearly reached.**

| Species | Management Area | Management Harvest Season |
|---|---|---|
| Groundfish<br>• Atlantic Cod<br>• American Plaice<br>• Witch Flounder<br>• Redfish (Unit II)<br>• Skates | 3Ps | • Atlantic Cod: April-March (closure ~April–May to protect spawning aggregations)<br>• American Plaice: under moratorium since 1993 (caught as bycatch)<br>• Witch Flounder: April–March<br>• Redfish (Unit II): April–March<br>• Skates: [likely] April–March |
| Snow Crab | 3Ps | April–July/August (closure August–September to protect soft shell crabs) |
| Lobster | Lobster Fishing Area 10 (Placentia Bay) | May–July |
| Sea Scallop | Scallop Fishing Area 10 (Placentia Bay), north of 47°N | January–December |
| Iceland Scallop | 3Ps | January–December |
| Whelk | 3Ps | March–December |
| Atlantic Herring | Herring Fishing Area 10 (Placentia Bay) | January–December |
| Capelin | 3Ps | Determined annually based on industry recommendations to DFO; varies by area and fleet; season remains open provided there are commercial quantities of capelin available and quota remaining |

| Species | Management Area | Management Harvest Season |
|---|---|---|
| Mackerel | 3Ps | August–December |
| Bluefin Tuna | 3P | July–November |
| Lumpfish | 3Ps | May–June/July |
| Redfish | Unit II, 3Ps | August–April |
| Winter Flounder | 3Ps | June–August |
| Greenland Halibut | 3Ps | May–March |
| Atlantic Halibut | 3Ps | Direct fishery not permitted; caught as bycatch; occasional retention temporarily permitted |
| Squid | 3Ps | July–December |
| Sea Cucumber | 3Ps | June–December |

Sources: DFO (2014, 2016a, 2017e,f,g, 2018b); Rideout et al. (2017).



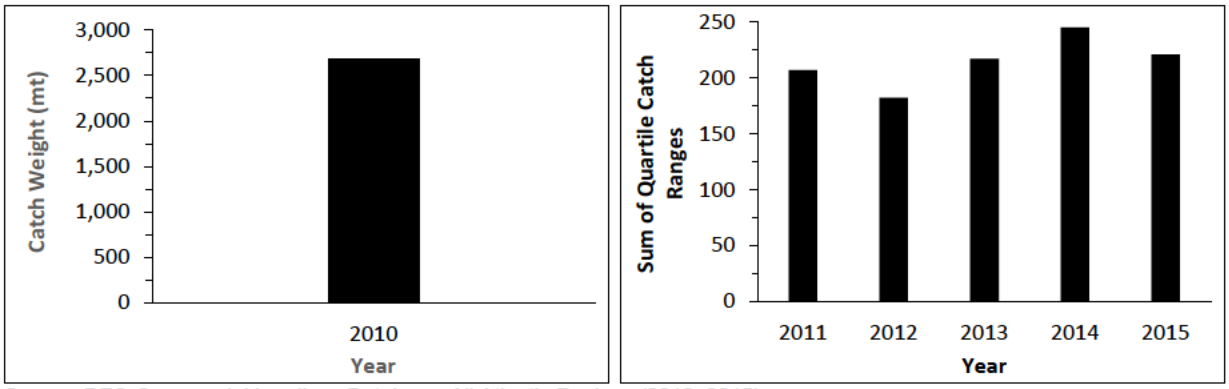

Source: DFO (2017h).

**Figure 4.12. DFO Lobster Fishing Areas (LFAs).**

*Principal Species: Atlantic Cod and Snow Crab*

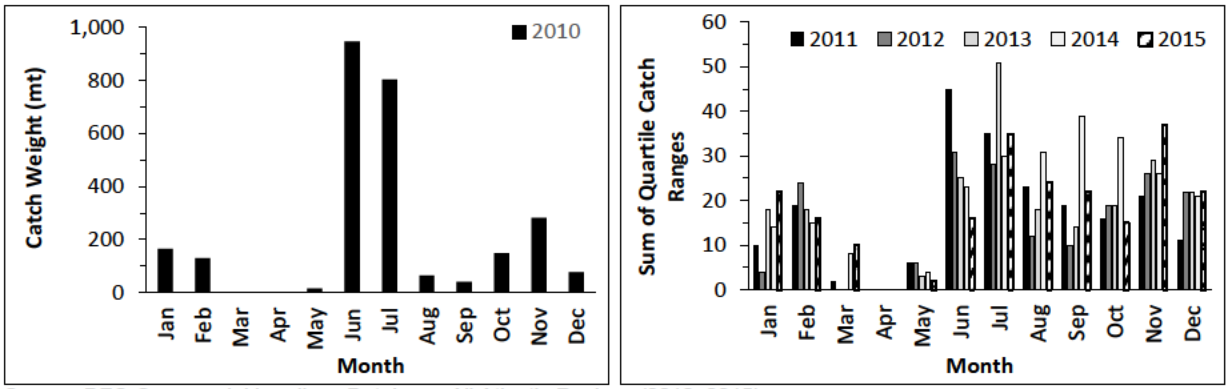
Atlantic cod catches comprised ~40% of the total catch weight and 27% of the total catch value within NAFO UA 3PSc in 2010 (see Table 4.2), and ~25% of the total quartile catch code counts in the Study Area in 2015 (see Table 4.7). Atlantic cod catches in the Study Area increased during 2012–2014, and decreased slightly in 2015 (Figure 4.13). Atlantic cod were primarily harvested during June and July in NAFO UA 3PSc in 2010 and during the summer and fall in 2011–2015 (Figure 4.14). After a DFO-advised delay in opening, the directed cod fishery for

inshore and mid-shore fixed gear fleets in NAFO Div. 3Ps opened on 23 May 2017, followed by the >100' mobile gear fleet on 11 November 2017 (DFO 2017g). Based on the previous season's harvest and the management season for this species (see Table 4.10), the 3Ps directed cod fishery will likely close by March 2018. The georeferenced harvest locations for Atlantic cod in the Study Area during 2010 and 6'x6' grid cell locations during 2015 are shown in Figure 4.15. Figure 4.4 indicates Atlantic cod harvesting locations based on DFO's qualitative CCRI data. Atlantic cod were harvested throughout Placentia Bay during 2010 and 2015, typically within ~20 km of shore in water depths <200 m. The same general harvest locations were indicated by the CCRI data (DFO 2008). Two Atlantic cod harvest locations occurred adjacent to the Long Island proposed sea cage site in 2010. Otherwise, 2010 Atlantic cod catches occurred in the vicinity of the proposed sea cage sites within the Rushoon, Merasheen and Long Harbour BMAs. No Atlantic cod catch locations were reported near the proposed sea cage sites within the Red Island BMA during 2010. During 2015, Atlantic cod harvest grid cells overlapped with the Long Island, Gallows Harbour, Ship Island, Brine Islands and Iona Islands proposed sea cage sites.



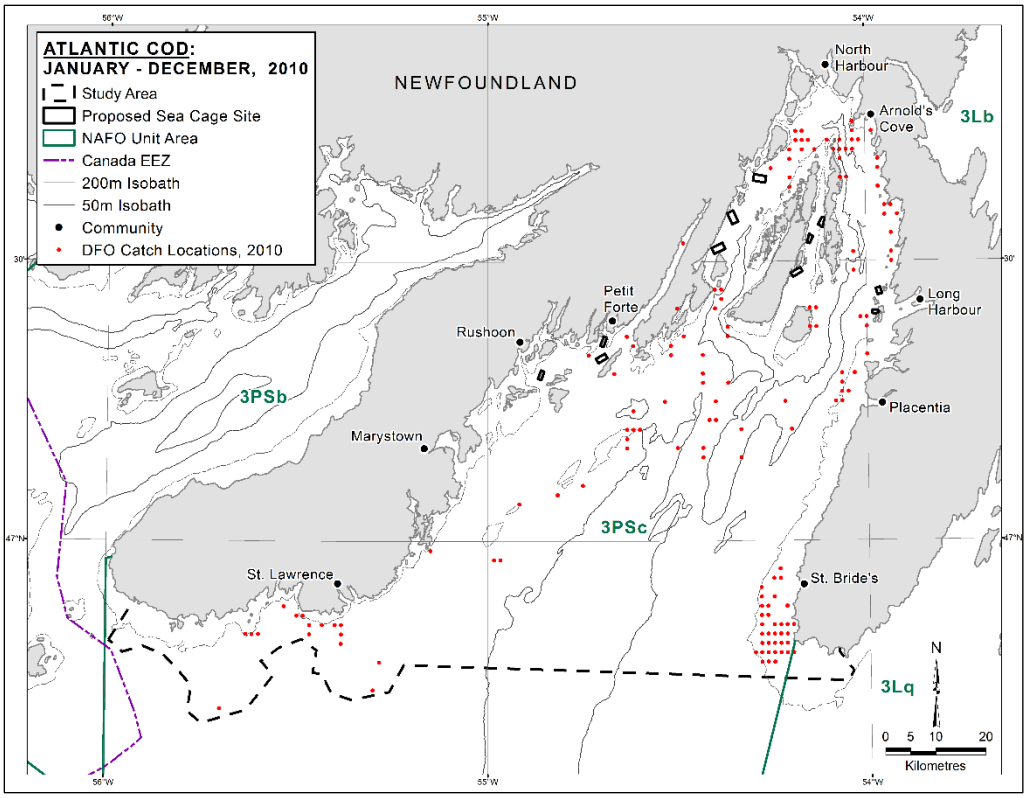
Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

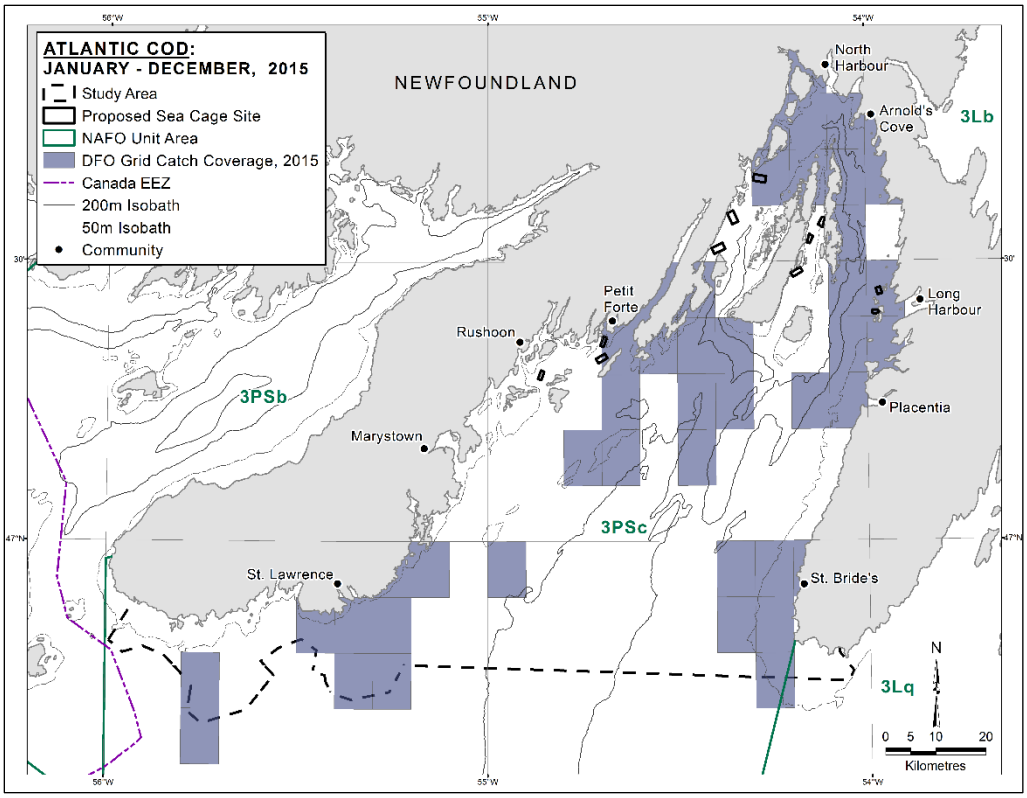
**Figure 4.13. Total catch weight, 2010 (left), and annual total sum of catch weight quartile codes, 2011–2015 (right) for Atlantic cod within the Study Area (within NAFO UA 3PSc for 2010).**



Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

**Figure 4.14. Total monthly catch weight, 2010 (left), and monthly total sum of catch weight quartile codes, 2011–2015 (right) for Atlantic cod within the Study Area (within NAFO UA 3PSc for 2010).**



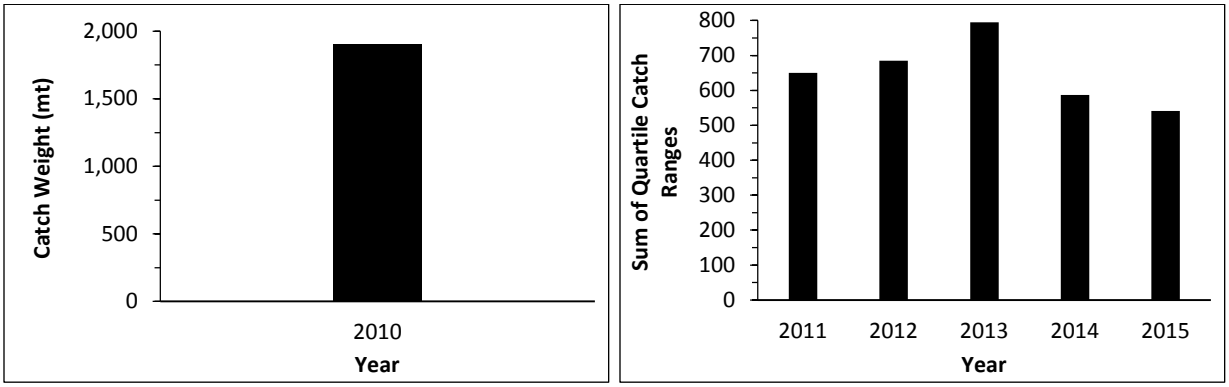




Source: DFO Commercial Landings Database, All Atlantic Regions (2010, 2015).

**Figure 4.15. Distribution of commercial harvest locations for Atlantic cod in the Study Area, 2010 (top) and 2015 (bottom).**

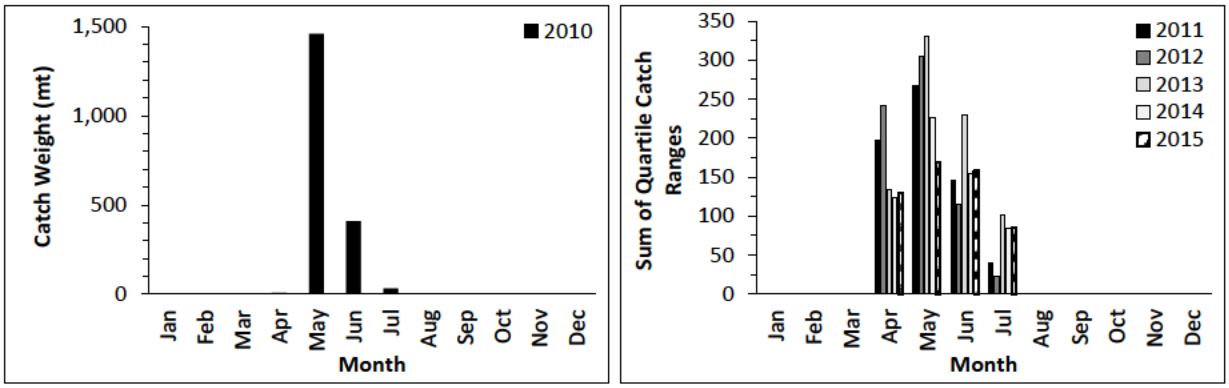
The Atlantic cod stock in NAFO Div. 3PS is managed by NAFO, although the distribution of 3Ps cod does not conform well to management boundaries and is considered a complex mixture of inshore and offshore sub-components, with seasonal migration between them (DFO 2018b). Total landings for the 2015–2016 management season (i.e., April–March) were 6,427 mt in 3Ps, 48% of the TAC (Rideout et al. 2017). The TAC for Atlantic cod in 3Ps for 2017–2018 is 6,500 mt, a decrease from 13,490 mt for 2015–2016 (DFO 2017e). The 2017–2018 TAC allots 1,505 mt and 571 mt for the fixed gear <35' and 35–64' fleets, respectively, in Placentia Bay (DFO 2018d). As of 15 February 2018, both Placentia Bay TACs have been exceeded for the season, with 2,172 mt and 875 mt harvested by the <35' and 35–64' fleets, respectively (DFO 2018d). If the current high mortality levels within Div. 3Ps persist, the biomass of the stock is likely to decline sharply in the coming years (Rideout et al. 2017). In addition to seasonal closures to protect the cod stock, bycatch restrictions are in place and it is mandatory for fish harvesters to submit their completed logbooks to DFO for all commercial groundfish (DFO 2018c).

Snow crab harvests comprised ~28% and 58% of the 2010 total catch weight and value, respectively, in Div. 3PSc (within which the Study Area occurs) (see Table 4.2), and ~61% of the total quartile catch code counts in the Study Area in 2015 (see Table 4.7). Snow crab harvests in the Study Area increased during 2011–2013, but they have decreased each year since then (Figure 4.16). The majority of snow crab was harvested in May during 2010–2015 (Figure 4.17). Snow crab were harvested throughout the Placentia Bay area during 2010 and 2015, typically in water depths >50 m (Figures 4.4 and 4.18). While two snow crab harvest locations occurred within the Darby Harbour proposed sea cage site in 2010, other 2010 snow crab catches occurred southeast of the Valen Island and Darby Harbour proposed sea cage sites, and in the vicinity of the proposed sea cage sites within the Rushoon and Long Harbour BMAs. Snow crab grid cell harvest locations overlapped with all of the proposed sea cage sites during 2015.




Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

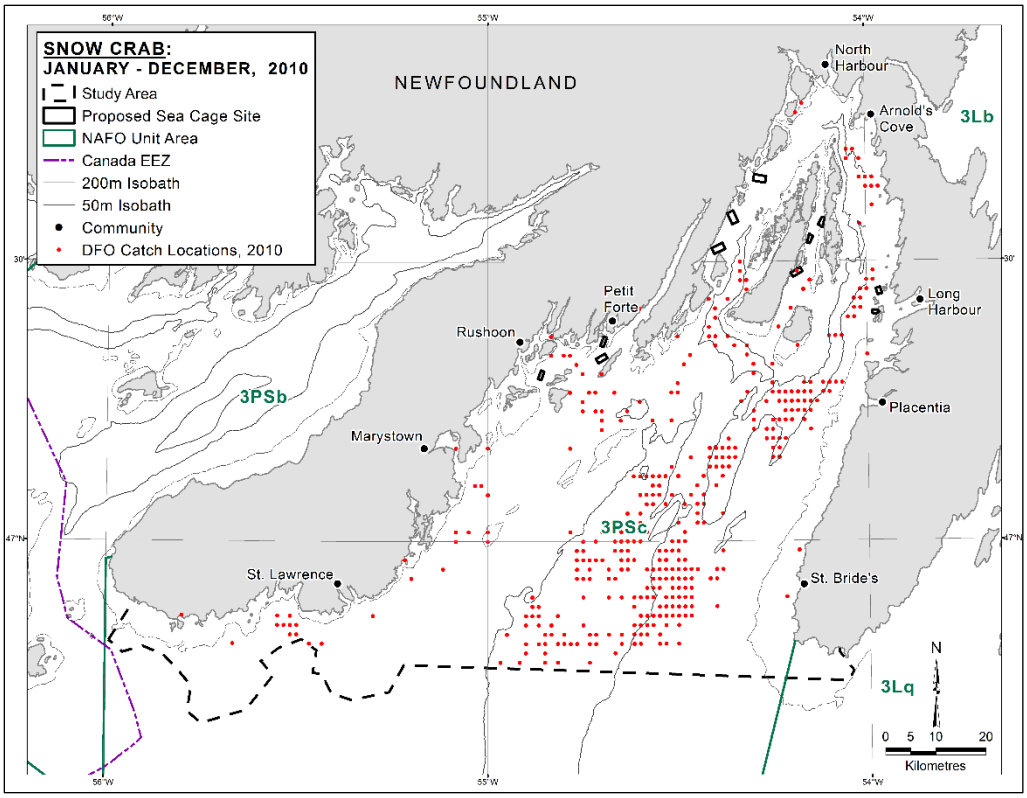
**Figure 4.16. Total catch weight, 2010 (left), and annual total sum of catch weight quartile codes, 2011–2015 (right) for snow crab within the Study Area (within NAFO UA 3PSc for 2010).**

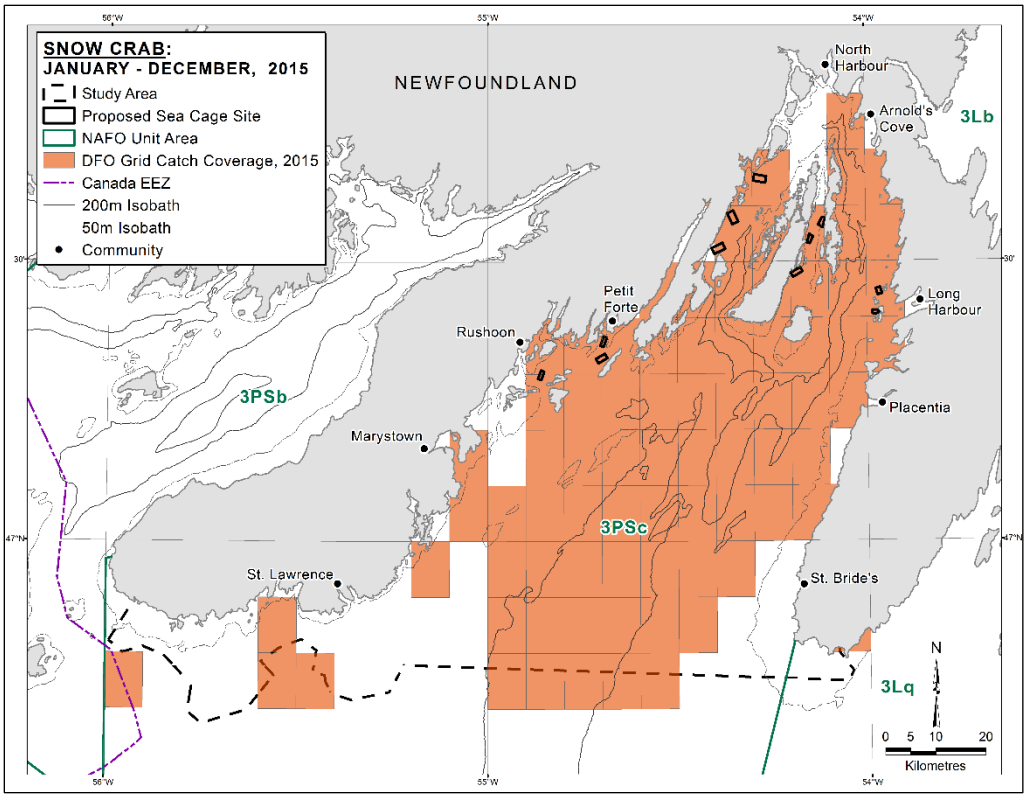


Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

**Figure 4.17. Total monthly catch weight, 2010 (left), and monthly total sum of catch weight quartile codes, 2011–2015 (right) for snow crab within the Study Area (within NAFO UA 3PSc for 2010).**

The stock status of Newfoundland and Labrador snow crab is assessed annually within each NAFO Div. (DFO 2017i). The TAC for snow crab for 2017–2018 in Placentia Bay (north of 46°30'N) is 560 mt, a decrease of 50% from the previous year (DFO 2017e). This TAC is divided evenly for harvesters north of 46°30'N and those north of 46°30'N outside of 12 miles. During the 2017 season, 74% (206 mt) and 58% (163 mt) of the TAC portions were harvested in these two areas, respectively, before the fishery closed on 22 June 2017 (DFO 2018d). Snow crab landings within Div. 3Ps declined from a recent peak of 6,700 mt in 2011 to a low of 1,200 mt in 2016 (DFO 2017i). Within Div. 3Ps, fishing effort has decreased by half since the historically-high effort during 2014, with only 40–60% of the TAC taken during 2015 and 2016 (Mullowney et al. 2018). Since 2009, catch per unit effort (CPUE) steadily declined in 3Ps to a record low in 2016, reflecting declines in exploitable biomass and recruitment in recent years (DFO 2017i). Overall, the snow crab fishery in 3Ps performed poorly in 2016, with declines in CPUE within Placentia Bay from ~15–16 kg/trap in 2009/2010 to 3 kg/trap in 2016 (Mullowney et al. 2018). The sharp reduction in CPUE and abundance of legal-sized crab in 3Ps population distributions during recent years suggests that the stock is heavily exploited and/or severely depleted (Mullowney et al. 2018). Considering that discards (i.e., of sub-legal-sized crabs) comprised half of the 3Ps snow crab catch in 2016, the stock's reproductive capacity may be impaired if fishing continues under elevated mortality levels for sub-legal-sized crab (DFO 2017i). The minimum legal size for retention in Newfoundland and Labrador is a 95-mm carapace width, which excludes females and a large proportion of adult males from the fishery in order to promote the protection of the stock's reproductive capacity (DFO 2017i). Other management measures include early and shortened fishing seasons, mandatory sorting of sub-legal-sized crab on deck, improved soft-shell protocols with effective monitoring, at-sea observer coverage, and quota adjustments in areas that show a flux in population demographics (DFO 2018c).



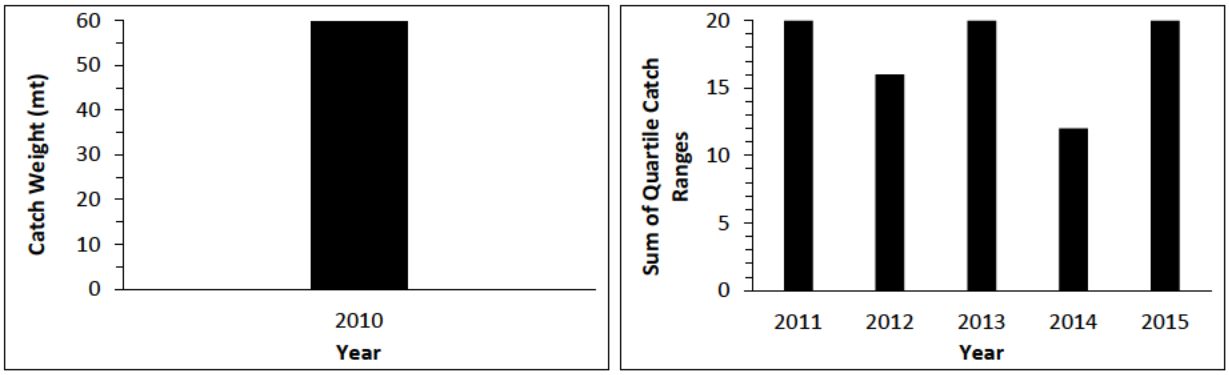

Source: DFO Commercial Landings Database, All Atlantic Regions (2010, 2015).

**Figure 4.18. Distribution of commercial harvest locations for snow crab in the Study Area, 2010 (top) and 2015 (bottom).**

*Other Notable Species: American Lobster, Sea Scallop, American Plaice and Atlantic Herring*

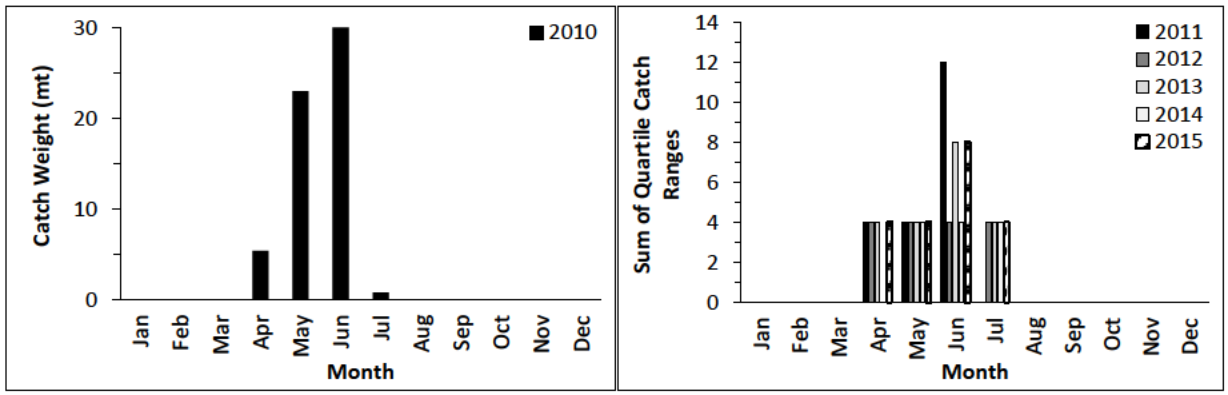
During 2010, the lobster fishery comprised ~1% and 4% of the 3PSc commercial harvest catch weight and value, respectively (see Table 4.2). Lobster harvests were variable within 3PSc during 2011–2015 (Figure 4.19). Most lobster were harvested during June (Figure 4.20). In 2017, the lobster fishery in LFA 10 was open for 10 weeks (1 May–9 July) (DFO 2017d). The fishery is managed by DFO through annual fisheries management decisions (DFO 2017e), and participants are restricted to fishing within the LFA in which they reside or have historically fished (Vale 2008). Traps are set nearshore, generally at depths <20 m (see Figure 4.4), and the fishery is prosecuted using small open boats (DFO 2016b). Throughout Newfoundland, trap limits vary from 100–300 per licenced fisher, depending on the LFA (DFO 2016b). The minimum carapace length to buy, sell or possess lobster for all LFAs in Newfoundland and Labrador is 82.5 mm (DFO 2017j). Other management measures to sustain the lobster resource include a voluntary v-notching program for ovigerous (egg-bearing) females (it is prohibited to harvest ovigerous females or retain v-notched females) (Coughlan et al. 2015), mandatory logbooks, closed areas for conservation, trap limits, and established season duration (DFO 2017e). Traps must possess vents which allow undersized lobsters to escape (DFO 2016b).

Sea scallops accounted for ~0.4% and 1% of the 2010 3PSc commercial harvest weight and value, respectively (see Table 4.2), and ~5% of the total quartile code counts in the Study Area during 2015 (see Table 4.7). During 2011–2015, sea scallop harvests were variable, with the largest harvest occurring in 2015 (Figure 4.21). Sea scallops are primarily harvested during the fall in the Study Area, followed by a late-winter harvest (March) (Figure 4.22). The Placentia Bay 3Ps commercial scallop fishery in Scallop Fishing Area 10 (Figure 4.23) opened for all fish harvesters on 11 January 2018 (DFO 2018e). The georeferenced harvest locations for sea scallops in the Study Area during 2010 and 6'x6' grid cell locations during 2015 are shown in Figure 4.24. Sea scallops are harvested nearshore in northern Placentia Bay, in water depths <200 m. During 2010, one harvest location occurred within the Red Island proposed sea cage site. Harvest locations were otherwise <2 km of proposed sea cage sites within the Red Island BMA, and >3 km from the Merasheen BMA proposed sea cage sites. The 2010 harvest locations closest to the Long Harbour BMA proposed sea cage sites were in the vicinity of the town of Placentia. No harvest sites were located near the Rushoon BMA proposed sea cage sites during 2010. During 2015, sea scallop grid cell harvest locations overlapped with the Ship Island, Butler Island and Red Island proposed sea cage sites. The TAC for 3Ps inshore sea scallop in effect from 2016–2019 is 872 mt round weight and 105 mt meats, an overall quota decrease of 22% from 2015 (DFO 2016a). A recent DFO requirement stipulates that only vessels registered in the Newfoundland and Labrador Region during the past 12 consecutive months are permitted to participate in the 3Ps inshore sea scallop fishery on the north bed and in the core area (DFO 2016a).



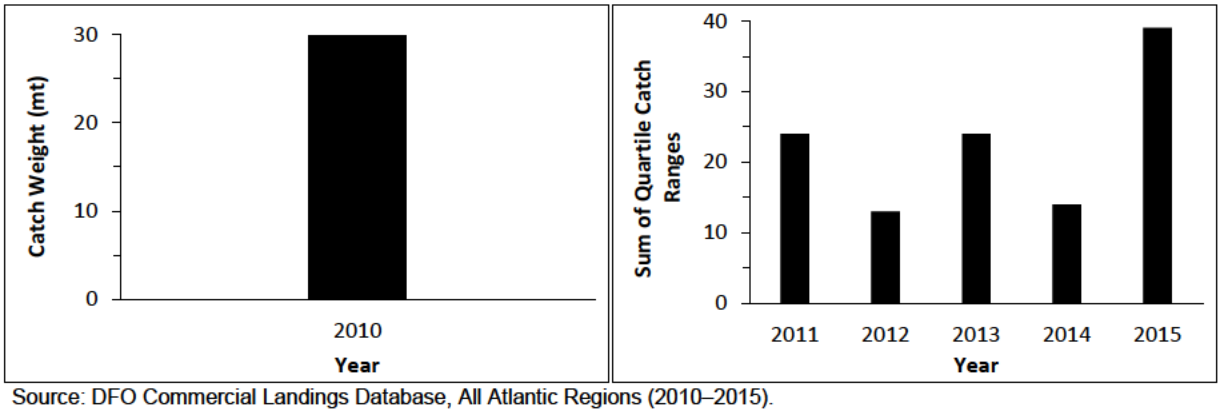

Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

**Figure 4.19. Total catch weight, 2010 (left), and annual total sum of catch weight quartile codes, 2011–2015 (right) for lobster within the Study Area* (*within NAFO UA 3PSc; lobster catches are not georeferenced or designated within 6'x6' grid cells).**



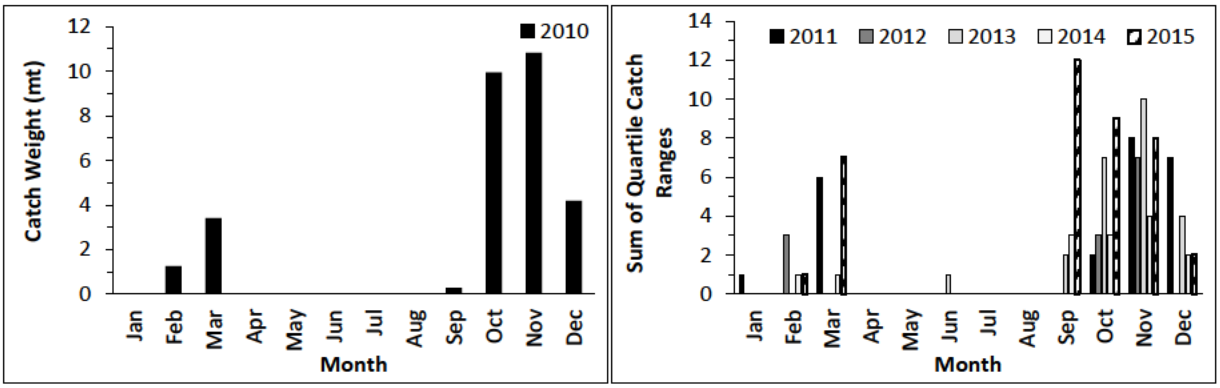

Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

**Figure 4.20. Total monthly catch weight, 2010 (left), and monthly total sum of catch weight quartile codes, 2011–2015 (right) for lobster within the Study Area* (*within NAFO UA 3PSc; lobster catches are not georeferenced or designated within 6'x6' grid cells).**



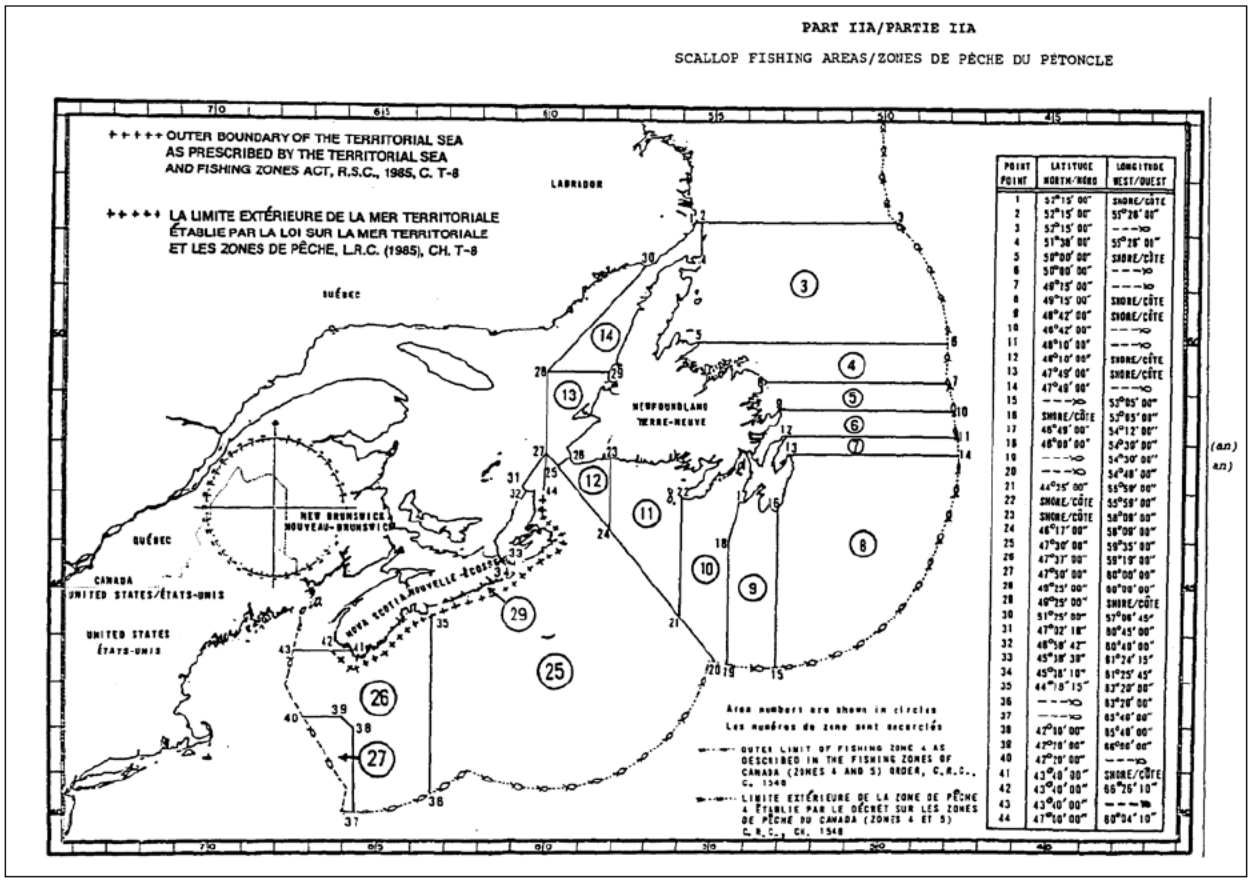

Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

**Figure 4.21. Total catch weight, 2010 (left), and annual total sum of catch weight quartile codes, 2011–2015 (right) for sea scallops within the Study Area (within NAFO UA 3PSc for 2010).**



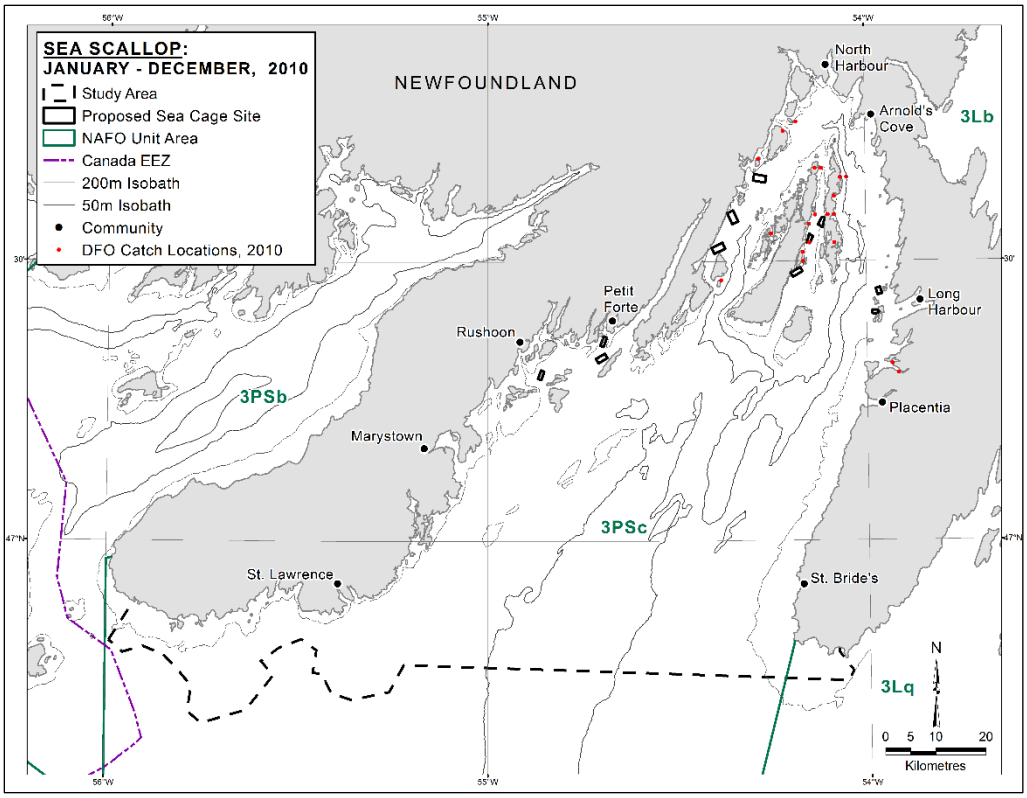

Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

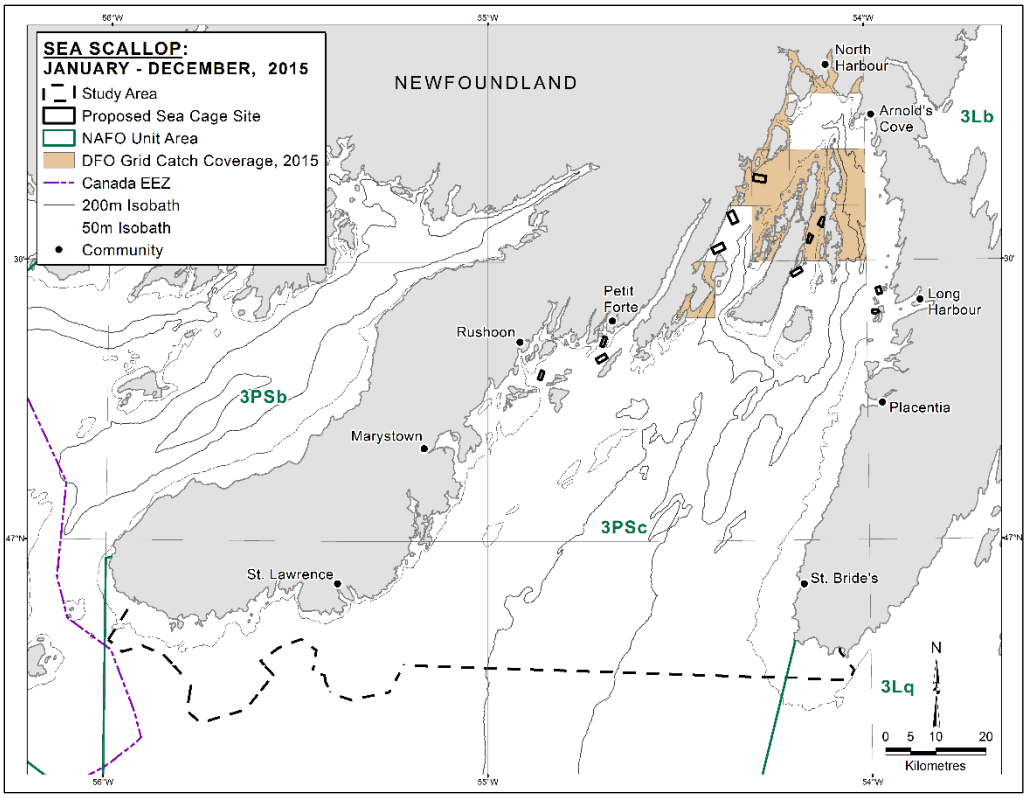
**Figure 4.22. Total monthly catch weight, 2010 (left), and monthly total sum of catch weight quartile codes, 2011–2015 (right) for sea scallops within the Study Area (within NAFO UA 3PSc for 2010).**




Source: DFO (1997).

**Figure 4.23. DFO Scallop Fishing Areas.**

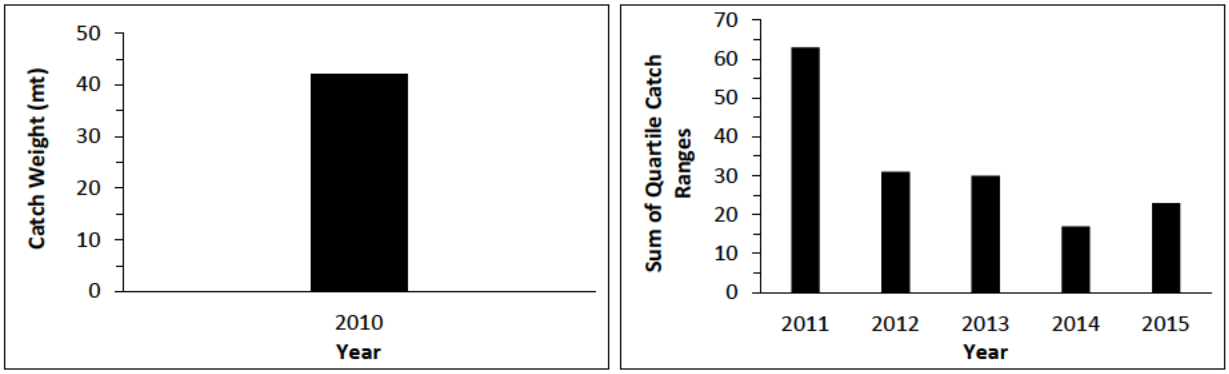



Source: DFO Commercial Landings Database, All Atlantic Regions (2010, 2015).

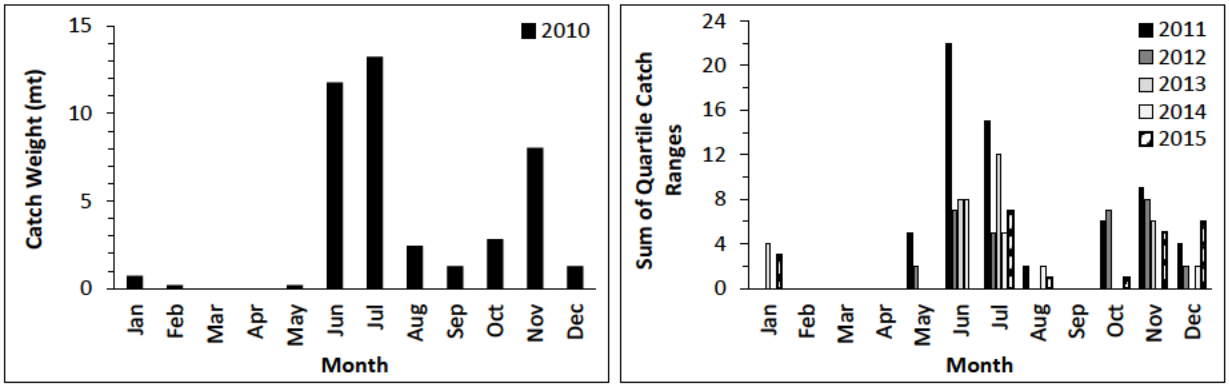
**Figure 4.24. Distribution of commercial harvest locations for sea scallops in the Study Area, 2010 (top) and 2015 (bottom).**

A moratorium on direct fishing for American plaice has been in place since September 1993 (Morgan et al. 2014). All American plaice captured during commercial fisheries in the Study Area are taken as bycatch. American plaice catches represented ~1% and 0.3% of the commercial catch weight and value, respectively, in 3PSc in 2010 (see Table 4.2), and ~2% of the total quartile code counts in the Study Area in 2015 (see Table 4.7). American plaice catches in the Study Area decreased by approximately 50% between 2011 and 2012, then remained relatively steady until another decrease in 2014, followed by a slight increase in 2015 (Figure 4.25). American plaice are caught primarily during June and July in the Study Area, with a small peak during late-fall (Figure 2.26). The majority of American plaice are taken as bycatch in the directed Atlantic cod and witch flounder fisheries (Morgan et al. 2014). American plaice were caught in water depths <200 m throughout Placentia Bay during 2010, coinciding with Atlantic cod harvest locations (see Figures 4.15 and 4.27). While no American plaice harvest locations were reported within any of the proposed sea cage sites during either 2010 or 2015, several catch locations were in the vicinity of the Ship Island and Valen Island proposed sea cage site of the Merasheen BMA. Forty-six and 50 mt of American plaice were taken in Div. 3Ps in 2016 and 2017, respectively, by vessels <65' operating fixed gear (DFO 2018d).



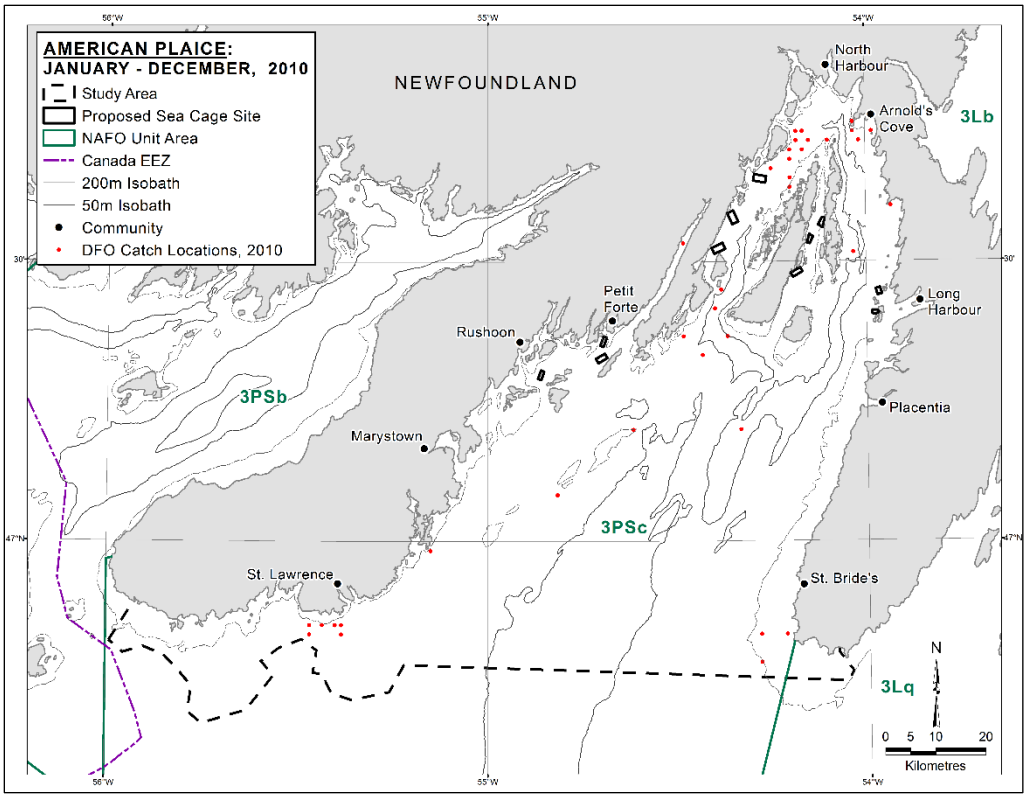

Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

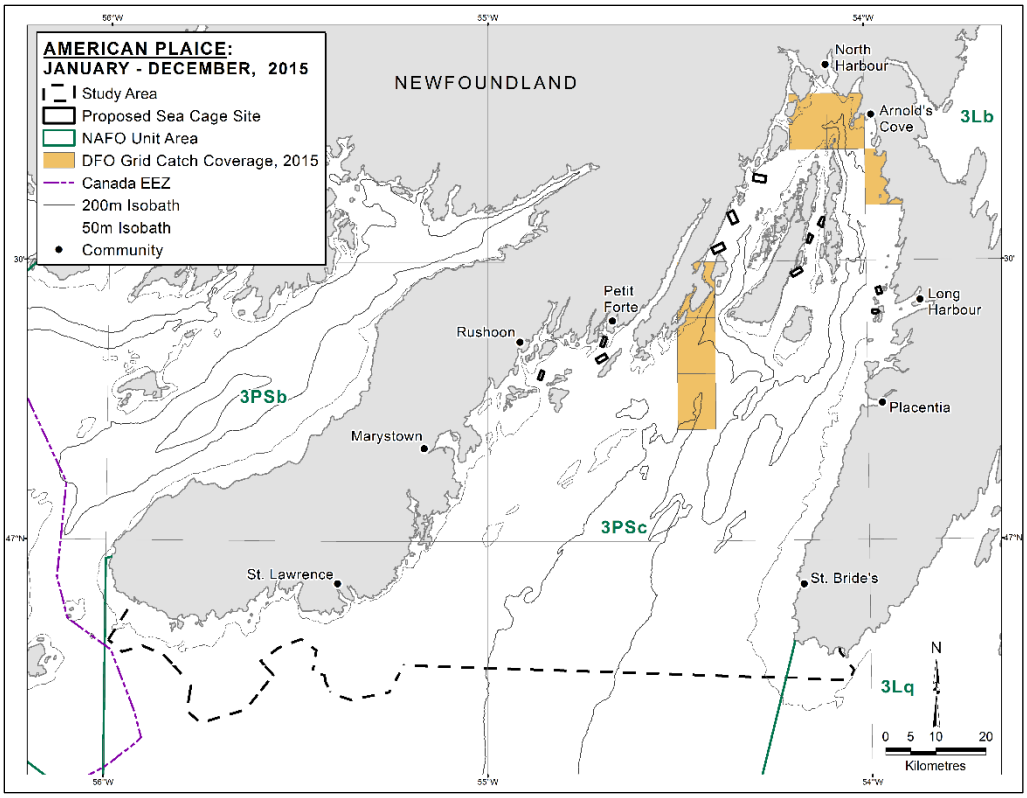
**Figure 4.25. Total catch weight, 2010 (left), and annual total sum of catch weight quartile codes, 2011–2015 (right) for America plaice within the Study Area (within NAFO UA 3PSc for 2010).**




Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

**Figure 4.26. Total monthly catch weight, 2010 (left), and monthly total sum of catch weight quartile codes, 2011–2015 (right) for American plaice within the Study Area (within NAFO UA 3PSc for 2010).**

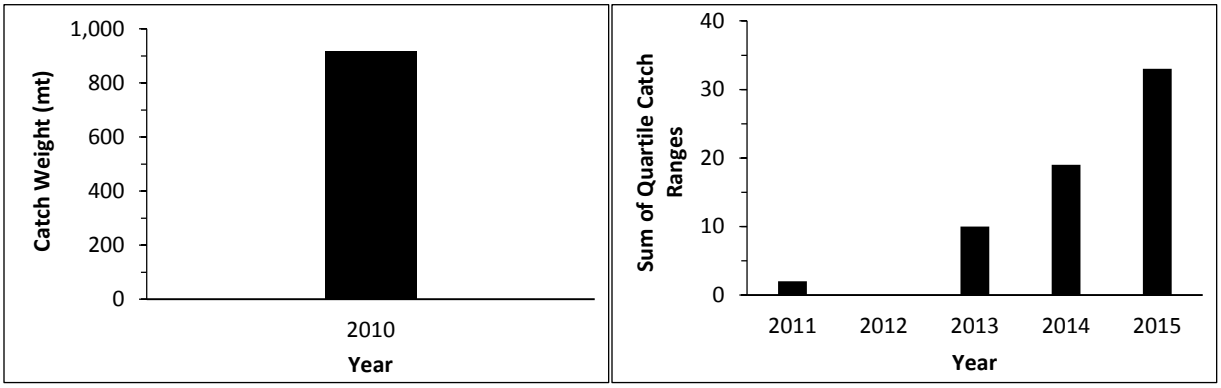



Source: DFO Commercial Landings Database, All Atlantic Regions (2010, 2015).

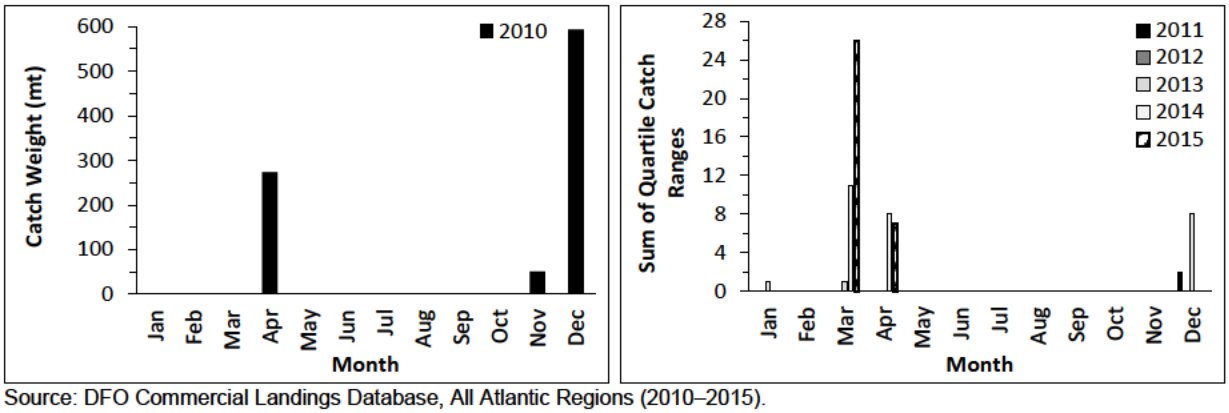
**Figure 4.27. Distribution of commercial harvest locations for American plaice in the Study Area, 2010 (top) and 2015 (bottom).**

Atlantic herring comprised ~14% and ~2% of the 3PSc 2010 commercial fishery catch weight and catch value, respectively (see Table 4.2), and ~2% of the total quartile code counts in the Study Area during 2015 (see Table 4.7). While there were only a few Atlantic herring harvests within the Study Area during 2011 and none during 2012, herring harvests have steadily increased since 2013 (Figure 4.28). Atlantic herring are only harvested during the spring and winter in the Study Area, with the majority of recent harvests occurring during March (Figure 4.29). The Atlantic herring fishery for mobile gear vessels >55' (16.76 m) in Placentia Bay (Herring Fishing Area 10; Figure 4.30) opened on 30 January 2018 (DFO 2018f). In the Study Area, Atlantic herring were mainly harvested nearshore in northern Placentia Bay during 2010, typically in water depths <100 m. Several harvesting locations near the mouth of Placentia Bay were also reported in 2010 (Figure 4.31). There were no harvest locations within the proposed sea cage sites in either 2010 or 2015. The nearest harvest locations were along the northern side of Bar Haven Island. The combined TAC for St. Mary's Bay and Placentia Bay is 2,100 mt for 2017–2018, unchanged from the previous year, and the minimum size limit for herring in 2017–2018 is 24.76 cm (DFO 2017e). Fixed gear fishers are only permitted to fish in their Fishing Area of residence, and mobile fishers living on the southeast coast of Newfoundland are permitted to fish in Herring Fishing Areas 9 and 10 (Cape Race to Point Crewe) (DFO 2017e). In an effort to minimize potential bycatch of salmon in the commercial herring fishery, it is prohibited for harvesters to utilize monofilament netting in herring trap net leaders and gillnets, or trap net leaders with a mesh size between two and seven inches (DFO 2017e). Measures have also been taken in the herring bait fishery to minimize salmon bycatch, including a requirement for bait nets to be set parallel to the nearest shore with the head ropes no less than one fathom below the surface, and no setting of bait nets during peak salmon run periods (in most areas) (DFO 2017e). All licenced herring fishers operating vessels ≥35' as well as those operating mobile gear vessels of all lengths are required to provide detailed logbooks of catch and fishing activity. As of 2017, it is mandatory for harvesters to return bait logbooks (DFO 2017e). At the request of DFO, purse seine herring licence holders will be required to carry an at-sea observer intermittently throughout the fishery, and to provide information on their activities specific to DFO's Science program requirements (DFO 2017e). The Atlantic herring fishery is subject to a Dockside Monitoring Program (DFO 2017e).



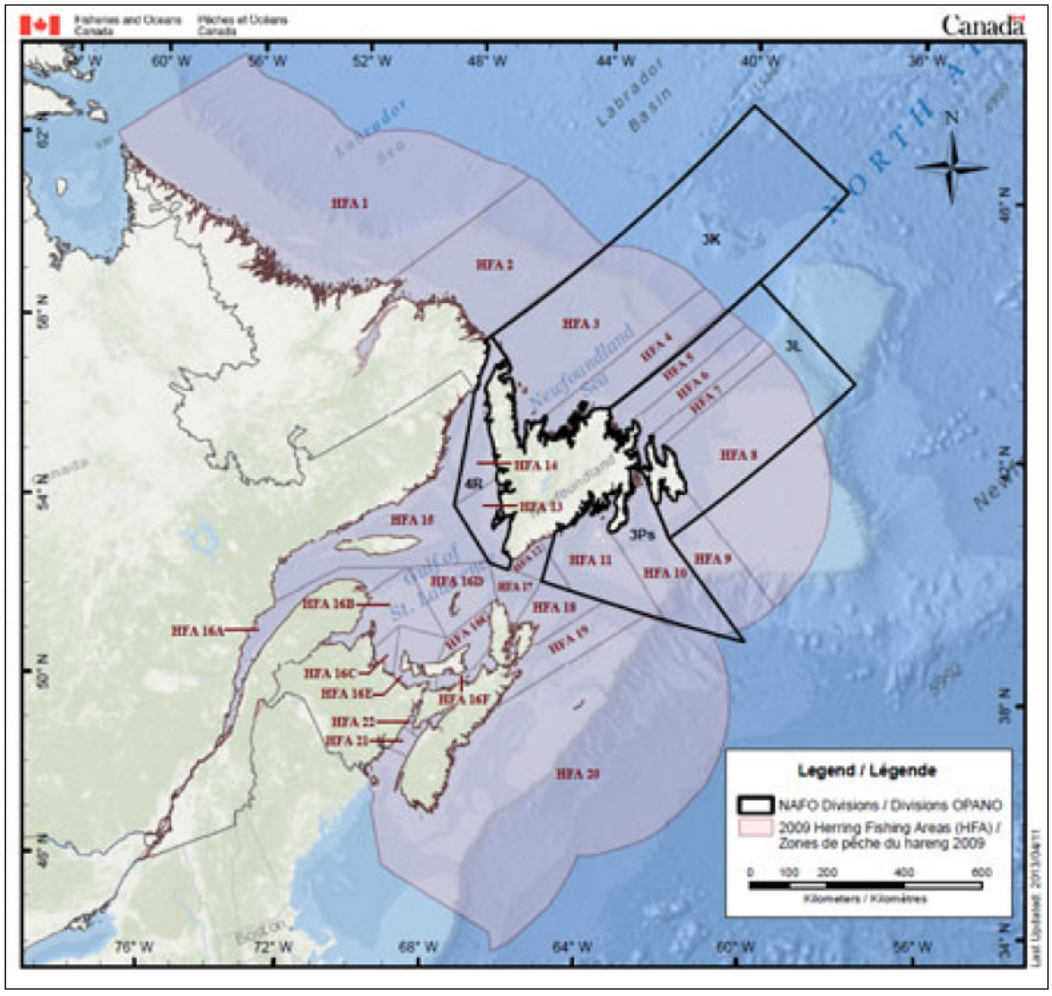

Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

**Figure 4.28. Total catch weight, 2010 (left), and annual total sum of catch weight quartile codes, 2011–2015 (right) for Atlantic herring within the Study Area (within NAFO UA 3PSc for 2010).**



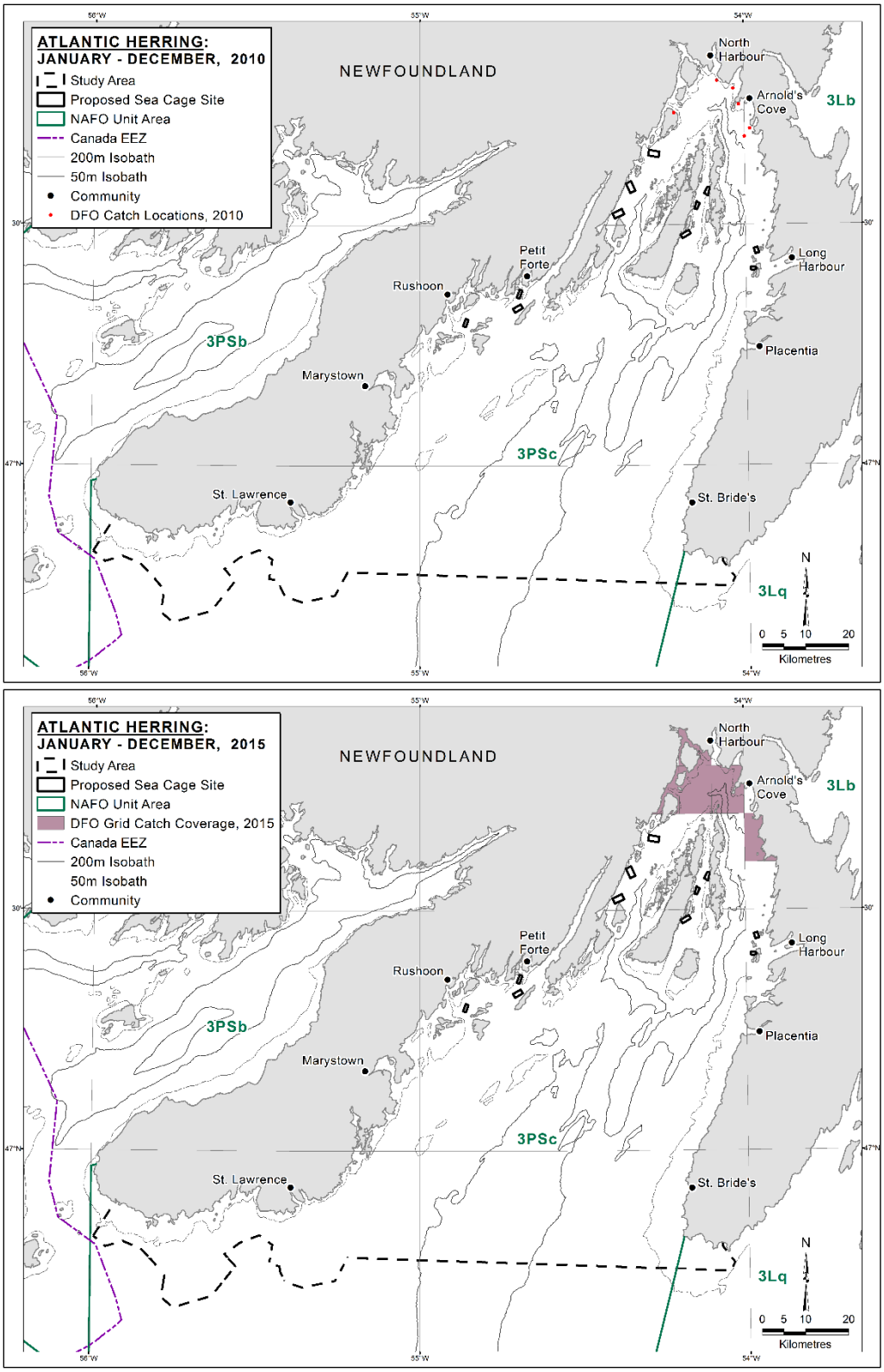

Source: DFO Commercial Landings Database, All Atlantic Regions (2010–2015).

**Figure 4.29. Total monthly catch weight, 2010 (left), and monthly total sum of catch weight quartile codes, 2011–2015 (right) for Atlantic herring within the Study Area (within NAFO UA 3PSc for 2010).**




Source: DFO (2015a).

**Figure 4.30. DFO Herring Fishing Areas (HFAs).**




Source: DFO Commercial Landings Database, All Atlantic Regions (2010, 2015).

**Figure 4.31. Distribution of commercial harvest locations for Atlantic herring in the Study Area, 2010 (top) and 2015 (bottom).**

*Licences, Vessels and Enterprises*

Under the system established by DFO in 1996, a "core" fishing enterprise is a commercial fishing enterprise which holds key species licences (Vale 2008). Generally, new core enterprises are not created but rather existing enterprises may be transferrable to a new eligible harvester (Vale 2008). In the event of a transfer, DFO requires that the enterprise become a Level II professional fish harvester, certified by the Professional Fish Harvesters Certification Board (PFHCB) of Newfoundland and Labrador (Vale 2008). A "non-core" enterprise holds other and/or single species licences (Vale 2008). As of 17 April 2018, within the Placentia Bay region, 426 and 108 core and non-core enterprises (i.e., vessel registrations) were held by vessels ≤35' (≤10.7 m) and >35' (>10.7 m), respectively (Table 4.11). The majority of enterprises were held by harvesters with home ports of Parkers Cove, Baine Harbour, Rushoon, Oderin, Red Harbour, Jean de Baie, Little Bay, Fox Cove, Mortier, Port au Bras and Burin, and Southern Harbour (Table 4.11).

**Table 4.11. Core and non-core vessel registrations in Placentia Bay as of 17 April 2018, by home port and vessel size.**

| Home Port | Number of Vessel Registrations | | Total No. Vessels |
|---|---|---|---|
| | LOA ≤35' (≤10.7 m) | LOA >35' (>10.7 m) | |
| St. Bride's & Patrick's Cove* | 24 | 15 | **39** |
| Placentia (Incl. Southeast) | 12 | 6 | **18** |
| Dunville, Jerseyside, Freshwater, Freshwater, Fox Harbour & Ship Harbour* | 39 | 9 | **48** |
| Mt. Arlington Heights, Fair Haven & Little Harbour East* | 36 | 6 | **42** |
| Southern Harbour | 47 | 14 | **61** |
| Arnold's Cove, Come By Chance & North Harbour* | 29 | 7 | **36** |
| Garden Cove, Prowseton, Sand Harbour, Davis Cove, Bar Haven, Red Island, Merasheen & Isle Au Valen* | 32 | 10 | **42** |
| Little Paradise & Great Paradise* | 5 | 0 | **5** |
| South East Bight | 40 | 5 | **45** |
| Monkstown | 8 | 0 | **8** |
| Petit Forte | 28 | 9 | **37** |
| Boat Harbour (Incl. Brookside) | 7 | 0 | **7** |
| Parkers Cove, Baine Harbour, Rushoon, Oderin, Red Harbour, Jean de Baie, Little Bay, Fox Cove, Mortier, Port au Bras & Burin* | 56 | 11 | **67** |
| Little St. Lawrence, St. Lawrence & Lawn* | 24 | 10 | **34** |
| Lord's Cove, Point UA Gal, Lamaline & Point May* | 39 | 6 | **45** |
| **Total** | **426** | **108** | **534** |

Source: E. Careen, Senior Regional Aquaculture Management Officer, DFO, pers. comm. 23 April 2018. Data were derived from the Newfoundland and Labrador Fisheries Information Network (NLFIN).
LOA = Length overall; Incl. = Includes.
* Denotes homeports were grouped in accordance with the Privacy Rule of 5, whereby data are combined if there are <5 registered vessels in order to protect the privacy and identification of individual fishers.

Across all species, the total number of licences in the Placentia Bay area as of 17 April 2018 was 3,609 (Table 4.12). The majority of licences are for snow crab (586 licences), lobster (532) and bait (527), and the fewest are for eel (8) and sea urchin (7). The number of licences for commercial and recreational scallop harvests are roughly equivalent, at 179 and 171, respectively. In accordance with the most recent integrated fisheries management plan for snow crab (DFO 2010a), no new licences are available for this closed fishery beyond the total 813 licences allotted for Div. 3Ps during 2009, of which 713 and 100 were designated for the inshore and supplementary snow crab fisheries, respectively. The number of licences decreased over time with the implementation of enterprise combining in 2008 (DFO 2010a). Div. 3Ps harvesters currently hold a total of 597 snow crab licences (FFAW|Unifor 2017a).

**Table 4.12. Core, non-core and recreational licences in Placentia Bay as of 17 April 2018, by species.**

| Species | Number of Licences |
|---|---|
| Bait | 527 |
| Capelin | 82 |
| Eel | 8 |
| Groundfish | 144 |
| Herring | 266 |
| Lobster | 532 |
| Mackerel | 298 |
| Scallop (Commercial) | 179 |
| Scallop (Recreational) | 171 |
| Sea Cucumber | 35 |
| Sea Urchin | 7 |
| Seal (Commercial) | 13 |
| Seal (Personal Use) | 95 |
| Snow Crab | 586 |
| Squid | 328 |
| Tuna (Bluefin) | 17 |
| Whelk | 321 |
| **Total** | **3,609** |

Source: E. Careen, Senior Regional Aquaculture Management Officer, DFO, pers. comm. 23 April 2018. Data were derived from the Newfoundland and Labrador Fisheries Information Network (NLFIN).

The commercial fisheries in Placentia Bay are prosecuted using primarily small vessels (<45' [13.7 m]) (Table 4.13). During 2010 and 2015, no vessels >65' (19.8 m) were used during commercial fisheries within the Study Area. Including vessel crew members, there are currently about 1,500 harvesters in the NAFO Div. 3Ps region (FFAW|Unifor 2017a).

**Table 4.13. Commercial fisheries harvest catch weight within NAFO UA 3PSc in 2010 and commercial catch weights in the Study Area in 2015, by vessel class (2015 values indicate the frequency of catch weight quartile codes [i.e., 1–4] attributed to each vessel class).**

| Vessel Class | 2010 Catch Weight | | 2015 Catch Weight Quartile Code Counts [a] | | | | |
|---|---|---|---|---|---|---|---|
| | mt | % of Total | 1 | 2 | 3 | 4 | Total Counts [b] |
| 1–34.9' (0.3–10.6 m) | 3,889 | 58 | 137 | 87 | 12 | 1 | 237 |
| 35–44.9' (10.7–13.7 m) | 1,958 | 29 | 158 | 116 | 24 | 4 | 302 |
| 45–64.9' (13.7–19.8 m) | 869 | 13 | 5 | 19 | 7 | 3 | 34 |
| 65–99.9' (19.8–30.5 m) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100–124.9' (30.5–38.1 m) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ≥125' (≥38.1 m) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **6,716** | **1005** | **300** | **222** | **43** | **8** | **573** |

Source: DFO Commercial Landings Database, All Atlantic Regions (2010, 2015).

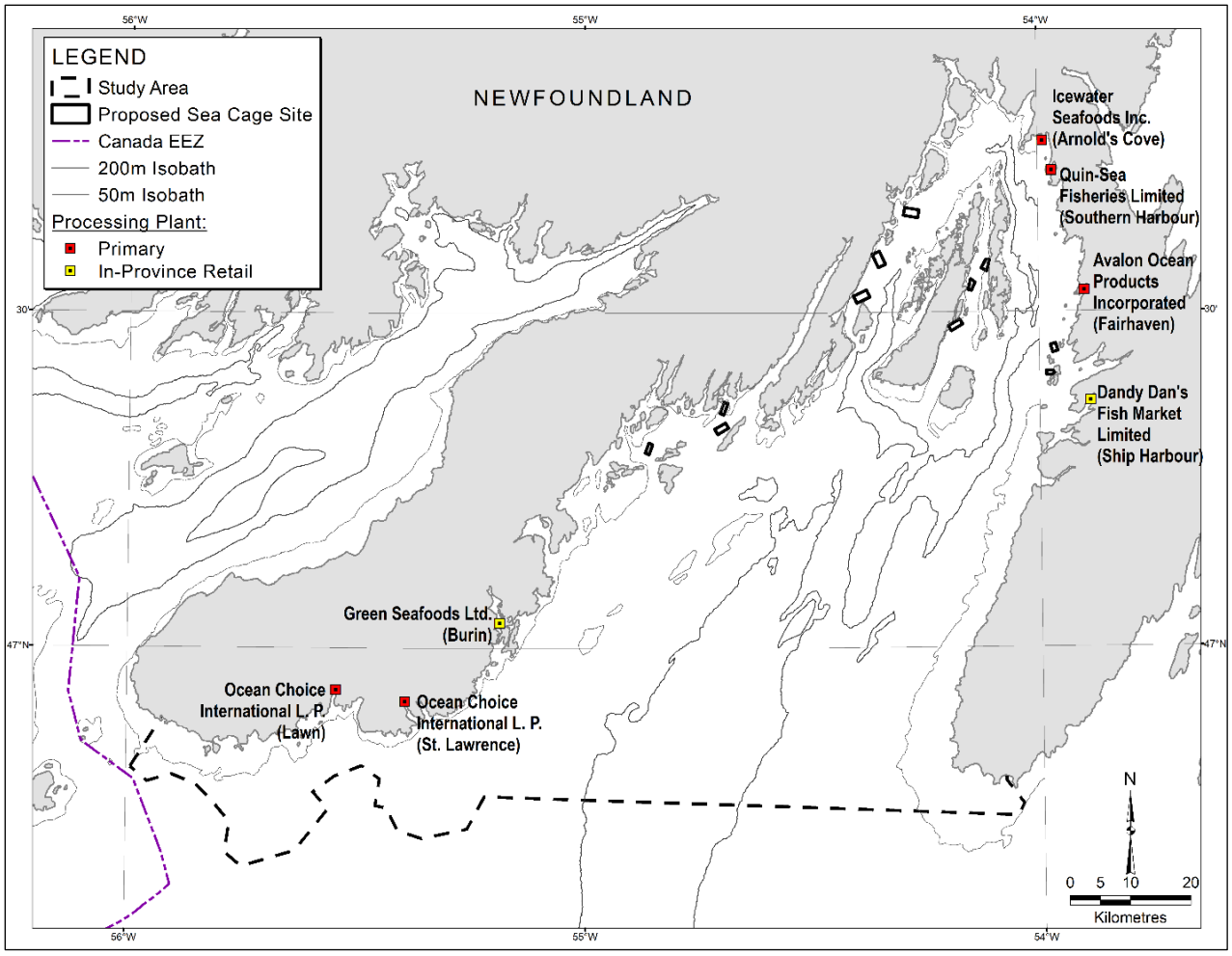
[a] Quartile ranges provided by DFO (quartile ranges calculated annually by DFO based on total catch weights in a given year, all species combined). 2015 quartile ranges: 1 = 0 – 2,253 kg, 2 = 2,254 – 9,535 kg, 3 = 9,536 – 40,703 kg, 4 = ≥ 40,704 kg.

[b] Total counts of the number of catch records per vessel class.

*Processing*

The Department of Fisheries and Land Resources (DFLR) (formerly DFA) licenses fish processing operations, conducts market research, maintains an overview of current market conditions for major species, and supports the fish price negotiation process by providing marketing information to fishers and fish processor's representatives (DFO 2016c). The DFLR Fisheries Technology and New Opportunities Program "provides support for harvesting, processing and marketing initiatives, in order to diversify and increase the overall viability of the provincial seafood industry" (DFO 2016c). The Program focuses on research and development in the harvesting and processing sectors, emphasising "more efficient use of traditional species, better use of under-used species and enhanced value-realization of all fisheries resources" (DFO 2016c). The Program will also underscore the recovery of raw material wastage and reduced discards of fishery by-products (DFO 2016c).

During 2016, there were 92 licenced fish processing plants in Newfoundland and Labrador, of which 73 held primary licences (for primary processing; e.g., cleaning, icing, cooking, canning, etc.), two held secondary licences (for secondary processing; e.g., adding ingredients other than water or salt, breading, battering, smoking, marinating, etc.), six were aquaculture licences, and 11 were in-province retail establishments (DFLR 2017a). There are currently seven licenced fish processors in Placentia Bay, of which five are primary licence holders and two are in-province retail establishments (NLSA 2018; Figure 4.32). The nearest processors to the proposed sea cage sites are the Avalon Ocean Products Incorporated primary licenced plant in Fairhaven, and Dandy Dan's Fish Market Limited in-province retailer in Ship Harbour, both of which are within ~10 km of the proposed sea cage sites in the seasonal Long Harbour BMA.




Source: NLSA (2018).

**Figure 4.32. Fish processing plants in Placentia Bay.**

### *Potential Fisheries in the Study Area*

One of the objectives of the DFLR is to consider the use of underutilized species (DFO 2016c). Evaluating a potential fishery in an area requires consideration of biological and socio-economic factors, such as the presence and volume of exploitable biomass, status of a species, market demand and value, and skills or equipment required by harvesters (Nalcor 2011). One method to determine the presence of underutilized species is to analyze the catch data of macroinvertebrates and fishes collected during annual DFO Research Vessel (RV) multi-species trawl surveys. The following subsection describes species collected during DFO RV surveys in Placentia Bay during recent years.

*Macroinvertebrates and Fishes Collected during DFO Research Vessel Surveys, 2010–2015*

The total catch weight during the 2010–2015 DFO RV surveys in the Study Area was ~2.6 mt, ranging from 0.3–0.6 mt per year. DFO RV surveys were only conducted during the spring

(March–May) within the Study Area during this period. Data collected during these surveys were analyzed, and catch weights, catch numbers and mean catch depths of species/groups contributing ≥0.1% of the total catch weight as well as sensitive species (e.g., corals and sponges) are presented in Table 4.14.

**Table 4.14. Catch weights and numbers, and mean catch depths of macroinvertebrates and fishes collected during DFO RV surveys within the Study Area, 2010–2015.**

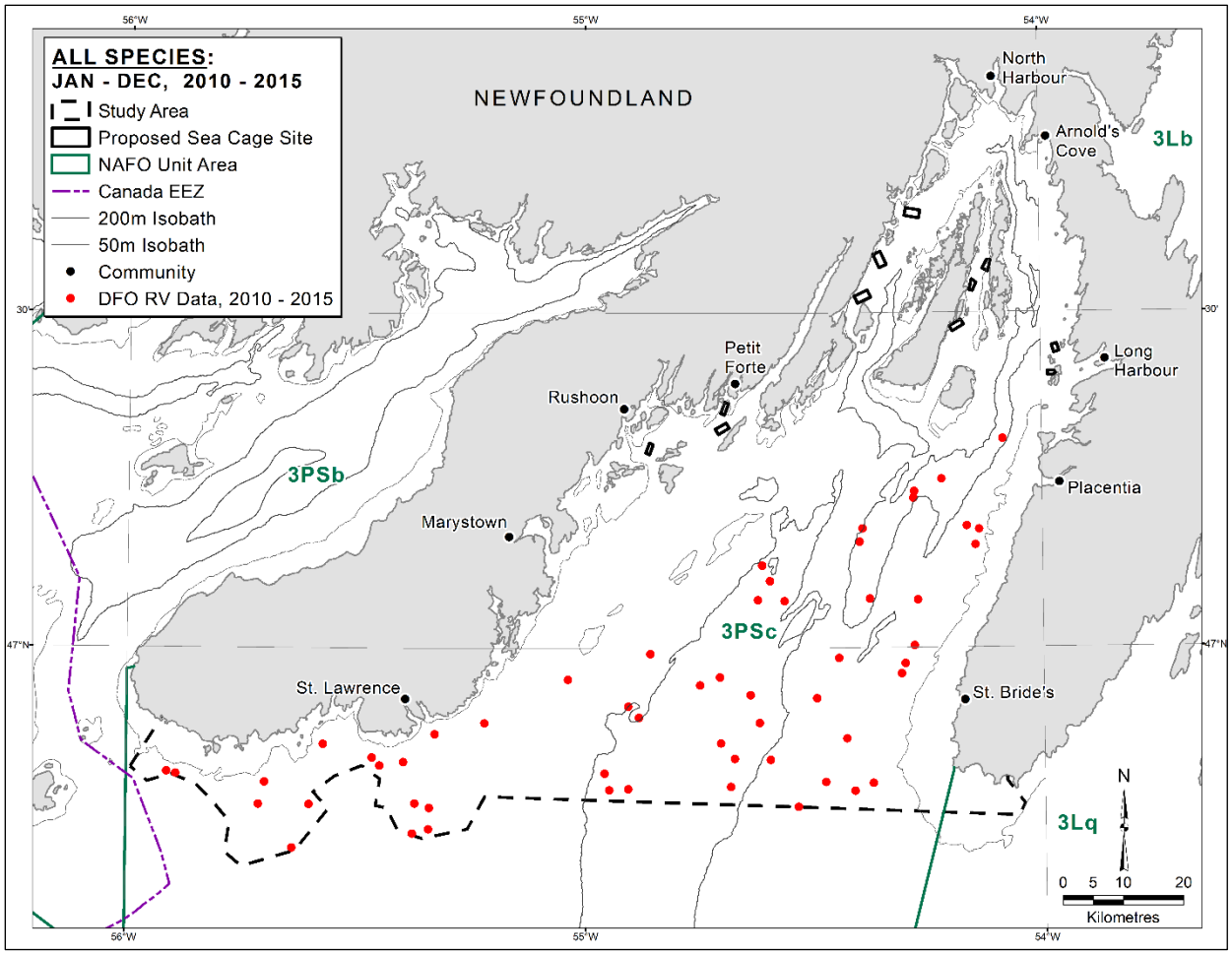
| Species | Catch Weight (mt) | Catch Number | Mean Catch Depth (m) |
|---|---|---|---|
| Capelin | 0.4 | 51,789 | 162 |
| Northern Shrimp | 0.4 | 86,530 | 190 |
| American Plaice | 0.3 | 4,119 | 143 |
| Striped Shrimp | 0.2 | 61,875 | 135 |
| Atlantic Cod | 0.2 | 997 | 139 |
| Snow Crab | 0.1 | 2,149 | 141 |
| Greenland Halibut | 0.1 | 478 | 206 |
| Basket Star (*Gorgonocephalus arcticus*) | 0.1 | 0 [a] | 139 |
| Shorthorn Sculpin | 0.1 | 218 | 128 |
| Arctic Argid Shrimp (*Argis dentata*) | 0.1 | 12,069 | 151 |
| Basket Star (Gorgonocephalidae) | 0.1 | 2 | 130 |
| Green Sea Urchin | 0.1 | 2,526 | 125 |
| Sea Raven | 0.1 | 76 | 151 |
| Greenland Shrimp | 0.1 | 46,470 | 179 |
| Lumpfish (*Cyclopterus lumpus*) | 0.1 | 31 | 162 |
| Thorny Skate | <0.1 | 16 | 217 |
| Mud Star (*Ctenodiscus crispatus*) | <0.1 | 2,483 | 192 |
| Arctic Cod | <0.1 | 2,552 | 154 |
| Sculptured Shrimp (*Sclerocrangon boreas*) | <0.1 | 2,511 | 130 |
| Arctic Eelpout | <0.1 | 29 | 155 |
| Toad Crab (*Hyas* sp.) | <0.1 | 1,758 | 132 |
| Northern Alligatorfish | <0.1 | 882 | 162 |
| Mailed Sculpin | <0.1 | 1,401 | 127 |
| Eelpout (*Lycodes* sp.) | <0.1 | 182 | 177 |
| Moustache Sculpin | <0.1 | 1,413 | 131 |
| Eelpout (Zoarcidae) | <0.1 | 219 | 187 |
| Atlantic Herring | <0.1 | 206 | 156 |
| Offshore Sand Lance | <0.1 | 505 | 85 |
| Brittle Star (*Ophiura sarsi*) | <0.1 | 99 | 127 |
| Longhorn Sculpin | <0.1 | 87 | 117 |
| Sea Urchin (*Strongylocentrotus* sp.) | <0.1 | 305 | 105 |
| Sea Anemone (Actinaria) | <0.1 | 287 | 157 |
| Seasnail (Liparidae) | <0.1 | 336 | 180 |
| Spatulate Sculpin | <0.1 | 401 | 152 |
| Spiny Lumpfish | <0.1 | 362 | 110 |
| Shanny (*Lumpenus maculatus*) | <0.1 | 323 | 160 |
| Rigid Cushion Star | <0.1 | 300 | 224 |
| Corals | <0.1 | 120 | 139 |
| Yellowtail Flounder | <0.1 | 23 | 97 |
| Winter Skate | <0.1 | 3 | 128 |
| Iceland Scallop | <0.1 | 69 | 101 |
| Sessile Tunicate (*Boltenia* sp.) | <0.1 | 72 | 136 |
| Sea Star (*Crossaster papposus*) | <0.1 | 149 | 98 |

| Species | Catch Weight (mt) | Catch Number | Mean Catch Depth (m) |
|---|---|---|---|
| Sponges | <0.1 | 0 [a] | 113 |
| Snake Blenny | <0.1 | 137 | 160 |
| Common Alligatorfish | <0.1 | 154 | 148 |
| Polar Sea Star | <0.1 | 29 | 102 |
| Shrimp (*Eualus gaimardii gaimard*ii) | <0.1 | 1,767 | 150 |
| Atlantic Wolffish | <0.1 | 21 | 73 |
| Comb Jelly (Ctenophora) | <0.1 | 0 [a] | 76 |
| Orange-footed Sea Cucumber | <0.1 | 4 | 77 |
| Sea Urchin (Echinoida) | <0.1 | 92 | 84 |
| (Common) Ocean Pout | <0.1 | 7 | 72 |
| Arctic Mailed Sculpin | <0.1 | 200 | 73 |
| Hookear Sculpin (*Artediellu*s sp.) | <0.1 | 230 | 133 |
| Parrot Shrimp (*Spirontocaris spinus*) | <0.1 | 812 | 107 |
| Smooth Skate | <0.1 | 1 | 106 |
| Deepwater Redfish | <0.1 | 13 | 96 |
| **Total** | **2.6** | **289,889** | **136** |

Source: DFO RV Survey Data (2010–2015).
[a] Denotes data incomplete.

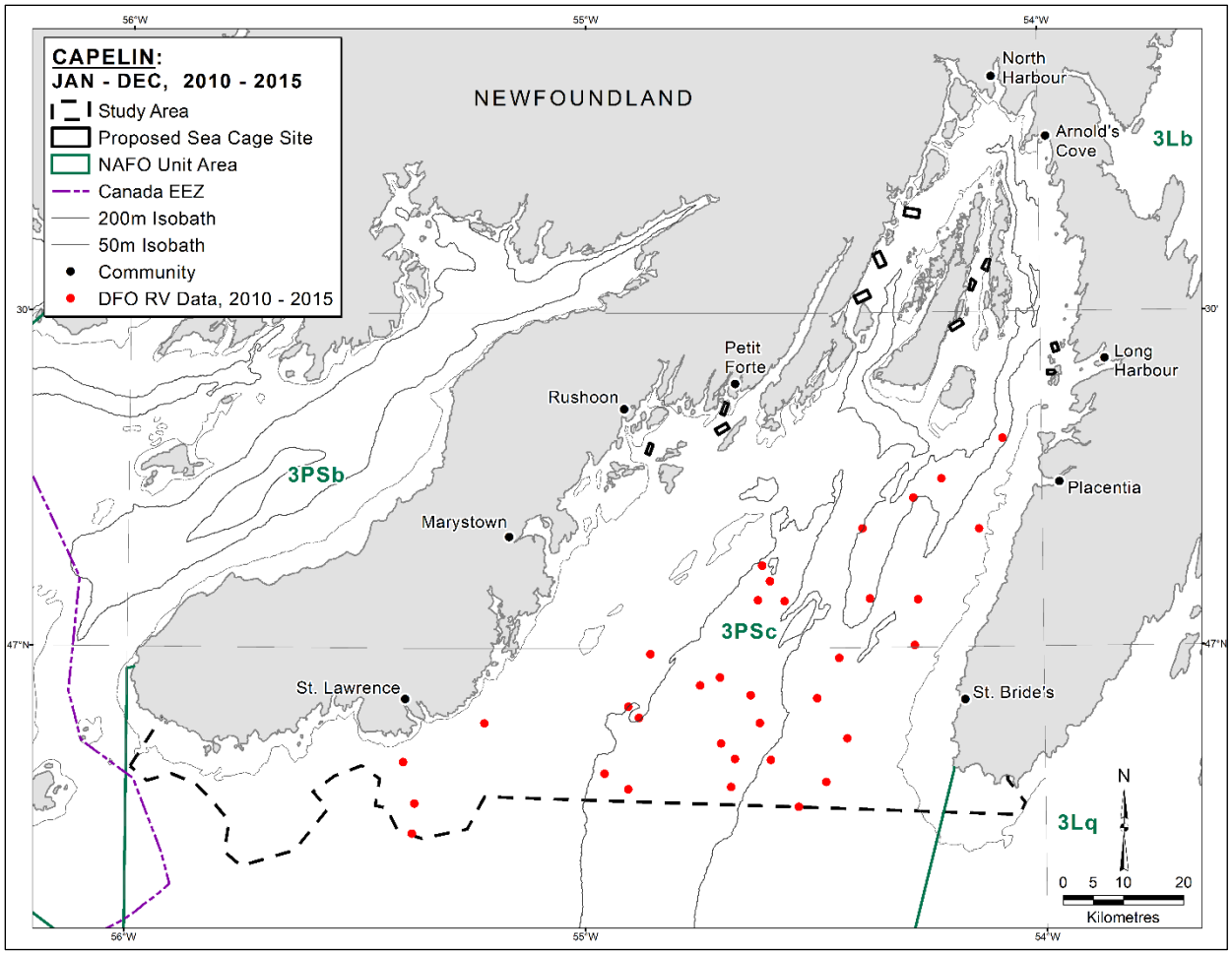
Capelin accounted for 16% of the total catch weight within the Study Area during 2010–2015, followed by northern shrimp (*Pandalus borealis*; 14%), American plaice (10%), striped shrimp (*Pandalus montagui*; 7%), Atlantic cod (7%), snow crab (5%) and Greenland halibut (5%). All other species/groups accounted for <5% each of the total 2010–2015 catch weight in the Study Area. The average mean depth during the 2010–2015 RV surveys within the Study Area was 136 m (min: 67 m; max: 258 m). Principal species captured during the 2010–2015 DFO RV surveys were generally reflective of predominant species targeted using mobile gear (bottom trawls) in the commercial fishery during recent years.

Species were caught predominantly in the southern and southeastern portion of the Study Area during the 2010–2015 DFO RV surveys in water depths >50 m (Figure 4.33). No RV catch locations during this period were within 10 km of the proposed sea cage sites. The nearest catch location was ~13 km southwest of the Iona Islands proposed sea cage site within the Long Harbour BMA. DFO RV survey catch locations for capelin, northern shrimp, American plaice, striped shrimp, Atlantic cod, snow crab, Greenland halibut, Atlantic wolffish (*Anarhichas lupus*), corals and sponges during 2010–2015 are shown in Figures 4.34–4.43, respectively.



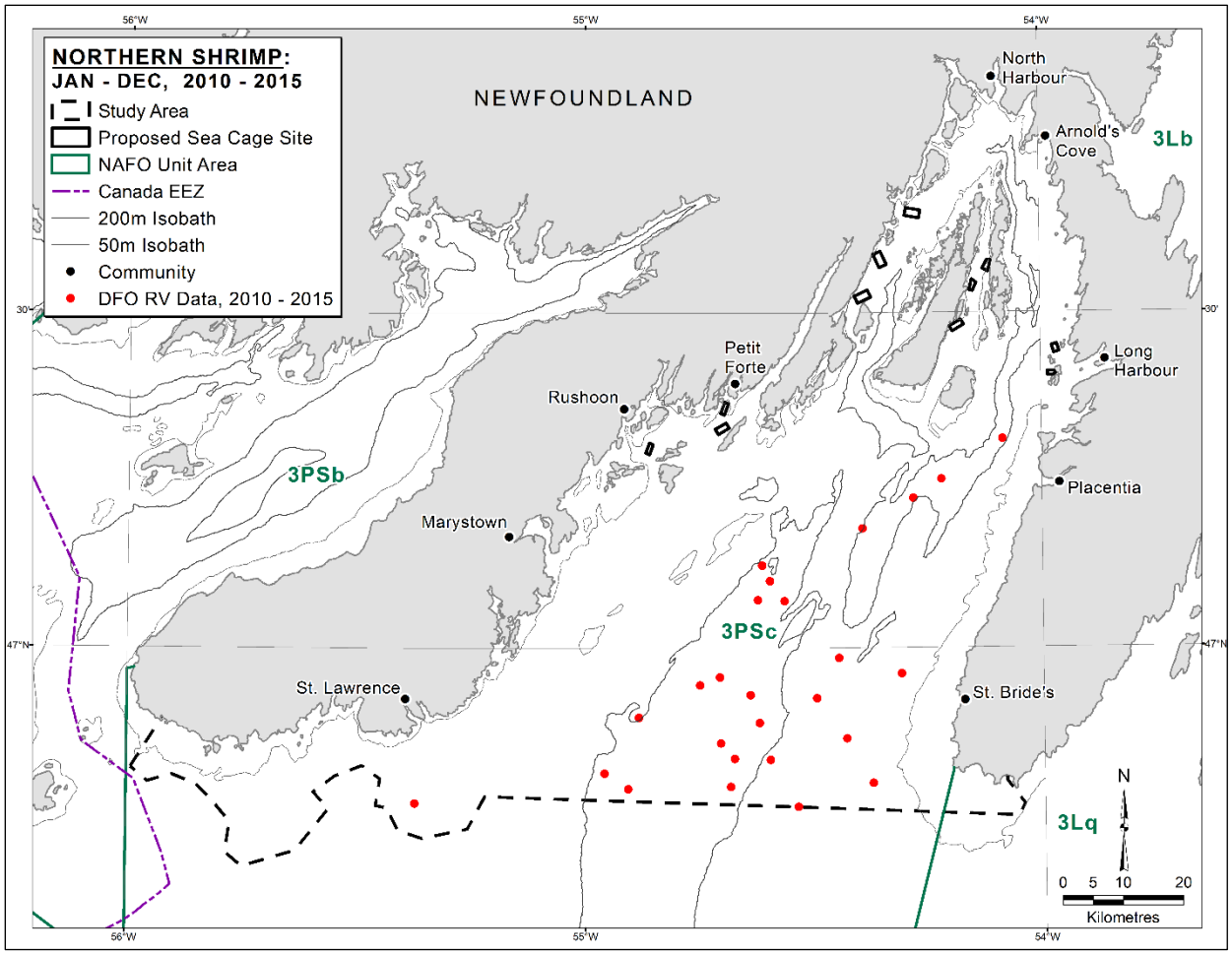

Source: DFO RV Survey Database (2010–2015).

**Figure 4.33. Distribution of DFO RV survey catch locations in the Study Area, all species, 2010–2015.**



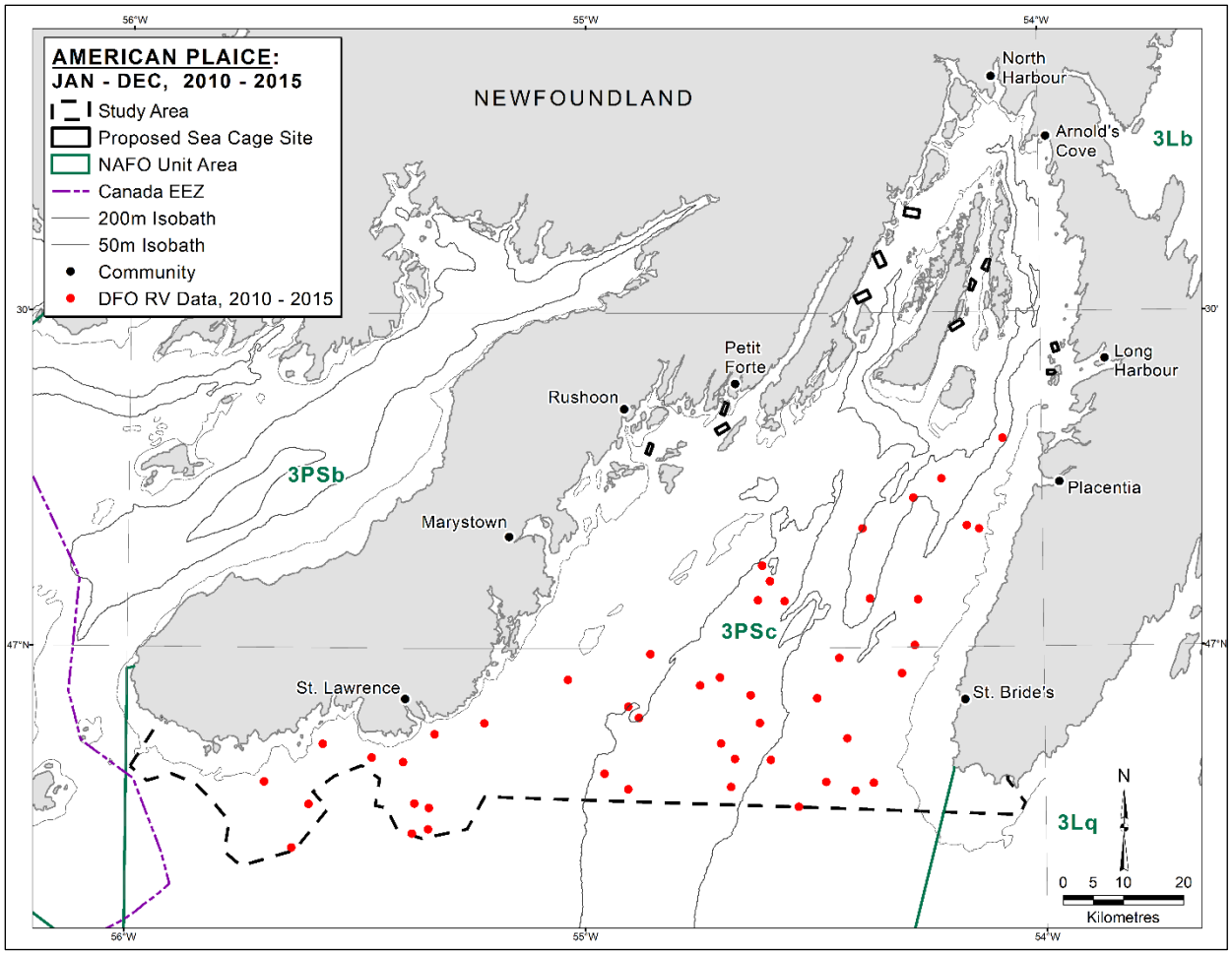

Source: DFO RV Survey Database (2010–2015).

**Figure 4.34. Distribution of DFO RV survey catch locations of capelin in the Study Area, 2010–2015.**



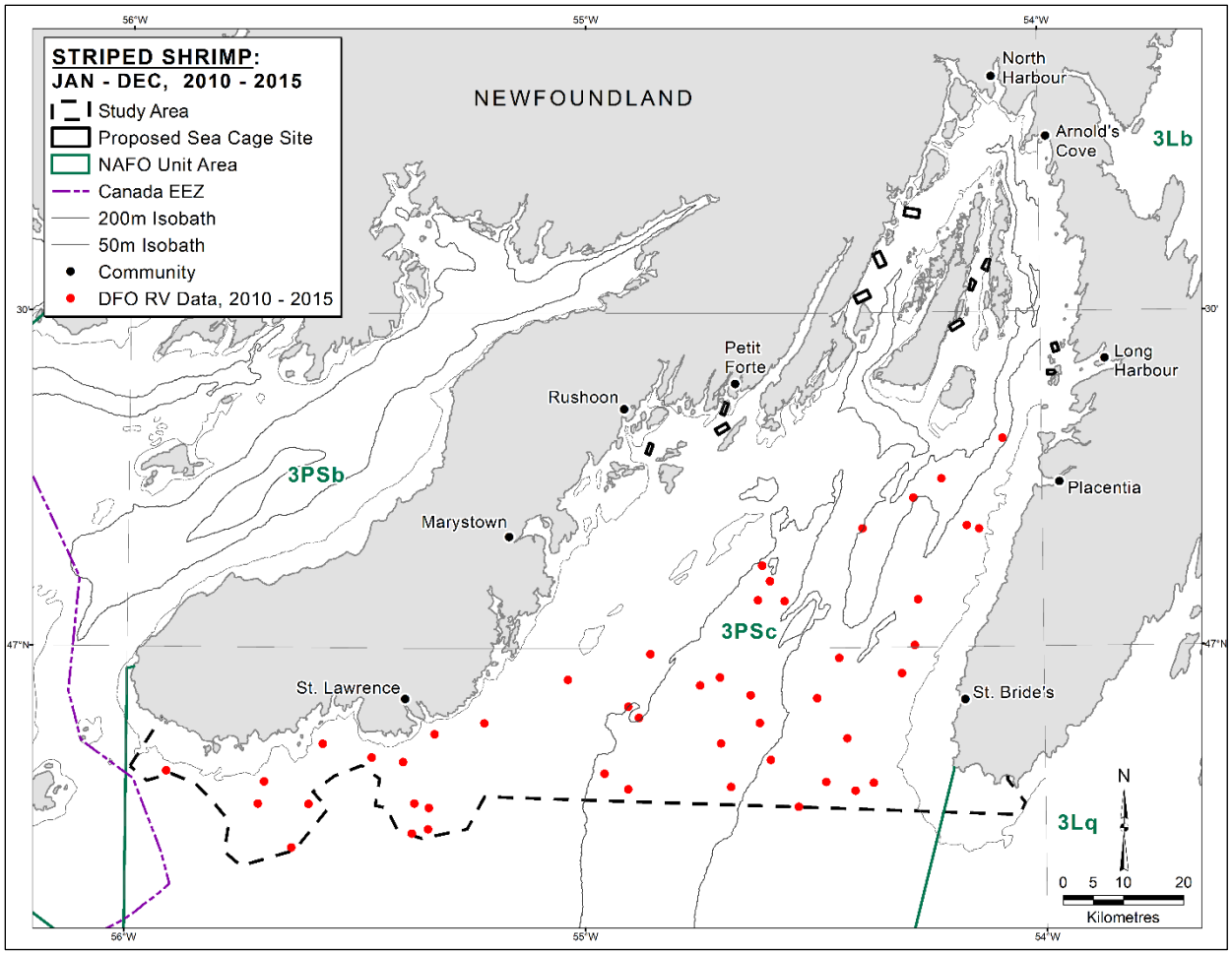

Source: DFO RV Survey Database (2010–2015).

**Figure 4.35. Distribution of DFO RV survey catch locations of northern shrimp in the Study Area, 2010–2015.**



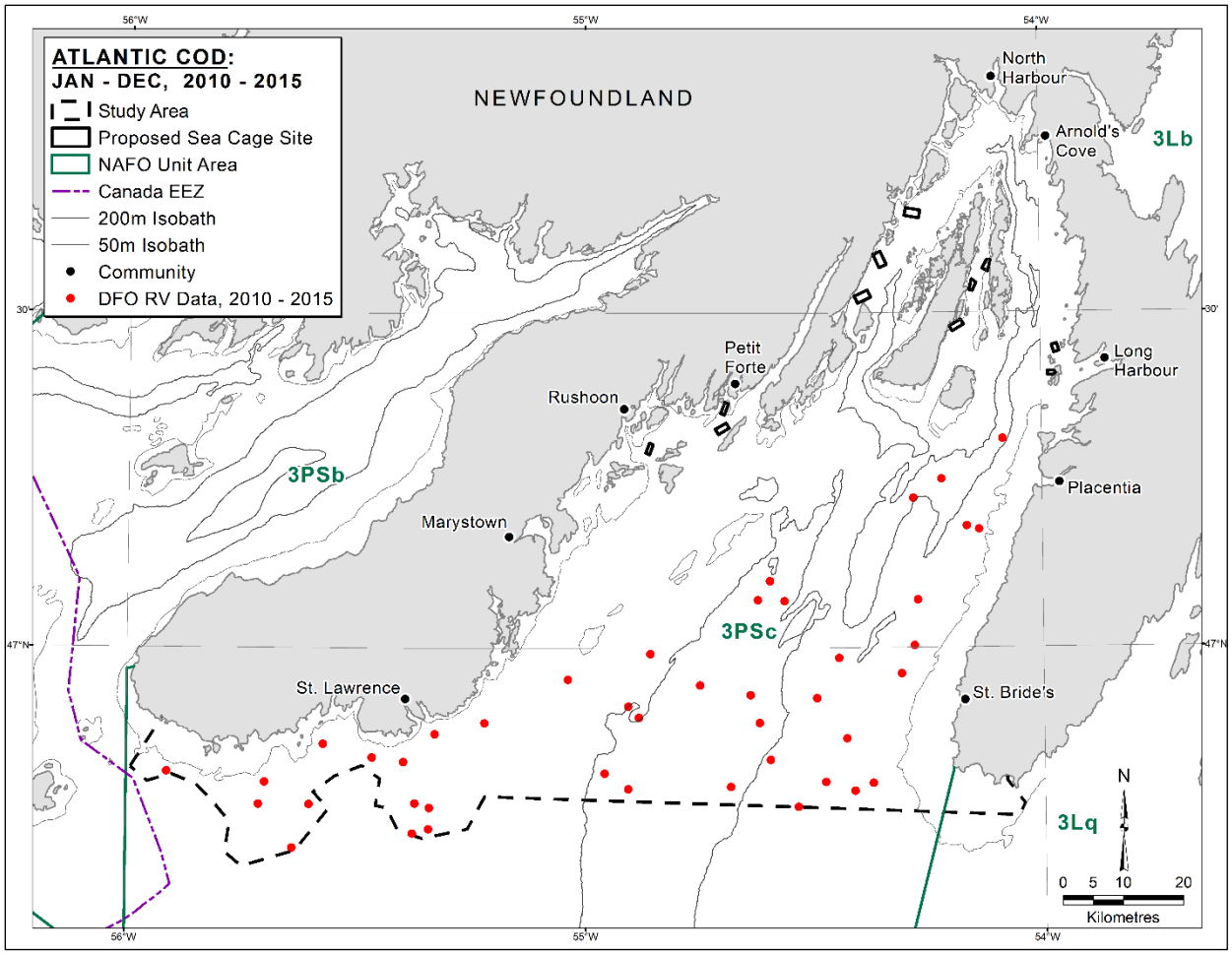

Source: DFO RV Survey Database (2010–2015).

**Figure 4.36. Distribution of DFO RV survey catch locations of American plaice in the Study Area, 2010–2015.**



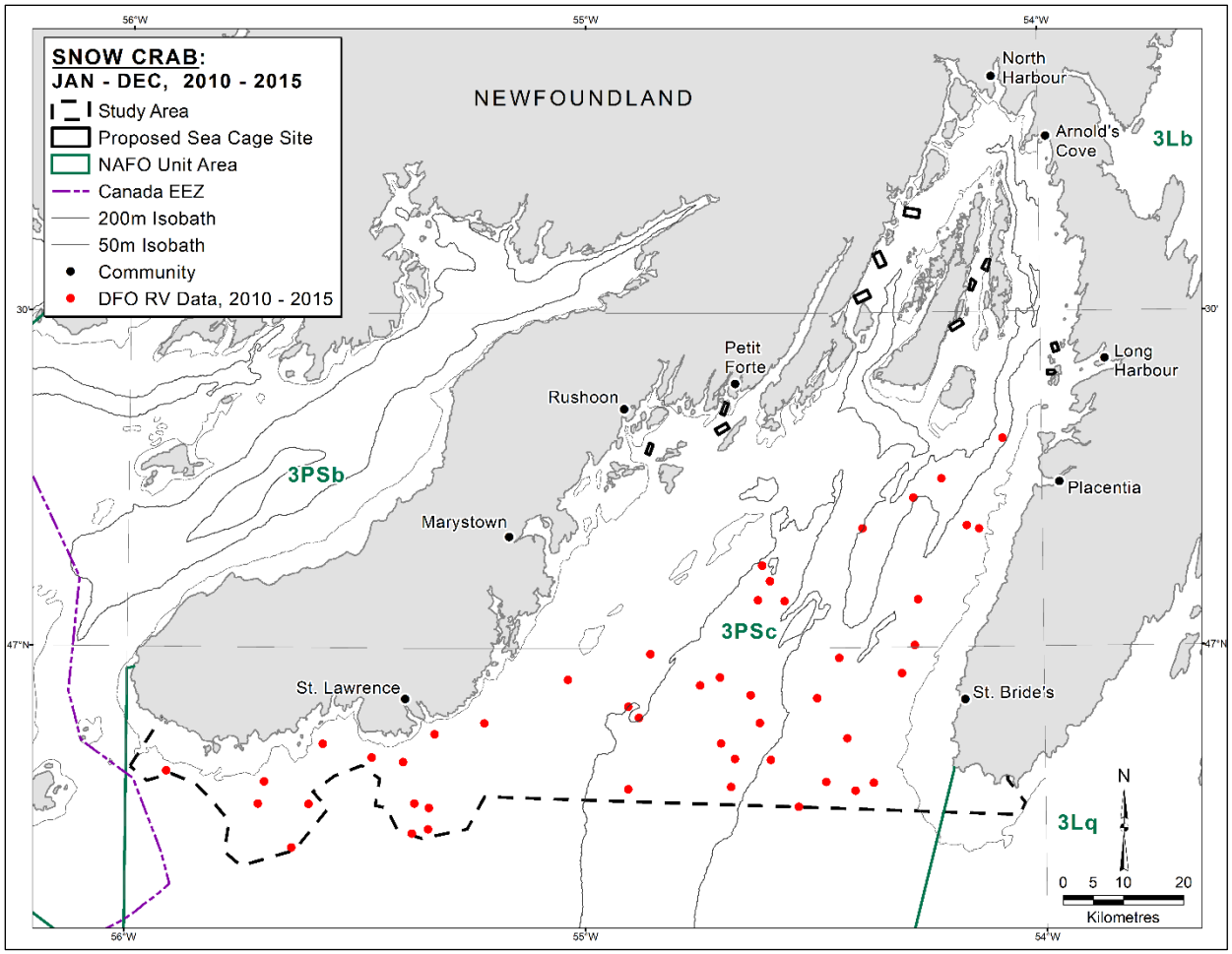

Source: DFO RV Survey Database (2010–2015).

**Figure 4.37. Distribution of DFO RV survey catch locations of striped shrimp in the Study Area, 2010–2015.**



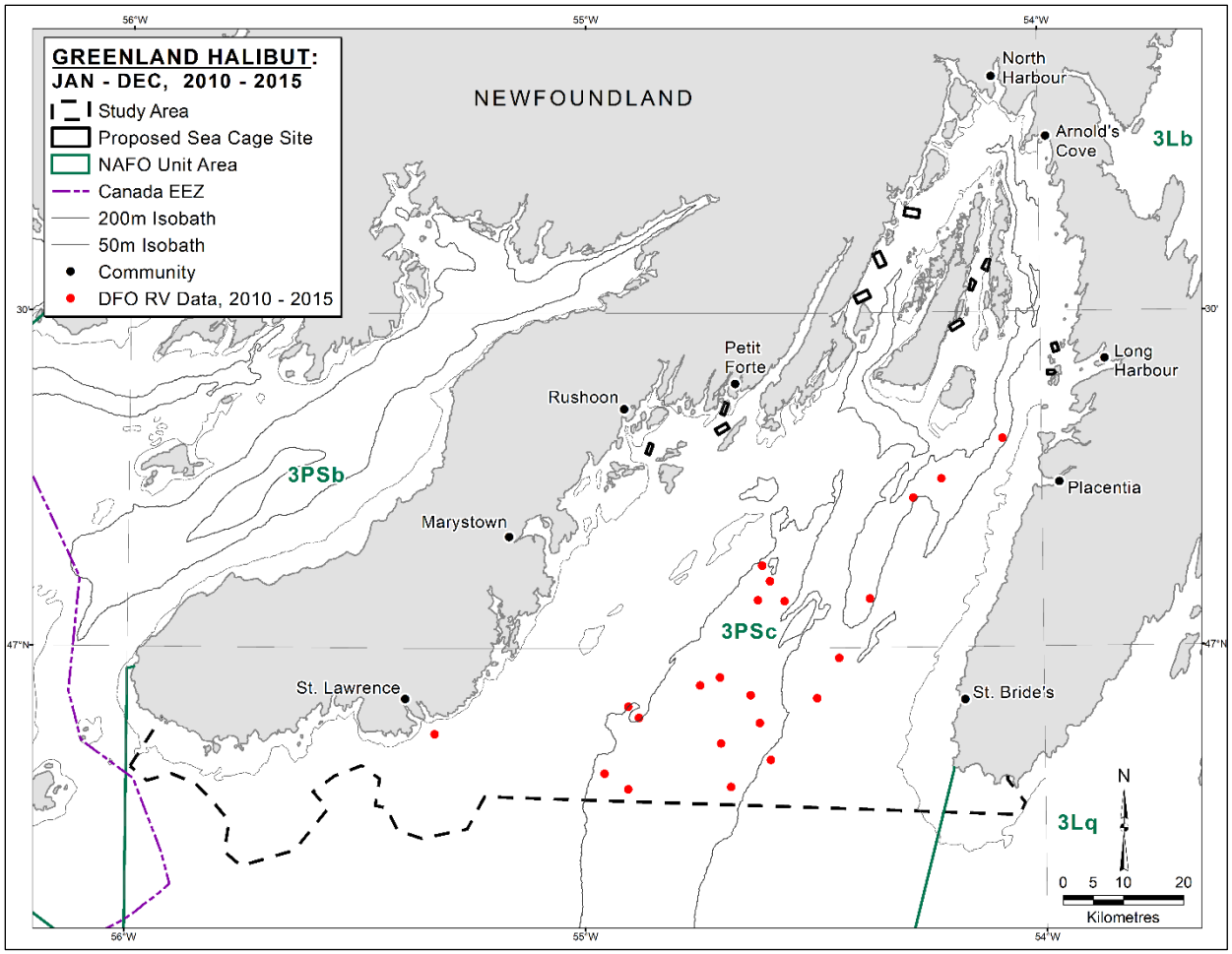

Source: DFO RV Survey Database (2010–2015).

**Figure 4.38. Distribution of DFO RV survey catch locations of Atlantic cod in the Study Area, 2010–2015.**



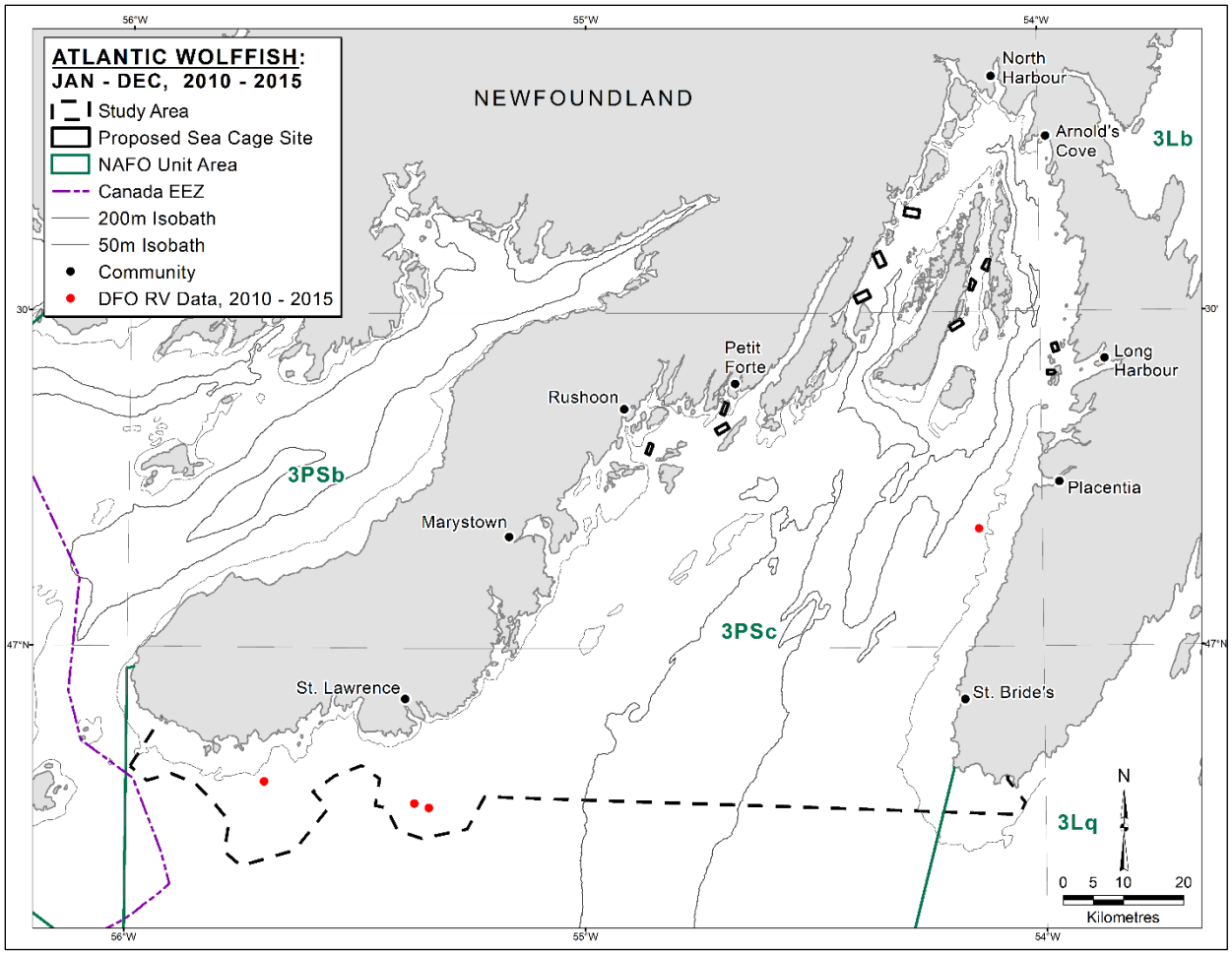

Source: DFO RV Survey Database (2010–2015).

**Figure 4.39. Distribution of DFO RV survey catch locations of snow crab in the Study Area, 2010–2015.**



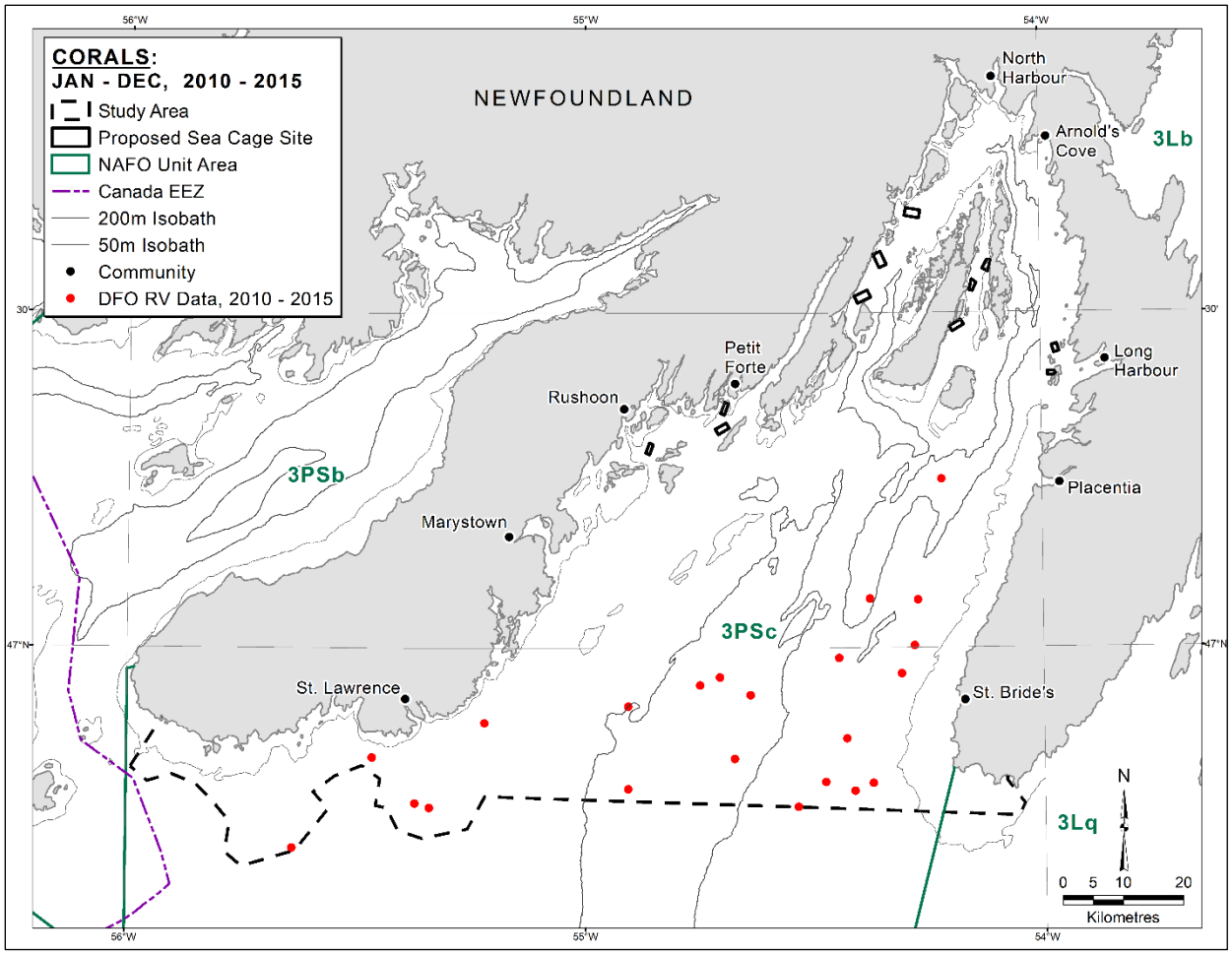

Source: DFO RV Survey Database (2010–2015).

**Figure 4.40. Distribution of DFO RV survey catch locations of Greenland halibut in the Study Area, 2010–2015.**



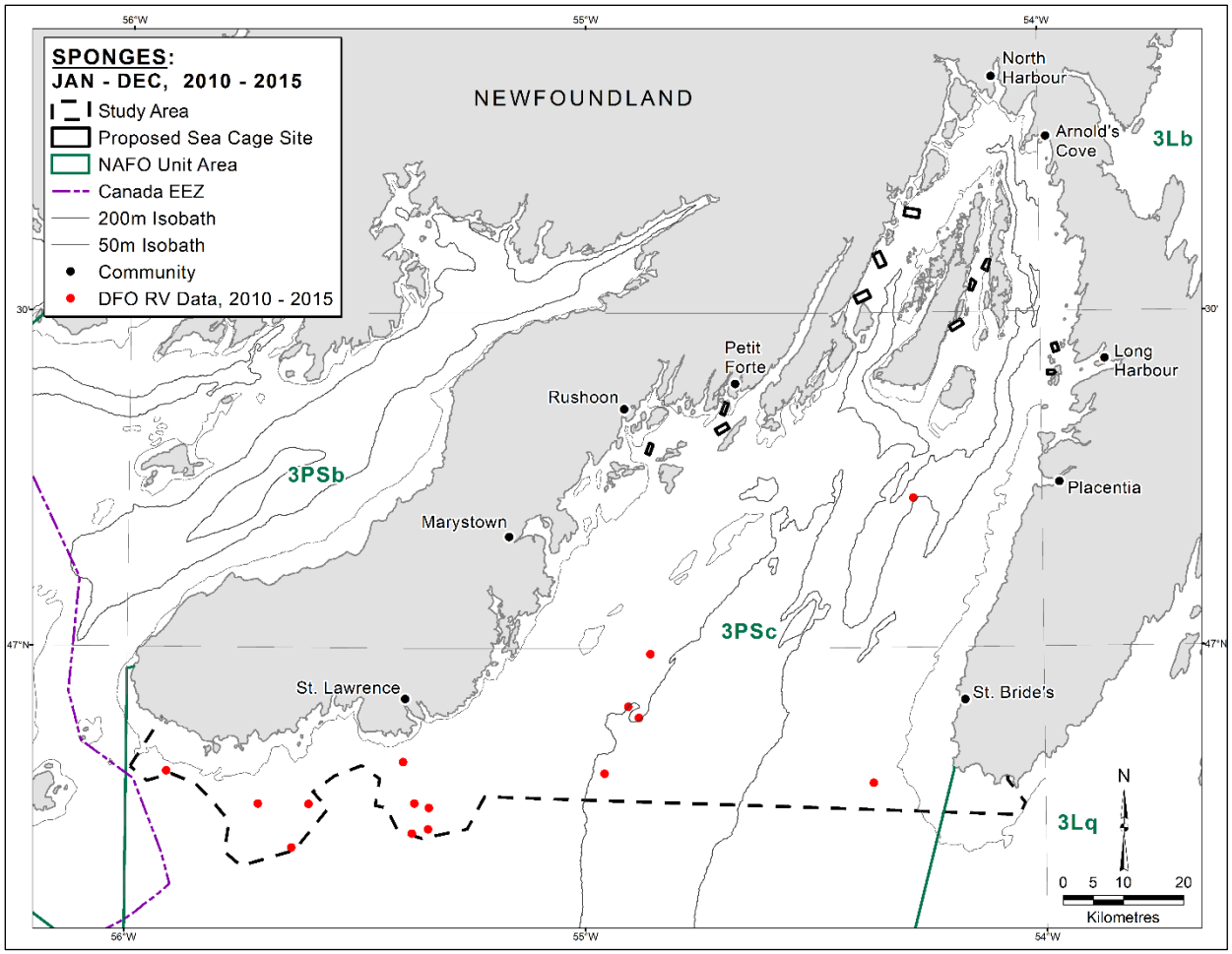

Source: DFO RV Survey Database (2010–2015).

**Figure 4.41. Distribution of DFO RV survey catch locations of Atlantic wolffish in the Study Area, 2010–2015.**




Source: DFO RV Survey Database (2010–2015).

**Figure 4.42. Distribution of DFO RV survey catch locations of corals in the Study Area, 2010–2015.**




Source: DFO RV Survey Database (2010–2015).

**Figure 4.43. Distribution of DFO RV survey catch locations of sponges in the Study Area, 2010–2015.**

Catches at various mean depth ranges were also examined. Total catch weights and predominant species/groups caught within each mean depth range in the Study Area during 2010–2015 are shown in Table 4.15. Atlantic cod (predominant commercial species targeted using mobile gear) were caught primarily at depths ranging from 100–200 m, similar to cod catch depths observed during the commercial fisheries in Placentia Bay.

**Table 4.15. Total catch weights and predominant species/groups caught at various mean catch depth ranges, DFO RV Surveys, 2010–2015.**

| Mean Catch Depth Range (m) | Total Catch Weight (mt) | Predominant Species (% of Total Catch Weight) |
|---|---|---|
| <100 | 0.02 | Offshore Sand Lance (34%)<br>Atlantic Wolffish (9%)<br>Comb Jelly (Ctenophora; 8%)<br>Sea Urchin (Echinoida; 8%)<br>Orange-footed Sea Cucumber (8%)<br>(Common) Ocean Pout (8%) |
| 100–199 | 2.4 | Capelin (17%)<br>Northern Shrimp (15%)<br>American Plaice (11%)<br>Striped Shrimp (8%)<br>Atlantic Cod (8%) |
| 200–299 | 0.2 | Greenland Halibut (72%)<br>Thorny Skate (25%) |
| 300–399 | 0 | - |
| 400–499 | 0 | - |
| 500–599 | 0 | - |
| 600–699 | 0 | - |
| 700–799 | 0 | - |
| 800–899 | 0 | - |
| 900–999 | 0 | - |
| ≥1,000 | 0 | - |

Source: DFO RV Survey Database (2010–2015).

#### 4.1.1.4 Aquaculture

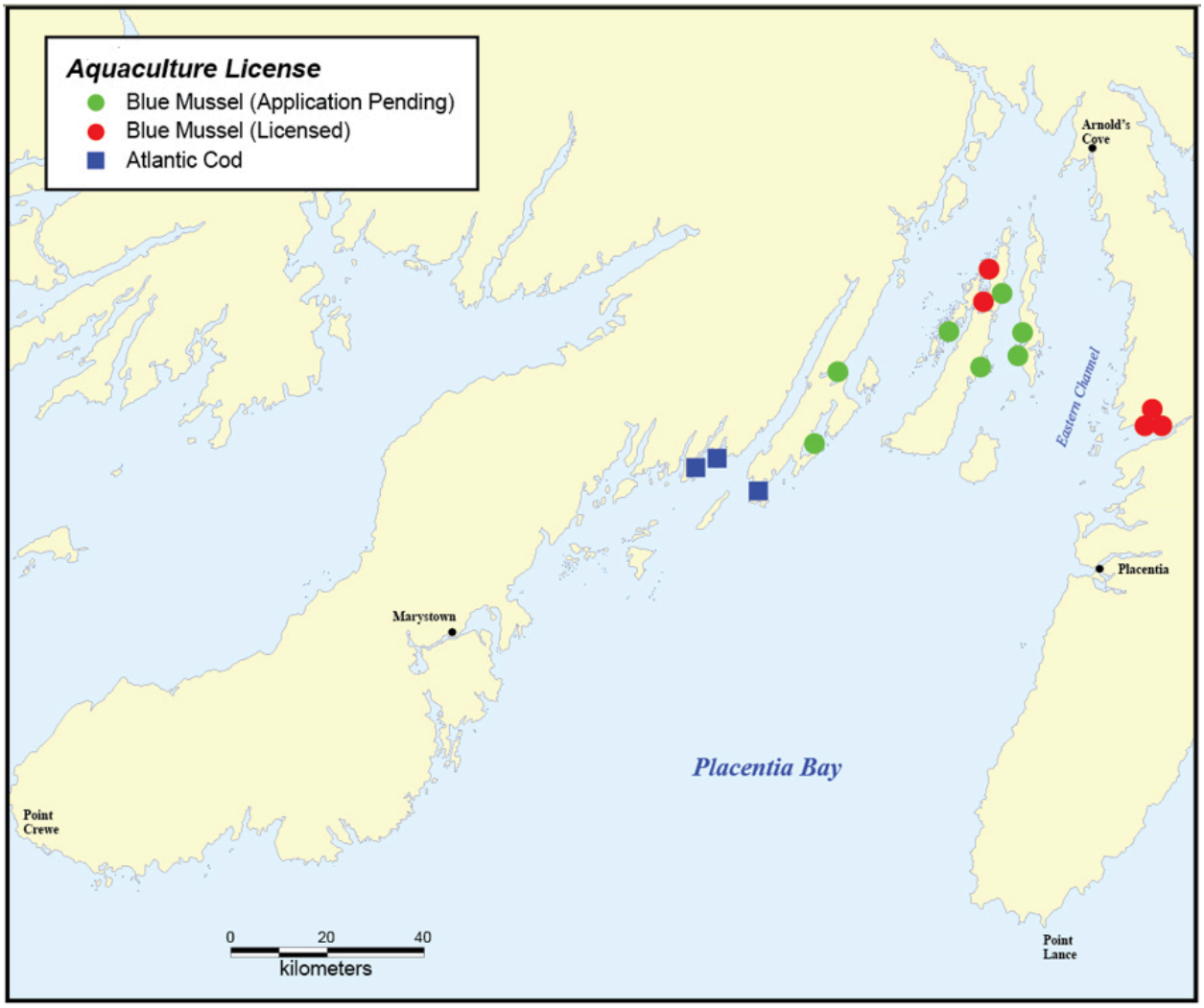
There are currently four principal marine species farmed in Newfoundland and Labrador: (1) Atlantic salmon; (2) blue mussels; (3), steelhead trout (*Oncorhynchus mykiss irideus*); and Atlantic cod (NAIA 2011). As of the end of 2015, a total of 152 aquaculture licences were held by enterprises throughout Newfoundland and Labrador, including 87 for salmonid operations, 51 for shellfish, four for hatcheries and an additional ten for unspecified operations (DFLR 2016). Of the licenced salmonid aquaculture cage sites, 38 were active during 2015 (i.e., had fish on-site at some point during the calendar year), and 49 were non-active (i.e., not currently part of a regular production schedule or in fallow) (DFLR 2017b). Aquaculture licences are valid for one year and require annual renewal (DFLR 2017b). Aquaculture companies in Newfoundland and Labrador are required to "operate within progressive fish health management policies based upon site and year class separation and regionally-based aquaculture plans", promoting "industry responsibility for maintaining environmental integrity" (DFLR 2017b). The province's first Aquaculture Strategic Plan was developed in 1999 in a collaborative effort involving governmental departments and industry, and has since been updated in 2002, 2005 and 2014 (DFLR 2017b).

The total market value for aquaculture products in Newfoundland and Labrador (primarily for Atlantic salmon, steelhead trout and blue mussel) was $59 and $161 million during 2014 and 2015, respectively. The industry employed ~439 individuals for aquaculture hatchery and

grow-out activities during 2014–2015 (DFLR 2016). While the production weight remained relatively unchanged in the province for shellfish during 2014 and 2015 (3,260 mt vs. 3,130 mt, respectively), salmonid production increased substantially (5,980 mt in 2014 vs. 19,684 mt in 2015) (DFLR 2016). During 1999, the total aquaculture production and estimated market values within Placentia Bay for blue mussel (*Mytilus edulis*) and Atlantic cod were $90,000 and >$500,000, respectively (DFO 2008). Production value was also $90,000 in Placentia Bay during 2006 (DFO 2008). During 2006–2007, mussel production levels in Placentia Bay were an estimated 3.5 million pounds with a primary product value (i.e., before processing) of ~$1.4 million (NLRC 2007).

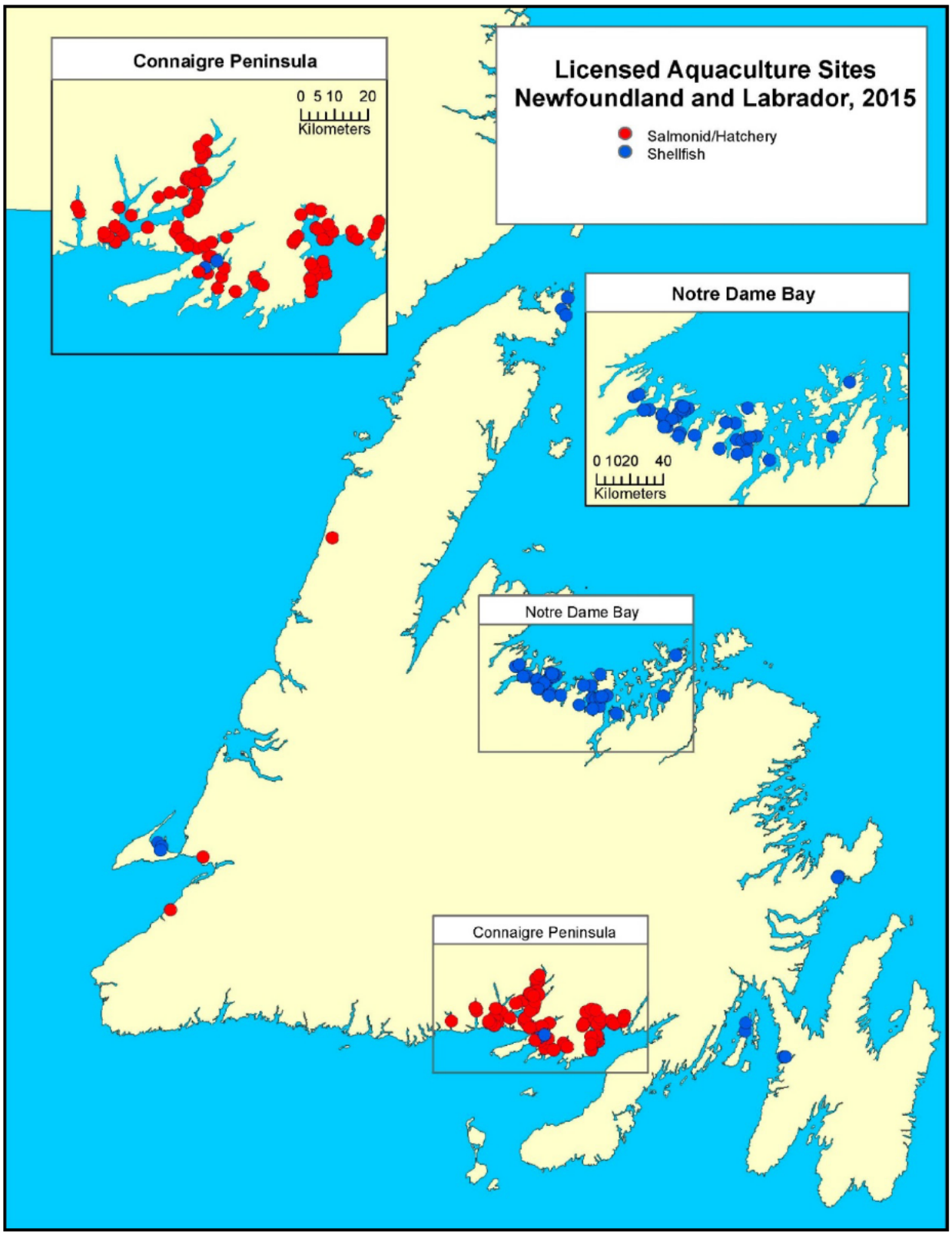
Aquaculture sites are located inshore, typically in sheltered coves or along protected shorelines, with specific site locations influenced by water temperatures, tides, bathymetry, benthic conditions, prevailing winds and currents, salinity, littoral factors and influences, proximity to other human activities (e.g., commercial fishing, pleasure craft use, shipping, or other marine-oriented industries), community sewage outfalls, and access to services such as roads and electricity (Vale 2008). As Atlantic salmon require relatively warm water during the winter, virtually all finfish production in Newfoundland occurs along the south coast of the province (NAIA 2011). The majority of salmonid aquaculture sites are located along the Connaigre Peninsula on the south coast of Newfoundland, while the shellfish sector is principally located along the northeast coast of Newfoundland, particularly in the Green Bay/Notre Dame Bay region (DFLR 2017b).

Within Placentia Bay, the aquaculture industry has previously focussed on blue mussels and cod, and aquaculture farms were typically family-run with owners generally having other/additional sources of income (DFO 2008). In 1997, there were approximately seven active aquaculture operations and several applications to investigate/develop additional sites within Placentia Bay (Vale 2008). During 2000–2003, the DFLR deployed thermographs in several locations in Placentia Bay to monitor water temperatures and assess their suitability as aquaculture sites. This was in response to aquaculture expansion and increased interest in the development of new sites, particularly on the Burin Peninsula and near Merasheen Island (Vale 2008). By 2003, there were 15 approved aquaculture operations in the Placentia Bay region, including six blue mussel sites and nine cod grow-out facilities. However, during 2004, only four operators were selling their product on a commercial basis, including a cod farming facility at Jerseyman Island, three blue mussel sites in Long Harbour (Crawley Island and St. Croix Bay), and two mussel sites near Merasheen Island (Vale 2008). As of 2007, there were 13 licenced aquaculture operations within Placentia Bay, including five mussel farms (commercially-active) and eight Atlantic cod grow-out sites (inactive commercially since 2003) (Vale 2008). During 2008, three licenced Atlantic cod aquaculture sites were located north and east of the Long Island and Gallows Harbour proposed sea cage sites in the Rushoon BMA, several blue mussel operations were located on the coast and among the islands in the vicinity of the proposed sea cage sites within the Merasheen and Red Island BMAs, and within Long Harbour (Figure 4.44). As of 2015, only four shellfish aquaculture sites were operating within Placentia Bay, two along Merasheen Island and two in Long Harbour. There were no salmonid nor hatchery sites remaining (Figure 4.45; Table 4.16).




Source: DFO (2008).

**Figure 4.44. Licenced aquaculture sites within Placentia Bay during 2008.**




Source: DFLR (2017a).

**Figure 4.45. Licenced aquaculture sites within Newfoundland and Labrador during 2015.**

**Table 4.16. Placentia Bay aquaculture site licences, 2015.**

| Licencee | Location | Site Size (Ha) | Latitude | Longitude | Species |
|---|---|---|---|---|---|
| Merasheen Mussel Farms Inc. | Merasheen Island | 112 | 47.6165 | -54.1642 | Blue Mussel; Oyster |
| Merasheen Mussel Farms Inc. | Big South West Cove, Merasheen Island | 54.3 | 47.5733 | -54.1727 | Blue Mussel; Oyster |
| Joseph Keating (Baie Sea Farms Limited) | Crawley Island, Long Harbour | 3.5 | 47.4250 | -53.8723 | Blue Mussel |
| Joseph Keating (Baie Sea Farms Limited) | Crawley Island, Long Harbour | 3.3 | 47.4250 | -53.8592 | Blue Mussel |

Source: DFLR (2017b).

#### 4.1.1.5 Recreational Fisheries

In Newfoundland and Labrador, species fished recreationally include Atlantic salmon, brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), ouananiche (landlocked salmon; *Salmo salar ouananiche*), Arctic char (*Salvelinus alpinus*), smelt (Osmeridae), northern pike (*Esox lucius*) and whitefish (*Coregonus* sp.) (DFO 2017k). Groundfish species and scallop are also caught recreationally (DFO 2017e,g).

Management measures for recreational fishing in Newfoundland and Labrador are developed in consultation with user groups and stakeholders, including anglers, outfitters, conservationists, indigenous groups and the provincial government (DFO 2017k). The Minister of Fisheries, Oceans and the Canadian Coast Guard may alter management measures at any time for conservation reasons (DFO 2017k). An Adaptive Management Strategy for recreational salmon angling involves a river classification system wherein individual rivers are rated Class 0, 2, 4 or 6, with each Class associated with specific retention limits, tag use and catch-and-release requirements (DFO 2008, 2017k). Ratings are based on several factors, including salmon population, spawner returns, river size, angling pressure, and river remoteness (DFO 2017k). Where salmon retention is permitted, a tag, provided by DFO (DFO 2017c), must be immediately and securely locked through the gills and mouth of the fish, and the month and day must be cut out from the vinyl portion of the tag (DFO 2017k). Only single, barbless hooks may be used on scheduled salmon rivers throughout Newfoundland and Labrador, and the barbs cannot be baited, weighted or attached to a spinner or similar device (DFO 2017k).

The entirety of insular Newfoundland is included within Trout Angling Zone 1, and Zones 2–6 are in Labrador (DFO 2017k). The Study Area includes rivers from Salmon Fishing Area (SFA) 10 (or 'Salmon Angling Zone 10'), which includes 20 scheduled rivers/tributaries which empty into Placentia Bay (Figure 4.46). The 2017–2018 winter and summer season dates for trout and other species (other than Atlantic salmon) in Trout Angling Zone 1 (non-scheduled waters) are 1 February–15 April and 15 May–7 September, respectively (DFO 2017k). The 2017 season for scheduled waters for brown trout in the Placentia Bay area was 8 September–7 October, including Northeast River, Southeast River, Come by Chance River and Piper's Hole River (DFO 2017k). The 2017 season dates for Atlantic salmon within Salmon Angling Zone 10 were

1 June–7 September (DFO 2017e,k). The lowest salmon returns on record occurred within the majority of SFAs in Newfoundland during 2017, and as a result all scheduled and non-scheduled salmon rivers on the island of Newfoundland were restricted to catch-and-release only effective as of 6 August 2017 (DFO 2017l; D. Ball, Resource Management and Aboriginal Fisheries [RMAF], DFO, pers. comm., 8 February 2018).

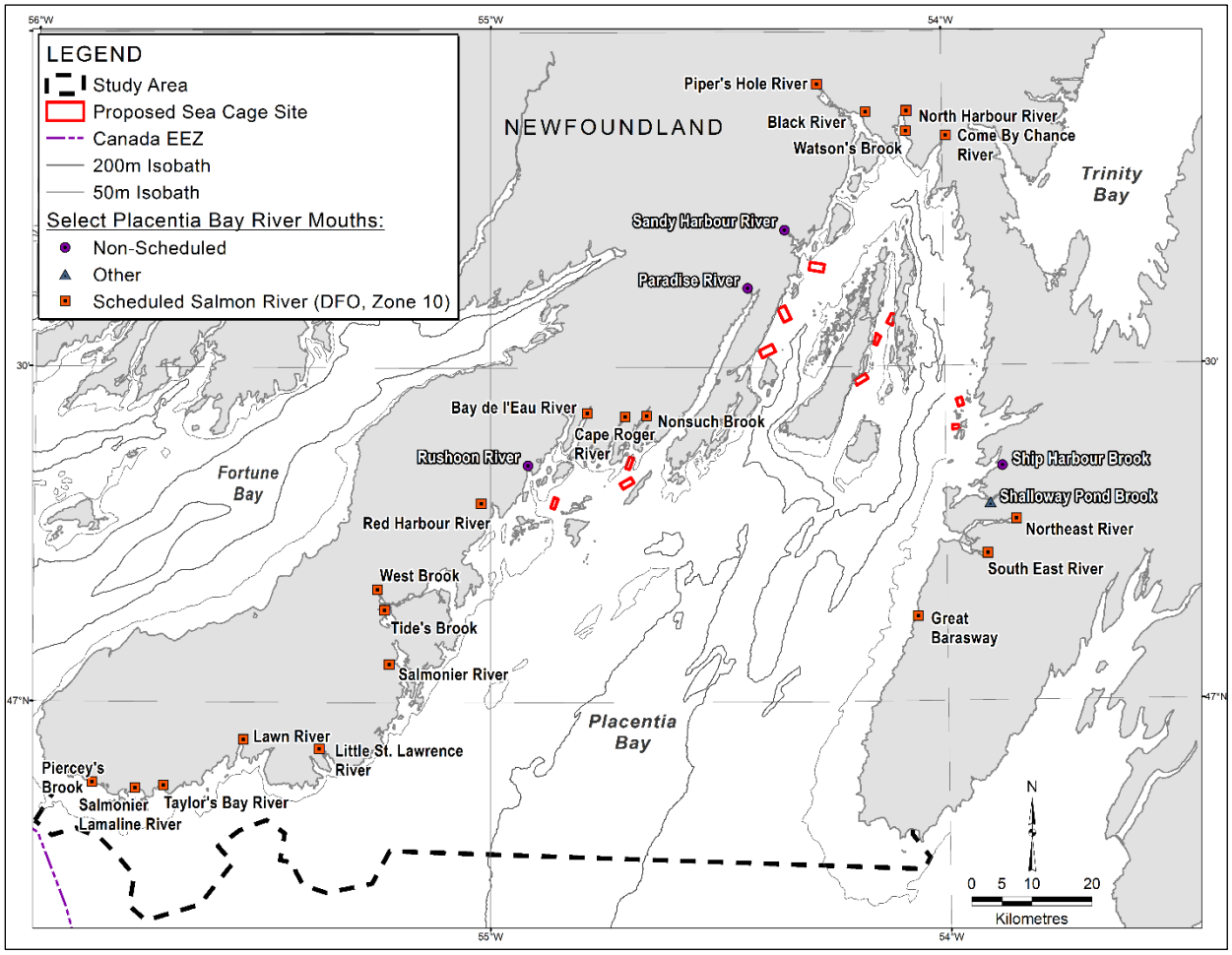



**Figure 4.46. Scheduled and non-scheduled salmon rivers within Salmon Fishing Area 10 (Placentia Bay).**

Within Newfoundland, the daily bag limit consists of 12 trout (any species) or five pounds round weight and one fish of any trout species, whichever is attained first (DFO 2017k). No rainbow or ouananiche of length <20 cm may be retained (DFO 2017k). The possession limit is twice the daily bag limit (DFO 2017k). The same regulations apply for Arctic char (DFO 2017k), and there are no daily bag limits, size restrictions or possession limits for smelt (DFO 2017k). Only the retention of brown trout is permitted on scheduled salmon rivers during 8 September–7 October 2018, and anglers must possess a valid salmon licence (DFO 2017k).

A valid inland fishery licence must be purchased by anglers to fish for salmon on unscheduled or scheduled rivers in Newfoundland and Labrador (including for catch-and-release), and no

salmon fry, parr, smolt or salmon of length <30 cm may be retained (DFO 2017k). An estimated total of 24,791 recreational salmon fishery licences were sold in Newfoundland and Labrador during 2016 (Veinott et al. 2018), an increase from 20,003 licences during 2010 (Dempson et al. 2012). Two salmon may be retained per day on unscheduled rivers in Newfoundland and Labrador, and anglers must use red tags 1 and 2 (DFO 2017k). One scheduled river within SFA 10, Nonsuch Brook (north and northeast of the Long Island and Gallows Harbour proposed sea cage sites, respectively), is rated Class 0, indicating that no salmon may be retained, and anglers may catch-and release a maximum of two fish per day (DFO 2017k). The remaining 19 scheduled rivers within SFA 10 are rated Class 2, whereby an angler may retain two fish per year, red tags 1 and 2 must be used, and a maximum of four fish may be caught-and-released per day (DFO 2017k). A recent announcement by DFO stated that the 2018 Newfoundland and Labrador recreational salmon fishing season will begin with only one fish retention permitted on all rivers that currently have retention and a reduction of catch-and-release limits to three fish per day for all rivers in the Province, with a departmental review during the season (DFO 2018g). Further details will be provided within the 2018–2019 Angler's Guide, which has not yet been released. Licenced salmon anglers are asked to complete and return salmon angling logbooks to DFO as soon as possible after the season closes (DFO 2017k).

There were a total of 8,880 rod days on scheduled salmon rivers in SFA 10 during 2016, resulting in a total catch of 2,511 salmon of which 1,437 were released (Table 4.17). On average, 156 salmon were caught per river during 2010–2016, with ~40% and 60% of salmon retained and released, respectively (Table 4.18). The majority of recreational salmon fishing occurred in Bay de l'Eau River, Tide's Brook, Southeast River, Northeast River, Piper's Hole River, Cape Rodger River and Come by Chance River (Tables 4.17 and 4.18).

**Table 4.17. Total number of salmon retained (ret.) and released (rel.), effort and catch per unit effort (CPUE) for scheduled salmon rivers in SFA 10 during 2016.**

| Scheduled Salmon River | No. of Small Salmon (<63 cm) | | No. of Large Salmon (≥63 cm) | | Total No. of Salmon | | | Effort (Rod Days) | CPUE |
|---|---|---|---|---|---|---|---|---|---|
| | Ret. | Rel. | Ret.[a] | Rel. | Ret. | Rel. | Total | | |
| Great Barasway Brook | - | - | - | - | - | - | - | - | - |
| Southeast River | 55 | 92 | 0 | 42 | 55 | 134 | 189 | 1,040 | 0.18 |
| Northeast River | 171 | 97 | 0 | 35 | 171 | 132 | 303 | 978 | 0.31 |
| Come By Chance River | 40 | 33 | 0 | 2 | 40 | 35 | 75 | 713 | 0.11 |
| North Harbour River | 115 | 31 | 0 | 7 | 115 | 38 | 153 | 538 | 0.28 |
| Watson's Brook | 0 | 25 | 0 | 14 | 0 | 39 | 39 | 55 | 0.71 |
| Black River | 33 | 5 | 0 | 0 | 33 | 5 | 38 | 210 | 0.18 |
| Piper's Hole River | 69 | 156 | 0 | 13 | 69 | 169 | 238 | 825 | 0.29 |
| Nonsuch River | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0.00 |
| Cape Rodger River | 106 | 90 | 0 | 19 | 106 | 109 | 215 | 776 | 0.28 |
| Bay de l'Eau River | 274 | 444 | 0 | 26 | 274 | 470 | 744 | 1,591 | 0.47 |
| Red Harbour River | 38 | 31 | 0 | 0 | 38 | 31 | 69 | 192 | 0.36 |
| West Brook, North West Arm, Mortier Bay, & tributary streams | - | - | - | - | - | - | - | - | - |
| Tide's Brook | 96 | 152 | 0 | 18 | 96 | 170 | 266 | 1,308 | 0.20 |
| Big Salmonier Brook | - | - | - | - | - | - | - | - | - |
| Little St. Lawrence River & tributary streams | - | - | - | - | - | - | - | - | - |
| Lawn River | - | - | - | - | - | - | - | - | - |
| Taylor Bay Brook | 11 | 5 | 0 | 7 | 11 | 12 | 23 | 27 | 0.85 |

| Scheduled Salmon River | No. of Small Salmon (<63 cm) | | No. of Large Salmon (≥63 cm) | | Total No. of Salmon | | | Effort (Rod Days) | CPUE |
|---|---|---|---|---|---|---|---|---|---|
| | Ret. | Rel. | Ret.[a] | Rel. | Ret. | Rel. | Total | | |
| Salmonier River (Lamaline) | 66 | 86 | 0 | 7 | 66 | 93 | 159 | 538 | 0.30 |
| Piercey's Brook | - | - | - | - | - | - | - | - | - |
| **Total** | **1,074** | **1,247** | **0** | **190** | **1,074** | **1,437** | **2,511** | **8,800** | **0.29** |

Source: G. Veinott, Research Scientist, Atlantic Salmon, DFO, pers. comm., 19 February 2018 (unpublished data).
"-" Denotes data unavailable.
[a] It is prohibited to retain large salmon (≥63 cm) in insular Newfoundland.

**Table 4.18. Average number of salmon retained (ret.) and released (rel.), effort and catch per unit effort (CPUE) for scheduled salmon rivers in SFA 10 during 2010–2016.**

| Scheduled Salmon River | No. of Small Salmon (<63 cm) | | No. of Large Salmon (≥63 cm) | | Total No. of Salmon | | | Effort (Rod Days) | CPUE |
|---|---|---|---|---|---|---|---|---|---|
| | Ret. | Rel. | Ret.[a] | Rel. | Ret. | Rel. | Total | | |
| Great Barasway Brook* | 5 | 4 | 0 | 1 | 5 | 5 | 9 | 18 | 0.55 |
| Southeast River | 91 | 119 | 0 | 32 | 91 | 151 | 242 | 994 | 0.25 |
| Northeast River | 131 | 130 | 0 | 19 | 131 | 148 | 280 | 927 | 0.27 |
| Come By Chance River | 48 | 89 | 0 | 38 | 48 | 128 | 176 | 510 | 0.40 |
| North Harbour River | 46 | 31 | 0 | 9 | 46 | 40 | 86 | 300 | 0.28 |
| Watson's Brook | 1 | 13 | 0 | 4 | 1 | 17 | 18 | 22 | 0.59 |
| Black River | 28 | 22 | 0 | 3 | 28 | 25 | 53 | 146 | 0.38 |
| Piper's Hole River | 129 | 248 | 0 | 21 | 129 | 269 | 397 | 1,008 | 0.42 |
| Nonsuch River* | 2 | 10 | 0 | 0 | 2 | 10 | 12 | 21 | 0.35 |
| Cape Rodger River | 128 | 206 | 0 | 13 | 126 | 219 | 342 | 725 | 0.47 |
| Bay de l'Eau River | 179 | 250 | 0 | 32 | 179 | 282 | 461 | 1,157 | 0.38 |
| Red Harbour River | 19 | 8 | 0 | 0 | 19 | 8 | 27 | 128 | 0.24 |
| West Brook, North West Arm, Mortier Bay, & tributary streams | - | - | - | - | - | - | - | - | - |
| Tide's Brook | 111 | 51 | 0 | 22 | 111 | 73 | 184 | 1,063 | 0.18 |
| Big Salmonier Brook* | 2 | 4 | 0 | 0 | 2 | 4 | 6 | 42 | 0.14 |
| Little St. Lawrence River & tributary streams | - | - | - | - | - | - | - | - | - |
| Lawn River* | 5 | 13 | 0 | 2 | 5 | 15 | 19 | 55 | 0.30 |
| Taylor Bay Brook* | 5 | 9 | 0 | 3 | 5 | 12 | 17 | 43 | 0.58 |
| Salmonier River (Lamaline) | 33 | 45 | 0 | 3 | 33 | 48 | 81 | 335 | 0.23 |
| Piercey's Brook* | 5 | 3 | 0 | 0 | 5 | 3 | 7 | 27 | 0.27 |
| **Total** | **63** | **81** | **0** | **13** | **63** | **94** | **156** | **483** | **0.34** |

Source: G. Veinott, Research Scientist, Atlantic Salmon, DFO, pers. comm., 19 February 2018 (unpublished data).
* Denotes that data were not available for all years during 2010–2016.
"-" Denotes data unavailable.
[a] It is prohibited to retain large salmon (≥63 cm) in insular Newfoundland.

Fishers may angle for trout and salmon year-round in coastal Newfoundland and Labrador waters (i.e., all marine waters outside DFO caution signs posted in the estuaries of some scheduled and non-scheduled salmon rivers, and outside the spring tide low-water mark in all other areas), and there is no closed season or licence requirement (DFO 2017k). The trout

angling regulations noted above apply in coastal waters, but the retention of salmon in coastal waters is prohibited and angling must be catch-and-release (DFO 2017k).

In marine waters, only angling gear and hand lines (including artificial lures, baited hooks or feathered hooks) with up to three hooks are permitted to catch groundfish recreationally. Jiggers are only permitted if they are modified to have a single hook (DFO 2017e).

The 2017 groundfish recreational fishery was open for a total of 46 days, with the summer season during 1 July–4 September and the winter season during 23 September–1 October (DFO 2017e). The periods during which scallops may be harvested recreationally are dependent upon sanitary conditions and the potential for water contamination, which can be influenced by factors such as heavy rainfall. Opening and closure notices are provided to harvesters (e.g., DFO 2017g).

There is currently no requirement for licences or tags for groundfish (DFO 2017e). All groundfish caught recreationally must be retained, although sculpins and cunners may be released. It is prohibited to retain Atlantic halibut, spotted or northern wolffish, or any species of shark during the groundfish recreational fishery (DFO 2017e). All retained groundfish must be kept in a readily identifiable state, up to a bag limit of five groundfish per day (DFO 2017e). The most recent survey of the recreational cod fishery in Newfoundland and Labrador was conducted in 2007. During 2007, 73,425 anglers participated in the five-week recreational cod fishery in Newfoundland and Labrador, and caught an estimated 1.2 million cod (BriLev 2008). Approximately 7% (5,380) of the participating anglers resided in the Burin-South Coast area, the majority of which were over 16 years of age (BriLev 2008). Recreational cod anglers residing in the Burin-South Coast area fished for a total of 21,998 days during 2007, catching a total of 95,450 cod at an average of 4.3 cod/day (BriLev 2008). An estimated 1,600 anglers throughout Newfoundland and Labrador reported catching wolffish incidentally during the 2007 recreational cod fishery for a total of 3,601 wolffish, all of which were successfully returned to the water (BriLev 2008).

Scallop fishers must hold a recreational scallop licence, and the authorized daily bag limit for the 2018 season is 50 scallops per day, with a possession limit of 100 scallops (DFO 2018h). DFO is presently reviewing the recreational scallop fishery (DFO 2018i).

Minimal recreational use of the marine waters of Placentia Bay in the vicinity of the proposed sea cage sites has been noted by Grieg NL during recent years. Fishers interviewed in February 2018 indicated that, over the past five to ten years, there has been an increase in recreational boating, with boats travelling to the Bay's islands (there are cabins or seasonal homes on several of the previously resettled islands) (C. Hepditch, Fisher, Baine Harbour, pers. comm., 21 February 2018). The food fishery in the area is generally prosecuted in waters just outside the communities where residents live (P. Power, Human Resources Manager, Grieg NL, pers. comm., 4 February 2018).

#### 4.1.1.6 Indigenous Fisheries

In addition to those Fishing Areas identified in previous subsections (see the Commercial Fisheries and Recreational Fisheries subsections), Placentia Bay is located in Sealing Area 8, Capelin Fishing Area 10, Mackerel Fishing Area 10 and Squid Fishing Area 10 (DFO 2009, 2016d, 2018j). At least six indigenous groups from Newfoundland and Labrador hold communal commercial fishing licences that would allow fishing in Placentia Bay: (1) the Miawpukek First Nation (MFN) holds multiple enterprises and licences that give access to groundfish, tuna, swordfish and whelk in NAFO Div. 3Ps, squid in Squid Fishing Area 10, and seal for Sealing Aras 4–33; (2) the Qalipu Mi'kmaq First Nation Band holds an inshore enterprise for capelin and mackerel giving them access to Capelin Fishing Areas 1–11 and Mackerel Fishing Areas 1–11; (3) the Mi'kmaq Alsumk Mowimsikik Koqoey Association (MAMKA), formed by the MFN and Qalipu Mi'kmaq First Nation Band, has an enterprise with a groundfish licence providing access to Div. 3Ps, capelin and herring licences providing access to Capelin Fishing Area 10 and Herring Fishing Area 10, and a whelk licence for Div. 3Ps; (4) the Nunatsiavut Government holds seal licences for Sealing Areas 4–33; (5) the Innu Nation has a mid-shore enterprise (65–100') with a groundfish licence providing access to a variety of areas throughout the Atlantic, including Div. 3Ps; and (6) the NunatuKavut Community Council holds seal licences with access in Sealing Areas 4–33 (D. Ball, RMAF, DFO, pers. comm., 9 February 2018).

Unlike other commercial fisheries enterprises in the region, the FFAW is not a representative for indigenous fisheries in Newfoundland and Labrador, and although the DFO database includes locations in which commercial licences held by indigenous groups permit activity, it does not indicate whether specific areas are utilized (D. Ball, RMAF, DFO, pers. comm., 8 February 2018). Therefore, the Proponent reached out to key contacts within each indigenous group (provided by DFO [D. Ball, RMAF, DFO, pers. comm., 9 February 2018]), to determine if the aforementioned licences have been or are likely to be used within Placentia Bay. To date, only the Nunatsiavut Government has replied, indicating that they have not used their licence to hunt seals in Placentia Bay.

In Newfoundland, MFN holds a Food, Social or Ceremonial (FSC) communal salmon fishing licence, but has chosen not to harvest salmon under this licence since 1997 due to conservation concerns (Veinott et al. 2018). Otherwise, there are no FSC licences issued for Placentia Bay (D. Ball, RMAF, DFO, pers. comm., 9 February 2018).

#### 4.1.1.7 Industry and Science Surveys

Annual fisheries research surveys conducted by DFO and the fishing industry are vital in determining stock status for the commercial fisheries. In a given year, there will be spatial overlap between the Study Area and research surveys in NAFO Div. 3Ps.

The tentative schedule of DFO RV surveys in the Study Area in 2018 is indicated in Table 4.19. Spring surveys within the Study Area may occur during April and early-May.

**Table 4.19. Tentative 2018 schedule of DFO RV surveys in the Study Area vicinity.**

| NAFO Division | Start Date | End Date | Vessel | Activity |
|---|---|---|---|---|
| 3P | 31 March | 12 April | *Needler* | NL Spring Survey |
| 3P | 12 April | 24 April | *Needler* | NL Spring Survey |
| 3P + 3O | 25 April | 8 May | *Needler* | NL Spring Survey |
| 3P + 3KLMNO | 26 April | 1 May | *Teleost* | Calibrations |

Note: Start/end dates subject to change as trip plans are finalized (D. Power, NAFO Senior Science Advisor/Coordinator, Science Branch, DFO, pers. comm., 31 January 2018).

### *DFO-Industry Collaborative Post-Season Snow Crab Trap Survey*

Prior to 2003, the fall DFO RV surveys were the primary index of abundance for the assessment of snow crab. Industry felt that a "survey dedicated solely for snow crab using commercial and modified commercial snow crab traps would allow the fishing industry to more accurately assess and ultimately better manage the valuable snow crab resource" (FFAW|Unifor 2018a). After extensive consultations between fish harvesters and scientists, the DFO-Industry Collaborative Post-Season Snow Crab Trap Survey was implemented in 2003, and by 2008, results of this survey were fully integrated into the snow crab scientific assessment methodology (FFAW|Unifor 2018a). As a result, harvesters and managers have improved partnership and higher confidence in the accuracy of recent stock status assessments (LGL 2016; FFAW|Unifor 2018a). Since the Trap Survey began, there have been approximately 900 participating snow crab harvesters (FFAW|Unifor 2018a).

The Post-Season Snow Crab Trap Survey typically occurs between early-September and November (LGL 2016). The annual snow crab TAC for this survey was 350 mt during the 2015 and 2016 seasons, and 470 mt during 2017 (DFO 2016a, 2017e). The 1,257 station locations remained consistent from year to year throughout all crab management areas up to and including the 2016 survey year. As of 2017, there was an increase in the total number of stations (to 1,316, including three new stations within Placentia Bay) and an alteration of methodology in that all of the stations will not necessarily be sampled during a given year. The new plan strategy is to randomize the survey locations within each NAFO Div. (N. Paddy, Contract Manager, PGS, pers. comm., 11 February 2017). A total of 73 station locations occur within the Study Area (Figure 4.47). While no stations are located within any proposed sea cage sites, several are located <10 km from some proposed sea cage sites in all four BMAs.

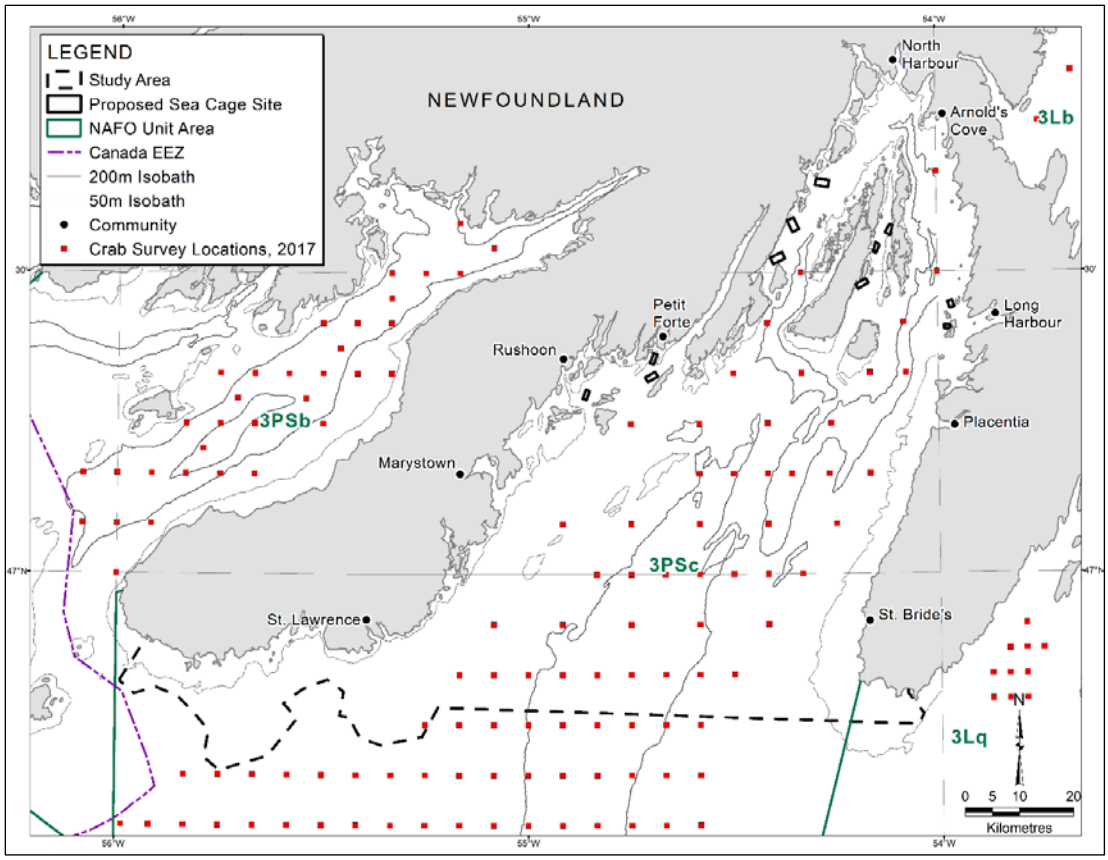
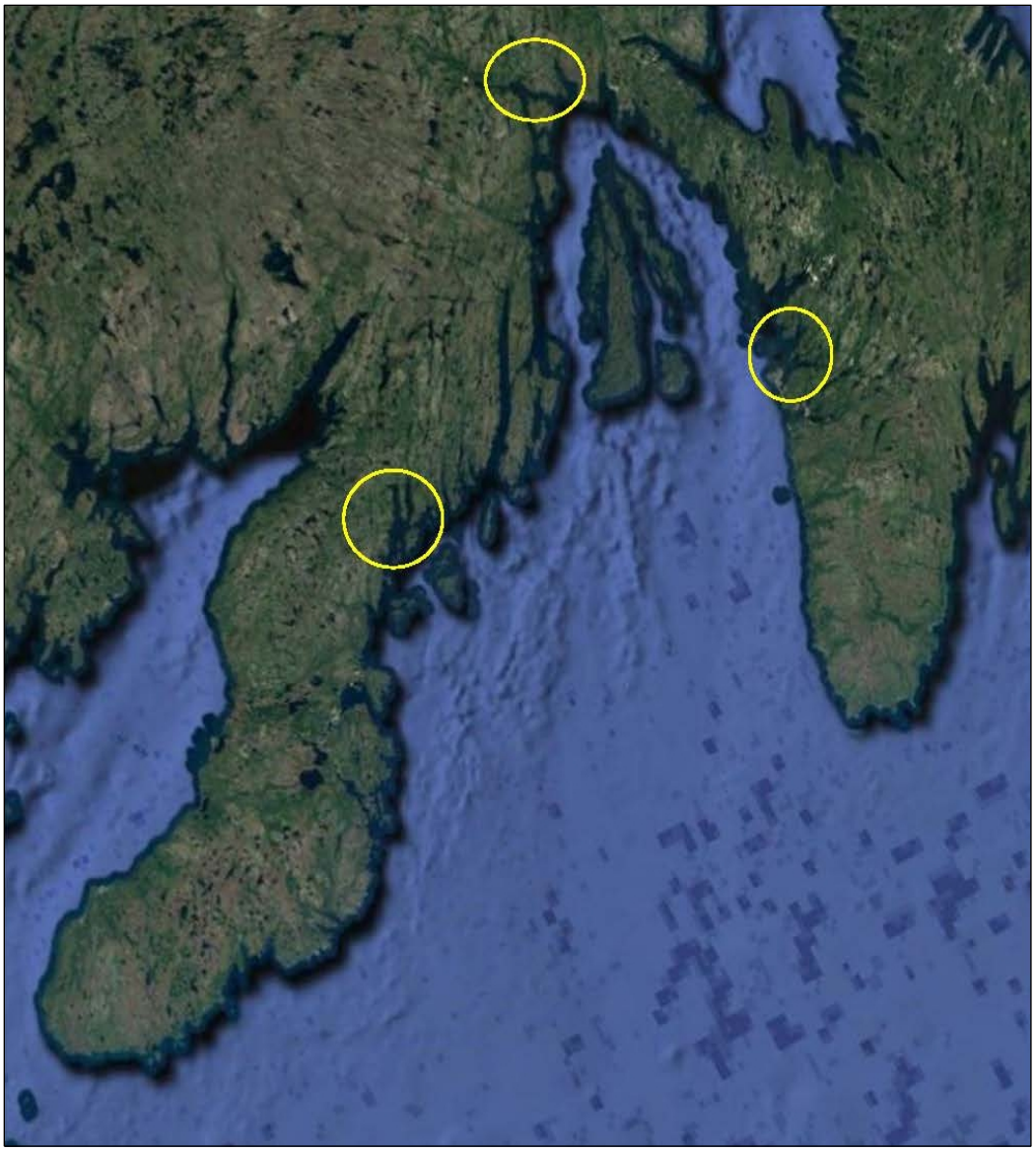



**Figure 4.47. Locations of DFO-Industry Collaborative Post-Season Snow Crab Trap Survey stations in the Study Area.**

### *Coastal Restoration Project – Placentia Bay*

Eelgrass in Placentia Bay has decreased over the past 20 years, perhaps due to an increase in the local population of the invasive species green crab (*Carcinus maenas*) (K. Best, Fisheries Biologist, Marine Institute of Memorial University of Newfoundland [MI], pers. comm., 13 February 2018). As a result, the Coastal Restoration Project, managed by the MI in collaboration with FFAW, seeks to restore eelgrass sites within Placentia Bay utilizing globally-established eelgrass transplantation methodology. An important aspect of site preparation for eelgrass restoration is the removal of green crab for research and population control. This research has provided an increased understanding of green crab biology, the effects of green crab on the catchability of, and competition with lobster, and the effects of green crab on eelgrass beds (FFAW|Unifor 2018b). There are nine sites within Placentia Bay from which green crab are removed for eelgrass restoration site preparation: three along the western portion of Placentia Bay, two in the north and four to the east. All are located ≥5 km from the proposed sea cage sites (Figure 4.48; K. Best, Fisheries Biologist, MI, pers. comm., 13 February 2018).



Source: K. Best, Fisheries Biologist, MI, pers. comm., 1 March 2018.

**Figure 4.48. Locations of eelgrass restoration sites (yellow circles) in which green crab are harvested for site preparation for the Coastal Restoration Project in Placentia Bay, NL.**

Through a contractual agreement between the MI and FFAW, harvesters catch green crab in accordance with the FFAW's standard compensation rate for research purposes (K. Best, Fisheries Biologist, MI, pers. comm., 13 February 2018). Eligible fishers (i.e., those residing either from North Harbour to Swift Current, Baine Harbour to Petit Fort including Boat Harbour and St. Josephs], or Fox Harbour to Southeast Arm [including Placentia Sound and Northeast Arm]) (FFAW|Unifor 2017b), wanting to participate in the Coastal Restoration Project submit applications to FFAW and one-year contracts are awarded to fishers on a lottery basis year (K. Best, Fisheries Biologist, MI, pers. comm., 13 February 2018). Unless conditions dictate otherwise, ten fishers per year harvest green crab at each of the nine eelgrass restoration preparation sites. The green crab harvest component of site preparation began in October 2017

and will continue until the end of March 2018 (FFAW|Unifor 2017b). The next fiscal year's (1 April–31 March) lottery results will be released by FFAW in mid-March. It will be the first full year involving green crab removal for the purpose of eelgrass site restoration preparation and it is anticipated to start in June of this year (K. Best, Fisheries Biologist, MI, pers. comm., 13 February 2018).

All crab removed from the water are culled once biological data are collected (e.g., carapace width measurements) in accordance with standard protocols (K. Best, Fisheries Biologist, MI, pers. comm., 13 February 2018). A subsample of the crab are collected for scientific analyses, and the remaining crab are either sent to a landfill or donated (e.g., to processing plants where they may be incorporated into fish meal) but not sold. Donated crab may be frozen at a large freezer terminal at the port in Argentia and distributed to companies which produce bi-products (K. Best, Fisheries Biologist, MI, pers. comm., 13 February 2018).

***Inshore Sentinel Program – Red Harbour (Placentia Bay) Sentinel Site***

The inshore sentinel fishery that occurs off the coasts of Newfoundland and Labrador in NAFO Div. 2J, 3KLPsPn and 4R is a fisheries science program involving inshore fish harvesters working collaboratively with DFO scientists to collect data on cod (FFAW|Unifor 2018c). Harvesters from the province have participated in the cod sentinel surveys since 1994/1995. Cod are fished in accordance with "systematic, well-defined and rigorous scientific protocols" in order to collect information on stock abundance trends, and the distribution, migration, condition and age of fish, which is incorporated into cod stock assessments (FFAW|Unifor 2018b,c). There are currently 74 fixed gear fishing enterprises involved in the sentinel program around the province, and four mobile gear vessels conducting stratified random bottom trawl surveys in NAFO Div. 4R and 3Pn (FFAW|Unifor 2018b). The FFAW is currently accepting applications from harvesters until 14 July 2018 to fish the Red Harbour, Placentia Bay, sentinel site (FFAW|Unifor 2017c). Red Harbour is located in the west-central portion of Placentia Bay, between Rushoon and Marystown, and harvesters eligible to apply for the sentinel fishery for this site are those residing from Baine Harbour to Jean de Baie (FFAW|Unifor 2017c).

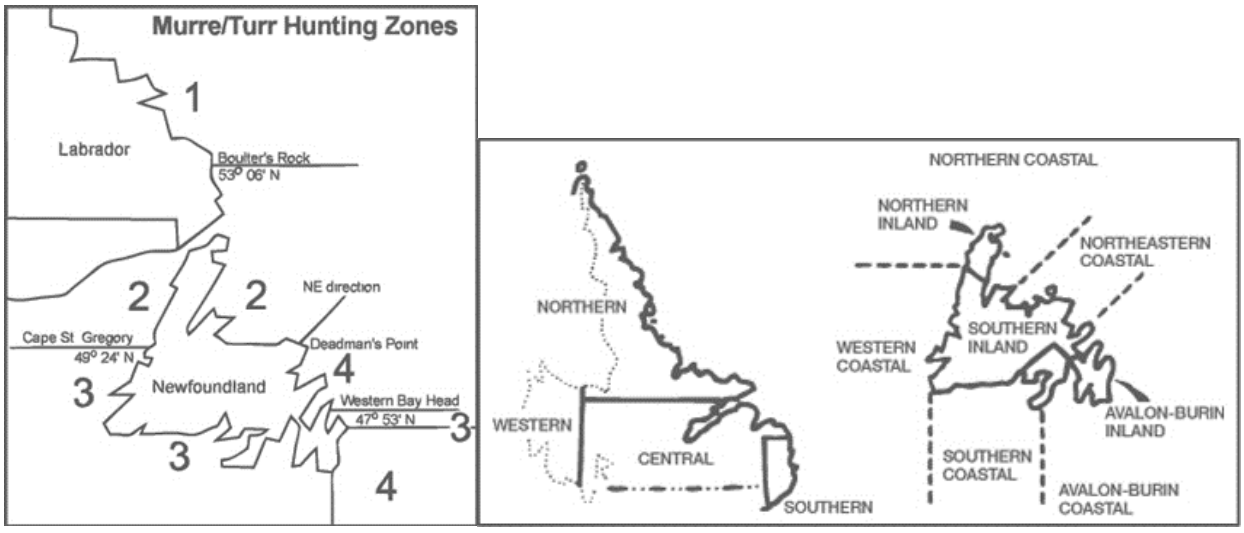
#### 4.1.1.8 Seabird Bycatch and Hunting

The rich, diverse feeding and breeding grounds of Placentia Bay attract a variety of marine birds to the area (DFO 2010b). At least 27 seabird species have been observed in Placentia Bay (ORCA Inc. 2005 *in* DFO 2010b), along with numerous nesting colonies (Community Resource Services Ltd & Jacques Whitford Environment Ltd 2001 *in* DFO 2010b). Some of these seabird species are year-round residents, while others undergo annual migrations (Lock et al. 1994 *in* DFO 2010b).

In shallow inshore waters, gillnets may take a high bycatch of seabirds, particularly birds that regularly dive below the surface to feed (DFO 2010b). An estimated 22,070 Common Murres (*Uria aalge*) per year were killed as bycatch in eastern Newfoundland during the early 1980s, but with the reduction in gillnet fisheries the bycatch is now <10% of the previous levels (Wiese and Robertson 2004 *in* DFO 2010b). Benjamins et al. (2008 *in* DFO 2010b) determined that 2,000–7,000 murres and >2,000 shearwaters were captured in Newfoundland and Labrador

gillnet fisheries during 2001–2003, along with significant numbers of gannets, Northern Fulmars (*Fulmarus glacialis*), cormorants, Razorbill Murres (*Alca torda*), puffins, Black Guillemots (*Cephhus grylle*) and Dovekies (*Alle alle*). Baited hooks, such as longlines, may also attract and capture various seabird species, although longline use is relatively low within Placentia Bay (DFO 2010b).

Hunters are required to possess a valid federal Migratory Game Bird Hunting Permit with a Canadian Wildlife Habitat Conservation Stamp in order to hunt migratory birds in Canada, including murres (locally known as "turrs") (ECCC 2017). Placentia Bay is located within Murre/Turr Hunting Zone 3 (Figure 4.49), with murres hunted primarily around Point Lance (southeast Placentia Bay) but otherwise throughout the Bay (DFO 2010b). Common Murres are the primary seabirds targeted during annual hunts in Placentia Bay, with Razor-bill Murres, Dovekies, guillemots and puffins also taken (DFO 2010b). Within Placentia Bay, harvests are typically comprised of up to 30% Common Murres and the remainder is mostly Thick-billed Murres (G. Robertson, pers. comm. *in* DFO 2010b). The murre hunt is only open to residents of Newfoundland and Labrador, and murres are the only migratory bird that can be legally hunted from a power boat (ECCC 2017). Non-toxic shot must be used to hunt migratory birds, with the exception of murres which can still be hunted with lead shot (ECCC 2017). The open season for murre within Zone 3 runs from 25 November 2017–10 March 2018, with daily bag limits of 20 murres and a possession limit of 40 murres (ECCC 2017). Numerous common seabird species, such as gannets, terns, petrels and gulls are not significantly impacted by hunting activities, although all over-wintering birds within Placentia Bay may be disturbed by hunts conducted using high-powered speed boats and/or shot guns (DFO 2010b). Since Placentia Bay is within a large Hunting Zone, seabird catch data specific to the Bay is not available (DFO 2010b). An estimated 250,000–300,000 birds were harvested in Newfoundland and Labrador during 2010, with a precautionary estimate of 25,000 birds taken in Placentia Bay (DFO 2010b).




Source: ECCC (2017).

**Figure 4.49. Murre/turr (left) and Waterfowl and Snipe (right) Hunting Zones in Newfoundland and Labrador.**

Waterfowl and snipe are hunted in coastal areas of Newfoundland and Labrador (i.e., coastal portions within 100 m of the mean ordinary high-water mark), including offshore islands and adjacent marine coastal waters (ECCC 2017). Placentia Bay is within the Avalon-Burin Coastal Hunting Zone (see Figure 4.49). Within Placentia Bay, residents from North Harbour indicated that the area is a good location for duck and goose hunting (NLRC 2007). Open seasons in Newfoundland for long-tailed ducks, eiders and scoters are from 25 November 2017–10 March 2018 (daily bag limits of 6 and possessions limit of 12), and for other ducks, geese and snipe from 16 September–30 December 2017 (ECCC 2017). Other ducks, geese and snipe have daily bag limits of 6, 5 and 10, respectively, and a possession limit of 18, 10 and 20, respectively. Limits on taking Barrow's Goldeneye (*Bucephala islandica*) and American Black Ducks (*Anas rubripes*) incidentally are one and four, respectively (ECCC 2017).

Concerns have been raised recently regarding the low number of wildlife officers and the associated inability to adequately patrol waters of Newfoundland and Labrador to enforce federal migratory bird hunting regulations (CBC 2016). Poaching can become a major issue in such situations. A local murre hunter residing in Placentia Bay noted that "hunters are arriving in Placentia Bay by the dozen, filling their boats with seabirds, and coming back for more…it seems…every time the weather is fit to go out" (W. Parsons, pers. comm. *in* CBC 2016). Mr. Parsons had been told that some hunters arrive in Placentia Bay, "dump their turrs aboard a waiting truck and head out again", and that many murres are being sold. Mr. Parsons expressed concern that "at the rate [murres] are being slaughtered now", he felt that few would live "to see their fifth birthday", a concern given that murres do not typically reach sexual maturity until age four to five years. As of June 2017, the Environmental Violations Administrative Monetary Penalties Regulations came into effect and administrative monetary penalties are now "available to game officers to enforce designated violations of the *Migratory Birds Convention Act* (*MBCA*)…and its associated regulations" (ECCC 2017). The monetary fine regime and sentencing provisions of the *MBCA*, including the Designation of Regulatory Provisions for the Purposes of Enforcement Regulations, were amended and implemented in July 2017, with the goal of ensuring that "court-imposed fines more accurately reflect the seriousness of environmental offences", including the imposition of minimum and higher maximum fines (ECCC 2017).

## 4.2 Tourism, Outfitters, Cabins and Recreation

Tourism was a $1.13 billion industry in the province in 2017 with spending split almost equally between non-resident visitors and resident tourism. More than 553,000 visitors made their way to the province in 2017 and spent an estimated $575 million. This is the highest level of non-resident visitation and spending in the history of Newfoundland and Labrador (HNL 2018; TCII 2018a).

Commercial tourism operators of accommodation and restaurant businesses on the Burin Peninsula rely on all types of travelers throughout the year, including those doing business and working in the area. However, most of the people who visit the Burin Peninsula are friends and relatives of local residents.

The comprehensive exit survey of visitors as they left the province in 2016 provided a profile of Burin Peninsula vacation travelers. Of the 211,000 parties who visited the province from May–October in 2016, 3.5% of non-resident party visits, or 7,400, visited the Burin Peninsula. Of these, 36% of the non-resident parties were in the region for vacation/pleasure, which was slightly higher than the provincial average of 34%. Most of the non-resident parties that reported an overnight visit to the region were from Ontario (35%). The rest came from western/other Canada (27%) and the Maritimes (17%) with fewer from international origins (8%) and the United States (4%). Visitors destined for Saint Pierre et Miquelon (SPM) also generate tourism travel on the Burin Peninsula, with the remaining 9% of visitors from Quebec (>5% provincial share of visitors from that province).

Of those visiting the Burin Peninsula, 73% graduated from university, slightly less than the 78% university graduate visitor proportion for the Province. Forty percent reported a household income of $100,000 or more, compared to 53% for the Province. The average party size was 2.1 persons, of which close to half (46%) were couples with no children, 16% higher than the Province as a whole. Close to a third (29%) of the visitors travelled alone, 18% lower than the overall provincial average. Over half (56%) of the non-resident travelers were 55 or older, as compared to 48% for the Province (TCII 2018b).

### 4.2.1 Tourism on the Burin Peninsula: 'Come Stay a Spell'

Tourism on the Burin Peninsula is encouraged and monitored by the Heritage Run Tourism Association (HRTA) (HRTA 2016). The HRTA includes the entire Burin Peninsula as well as the French islands of SPM. The HRTA membership includes businesses, educational institutions, individual museums, towns/municipalities, the provincial government and a number of associations, such as the Burin Heritage Tourism Association; Grand Bank Heritage Society; Placentia West Heritage Committee; St. Lawrence Historical Advisory Committee; Grand Bank Development Association; and the Burin Peninsula Chamber of Commerce. Other organizations also provide experiences for residents and visitors, such as the Burin Peninsula Arts Council.

The HRTA website (HRTA 2016) is a major marketing tool for tourism and provides thorough and up-to-date information about the history of the Burin Peninsula and its communities, logistics, services, accommodation, attractions and seasonal events. As guidance for visitors to the Burin Peninsula, highways are used as the connecting link among Heritage Run communities to provide travelers with information, including Mariner Drive, Captain Cook Drive, Captain Clarke Drive and French Island Drive (HRTA 2016).

The HRTA's information regarding 'Mariner Drive' includes the communities on both sides of the Burin Peninsula that are encountered after leaving the Trans-Canada Highway (see Figure 4.50). A passenger ferry to the isolated community of Rencontre East (and farther west to the Connaigre Peninsula) operates out of Bay L'Argent on Burin Peninsula's west coast.

Tourism marketing and product development on the Burin Peninsula's Heritage Run is also within the mandate of the Eastern Destination Marketing Organization (EDMO), also known as Legendary Coasts, one of the four provincial DMOs representing regional tourism industry operators and organizations (EDMO NL 2013). Employees of the EDMO are active in tourism

marketing initiatives and assist with regional tourism product and experience development on the peninsula. Legendary Coasts describes the Heritage Run as follows (EDMO NL 2013):

**"**Encompassing the entire Burin Peninsula, the Heritage Run heads south from the Trans-Canada Highway at Goobies. Past the hills overlooking Swift Current, the Heritage Run will take you past fertile woodlands, stark barrens, and dramatic coastal scenery. At Marystown, the road forks to form a loop around "The Boot". To the east is the town of Burin, snuggled amongst coastal heights, and further south is St. Lawrence, whose history as a mining town is punctuated with stories of incredible history. At the southwest corner of the peninsula are the beaches of Lamaline, which coax the road northward to the town of Fortune, where the ferry service to another country – France to be specific – can be found. The historic town of Grand Bank – whose mariners are the stuff of legends – will round out the loop as it returns to Marystown."

There has been regularly-scheduled passenger ferry service for the 25-km trip between Fortune, on the west side of the peninsula, and St. Pierre for many years. Two new car/passenger ferries are expected to enter into service after docking facilities are prepared in Fortune within the next year, which will greatly enhance travel between SPM and the Province. The EDMO, HRTA and SPM are working together to plan for the anticipated increased numbers of travelers, including the 6,000 French island residents and residents and visitors from Newfoundland.

The Government of France has partnered with the Government of Newfoundland and Labrador and the EDMO to support Legendary Coasts' marketing of the French islands, and the development of itineraries in partnership with the Burin Peninsula and other provincial operators. Dedicated staff and partnership programming has been funded to plan experiences and marketing to increase travel to and from the islands. Tourism operators and communities on the Burin Peninsula have the most potential to benefit from the initiative, by capturing a greater share of travelers from Quebec and France (D. Ambs, SPM Tourism Officer, Eastern Destination Marketing Organization, pers. comm., 7 February 2018).

### 4.2.2 Accommodation Occupancies Reflect the Burin Peninsula Economy

Accommodation occupancy rates reveal the impact of industrial activity on the Burin Peninsula. There is a core market that rents rooms for other business and vacation reasons. Roofed accommodations include three groups: (1) hotels/motels/resorts/suites; (2) B & B's/inns/tourist homes; and (3) cottages and vacation homes. Table 4.20 demonstrates that the volume of rooms available has steadily increased since 2003, and how industrial activity stimulated peaks every five years in 2005, 2010 and 2015, associated with Marystown fabrication yards for offshore oil platform construction projects. Accommodation and occupancy on the Burin Peninsula in 2016 represented 2.7% of total rooms available in the Province and 1.4% of revenue from all rooms sold in the Province, respectively (Table 4.21).

Other Burin Peninsula tourism indicators reveal predominantly resident tourism activity, such as overnight stays in Frenchman's Cove Provincial Park during 2013–2017 (values listed below are number of nights sold and seasonal occupancy rate [%], respectively) (R. Haynes, Research Analyst, Tourism Research Division, Department of Tourism, Culture, Industry and Innovation, pers. comm., 2 March 2018).

- 2013: 5,535 and 59%
- 2014: 5,837 and 62%
- 2015: 5,518 and 59%
- 2016: 4,662 and 49%
- 2017: 3,981 and 49%

**Table 4.20. Burin Peninsula accommodation revenue and occupancy rates in 2017.**

| Year | Total No. Rooms Available | Total No. Rooms Sold | Occupancy Rate (%) | Total Room Revenue ($CAD, Million) | Average Daily Rate ($CAD) |
|---|---|---|---|---|---|
| 2003 | 70,713 | 26,495 | 37.47 | 1.93 | 73.05 |
| 2004 | 71,531 | 31,400 | 43.90 | 2.55 | 81.40 |
| 2005 | 73,355 | 33,589 | 45.79 | 3.64 | 108.50 |
| 2006 | 63,762 | 18,910 | 29.66 | 2.04 | 108.04 |
| 2007 | 67,500 | 23,743 | 35.17 | 2.80 | 118.21 |
| 2008 | 69,324 | 25,482 | 36.76 | 3.01 | 118.17 |
| 2009 | 69,760 | 23,182 | 33.23 | 2.51 | 108.17 |
| 2010 | 72,378 | 33,247 | 45.94 | 3.09 | 93.02 |
| 2011 | 73,112 | 27,003 | 36.93 | 2.67 | 99.00 |
| 2012 | 73,240 | 33,178 | 45.30 | 3.71 | 111.86 |
| 2013 | 76,425 | 24,073 | 31.50 | 2.64 | 109.75 |
| 2014 | 78,068 | 29,459 | 37.74 | 3.23 | 109.65 |
| 2015 | 83,870 | 35,386 | 42.19 | 4.14 | 117.05 |
| 2016 | 82,166 | 22,988 | 27.98 | 2.78 | 120.80 |
| 2017 | 80,862 | 22,874 | 28.29 | 2.80 | 122.55 |

Source: TCII (2018c); R. Haynes, Research Analyst, Tourism Research Division, Department of Tourism, Culture, Industry and Innovation, pers. comm., 2 March 2018.

**Table 4.21. Newfoundland and Labrador accommodation revenue and occupancy rates in 2017.**

| Year | Total No. Rooms Available | Total No. Rooms Sold | Occupancy Rate (%) | Total Room Revenue ($CAD, Million) | Average Daily Rate ($CAD) |
|---|---|---|---|---|---|
| 2016 | 2,914,974 | 1,457,272 | 49.99% | $201.78M | $120.80 |

Source: TCII (2018c).

Residents are the predominant Frenchman's Cove Provincial Park users, representing 82% of overnight visitors in 2017. The remaining overnight visitors were from other Canadian provinces (15%), the US (2%), and other foreign countries (1%) (R. Haynes, Research Analyst, Tourism Research Division, Department of Tourism, Culture, Industry and Innovation, pers. comm., 2 March 2018).

The Provincial Seaman's Museum in Grand Bank receives ~3,000 visitors per year, and visitor information centres in Marystown, Fortune and Goobies receive ~2,400, 4,000 and 5,400 visitors per year, respectively (the visitor centre in Goobies was closed during 2017) (R. Haynes,

Research Analyst, Tourism Research Division, Department of Tourism, Culture, Industry and Innovation, pers. comm., 2 March 2018).

### 4.2.3 Tourism Attractions

Tourism on the Burin Peninsula and around Placentia Bay (see Figure 4.50 for communities involved in tourism) is based on family visits, heritage attractions and the natural environment, with hiking, camping, paddling, sailing and driving primarily pursued on an individual or self-guided basis.

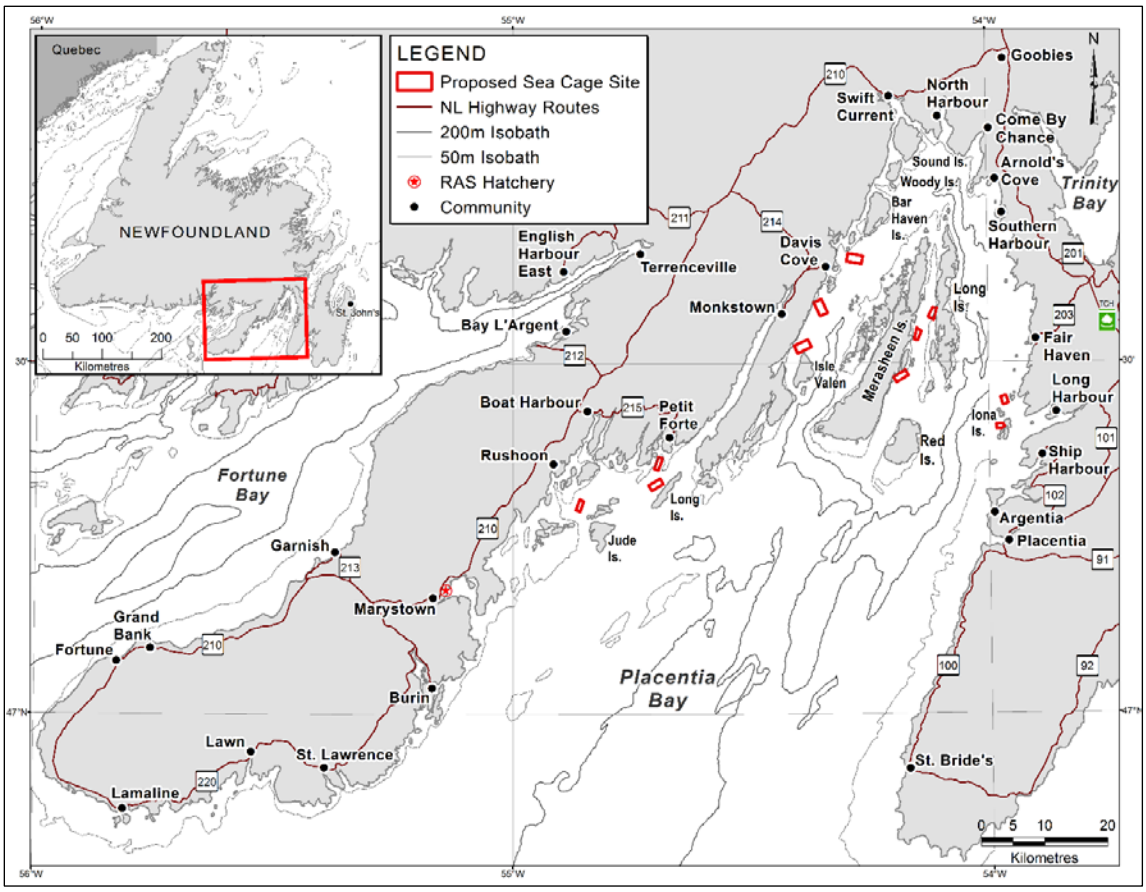



**Figure 4.50. Communities with tourism involvement on the Burin Peninsula and around Placentia Bay, relative to the proposed sea cage sites.**

There is one marine tourism operator based in Placentia Bay offering marine adventure tours, outfitting or diving. Commercial operations, such as inns, bed and breakfasts, motels and attractions (e.g., museums, signage, trails) are available to tourists. The provincial government takes the lead role in promotion, augmented by volunteer heritage and/or tourism association support in many communities, including via advertising, websites, visitor information centres and an annual Traveler's Guide (GNL 2018). The 2018 Traveler's Guide (GNL 2018) provided

a list of licensed tourism properties and main community events on the Burin Peninsula (Table 4.22).

While not tourism activity per se, there is also seasonal use of an estimated 400 cabins located on the islands and isolated shoreline of Placentia Bay. These cabins are predominantly used during the summer months for recreation purposes, and occasionally as a base for commercial fishing.

**Table 4.22. List of 2018 tourism properties and events.**

| Tourism Properties / Events | Location | Description |
|---|---|---|
| ***Built Attractions*** | | |
| Vernon's Antique Toy Shop | Swift Current, Route 210 | 60+ antique cars |
| Grand Meadows Golf Course | Frenchman's Cove, Route 213 | 9-hole golf course next to Frenchman's Cove Park |
| Golden Sands Amusement Park | Burin, Route 221 | Family park with pond and beach |
| ***Heritage Attractions*** | | |
| Livyer's Lot Heritage Site | Boat Harbour, Route 210 | Traditional lifestyles' exhibits; café |
| Marystown Heritage Museum | Marystown, Route 210 | Artifacts & murals |
| Burin Heritage Museums | Burin, Route 221 | Gallery, café, tidal wave & fishery exhibits |
| Oldest Colony Trust Building | Burin, Route 221 | Former cold storage, repurposed |
| Echoes of Valour | St. Lawrence, Route 220 | Commemoration sculpture for mining and ship disasters |
| Miner's Memorial Museum | St. Lawrence, Route 220 | Tools, artifacts and murals |
| Provincial Seamen's Museum | Grand Bank, Route 220 | Fishing family artifacts |
| Provincial Mariners' Memorial | Grand Bank, Route 220 | Tribute to mariner tragedies |
| Fortune Fishing Sheds | Fortune, Route 220 | Recreated fishing sheds and stages |
| Fortune History Board | Fortune, Route 220 | Mariner and town history |
| Lake Heritage House | Fortune, Route 220 | 125-year-old fishing family home |
| Wade Drake & Burch Nash Park | Fortune, Route 220 | Memorial to victims of Cougar helicopter tragedy |
| George Harris House | Grand Bank, Route 220 | Merchant house and museum |
| Lighthouse and Waterfront | Grand Bank, Route 220 | 1850s historic properties |
| Heritage Walk | Grand Bank, Route 220 | Historic settings throughout town |
| ***Natural Attractions*** | | |
| Fortune Head Ecological Reserve | Fortune, Route 220 | Rocks on exposed cliffs re: Precambrian and Cambrian eras |
| Fortune Head Geology Centre | Fortune, Route 220 | Interpretation, rock collections, reserve tours, camps, Fossil Shop |
| Shoal Cove Beach | St. Lawrence, Route 220 | Natural beach |
| Lawn Bay Ecological Reserve | Roundabout, Route 220 | Seabird breeding colonies on 3 islands in the bay |
| Frenchman's Cove Provincial Park | Frenchman's Cove, Route 213 | Natural habitat and 9-hole golf course |
| ***Trails and Lookouts*** | | |
| Cook's Lookout Trail | Burin, Route 221 | 6 km gravel & boardwalk |
| Salt Pond Walking Trail | Burin, Route 221 | Trail around pond |
| Cape Chapeau Rouge View Park and Trail | St. Lawrence, Route 220 | Centre town lookout and storyboards, trail to highest point |
| Chamber Cove Heritage Walk | St. Lawrence, Route 220 | 5 km trail tracing rescue route of *USS Truxton* and *USS Pollux* ship disasters; and old mine |
| St. Lawrence Nature Walk | St. Lawrence, Route 220 | 16 km trails on old mine roads |
| Horse Brook Walking Trail | Fortune, Route 220 | Ecological reserve view, with panels |
| Grand Bank Nature Trail | Grand Bank, Route 220 | 5 km trail to Bennett Hill, view salmon ladder |
| Marine Hike | Grand Bank, Route 220 | 7 km to Grand Bank Cape |
| Garnish Point Rosie Trail | Garnish, Route 213 | 50 km trail for ATV use, and recreation |
| ***Festivals and Events*** | | |
| Grand Bank Winter Carnival | Grand Bank, Route 220 | January 29-Febuary 3 |
| *USS Truxton* and *USS Pollux* | St. Lawrence, Route 220 | Annual memorial service for victims of ship |

| Tourism Properties / Events | Location | Description |
|---|---|---|
| commemorative service | | disaster (February 18) |
| Grand Bank Regional Theatre | Grand Bank, Route 220 | Summer plays and dinners; art displays (July 4-Aug 30) |
| Burin Peninsula Festival of Folk and Song | Burin, Route 221 | Traditional music performances and dances, workshops, food (July 6-8) |
| Grand Bank Summer Festival | Grand Bank, Route 220 | Week of family activities<br>July 28-August 4 |
| Burin Heritage Weekend | Burin, Route 221 | 4-day community event |
| St. Lawrence Laurentians Day | St. Lawrence, Route 220 | Annual games and parade, food, fireworks (August 3-5) |
| Garnish Bakeapple Festival | Garnish, Route 231 | Week of community events and food, entertainment (August TBA) |
| *Feller From Fortune* International Festival | Fortune, Route 220 | 4-day community event<br>August 16-19 |
| George Harris House Garden Party | Grand Bank, Route 220 | Community event at the merchant house and museum (July 31) |
| Annual Burin Peninsula Arts Council Craft Fair | Marystown, Route 210 | Fall fair of local crafts, music and workshops (November 2-4) |
| ***Shops and Galleries*** | | |
| Burin Heritage Crafts | Burin, Route 221 | Local crafts, hooked mats, art |
| Island Rock Jewelry & Crafts | St. Lawrence, Route 220 | Fluorspar jewelry and products; gift shop at Miner's Museum |
| Grand Bank Heritage Crafts | Grand Bank, Route 220 | Local crafts, sealskin, dories, art |
| Craft Tea Room | Fortune, Route 220 | Traditional crafts and food |
| ***Tours*** | | |
| Saint Pierre Ferry office | Fortune, Route 220 | Hour long ride, overnight packages |
| ***Accommodations and Campgrounds*** | | |
| Kilmory Resort & Trailer Park | Swift Current, Route 210 | 4-star 21 waterfront cottages; 2 ½-star 10 semi-services sites; trout, salmon fishing, boat rentals, trails |
| Woody Island Resort | Woody Island via Garden Cove, Route 210 | Resettled community, lodge |
| Marystown Motel and Convention Centre | Marystown, Route 210 | 3 ½-star 113 rooms, suites, conference rooms, restaurant, bar |
| Braxton Suites | Marystown, Route 210 | 4-star 13 housekeeping suites |
| Spanish Room Manor B&B | Marystown/Spanish Room | 4 ½-star 7 rooms, villa on 3 acres |
| Burin Efficiency Units | Salt Pond/Burin, Route 220 | 4-star 6 efficiency units |
| Golden Sands Resort & Trailer Park | Burin, Route 221 | 3-star 18 cottages, 4 chalets; 2 ½-star 137 sites |
| Ocean View Motel | St. Lawrence, Route 220 | 2½-star 16 rooms, pizza takeout |
| Dockside Efficiency Unit | Fortune, Route 220 | 3 ½-star 3 efficiency units |
| Fortune Harbourview Tourist Home | Fortune, Route 220 | 3 ½-star 5 rooms |
| Hotel Fortune | Fortune, Route 220 | 3 ½-star 8 rooms |
| Horseback Trailer Park | Fortune, Route 220 | 2-star 48 serviced sites |
| Abbie's Garden Suites | Grand Bank, Route 220 | 4 ½-star 5 rooms |
| Burin Peninsula Motes | Grand Bank, Route 220 | 3-star-10 rooms |
| Thorndyke B&B | Grand Bank, Route 220 | 4-star-4 rooms heritage home |
| Cape View Suite | Grand Bank, Route 220 | 3 ½-star efficiency suite |
| Dolly's Place | Grand Bank, Route 220 | 4-star-vacation home |
| Fishermen's View B&B | Grand Bank, Route 220 | 4-star-4 rooms |
| Grand Fairways Resort Cottages | Frenchman's Cove, Route 213 | 3 ½-star 6 cottages at golf course |
| Frenchman's Cove Provincial Park | Frenchman's Cove, Route 213 | 76 sites |
| Long Ridge Cottages | Garnish, Route 213 | 3 ½-star 4 cottages |

Source: GNL (2018).

### 4.2.4 Community-based Tourism Marketing

Larger communities on the peninsula also promote their attractions and events individually at visitor information centres, located at strategic locations such as on the main highway, the Trans-Canada Highway and within communities, using brochures, attractive websites and on-site signage. Information and suggested itineraries are provided on the provincial tourism website (NLT n.d.).

#### 4.2.4.1 Marystown

Marystown has a Visitor Information Centre that provides information for the rest for the peninsula as well as Marystown itself. Marystown has recently developed an update to its Integrated Community Sustainability/Municipal Plan (Tract 2017). The Town wants to attract more commercial, industrial and tourism business to diversify its tax base. The report suggests that, currently, non-resident tourists "…generally use Marystown as a service center and maybe a stop-over on the way to another destination. Marystown needs to define itself as a gateway destination, not just another stop on the Heritage Run" (Tract 2017).

Marystown lists several tourist attractions, including the largest conference venue, Marystown Heritage Museum, St. Gabriel's Hall/Veterans Centre Memorial Room. There is currently an effort to re-energize St. Gabriel's Hall (which has a 400-person auditorium/theatre space) and turn it into a multi-function facility (P. Curran, Lead Consultant, Pat Curran and Associates Ltd., pers. comm., 20 February 2018). Marystown has established sports facilities and attracts 'sports tourism'. The natural environment and sheltered ocean areas around Marystown have not historically been a focus for tourism, and provide potential for future tourism opportunities. Industrial tourism may also be a possibility, as the Grieg NL hatchery is planning to have visitor and education capabilities.

Near Marystown, at Midway on the Burin Highway (Route 210), the Heritage Committee, a subcommittee of the Development Association, established and operates an econo-musée showcasing textile craft, a specialty of the area. Econo-musées function to pass on traditional skills (E. Murphy, Chair, Placentia West Tourism Committee, pers. comm., 20 February 2018). The Committee also runs a café, The Tea Rose, at the same location, along with a museum and gift shop.

#### 4.2.4.2 Burin

Burin, an incorporated community adjacent to Marystown to the south, has recently prepared a Strategic Plan for 2018–2022, '*Navigating Our Way Forward'* (JW 2018) (K. Lundrigan, Mayor, Town of Burin, pers. comm., 21 February 2018). The Burin council "…places a high value on the town's rich history and wishes to work with various levels of government and with enterprising individuals and community groups to continue to carve out our niche market and develop our heritage area (and events). The current council feels it's far from complete yet. We are merely scratching the surface. Our past is worth celebrating. And our heritage area has a wealth of opportunity and potential for increased tourism and economic growth" (JW 2018).

The council has moved quickly on a key heritage tourism initiative, the Burin Heritage Square Revitalization Project (MLS 2017). Local people commonly refer to the community as Old Burin and New Burin, with Old Burin being the most seaward area of the community, essentially the end of a peninsula surrounded on three sides by Little Burin Bay, Placentia Bay (L. Hartsen, Town Manager, Town of Burin, pers. comm., 22 February 2018). Heritage Square is within the Old Burin area. The intent of the project is to revitalize this historic area (e.g., redevelop some of the historic buildings, add amenities such as walking trails and performance venues), using two guidance documents to build on Burin's culture, people and natural environment: *Tourism Destination Visitor Appeal Assessment: Eastern Region (TDVAA)* (BT and TC 2014) and *Uncommon Potential: A Vision for Newfoundland and Labrador Tourism* (*Vision 2020*) (HNL 2013). The proposed revitalization plan has been put on the town's website for residents' review and comment.

#### 4.2.4.3 St. Lawrence and Adjacent Communities

While the main tourism draw of the Burin Peninsula is the beauty of the natural environment, the Town of St. Lawrence is also known for sports (especially soccer) and mining (TSL 2015). The Town was awarded federal and provincial funding in 2016 for the renovation of the Community Centre as a sports and events complex, and to expand and enhance the Miner's Memorial Museum by adding exhibit space for both mining and the *Truxton* and *Pollux* naval disaster, as well as an experiential component in jewelry making using fluorspar and an electronic self-guided walking tour (expected to be available in 2018/2019).

St. Lawrence, the neighbouring community of Lawn, and several communities to the south (Lord's Cove, Taylor's Bay, Point aux Gaul and Lamaline) have museums and/or signage associated with a 1929 natural disaster, a tsunami which destroyed much of the communities and the fishing infrastructure. In addition, Allan's Cove highlights the Our Lady of the Lourdes Grotto, and Point May has Point Crewe Heritage Park and a view of the French islands of SPM.

#### 4.2.4.4 Fortune Bay

On the Fortune Bay side of the Burin Peninsula, the two communities of Fortune and Grand Bank are associated with the HRTA. Fortune is the point of departure by ferry between Newfoundland and SPM, France. Recently, a geological find is an added draw to Fortune; it is the site of the geological time boundary between the Precambrian Era and Cambrian period (i.e., rock and fossils from 541 million years ago that mark the increase in biodiversity on Earth). The Fortune Head Geology Centre supports this attraction, known officially as the Global Boundary Stratotype Section and Point (GSSP).

Grand Bank celebrates a long history of fishing through community architecture and museums, such as the Provincial Seamen's Museum. The Grand Bank Regional Theatre offers programs to both residents and visitors. Near-by Frenchman's Cove has a golf course and a Provincial Park, while Garnish advertises ATV trails.

#### 4.2.4.5 Head of the Bay

Arnold's Cove at 'the head of the Bay' (or innermost area) and the Placentia area on the east coast of the Bay also have active tourism associations.

Arnold's Cove viewpoints show both the natural beauty of the area and some of the main industrial activity in the Bay, with views of tankers travelling or at anchor in the Bay, heading to the refinery at Come By Chance or transshipment terminal at nearby Whiffen Head (TAC 2010a).

The cultural history in Arnold's Cove is focused on the Government of Newfoundland and Labrador's Resettlement Program, an initiative started in the 1960s to move residents of small, isolated communities on the islands within Placentia Bay into larger settlements. This interest was highlighted in the 2016 *Stories of Resettlement*, a year-long commemoration of 50 years of the resettlement of the Placentia Bay Islands, with a program of events including presentations, tours and theatre shows (TAC 2010a). Arnold's Cove has maintained interest in resettlement via the museum located in Drake House, now The Heritage House. This house was originally built and located in Haystack, an island community. In 1969, it was floated to Arnold's Cove and is now maintained by the Placentia Bay Islands and Area Heritage Foundation (Heritage NL 2016).

Arnold's Cove is a gateway for boaters (recreational and fishing) who wish to visit the islands and resettled communities, with travel facilitated by the development of facilities such as floating wharves and a new breakwater by the Harbour Authority (M. Slade, Harbor Authority, Arnold's Cove, pers. comm., 23 February 2018). There can be upwards of 75–100 pleasure craft using the wharves, both power boats and open speed boats. In some cases, boats overwinter in Arnold's Cove and use the Swift Current and Garden Cove wharves during the summer.

***Cabins and Islands***

Previous research (NLRC 2007) and personal communication (L. Pomeroy, Woody Island Resort Owner/Operator, Placentia Bay, pers. comm., 24 February 2018) suggests that there are likely more than 400 cabins on the Placentia Bay islands and some areas of the coast, principally on Merasheen, Long, Woody and Red Islands, and Bar Haven. Woody Island Resort is the only large marine tour operator in the area, and owns and operates a complex of four lodges/houses on Woody Island during the summer months, transporting visitors using its own vessel from Garden Cove to Woody Island (Figure 4.51). In the past, at times there were as many as three operators licensed to carry up to 25 passengers out to the islands from the Garden Cove area (L. Pomeroy, Owner/Operator, Woody Island Resort, Placentia Bay, pers. comm., 24 February 2108).

There are several small communities near Marystown and the proposed sea cages in the Rushoon BMA, including South East Bight, Petit Forte, Baine Harbour, Boat Harbour, Rushoon, St. Joseph and Parker's Cove. Grieg NL met with fishers from Petit Forte, Boat Harbour and Baine Harbour in February 2018 (Appendix A). During these meetings, fishers indicated that there has been an increase in pleasure boating, mainly power boats, over the last several years, primarily travelling to the islands, often to cabins built there. For some, it is a return to land abandoned during resettlement.

Source: WIR (2018).

**Figure 4.51. Woody Island Resort, Placentia Bay.**

#### 4.2.4.6 East Coast of Placentia Bay

Placentia is the largest community on the east coast of Placentia Bay and has a long history, dating from the 1600s (TP 2014). Tourism attractions include archaeological sites (e.g., Fort Louis, British New Fort and the Placentia Cultural Interpretation Centre), museums (e.g., Castle Hill), historic architecture and a town square that includes Sacred Heart Roman Catholic Church, one of Placentia's key architectural landmarks, and Our Lady of the Angels Convent. The square also includes modern additions such as the Placentia Bay Cultural Arts Centre, a state-of-the-art multipurpose facility fully equipped for cultural events and performances, conferences, exhibits and gallery space. The Centre also houses the Voices of Placentia Bay Exhibit, a celebration of singers, musicians and storytellers from Placentia Bay. This exhibit has interactive components where visitors can play music, tell their own story, and sing their own song.

Placentia is the entry to the Port of Argentia, a marine industrial area and location of the seasonal Marine Atlantic car/passenger ferry to Nova Scotia and to the 'Cape Shore', i.e., the coastline area extending south and east toward the ecological reserve at Cape St. Mary's, featuring seasonal populations of gannets, murres and kittiwakes.

### 4.2.5 Recreation

Recreation in Placentia Bay is typically connected to the natural environment, such as fishing, berry picking, hunting, hiking, bird watching and camping (NLRC 2007; Vale 2008). Many communities on the Burin Peninsula advertise and maintain trails and hiking paths and these are used by both visitors and residents alike (see Table 4.22).

#### 4.2.5.1 Sports and Recreation

Several towns in Placentia Bay have active recreational facilities and programs for residents of all ages. The facilities in larger communities are used by neighbouring communities and are described below.

***Marystown***

Marystown is a regional hub for recreation and sport on the Burn Peninsula, with facilities including the Marystown Arena, a soccer pitch, two baseball diamonds, and a professional level track and field complex (TM 2011). The Marystown Recreation Complex, opened in February 2016, is owned by the Town and operated by the Young Men's Christian Association (YMCA). It is open to all communities on the Burin Peninsula and soon to visitors from SPM, and offers a pool with lanes, play pool with waterslide, conditioning centre, indoor track, multipurpose gymnasium and facilities for young children (Tract 2017).

There is a full-time Director of Recreation and Community Services, and programming is available for all ages (TM 2011). In Marystown's recent planning document, opportunities are identified to further improve and connect trails within the town, increasing access and use by seniors (Tract 2017).

***Burin***

The Town of Burin has two regulation-size soccer pitches that are used by the Burin Minor Soccer Association. League soccer on the Burin Peninsula is highly competitive (e.g., the Challenge Cup), but the Association also welcomes young players (under 9 years of age) for recreational play and tournaments, using miniature sized nets (TB 2017). The Burin Minor Softball group supports softball and slow pitch leagues at the Craig Lundrigan Memorial Field, which is wheelchair accessible. In their recent Strategic Plan (JW 2018), recreation and community planning is identified as a priority for Council with a focus on the expansion of existing recreational facilities and programs, and providing increased access.

***St. Lawrence***

St. Lawrence is celebrated as the Soccer Capital of Canada (TSL 2015). The Town's men's team, the Laurentians, was established in 1904. There are two regulation-sized soccer pitches, as well as a multipurpose recreation centre, tennis courts, curling rink and softball field.

***Arnold's Cove***

Arnold's Cove has a volunteer-based Recreation Committee. Recreational facilities consist of a sportsplex area with a fenced, fully-equipped playground, regulation-sized ball field, outdoor rink and recreation building geared to the town's youth. An annual highlight is the summer Fog Festival, a two-day celebration, ongoing since the 1997 Come Home Year (TAC 2010a).

***Placentia***

On the eastern side of the Bay, Placentia has the Unity Parc, an indoor stadium that can be used for various sports, lessons, leagues, and school or family outings, such as skating, hockey, figure skating, curling and, for adults, an indoor walking program. The annual Placentia Regatta involves highly competitive rowing teams from several communities (TP 2014).

#### 4.2.5.2 Songs, Storytelling and Performance

Recreational activities in Placentia Bay also include art, concerts, theatre, and performance. As previously mentioned, there are several performance venues on the Burin Peninsula.

One project in particular focuses on capturing the traditional use of songs and storytelling (especially in the form of recitations) by the people of Placentia Bay to provide social commentary. The *Voices of Placentia Bay* project is a collaborative effort by the Placentia Bay Historical Society, Town of Placentia and Research Centre for the Study of Music, Media and Place (RCSMMP n.d.). The collection of songs originating in Placentia Bay and/or from Placentia Bay's history, and the importance and tradition of music and storytelling in Placentia Bay, provide a very human accounting of the social history and culture of the Bay. The *Voices of Placentia Bay* project has archived the songs (collected mainly by Eric West, a Newfoundland traditional musician) with the Memorial University of Newfoundland Folklore and Language Archive (MUNFLA).

The *Voices of Placentia Bay* project organizes the collected songs based on local significance, including Resettlement, People and Places, Historical Events, and Social Commentary. Songs in the People and Place, and Historical Events categories tell stories about individuals, the memory of a specific place, and, in some cases, "…serve as a memorial to those lost in…tragic events, and a reminder to those who survived them," such as The Tidal Wave Song about the 1929 earthquake and tidal wave (RCSMMP n.d.). Songs in the Social Commentary category speak to economic situations and other facets of society, such as the treatment of crime and criminals. Visitors to the Placentia Bay Cultural Arts Centre in the Town of Placentia are provided the opportunity to view, listen to and sing along with an exhibit from the *Voices of Placentia Bay* project.

Resettlement was and is controversial, and is still a reason to get together and sing, tell stories and speak of memories. In 2016, Arnold's Cove hosted a Commemoration of 50 Years of Resettlement event that drew a large number of participants. Other resettled communities hold occasional reunions at community sites. The first reunion associated with Haystack, a resettled community on Long Island, held in 1998, had 500 participants (E. Johnson, resident of North Harbour and Haystack, pers. comm., 29 April 2018). Many of the resettled communities now contain cabins or seasonal residences, (L. Pomeroy, Woody Island Resort Owner/Operator, Placentia Bay, pers. comm., 24 February 2018), increasing the amount of recreational boat traffic during the last several years. Songs and stories are still being created and performed, such as the *Inspired B'y Life Experience, Red Island – Resettlement Girl*, written and performed by Marion Counsel, Helen Murphy and Barbara O'Keefe at The Rooms in St. John's, NL on 16 February 2018.

#### 4.2.5.3 Eco-tourism

The physical landscape of the Burin Peninsula is well suited for hiking, exploring, camping, hunting and fishing, with barrens, woods, ponds, streams and rolling hills visible from the highway. The coastal waters are accessible for boating, sailing and paddling, with inlets, coves and islands to provide shelter from high winds and seas, and to give a glimpse of past life. The waters of the Bay support whales and seals, with sightings of tuna and sharks not uncommon in recent years (C. Hepditch, Fisher, Baine Harbour, pers. comm., 20 February 2018). Eagles, otters, moose and caribou are commonly sighted on the shoreline from boats.

While there appears to be an opportunity for eco-tourism in the area, such ventures are currently deterred by the high cost of insurance required to be able to carry paying passengers (L. Pomeroy, Owner/Operator, Woody Island Resort, Placentia Bay, pers. comm., 24 February 2018). At present, there is a single tour operator providing single- and multi-day excursions on a commercial basis within the waters of Placentia Bay, travelling by vessel to accommodations on Woody Island, one of over 360 islands in the area.

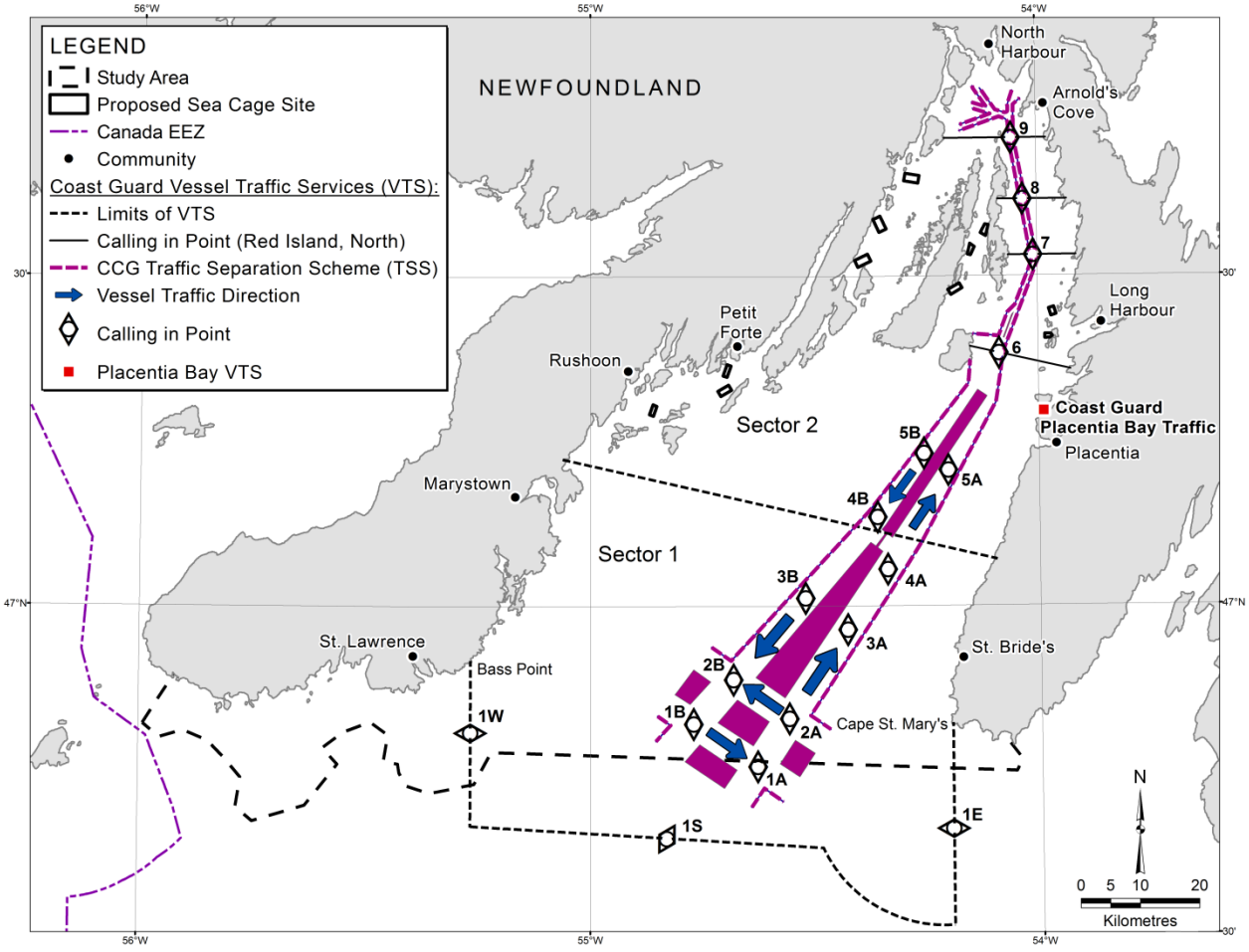
Overall, the islands are frequently visited, with individuals and families building summer homes or cabins and wharves on many of the islands, some returning to family-held land and others exploring. Visitors travel to the islands by boat, either via their own vessel or through an arrangement with someone in a coastal community. Kayakers can arrange to be transported by fishing boat or speedboat across the open waters of the Bay to paddle and camp among the islands (D. Miller, Past President, Kayak NL, pers. comm., 25 February 2018). An estimated 400 cabins are located on the islands throughout Placentia Bay, and during the summer there are up to 200 recreational boaters on the water on a given day (NLRC 2007). Fishers in the communities nearest the proposed sea farms report that over the past five to ten years, there has been an increase in recreational boating in their fishing area during the summer months, with people visiting nearby islands to hike, stay at their cabins, or fish cod during the recreational fishery (K. Handrigan, Fisher, Petit Fort, pers. comm., 20 February 2018; C. Hepditch, Fisher, Baine Harbour, pers. comm., 20 February 2018).

## 4.3 Marine Navigation

There is considerable commercial vessel traffic in Placentia Bay, primarily large tankers or bulk carriers travelling into the inner bay to the refinery at Come By Chance, the International-Matex Tank Terminals (IMTT) Transshipment Terminal at Whiffen Head near Arnold's Cove, and Vale's Long Harbour Processing Plant (LHPP), as well as large fishing vessels travelling to the Icewater Seafood Inc. fish plant in Arnold's Cove. Some commercial bulk carriers and seasonal Marine Atlantic car/passenger ferries that enter the Bay go into the Port of Argentia. Operating among these large vessels are many small fishing vessels, fishing crab at the edges of the vessel traffic lanes or crossing the lanes to reach fishing grounds (NLRC 2007).

Placentia Bay is designated a high-level traffic zone where Vessel Traffic Services function is needed. This service is provided by the Canadian Coast Guard (CCG) Placentia Marine Communications and Traffic Services (MCTS) (A. Brown, Acting Head of Station, CCG, Placentia, pers. comm., 27 February 2018). The Placentia Bay Vessel Traffic Services zone

comprises all Canadian waters between a line bearing 180° True from Bass Point (46°55’05”N, 055°15’55”W), and a line bearing 180° True from Cape St. Mary's lighthouse (46°49’22”N, 054°11’49”W), and includes two sectors and 12 calling-in points. All aspects of the Grieg NL proposed Project are within the Vessel Traffic Services area of Placentia Bay (Figure 4.52).




Source: CCG 2017.

**Figure 4.52. Vessel Traffic Services area of Placentia Bay.**

Vessel traffic is monitored by radar and Automatic Identification System (AIS). Vessels meeting the criteria below are required to call at calling-in points to provide an Estimated Time of Arrival (ETA) and receive relevant traffic information.

a. a ship ≥20 m in length; and/or
b. a ship engaged in towing or pushing any vessel or object, other than fishing gear, where:

i. the combined length of the ship and any vessel or object towed or pushed by the ship is ≥45 m in length; or
ii. the length of the vessel or object being towed or pushed by the ship is ≥20 m in length.

Participation by vessels meeting the above criteria is mandatory. Generally, recreational vessels are not required to participate, but some contact the MCTS Centre for vessel information when crossing the lanes in the Vessel Traffic Separation Scheme (VTSS) (M. Slade, Harbour Authority, Arnold's Cove, pers. comm., 22 February 2018). It is likely that most recreational boaters rely on cell phone and/or VHF for communication (R. Wareham, Resident, Arnold's Cove and Harbour Buffet, pers. comm., 31 January 2018). The vessel traffic lanes are managed as per the *Canada Shipping Act* and associated Collision Regulations. The vessel traffic system is managed by the MCTS Centre ('Placentia Traffic') located in Argentia (A. Brown, Acting Head of Station, CCG, Placentia MCTS, pers. comm., 26 February 2018). The MCTS tracks, monitors and controls tankers and other commercial vessels >20 m length overall (LOA), as well as fishing vessels >24 m LOA and any other vessels that are visible on radar or by AIS, or call in to the Centre.

There is compulsory pilotage within the VTSS and optional pilotage for Long Harbour. The compulsory pilotage area within the Bay consists of all the navigable waters north of a line drawn from Long Harbour Head to Fox Island, thence along a line to a position of Latitude 47°20′ N, Longitude 54°06.5′ W, thence to Ragged Point (the most southerly point of Red Island), and Eastern Head. Grieg NL's marine operations planned in relatively nearshore waters within the west side of the Bay and between Merasheen and Long Islands are located beyond the large vessel traffic and traffic lanes (see Figure 4.52). Two proposed sea cage sites off the entrance of Long Harbour on the east side of the Bay are near, but outside the vessel traffic lane into Long Harbour as well as the original VTSS.

Table 4.23 provides a snapshot of typical annual vessel traffic in Placentia Bay for a year. The data were developed for the Transport Canada 2006 public consultation regarding oil spill risk assessment on the south coast of Newfoundland (Transport Canada 2006 *in* NLRC 2007). The Vale LHPP began operations after these data were compiled. The Long Harbour facility receives eight visits by the ice-strengthened bulk carrier MV *Umiak*, and two to three bulk carriers carrying reagents during a year. Ten vessels are anticipated to transit to the Processing Plant during 2018, which may increase to 10–14 vessels per year in the near future (S. Hunt, LHPP Operations, pers. comm., 11 April 2018).

**Table 4.23. Placentia Bay Vessel Traffic: Annual movements, April 2004–March 2005.**

| Vessel Type | Inbound | Outbound | Transit | In-Zone | Out-Zone | Total |
|---|---|---|---|---|---|---|
| Tanker <50,000 DWT | 133 | 141 | 24 | 66 | 0 | 364 |
| Tanker >50,000 DWT | 352 | 355 | 12 | 193 | 0 | 912 |
| Chemical Tanker | 27 | 20 | 6 | 9 | 0 | 62 |
| General Cargo | 28 | 30 | 32 | 14 | 0 | 104 |
| Bulk Cargo | 6 | 6 | 14 | 0 | 0 | 26 |
| Container | 52 | 52 | 268 | 19 | 1 | 392 |
| Tug | 11 | 11 | 8 | 2,016 | 0 | 2,046 |
| Tug with Tow | 14 | 13 | 10 | 2 | 0 | 39 |
| Government | 46 | 48 | 18 | 119 | 0 | 231 |
| Fishing | 128 | 131 | 5 | 29 | 0 | 293 |
| Passenger | 2 | 1 | 5 | 0 | 0 | 8 |
| Other (recreation and fishing vessels >20m) | 3 | 2 | 5 | 1,286 | 0 | 1,296 |
| Vessels <20 m | 0 | 16 | 18 | 978 | 0 | 1,012 |
| **Sub-total Movements** | **802** | **826** | **425** | **4,731** | **1** | **6,785** |
| Ferry | 39 | 42 | 9 | 1,411 | 0 | 1,501 |
| **Total Movements** | **841** | **868** | **434** | **6,142** | **1** | **8,286** |

Source: Transport Canada (2006 *in* NLRC (2007).
Vessel movements are categorized as follows;
Inbound: A vessel entering the Vessel Traffic Services (VTS) Zone;
Outbound: A vessel leaving the VTS Zone;
Transit: No arrival or departure port within the Zone;
In-Zone: A vessel movement that begins and ends within the VTS Zone (within Placentia Bay; and
Out-Zone: A vessel participating in VTS but which his not within the VTS Zone of responsibility.

## 4.4 Sensitive Areas

In accordance with the Strategic Environmental Assessment (SEA) for southern Newfoundland (C-NLOPB 2010), a 'sensitive area' is defined as the following:

1. an area that is afforded some level of protection under federal or provincial legislation;
2. an area that may be under consideration for such legislative protection; or
3. an area that is known to have particular ecological or cultural importance and is not captured under federal or provincial regulatory framework.

Various regulatory frameworks are either directly or indirectly involved with sensitive areas in Newfoundland and Labrador. Fisheries and Oceans Canada (DFO) administers marine fisheries through the federal *Fisheries Act*, which also includes management of marine mammals under the *Marine Mammals Regulations* of the *Fisheries Act* (LGL 2015). Species at risk and measures to protect them are administered under the *Species at Risk Act* (2002). Marine Protected Areas (MPAs) are established by DFO under the *Oceans Act* (1996) to protect and conserve important fish and marine mammal habitats, endangered marine species, unique features and areas of high biological productivity or diversity (LGL 2015). Depending on the species, migratory birds are solely or jointly managed between Canada and the U.S. through the

Canadian Wildlife Service (CWS) branch of Environment and Climate Change Canada (ECCC), via legislation and agreements including the Convention for the Protection of Migratory Birds (1916), *Migratory Birds Convention Act*, and the North American Waterfowl Management Plan (LGL 2015). Waterfowl are managed according to "flyways" denoting wintering and summering habitat connected by international migration corridors (LGL 2015).

Sensitive areas which overlap the Study Area are shown in Figure 4.53, and discussed in the following subsections.

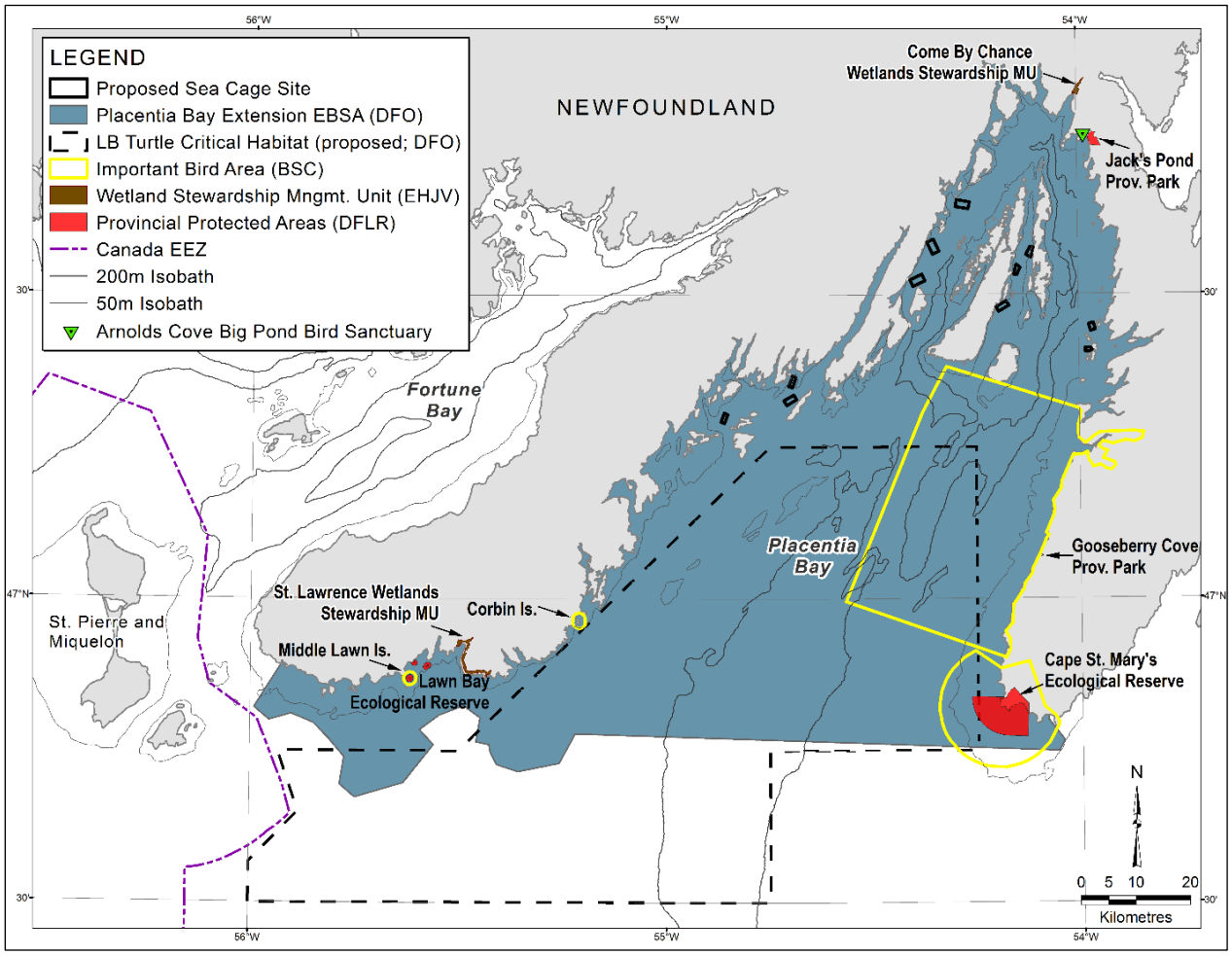



**Figure 4.53. Sensitive areas overlapping or immediately proximate to the Study Area.**

### 4.4.1 National, Provincial and Recreational Parks and Reserves

The government of Newfoundland and Labrador designates wilderness and ecological reserves using the *Wilderness and Ecological Reserves* (*WER*) *Act* as guidance, with administration by the Natural Areas Program, Land Management Division within the Department of Fisheries and Land Resources, in cooperation with the Wilderness and Ecological Reserve Advisory Council (DFLR 2017c). Wilderness and ecological reserves are designated to protect the province's

natural heritage and are utilized as a tool for the province's conservation strategy, with the goal of preserving wilderness, wildlife and biodiversity and providing outdoor venues for education, research and public enjoyment (DFLR 2017c). Since the establishment of reserves can be a lengthy process, the *WER Act* allows for the creation of "provisional reserves" which receive protection while they are under review for full designation (DFLR 2017c). In situations of immediate threat, the *WER Act* also allows the Minister to establish "emergency reserves" (DFLR 2017c). The Lawn Bay and Cape St. Mary's Ecological Reserves and Jack's Pond and Gooseberry Cove Provincial Parks occur within or immediately adjacent to the Study Area, and there are no provisional or emergency reserves in the region (see Figure 4.53). With the exception of the Cape St. Mary's Ecological Reserve, the province's reserves have few roads and services, and no public buildings or trail markers (DFLR 2017c). The disturbance, removal or introduction of plants, animals, fossils or other foreign objects to or from reserve landscapes is strictly prohibited, as are forestry, mining, hydro or new road/track/building development, agriculture, or driving off-road or all-terrain vehicles (DFLR 2017c).

The Lawn Bay Ecological Reserve encompasses Middle Lawn, Swale and Colombier Islands, located in the southwestern portion of the Study Area near the communities of Lawn and Lord's Cove on the Burin Peninsula (DFLR 2017d). Established as a provisional reserve in 2009 and designated as a full reserve in 2015, the Lawn Bay Ecological Reserve covers ~4 $km^2$, of which ~3.7 $km^2$ is the marine component (DFLR 2017d). The islands are used by thousands of nesting seabirds and the Reserve's primary reason of establishment was to protect North America's only known colony of Manx Shearwater, a nocturnal seabird (DFLR 2017d). The Reserve also provides habitat for at least seven other breeding seabird species, including Leach's Storm-petrel, Great Black-backed Gull, Herring Gull, Black Guillemot, Black-legged Kittiwake, Common Murre and occasionally Arctic and Common Terns (DFLR 2017d). The islands provide important habitat for thousands of feeding and fledging seabirds (DFLR 2017d). During the breeding season (15 March–30 October), all activities other than permitted scientific research are prohibited on the islands in the Reserve (DFLR 2017d). Otherwise, access is unrestricted to Swale and Colombier Islands, and a specific permit is required to access Middle Lawn Island (DFLR 2017d). Although commercial and recreational fisheries are permitted in the Reserve's waters, in accordance with provincial and federal fishing regulations, boaters must take care not to disturb the birds (DFLR 2017d). Fishers are encouraged to fish outside the marine component area in an effort to promote stewardship and protection of the Reserve (DFLR 2017d). Boats, motorized or otherwise, are not permitted within 100 m of the cliffs containing nesting birds during the breeding season. There are currently no licenced commercial boat tour operators registered with the Natural Areas Program that can take the public around the islands (DFLR 2017d). Hunting is prohibited in the reserve at all times. During bird breeding season, aircraft are not permitted to either take off or land within the reserve, or fly lower than 300 m over the reserve (DFLR 2017d).

The Cape St. Mary's Ecological Reserve, established in 1983 and located in the southeastern portion of the Study Area south of St. Bride's, is one of the best and most accessible places in the world to view nesting seabirds (DFLR 2017e). Considered a major seabird colony habitat, this 64 $km^2$ reserve typically hosts 24,000 Northern Gannet, 20,000 Black-legged Kittiwake, 20,000 Common Murre, and 2,000 Thick-billed Murre during breeding season (DFLR 2017e). The Gannet colony within the Reserve is the largest in Atlantic Canada and the third largest in North

America (BirdLife International 2002, Lock et al. 1994 and Mercer and Willcott 2005 *in* DFO 2010b). Over 100 pairs of Razorbill, 60 pairs of Black Guillemot, and various numbers of Double-crested and Great Cormorant and Northern Fulmar also nest there (DFLR 2017e). A footpath through open meadows atop steep cliffs, leads to "Bird Rock", the nesting site for the majority of Northern Gannet in the Reserve (DFLR 2017e). The offshore waters of the Reserve (54 $km^2$) are an important wintering site for thousands of sea ducks, including Harlequin, Common Eider and Long-tailed ducks and scoters (DFLR 2017e). As one of the world's most southerly expanses of sub-Arctic tundra, the plateaus of the Cape also host mosses, lichens, alpine wildflowers and low-growing shrubs, and feature ponds, bogs, brooks and sheer sea cliffs (DFLR 2017e). A modern Interpretive Centre is located in the Reserve, near the Coast Guard-operated lighthouse which was originally built in 1860, offering environmental and seabird interpretation by provincial naturalists (DFLR 2017e; IBA Canada n.d.). Thousands visit Cape St. Mary's annually to view the birds and other wildlife, including whales, dolphins, porpoises and seals in the summer, and fall and spring migrating shorebirds and raptors (DFLR 2017e; IBA Canada n.d.). Although commercial and recreational fishing is permitted in the waters of the reserve, boaters are expected to exhibit caution to avoid disturbing the birds (DFLR 2017e). Pets, other than service animals, and hunting are not permitted within the Reserve. Motorized boats must remain >100 m from cliffs during the breeding season (1 April–30 October), and non-motorized boats must remain >20 m from the cliffs during this same time (DFLR 2017e).

Jack's Pond Provincial Park is located on Route 1, 8 km from Arnold's Cove (TCII 2017a). Jack's Pond is a Provincial Park Reserve, an area with significant natural features and landscapes and a component of a provincial initiative to protect representative portions of all of the province's different ecoregions (TCII 2017a). Provincial Park Reserves do not have day use facilities and are not open to camping (TCII 2017a). Jack's Pond Provincial Park preserves some of Newfoundland and Labrador's rare plant species and contains high habitat diversity, such as barren vegetation, wetlands and a forested stream valley (TCII 2017a). Migration routes for the Canada lynx, black bear and coyote are located within the Park (SNC Lavalin 2007).

Gooseberry Cove Provincial Park, located south of Placentia, is a day use sandy beach area with a grassy back shore (TCII 2017b). Gooseberry Cove Provincial Park is considered a Natural and Scenic Attraction, defined as an area protecting and providing access to sites with significant natural features and/or special high quality scenic attributes (TCII 2017b). Natural and Scenic Attractions are located near or adjacent to highways and/or scenic routes, providing rest stops for the travelling public. Camping is not permitted and high wave action restricts swimming at the Park (TCII 2017b).

### 4.4.2 Placentia Bay Extension Ecologically and Biologically Significant Area (EBSA)

Large Ocean Management Areas (LOMAs) are marine regions established for planning purposes, forming the basis for the implementation of integrated management plans intended to address the socio-economic needs of humans while preserving the health of the marine ecosystem (C-NLOPB 2010). The Study Area occurs within the Placentia Bay/Grand Banks (PB/GB) LOMA (see Figure 4.53), one of five priority LOMAs in Canada. It has an area >500,000 $km^2$, and includes nearshore and offshore components of the Grand Banks portion of the Newfoundland and Labrador continental shelf (C-NLOPB 2010; DFO 2012a). The vision

statement for the PB/GB LOMA is “safe and sustainable use of healthy oceans through collaborative and effective governance”, involving federal and provincial government departments and agencies, indigenous groups, industry organizations, environmental and community groups, and academia (C-NLOPB 2010; DFO 2012a). There are two Coastal Management Areas (CMAs) within the coastal portion of the PG/GB LOMA, Placentia Bay and Coast of Bays (C-NLOPB 2010). The Placentia Bay Integrated Management Planning Committee (PBIMPC) is a multi-stakeholder group formed in 2005 to assist in addressing issues/concerns resulting from multiple ocean users within the Placentia Bay CMA. The PBIMPC uses a collaborative approach to consider all ocean users and maintain the health of the marine environment (C-NLOPB 2010). It develops and implements integrated management plans, and monitors and evaluates functions during plan implementation phases (DFO 2007, 2012a; ICOM NL n.d.).

Canada has agreed to the Convention on Biological Diversity (CBD) Aichi Target 11, which includes the conservation of 10% of its coastal and marine waters by 2020 (DFO 2016e). The ‘Newfoundland and Labrador Shelves’ has been identified as one of five biogeographic units for MPA Network development in Canada (DFO 2016e). EBSAs are a primary feature in consideration for MPA network development (DFO 2016e). Twenty-five EBSAs have been identified in the Newfoundland and Labrador Shelves Bioregion since 2007, eleven of which are associated with the PB/GB LOMA. The EBSAs are based primarily on uniqueness (i.e., rarity), aggregation (density/concentration) and fitness consequences (importance to reproduction/survival), and secondarily on resilience (sensitivity to disturbance) and naturalness (undisturbed state of habitat) (Templeman 2007; DFO 2016e). Delineation of the Study Area is equivalent to that of the Placentia Bay Extension EBSA. The features that led to the designation of this EBSA are summarized in Table 4.24.

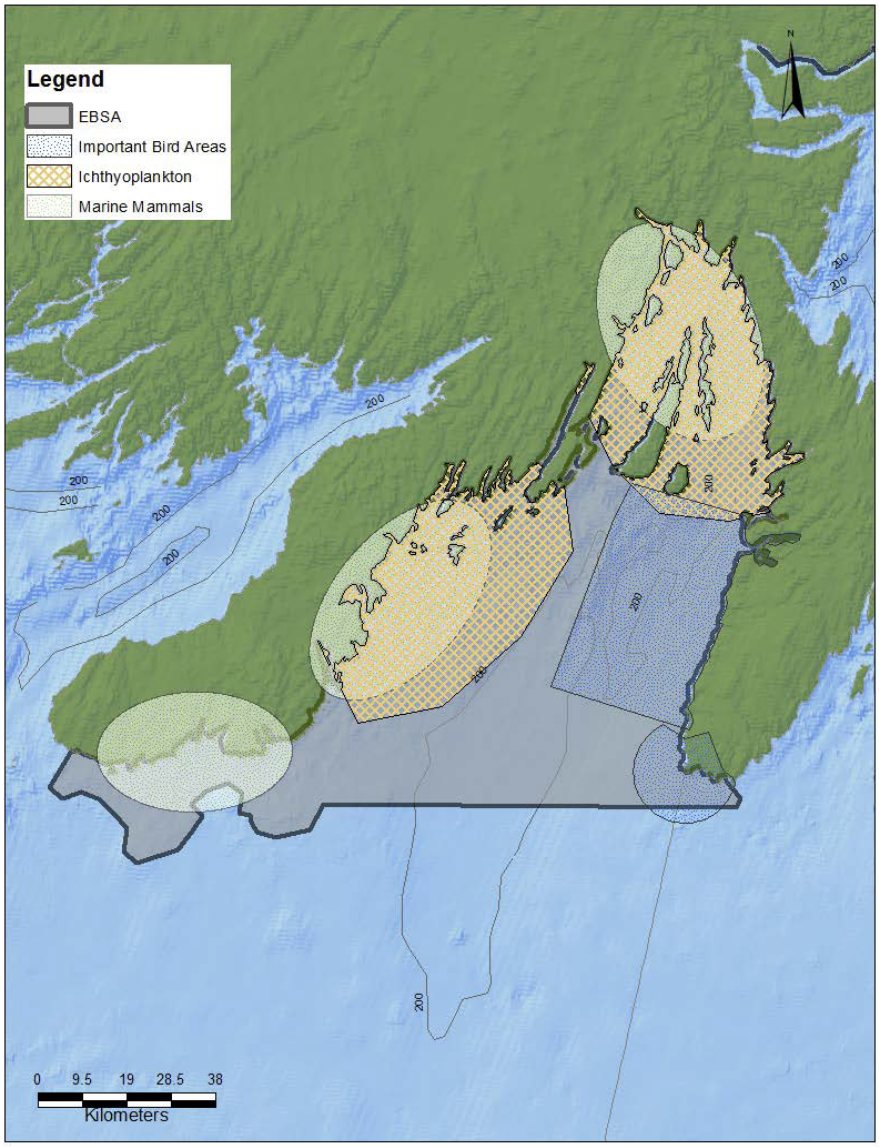
#### 4.4.2.1 Ichthyoplankton

Western and northern Placentia Bay have the highest concentrations of early-stage eggs of Atlantic cod, American plaice and cunner in the Study Area (Figure 4.54; DFO 2016e). Based on several ichthyoplankton surveys in Placentia Bay during the spring and summer in 1997 and 1998, Bradbury et al. (2003) found that while the pelagic eggs and early larvae were distributed in accordance with passive drifting, the distributions of older larvae were congruent with the areas of high biological production denoted in Figure 4.54. Bradbury et al. (2003) concluded that the spatial distribution of pelagic larvae is increasingly determined by their behaviour and ability to swim as they develop.

**Table 4.24. Principal features of the Placentia Bay Extension EBSA.**

| Feature | Rating | | | | |
|---|---|---|---|---|---|
| | **Uniqueness** | **Aggregation** | **Fitness Consequences** | **Resilience** | **Naturalness** |
| Ichthyoplankton | | **High:** High ichthyoplankton concentrations (e.g., Atlantic cod, cunner, American plaice, capelin) | **High:** Important for survival & dispersal of high concentrations of ichthyoplankton | | |
| Marine Mammals and Sea Turtles | **High:** Numerous cetaceans & leatherback sea turtles aggregate during spring & summer; harbour seals & otters utilize the area year-round; high biomass of terrestrial mammals in river & estuarine habitats | **High:** Important area for feeding, reproduction & migration of marine mammals & sea turtles | **High:** Important feeding area (especially harbour porpoises & humpback whales); important nursing/rearing area (e.g., three important pupping areas for harbour seals; otter reproduction; female cetaceans with young during critical feeding periods)<br>**Moderate:** Important feeding area for migrating leatherbacks | | |
| Fish | **High:** High pelagic & demersal species diversity; contains NW Atlantic Ocean's largest Atlantic cod spawning stock | **High:** contains NW Atlantic Ocean's largest Atlantic cod spawning stock | **High:** contains NW Atlantic Ocean's largest Atlantic cod spawning stock | | |
| Birds | **High:** Supports high biomass of birds associated with river and estuarine habitats; contains four Important Bird Areas for nesting, feeding & overwintering | **High:** Supports high biomass of birds associated with river and estuarine habitats; contains four Important Bird Areas for nesting, feeding & overwintering | **High:** Supports high biomass of birds associated with river and estuarine habitats; contains four Important Bird Areas for nesting, feeding & overwintering | | |
| Other Features | **High:** counter-clockwise gyre (offshoot of Labrador Current, enters in east & exits in west); localized upwelling (where currents meet at Burin Peninsula south & Cape St. Mary's headlands); stable temperature & salinity compared to other embayments | **High:** high primary & secondary production (at headlands & within the Bay) | | **High:** important spawning/nursing & coastal bird breeding areas highly sensitive to disturbance | **Moderate:** some contamination or disturbance (due to high levels of commercial & industrial activity within/near Placentia Bay over time) |

Source: Templeman (2007).




Source: DFO (2016e).

**Figure 4.54. Important area for ichthyoplankton, marine mammals and seabirds within the Placentia Bay Extension EBSA.**

### 4.4.2.2 Marine Mammals and Sea Turtles

While numerous cetaceans and leatherback sea turtles aggregate in Placentia Bay during spring and fall to feed, harbour seals, river otters (*Lontra canadensis*) and some cetaceans feed in the area year-round (Templeman 2007). The inner reaches of Placentia Bay, particularly around Merasheen Island and Long Island, support one of the highest densities of river otter in the province (Goudie and Jones 2007; Coté et al. 2008). There, some river otters have adopted a primarily marine lifestyle inhabiting coastal waters. Point May and its surrounding area, located near the southwestern-most portion of the Study Area, is an historic harbour seal haulout and pupping site (Templeman 2007). Placentia Bay is also along the migratory path for leatherback

sea turtles (Templeman 2007; CPAWS-NL 2009). Sjare et al. (2003, *in* DFO 2016e) utilized Local Ecological Knowledge (LEK) to identify areas of high pelagic fish and marine mammal productivity and occurrence. Three notable areas of high biodiversity of marine mammals and pelagic fish were identified in Placentia Bay: (1) St. Lawrence; (2) Marystown; and (3) Swift Current (see Figure 4.54). Other marine mammals found in Placentia Bay include grey and harp seals, Atlantic white-sided, white-beaked and common dolphins, and blue, sei, fin, long-finned pilot and minke whales (CPAWS-NL 2009).

#### 4.4.2.3 Fish

At least 14 species of groundfish and nine pelagic fish species inhabit Placentia Bay (CPAWS-NL 2009). In addition to Atlantic cod, species include lumpfish, flounders, Greenland halibut, skates, sculpins, Atlantic haddock, pollock, sand lance, wolffishes, American plaice, sturgeon, mackerel, sharks, capelin, herring, sunfish, eels, Atlantic salmon and brook trout (CPAWS-NL 2009). Shellfish species within the Bay include snow and rock crab, mussels, clams, American lobster, sea, Icelandic and giant scallops, whelk and squid (CPAWS-NL 2009).

#### 4.4.2.4 Birds – Important Bird Areas

The four Important Bird Areas (IBAs) within the Placentia Bay Extension EBSA are: (1) Cape St. Mary's (NF001); (2) Placentia Bay (NF028); (3) Corbin Island (NF030); and (4) Middle Lawn Island (NF031) (see Figure 4.53; Templeman 2007; IBA Canada n.d.). These IBAs are described below.

The Cape St. Mary's IBA is located in the southeastern portion of the Study Area, at the eastern headland of Placentia Bay. The IBA habitats include marine waters, rocky shores and flats, and cliffs which rise to ~130 m above sea level featuring grassy barrens on their tops. An isolated offshore sea stack, 'Bird Rock', is also a component of the Cape St. Mary's IBA. A site where seabird studies and surveys are conducted by researchers from Memorial University of Newfoundland (MUN) and the CWS, the ~329 $km^2$ IBA extends beyond the Cape St. Mary's Ecological Reserve to encompass Bull Island Point, Bull, Cow and Calf islets, St. Mary's Keys (Cays), and Lance Point. Cape St. Mary's supports over 30,000 breeding pairs of seabirds, with Common Murre and Black-legged Kittiwake among the most abundant species, estimated at ~15,484 pairs of Common Murre as of 2016 and ~10,000 pairs of Black-legged Kittiwake as of the late-1980s (IBA Canada n.d.; ECCC-CWS unpublished data). Approximately 2% and 4–5% of the eastern North America population of Common Murre and the western Atlantic breeding population of Black-legged Kittiwake, respectively, inhabit this IBA. An estimated 2% of the global population and ~12% of the North American population of Northern Gannet are located in the Cape St. Mary's IBA, with 5,485 pairs estimated during the late 1980's and 14,789 pairs as of 2016 (IBA Canada n.d.; ECCC-CWS unpublished data). Other nesting species at the Cape include Thick-billed Murre, Razorbill, Black Guillemot, Herring Gull, Great Black-backed Gull, Great Cormorant and Double-crested Cormorant. Cape St. Mary's also supports migrant sea ducks, including Oldsquaw, scoters, eiders, and possibly >1% of the eastern North American population of Harlequin Duck. Other species which have been noted in the IBA include Black-headed Gull, Dovekie, Manx Shearwater and Piping Plover. Disturbance, fisheries and pollution, e.g., oil slicks or spills, are of concern for the Cape St. Mary's IBA, as it is situated

near a major shipping route between the offshore oilfields and refinery/oil storage facilities in Placentia Bay. The area also experiences a high volume of shipping traffic, particularly during the winter (IBA Canada n.d.).

The Placentia Bay IBA encompasses a ~1,398 $km^2$ area and occupies the majority of the southeastern portion of the Study Area, ranging from Argentia to Cape St. Mary's and extending out to ~25 km from shore. The IBA habitats include marine waters and inlets/coasts, including low, non-vegetated rocky islets and the Virgin Rocks. Capelin spawn in the shallow waters of Placentia Bay sometime during June and July, attracting large numbers of seabirds close to shore. Greater Shearwater is the most abundant of the shearwater species regularly occurring in the IBA, with a globally-significant concentration of >100,000 individuals recorded. Sooty Shearwater is also common in the IBA, while Manx Shearwater is uncommon. Local breeding seabirds from Cape St. Mary's feed on capelin in the Placentia Bay IBA, including Northern Gannet, Black-legged Kittiwakes and Common Murre. Large numbers of sub-adult Black-legged Kittiwake also feed in the Bay, likely from various breeding colonies in the North Atlantic. Numerous jaegers attempt to steal capelin from the juvenile kittiwakes in the area, particularly Parasitic and Pomarine jaegers. Long-tailed Jaeger is rare in Placentia Bay. Approximately 1,000–2,000 Common Eider congregate to winter around the Virgin Rocks, entering Placentia Bay from various points from Great Barasway to Gooseberry Cove. Other species noted in the IBA include Dovekie and Red Crossbill. Due to year-round oil tanker vessel traffic, there is potential for oil spills in the Placentia Bay IBA. There are also additional freighter vessels and the Argentia-North Sydney ferry transiting in the area during the summer and fall (IBA Canada n.d.).

The Corbin Island IBA is located in the southwestern portion of the Study Area ~1 km from the mainland, with an area of ~5 $km^2$, including the ~0.2 $km^2$ Corbin Island area, with an elevation from 0–70 m above sea level. The IBA habitats include the rocky cliffs/shores and grassy and low-shrub covered surface of Corbin Island, and the surrounding marine waters. The most recent surveys available for the Corbin Island IBA were completed during 1974. These surveys indicated that the IBA likely supports a globally-significant colony of Leach's Storm-petrels (~2% of the Western Atlantic population), with an estimated 100,000 pairs noted at the site during the survey. A large Herring Gull colony was also found in the IBA during the 1974 survey, comprised of ~5,000 pairs, representing ~3.5% of the estimated North American population. Other nesting species in the IBA include Black-legged Kittiwake, Great Black-backed Gull and Black Guillemot. Although little research has been completed at this IBA, as with all seabird colonies, the potential for oil spills in adjacent marine areas is a concern (IBA Canada n.d.).

The Middle Lawn Island IBA includes a ~4 $km^2$ area encompassing Middle Lawn Island and the surrounding marine waters, located in the southwestern portion of the Study Area near Lord's Cove on the Burin Peninsula. The Island habitat is comprised of meadows vegetated with grasses and ferns, coastal cliffs and rocky shores. Ocean ice rarely forms on the southern side of the Island, due to its exposure to the Atlantic Ocean. North America's largest concentration of nesting Manx Shearwater occurs on Middle Lawn Island. During the 1980s, ~100 pairs and 300 non-breeding Manx Shearwater were recorded on the Island, along with >26,000 pairs of Leach's Storm-petrel (13,879 pairs were recorded by Cairns et al. 1989), 20 pairs of Herring

Gull, six pairs of Greater Black-backed Gull, and eight pairs of Black Guillemot (IBA Canada n.d.). Seven pairs of Manx Shearwater were recently recorded on Middle Lawn Island (Fraser et al. 2013). Due to the nearby heavily used shipping routes of the Gulf of St. Lawrence, oil pollution is a threat to seabirds and other wildlife inhabiting the Middle Lawn Island IBA. As Middle Lawn Island is not utilized by humans and is considered a natural area, the threat of introduced species, such as rats, could have a significant and negative impact on the nesting seabirds there (IBA Canada n.d.).

The Placentia Bay Extension EBSA is also an important area for nesting, feeding and/or overwintering for Atlantic Puffin and Northern Fulmar (Templeman 2007). Other seabirds that inhabit Placentia Bay include Ring-billed, Glaucous and Iceland gulls, Great and South Polar skuas, and Arctic Tern (CPAWS-NL 2009). Waterfowl include Common Loon, Red-necked Grebe, Canada Goose, Black Duck, Green-winged Teal, Common Goldeneye, Common and Red-breasted mergansers, and Greater Scaup (CPAWS-NL 2009). Additional shorebird species include Greater Yellowlegs, Spotted, Purple, Least and Semipalmated sandpipers, Wilson's, Northern and Red phalaropes, Whimbrel, Semipalmated Plover, Ruddy Turnstone, and Sanderling (CPAWS-NL 2009).

#### 4.4.2.5 Estuaries, Rivers and Habitats of Species at Risk

A recovery strategy was recently proposed for leatherback sea turtle in Atlantic Canada, describing critical habitat for this species within Placentia Bay (DFO 2016f). Critical habitat is necessary for the survival or recovery of a species, which may include habitat for reproduction, nursery, rearing, feeding, migration or any other aspects necessary for aquatic species to complete their life processes, or areas where aquatic species formerly occurred and may be reintroduced (DFO 2016f). Researchers used satellite tagging data to help determine habitat use and seasonal movements of leatherback sea turtles in Atlantic Canada, and inferred that residency behaviour is positively correlated with good foraging habitat (DFO 2016f). Within the Study Area, the proposed recovery strategy identified critical habitat for the Atlantic population of leatherbacks within southern Placentia Bay, and south and east of the Burin Peninsula (DFO 2016f). The critical habitat is south of the proposed sea cage sites, with the northernmost portion of the critical habitat in the vicinity of the proposed sea cage sites within the Rushoon BMA (see Figure 4.53).

Features which led to the proposed designation of critical habitat for leatherback sea turtles within Placentia Bay focus on the quantity/quality of prey items, the acoustic environment, and water quality (DFO 2016f). It was determined that the area's environmental, oceanographic and bathymetric conditions support and aggregate sufficient concentrations and quality of gelatinous prey, e.g., jellyfish, salps and siphonophores, to support the leatherback population's survival, migration and reproduction (DFO 2016f). The region's anthropogenic noise levels are considered sufficiently low to allow for uninterrupted feeding and foraging, and the water within the area is of sufficient quality so as to not result in adverse health effects for the leatherbacks (DFO 2016f).

Mature and large sub-adult leatherback sea turtles of the western Atlantic nesting populations occur within Atlantic Canadian waters during late-spring and fall (James et al. 2005, 2007 *in* DFO 2016f), with peak use of critical habitat areas occurring during summer and fall

(DFO 2012b *in* DFO 2016f). Residency within and migration through critical habitat areas is thought to correspond to the distribution and abundance of suitable gelatinous prey species, which is poorly understood (DFO 2016f).

Activities which may damage or destroy Atlantic Canadian leatherback sea turtle critical habitat include: 1) a reduction in their food supply, such as by the direct or indirect harvest of gelatinous prey species; 2) increased acoustic disturbance, including vessel noise, sonar, and large scale industrial development and operations (e.g., pile driving, dredging, construction); and 3) marine pollution, such as from ocean dumping, industrial developments or persistent vessel discharges (DFO 2016f).

#### 4.4.2.6 Other Sensitive Areas

***Marine Protected Areas***

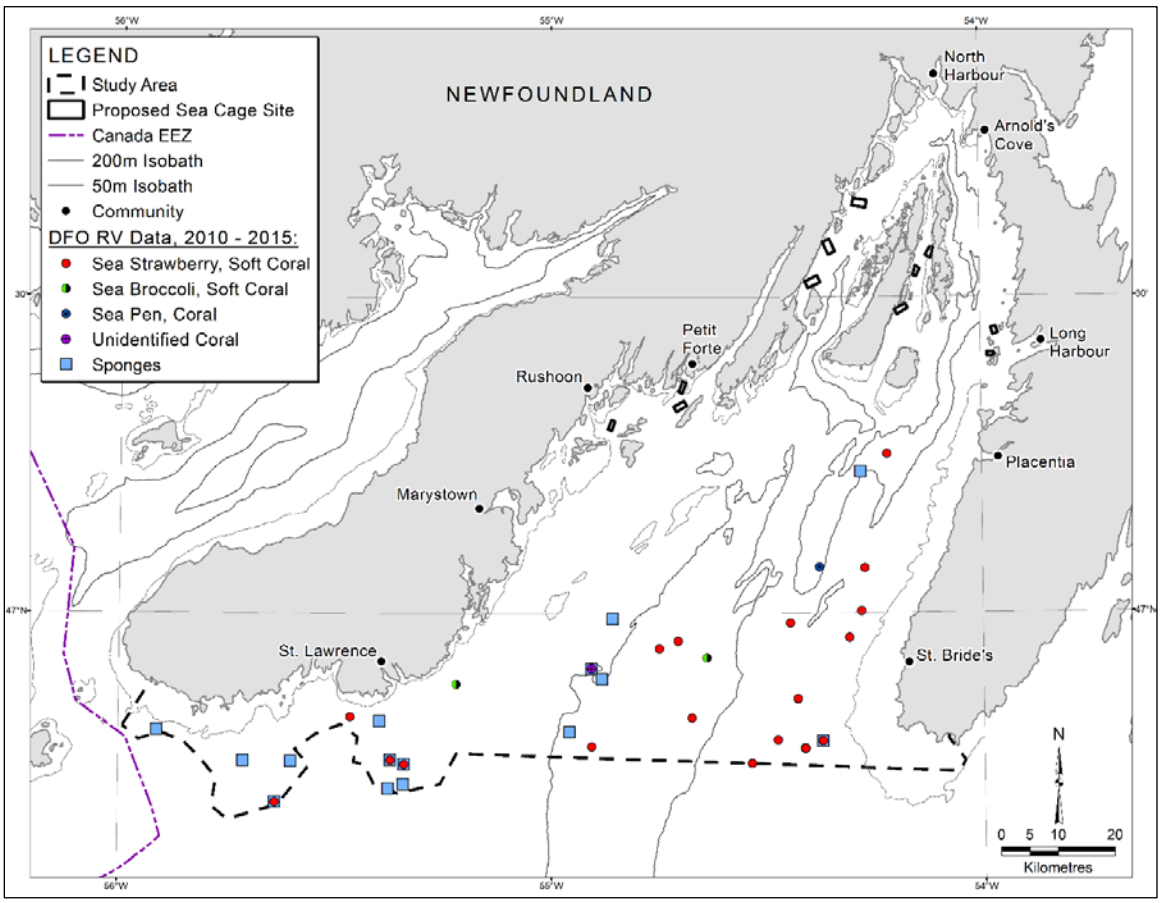
An MPA is a "part of the ocean that is legally protected and managed to achieve the long-term conservation of nature" (DFO 2017m). There are no MPAs or other 'effective area-based conservations measures' designated by DFO within or proximate to the Study Area (DFO 2017n).

***Deep-sea Corals and Sponges***

Deep-sea corals and sponges provide structural habitat for marine organisms (e.g., for resting, feeding, spawning and predator avoidance), including marine species of commercial importance to Canadians (DFO 2012b, 2015b). Coral and sponge communities also contribute to species richness and biodiversity (DFO 2015b). They are sessile, typically long-lived and slow-growing, making them particularly vulnerable to direct human activities (e.g., bottom contact fishing gear) and indirect activities, such as smothering by sedimentation, climate change and ocean acidification (DFO 2012b, 2015b). Given these factors, deep-sea corals and sponges have been identified as a primary conservation priority in the PB/GB LOMA (DFO 2012b). DFO has developed a Coral and Sponge Conservation Strategy for Eastern Canada to "facilitate the conservation and protection of cold water coral and sponge species, communities, and their habitats in the Atlantic and Arctic Oceans of Eastern Canada" (DFO 2015b).

During recent years, deep-sea coral and sponge research in Newfoundland and Labrador waters, conducted collaboratively between DFO Science, MUN, and industry, has increased (DFO 2012b). Edinger et al. (2009 *in* Gilkinson and Edinger 2009) found a significant correlation between coral biomass and fish biodiversity, perhaps indicating that soft corals, sea pens and small gorgonian corals are important to groundfish and invertebrate species in the region. Data collected during DFO Research Vessel (RV) multi-species surveys within the Newfoundland and Labrador Shelves Bioregion during 2000–2007, and data collected by Fisheries Observers aboard commercial fishing vessels during 2004–2007 included several catch locations of soft corals in Placentia Bay (Gilkinson and Edinger 2009). Sea strawberry corals (*Gersemia rubiformis*) were caught in the southwestern, south-central and northeastern portions of the Study Area, and *Nephtheid* spp. corals in the south-central and southeastern portions of the Study Area (Gilkinson and Edinger 2009). The following coral and sponge catches were

reported during DFO RV multi-species surveys within the Study Area during 2010–2015 (Figure 4.55):




Source: DFO RV Survey Database (2010–2015).

**Figure 4.55. Distribution of DFO RV multi-species survey catch locations of corals and sponges in the Study Area, 2010–2015.**

- an unidentified coral was caught in the southern portion of the Study Area at ~200 m water depth;
- sea pens (soft coral) were found in the southeastern portion of the Study Area in water depths ~200 m;
- sea strawberry corals (soft coral) were caught throughout the southern portion of the Study Area in water depths between 50 and 200 m;
- sea broccoli corals (*Capnella florida*; soft coral) were found in the southwestern and south-central portions of the Study Area in water depths of 100 m and 200 m; and
- sponges were found in the southwestern and northeastern portions of the Study Area in water depths of 50–200 m.

Closure areas are a management tool used for the purpose of protecting sensitive benthic areas, including coral and sponge communities (DFO 2015b). Within the marine waters of Eastern

Canada, closure areas include NAFO Coral, Sponge and Seamount Closures, DFO Coral/Sponge Conservation Areas and MPAs, National Marine Conservation Areas (NMCAs), and voluntary closures driven by the fishing industry (DFO 2015b). No such closure areas are identified within the Study Area.

*Natural Areas*

The Stewardship Association of Municipalities (SAM) works in partnership with the Eastern Habitat Joint Venture (EHJV) in Newfoundland and Labrador to "secure, enhance, and restore important wildlife habitat, namely wetlands, uplands, coastal areas and species at risk habitat generally found within municipal planning boundaries" (DFLR 2017f). The SAM utilizes Management Units and Stewardship Zones to promote the protection of natural resources. Within a Management Unit, all development is reviewed by the Wildlife Division of the Department of Fisheries and Land Resources, and only low-impact developments, such as trails and benches, are permitted in terrestrial components (L. King, SAM, Conservation Biologist, pers. comm., 26 February 2018). Management Units are formalized provincially as a Crown land interest, and legalized municipally by being zoned for conservation or environmental protection (L. King, SAM, Conservation Biologist, pers. comm., 26 February 2018). A Stewardship Zone is a broader concept, whereby participant communities commit to the "wise use" of resources, and developments are not necessary referred to the Wildlife Division for approval (L. King, SAM, Conservation Biologist, pers. comm., 26 February 2018). A Stewardship Zone encompasses important bird habitat, especially waterfowl, and encompasses a larger area than a Management Unit (L. King, SAM, Conservation Biologist, pers. comm., 26 February 2018). As a Stewardship Zone is intended to describe the area that a town manages through its planning process rather than sensitive habitat, only Management Units are shown on Figure 4.1 (J. Sharpe, Department of Fisheries and Land Resources, Wildlife Division, pers. comm., 26 February 2018).

The Wetland Stewardship Area in the northern Placentia Bay community of Come by Chance was introduced in 1995, followed by the development of a Habitat Management Plan to protect the region's wetland habitat, and bird and fish species (SNC Lavalin 2007). The Come by Chance Wetland Stewardship Zone encompasses >40 $km^2$, including a ~2 $km^2$ Estuary Management Unit located west of the town (SNC Lavalin 2007; SAM 2017a). Wetlands in the region are important staging habitats for various waterfowl species, including American Black Duck, Green-winged Teal and Canada Goose (SAM 2017a). At least 65 other species of birds and waterfowl have been observed in the area of Come by Chance, including Red Knot (CLO 2018a). Out of concern for all-terrain vehicle-induced damage to the Stewardship Area's wetlands, barriers were installed at trailheads to reduce traffic (Eastern Habitat Joint Venture 2003 *in* SNC Lavalin 2007).

The St. Lawrence Wetland Stewardship Management Unit was established in October 2013 (SAM 2017b). The ~6 $km^2$ Management Unit encompasses the coastline from the outflow of Three Stick Pond to Cape Chapeau Rouge, and extends ~400 m inland (SAM 2017b). Habitat in the St. Lawrence region includes balsam fir tuckamore, extensive open barrens and bogs (SAM 2017b). At least 51 species of shorebirds, waterfowl and seabirds inhabit the

St. Lawrence Management Unit, including birds from the nearby nesting colonies at the Lawn Islands Ecological Reserve (SAM 2017b; CLO 2018b).

Arnold's Cove developed the Big Pond Bird Sanctuary within its town limits to provide protection for numerous species of birds and an easy means of viewing them (SNC Lavalin 2007; NL Tourism 2018). The Sanctuary, located 50 m from shore, is an important migratory stop for birds year-round (TAC 2010b). Species using the Sanctuary include Canada Goose, Pie Duck, Mallard Duck, Ruddy Turnstone, Spoked Sandpiper, Greater Yellowlegs, mergansers, plomers, gulls, and eastern Canada's highest concentration of American Black Duck (TAC 2010b). Other species that have been observed in the Sanctuary include ptarmigans, cormorants, osprey, Bald Eagle and occasionally some endangered bird species (TAC 2010b). Hunting, trapping or snaring of birds is strictly prohibited within the Bird Sanctuary's limits (SNL Lavalin 2007).

#### 4.4.2.7 Habitat Enhancement Projects

***Coastal Restoration Project – Eelgrass in Placentia Bay***

Among the world's most productive environments for primary productivity, eelgrass beds "form extensive underwater networks providing a crucial habitat that reduces local currents, provides protection from predation, stabilize the sediment, filter water, and increase habitat complexity" in sheltered photic environments (DFO 2012b). In addition to various non-obligate algal species that are associated with eelgrass, there are at least 20 obligate algal species that are dependent on eelgrass for the completion of their life cycles (DFO 2012b). Eelgrass has been shown to support increased fish species diversity and density compared to unvegetated seabed areas, serving as important nursery grounds for some benthic species in Newfoundland, including Atlantic cod (DFO 2012b). Within eelgrass beds, predation rates for some fish species are reduced, and growth rates for some fish species, including Atlantic cod, have been shown to be higher than those in unvegetated seabed areas (DFO 2012b). Fluctuations in eelgrass structure occur in association with climactic events (e.g., temperature change and sea-ice cover). The relatively recent arrival of the invasive species green crab (*Carcinus maenas*) appears to be impacting eelgrass habitats through its burrowing behaviour among the eelgrass root system (DFO 2012b). The Coastal Restoration Project, managed by the MI in collaboration with FFAW, plans to restore eelgrass sites within Placentia Bay through the utilization of globally-established eelgrass transplantation methodology, and is described in Subsection 4.1.1.7, above.

## 4.5 Potential Effects, Mitigation Measures, and Follow-up Monitoring

There is considerable use of the waters of Placentia Bay for commercial fishing, tanker traffic, bulk carriers, petroleum industry fabrication, mussel/oyster aquaculture, car/passenger ferries and recreation. In addition, the entire Bay is characterized as an EBSA, an Ecologically and Biologically Significant Area. The proposed Grieg NL salmon aquaculture project is the introduction of a new type and scale of aquaculture in Placentia Bay.

This Component Study, *The Cultural, Recreational and Commercial Importance of the Waters of Placentia Bay*, has investigated these attributes through consideration of fisheries, tourism and recreation, marine navigation (commercial and recreational) and the many unique or special features of the marine and coastal environments. The potential effects, planned mitigation measures, and follow-up monitoring are described below. This information will be used in the EIS for the proposed Project required by the Minister of Municipal Affairs and Environment.

### 4.5.1 Fisheries

Requirements of both regulations (the *Aquaculture Activities Regulations* (*AAR;* under the authority of the *Fisheries Act*)[2] and NL Aquaculture Licensing Process for Sea Cage Sites (DFA 2015) and Grieg NL's own operating practices are focused on prevention of effects on marine life through proven equipment, operations and husbandry.

Grieg NL has worked with the federal and provincial governments and with communities to identify prospective locations for the sea cage sites that have the requirements for fish rearing: deep water, shelter, good circulation and tidal flow to keep the water oxygenated, in addition to being located away from community or industrial effluents. The western coastal waters of Placentia Bay meet all of these requirements. As well, the identified locations for the three semi-annual BMAs, Rushoon, Merasheen and Red Island, are away from large vessel traffic associated with other industries in the bay and can be located to avoid or minimize interference with existing established fishing. The seasonal BMA, Long Harbour, has similar key attributes although is closer to the area used by large vessels. Final placement of sea cage sites will avoid key areas such as the travel routes identified by local fishers (Appendix A; see Figure 4.9). The annual closure area to protect cod spawning grounds is partially within the northwestern portion of the Merasheen BMA, but ~2 km north of the Ship Island proposed sea cage site. The boundary of the closure area extends from the western Placentia Bay shoreline near Sandy Harbour to the southern coast of Ship Island, and continues northward along the eastern coasts of Bar Haven, Woody and Sound Islands, until the northern shoreline of Placentia Bay near Baker's Cove Point (DFO 2018a).

Grieg NL has met several times with the fishers in the area of the proposed sea cage sites, using charts of the area with the proposed locations of the sea cages indicated and described the proposed operations of the sea cages and sites (Appendix A). Fishers have requested two changes in the proposed Rushoon BMA, i.e., a change in orientation of the Oderin Farm, removal of the Gallows Harbour site from its presently indicated position and emphasize that use of their traditional travel routes (e.g., to either side of Cross Island from Boat Harbour) and continued access to cod and crab grounds is essential. At the consultations with the area fishers, they sketched their grounds and travel routes on charts (see Figures 4.8 and 4.9).

Grieg NL personnel will follow-up with the representatives of the fishers of the Rushoon BMA to review the sea cage positions. During the February 2018 meetings, Grieg NL personnel suggested that fishers be invited out to the sea cage sites to review final site locations prior to submitting applications for site licenses to DFLR (see Appendix A).

[2] These aquaculture laws, regulations and policies are available at DFO's website (http://www.dfo-mpo.gc.ca/aquaculture/management-gestion/regs-eng htm)

The Proponent has considered the operating environment in Placentia Bay in its selection of equipment and operating practices. In particular, the sea cages to be used are robust, designed for higher seas and for deeper water than those used elsewhere in the province. Cages will be continually monitored for damage and biofouling: damage will be repaired immediately and cleaning will be frequent and done by a Remotely Operated Vehicle (ROV) with minimal use of divers.

The sea cages incorporate predator prevention/protection measures with bird netting and the capability to install predator nets outside the cage. Sea cage sites will be monitored for unusual occurrences of fish, including tuna and sharks, and marine mammals, including seals and whales, and such occurrences will be reported to DFO and DFLR.

Grieg NL's operational procedures include frequent (daily [weather permitting] or more) removal of dead fish or any other waste from the cages. Management procedures will ensure that each cage site is left fallow for at least 16 months (longer than required by regulation), in order to enable assimilation of organic matter (natural cleaning of sea floor) beneath the cage by current and bottom feeders. Follow-up monitoring of benthic recovery will be conducted as per AAR regulations.

To address the concern about the farmed salmon potentially interbreeding with wild salmon, Grieg NL intends to use all-female sterile triploid female eggs; these fish will grow but will not become sexually mature and could not interbreed if there should be an escape. As well, as recommended by DFO (2016g), Grieg NL has made efforts to locate sea cages at least 20 km distant from any sensitive area, salmon streams/rivers, and areas presently undergoing eel grass restoration efforts. The concerns about potential effects on wild salmon remain: this issue is considered in another Component Study required for development of the Project EIS, *Wild Atlantic Salmon* (LGL 2018).

There is concern about sea lice and disease in aquaculture operations and the potential for treatment to result in substances such as therapeutants entering the sea. Grieg NL primary effort will be to control sea lice through the use of cleaner fish (lumpfish), which eat the sea lice (a species of naturally occurring copepod), in the sea cages. If sea lice levels require additional mitigation measures, GNL will implement further preventative mitigation measures including sea lice skirts, delivering feed deeper in the cage below the water depth typically used by the copepods, and using functional feed developed to inhibit sea lice by increasing mucous production on the salmon skin, thereby making it more difficult for sea lice to attach to the salmon. If the use of all these measures is not successful at controlling sea lice, Grieg NL will consult with private and provincial veterinarians. At this stage, three options will be considered: harvesting the fish, the use of a "Thermolicer"[3], or therapeutants. If therapeatants (and/or antibiotics) are used samples of the deposited organic material in the vicinity of the sea cages will be collected and analyzed for presence of the chemicals as part of a follow-up monitoring program.

[3] Thermolicer® works by exposing fish and sea lice to 30–34°C water for ~25–30 seconds. The sea lice have a much lower tolerance to this warm water than the fish do and fall off and die when exposed to these conditions.

Health inspections start before the salmon eggs are approved for shipment and continue throughout the life cycle of the salmon. The salmon are vaccinated and subjected to health checks prior to transport to sea.

Grieg NL has provided a document listing the substances, agents and chemicals that may be used in the event of emergency or disease (Grieg NL 2016a). Health Canada notified Grieg NL that it was satisfied with the proposed list of substances (A. Denning, Health Canada, via email on 14 October 2016).

Grieg NL will assist DFO's monitoring program for Non-Native/Aquatic Invasive Species and regularly examine cages and mooring equipment for AIS occurrence. In addition, Grieg NL will be monitoring the benthic habitat as part of the *AAR* regulations and will also note and report any incidence of green crab.

Efforts will continue by Grieg NL to connect with the Indigenous Groups who hold various commercial fishing licences valid for Placentia Bay.

### 4.5.2 Tourism and Recreation

The Grieg NL Project will bring a new industry to the Burin Peninsula, not a boom/bust project as has been the recent history for Marystown and the peninsula. There will not be a temporary influx of a large number of workers; Grieg NL anticipates obtaining their workforce from the Burin Peninsula and has emphasized their intent to provide training for their operations.

The population of the Burin Peninsula is declining, in large part due to the lack of employment opportunities: the Grieg NL project and associated spinoffs will provide employment and enable some residents to stay or return, especially as the industry becomes established. A stable work force will help maintain operation of recreation facilities. This Project is not anticipated to attract large numbers of transient workers and there should not be stress on recreational facilities or use of the countryside (hunting, fishing).

The Grieg NL facilities themselves can be a tourist draw – the RAS Hatchery will have visitor capability. There may be enough interest from residents and visitors to warrant one or more individuals obtaining licences for vessels to carry passengers to include a visit to the sea cage sites as well. Some of the sites are relatively close to communities and in sheltered waters.

With the ongoing interest in resettlement and the presence of cabins on some of the islands, there may be an opportunity for eco-tourism, re-visiting 'the old days', combining boat travel to the islands and multi-day stays in rented accommodation (possibly along the lines of a home stay style or short-term rental).

The anticipated increase in tourism associated with the new car/passenger ferries to St. Pierre et Miquelon will be an economic boost to the Burin Peninsula as a whole; the aquaculture facilities may be an attraction of interest.

There should be no negative effects of the Grieg NL project on tourism and recreation. The Project will increase employment among residents already in the area but not result in a boom/bust situation with a large influx of transient workers. Grieg NL anticipates its workforce will be drawn primarily from the Burin Peninsula; these workers and their families will be those who participate in recreation opportunities and facilities on the peninsula. Tourism is monitored by the Heritage Run Tourism Association and the NL Department of Tourism, Culture, Industry and Innovation.

### 4.5.3 Marine Navigation

There is considerable large vessel, commercial traffic on the eastern side and inner waters of Placentia Bay. Placentia Bay is designated a high level traffic zone where Vessel Traffic Services are needed as described earlier. Large vessels associated with the Grieg NL Project, e.g., the well boat and the bulk feed carrier, will be equipped with AIS, and any Project vessel crossing the Vessel Traffic Separation Scheme lanes will call in to the MCTS Centre. All commercial and indigenous licence holders for Placentia Bay have access to the same VTS and MCTS services and information.

A Placentia Bay Traffic Committee, chaired by the CCG, has been in place for many years as a forum for all marine users of the Bay to address traffic issues and concerns in the area (NLRC 2007). As a member of the marine community of Placentia Bay, Grieg NL will participate on this Committee in order to remain informed about concerns and changes to vessel traffic in the bay.

Grieg NL will ensure that the location and navigation markings for sea cage sites and descriptions of Grieg NL vessels are provided to official marine information systems and the Placentia Bay Traffic Committee. The locations of the proposed sea cages will be provided to MCTS for Notices to Mariners and Notices to Shipping.

Grieg NL will place posters with key information about the sea cage sites at marinas in Placentia Bay communities as an additional effort to ensure that recreational boaters are also aware of the marine equipment. Grieg NL will work with Harbour Authorities to identify relevant locations for posters for recreational boaters and fishers such as Garden Cove, Swift Current, Arnold's Cove and Southern Harbour and others as requested. These locations may also be useful to notify boaters of specific operations.

The locations of the individual proposed sea cage sites were discussed and agreed upon with area fishers in order to avoid interference with traditional passages and fishing grounds. Consultations between Grieg NL personnel and fishers occurred during November and December 2015, with update meetings during February 2018 (see Appendix A). During the February 2018 meetings, Grieg NL personnel suggested that fishers be invited out to the sea cage sites to review final site locations prior to submitting applications for site licenses to DFLR.

With the exception of the two proposed seasonal sea cage sites near the islands (Iona and Brine Islands) outside the entrance to Long Harbour, the proposed locations of the sea farms in Rushoon, Merasheen and Red Island BMAs are clear of the areas usually used by commercial

large vessel traffic. Ongoing communication with fishers who use the grounds in these BMAs has been established and will be maintained to avoid or minimize interaction.

The cage locations will be marked as required by Transport Canada, and be reported to MCTS for Notices to Mariners and Notices to Shipping Notices by recognized procedures. Notices to Mariners and Notices to Shipping will inform mariners of the sea cages sites and marine routes used by Grieg NL to service the BMAs, as well as specific on-water activities, such as towing of a sea cage.

Grieg NL will meet with the Placentia Bay pilots to familiarize them with location and structure of the sea cages and sea farm operations.

Grieg NL will provide cage location and markings information to the Placentia Bay Integrated Management Planning Committee (PBIMPC) as well as updates regarding the activities planned for the BMAs, e.g., when there will be harvesting, when cages will be removed for fallowing. The PBIMPC develops and implements integrated management plans, and monitors and evaluates functions during plan implementation phases (DFO 2007, 2012a; ICOM NL n.d.). Grieg NL met with PBIMPC in the fall of 2015 to describe the proposed Project.

Grieg NL will keep the Marystown Harbour management informed as to their activities at the industrial park's RAS Hatchery, in particular when fish are being transferred or a large vessel, e.g., feed vessel, is due. Marystown has been identified by Grieg NL as a potential supply/service location.

The effect of Grieg NL's operations on the Vessel Traffic Separation Scheme (VTSS) will be minimal as only two of the sea cage sites are on the eastern side of the Bay near Long Harbour and are seasonal operations, in use from May/June through December at which point the fish will be harvested. The two cage sites are located near but not in the VTSS with its compulsory pilotage or the vessel traffic route into the Long Harbour Processing Plant.

Recreational vessels are not required to call in to the MCTS Centre if they are in or crossing the traffic lanes: however, some do for safety reasons. Most of the islands (and coastline) with cabins and associated recreational boating are located west of the traffic lanes. In the BMAs, there will be a continuous, 24/7 presence at the feed/accommodation barge moored at each set of sea cages, as well as several powerboats, which adds to the local ability to respond to on-water emergencies.

### 4.5.4 Sensitive Areas

The whole of Placentia Bay is considered an Ecologically and Biologically Significant Area, the Placentia Bay Extension EBSA. As described earlier, there are many unique attributes and sensitive areas within the Placentia Bay EBSA. The primary mitigation measure for many of the sensitive areas in the Study Area is avoidance. Grieg NL's proposed sea cage sites are located well away from IBAs and Provincial Protected Areas (see Figure 4.53). The proposed sea cage sites are also located outside of proposed leatherback sea turtle critical habitat. Additional mitigation measures are outlined below.

Good husbandry and a strong pollution prevention focus in operating procedures are essential. Grieg NL will include this message in its training and orientation information and presentations and maintain an ongoing environmental awareness program for marine operations.
Environmental protection measures will include:

1) All Project-related vessels must be in good working order, and all efforts must be made to avoid the discharge of oils, fuels or other such compounds into the marine environment. Bilge dumping will be strictly prohibited. Project vessel crews must remain mindful of wind and sea conditions and forecasts. Project vessels' maximum speed is 10 knots (18.5 km/h) or less.

2) Vessel-based operations: Waste management will be consistent with industry best practices. No waste of any kind is permitted to be thrown overboard. Any garbage generated during construction, operation or monitoring phases is to be collected and separated in accordance with MARPOL 73/78 Annex IV: Pollution by Sewage from Ships, and Annex V: Pollution by Garbage from Ships. Air emissions will be those associated with standard operations for marine vessels, in accordance with MARPOL 73/78 Annex VI: Regulations for the Prevention of Air Pollution from Ships.

3) Fuel for the barges will be delivered by a third-party service provider. Refueling will be conducted in accordance with the *Canada Shipping Act* and follow Transport Canada's procedures for the refueling of small commercial vessels[1]. It is the responsibility of the ship's Master to ensure that all steps and procedures are conducted. Grieg NL will have spill kits and procedures in place on the feed/accommodation barge(s) in each of the BMAs. Details will be in the Emergency Response Plan.

4) Grieg NL's Environmental Protection Plan will identify sensitive areas and times of year for each of the BMAs, and specify any additional precautions that are to be taken by project vessels.

5) Should vessels associated with the project require transit in the vicinity of any of the designated areas containing breeding seabird colonies, they are to abide by safe distance regulations in accordance with the area in question, and avoid disturbing the birds to the extent possible, particularly during breeding seasons.

6) All vessels should exercise caution with respect to whales and sea turtles in the Bay (particularly during summer and fall months) and, if sighted, slow, then maintain speed and direction.

[1] https://www.tc.gc.ca/eng/marinesafety/debs-small-vessels-procedures-refuelling-2995 htm

### 4.5.5 Conclusion

Consideration of the potential effects of the proposed Placentia Bay Atlantic Salmon Aquaculture Project on the culture, recreation and commercial importance of the waters of Placentia Bay has been examined through consideration of:

- fisheries;
- tourism, cabins and recreation;
- marine navigation, both commercial and recreational; and
- unique sites or special features, environmentally sensitive areas, reserves or protected areas, conservation agreement lands, and habitat enhancement projects.

The unique marine environment of Placentia Bay has been recognized through its designation as an EBSA and will be considered in Grieg NL's Environmental Protection Plan. There is increased awareness and funding for the protection and restoration of the marine and coastal environment through the federal Oceans Protection Plan (TC 2017): Placentia Bay is already benefitting with two habitat restoration projects underway.

There is active fisheries management in the Bay and effective forums for discussion and resolution of marine issues, the Placentia Bay Traffic Committee and the Placentia Bay Integrated Management Planning Committee, both with representatives from industry, government, fish harvesters and communities.

The present uses of the waters of the Bay for commercial purposes such as tanker and bulk carrier traffic and commercial fishing should not be affected. The traffic management system in Placentia Bay has capacity to manage an increased number of vessels. That said, the aquaculture operations will make minimal use of the traffic lanes as their operations are on the western side of the Bay, almost exclusively.

While the Project is registered and considered as a stand-alone project, the 'project' can establish a new industry in the region that will continue for years. If the project proceeds there will be positive, tangible socio-economic effects through employment, training, and new business opportunities associated with a new industry. The out-migration from the Burin Peninsula can be slowed, possibly reversed. A stronger economy will enable greater use of recreation and tourism facilities.

The cultural, recreational and commercial importance of the waters of Placentia Bay should not be negatively affected by the Placentia Bay Atlantic Salmon Aquaculture Project as it has been proposed to be designed and operated in the Registration of an Undertaking, 'Placentia Bay Atlantic Salmon Aquaculture Project' (Grieg NL 2016b) and summarized in Section 1.2. The effects of the Project are likely to be positive to neutral for the aspects listed above.

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# Appendix A: Consultation with Fishers on the Proposed Placentia Bay Atlantic Salmon Aquaculture Project (November and December 2015; February 2018)

Grieg NL is an aquaculture company, based in Newfoundland and Labrador, interested in developing an Atlantic salmon hatchery and sea farm project in Placentia Bay, NL. Both as part of company due diligence and the requirements of the NL *Aquaculture Licensing Process for Sea Cage Sites*, representatives of Grieg NL met with members of the commercial fishing industry who fish in the vicinity of areas under consideration for the sea cage sites. There were three rounds of consultation: November 2015, December 2015, and February 2018.

**November 2015**

A consultant for Grieg NL met with local fishers at various locations in the potentially affected communities. At each discussion, a short presentation was provided, either as a power point or paper information, describing the project and clearly showing the proposed locations of the sea cages on charts of the area. Discussions focussed on ensuring that the cages would not interfere with traditional fishing grounds and travels routes to/from the grounds. Fishers requested that the orientation of one sea farm (a line of 12 cages) in the Rushoon Bay Management Area be re-oriented to avoid interference with passage and that one sea farm be fully relocated to avoid interference with crab fishing; both of these proposed changes were agreed upon Grieg NL.

**December 2015**

Follow up meetings with fishers were held in December 2015 with Grieg NL senior management participating in the discussions. It was reiterated that the requested changes in orientation and location of cages would be made before finalizing the sea cage sites.

**February 2018**

Grieg NL's Human Resources Manager and two consultants working on the project's Environmental Impact Statement met with area fishers in the communities of Petit Fort (8 attending, 20 February), Baine Harbour (7 attending, 20 February) and Boat Harbour (6 attending, 21 February). The charts showing the proposed sea cage locations were presented, noting that the agreed changes were not yet shown on the charts. The need for the changes was emphasized again by the fishers in particular at the Baine Harbour and Boat Harbour meetings.

At all meetings, fishers were requested to indicate on individual charts as to where they fished and travelled to/from the fishing grounds; composite charts are shown in Figures 4.8 and 4.9 (see Section 4.1.1.3 earlier). Fishers indicated that with the changes previously requested (in November 2015), the proposed sea cage locations did not interfere with fishing. In Baine Harbour and Boat Harbour, fishers suggested a location for the sea cage site that was to be relocated and emphasized the importance of keeping the route on either side of Cross Island free of obstruction to passage.

Fishers were also asked for input on other topics including employment, recreational boating, and ecological changes.

*Employment at the sea cage locations*

At all three meetings with fishers in February 2018, Grieg NL reminded the fishers that the sea cage sites would have personnel at the farms full time, with 7 days on, 7 days off shift schedule. This schedule could enable fishers to work on the sea farms and maintain fishing. Grieg NL plan to install high speed internet for their operations which will be controlled out of Marystown; they would offer free access to communities in the area. One fisher pointed out that the 24/7 presence on the water could be an increase in security with boats closer and better communication.

*Recreational boating*

Fishers were also asked about recreational boating activity in the area. In general, they report that recreational boating during the summer months has increased considerably over the last 5–10 years, mainly in association with travel to the islands and/or the recreational cod fishery. Boats are primarily power boats with an occasional sail boat. No kayaks had been noted.

*Ecological changes*

Fishers were also asked if they had noted any changes in the ecology of the area. They reported an increase in sharks over the last 4–5 years (number and species, with mako as well as blue sharks and occasional very large sharks not identified to species); big increase in seals with grey seals (as many as 70 caught in nets in 2017) as well as harbour seals; increase in whales, particularly humpback and minke whales; and more tuna.

**Actions to be taken:**

1. At the meeting in Boat Harbour, it was agreed that the fishers would work directly with Grieg NL on the final location of the sea cage sites, including the re-orientation and the re-location.
2. Grieg NL invited the fishers to go on the water with them when the sea cage sites were being finalized before the sea cages were put in place: this was supported by the fishers.