

4.2.1.11 Other Ecologically Important Areas

As described above, a number of ecologically important habitats have been identified through the EBSA process and are also reflected in the designation of Vulnerable Marine Ecosystems based on sensitive coral areas and NAFO coral, seamount and sponge protection zones. NAFO also has several areas closed to shrimp trawling in the area of the Flemish Cap and the Nose of the Grand Banks (NAFO 2013a) and the organization has highlighted several areas of importance that remain unprotected. These include the southern slope of the Flemish Pass (sponges), the eastern slope of the Flemish Cap (large Gorgonian corals) and the Tail of the Grand Banks (small gorgonian corals) where various VMEs indicator species occur at high concentrations (NAFO 2013b).

Additional areas were also defined for the Orphan Basin area in that previous SEA (LGL Limited 2003) and include the following (Figure 4.92):

- 1) The “Bonavista Cod Box”, an important spawning and migration area for Atlantic cod, American plaice and redfish;
- 2) Enhanced production / important feeding areas, such as a) the slope of Northern Grand Banks; and b) high productivity frontal zone associated with the Labrador Current and on the continental slope, in the northern portions of the SEA Study Area; and
- 3) Various potential biophysical “zones” for planning purposes based on water depths: *Zone A*: Top Shelf (< 200 m); *Zone B*: Low Shelf (200 m to < 400 m); *Zone C*: Deep Break (400 m to < 2,000 m); *Zone D*: Deep Basin (2,000 m to 3,000 m); *Zone E*: Orphan Knoll (1,800 m to 2,000 m); and *Zone F*: Very Deep Basin (3,000 m to 4,000+ m).

Additional sensitive and special areas can be found in coastal areas outside of but adjacent to the SEA Study Area, where eelgrass beds serve as important fish nurseries (Cote et al 2013) and estuaries are important staging areas for diadromous species such as American eels and Atlantic salmon.

Ecologically important zones may also be reflected by their relatively high levels of faunal abundance, biomass and/or species richness. Canadian RV survey data indicate that important areas vary for each metric (Figures 4.93 to 4.95). For example, the relative abundance of fish (individuals) captured was relatively high on the northeast slope of the Grand Banks, the Bonavista Corridor and the northeast corner of the SEA Study Area. High biomass areas were also located in these areas, but the tail of the Grand Banks had particularly high concentrations of biomass. This divergence is likely at least partially explained by the biases associated with each measure. For example, the distribution of small bodied animals like shrimp can dominate abundance measures, but are less important in measures of biomass. However, many large-bodied groundfish (such as cod) occur on the Tail of the Grand Banks, where shrimp are scarce. Species richness was found to be particularly high along northern sections of the continental slope, but also saw elevated levels in the Bonavista Corridor and on the slope of the Flemish Cap.

Areas of high marine fish abundance, biomass and species richness often coincide with previously identified sensitive and special areas, including the Bonavista Corridor / Bonavista Cod Box (abundance, biomass and richness), some sensitive coral areas and NAFO coral protection zones (species richness, and the Southeast Shoal and Tail of the Grand Banks EBSA (biomass).

Figure 4.92 Ecologically Important Areas Identified in the Orphan Basin SEA (2003)

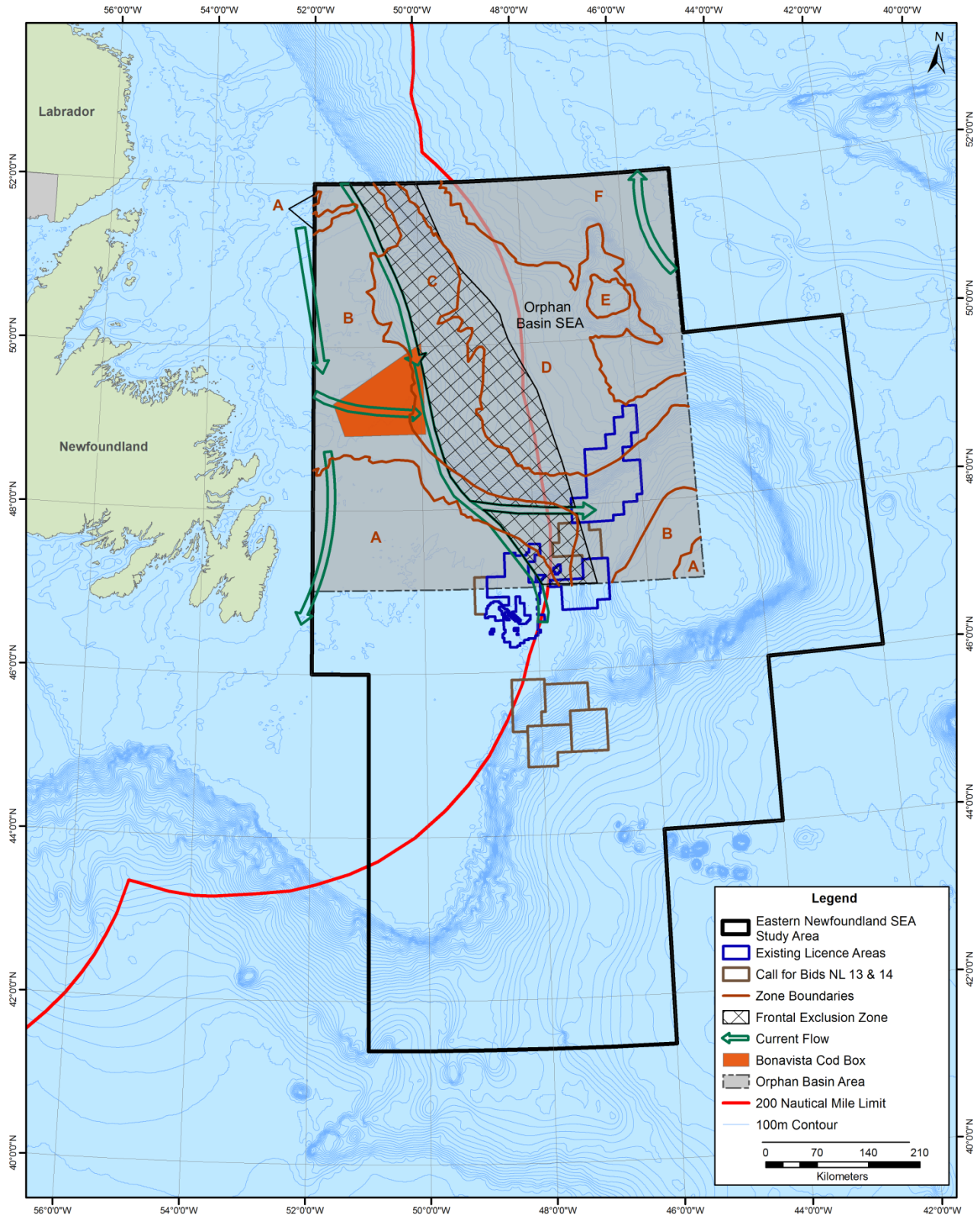


Figure 4.93 Areas of Relatively High Faunal Abundance as Identified by Canadian RV Surveys, 2005-2009 (Finfish and Invertebrates)

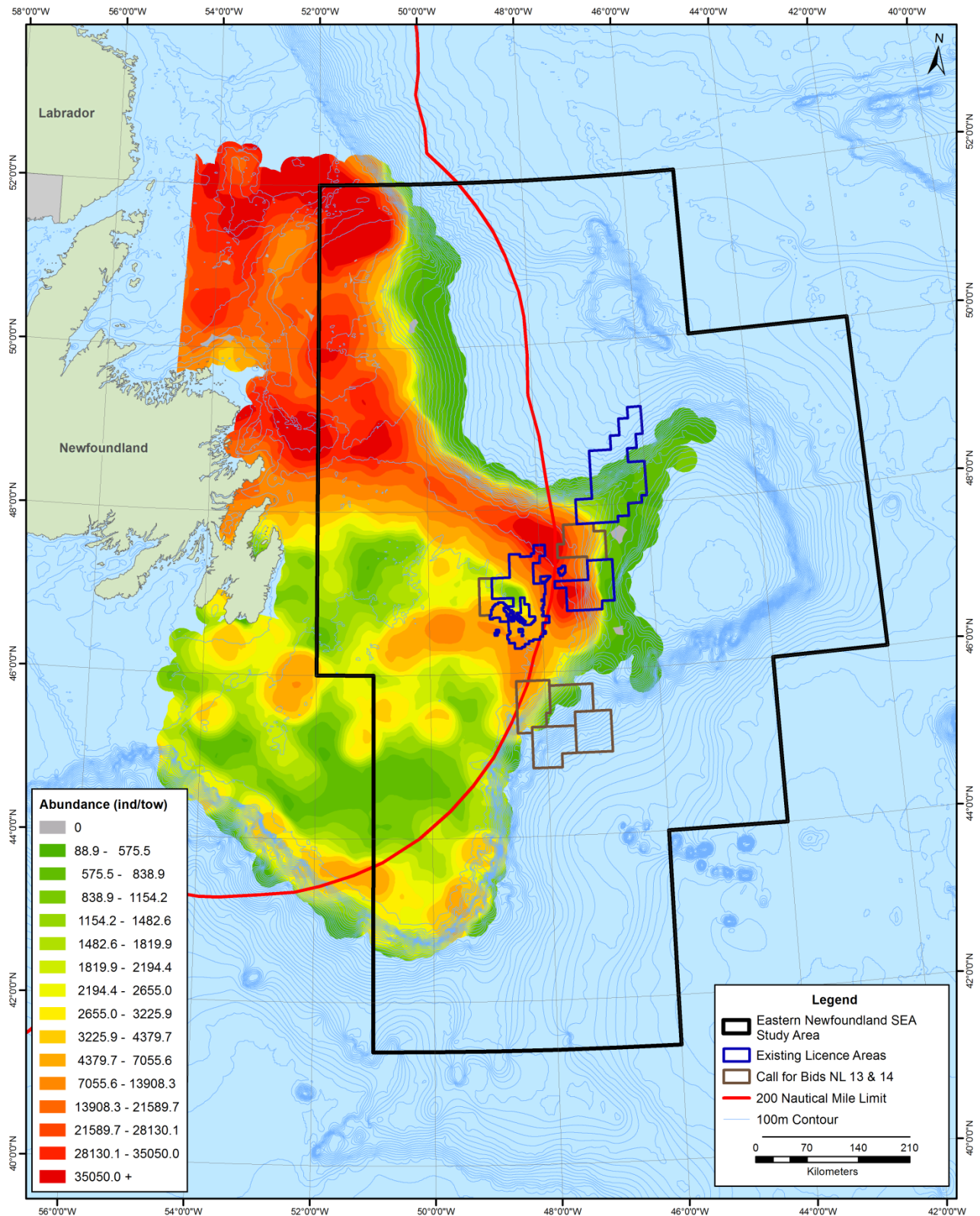


Figure 4.94 Areas of Relatively High Faunal Biomass as Determined by Canadian RV Surveys, 2005-2009 (Finfish and Invertebrates)

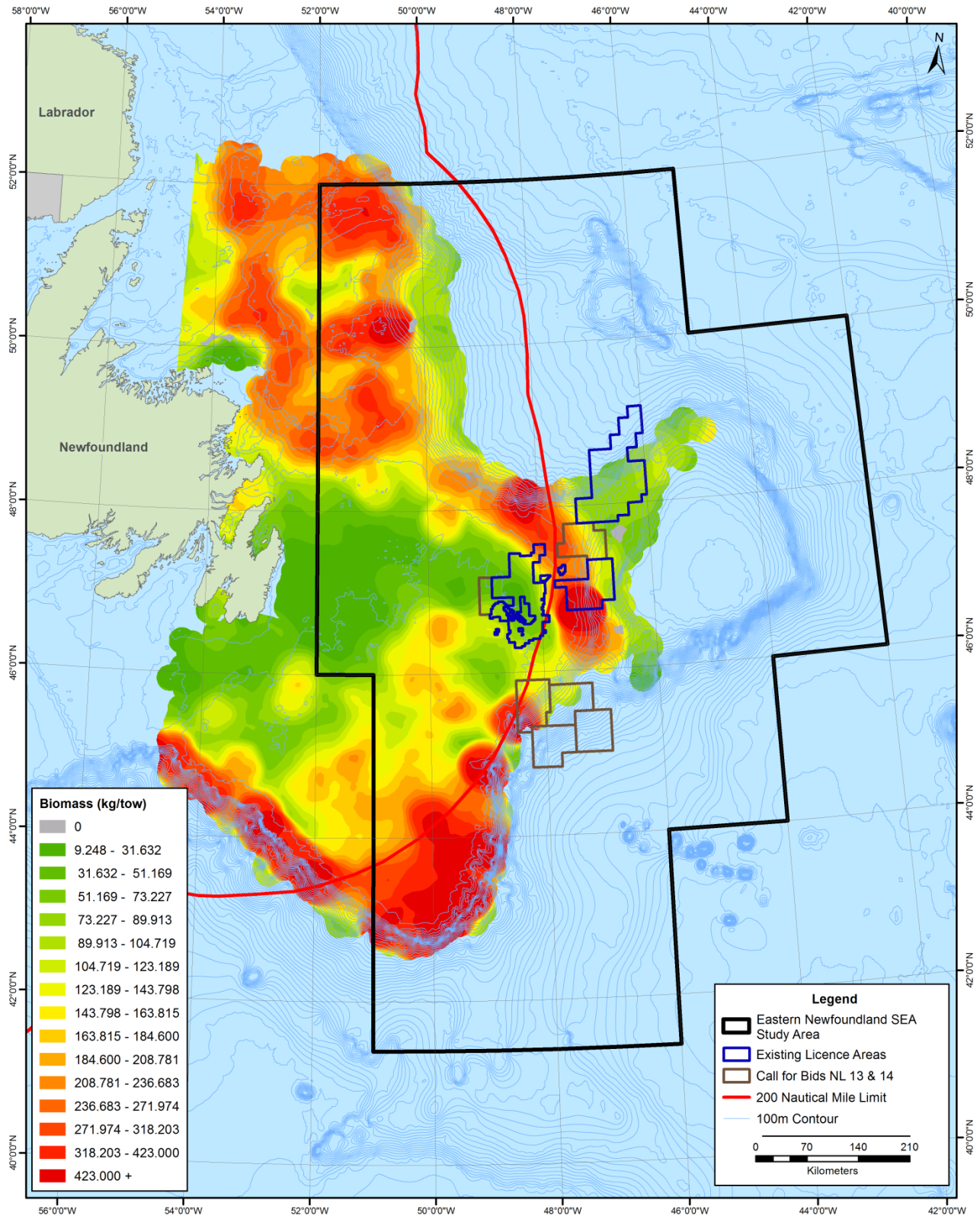
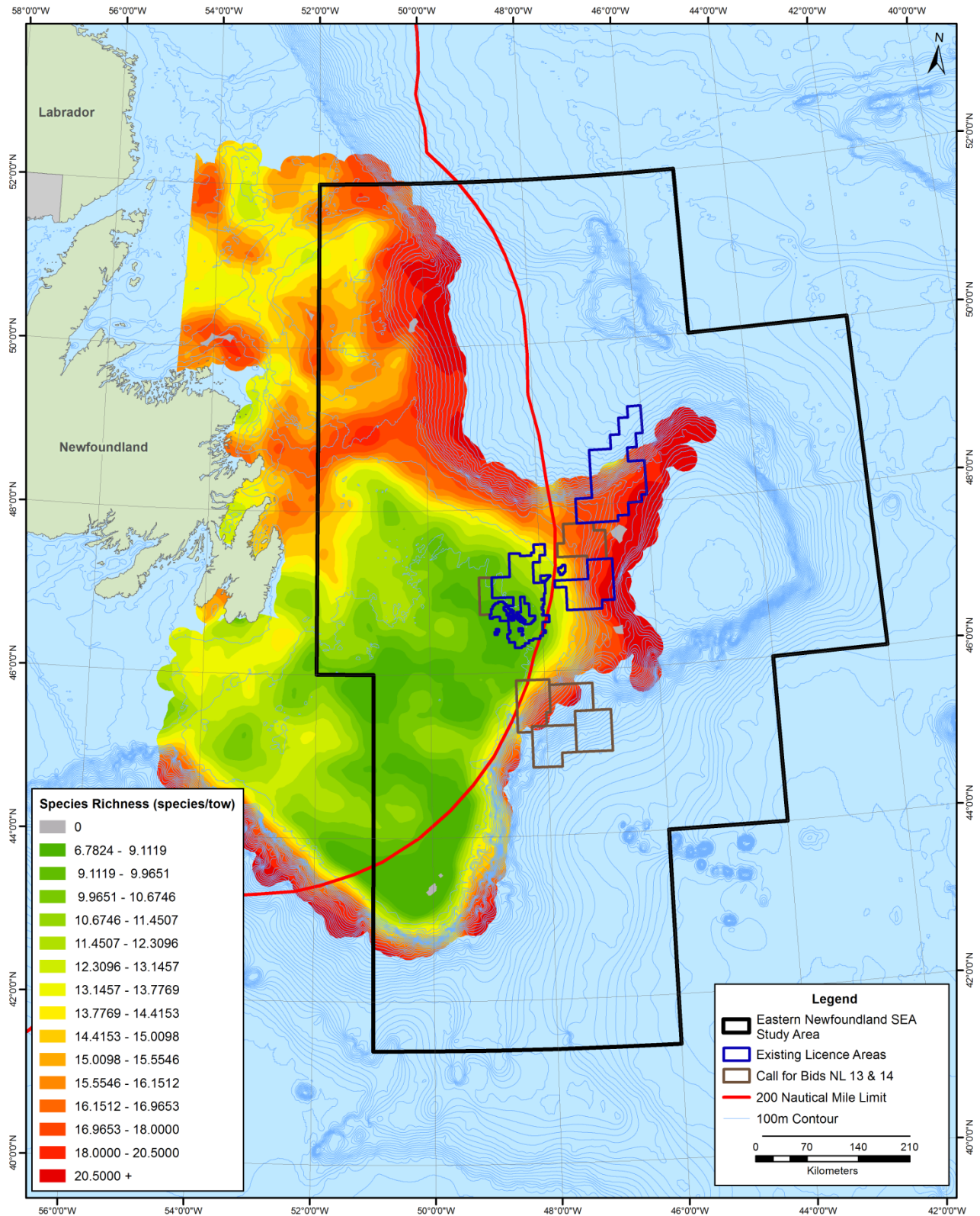


Figure 4.95 Areas of Relatively High Taxonomic Richness as Determined by Canadian RV Surveys, 2005-2009 (Finfish and Invertebrates)



4.2.2 Marine Birds

This section describes the overall presence, distribution and seasonal abundance of marine-associated bird species in the SEA Study Area. For the purposes of this discussion, these avifauna are grouped into several categories: 1) seabirds, 2) coastal waterfowl (including loons and grebes), 3) shorebirds, and 4) landbird species, including passerines. Seabirds, coastal waterfowl and shorebirds are considered to be the most vulnerable to perturbation as they spend much of their life in the marine environment, although some landbird species may also be affected, particularly those that are associated with coastal habitats.

Wildlife in Newfoundland and Labrador are managed under the provincial *Wildlife Act and Regulations*. Most migratory birds found in Canada are also protected under the federal *Migratory Birds Convention Act (MBCA)*, which implements the terms of the Migratory Birds Convention of 1916 between Canada and the United States. In Canada, the *MBCA* and associated *Migratory Birds Regulations* are administered by the Canadian Wildlife Service of Environment Canada (EC-CWS). These strictly prohibit the harming of migratory birds and the disturbance or destruction of their nests and eggs.

Data on avian presence and abundance in and near the SEA Study Area were obtained from various sources. EC-CWS was consulted for information on seabird colonies off Eastern Newfoundland, as well as for recent data on seasonal and spatial trends in seabird abundance from the Eastern Canadian Seabirds at Sea (ECSAS) program. Records from the Atlantic Canada Shorebird Survey (ACSS) and the Important Bird Areas (IBAs) of Canada programs provided further information on species presence and were used to identify avian “hotspots”. Both the Wildlife Division and the Parks and Natural Areas Division of the Newfoundland and Labrador Department of Environment and Conservation were contacted for information on presence of endangered species in coastal habitats of Eastern Newfoundland, and the e-Bird database (e-Bird 2013) was consulted to obtain additional sightings information for rare species.

4.2.2.1 Seabirds

Seabirds are of high intrinsic ecological importance, often serving as indicators of ecosystem health. Furthermore, there are also typically of socioeconomic importance as a food source (especially, murre, known locally as “turrs”) and in tourism, particularly in the Witless Bay and Cape St. Mary’s Ecological Reserves. The nutrient-rich Grand Banks provide an extremely important feeding area for seabirds, and tens of millions of these birds representing numerous species nest off Eastern Newfoundland (Russell and Fifield 2001a,b; Fifield et al 2009a). Seabirds that occur in the marine waters off Eastern Newfoundland include cormorants, gannets, phalaropes, gulls, terns, alcids (auks), jaegers and skuas, and tubenoses (fulmars, petrels and shearwaters), each of which is discussed in turn below. Most seabird nesting in the area takes place on islands off the coast, although some species nest on inaccessible mainland cliffs or on sandy beaches and peninsulas. Generally speaking, seabirds occurring in the SEA Study Area are long-lived with low fecundity, delayed recruitment and low rates of population growth. Seabirds are present at the colonies throughout much of the year. Some species arrive at the colonies as early as February (Black-legged Kittiwakes) and March (Northern Gannet), and egg-laying commences in mid to late May and into June. The young of most species depart the colony by July to August, and as late as November for Northern Gannets.

EC-CWS has reinvigorated its efforts to monitor seabird species at sea, and in 2006 initiated the ECSAS program (Gjerdrum et al 2008; Fifield et al 2009b). According to data from Fifield et al (2009b),

the largest concentration of seabirds in the SEA Study Area is from March to August. Seabirds are least abundant in the SEA Study Area in the fall (September - October), when most survey blocks had fewer than 10 birds per square kilometre.

Figures 4.96 to 4.99 (modified from Fifield et al 2009b) show the seasonal trends in abundance for all seabird species in the offshore seabird monitoring program data from 2006 to 2009. In these figures, the numbers represent the total seabird density within the 1 degree survey block (top) +/- standard error (bottom), while one degree blocks without a coloured block were not surveyed. The seasonal trends observed largely correspond with earlier seabird survey data from Lock et al (1994). In both data sets, the geographical survey coverage was considerably greater in the spring and summer months than in the fall and winter. The ECSAS monitoring program is ongoing, and its Working Group is in the process of developing a publically available interactive online atlas of seabird density and distribution that will provide up-to-date information on the status of seabirds in the region (C. Gjerdrum, pers. comm.).

ECSAS data for the SEA Study Area from 2010 to 2013 were obtained from EC-CWS, and while these data cannot be used to calculate densities (as they have not been corrected for detectability, unlike the data in Fifield et al 2009b), they do provide additional information on seasonal and spatial trends in abundance for the different seabird groups. For groups that were commonly observed in the SEA Study Area, figures have been generated to illustrate these survey data for the spring (March-April), summer (May-August), fall (September-October) and winter (November-February) periods. It should be noted that the data are geographically limited, particularly in the fall months, as the survey program relies heavily on the use of vessels of opportunity rather than dedicated survey vessels.

Figure 4.96 Distribution and Seasonal Abundance of Seabirds (March-April)

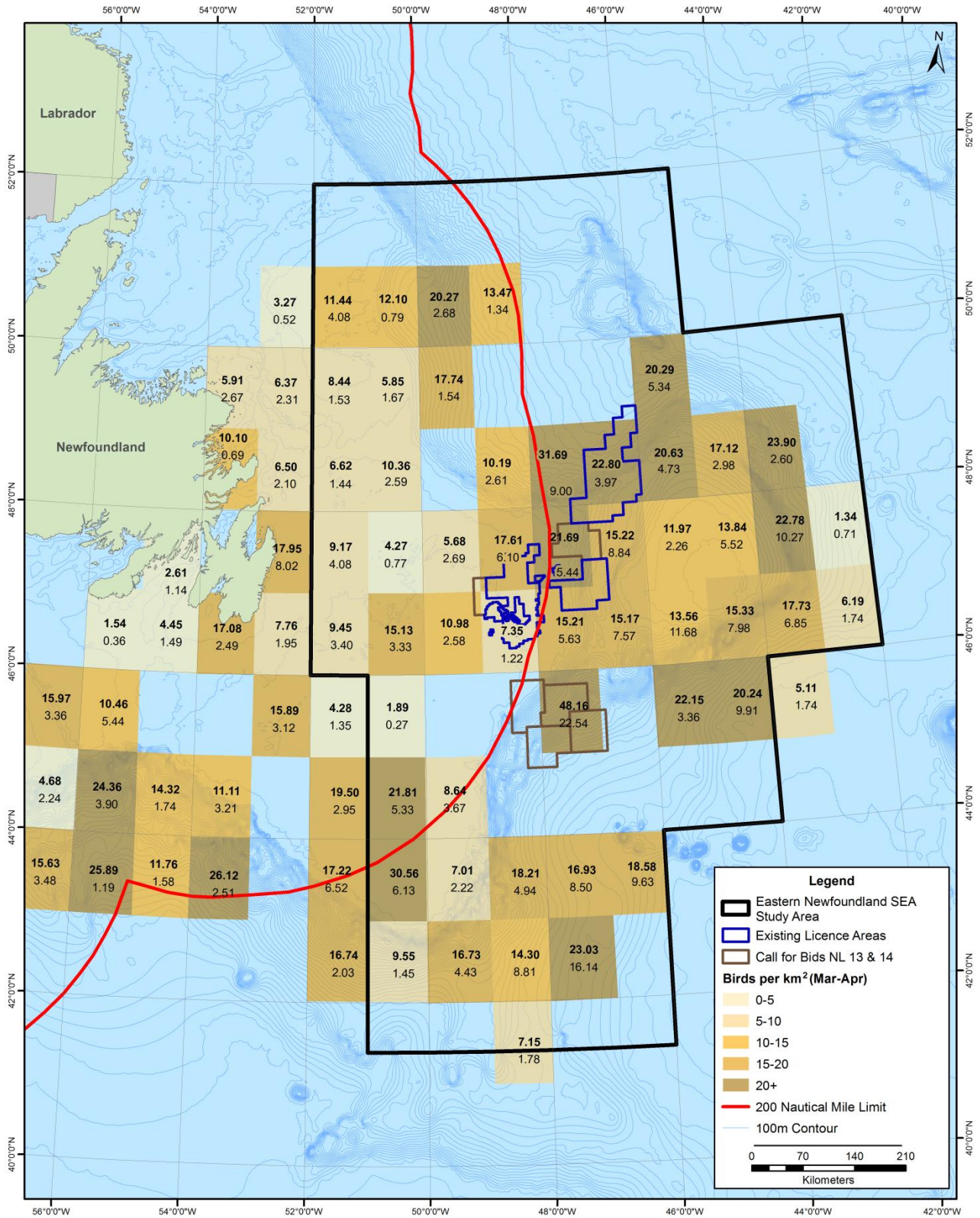


Figure 4.97 Distribution and Seasonal Abundance of Seabirds (May-August)

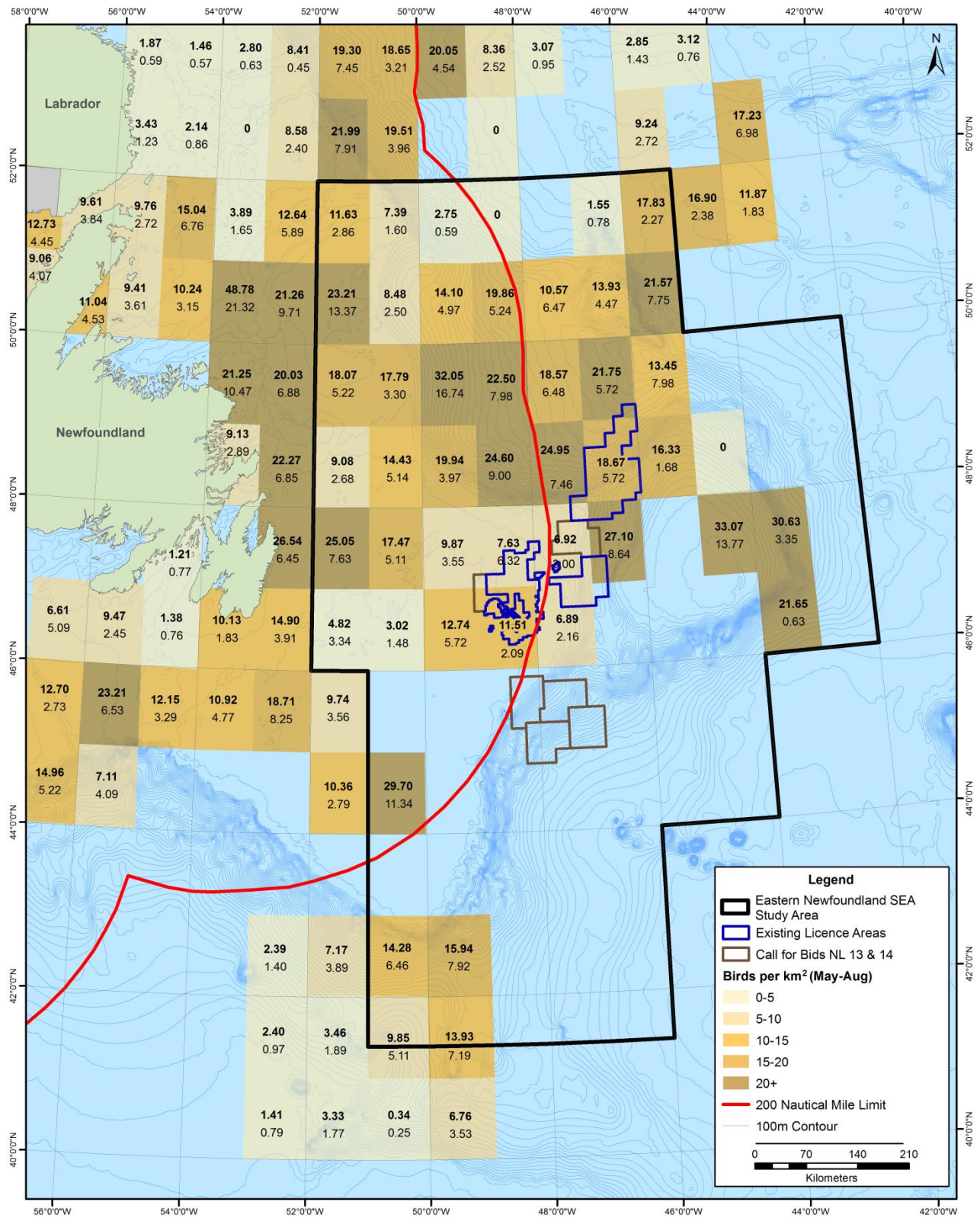


Figure 4.98 Distribution and Seasonal Abundance of Seabirds (September-October)

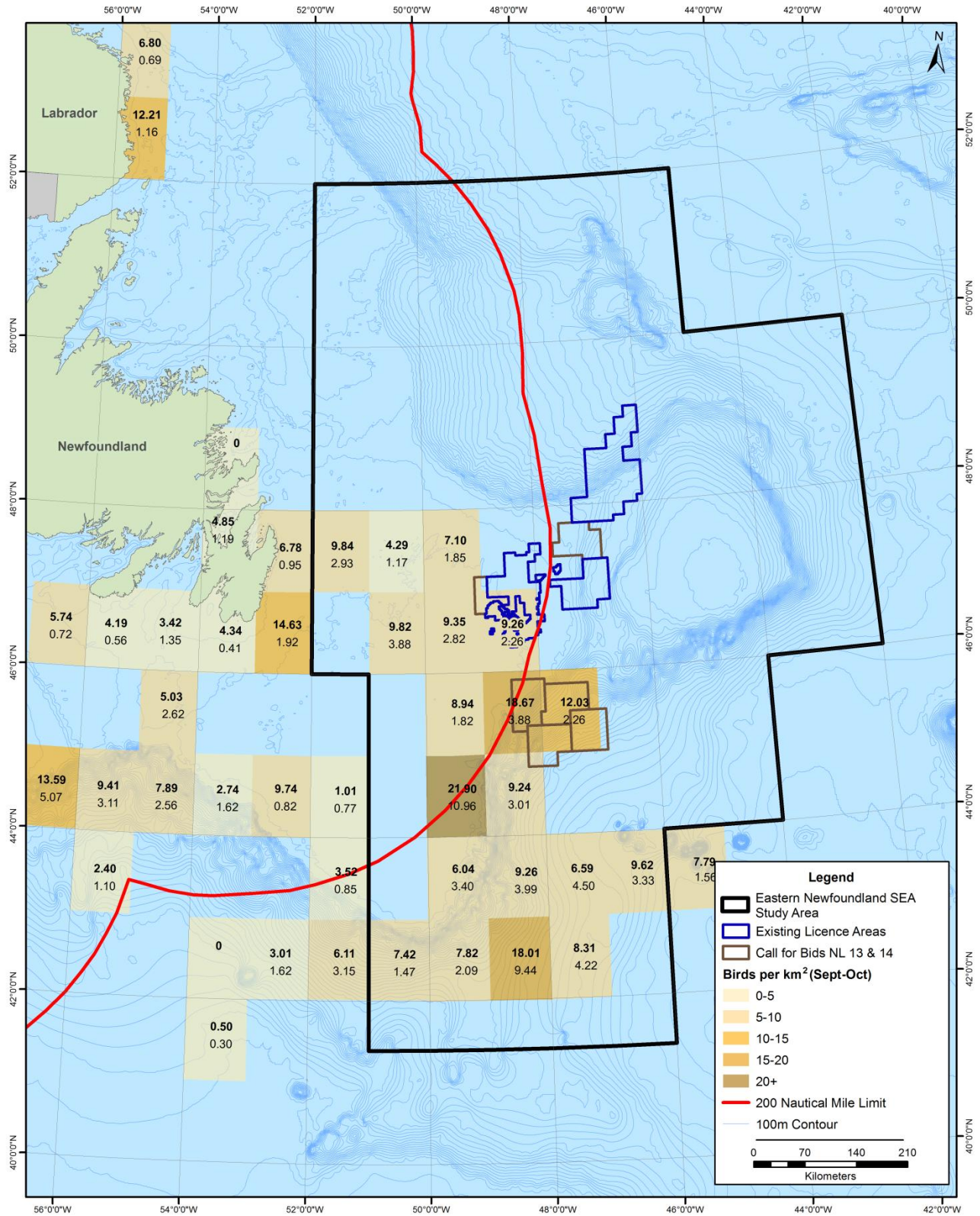
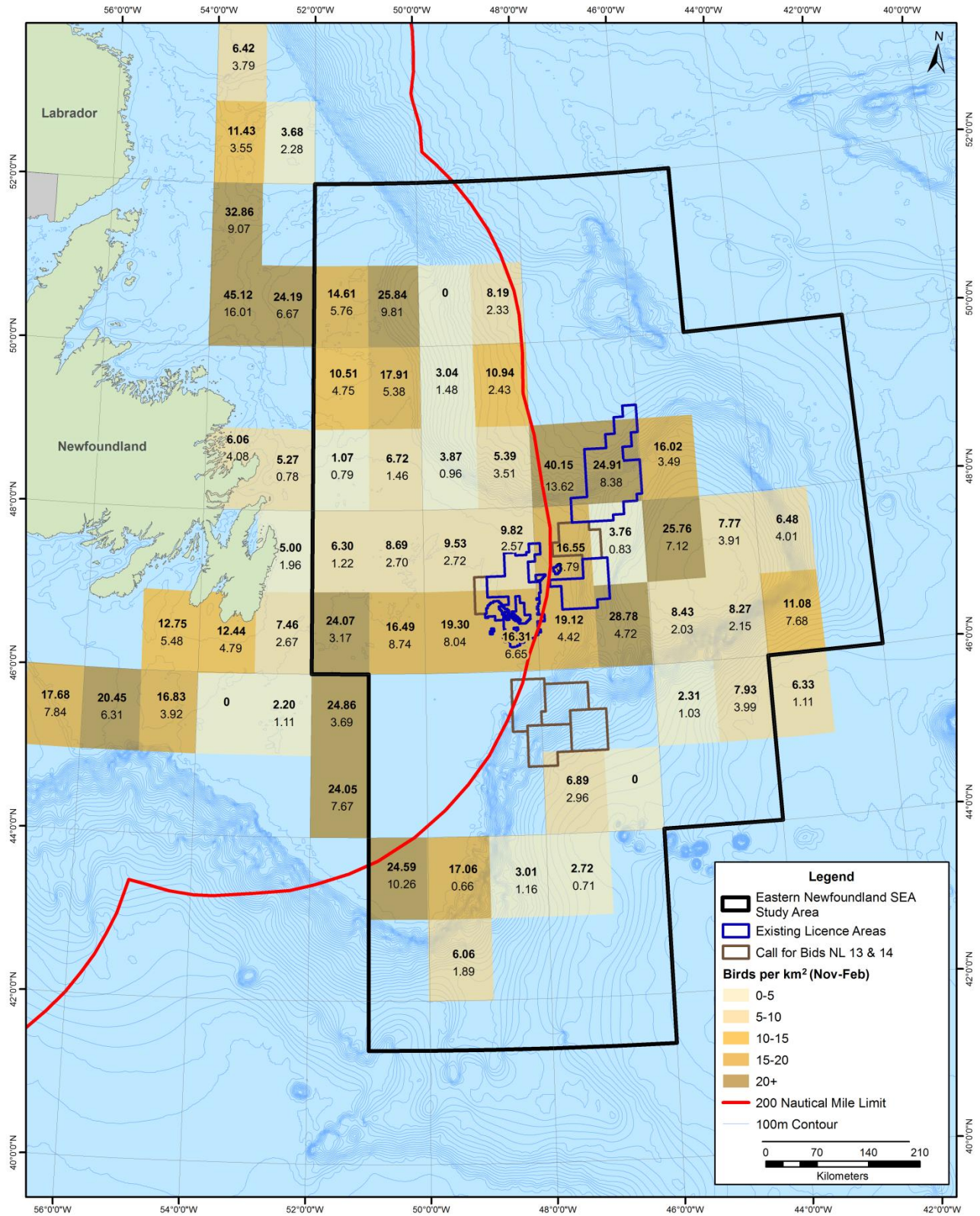


Figure 4.99 Distribution and Seasonal Abundance of Seabirds (November-February)



Cormorants

The cormorant family is represented by two species in the SEA Study Area. Table 4.70 summarizes the habits, habitats and key life history characteristics of these cormorant species.

Table 4.70 Overview of Cormorant Species Occurring in the SEA Study Area

Cormorants (<i>Phalacrocoracidae</i>)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Large-bodied, long-necked black seabirds with colourful bare facial patches. • Long-lived colonial seabirds. • Two species found in SEA Study Area: Double-crested Cormorant and Great Cormorant. • Great Cormorant is widespread along the eastern coast of North America, while Double-crested is found on east and west coasts as well as inland. • Both species are secure in Canada. Double-crested Cormorant populations have increased significantly since 1970. 	Hatch and Weseloh (1999); Hatch et al (2000); Environment Canada (2011)
Habitats and Movements	<ul style="list-style-type: none"> • Coastal species; typically found in shallow (< 8 m) waters. • Arrive at breeding territory in early spring • North Atlantic populations of Double-crested Cormorants migrate south in late fall • Great Cormorants are partial migrants, with some individuals remaining within the breeding range year round. 	Hatch and Weseloh (1999); Hatch et al (2000)
Reproduction	<ul style="list-style-type: none"> • Nests may be constructed on cliffs, artificial platforms, rocky ground, shrubs or trees. • Begin to breed at 3 (sometimes 2) years of age. • Mean clutch size: 4 eggs (range 1-7). • Great Cormorant: Egg-laying begins in mid-April. Chick rearing takes place from mid-May until mid-August. • Double-crested Cormorant: Egg-laying begins in early May. Chick rearing is from early June until late August. • Number of fledglings per breeding pair for populations in eastern Canada range from 0.98 - 2.35 (Double-crested) and 1.2 - 1.97 (Great). 	Hatch and Weseloh (1999); Hatch et al (2000)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Feed by pursuit diving to depths of up to 35 m, though typically 10 m or shallower • Prey on a wide variety of small fish (typically < 20 cm) and invertebrates, predominantly marine bottom species 	Hatch and Weseloh (1999); Hatch et al (2000)

As with all seabird species, breeding colonies are particularly sensitive areas for populations. Although Double-crested Cormorants have a wide breeding distribution in Newfoundland, the breeding range of Great Cormorants is restricted to the south and southwest coast of the Island (Cairns et al 1989). In Southeastern Newfoundland, both Great and Double-crested Cormorants are reported to nest at Cape St. Mary's (IBA 2013). A coastal species seldom found in deep waters, cormorants were only rarely observed in the ECSAS surveys in the waters off Eastern Newfoundland (ECSAS 2013).

Gannets

A single gannet species, the Northern Gannet, is found in the SEA Study Area. Table 4.71 summarizes the habits, habitats and key life history characteristics of the Northern Gannet.

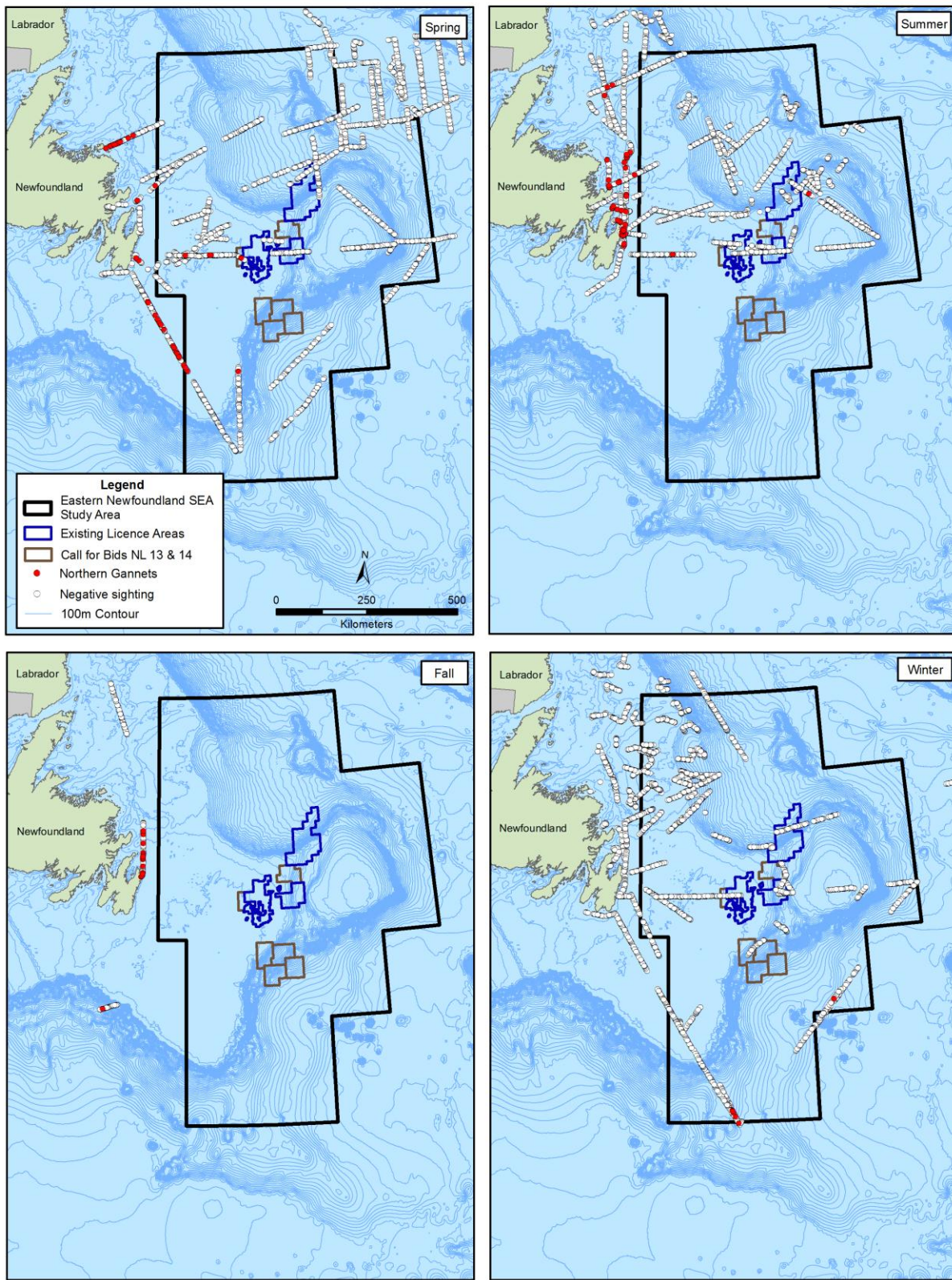
Table 4.71 Overview of Gannet Species Occurring in the SEA Study Area

Gannets (<i>Sulidae</i>)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Northern Gannet is a large-bodied seabird with long neck and large, bluish bill. Adult plumage is white with yellowish-buff wash on head and neck, black wing tips. Long-lived colonial seabird. • Entire Northwest Atlantic breeding population is confined to six colonies in eastern Newfoundland and Québec. Winter range extends along the eastern coast of the United States, as far as northern Mexico. • Gannets are secure in Canada, with a steadily increasing population of between 200,000 and 300,000 breeding adults. 	Mowbray (2002); Environment Canada (2011)
Habitats and Movements	<ul style="list-style-type: none"> • Gannets typically inhabit continental shelf waters at all times of the year. • Adults arrive at breeding territory in mid-March, followed a few weeks later by subadults. • Juvenile gannets begin a southward migration in September. Adults and older immatures may travel north from the breeding colonies in order to feed along the Labrador Coast before beginning southward migration. • Winter range is south of the SEA Study Area, extending from the Gulf of Maine as far south as Mexico. 	Mowbray (2002)
Reproduction	<ul style="list-style-type: none"> • Nests in dense colonies on cliff ledges, typically on islands, but occasionally inaccessible mainland areas. • Age at first breeding between 4 and 7 years. • Clutch size: 1 egg. • Egg-laying begins in mid-May. Chick rearing takes place from late June until early October. • Number of fledglings per year per breeding pair: 0.81. 	Mowbray (2002); Montevecchi and Porter (1980)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Feeds by deep plunge diving from a height of 10 - 40 metres above the surface. • Large flocks (up to 1000 birds) may congregate over shoals of food fish. • Descends to depths of up to 15 m. • During breeding season, may travel up to 180 km from breeding colony to forage. • Preys on shoaling fish, predominantly herring, mackerel and capelin, as well as invertebrates such as squid. 	Mowbray (2002); Montevecchi and Porter (1980)

Northern Gannets breed in Eastern Newfoundland, with three large colonies situated in Funk Island, Baccalieu Island and Cape St. Mary's (EC-CWS 2013; IBA 2013). Gannets are common off Eastern Newfoundland in the spring, summer and fall, and are absent in winter (Husky Energy 2000). In the summer months, areas of high prey density where individuals may forage in groups of more than 1,000 are particularly sensitive for this species. During the 2006 - 2009 ECSAS summer surveys, the largest concentration of gannets was found near the breeding colonies in the spring and summer months,

typically close to shore in Southern and Eastern Newfoundland. In September and October, gannets were more common in the southern portion of the survey area, and uncommon in the SEA Study Area itself (Fifield et al 2009b). Similar seasonal trends for gannets in the SEA Study Area were observed in ECSAS sightings data from 2010 to 2013 (Figure 4.100), with the majority of gannet observations occurring in the spring and summer months and relatively close to shore at most times of year.

Figure 4.100 Seasonal Distribution of Northern Gannet Observations



Phalaropes

The Red Phalarope and Red-necked Phalarope are occasionally encountered in the SEA Study Area. Although taxonomically aligned with shorebirds such as sandpipers and plovers (Family: *Scolopacidae*), the phalaropes that occur in the region are pelagic outside of the breeding season (Table 4.72), and so are grouped with the seabirds for the purposes of this discussion.

Table 4.72 Overview of Phalarope Species Occurring in the SEA Study Area

Phalaropes (<i>Scolopacidae</i>)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> Two species occur offshore in the SEA Study Area, the Red Phalarope and the Red-necked Phalarope. Among the smallest seabirds, phalaropes are unusual in that they display reverse sexual dimorphism, females being larger and more brightly coloured than males. Both species breed throughout the Arctic and winter in offshore waters, mostly in tropical and sub-tropical regions. Red-necked Phalarope populations have decreased slightly, while insufficient data exists to determine population trends for Red Phalaropes. Both species are estimated to have a population of over 1,000,000 adults in Canada. 	Rubega et al (2000); Tracy et al (2002); Environment Canada (2011)
Habitats and Movements	<ul style="list-style-type: none"> Phalaropes spend most of the year offshore, coming on land only during the summer months to breed. Found in Arctic tundra during breeding season. Typically spend winter along offshore ocean fronts, where upwellings are associated with higher prey densities. 	Rubega et al (2000); Tracy et al (2002)
Reproduction	<ul style="list-style-type: none"> Ground nester, lays eggs in short vegetation (e.g. sedges, mossy hummocks) typically close to fresh water. Male is sole provider; female leaves shortly after egg laying. Typically breed in first year. Clutch size: typically 4. Egg-laying begins in late May to early June. Chick rearing takes place from mid-July until early September. Number of fledglings per year highly variable depending on predator populations; average believed to be approximately 10 percent in Canada for the Red Phalarope. 	Rubega et al (2000); Tracy et al (2002)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> Phalaropes employ a unique surface feeding strategy whereby they spin in tight circles on the water surface, churning prey upwards to within reach. Feed on zooplankton and small aquatic invertebrates. 	Rubega et al (2000); Tracy et al (2002)

Both phalarope species are absent from the region in winter, and uncommon or scarce in all other seasons (Husky Energy 2000). In vessel-based surveys conducted in the SEA Study Area from 2010 to 2013, phalaropes were reported in small numbers between May and December, but absent for the rest of the year (ECSAS Database 2013). The waters just offshore from Cape Spear are reportedly a good place to see both species during their fall migration (Environment Canada 2009). Individuals that

are present are likely to congregate in areas where prey items are most readily available, such as along ocean fronts and around upwellings, and it is in these areas where phalaropes are most vulnerable to disturbance.

Gulls

Several species of gulls occur in the SEA Study Area throughout the year, including three species that are known to breed in Eastern Newfoundland (Table 4.73).

Table 4.73 Overview of Gull Species Occurring in the SEA Study Area

Gulls (<i>Laridae</i>)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Nine species occur in the SEA Study Area: Herring Gull, Iceland Gull, Glaucous Gull, Great Black-backed Gull, Ring-billed Gull, Black-headed Gull, Sabine's Gull, Ivory Gull and Black-legged Kittiwake. • One species, the Ivory Gull, is considered at risk at the federal and provincial level. This species has suffered a large decrease in numbers since 1970, with an estimated population of 500 - 1000 pairs in Canada. • There are insufficient data to estimate Sabine's Gull population trends. Glaucous Gulls are in global decline and are known to occur in the Eastern Newfoundland offshore area. Regional data concerning Glaucous Gulls are sparse, but it is likely that this species is in decline in the SEA Study Area as well. Further research is required. However, all other species are considered secure. 	Gilchrist (2001); Good (1998); Pierrotti and Good (1994); Snell (2002); Mallory et al (2008); Pollet et al (2012); Day et al (2001); Fifield et al (2009b); Warkentin and Newton (2009); Environment Canada (2011)
Habitats and Movements	<ul style="list-style-type: none"> • Iceland, Glaucous, Ivory and Sabine's breed in the Arctic; Iceland and Glaucous occur in offshore and coastal areas outside the breeding season, while Ivory and Sabine's are restricted to offshore waters the rest of the year. • Herring, Great Black-backed, Ring-billed and Black-headed Gulls, as well as Black-legged Kittiwakes, are found in temperate areas year-round. 	Fifield et al (2009b); Gilchrist (2001); Good (1998); Pierrotti and Good (1994); Snell (2002); Mallory et al (2008); Pollet et al (2012); Day et al (2001)
Reproduction	<ul style="list-style-type: none"> • Most species are ground nesters, although Black-legged Kittiwake breeds on cliffs. • Typically begin to breed at between 3 and 7 years of age • Clutch size: typically 2-3. • Egg-laying begins in late May to early June. Chick rearing takes place from mid-June to late August for Herring and Great Black-backed Gulls, and to late September for Black-legged Kittiwakes. 	Gilchrist (2001); Good (1998); Pierrotti and Good (1994); Snell (2002); Mallory et al (2008); Pollet et al (2012); Day et al (2001)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Surface feeders. • Feed on invertebrates (cephalopods and crustaceans) and fish, as well as offal. • Large gulls including Herring and Great Black-backed also prey on eggs, young, and occasionally adults of other seabird species. 	Gilchrist (2001); Good (1998); Pierrotti and Good (1994); Snell (2002); Mallory et al (2008); Pollet et al (2012); Day et al (2001)

Herring Gulls, Great Black-backed Gulls and Black-legged Kittiwakes breed in many locations, in colonies along the coastal reaches of the SEA Study Area (EC-CWS 2013). Ring-billed Gulls are known to breed in the Cabot Island and Wadham Islands Important Bird Areas (Warkentin and Newton 2009).

According to Husky Energy (2000), Herring and Great Black-backed Gulls are considered common in and around the SEA Study Area year-round (although Herring Gulls tend to be found closer to land; Fifield et al 2009b). Iceland and Glaucous Gulls are absent in summer and uncommon in the spring; in the fall and winter months, Iceland Gulls are common and Glaucous uncommon (Husky Energy 2000). Collectively, large gulls (including Herring, Iceland, Glaucous and Great Black-backed) tend to be more common closer to shore in the summer months, when breeding individuals return to their coastal colonies (Fifield et al 2009b; Figure 4.101); outside of the breeding season, they are more widespread, but the highest concentrations occur at the Nose and Tail of the Grand Banks where fishing activity is also high (Fifield et al 2009b).

Black-legged Kittiwakes are highly pelagic compared with the larger gulls, and are commonly observed in the SEA Study Area year-round (Husky Energy 2000; Fifield et al 2009b; Figure 4.102). Like the large gulls, they also tend to be more concentrated near the breeding colonies in spring and summer months, but are also abundant near the edge of the continental shelf and in the Orphan Basin (Fifield et al 2009b).

Ivory Gull and Sabine's Gull are high Arctic species which are occasionally found in offshore waters of the SEA Study Area. The former is absent off the coast of eastern Newfoundland in the summer and occurs only rarely in other seasons, while the latter is a rare autumn visitor (Husky Energy 2000).

Figure 4.101 Seasonal Distribution of Large Gull Observations

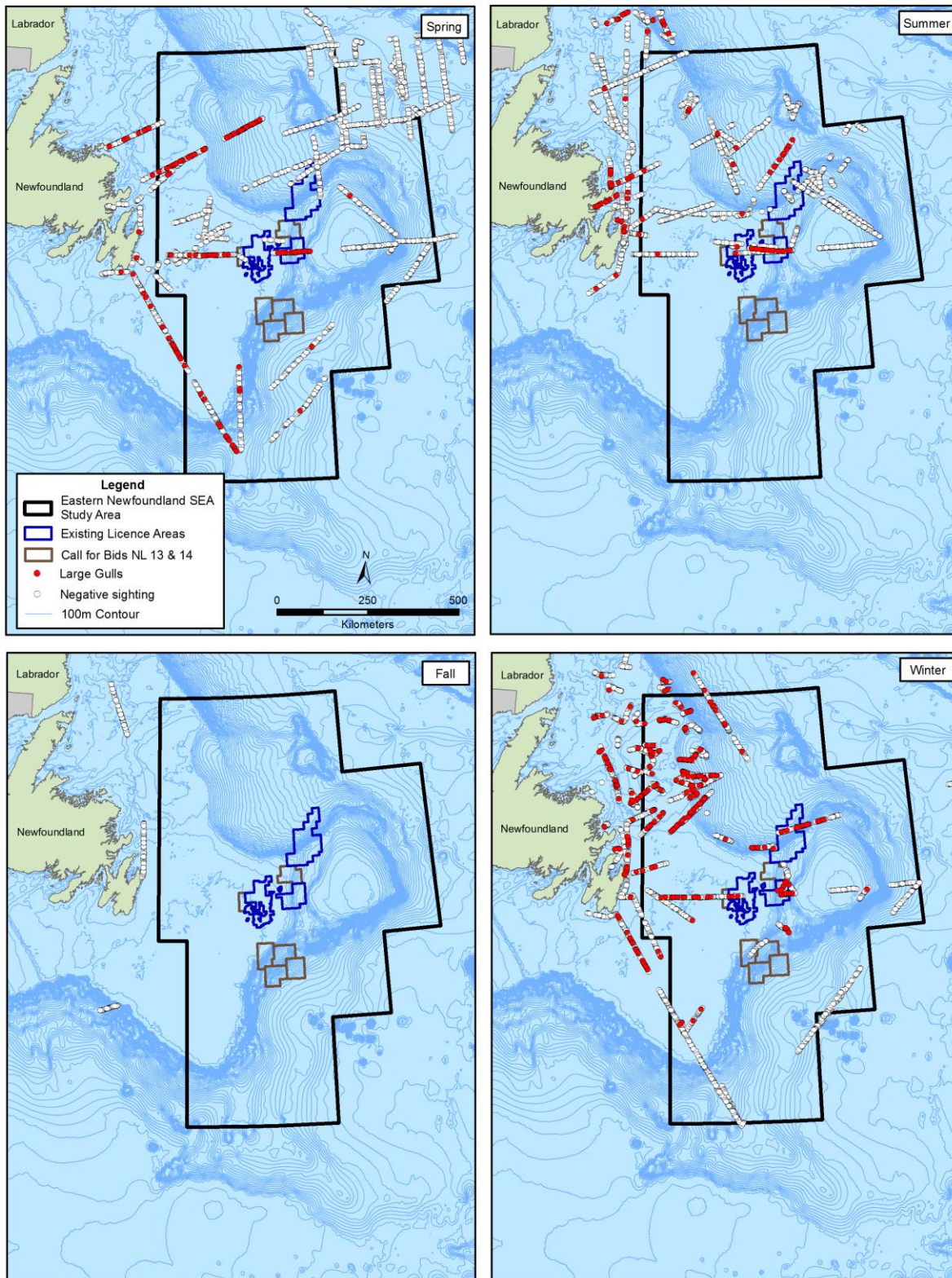
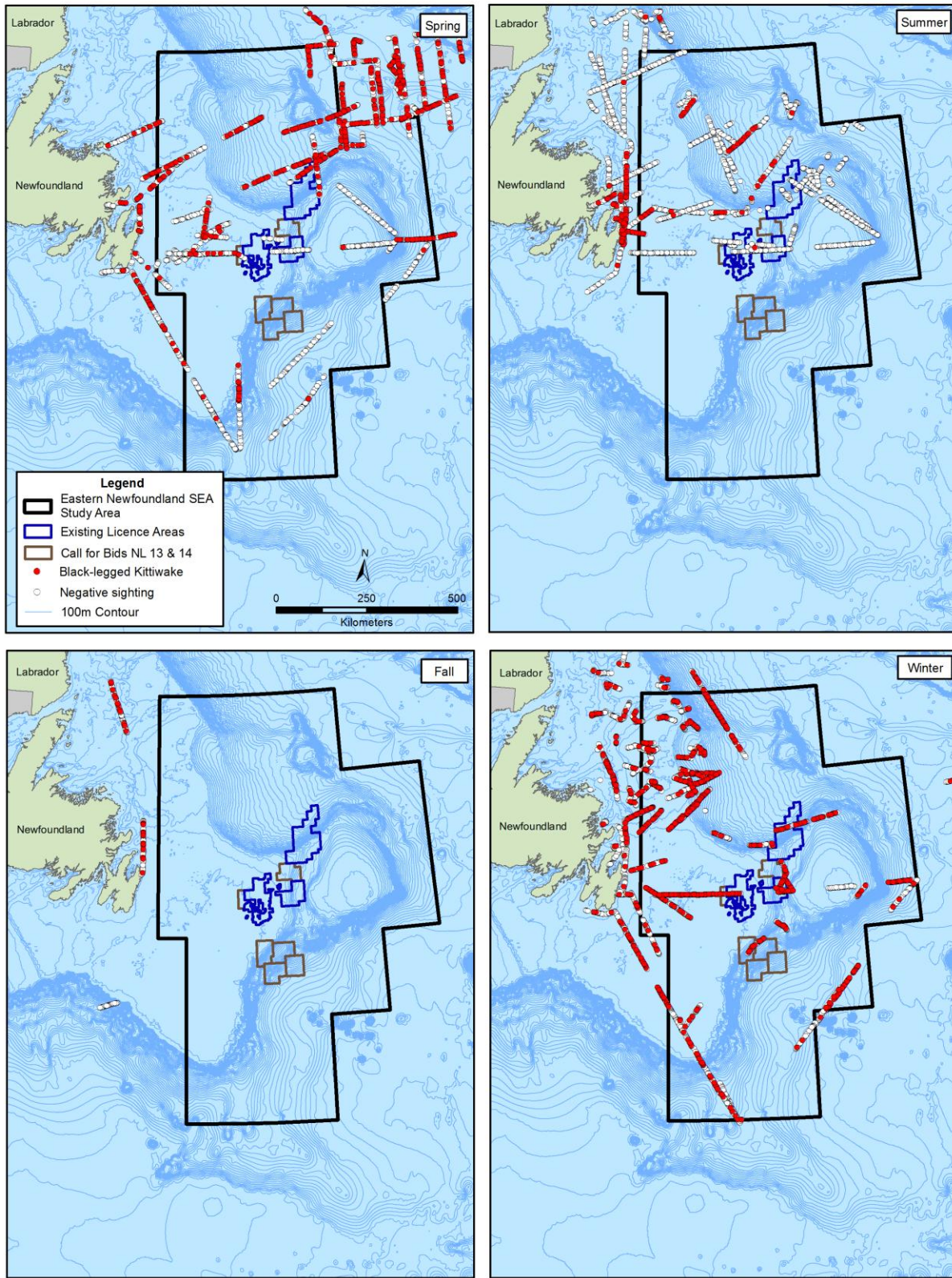


Figure 4.102 Seasonal Distribution of Black-legged Kittiwake Observations



Terns

Three tern species are known to occur in Eastern Newfoundland. Table 4.74 presents information on the habits, habitats and key life history characteristics of tern species in the SEA Study Area.

Table 4.74 Overview of Tern Species Occurring in the SEA Study Area

Terns (Sternidae)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Three species occur in the SEA Study Area: Common Tern, Arctic Tern and Caspian Tern. • Widely distributed throughout North America, although the Caspian Tern is locally uncommon. • Populations are considered stable in Canada, with little change since the 1970s, at between 100,000 and 200,000 individuals for Common and Arctic Terns. Caspian Tern populations are somewhat smaller. 	Hatch (2002); Nisbet (2002); Cuthbert and Wires (1999); Environment Canada (2011)
Habitats and Movements	<ul style="list-style-type: none"> • Breed in northern North America, often on islands and typically in areas with sand or low vegetation. • Found in coastal and offshore waters. • Arctic Terns undertake long migrations to the waters off of Antarctica, while Common and Caspian Terns winter in Central and South America. 	Hatch (2002); Nisbet (2002); Cuthbert and Wires (1999)
Reproduction	<ul style="list-style-type: none"> • Ground nester. • Begin to breed at 2 to 4 years of age. • Clutch size: 1 - 3 eggs. • Egg-laying begins in early June. Chick rearing takes place from mid-July until early August. • Number of chicks fledged per pair varies between 0.59 and 2.0 in different studies. 	Hatch (2002); Nisbet (2002); Cuthbert and Wires (1999)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Surface feeding and pursuit plunging. • Feed on fish and small crustaceans. 	Hatch (2002); Nisbet (2002); Cuthbert and Wires (1999)

Terns are most vulnerable to perturbation during the breeding season, and near their colonies. The Wadham Islands and Cabot Island are known to support large colonies of Common and Arctic Terns (Russell and Fifield 2001a), and Caspian Terns also reportedly breed there (Warkentin and Newton 2009). Common and Arctic Terns also nest in several colonies within the Terra Nova National Park and on Green Island off the Burin Peninsula (IBA 2013). Terns are uncommon off Eastern Newfoundland in spring and summer, but generally rare in fall and absent in winter (Husky Energy 2000). During the ECSAS surveys in the waters off Eastern Newfoundland, terns were seldom observed.

Alcids

Six alcid species utilize the waters off of Newfoundland during at least part of the year, five of which are known to breed in the SEA Study Area (Table 4.75).

Table 4.75 Overview of Alcid Species Occurring in the SEA Study Area

Alcids (Alcidae)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Six species occur in the SEA Study Area: Dovekie, Razorbill, Common Murre, Thick-billed Murre, Atlantic Puffin and Black Guillemot. • Alcids are heavy-bodied and proportionately small winged black-and-white birds of the northern hemisphere. • Distribution of alcids in eastern North America is from the high arctic to north of the Carolinas. • Alcid populations are considered secure, with many species showing slight increases in number in recent years. 	Ainley et al (2002); Gaston and Hipfner (2000); Butler and Buckley (2002); Lowther et al (2002); Lavers et al (2009); Fifield et al (2009b); Environment Canada (2011)
Habitats and Movements	<ul style="list-style-type: none"> • Breed on offshore islands or inaccessible cliffs, away from terrestrial predators. • Typically found in offshore waters outside the breeding season; however, Black Guillemot tends to prefer more coastal environments, often close to breeding colonies. • Dovekie is a largely arctic species that ranges into offshore eastern Canada only in winter. 	Ainley et al (2002); Gaston and Hipfner (2000); Butler and Buckley (2002); Lowther et al (2002); Lavers et al (2009)
Reproduction	<ul style="list-style-type: none"> • Cliff nesters and cavity nesters in inaccessible (typically island) colonies. • Typically breed at 2 years or older. • Clutch size: 1 for most species; 2 for Black Guillemot • Egg-laying begins in May to early June. Chick rearing takes place from mid-June until late August. • For Razorbills and the two murre species, instead of “fledging” in the typical sense, the chick departs the colony with the male parent; father and offspring remain together for several weeks before the chick attains independence. • Number of fledglings per breeding pair varies from 0.26 - 0.72 for Black Guillemot, and from around 0.40 to 0.60 for Atlantic Puffins (in eastern Newfoundland studies). Successful nest departures per breeding pair range from 0.65 - 0.75 for the Razorbill, from 0.35 - 0.85 for Common Murres (the <i>aalge</i> subspecies found in Newfoundland), and 0.48 - 0.79 for Thick-billed Murres in the Atlantic. Factors affecting breeding success include food availability, weather and parental experience. 	Ainley et al (2002); Gaston and Hipfner (2000); Butler and Buckley (2002); Lowther et al (2002); Lavers et al (2009)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Feed by pursuit diving. • Primary food source for alcids in Newfoundland is small fish such as capelin and sand lance; also take some invertebrates such as copepods. 	Ainley et al (2002); Gaston and Hipfner (2000); Butler and Buckley (2002); Lowther et al (2002); Lavers et al (2009)

Amongst seabirds, alcids (particularly murre) are considered to be particularly vulnerable to the effects of oil spills, because they spend a large proportion of their time on the water relative to more aerial species (Fifield et al 2009a). They are most vulnerable at sea in the winter months, when they spend the greatest proportion of their time on the water, and in fact they are rendered flightless for a period of several weeks during their winter moult (Gaston and Hipfner 2000). The coast of Eastern Newfoundland supports numerous alcid colonies, the largest being at Funk Island, Baccalieu Island, the Witless Bay islands and Cape St. Mary's (EC-CWS 2013). During the summer months, alcids tend to be most abundant in the waters near the colonies.

In the waters of the SEA Study Area, Black Guillemots are considered common year-round, while Common Murre and Atlantic Puffin are scarce in winter and common the rest of the year (Husky Energy 2000). Dovekies are common in the fall and winter months, uncommon in spring, and were reportedly absent from the SEA Study Area in the summer months year (Husky Energy 2000), although recent survey data indicate that this is not the case (Fifield et al 2009b; Figure 4.103). Thick-billed Murre is scarce in the summer months and common throughout the rest of the year. Razorbill is considered rare in the winter months and scarce throughout the rest of the year (Husky Energy 2000).

In recent surveys conducted in the SEA Study Area, alcids were the most commonly observed group at all times of year (Fifield et al 2009b; ECSAS Database 2013). In the spring and summer, Dovekies (although uncommon overall) were most concentrated along the continental shelf, although their distribution was more widespread in the fall and winter (Fifield et al 2009b). Murre were abundant throughout the SEA Study Area at all times of year, with the majority of survey blocks containing 1 - 10 birds/km²; in the summer months. The greatest concentrations were seen in coastal waters near the breeding colonies, while in the winter, the Grand Banks had the greatest murre concentrations (Fifield et al 2009b). Murre abundance was relatively low in areas with water depths greater than 1,000 m (Fifield et al 2009b; Figure 4.104). Other alcids, including Atlantic Puffin, Razorbill and Black Guillemot as well as alcid species that could not be positively identified in the field, were most abundant closest to the breeding colonies. In the fall and winter, the highest densities were found close to shore in Eastern Newfoundland, and on the Grand Banks and Northeast Newfoundland shelf (Fifield et al 2009b; Figure 4.105).

Figure 4.103 Seasonal Distribution of Dovekie Observations

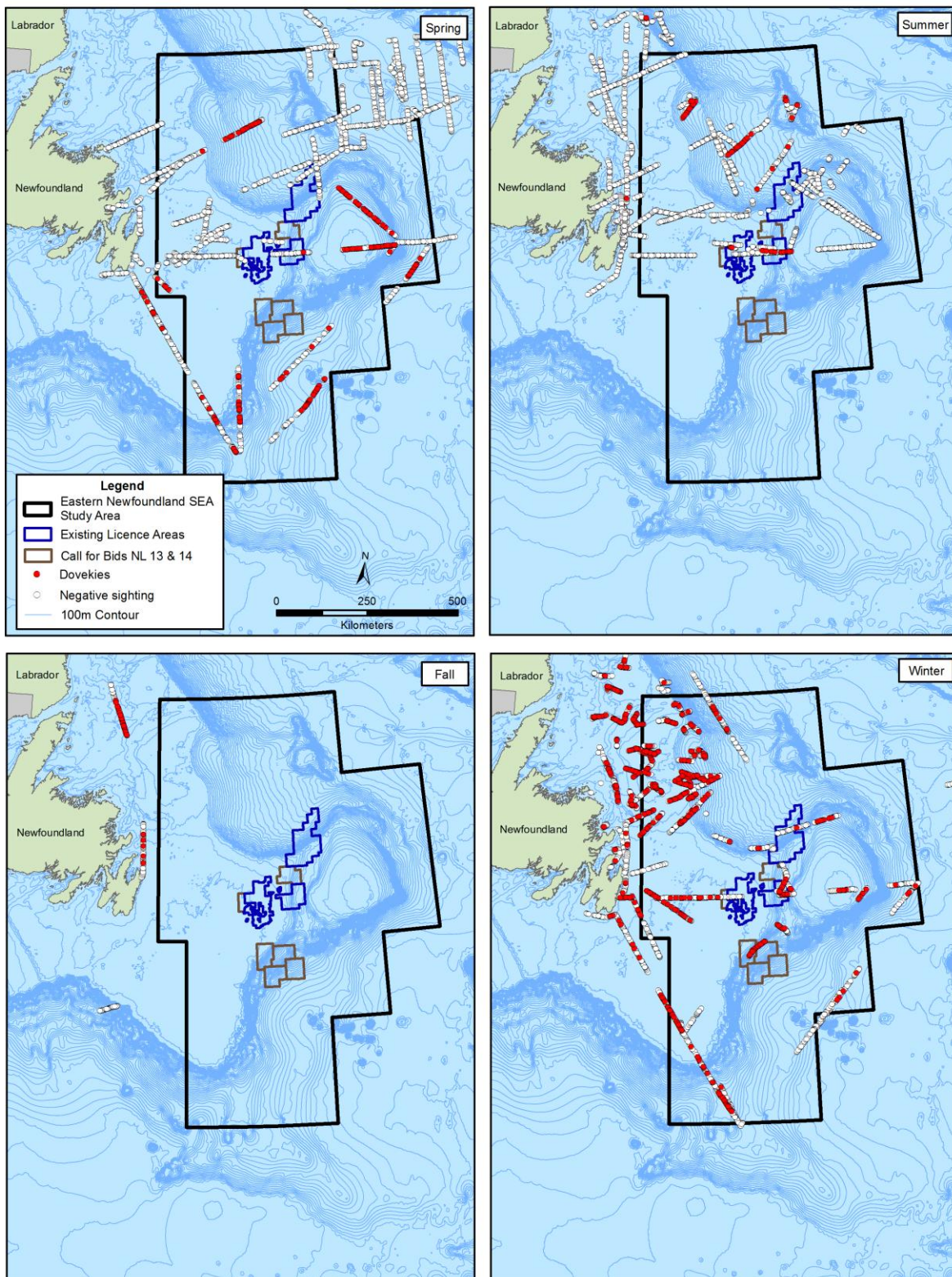


Figure 4.104 Seasonal Distribution of Murre Observations

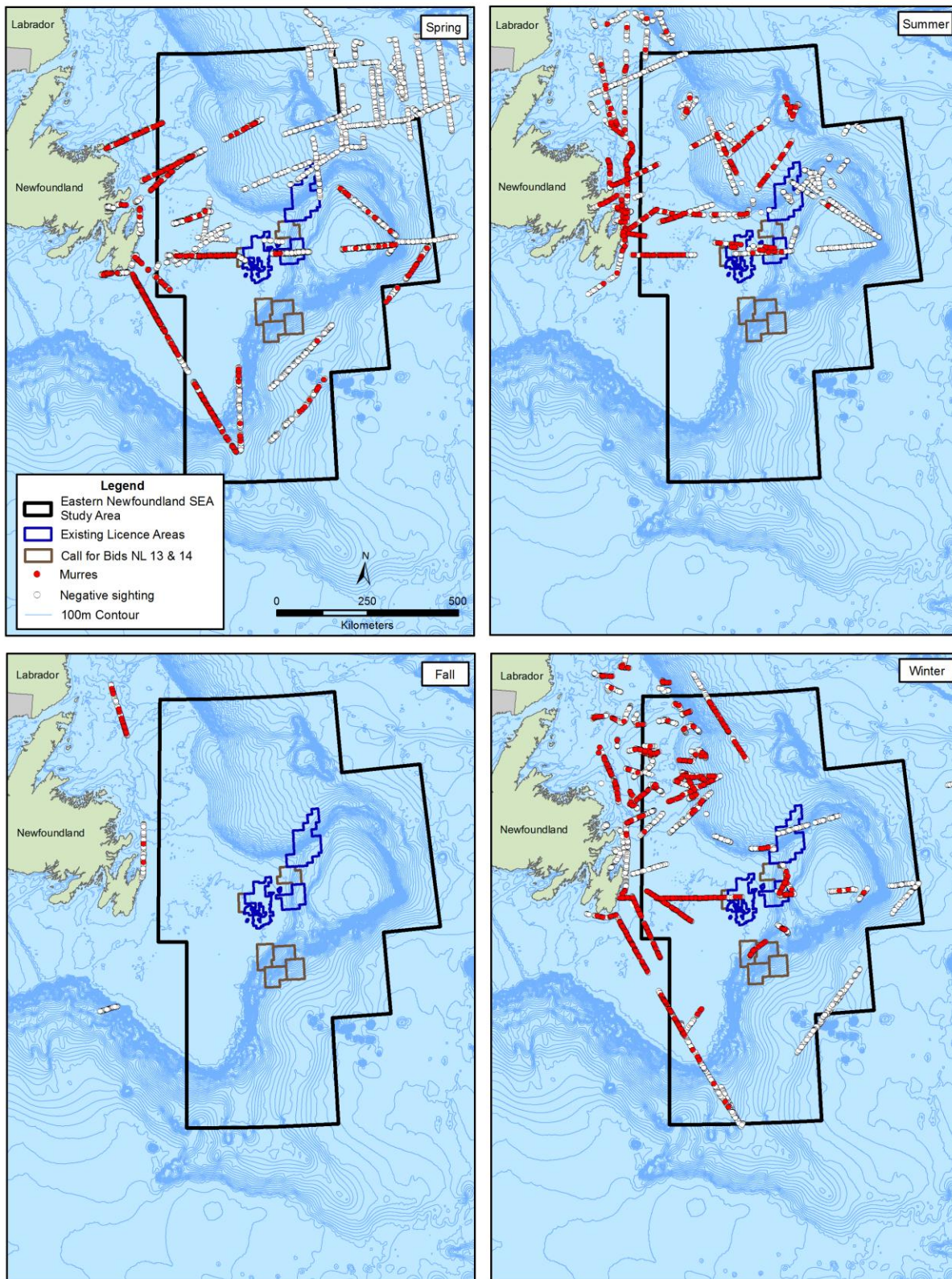
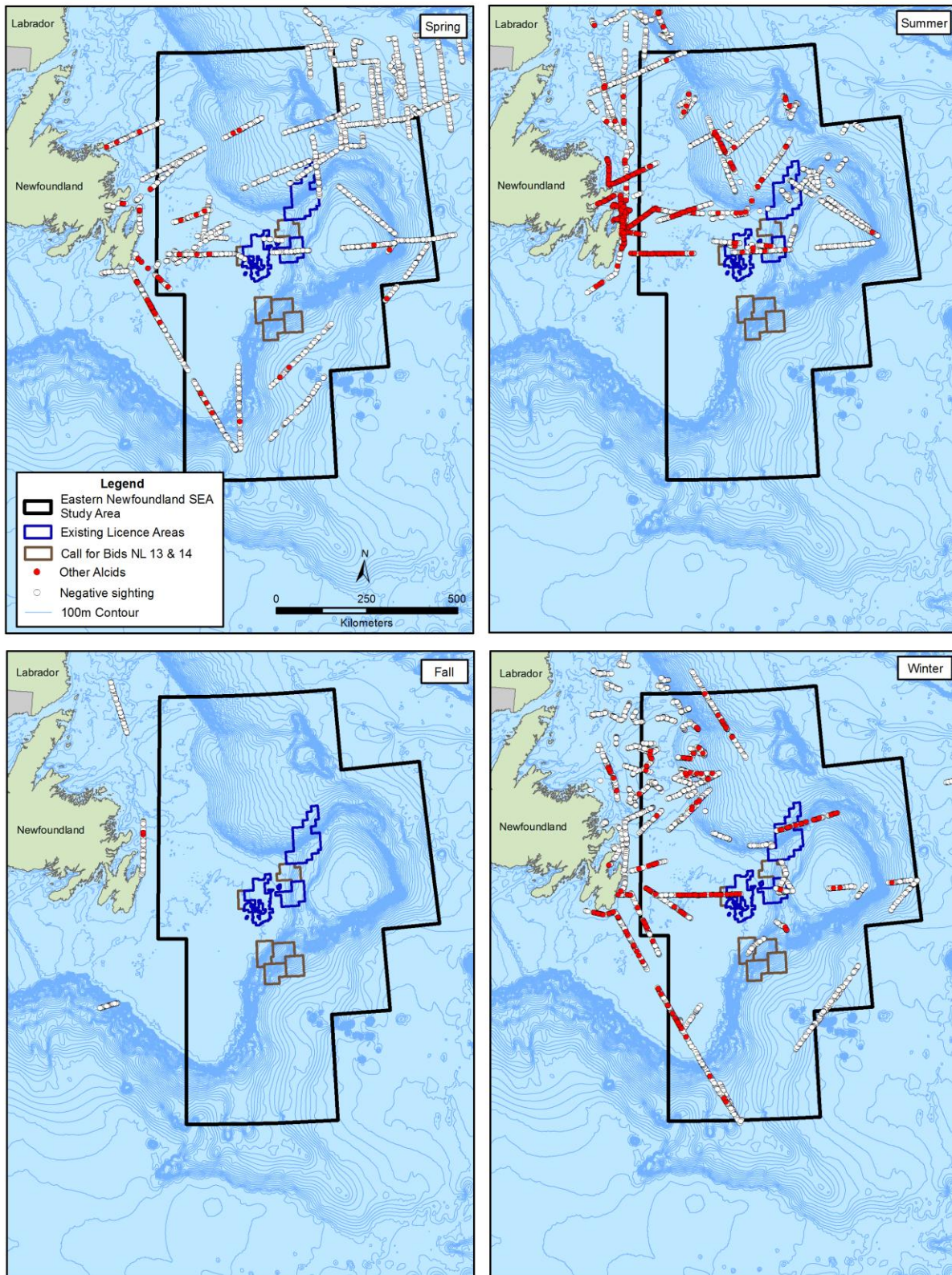


Figure 4.105 Seasonal Distribution of Other Alcids



Jaegers and Skuas

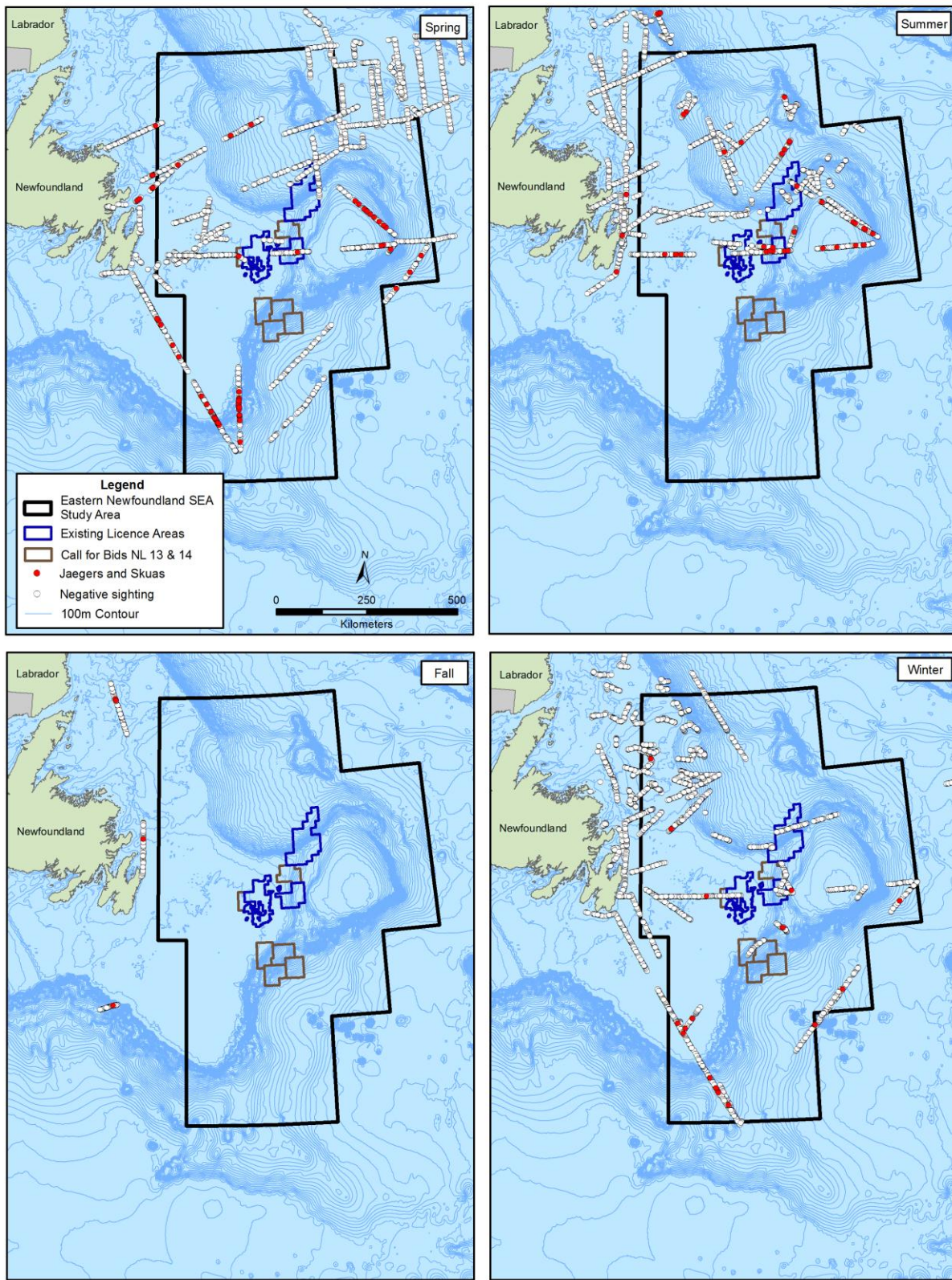
Jaegers and skuas are occasional visitors to the SEA Study Area. Five species occur with some regularity off Eastern Newfoundland (Table 4.76).

Table 4.76 Overview of Jaeger and Skua Species Occurring in the SEA Study Area

Jaegers and Skuas (<i>Stercorariidae</i>)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Five species occur in SEA Study Area: Pomarine Jaeger, Parasitic Jaeger, Long-tailed Jaeger, Great Skua and South Polar Skua. • High arctic breeders which are found in offshore waters the rest of the year. • Great and South Polar Skuas do not breed in Canada, but are occasionally seen in offshore waters of the northwest Atlantic. • Insufficient data exist to determine population trends for jaegers. All three species are estimated to have a population of over 100,000 – 200,000 adults in Canada. 	Wiley and Lee (1998, 1999, 2000); Environment Canada (2011)
Habitats and Movements	<ul style="list-style-type: none"> • Jaegers and skuas spend most of the year offshore, coming on land only during the summer months to breed. • Breed in Arctic tundra. 	Wiley and Lee (1998, 1999, 2000)
Reproduction	<ul style="list-style-type: none"> • Age at first breeding believed to be typically 4 years. • Clutch size: typically 2. • Egg-laying begins in late May to early June. Chick rearing takes place from mid-July until early September. • Number of fledglings per pair varies with factors such as parental experience and prey density; range is between approximately 0.5 - 1.5. 	Wiley and Lee (1998, 1999, 2000)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Frequently engage in kleptoparasitism, stealing food items from other seabirds, especially in winter; Long-tailed and Pomarine Jaegers largely predatory during breeding, feeding on lemmings and voles. 	Wiley and Lee (1998, 1999, 2000)

Jaegers and skuas are scarce or rare in the waters off Eastern Newfoundland, and with the exception of the Great Skua, they are absent in winter (Husky Energy 2000). Combined, jaegers and skuas are rarely observed but widespread throughout the SEA Study Area, and at least in the spring they appear to be somewhat more common along the continental shelf (Figure 4.106). They are high Arctic breeders, not known to breed in the SEA Study Area itself. Therefore, their populations are not considered highly vulnerable to the effects of offshore activities relative to some other seabird groups found in the SEA Study Area.

Figure 4.106 Seasonal Distribution of Jaeger and Skua Observations



Fulmars and Shearwaters

Four members of the shearwater family occur in the SEA Study Area. Table 4.77 presents information on the habits, habitats and key life history characteristics of these species in the SEA Study Area.

Table 4.77 Overview of Fulmar and Shearwater Species Occurring in the SEA Study Area

Fulmars and Shearwaters (<i>Procellariidae</i>)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> Northern Fulmar and three shearwater species, Great Shearwater, Sooty Shearwater and Manx Shearwater, occur in the SEA Study Area. Cory's Shearwater is also known to occur off the southern Grand Banks. Wide-ranging at sea outside of the breeding season. Only the Northern Fulmar and Manx Shearwater nest in Canada; the other three shearwater species breed in the Southern hemisphere. Fulmar populations have shown little change in recent years, with a stable population of 300,000 – 400,000 individuals in Canada. Manx Shearwaters breed in one small colony of less than 20 pairs in southern Newfoundland. 	Lee and Haney (1996); Fifield et al 2009b; Environment Canada (2011); Mallory et al (2012); EC-CWS (2013)
Habitats and Movements	<ul style="list-style-type: none"> Spend most of the year in coastal and offshore waters, primarily along the continental shelf in temperate to cold water environments. Breed on islands, often on cliffs. 	Lee and Haney (1996); Mallory et al (2012);
Reproduction	<ul style="list-style-type: none"> Most shearwaters are burrow nesters, while fulmars nest on cliffs. Typically start to breed at 5-8 years, female fulmars generally older at first breeding. Northern Fulmar: egg laying begins in mid June, and chick rearing is from mid July to end of September. Manx Shearwater: egg laying begins in mid April; chick rearing is from mid June to end of October. Clutch size: 1. Number of fledglings per pair per season ranges from 0.28 - 0.62 	Lee and Haney (1996); Mallory et al (2012)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> Shearwaters feed by pursuit plunging, while fulmars are typically surface feeders. Feed on fish, offal, squid. 	Lee and Haney (1996); Mallory et al (2012);

Northern Fulmar is considered common in the waters off Eastern Newfoundland year-round (Husky Energy 2000). They are primarily an Arctic-nesting species, but within this region they breed on Funk Island, Baccalieu Island, the Witless Bay Islands, Cape St. Mary's and Ship Island (EC-CWS 2013). In the winter months, fulmars were more abundant in the SEA Study Area than at other times of year, with densities generally between 2 and 5 birds / km² (Fifield et al 2009b). In the spring, summer and fall months, fulmars were most abundant on the continental slope in the southern Orphan Basin, as well as the tail and nose of the Grand Banks, and were less abundant in nearshore waters (Fifield et al 2009b; Figure 4.107).

Great and Sooty Shearwaters are common in the summer and fall months, uncommon in spring, and reportedly absent in winter (Husky Energy 2000). Manx Shearwater is also reportedly absent in the area in the winter, and scarce the rest of the year (Husky Energy 2000), and there are very few known breeding sites for this species in North America, including one small colony on Middle Lawn Island (EC-CWS 2013). In the spring, the ECSAS survey data showed that shearwaters were most abundant on the Grand Banks, particularly in the southeastern portion (Fifield et al 2009b). In the summer and fall, shearwaters are considerably more common overall in the SEA Study Area, and were particularly abundant on the east and northeast Grand Banks (Fifield et al 2009b; ECSAS Database 2013). In contrast to Husky Energy (2000), ECSAS surveys report small numbers of shearwaters in the winter months in the SEA Study Area on the Grand Banks (Fifield et al 2009b; Figure 4.108). Shearwaters are known to be strongly attracted to artificial light sources including flaring (Weise et al 2001).

Figure 4.107 Seasonal Distribution of Northern Fulmar Observations

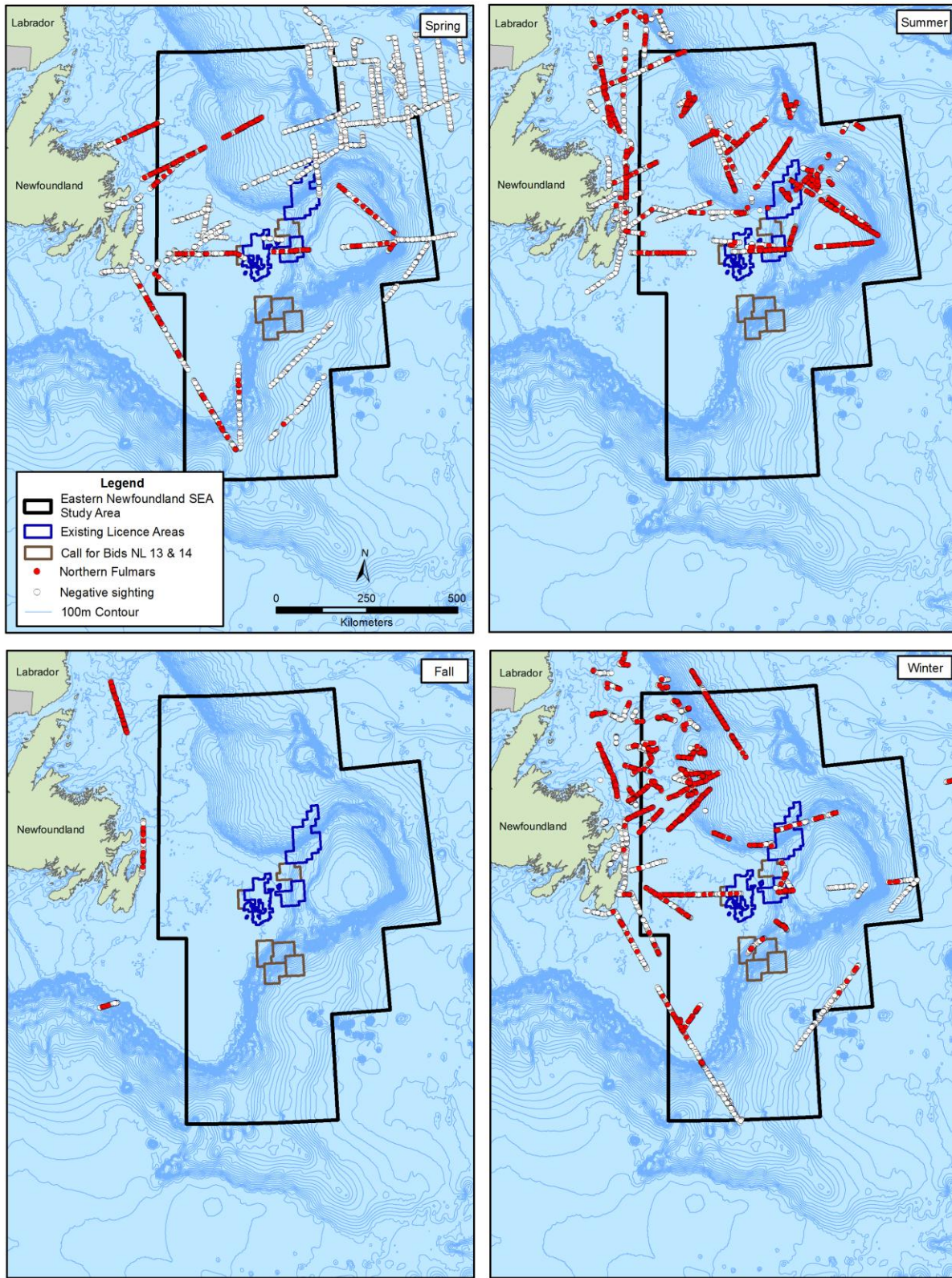
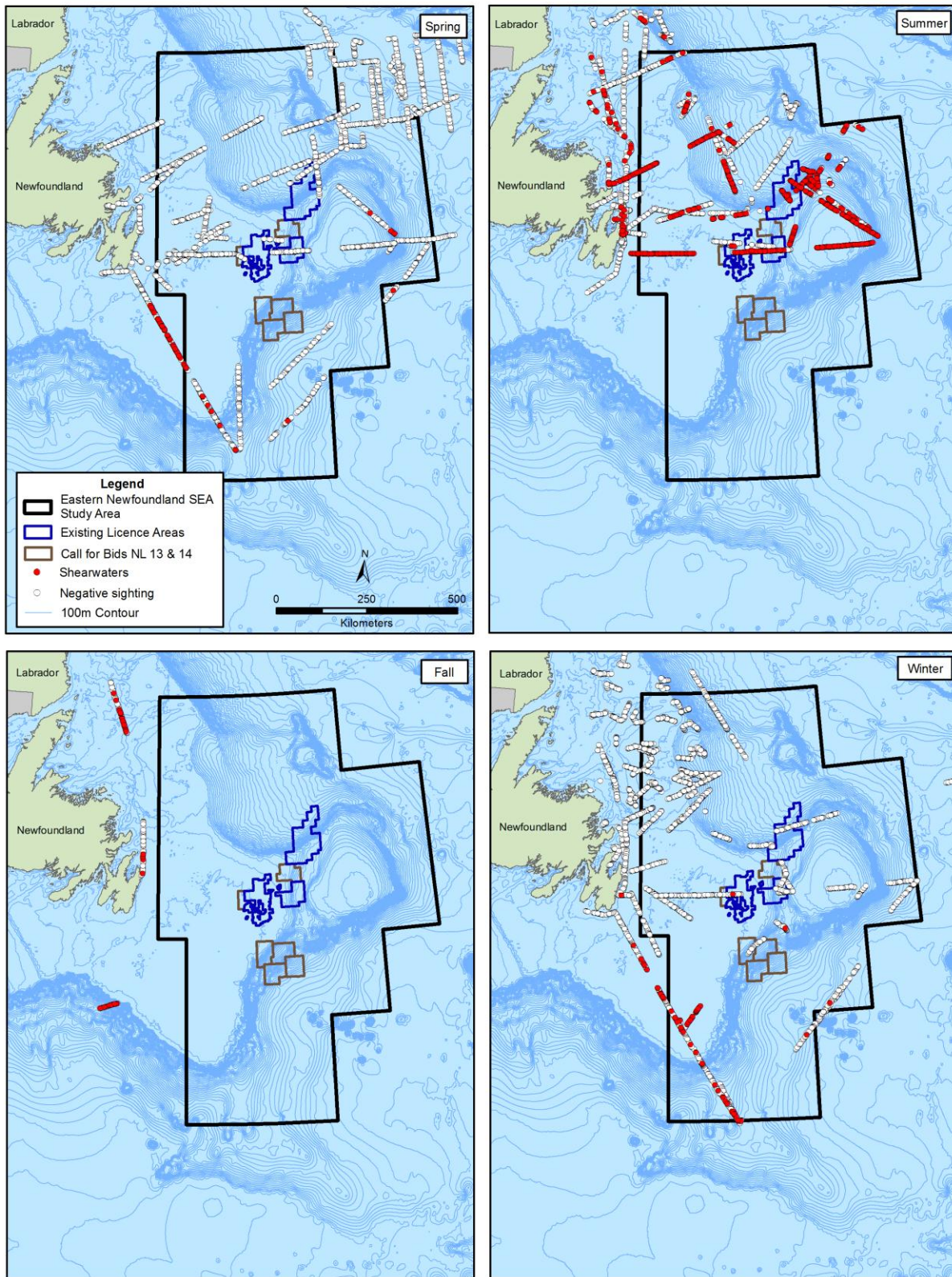


Figure 4.108 Seasonal Distribution of Shearwater Observations



Storm-petrels

Two species of storm-petrel (which are small relatives of shearwaters) are found in the SEA Study Area (Table 4.78).

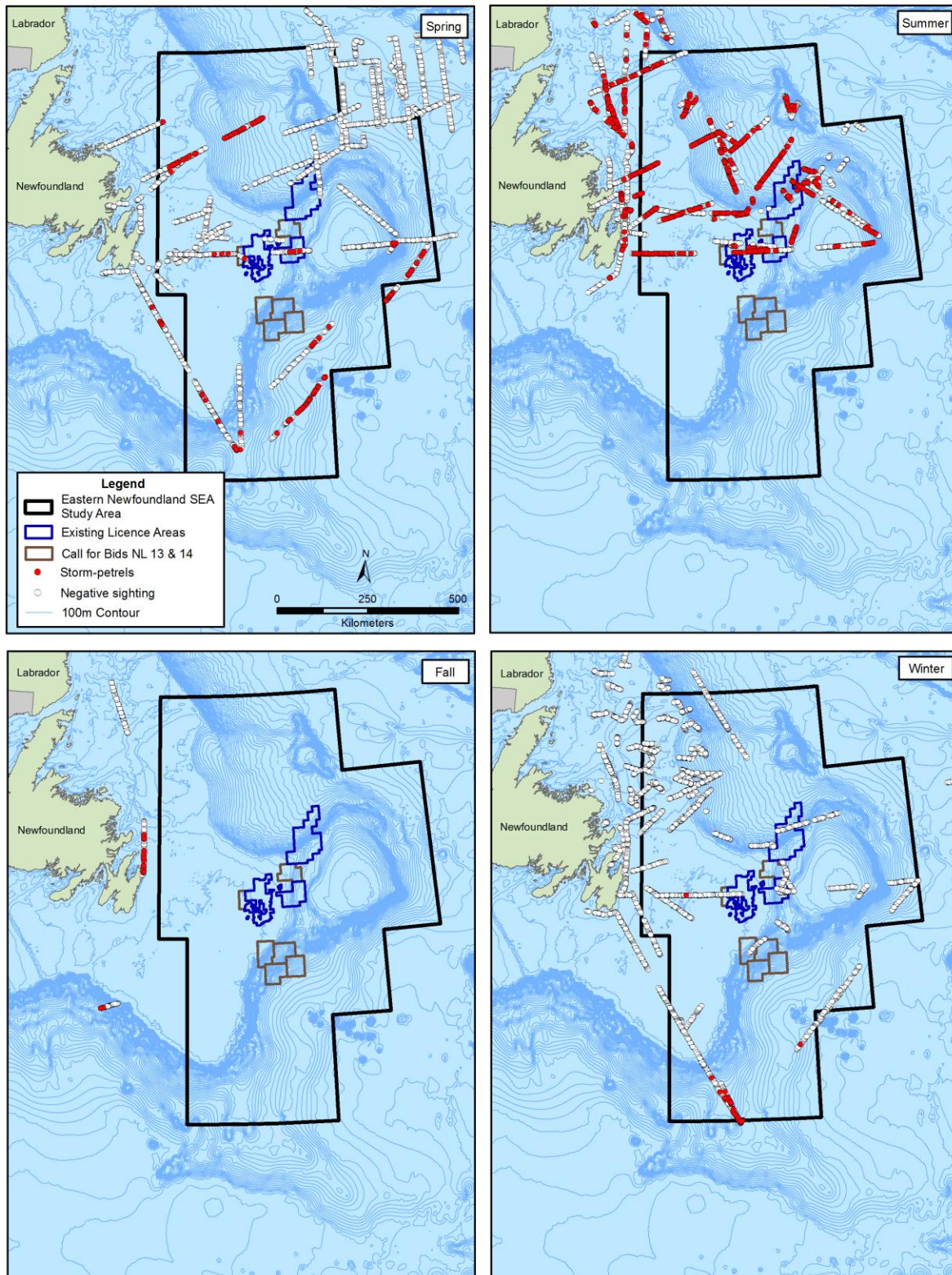
Table 4.78 Overview of Storm-petrels Occurring in the SEA Study Area

Storm-petrels (<i>Hydrobatidae</i>)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Two species in SEA Study Area, Leach’s Storm-petrel and Wilson’s Storm-petrel. • Among the smallest of seabirds, both species are dark in colour with a white rump and with a decidedly bat-like flight. • Only Leach’s breeds in Canada; Wilson’s is an Antarctic breeder. • While there are insufficient data to assess population trends, there are over 10 million breeding Leach’s Storm-petrels in Canada. 	Huntington et al (1996); Fifield et al (2009b); Environment Canada (2011)
Habitats and Movements	<ul style="list-style-type: none"> • Breed on offshore islands • Nocturnal at the breeding colony, and are seldom seen from land. • Highly pelagic; even during breeding season, returns to land only at night. 	Huntington et al (1996); Fifield et al (2009b)
Reproduction	<ul style="list-style-type: none"> • Nests in burrows in offshore islands. • Age at first breeding typically breed in fifth year. • Clutch size: 1. • Egg-laying begins in early June. Chick rearing takes place from mid-July until late October. • Fledging success in Newfoundland estimated at 48 percent. 	Huntington et al (1996)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Surface feeders, hovering over the surface while gleaning prey items. • Often follow ships and fishing boats (particularly Wilson’s) • Feed on zooplankton, small crustaceans. 	Huntington et al (1996)

Wilson’s Storm-petrels are rare to uncommon spring and summer visitors to Eastern Newfoundland and are absent in fall and winter. Leach’s Storm-petrels are reportedly absent in winter and common for the rest of the year (Husky Energy 2000). In recent ECSAS surveys, storm-petrels were largely absent in the winter months, but present to the south of the tail of the Grand Banks (Figure 4.109), and were found in relatively low numbers in spring where the highest concentrations off the Newfoundland coast were to the south and east of the Grand Banks (Fifield et al 2009b). In the summer, storm-petrels were much more common in the SEA Study Area, particularly in the Orphan Basin and along the northern edge of the Flemish Cap, while in the fall, the highest densities were east of the Grand Banks and at the continental shelf break to the south of the Tail of the Bank (Fifield et al 2009b; Figure 4.109).

Over five million pairs of Leach’s Storm-petrels breed on the eastern coast of Newfoundland, most on Baccalieu Island and the Witless Bay Islands (EC-CWS 2013). The former colony is home to more than a third of the world’s population of the species (Fifield et al 2009b).

Figure 4.109 Seasonal Distribution of Storm-Petrel Observations



4.2.2.2 Coastal Waterfowl, Loons and Grebes

Waterfowl, loons, and grebes spend much of their time on the water’s surface. Although loons and grebes are not waterfowl, they have fairly similar life histories and therefore similar vulnerabilities to offshore development. They have therefore been combined in this section.

Broadly, waterfowl may be categorized as dabbling ducks (primarily inland breeders) and diving ducks (most of which are considered “sea ducks” as they spend much of the non-breeding season at sea).

Table 4.79 presents information on the habits, habitats and key life history characteristics of waterfowl (including loons and grebes) in the SEA Study Area.

Table 4.79 Overview of Coastal Waterfowl, Loons and Grebes Occurring in the SEA Study Area

Waterfowl (Anatidae), Loons (Gaviidae), Grebes (Podicipedidae)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> The Common Loon, Pied-billed Grebe and at least fourteen species of waterfowl breed in Newfoundland, and over twenty species occur in the SEA Study Area during at least part of the year. Populations of inland-breeding duck species surveyed by CWS (American Black Duck, Mallard, Green-winged Teal and Ring-necked Duck) are considered stable throughout Eastern Canada. Available information indicates that sea duck populations are stable; however, because most sea ducks breed in remote areas, population trends are relatively poorly known. The Common Eider is the most abundant waterfowl species in all seasons in coastal Newfoundland 	Lock et al (1994); CWS Waterfowl Committee (2012); Warkentin & Newton (2009); IBA 2012
Habitats and Movements	<ul style="list-style-type: none"> Most nest inland on freshwater lakes and rivers; some (e.g. American Wigeon, Blue-winged Teal, Northern Shoveler, Pied-billed Grebe) nest in estuaries. Common Eider breeds in colonies on coastal islands. In the fall, many species aggregate at staging areas Many species spend winter months offshore in the study area (e.g. scoters, mergansers, Common Goldeneye, Long-tailed Duck, Common Eider). 	IBA 2012; Lock et al 1994
Reproduction	<ul style="list-style-type: none"> Loons, grebes and sea ducks typically have lower reproductive rates compared with inland duck species. 	CWS Waterfowl Committee (2012); Warkentin & Newton (2009)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> The main foraging strategies of this group are diving and dabbling (surface-feeding). 	Warkentin & Newton (2009)

A great diversity of breeding waterfowl occur in the Bay du Nord Wilderness Reserve and Middle Ridge Wildlife Reserve, including American Black Duck, Canada Goose, Green-winged Teal, Common Goldeneye and Common Merganser (IBA 2013).

Sea ducks (White-winged Scoters, Surf Scoters, Black Scoters, Long-tailed Ducks and Common Eiders) occur in large flocks (“rafts”) in coastal waters from autumn to spring (Lock et al 1994). The Witless Bay Islands are particularly important to sea ducks in the fall months, and large wintering congregations of up to 25,000 eiders can be seen between the Cape Freels coastline and nearby Wadham Islands. Other major wintering areas for Common Eider and other sea ducks include Grates Point, Cape St. Francis, Mistaken Point, Cape St. Mary’s and Placentia Bay. Small numbers of Barrow’s Goldeneye have been reported wintering in Eastern Newfoundland at Port Blandford and Newman Sound in Terra Nova National Park, as well as Traytown Bay, St. Mary’s Bay, and Spaniard’s Bay (Schmelzer 2006).

Harlequin Duck is thought to breed in the Bay du Nord Wilderness Reserve (IBA 2013). In late summer to fall, a small moulting concentration congregates at Cape St. Mary’s (IBA 2013), one of just three such sites in Newfoundland. In the winter, Harlequin Ducks are found along rocky coastline, subtidal ledges, and exposed headlands, including the waters off Cape St. Mary’s (IBA 2013; NLDEC 2013a).

4.2.2.3 Shorebirds

Shorebirds in the SEA Study Area are most abundant during fall migration, particularly from July to mid-October, when Arctic-nesting species migrate through the area en route to their wintering areas. Many species utilize coastal habitats such as sandy mudflats, and exhibit foraging strategies such as foraging at the water’s edge, on flats exposed at low tide, or while wading in shallow water.

Table 4.80 presents information on the habits, habitats and key life history characteristics of shorebird species in the SEA Study Area.

Table 4.80 Overview of Shorebird Species Occurring in the SEA Study Area

Shorebirds (Scolopacidae, Charadriidae)	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • At least 28 species of shorebirds pass through Eastern Newfoundland during fall migration. Commonly seen migrants include White-rumped Sandpiper, Greater Yellowlegs, Semipalmated Plover, Sanderling, American Golden-plover, Semipalmated Sandpiper, Whimbrel and Black-bellied Plover. Other species reported less frequently in the area include Dunlin, Hudsonian Godwit, Ruddy Turnstone, Least Sandpiper, Buff-breasted Sandpiper and the endangered <i>rufa</i> subspecies of Red Knot. Purple Sandpiper and Ruddy Turnstone are present in the winter months. • Small numbers of shorebirds breed in Newfoundland, including the Least Sandpiper, Spotted Sandpiper, Greater Yellowlegs, Semipalmated Plover, Piping Plover and Killdeer. The endangered Piping Plover’s nesting range is concentrated in the western and southwestern portions of the Island, but they have 	Warkentin & Newton (2009); Elphick and Tibbitts (1998); Nebel and Cooper (2008); Environment Canada (2009)

Shorebirds (Scolopacidae, Charadriidae)	Summary	Reference(s)
	recently been found breeding in Eastern Newfoundland.	
Habitats and Movements	<ul style="list-style-type: none"> • Shorebirds are generally long distance migrants, and most species that occur in the study area nest in the far north. • Most species that do nest in Newfoundland tend to breed close to inland freshwater bodies; the Greater Yellowlegs will nest in estuaries and tidal flats • Spring and fall migration routes differ; in Atlantic Canada, greater numbers of most species are seen during fall migration. 	Morrison (2001); Warkentin & Newton (2009)
Reproduction	<ul style="list-style-type: none"> • Most species typically lay four eggs. Incubation lasts approximately three weeks. • Chicks are relatively precocious, leaving the nest within 24 hours of hatching, although they are unable to fully thermoregulate for the first few days. 	Warkentin & Newton (2009); Morrison (2001)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Most shorebirds feed in tidal mudflats, probing the sand with their long bills. • Some species (e.g. Whimbrel) feed on berries in coastal barrens. The Purple Sandpiper feeds on small invertebrates (e.g. mollusks) along rocky shorelines and offshore ledges and islands. 	Warkentin & Newton (2009)

Newfoundland does not host a high proportion of fall migrating shorebirds along the Atlantic Flyway, and the west coast of Newfoundland hosts the greatest proportion of migrating shorebirds within the province. However, results from the Atlantic Canada Shorebird Survey indicate that considerable numbers of shorebirds do stop along the eastern coast of the Island during their fall migration, particularly on the eastern side of the Avalon Peninsula (Witless Bay, Renewals, Long Beach, St. Shotts, Spaniard’s Bay, Bellevue Beach) as well as Cape Freels and Cape Bonavista (Environment Canada 2009). In the winter months, generally from November to April, Purple Sandpipers are present along rocky shorelines and offshore ledges and islands along the coast, including at Cape Spear, Witless Bay, Ferryland, Cape St. Francis and Mistaken Point in Eastern Newfoundland (IBA 2013; Environment Canada 2009). In 2013, the endangered Piping Plover, which nests on sandy shorelines, was found to be breeding in Deadman’s Bay Provincial Park near the northwest head of Bonavista Bay. A small number of Ruddy Turnstones also overwinter at Mistaken Point, far north of the species’ usual wintering grounds.

4.2.2.4 Other Birds, Including Passerines

Newfoundland is home to many breeding landbirds, most of which are migratory (Warkentin and Newton 2009). Although most of these species do not occur in the marine environment for most of the year, certain species of landbirds feed in coastal habitats (e.g. Savannah Sparrow, Short-eared Owl, some raptor species). In addition, during migration, many species fly long distances over water. In particular, passerines are primarily nocturnal migrants that are known to be attracted to artificial light sources including flares, particularly in inclement weather conditions (e.g. fog).

Terra Nova National Park, with its variety of coniferous and mixed forest, wetland and coastal habitats, is an area of particular importance to landbirds in Eastern Newfoundland in terms of both abundance and diversity (IBA 2013). This area supports populations of forest bird subspecies that have small ranges, the Ovenbird *furvoir* subspecies, the provincially vulnerable Gray-cheeked Thrush (minimus subspecies) and the federally and provincially endangered Red Crossbill *percna* subspecies. IBA (2013) provides a non-exhaustive list of some of the many landbird species that breed in the Park, including Black-backed Woodpecker, Boreal Owl, Ruby-crowned Kinglet, Northern Goshawk, Yellow-bellied Flycatcher and a number of warbler species (American Redstart, Black-throated Green Warbler, Magnolia Warbler, Mourning Warbler, Ovenbird, Palm Warbler and Tennessee Warbler).

4.2.2.5 Bird Species at Risk

A number of marine bird species that are at risk and are therefore protected under the Canadian *Species at Risk Act* (SARA) and/or the Newfoundland and Labrador *Endangered Species Act (NL ESA)* are known or likely to occur in the SEA Study Area and may be at risk of interactions with oil and gas activities. These include the: 1) Harlequin Duck; 2) Barrow's Goldeneye; 3) Ivory Gull; 4) Red Knot (*rufa* subspecies); 5) Piping Plover; 6) Peregrine Falcon; 7) Gray-cheeked Thrush; 8) Olive-sided Flycatcher; and 9) Short-eared Owl. In addition, species that may occur in the SEA Study Area that have been assessed by COSEWIC as being of conservation concern (but do not have formal protection under SARA) include the: 1) Buff-breasted Sandpiper; 2) Bank Swallow; and 3) Bobolink. These species are discussed below and summarized in Table 4.81.

Landbird species at risk that do not migrate over the offshore area, or that migrate during the day (and therefore are unlikely to be vulnerable to disorientation from marine artificial lighting), are not included here. The Red Crossbill (*percna* subspecies) is a year-round resident species inhabiting forests (Environment Canada 2006), and is not considered likely to occur in the Eastern Newfoundland Offshore Area. The Rusty Blackbird breeds throughout Newfoundland and may migrate over the offshore area, but as a diurnal migrant (Baird and Nisbet 1960). Other species at risk that may migrate over the offshore area but are not considered here because they are diurnal migrants are the Chimney Swift (Cink and Collins 2002) and Barn Swallow (Brown and Bomberger Brown 1999).

- *Harlequin Duck*: The eastern population of this species is listed as a species of special concern under SARA, and is considered vulnerable under the *NL ESA*. The Harlequin Duck breeds in fast-flowing streams; there is evidence to suggest that the Bay du Nord River in Southeastern Newfoundland may support nesting Harlequins. A few moulting individuals regularly congregate at Cape St. Mary's, one of only three such sites in Newfoundland (Parks Canada 2012). In the winter, they are found along rocky coastline, subtidal ledges, and exposed headlands, often remaining very close to shore (Goudie and Ankney 1986), including the waters off Cape St. Mary's. A small number of non-breeding individuals may be found here year round (Environment Canada 2007).
- *Barrow's Goldeneye*: Listed as a species of special concern and vulnerable under the *SARA* and *NL ESA*, respectively, the species moults and winters in small numbers, often in groups with Common Goldeneye, off the coast of Eastern Canada. Small numbers of Barrow's Goldeneye have been reported wintering in Eastern Newfoundland at Port Blandford and Newman Sound in Terra Nova National Park, as well as Traytown Bay, St. Mary's Bay, and Spaniard's Bay (Schmelzer 2006). These birds are known to congregate in relatively small geographic areas in important shipping corridors, and therefore the population is considered to

be particularly vulnerable to being affected by oil spills and the bioaccumulation of environmental contaminants (NLDEC 2013a).

- *Ivory Gull*: This species is listed as endangered under the federal and provincial legislation. It breeds in the far north and winters offshore, occurring in small numbers in the waters off Eastern Newfoundland (Ryan et al 2006). They are found most often among the pack ice, and are more rarely seen on the coast of the Northern Peninsula and ashore (Stenhouse 2004).
- *Piping Plover*: Listed as endangered under SARA and the NL ESA, the recovery plan for this species identifies a number of critical habitat beaches, including sites in the southern and southwestern part of Newfoundland, notably the Grand Bay West to Cheeseman Provincial Park IBA and Shallow Bay and Western Brook Beach in the Gros Morne IBA (Environment Canada 2012b). In 2013, Piping Plover nests were found in eastern Newfoundland at Deadman's Bay Provincial Park, near the northwest head of Bonavista Bay. Piping Plovers nest on sandy shorelines above the high water mark, and are present at the breeding grounds from April to September (Boyne and Amirault 1999).
- *Red Knot (rufa subspecies)*: This species is currently listed as endangered under SARA and NL ESA, and has been sighted in several coastal Newfoundland locations. Red Knot sightings have been reported around almost the entire coast of Newfoundland. However, most have been seen on the west coast of the Island, with the majority of sightings being at Stephenville Crossing, Shallow Bay (Belldowns Point), Sandy Point and St. Paul's Inlet (Garland and Thomas 2009; Parks Canada 2012). During fall migration, from August 1st to October 31st, they frequent open sandy inlets, coastal mudflats, sand flats, salt marshes, sandy estuaries and areas with rotting kelp deposits (Garland and Thomas 2009; Baker et al 2013). In the Atlantic Canada Shorebird Survey, they are considered an occasional species during fall migration at Cape Freels (Environment Canada 2009). In general, however, Newfoundland is not considered to be a major stopover location, and so within the province threats to the species are considered unlikely to be severe (Garland and Thomas 2009).
- *Buff-breasted Sandpiper*: This species was recently assessed as a species of special concern by COSEWIC (2012c), but is not currently listed on Schedule 1. During fall migration surveys, they are typically observed in more upland grassy areas such as golf courses and airports (Campbell and Gregory 1976), but small numbers of this species have been observed in coastal areas during the Atlantic Canada Shorebird Survey. They are considered an occasional species at St. Shott's Sod Farm near the southern shore of the Avalon Peninsula and at Cape Bonavista (Environment Canada 2009), and it is considered to be a rare fall migrant in the province (COSEWIC 2012c).
- *Peregrine Falcon*: Listed as a species of special concern under SARA (both *anatum* and *tundrius* subspecies) and vulnerable under NL ESA, this species migrates along the coast of Newfoundland during the fall (particularly the west coast) and preys on concentrations of migrating shorebirds (Parks Canada 2012; COSEWIC 2007). In Eastern Newfoundland, Peregrine Falcon sightings have been reported in the fall on the Bonavista Peninsula and at all times of year (but most frequently during the fall) on the Avalon Peninsula (e-Bird 2013).
- *Bank Swallow*: Assessed by COSEWIC as threatened, this colonial species nests in burrows. They frequently construct their burrows in banks created through coastal erosion, and therefore

may be located in close proximity to the marine environment during the breeding season. They are diurnal migrants (Garrison 1999). Within the province, Bank Swallows nest primarily in southwestern Newfoundland (Warkentin and Newton 2009); however, sightings have been reported in Eastern Newfoundland (e-Bird 2013).

- *Gray-cheeked Thrush*: Considered vulnerable under *NL ESA*, this species occurs in suitable dense coniferous forest habitat throughout insular Newfoundland (Lowther et al 2001). It is most common on the Northern Peninsula and along the northeast coast, as well as the northern Avalon Peninsula (Endangered Species and Biodiversity Section 2010). It has also been reported in Placentia Bay (Endangered Species and Biodiversity Section 2010) and is reportedly breeding in Terra Nova National Park (IBA 2013).
- *Olive-sided Flycatcher*: Listed as threatened under both *SARA* and *NL ESA*, this species is found in boreal forest habitat, particularly open areas such as wetlands with tall trees and snags, and migrates to south and central America to overwinter (Altman and Sallabanks 2012). It breeds throughout insular Newfoundland as well as Southern Labrador (COSEWIC 2007), and in Eastern Newfoundland it has been reported at several locations on the Avalon Peninsula as well as at Terra Nova National Park (e-Bird 2013).
- *Bobolink*: Assessed as threatened by COSEWIC, the Bobolink nests in agricultural and natural grasslands. In the fall, they migrate to wintering grounds in South America; like most passerines, they are nocturnal migrants (Pettingill 1983). Breeding has been reported in western Newfoundland at Codroy Valley IBA (IBA 2013), and there have been sightings in eastern Newfoundland on the Avalon Peninsula and Terra Nova National Park in the summer months (e-Bird 2013).
- *Short-eared Owl*: This species, listed as being of special concern under *SARA* and vulnerable under *NL ESA*, occurs in low numbers on the coast of Newfoundland where it typically nests in coastal barrens and grasslands (Schmelzer 2005). Suitable habitat occurs in much of coastal Southeastern Newfoundland, and sightings of this species have been reported throughout the eastern portion of the Island from Wadham Islands to the Avalon Peninsula, mainly in June and July (Schmelzer 2005; e-Bird 2013).

Several additional marine-associated avian species at risk in Eastern Canada, Roseate Tern and Eskimo Curlew, are not considered likely to occur in the SEA Study Area. Within North America, the Roseate Tern breeds in Southern Nova Scotia and the Northeastern United States, and winters further south (Gochfeld et al 1998). The Eskimo Curlew once bred in large numbers in the Arctic and passed through Newfoundland and Labrador on its migration to the South American wintering grounds in the fall. However, the species' numbers have declined sharply, and there have been no confirmed sightings of the Eskimo Curlew since 1963 (and the species is therefore considered to possibly be extinct) (COSEWIC 2009b).

Table 4.81 Bird Species at Risk that are Known to or May Occur within the SEA Study Area

Common Name	Scientific Name	Population/Occurrence	Provincial Designation	SARA Listing			COSEWIC Assessment
				Endangered	Threatened	Special Concern	
Barrow's Goldeneye	<i>Bucephala islandica</i>	Québec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador	Vulnerable			Schedule 1	Special Concern
Harlequin Duck	<i>Histrionicus histrionicus</i>	Québec, New Brunswick, Nova Scotia, Newfoundland and Labrador	Vulnerable			Schedule 1	Special Concern
Ivory Gull	<i>Pagophila eburnean</i>	Newfoundland and Labrador	Endangered	Schedule 1			Endangered
Piping Plover (<i>Melodus</i> subspecies)	<i>Charadrius melodus melodus</i>	Québec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador	Endangered	Schedule 1			Endangered
Red Knot (<i>Rufa</i> subspecies)	<i>Calidris canutus rufa</i>	Québec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador	Endangered	Schedule 1			Endangered
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Yukon, Northwest Territories, Nunavut, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Nova Scotia, Newfoundland and Labrador					Special Concern
Peregrine Falcon	<i>Falco peregrinus anatum</i> and <i>tundrius</i>	Yukon, Northwest Territories, Nunavut, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Newfoundland and Labrador	Vulnerable			Schedule 1	Special Concern
Bank Swallow	<i>Riparia riparia</i>	Yukon, Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador					Threatened
Gray-cheeked Thrush	<i>Catharus minimus</i>	Newfoundland (<i>minimus</i> ssp.)	Vulnerable				
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Yukon, Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island,	Threatened		Schedule 1		Threatened

Common Name	Scientific Name	Population/Occurrence	Provincial Designation	SARA Listing			COSEWIC Assessment
				Endangered	Threatened	Special Concern	
		Nova Scotia, Newfoundland and Labrador					
Bobolink	<i>Dolichonyx oryzivorus</i>	British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador					Threatened
Short-eared Owl	<i>Asio flammeus</i>	Yukon, Northwest Territories, Nunavut, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador	Vulnerable			Schedule 1	Special Concern

Locally Rare and Restricted Range Species

The Manx Shearwater has only recently been discovered nesting in North America, and the largest confirmed breeding colony on the continent (and the only colony in Newfoundland) is found on Middle Lawn Island (IBA 2013; EC-CWS 2013). Northern Gannets in Newfoundland breed in just three colonies: Funk Island, Baccalieu Island and Cape St. Mary’s (EC-CWS 2013). Terra Nova National Park supports a breeding population of the Newfoundland (*furvoir*) subspecies of Ovenbird, a migratory warbler species (IBA 2013).

4.2.2.6 Identified Important Times and Significant Bird Habitat Areas (Including IBAs)

Designated Important Habitat Areas

Areas of particular importance to the survival of bird species may be given the designation of Important Bird Area (IBA). The IBA program is coordinated by BirdLife International, and administered in Canada by the Canadian Nature Federation and Bird Studies Canada (IBA 2013). The criteria used to identify important habitat are internationally standardized, and are based on the presence of species at risk, species with restricted range, habitats holding representative species assemblages, or a congregation of a significant proportion of a species’ population during one or more season. These criteria are used to identify sites of national and international importance.

There are a total of 17 IBA sites in Eastern Newfoundland, in proximity to the SEA Study Area (IBA 2013), which are summarized in Table 4.82 and illustrated in Figure 4.110.

Table 4.82 Important Bird Areas (IBAs) in Eastern Newfoundland Near the SEA Study Area

IBA Name	Description and Significance
<i>Funk Island (NF004)</i>	<ul style="list-style-type: none"> Located approximately 60 km from shore in Northeastern Newfoundland, and with an area of 135.18 m², Funk Island supports a very large concentration of nesting seabirds, including a globally significant Common Murre population, as well as large numbers of Northern Gannets. Funk Island is also a provincially protected Seabird Ecological Reserve, and access to the island is restricted to persons conducting approved scientific research.
<i>Wadham Islands and adjacent Marine Area (NF013)</i>	<ul style="list-style-type: none"> Located 40 km from shore (15 km from Fogo Island), the Wadham Islands are composed of 7 main islands and several smaller rocks and shoals within a 159.23 km² area. This IBA supports a globally significant number of wintering Common Eiders (approximately 25,000 were recorded in a 1995 survey). Many seabirds nest on the Wadham Islands, including large numbers of Atlantic Puffin, Leach’s Storm-Petrel and Razorbill.
<i>Cape Freels Coastline and Cabot Island (NF025)</i>	<ul style="list-style-type: none"> Located at the head of Bonavista Bay and including several small islands and shoals offshore, this 334.48 km² IBA supports a large number of nesting Common Murres, and a few pairs of Razorbills. Atlantic Puffins have been reported as breeding here in the past, although none were recorded in recent EC-CWS surveys. As well, up to 25,000 wintering Common Eiders have been reported in the waters between the Cape Freels coastline and Wadham Islands.
<i>Terra Nova National Park (NF017)</i>	<ul style="list-style-type: none"> This large park (655.56 km²) is situated on the inner reaches of Bonavista Bay. Much of the area is forested, but there are numerous lakes and wetlands, and a significant coastal component. The Park supports numerous forest species, including two subspecies with restricted ranges: the federally-listed Red Crossbill (<i>percna</i> ssp.) and Ovenbird (<i>furvoir</i> ssp.). Shorebirds can be seen on the flats at the outlet of Big Brook, as well as Newman Sound. These areas are also frequented by gulls and waterfowl.

IBA Name	Description and Significance
	At least six tern colonies, totalling between 1000 and 1500 pairs, are known in the park; these colonies include both Common and Arctic Terns.
<i>Grates Point (NF019)</i>	<ul style="list-style-type: none"> This IBA, on the northern tip of the Bay de Verde Peninsula separating Trinity Bay from Conception Bay, has an area of 66.55 km² and supports a large number of wintering Common Eiders; typically around 2,800 individuals, although as many as 12,000 have been recorded. Other species frequenting this IBA in the winter include Black-legged Kittiwake, Thick-billed Murre and Dovekie. In the summer months, Atlantic Puffin and Northern Gannet are found in the area.
<i>Baccalieu Island (NF003)</i>	<ul style="list-style-type: none"> Located 5.5 km from the northern tip of the Avalon Peninsula, this IBA has an area of 45.22 km² and, like Funk Island, is a provincially designated Seabird Ecological Reserve. Baccalieu Island has the greatest species abundance and diversity in Eastern North America, and supports the largest known population of Leach's Storm-petrels in the world, including 70 percent of the North American population. Significant breeding populations of Atlantic Puffin, Black-legged Kittiwake and Northern Gannet also occur here, as well as smaller numbers of Common Murre, Thick-billed Murre, Razorbill, Black Guillemot, Northern Fulmar, Herring Gull and Great Black-backed Gull.
<i>Cape St. Francis (NF021)</i>	<ul style="list-style-type: none"> Located on the Avalon Peninsula at its northern tip, and with an area of 70.21 km², this IBA is a known congregating area for Common Eiders in the winters, with up to 5000 individuals recorded. As well, Purple Sandpipers regularly occur along the rocky shoreline in the wintertime.
<i>Quidi Vidi Lake (NF022)</i>	<ul style="list-style-type: none"> This lake is situated within the St. John's city limits, and is fed by the Virginia River and Rennie's River. The IBA has an area of 7.0 km². From late fall to early spring, the lake is important as a daytime resting site for gulls, including significant numbers of Herring, Great Black-backed, Iceland, Glaucous and Common Black-headed Gulls. Ring-billed, Mew and Lesser Black-backed Gulls have also been recorded on occasion. Waterfowl including American Black Ducks, Mallards and Northern Pintails are common here in the winter, subsisting on food handouts from people.
<i>Witless Bay Islands (NF002)</i>	<ul style="list-style-type: none"> This IBA, which has a total area of 62.08 km² and includes four small islands off the east coast of the Avalon Peninsula, is also a provincially designated Seabird Ecological Reserve. These islands support a globally significant colony of breeding seabirds, including more than half of the eastern North American population of Atlantic Puffins, as well as large numbers of Leach's Storm-petrels, Common Murres, Black-legged Kittiwakes and Herring Gulls. Great Black-back Gulls, Northern Fulmars, Thick-billed Murres, Razorbills and Black Guillemots also nest in smaller numbers. Most of the colonies are located on Great Island, Gull Island and Green Island; the smaller Pee Pee Island hosts small colonies of Herring Gull and Great Black-Backed Gull, along with a small number of Puffins. During the fall migration, the surrounding marine area is important to sea ducks including White-winged Scoter, Surf Scoter, Long-tailed Duck and Common Eider.
<i>Mistaken Point (NF024)</i>	<ul style="list-style-type: none"> Located near the southeastern corner of the Avalon Peninsula, Mistaken Point has an area of 102.77 km² and is a provincially designated Ecological Reserve because of its rich fossil deposits. This IBA is an important wintering area for Common Eiders, with as many as 12,000 birds recorded. This area is also important for wintering shorebirds; the Purple Sandpiper occurs here in significant numbers, and small numbers of Ruddy Turnstone overwinter regularly at this site, far north of its usual wintering range. Black-legged Kittiwake, Common Murre and Razorbill breed at Mistaken Point.
<i>Cape St. Mary's (NF001)</i>	<ul style="list-style-type: none"> This IBA, also a provincial Seabird Ecological Reserve, has an area of 329.39 km² and is located at the entrance to Placentia Bay on the southwestern Avalon Peninsula. Significant numbers of Northern Gannet, Common Murre and Black-legged Kittiwake nest here, as well as smaller populations of Thick-billed Murre, Razorbill, Great Cormorant and Double-crested Cormorant. Herring Gull, Great Black-backed Gull and

IBA Name	Description and Significance
	Black Guillemot have also been reported nesting at Cape St. Mary's. In the winter, large numbers of migrating sea ducks occur here, including scoters, Common Eider, Long-tailed Duck and the Eastern Population of Harlequin Duck (SARA: Special Concern)
<i>Placentia Bay (NF028)</i>	<ul style="list-style-type: none"> This IBA, including the eastern half of Placentia Bay between the Avalon and Burin peninsulas in southeastern Newfoundland and extending out 25 km from shore, has a total area of 1398.05 km². It is an exceptional feeding area for seabirds during the summer capelin spawning season; more than 100,000 shearwaters have been recorded during a survey, consisting of mostly Greater and Sooty Shearwater, with smaller numbers of Manx Shearwater. Large numbers of other species breeding in nearby Cape St. Mary's feed here, including Northern Gannet, Black-legged Kittiwake, Atlantic Puffin, Thick-billed Murre and Common Murre. Pomarine and Parasitic Jaegers may also be found in large numbers, kleptoparasitizing foraging kittiwakes. In the winter, more than 1,000 Common Eiders regularly congregate in the area.
<i>Cape Pine and St. Shotts Barren (NF015)</i>	<ul style="list-style-type: none"> Located on the southern tip of the Avalon Peninsula, this 57.4 km² IBA attracts large, possibly globally significant numbers of American Golden-Plover during their fall migration (August to mid-October). Dozens of Whimbrel are also seen during fall migration.
<i>Corbin Island (NF030)</i>	<ul style="list-style-type: none"> Located at the southeast corner of the Burin Peninsula, this 5.25 km² IBA supports a colony of an estimated 100,000 Leach's Storm-petrels. Historically, colonies of Herring Gull, Great Black-backed Gull, Black Guillemot and Black-legged Kittiwake have also been reported.
<i>Middle Lawn Island (NF031)</i>	<ul style="list-style-type: none"> Off the southern tip of the Burin Peninsula, Middle Lawn Island is a small, rugged island within the 4.17 km² IBA. This island supports the largest, and one of the few, known colonies of Manx Shearwaters in North America. As many as 100 pairs have been reported breeding on the island, with another 300 non-breeding individuals estimated to occur. As well, large numbers of Leach's Storm Petrels breed on the island, and nesting Black Guillemot, Herring Gull and Great Black-backed Gull have been reported. Middle Lawn Island is part of the Lawn Islands Archipelago, which is a provisional Seabird Ecological Reserve.
<i>Green Island (NF032)</i>	<ul style="list-style-type: none"> Located midway between the Burin Peninsula and the French islands of St. Pierre and Miquelon, this IBA has an area of 5.61 km². It supports a large colony of Leach's Storm-petrels. Common and Arctic Terns have been reported breeding on this island, as well as very small numbers of Herring Gull. Spotted Sandpipers have been reported on the island during the summer months. While not confirmed, Manx Shearwaters and Black Guillemots are suspected to breed on the island.
<i>Bay du Nord Wilderness Reserve and Middle Ridge Wildlife Reserve (NF018)</i>	<ul style="list-style-type: none"> This large (3804.04 km²) IBA is composed of two large inland reserves in southeastern Newfoundland. It is an upland plateau with extensive barrens, heaths and wetlands, supporting several species of breeding waterfowl (including Canada Goose, American Black Duck, Green-winged Teal, Common Goldeneye and Common Merganser), and there is evidence that the Eastern Population of Harlequin Duck (SARA: Special Concern). may breed on Bay du Nord River. The Newfoundland (<i>welchii</i>) subspecies of Rock Ptarmigan, which is a restricted-range species, is believed to breed in small numbers in this IBA.
Source: Important Bird Areas of Canada (IBA 2013); Atlantic Canada Colonial Waterbird database (EC-CWS 2013)	

Environment Canada has designated several Migratory Bird Sanctuaries in Canada. These are protected by the *Migratory Bird Sanctuary Regulations* which prescribe rules and prohibitions regarding the taking, injuring, destruction or molestation of migratory birds or their nests or eggs in the

sanctuaries. Hunting of migratory species not permitted in any Migratory Bird Sanctuary. There is one Migratory Bird Sanctuary (MBS) in the area, the Terra Nova MBS, which is also an IBA.

Provincially, there are a number of protected Wilderness and Ecological Reserves including six designated Seabird Ecological Reserves, four of which are within the SEA Study Area (NLDEC 2013b). These sites, Witless Bay, Baccalieu Island, Cape St. Mary's and Funk Island, are also IBAs and have been discussed in Table 4.82. In 2009, the Lawn Islands Archipelago (which includes Middle Lawn Island) was named as a provisional Seabird Ecological Reserve, and as such has been afforded interim protection until the site assessment process has been completed (Government of NL 2009). The provincial *Seabird Ecological Reserve Regulations* prohibit or limit industrial development as well as certain activities that can cause disturbance to breeding seabirds, including limitations on hiking, boat traffic and low-flying aircraft near the colonies during the breeding season, and prohibition of ATVs at all times. Mistaken Point is also a designated Ecological Reserve because of its rich assemblage of fossils, and as such is afforded similar protection from development and off-road vehicles.

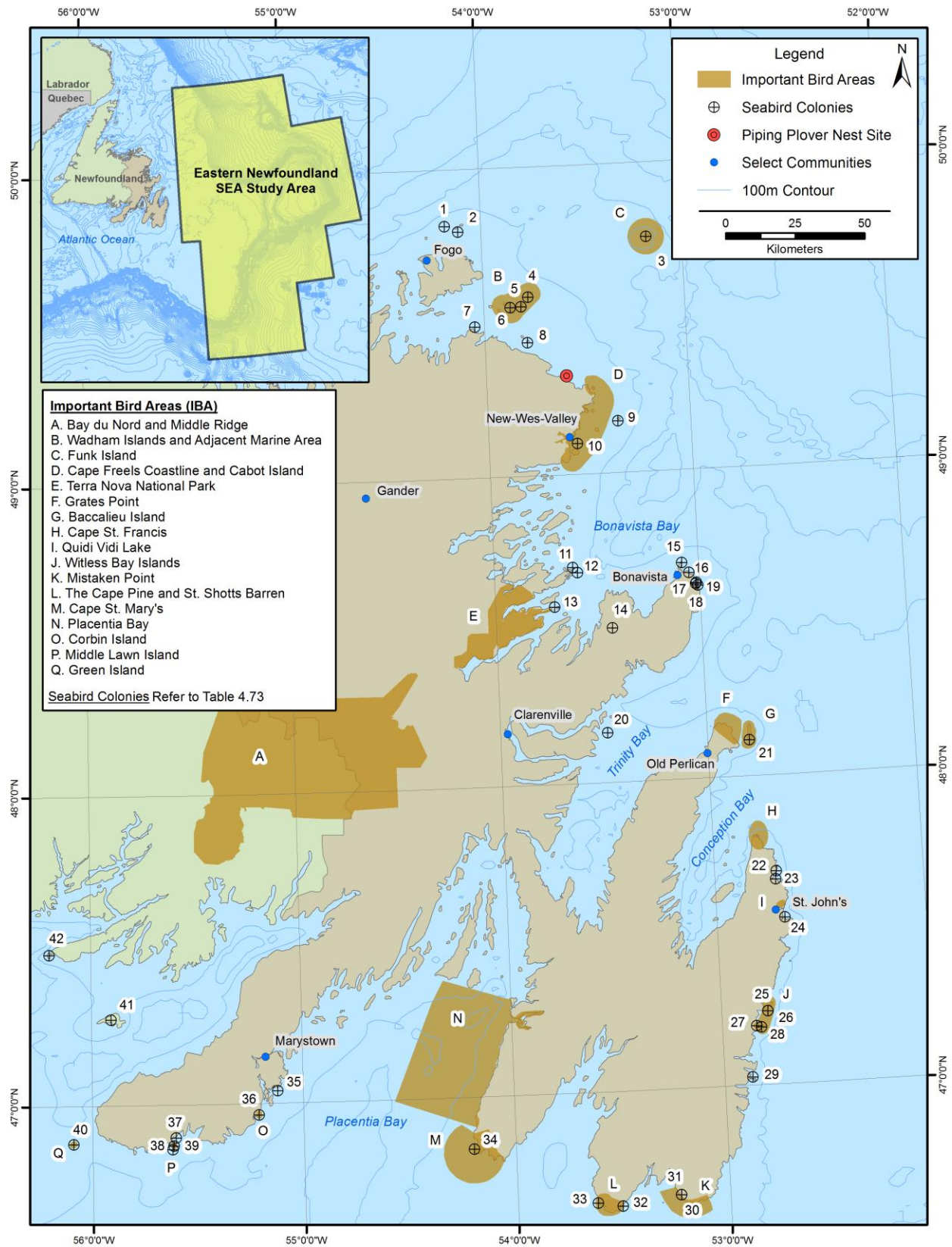
Other Important Habitat Areas

In addition to designated IBAs and MBSs, locations of colonial and rare species nesting sites as well as select areas of regional importance are also considered important. Breeding sites for colonial species and species at risk also constitute particularly important areas and habitats for marine birds. Figure 4.110 shows the locations of major seabird colonies in the SEA Study Area; these numbered colonies are summarized in Table 4.83. In addition to these major colonies, there are several smaller colonies along the eastern coast of Newfoundland that have not been included in the Table. In coastal surveys of insular Newfoundland conducted in 2005 - 2007, there were a total of 81 tern colonies (Common and/or Arctic Terns) in Eastern Newfoundland, totalling more than 10,000 individuals (Thomas et al n.d.). These surveys also recorded gull colonies, although due to constraints, the colony sizes were reported as range counts rather than numbers of individuals. In Eastern Newfoundland, there were 126 Herring Gull colonies, most of them small (1 - 100 individuals), but some with more than 1,000 individuals (Thomas et al n.d.). There were more than 100 Great Black-backed Gull colonies in Eastern Newfoundland (112 in total; mostly small colonies with 1 - 100 individuals), as well as several Ring-billed Gull (14 colonies, most of them medium-sized with 101 - 500 individuals) and Black-legged Kittiwake colonies (44 colonies, mostly small to medium-sized) (Thomas et al n.d.).

In 2013, evidence of Piping Plover nesting activity was observed at Deadman's Bay Provincial Park (Figure 4.110). While this site is not among the identified critical habitat beaches for the species (Environment Canada 2012b), the Piping Plover and its habitat are protected under SARA.

As discussed previously, a number of Ecologically and Biologically Significant Areas (EBSAs) have also been identified within the Placentia Bay Grand Banks Large Ocean Management Area. Among the criteria for selection and ranking of these important areas was their importance to marine birds and mammals in terms of biodiversity, density and importance to reproduction and survival. A discussion of key relevant characteristics of EBSAs that were identified as possessing important attributes to marine mammals and birds is provided later in this report. For seabirds, these are primarily important offshore feeding areas.

Figure 4.110 Important Bird Areas and Seabird Colony Locations



Seasonal Considerations

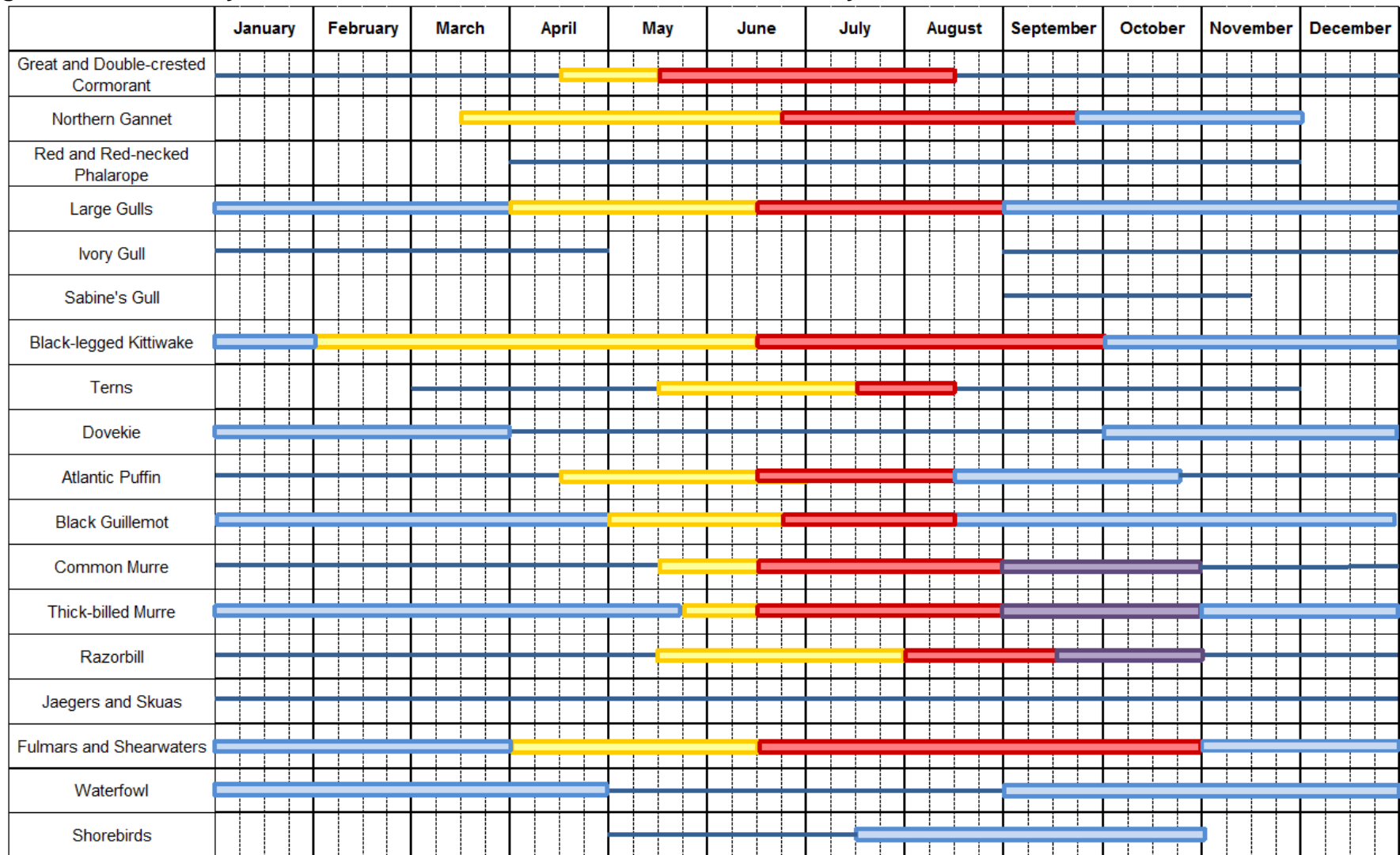
Figure 4.111 provides an overview of the seasonal patterns of abundance and life cycles of marine-associated bird species found in the SEA Study Area. Within this area, the Grand Banks region supports large concentrations of seabirds year-round (Fifield et al 2009), including species that breed on the eastern coast of Newfoundland and many non-breeding migrant seabirds. In the winter, it is the main wintering area for Dovekies and Thick-billed Murres (Lock et al 1994), and supports high concentrations of Black-legged Kittiwakes and other gulls, as well as Northern Fulmars and shearwaters (Fifield et al 2009). Throughout the year, but mainly in the summer and fall months (May to November), large numbers of Southern Hemisphere species such as Great and Sooty Shearwaters and Wilson's Storm-petrels arrive to feed in the area (Fifield et al 2009; Lock et al 1994). Shearwaters are particularly vulnerable in the early summer at the southernmost tip of the Grand Banks, the South-east Shoal, as moulting of their flight feathers takes place from May until late July, which impairs their ability to become airborne (Lock et al 1994). The northeast section of the Bank, which is also the location of the Jeanne D'Arc Basin oil production area, has a particularly high abundance of murres year-round, and in the spring, supports a high concentration of kittiwakes and large gulls, Dovekies, and Northern Fulmars (Fifield et al 2009). In the fall and winter, some of the highest observed densities of many seabird species are within the Orphan Basin, and the Flemish Cap and Pass areas are also considered hotspots for Black-legged Kittiwake, Dovekie, murres and Northern Fulmar (Fifield et al 2009).

During the summer breeding season, the greatest abundance of seabirds is concentrated around nesting colonies (Lock et al 1994). Seabirds are relatively long-lived, and in many species, individuals do not breed until four or five years of age. Large groups of non-breeding immature birds will tend to congregate in waters close to the breeding grounds and offshore.

Waterfowl that breed in coastal and estuarine environments in Newfoundland, particularly the colonial Common Eider, are particularly vulnerable in the summer months. In the fall staging period and in the winter, large numbers of wintering duck species such as eiders, scoters and mergansers are found in coastal waters. The Harlequin Duck and small numbers of Barrow's Goldeneye may be found in coastal waters outside of the breeding season.

In the late summer and fall months, from early August to late October, migratory species that nest in Newfoundland move southward to their wintering grounds. Many species migrate over the SEA Study Area, and those that migrate at night are vulnerable to disorientation from or collision with artificial light sources, including flares. As well, from July to October, many shorebird species utilize coastal habitats (e.g., sandy mudflats, salt marshes and river outlets) during their migration. Purple Sandpipers and a small number of Ruddy Turnstones are present on rocky shorelines and islands in the winter months.

Figure 4.111 Summary of Seasonal Patterns of Bird Presence in the SEA Study Area



- Present at colony in Eastern Newfoundland
- Chick rearing period
- Flightless birds (dependent young and/or moulting adults) at sea
- Common in SEA Study Area and Eastern Newfoundland coastal areas
- Present in SEA Study Area and Eastern Newfoundland coastal areas

Table 4.83 Estimated Number of Breeding Pairs of Seabirds at Marine Colonies in Eastern Newfoundland

Nesting Areas and Important Bird Areas ¹	Colony # (Refer to Figure) ²	Fulmars and Shearwaters		Storm-Petrels	Gannet	Gulls				Terns	Alcids (Auks)				
		N Fulmar	Manx Shearwater	Leach's Storm-petrel	N Gannet	Herring Gull	Great Black-backed Gull	Ring-billed Gull ³	Black-legged Kittiwake	Common and Arctic Terns ³	Common Murre	Thick-billed Murre	Razor bill	Black Guillemot ⁴	Atl Puffin
Storehouse Islets	1			100		1 - 100 ³	1 - 100 ³			48					
Little Fogo Islands	2			38,000		506	67		110		15		265	290	12,015
<i>Funk Island</i>	3	85			9,043	150	75		100		470,000	250	200		2,000
Small Island, Wadham Island	4			1,038			1 - 100 ³						273		6,190
Coleman Island	5			5,000			1 - 100 ³	101 - 500 ³		85			10		950
Pigeon Island (NDB)	6									28					120
Ladle Island	7			20		1 - 100 ³	1 - 100 ³								
Penguin Island, South	8			7,800		101 - 500 ³	1 - 100 ³			80					1,500
<i>Cabot Island, South</i>	9					1 - 100 ³	1 - 100 ³				10,000		4		
Pound Island	10			1,000		101 - 500 ³	1 - 100 ³								
Shag Islands	11			1,700						200					
Little Denier Island	12			1,300		1 - 100 ³	1 - 100 ³		101 - 500 ³						1,000
Copper Island	13			10		1 - 100 ³	1 - 100 ³								
Green Island, Trinity Bay	14					>1000 ³	1 - 100 ³	101 - 500 ³							1,277
Cape Bonavista, uni E. of	15														120
Spillars Point	16								501 - 1000 ³						250
North Bird Island	17					101 - 500 ³			1 - 100 ³						1,000
Elliston Point Island	18					101 - 500 ³									400
Bird, South	19			50		101 - 500 ³	1 - 100 ³		1 - 100 ³						1,000
Duck Island, Trinity Bay	20					101 - 500 ³									3,000
<i>Baccalieu Island</i>	21	13		4,623,911	2,157	180	9		5,096		1,440	73	1,500	143	75,000
Flatrock	22								1,644						

Nesting Areas and Important Bird Areas ¹	Colony # (Refer to Figure) ²	Fulmars and Shearwaters		Storm-Petrels	Gannet	Gulls				Terns	Alcids (Auks)				
		N Fulmar	Manx Shearwater	Leach's Storm-petrel	N Gannet	Herring Gull	Great Black-backed Gull	Ring-billed Gull ³	Black-legged Kittiwake	Common and Arctic Terns ³	Common Murre	Thick-billed Murre	Razor bill	Black Guillemot ⁴	Atl Puffin
Torbay	23								115						
Freshwater Bay	24								2,747						
<i>Gull Island, Witless Bay</i>	25	7		170,000		1,881	33		4,530		3,496		294	2	140,429
<i>Green Island, Witless Bay</i>	26	1		20		100	20		2,188		250,000	242	170		9,300
<i>Pee Pee Island, Witless Bay</i>	27					present	present								1,850
<i>Great Island, Witless Bay</i>	28	10		134,000		1,640	28		6,710		4,656		117	3	174,500
Ship Island	29	10				101 - 500 ³	1 - 100 ³								
The Drook	30														50
<i>Mistaken Point</i>	31								4,170		84		72		
Cape Pine Head	32								575		9		189		259
Western Head	33										27		7		
<i>Cape St. Mary's</i>	34	9			14,696				10,000		15,484	1,000	100		
Iron Island	35			10,000		101 - 500 ³	1 - 100 ³								
<i>Corbin Island</i>	36			100,000		1 - 100 ³									
Swale Island	37			88											
<i>Middle Lawn Island</i>	38		13	8,773		1 - 100 ³									
Lawn Island, Offer	39			224		1 - 100 ³	1 - 100 ³								
<i>Green Island, Fortune Bay</i>	40			103,833											
Brunette Island (north of Harbour Breton)	41					1 - 100 ³	1 - 100 ³						50		
Pass Island	42			100			1 - 100 ³		1 - 100 ³						

Notes: Data obtained from the Atlantic Canada Colonial Waterbird database maintained by Environment Canada - Canadian Wildlife Service (EC-CWS 2013) unless otherwise noted.
 1. Bird colonies in *italics* are IBAs. 2. Colony # corresponds to the numbered seabird colonies in Figure 4.110
 3. Data obtained from Thomas et al (n.d.). These numbers are reported as individual birds, not breeding pairs. Common and Arctic Terns are combined, as the two species cannot be reliably distinguished from aerial surveys.
 4. Black Guillemot numbers are likely to be underestimates due to the loose colony distribution and solitary nature of the species.

4.2.3 Marine Mammals and Sea Turtles

Over 20 marine mammal and sea turtle species are known to occur with some degree of frequency in the waters off Eastern Newfoundland, many of which are considered to be at risk or otherwise of special conservation concern. A number of Ecologically and Biologically Significant Areas have also been identified in the SEA Study Area, due in part to their known importance to a number of marine mammal species (Templeman 2007).

4.2.3.1 Mysticetes

Six species of the cetacean suborder Mysticetes (the baleen whales) have been reported in the waters off Eastern Newfoundland. These large whales are characterized by having plates of baleen (instead of teeth), which filter food items from seawater. Baleen whales are opportunistic feeders that migrate into the waters of the SEA Study Area for a limited amount of time, feeding on aggregations of relatively specific prey species (plankton and krill, or small schooling fish such as capelin). As these prey species are densely aggregated and have variable distribution and abundance, the presence of these cetaceans is temporally and spatially variable.

Baleen whales are typically solitary or clustered in small groups called pods. Within their pods, baleen whales are social, and acoustic communication (vocalizations and other underwater sounds) is critical to maintaining complex social structures. They are sensitive mainly to low to moderate-frequency sounds around the 10 Hz - 30 kHz range (Richardson et al 1995; National Research Council 2003).

The Tables that follow summarize key life history and habitat information for each of the species of baleen whales that do or may occur in the SEA Study Area.

Table 4.84 Overview of the North Atlantic Right Whale

North Atlantic Right Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Adult North Atlantic right whales average 13-16 m in length and 40,000 to 70,000 kg in weight. • Concentrated in the western North Atlantic, but may occur further east to Europe. • Considered to be the most endangered large whale in the world, with approximately 300-350 individuals remaining. • Endangered (SARA Schedule 1). 	COSEWIC (2003a); Kraus et al (2001)
Habitats and Movements	<ul style="list-style-type: none"> • Generally found in waters with surface temperatures ranging from 8-15°C, in areas that are 100-200 m deep. • Shifts in the distribution and abundance of their primary prey items can dramatically affect right whale distribution within their range. 	COSEWIC (2003a); Kenney (2001)
Reproduction	<ul style="list-style-type: none"> • Mean age at first reproduction is 10 years for females and is likely similar for males. • Gestation period is unknown; may be >12 months. • Interval between births typically 3 - 5 years (mean: 3.7). 	COSEWIC (2003a)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Plankton feeders. The primary prey item of the North Atlantic Right whale is the copepod <i>Calanus finmarchicus</i>, which they capture by filtering seawater through the baleen plates in their mouths. 	Kenney (2001)

North Atlantic Right Whales are known to aggregate in five seasonal habitat areas along the east coast of North America, all of which are south of Newfoundland (COSEWIC 2003a). In Canada, they can be found in the Bay of Fundy from June-November, with peak abundance in August to early October, and in the Roseway Basin south of Nova Scotia from July to November. Right whales are only rarely sighted in the SEA Study Area, and none were observed during aerial surveys conducted in 2007 in the areas off Eastern and Southern Newfoundland (Brown et al 2009; Lawson and Gosselin 2009). Occurrences are therefore likely to be extremely rare in the Eastern Newfoundland Offshore Area.

Table 4.85 Overview of the Humpback Whale

Humpback Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Adult humpback whales average 13-16 m in length with females growing larger than the males. • It has unusually long pectoral flippers. • Known for its surface displays and breaching acrobatics. • Western North Atlantic Population: Special Concern (SARA, Schedule 3). 	COSEWIC (2011a); IWC (2002)
Habitats and Movements	<ul style="list-style-type: none"> • Highly migratory, with seasonal movements between temperate to arctic feeding areas and low-latitude breeding areas. • In the North Atlantic, six distinct feeding areas: Gulf of Maine, Gulf of St Lawrence, Newfoundland and Labrador, West Greenland, Iceland and North Norway. • One common breeding area located in the West Indies. • Often sighted singly or in groups of two or three, except during breeding and feeding times, where groups can be as large as 15 individuals. 	IWC (2002); Lesage et al (2007)
Reproduction	<ul style="list-style-type: none"> • Average age at sexual maturity is 9 years. • Calving occurs between January and April after a gestation of approximately 12 months. • Inter-calving interval of 2 years. 	COSEWIC (2011a)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Humpback whales feed on small schooling fishes and krill. • They often feed cooperatively in groups and have been observed using specialized feeding techniques such as bubble net feeding. 	COSEWIC (2011a)

Humpback whales are considered to be relatively common within the SEA Study Area. Based on surveys conducted off Southern and Eastern Newfoundland in 2007, the abundance of humpback whales in these areas is estimated at 1,427 individuals (95 percent confidence range of between 952 and 2,140 individuals). These estimates are considered by the authors to be preliminary, however, as they have not been corrected for perception biases (Lawson and Gosselin 2009).

Table 4.86 Overview of the Blue Whale

Blue Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • The largest animal ever known to live, an adult blue whale can reach up to 30 m in length. • All populations have been exploited commercially. It is estimated the western North Atlantic stock to be on the order of a few hundred individuals. • Widely distributed throughout the world's oceans and 	COSEWIC (2002)

Blue Whale	Summary	Reference(s)
	<ul style="list-style-type: none"> occurs in coastal, shelf and oceanic waters. Atlantic Population: Endangered (<i>SARA</i> Schedule 1). 	
Habitats and Movements	<ul style="list-style-type: none"> In the western North Atlantic, blue whales occur in the Gulf of St. Lawrence and east of Nova Scotia in spring, summer and fall and off southern Newfoundland in winter. Usually occur alone or in small groups. Distribution during feeding seasons is largely dependent on the areas of high concentrations of their primary food item. 	Waring et al (2002); Leatherwood and Reeves (1983)
Reproduction	<ul style="list-style-type: none"> Mate and calve from late fall to mid-winter in Northern hemisphere. Age at sexual maturity: 5 - 15 years for both sexes. Gestation period 10 - 11 months. Interval between births is 2 - 3 years. 	COSEWIC (2002)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> The primary prey item of the blue whale is euphausiids. 	Yochem and Leatherwood (1985)

The North Atlantic population of blue whales was severely depleted by whaling, and sightings of this species anywhere within its range are quite uncommon. Sightings occur predominantly along the Quebec North Shore between Saguenay River and the Strait of Belle Isle, and along the southwest and eastern coasts of Newfoundland during winter and early spring (Sears et al 1990; Lesage et al 2007). Small numbers of blue whales (four sightings totalling six individuals) were observed during aerial surveys off the South and East Newfoundland coasts in the summer of 2007 (Lawson and Gosselin 2009).

Table 4.87 Overview of the Fin Whale

Fin Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> Adult fin whales average 18-20 m in length. Lower jaw is white on the right side while the left side is gray or black. One of the fastest whales on earth and nicknamed “the greyhound of the sea”, the fin whale can sustain speeds of up to 37km/h and burst speeds of over 40km/h. Atlantic population: Special Concern by <i>SARA</i> (Schedule 1) and COSEWIC. 	COSEWIC (2005)
Habitats and Movements	<ul style="list-style-type: none"> Widely distributed in all the world’s oceans but typically occur in temperate and polar regions. Appear to have complex seasonal movements and are likely seasonal migrants. Mate and calve in temperate waters during winter but migrate to northern latitudes during the summer to feed. Occur in coastal and shelf waters, as well as in oceanic waters. Observed alone or in pairs but groups of up to 20 individuals are often seen on feeding grounds 	Gambell (1985); COSEWIC (2005)
Reproduction	<ul style="list-style-type: none"> Average age of sexual maturity: 6-7 years for males 7-8 years for females. 	COSEWIC (2005)

Fin Whale	Summary	Reference(s)
	<ul style="list-style-type: none"> • Conception and calving typically in winter. • Average 2.7 years between births. 	
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • The primary prey of the fin whale is small schooling fishes such as capelin, as well as krill. 	Kenney (2001)

The fin whale is common in the Grand Banks, particularly during the summer months, and its distribution is associated with the presence of abundant food supply (e.g. capelin). Based on surveys conducted off Southern and Eastern Newfoundland in 2007, the abundance of fin whales in the area is estimated at 890 individuals (95 percent confidence range of between 551 and 1,435 individuals). Again, these estimates are considered by the authors to be preliminary and likely negatively biased, as they have not been corrected for perception biases (Lawson and Gosselin 2009).

Table 4.88 Overview of the Sei Whale

Sei Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Adult sei whales can reach up to 18 m in length. • A relatively tall sickle shaped dorsal fin that may appear simultaneously as the blow, as seen from the surface. • Atlantic population considered Data Deficient by COSEWIC. 	COSEWIC (2003b)
Habitats and Movements	<ul style="list-style-type: none"> • Migrate between tropical to subtropical latitudes in winter and temperate and subpolar latitudes in summer, staying mainly in water temperatures of 8 - 18°C. • Winter distribution seems to be widely dispersed and is not fully mapped; summer distribution is highly variable, but in the western North Atlantic, generally north of southern Nova Scotia. • Typically occur in offshore, pelagic habitats; appear to be associated with the continental shelf edge in the northwest Atlantic. • Highly mobile and are known to make unpredictable movements. • Not considered deep divers. 	Reilly et al (2008a); COSEWIC (2003b)
Reproduction	<ul style="list-style-type: none"> • Reach sexual maturity at 5 to 15 years of age; mean age at first reproduction has apparently decreased since the 1930s. • Gestation period 10.5 - 12 months. Conception and birth typically occur in winter months. • Calving interval of 2 - 3 years. 	COSEWIC (2003b)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Diet includes copepods, euphasids and small fish. 	COSEWIC (2003b)

Although it has a relatively wide distribution overall, this species is considered uncommon in the Eastern Newfoundland Offshore Area. An assessment of stocks in the Northwest Atlantic indicated two main concentrations, one off southern Nova Scotia and one in the Labrador Sea (Mitchell and Chapman 1977). Just one sei whale was observed during aerial surveys conducted off Eastern Newfoundland in 2007 (Lawson and Gosselin 2009).

Table 4.89 Overview of the Minke Whale

Minke Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Adult minke whales average 7-10 m in length, the smallest of the baleen whales. • Like most whale species, females are larger. • White band on each flipper is diagnostic. • Assessed as Not at Risk by COSEWIC; populations are considered to be more secure than other baleen whales. 	ACS (2006); COSEWIC (2006b)
Habitats and Movements	<ul style="list-style-type: none"> • Cosmopolitan distribution that spans ice-free latitudes. Prefer colder waters. • Very little information on winter distribution; have been reported along the western North Atlantic south of 40 degrees latitude. • Migrate northward from calving grounds during spring and summer. • Appear to prefer shallow water (less than 200 m). • Relatively solitary; usually seen individually or in small groups of two or three. • Larger groups have been observed in areas of concentrated feeding. 	Stewart and Leatherwood (1985); Reilly et al (2008b); ACS (2006)
Reproduction	<ul style="list-style-type: none"> • Both sexes reach sexual maturity at about 7 to 8 years • Gestational period of 10-11 months • Produce calves every 2 years on average 	ACS (2006)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • The preferred prey items of the minke whale are sand lance and capelin, although other small schooling fishes likely make up a large part of their diet as well. Copepods and krill are also taken. 	Naud et al (2003); ACS (2006)

Minke whales are commonly observed on the Grand Banks in the summer, associated with the presence of their prey species (Piatt et al 1989). As with the other baleen whale species, minke whales are more common off Eastern Newfoundland than the west and southwest coasts of the Island (Kingsley and Reeves 1998). Based on surveys conducted off Southern and Eastern Newfoundland in 2007, the abundance of minke whales in the area is estimated at 1,315 individuals (95 percent confidence range of between 855 and 2,046 individuals), although again these estimates are considered by the authors to be preliminary and likely biased (Lawson and Gosselin 2009).

4.2.3.2 Odontocetes

The cetacean suborder Odontoceti includes toothed whales, dolphins and porpoises. Five species of larger toothed whales, three dolphin species and one porpoise have been reported in the waters off Eastern Newfoundland. Like baleen whales, the toothed whales have complex social structures and rely heavily on acoustic means of communication. Their auditory range is much higher than that of the mysticetes, from 200 Hz to as high as 200 kHz (National Research Council 2003). In addition to using sound for communication, many species of toothed whales use echolocation as a means to navigate and to locate prey (Richardson et al 1995).

The following Tables summarize key life history and habitat information for toothed whales, dolphins and porpoises that do or may occur in the SEA Study Area.

Table 4.90 Overview of the Sperm Whale

Sperm Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Largest of the toothed whales, growing to a length of approximately 20.5 m with a worldwide distribution. • Routinely dive to depths of hundreds of meters and may occasionally dive as deep as 3000 m. • Considered to be Not At Risk by COSEWIC. 	Rice (1989)
Habitats and Movements	<ul style="list-style-type: none"> • Range as far north and south as the edges of the polar pack ice, although they are most abundant in tropical and temperate waters where temperatures are higher than 15°C. • Distribution is linked to social structure; adult females and juveniles generally occur in tropical and subtropical waters, whereas adult males are commonly alone often occurring in higher latitudes outside of the breeding season. • Generally distributed over large areas that have high secondary productivity and steep underwater topography. 	Rice (1989); Best (1979); Watkins and Moore (1982); Arnbom and Whitehead (1989); Whitehead and Waters (1990)
Reproduction	<ul style="list-style-type: none"> • Females reach reproductive maturity at 7 to 13 years, males somewhat later. • Gestation is 14 to 16 months. • Interval between births is typically 3 to 6 years. 	Shirihai and Jarrett (2006)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • The primary prey item of the sperm whale is squid. 	Shirihai and Jarrett (2006)

Sperm whales were observed in small numbers in the waters off Eastern and Southern Newfoundland during aerial surveys conducted in the summer of 2007 (two and nine individuals, respectively; Lawson and Gosselin 2009). The species feeds in deep water and is likely to be found in such habitats, although researchers have also sighted sperm whales in shallow water and close to the coastline in Southern Newfoundland.

Table 4.91 Overview of the Northern Bottlenose Whale

Northern Bottlenose Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Adult northern bottlenose whales grow to approximately 10 m in length. • Pronounced beak that is white on males and grey on females. • Davis Strait-Baffin Bay-Labrador Sea population listed by COSEWIC as a species of Special Concern, while localized Scotian Shelf population considered endangered by SARA (Schedule 1) and COSEWIC. • Scotian Shelf population is believed to be non-migratory, while the Labrador population migrates north to south seasonally. 	COSEWIC (2011b)
Habitats and	<ul style="list-style-type: none"> • Live in deep water areas of the North Atlantic and are rarely found in waters less than 800 m deep. 	Gowans (2002)

Northern Bottlenose Whale	Summary	Reference(s)
Movements	<ul style="list-style-type: none"> • Capable of remaining submerged for over an hour. • Can be found in groups ranging in size from one to 20 individuals. • Two areas of abundance in the western North Atlantic: Davis Strait off northern Labrador and “the Gully” on the Scotian Shelf. 	
Reproduction	<ul style="list-style-type: none"> • Mate and give birth in April in the Labrador population. • Females reach reproductive age at 8 - 13 years, males somewhat earlier. • Single offspring produced every two years. 	COSEWIC (2011b)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • The primary prey item of the Northern bottlenose whale is deep water squid. 	Gowans (2002)

Northern bottlenose whales are known to occur in the Grand Banks, and were sighted in the waters off Eastern and Southern Newfoundland during aerial surveys conducted in 2007 (Lawson and Gosselin 2009). Any individuals of this species that are found in the SEA Study Area may be of either the Labrador (Davis Strait) population or the endangered Scotian Shelf population, although the latter is considered to be less wide-ranging (COSEWIC 2011b).

Table 4.92 Overview of the Killer Whale

Killer Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • Killer whales, also known as orcas, are large members of the dolphin family. They are black with distinct white patches on the chest, sides and above the eye. • Adult male killer whales can reach a length of 6-8 m while females can reach a length of 5-7 m. • Have tall dorsal fins that can reach a height of 2 m. • Northwest Atlantic / Eastern Arctic population assessed as Special Concern by COSEWIC. 	COSEWIC (2008)
Habitats and Movements	<ul style="list-style-type: none"> • Cosmopolitan and globally fairly abundant; have been observed in all oceans of the world. • Prefer warm waters but have been reported in cold waters as well. Not known to be reliably migratory. • The greatest abundance of killer whales is found within 800 km of major continents. • Often travel in close-knit matrilineal groups of a few to tens of individuals. 	Ford (2002); COSEWIC (2008)
Reproduction	<ul style="list-style-type: none"> • Males reach sexual maturity at about 13 years, females at 14 - 15 years. • Calving peaks from fall to spring. • Average period between calving is approximately 5 years. 	COSEWIC (2008)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • Prey on a diverse variety of items including marine mammals, fish and squid. 	COSEWIC (2008)

Killer whales occur year round in small numbers within the SEA Study Area (Lien et al 1988). They have been sighted in the marine areas off Eastern Newfoundland in small numbers (Weise and Montevecchi 1999; Lawson and Gosselin 2009). Based on the available information, this species is likely to be present but uncommon in the Eastern Newfoundland Offshore Area.

Table 4.93 Overview of the Long-finned Pilot Whale

Long-finned Pilot Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> Members of the dolphin family. Adult long-finned pilot whales reach a length of approximately 3.5 - 4.5 m, with males somewhat larger than females. Bulbous forehead and sickle shaped dorsal fin. Population considered Not At Risk by COSEWIC. 	ACS (2006)
Habitats and Movements	<ul style="list-style-type: none"> Widely distributed throughout the world's oceans, and abundant throughout the North Atlantic as far north as 70°N. No evidence for marked north-south migration, but may migrate inshore-offshore seasonally in response to prey availability. Pods are known to strand frequently en masse. Typically only found in cold waters. 	Bernard and Reilly (1999); Olson and Reilly (2002); Lesage et al (2007)
Reproduction	<ul style="list-style-type: none"> Gestation period is 12 - 15 months. Age at first breeding: 6 to 7 years. Calving occurs every 3 to 5 years. Calving may occur year round, but typically in summer. 	ACS (2006)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> Long-finned pilot whales feed primarily on squid but known to consume octopus, cuttlefish and some fish species as well. 	ACS (2006)

During aerial surveys conducted in summer of 2007, 10 observations totalling 65 individual long-finned pilot whales were recorded off Southern Newfoundland, although none were observed in the Eastern Newfoundland Offshore Area (Lawson and Gosselin 2009). This species is, however, generally considered to be abundant in the Grand Banks area from July to December (LGL Limited 2003). Observations from the Gulf of St. Lawrence suggest that the species is typically found in deep water with steep bottom topography (Kingsley and Reeves 1998).

Table 4.94 Overview of the Sowerby's Beaked Whale

Sowerby's Beaked Whale	Summary	Reference(s)
Description	<ul style="list-style-type: none"> Up to 5.5 m long and dark grey in colour. Small head with a long, narrow beak, and a small triangular dorsal fin and relatively long dorsal fins. Tail flukes lack center notch. Species of special concern according to COSEWIC and SARA (Schedule 1). 	COSEWIC (2006c)
Habitats and	<ul style="list-style-type: none"> Most northerly of the beaked whales; has been found on the eastern and western side of the North Atlantic. 	COSEWIC (2006c)

Sowerby's Beaked Whale	Summary	Reference(s)
Movements	<ul style="list-style-type: none"> No data on seasonal movements of the species. Social structure poorly known, but most sightings and strandings have been of small groups of fewer than ten individuals. 	
Reproduction	<ul style="list-style-type: none"> Poorly known. Females apparently sexually mature when they attain a length of between 4.6 and 4.8 m, while males are apparently sexually mature at 5.0 m. 	COSEWIC (2006c)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> Based on stomach contents and isotope analysis, diet appears to consist primarily of mid- to deep-water fishes and squid. 	COSEWIC (2006c)

During aerial surveys conducted in summer of 2007, Sowerby's beaked whales were not observed in the areas off Eastern and Southern Newfoundland (Lawson and Gosselin 2009). The SEA Study Area is, however, within the species' known range (COSEWIC 2006c). Moreover, Sowerby's beaked whales are known to prefer deep waters (> 1,000 m) which is present in the SEA Study Area, and so it is considered to possibly occur in this area (LGL Limited 2003). All confirmed sightings and strandings of this species off Newfoundland have been in the summer months, although this may be due to the relatively poor sighting conditions and lack of search effort in other times of the year (COSEWIC 2006c).

Table 4.95 Overview of Small Dolphin Species

Dolphins	Summary	Reference(s)
Description	<ul style="list-style-type: none"> In addition to killer whale and Long-finned pilot whale, five dolphin species may be found in SEA Study Area: 1) Atlantic white-sided dolphin, 2) white-beaked dolphin, 3) common bottlenose dolphin, 4) Risso's dolphin and 5) short-beaked common dolphin. All five species have been assessed by COSEWIC and populations were considered Not at Risk. Atlantic white-sided dolphins are considered abundant throughout their range. 	Reeves et al (1999); Hammond et al (2008a,b)
Habitats and Movements	<ul style="list-style-type: none"> All species occur in temperate to warm waters in the North Atlantic. The Atlantic white-sided dolphin and white-beaked dolphin also inhabit sub-Arctic portions of the North Atlantic. The short-beaked dolphin also inhabits southern waters off the coast of Venezuela and the Gulf of Mexico. Seasonal migration patterns for these species are poorly understood. Most commonly found in groups of 30 to 70 individuals; however, larger groups numbering several hundred individuals are also observed. Often associate and feed with large baleen whales, and are known to form mixed dolphin species groups. 	Reeves et al (1999); Kinze (2002); ACS (2006) Hammond et al (2008a,b)
Reproduction	<ul style="list-style-type: none"> Reach sexual maturity at 3 to 4 years. Gestation lasts from 10 - 14 months. 	ACS (2006)

Dolphins	Summary	Reference(s)
Foraging Strategy and Food Sources	Diet for most species consists of a variety of small schooling fishes and squid; Risso’s dolphin feeds almost exclusively on squid	ACS (2006); Hammond et al (2008 a,b)

Atlantic white-sided dolphins may be found throughout the SEA Study Area, and have been recorded within 30 km of the White Rose site during vessel-based surveys (Wiese and Montevecchi 1999). White-beaked dolphins, although less abundant in the Western North Atlantic than in the eastern portion of their range, have also been observed in the SEA Study Area. This cool-water species is most likely to occur in coastal areas in relatively shallow waters (Reeves et al 1999). Short-beaked common dolphins are fairly common off the coast of Eastern Newfoundland, and are usually found in groups of 50 - 200 individuals with most of the Northwest Atlantic population being found south of Georges Bank (Reeves et al 1999).

Based on surveys conducted off Southern and Eastern Newfoundland in 2007, the abundance of these three dolphin species (at the 95 percent confidence level) is as follows: Atlantic white-sided dolphins: 1,507 (968 - 2,347); white-beaked dolphin: 1,842 (1,118 - 2,854); short-beaked common dolphins: 576 (314 - 1,056). These estimates are again considered by the authors to be preliminary and likely low, as they have not been corrected for perception biases (Lawson and Gosselin 2009).

Common bottlenose dolphin and Risso’s dolphin both tend to be found in more tropical waters and are less common in the SEA Study Area. Neither species was identified in Newfoundland waters in the Lawson and Gosselin (2007) aerial surveys.

Table 4.96 Overview of Harbour Porpoise

Harbour Porpoise	Summary	Reference(s)
Description	<ul style="list-style-type: none"> • The harbour porpoise is a small compared to other cetaceans, growing to a length of 1.2 to 1.4 m. • Most commonly observed near the coast and will enter small bays and estuaries. • Harbour porpoises in the Western North Atlantic Population have been divided into three different subpopulations: the Bay of Fundy/Gulf of Maine, the Gulf of St. Lawrence and the Newfoundland populations. The boundaries between these sub-populations are not well defined as there is some genetic overlap. 	COSEWIC (2006d); Wang et al (1996)
Habitats and Movements	<ul style="list-style-type: none"> • Found in shelf waters throughout the northern hemisphere, usually in waters colder than 17°C. • Usually seen in small groups of one to three animals often including at least one calf. Occasionally they form larger groups. • Present in northern coastal waters only during the summer months. 	COSEWIC (2006d)
Reproduction	<ul style="list-style-type: none"> • Most mature females become pregnant each year. Gestational period is 10 - 11 months. • Mean age at sexual maturation is 3.5 years. 	COSEWIC (2006d)

Harbour Porpoise	Summary	Reference(s)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> Feed on small schooling fishes. 	COSEWIC (2006d)

Off Eastern Newfoundland, harbour porpoises are most likely to be found in the shallower waters of inshore areas. Bycatch data show that porpoises occur around the entire Island of Newfoundland, especially along the south coast, west coast and in Notre Dame Bay. However, in the 1980s, bycatches were particularly common in St. Mary's Bay and elsewhere in Southeastern Newfoundland during the early summer (COSEWIC 2006d). Harbour porpoise bycatch has also been reported across the entire Grand Banks (COSEWIC 2006d). Based on surveys conducted off Southern and Eastern Newfoundland in 2007, the abundance of harbour porpoises in the area is estimated at 1,195 individuals (95 percent confidence range of between 639 and 2,235 individuals), although again these estimates are considered by the authors to be preliminary (Lawson and Gosselin 2009).

4.2.3.3 Pinnipeds

Six seal species are known to occur in the SEA Study Area. The three most common species that are found in the waters off Eastern Newfoundland, namely the harp, hooded and grey seals, are discussed in turn below.

Table 4.97 Overview of the Harp Seal

Harp Seal	Summary	Reference(s)
Description	<ul style="list-style-type: none"> Adults may reach a length of approximately 1.7-2.0 m, with both sexes similar in size. The most abundant pinniped in the northwest Atlantic, estimated population size was 7.7 million in 2012. Populations are considered secure in the region, having increased by 400 percent since the 1970s. 	DFO (2000); DFO (2013i); DFO (2012e)
Habitats and Movements	<ul style="list-style-type: none"> Older harp seals form large moulting concentrations on the sea ice off northeastern Newfoundland and in the northern Gulf of St. Lawrence during April and/or May. Following the moult, seals disperse and eventually migrate northward. Small numbers of harp seals may remain in southern waters throughout the summer while a portion of the population remains in the Arctic. Whelping occurs in the spring in an area off southern Labrador and northeastern Newfoundland known as the 'Front,' as well as in Gulf of St. Lawrence. 	DFO (2000); DFO (2012e); Lesage et al (2007)
Reproduction	<ul style="list-style-type: none"> Harp seal pups are born on the ice and females will nurse their pups for approximately 12 days, then mate and disperse. Give birth in late February or March on medium to thick first year pack ice. 	DFO (2000); DFO (2012e)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> Diet includes a variety of fish species, predominantly capelin, sand lance, Arctic cod, and flatfish such as halibut. Other fish and invertebrates such as crustaceans, krill, squid, shrimp are also taken. 	Hammill and Stenson (2000)

Harp Seal	Summary	Reference(s)
	<ul style="list-style-type: none"> Diet varies considerably with age and season. 	

Harp seals are relatively common in the SEA Study Area in the winter months, although small numbers remain in southern waters in the summer. They feed on the northeastern Grand Banks, at the Sackville Spur west (Templeman 2007). The offshore waters along the northern edge of the Grand Banks provides an important overwintering area for some harp seals (Stenson and Kavanagh 1994), and an area called the Front, off Southern Labrador and Northeastern Newfoundland, provides an important whelping area for these species (DFO 2000, 2012e). Harp seals are highly dependent on sea ice for much of the year, and recent research suggests that climate change is affecting breeding success and the survival of individuals (Johnston et al. 2012; Soulen et al. 2013).

Table 4.98 Overview of the Hooded Seal

Hooded Seal	Summary	Reference(s)
Description	<ul style="list-style-type: none"> Adults reach a length of approximately 2.0 m for females and 2.6 m for males. Populations are considered secure in the region; a recent study estimated the population at approximately 592,100 individuals. Assessed by COSEWIC as Not At Risk. 	Kovacs (2002); ICES 2006)
Habitats and Movements	<ul style="list-style-type: none"> Feed in the Canadian Arctic and Greenland during the summer months, migrating to the Gulf of St. Lawrence in December and January and leaving the area in April to May. Highly pelagic; it is not uncommon to see them outside of their normal range. The largest whelping concentration in the Northwest Atlantic occurs off the coast of southern Labrador or northern Newfoundland (the 'Front'), as well as in the Davis Strait and the Gulf of St. Lawrence. After breeding, they move to moulting areas off Greenland. 	Kovacs (2002); Lesage et al (2007); Stenson et al (1996)
Reproduction	<ul style="list-style-type: none"> Congregate to breed on pack ice in mid March. Very short breeding season, including the shortest lactation period for any mammal with most pups being weaned in four days. 	Kovacs (2002; 2008)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> Diet includes a variety of fish species, including cod, haddock, herring and mackerel. Crustaceans, krill, squid, shrimp and other invertebrates are also taken. 	Hammill and Stenson (2000)

Hooded seals are relatively common in the SEA Study Area in the winter and spring, and small numbers may be found in the summer as well (Anderson et al. 2012; Lesage et al 2007). A recent publication on satellite movements of hooded seals indicates that there is significant feeding along the shelf edge to the east of the Northeast Shelf and Slope EBSA (Anderson et al. 2012).

Hooded seals feed in the northeastern Grand Banks, at the Sackville Spur east (Templeman 2007). The Grand Banks provides an important overwintering area for some hooded seals (Stenson and Kavanagh 1994), and the 'Front' provides a very important whelping area for the species (DFO 2000). Like harp seals, the hooded seal is highly associated with pack ice, using it as a substrate for pupping,

moulting, and resting; it is similarly vulnerable to changes in the extent and timing of pack ice formation (Kovacs 2008).

Table 4.99 Overview of the Grey Seal

Grey Seal	Summary	Reference(s)
Description	<ul style="list-style-type: none"> Highly sexually dimorphic; adults can grow to a length of approximately 1.6-2.0 m for females and 2.5-3.3 m for males. Populations considered secure in the region; grey seals have been assessed by COSEWIC as Not At Risk. Canadian population estimated at 250,000 individuals. 	DFO (2000); Kovacs (2002); Thompson and Harkonen (2008)
Habitats and Movements	<ul style="list-style-type: none"> Inhabit cold temperate to sub-Arctic areas in North Atlantic waters over the continental shelf. Year round residents in the SEA Study Area. 	Hall (2002)
Reproduction	<ul style="list-style-type: none"> The largest colony of grey seals is found off Nova Scotia. Grey seals give birth between September and March, with peak pupping occurring in January. 	Hall (2002)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> Diet includes a variety of fish species, including capelin, sand lance, herring and Atlantic cod. Largely demersal and benthic feeders. 	Hall (2002); Thompson and Harkonen (2008)

Grey seals are found in the SEA Study Area primarily in the summer months (Lesage et al 2007). They are primarily migrants from the Sable Island and Gulf of St. Lawrence breeding populations, potentially occurring year round but most often seen in July and August (Stenson 1994). Compared to harp and hooded seals, grey seals are thought to occur in low numbers in the SEA Study Area (LGL Limited 2003).

The harbour seal is a regular inhabitant, thought to occur along the southern shore of the Avalon Peninsula for most of the year as it does in bays along the south coast of the province. Two additional pinniped species, the ringed seal and the bearded seal, are typically Arctic dwellers but may occasionally be found in the SEA Study Area in winter.

4.2.3.4 Sea Turtles

Sea turtles are marine reptiles that are found in all but the polar regions of the world’s oceans. All seven species of sea turtles are considered endangered by the IUCN, with fisheries bycatch, hunting, contamination and beach development all considered to be major threats.

Three species of sea turtles are or may be found in the waters of the SEA Study Area, as summarized in Table 4.100.

Table 4.100 Overview of Sea Turtle Species

Sea Turtles	Summary	Reference(s)
Description	<ul style="list-style-type: none"> There are three species of sea turtles that do or may occur within the SEA Study Area; Leatherback turtle, Loggerhead turtle and Kemp’s ridley turtle. The leatherback is the largest living turtle, measuring up 	Ernst et al (1994); Marine Turtle Specialist Group (1996); COSEWIC

Sea Turtles	Summary	Reference(s)
	<p>to 2.19 m in length.</p> <ul style="list-style-type: none"> • The loggerhead is the largest hard-shelled turtle in the world, typically reaching 0.85-1.0 m in length. • Kemp's ridley is the smallest sea turtle, at 0.6 - 0.7 m in length. • Leatherback (Atlantic population) is listed as endangered under Schedule 1 of SARA, while the loggerhead is considered endangered by COSEWIC. • Kemp's ridley is only rarely found in Canadian waters (considered an accidental visitor), but is considered critically endangered by IUCN. 	(2010d); COSEWIC (2012d)
Habitats and Movements	<ul style="list-style-type: none"> • Leatherbacks range throughout the Atlantic, Pacific and Indian oceans. In Atlantic Canadian waters, present from April to December and most numerous from July to September. They are predominantly pelagic, typically inhabiting coastal shelf waters to a depth of <200m. • Loggerhead is the most abundant sea turtle in North American waters. Wander widely in their range from coastal areas to more than 200 km from shore. In Eastern Canada, seldom found in nearshore waters. • Adult Kemp's ridley turtles rarely range beyond the Gulf of Mexico, but juveniles can be found as far north as Newfoundland. 	Ernst et al (1994); Marine Turtle Specialist Group (1996); COSEWIC (2010d); COSEWIC (2012d)
Reproduction	<ul style="list-style-type: none"> • Leatherbacks nest on open beaches in the tropics; females lay an average of 6 clutches per season. • Loggerheads nest in the southern United States and in tropical areas; they lay 4 clutches per season, and will go 2 - 3 years between breeding seasons. • Kemp's ridley turtles nest exclusively in the Gulf of Mexico where they lay an average of 2.5 clutches per season. • Sex determination of marine turtle hatchlings is temperature dependent. 	COSEWIC (2010d); COSEWIC (2012d); National Marine Fisheries Service (2010)
Foraging Strategy and Food Sources	<ul style="list-style-type: none"> • The preferred prey for leatherbacks is jellyfish and other gelatinous organisms. • Loggerheads and Kemp's ridleys consume crustaceans, mollusks and jellyfish. 	Ernst et al (1994); COSEWIC (2012d); Marine Turtle Specialist Group (1996)

Population estimates for leatherbacks in the North Atlantic range from 34,000 - 94,000 individuals, and they are thought to be a regular (albeit uncommon) part of the Newfoundland marine fauna in the summer and fall (COSEWIC 2012d; Goff and Lien 1988). The south coast of Newfoundland, in particular the Placentia Bay area, is a relatively high-use habitat for this species (Templeman 2007; COSEWIC 2012d). Loggerheads are less common than leatherbacks in Eastern Canadian waters (Breeze et al 2002). Off Eastern Newfoundland, the greatest concentration is found in the Grand Banks, where they tend to prefer warmer waters of 22°C and above (COSEWIC 2010b). The number of Kemp's ridley turtles that visit the Eastern Newfoundland Offshore Area is unknown, but this species is likely to be extremely rare in the SEA Study Area.

4.2.3.5 Marine Mammal and Sea Turtle Species at Risk

A total of five federally listed marine mammal species at risk and one listed sea turtle may occur or are known to be present in the Eastern Newfoundland Offshore Area: 1) blue whale - Atlantic population; 2) North Atlantic right whale; 3) Sowerby's beaked whale; 4) northern bottlenose whale - Scotian Shelf population; 5) fin whale - Atlantic population; and 6) leatherback turtle -Atlantic population (Table 4.101).

Four additional populations that do or may occur in the SEA Study Area have been assessed by COSEWIC as being of conservation concern, but do not have formal protection under SARA: 1) the northern bottlenose whale (Davis Strait population); 2) the killer whale (Northwest Atlantic and Eastern Arctic populations); 3) the harbour porpoise: Northwest Atlantic population; and 4) loggerhead sea turtle (Atlantic Ocean population) (Table 4.101). The harbour porpoise is listed on Schedule 2 of SARA, but is not subject to the same legal protections as Schedule 1 species.

A third sea turtle species, the Kemp's ridley, is not federally listed but is considered by the IUCN to be critically endangered.

Table 4.101 Marine Mammal and Sea Turtles Species at Risk that are Known to or May Occur within the SEA Study Area

Common Name	Scientific Name	Population / Occurrence	SARA Status			COSEWIC Assessment
			Endangered	Threatened	Special Concern	
Marine Mammals						
Blue whale	<i>Balaenoptera musculus</i>	Atlantic population	Schedule 1			Endangered
North Atlantic right whale	<i>Eubalaena glacialis</i>		Schedule 1			Endangered
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>	Scotian Shelf population	Schedule 1			Endangered
		Davis Strait population				Special Concern
Fin whale	<i>Balaenoptera physalus</i>	Atlantic population			Schedule 1	Special Concern
Sowerby's beaked whale	<i>Mesoplodon bidens</i>	Atlantic Ocean			Schedule 1	Special Concern
Killer whale	<i>Orcinus orca</i>	Northwest Atlantic population, Eastern Arctic population				Special Concern
Harbour porpoise	<i>Phocoena phocoena</i>	Northwest Atlantic population		Schedule 2		Special Concern
Sea Turtles						
Leatherback turtle	<i>Dermochelys coriacea</i>	Atlantic population	Schedule 1			Endangered
Loggerhead turtle	<i>Caretta caretta</i>	Atlantic Ocean				Endangered

4.2.3.6 Identified Important Areas and Times for Marine Mammals and Sea Turtles

Figure 4.112 provides information on marine mammal (baleen whales, large toothed whales, and dolphin and porpoises) sightings off Eastern Newfoundland, based on information obtained from DFO's current cetacean sightings database (J. Lawson, pers. comm.).

Although useful and informative at a regional scale, there are a number of caveats associated with this dataset which should initially be noted. Firstly, the sighting data have not been completely error-checked by DFO, and the quality of some of the information is therefore unknown. Most sightings are collected on an opportunistic basis and observations may come from individuals with varying degrees of experience and expertise in marine mammal identification. Most data have been gathered from platforms of opportunity that were vessel-based, and the possible negative or positive reactions by cetaceans to such vessels have not yet been factored into the data. As the sighting effort has not been quantified, the numbers cannot be used to estimate true species density or abundance for an area, and a lack of sightings does not necessarily indicate a lack of presence in a particular location. Numbers sighted have not been verified, especially in light of the significant differences in detectability between species. For completeness, these data represent an amalgamation of sightings from a variety of years and seasons; the effort is not necessarily consistent among seasons, years, and areas, and there are gaps between years. Finally, many sightings could not be identified to the species level, and these have been assigned to the smallest taxonomic group possible. Sightings of unidentified whales that were not identified as either toothed or baleen whales are not included in the Figure, although these make up only a small proportion (less than two percent) of the total number of sightings in the database.

From the data, the greatest concentration of marine mammal sightings within the SEA Study Area overall has occurred in the Southern Grand Banks area and within the 200 nautical mile limit. As noted above, this may not be representative of the true distribution of marine mammals, because the level of search effort was not consistent over the entire region. Despite these caveats, however, for a few species there were some apparent "hotspots", such as a relatively large proportion of the sightings of fin whale being clustered off the northeast coast of Newfoundland. Humpback whale sightings were somewhat widespread in continental shelf waters, but particularly abundant on the Tail of the Grand Banks. Sperm whale sightings appear to be highly associated with the continental slope.

As discussed previously in this report, a number of Ecologically and Biologically Significant Areas (EBSAs) have been identified by DFO within the Placentia Bay Grand Banks Large Ocean Management Area (Templeman 2007) and in the Newfoundland and Labrador Shelves Bioregion (DFO 2013j). Among the criteria for the identification, evaluation and selection of these important areas was their importance to marine mammals and seabirds in terms of biodiversity, density and importance for reproduction and survival. In March 2014, the Convention on Biological Diversity conducted a science advisory workshop to delineate EBSAs in the Northwest Atlantic Area, including areas beyond the 200 mile limit. One of the potential EBSAs discussed was the shelf break area from the vicinity of Lilly Canyon-Carson Canyon EBSA (Table 4.102) extending northward to approximately 48°N, emphasizing the biological importance of slope habitat to marine fauna. Offshore operators and others are encouraged to seek updated information on potentially forthcoming EBSAs in the Northwest Atlantic Area.

Table 4.102 provides an overview of the key relevant characteristics of those EBSAs that are located within or near the SEA Study Area, with particular reference to their use by and importance for marine mammals and seabirds.

Table 4.102 Ecologically and Biologically Significant Areas Within or in Proximity of the SEA Study Area and their Importance to Marine Mammals and Seabirds

EBSA Name	Description and Importance to Marine Mammals and Seabirds
<i>Southeast Shoal and Tail of the Banks</i>	<ul style="list-style-type: none"> Defined as the area east of 51°W and south of 45°N extending to the edge of the Grand Banks, this EBSA includes an offshore spawning area for Capelin and Sand Lance, key prey species for marine birds. The presence of a high concentration of forage species draws large and diverse aggregations of seabirds and marine mammals, especially humpback whale and northern bottlenose whale. In terms of fitness consequences, this EBSA is an important seasonal foraging area for seabirds and cetaceans.
<i>Placentia Bay Extension</i>	<ul style="list-style-type: none"> Includes all of Placentia Bay, across the mouth of the bay from Point Crewe (Burin Peninsula) to Point Lance (Avalon Peninsula), and extending out to the 50 m isobath. This EBSA has a high level of biodiversity. It supports important seabird breeding areas along the coast, as well as a high biomass of birds and mammals typical of river and estuarine habitats. In the spring and summer, this EBSA supports a high aggregation of cetaceans, as well as leatherback sea turtles. Otters and harbour seals use the area year round. In terms of aggregation and fitness consequences, this EBSA is an important feeding area from spring to fall for many seabird species, cetaceans (especially humpbacks and porpoises) and leatherback turtles; otters, harbour seals and some cetaceans feed in the area year-round. The area is important for reproduction of many seabird species, harbour seals and otters; female cetaceans with young inhabit the area during critical feeding periods. It is thought to be a possible migratory path for leatherbacks.
<i>Southwest Shelf Edge and Slope</i>	<ul style="list-style-type: none"> This is the area from 55°W to 52°W, encompassing the shelf edge of the Grand Bank to the 2000 m isobath. This area is critical to a wide variety of seabirds, providing the highest density of pelagic seabird feeding within the Placentia Bay Grand Banks Large Ocean Management Area. Further, many marine mammals and leatherback sea turtles aggregate here, particularly in the summer months.
<i>St. Pierre Bank</i>	<ul style="list-style-type: none"> The northwest St. Pierre Bank to the south and west of the Canada-France International Boundary to the 200 m isobath, this EBSA is west of the SEA Study Area. It serves as an important feeding area for several species of cetaceans, and in particular is considered a potentially important spring feeding area for migrating and overwintering whales.
<i>Laurentian Channel and Slope</i>	<ul style="list-style-type: none"> This EBSA extends from 45°N to 47.5°N, from the slopes of the banks into the Laurentian Channel, westward to the boundary of the Placentia Bay Grand Banks Large Ocean Management Area. It provides an important (in fact, the only) migratory corridor for marine mammals moving in and out of the Gulf of St. Lawrence.
<i>Eastern Avalon Coast</i>	<ul style="list-style-type: none"> Defined as the area from Blackhead to Cappahayden, out to the 100 m isobath, this EBSA provides a potentially important feeding area for marine mammals, particularly humpback whales. Many marine mammals aggregate here, especially in the summer months, although a variety of cetaceans, seals, leatherback sea turtles and seabirds feed in the area from spring to fall.
<i>Lilly Canyon-Carson Canyon</i>	<ul style="list-style-type: none"> Defined as the area from 44.8°N to 45.6°N along the 200 m isobath of the southeast slope of the Grand Bank. This EBSA is important as a seasonal refuge and feeding area for overwintering marine mammals.

EBSA Name	Description and Importance to Marine Mammals and Seabirds
<i>Northeast Shelf and Slope</i>	<ul style="list-style-type: none"> • The northeastern Grand Bank, starting at the nose of the Bank, from 48°W to 50°W, and from the edge of the shelf to the 1,000 m isobath. • A recent study of the movements of hooded seals indicates a significant feeding area is present along the shelf edge to the east of this EBSA (Anderson et al 2012). • This EBSA has moderate fitness consequences as a potentially important marine mammal feeding area; harp seals, hooded seals and pilot whales in particular aggregate in this area.
<i>Orphan Spur</i>	<ul style="list-style-type: none"> • A large area extending along the Labrador Slope and Outer Shelf in NAFO Division 3K, including the Orphan Spur and part of the Trinity Trough Mouth Fan. • The northern portion extends from 400 m to 2,000 m depth; south of the Orphan Spur, the maximum depth is approximately 1,000 m. • Several marine mammal and seabird species frequent this area, including the Thick-billed Murre, Black-legged Kittiwake, Northern Fulmar, Greater Shearwater, Dovekie, storm-petrels, skuas and jaegers.
<i>Fogo Shelf</i>	<ul style="list-style-type: none"> • This EBSA extends from the headlands at the western entrance of the Bay of Exploits, and approximately follows the 200 m isobath eastward to the study area boundary near Cape Freels. • Includes Twillingate Island, New World Island, Fogo Island, and many smaller islands in the Bay of Exploits and Gander Bay areas, as well as Funk Island, home to the largest Common Murre colony in the western North Atlantic and the only Northern Gannet breeding colony the Newfoundland and Labrador Shelves bioregion. • Other bird species that aggregate in high concentrations throughout this EBSA include Common Eider, Atlantic Puffin, Great Black-backed Gull, Great Shearwater, Herring Gull, Northern Fulmar, Thick-billed Murre and terns. • An abundance of beach and sub-tidal capelin spawning areas in coastal portions of the EBSA, with the greatest concentrations on North Twillingate Island and along the coast west of Cape Freels. • Important cetacean feeding areas have also been identified in this area; community-based Coastal Resource Inventory data identified several areas of marine mammals presence.
<i>Notre Dame Channel</i>	<ul style="list-style-type: none"> • Part of a larger channel extending offshore from Notre Dame Bay towards the Labrador Slope, branching southward along the inner edge of Funk Island Bank; this EBSA includes only the southeast branch of the Channel between the Fogo Shelf area and Funk Island Bank. • This EBSA is significant for cetacean feeding and migration. • Also frequented by several species of seabirds, including Common Murre, Thick-billed Murre, Black-legged Kittiwake, Great Black-backed Gull, Northern Fulmar, phalaropes, skuas and jaegers, Sooty Shearwater and storm-petrels. • Harp seals are known to feed in this EBSA and surrounding areas during winter.
<i>Grey Islands</i>	<ul style="list-style-type: none"> • Located east of the Northern Peninsula, this EBSA includes the coastal areas surrounding the Grey Islands, extending inshore to include part of Hare Bay and southeast along the inner shelf towards Fogo Island. • Important for waterfowl, as well as seabirds in coastal areas and on the shelf. • Along the coast, Common Eider and Harlequin Duck occur in high concentrations. Great Black-backed Gulls, Herring Gulls and terns also have important breeding colonies in this area. • A high diversity of seabird species (e.g. Common Murre, Atlantic Puffin, Black-legged Kittiwake, Dovekie, Great Black-backed Gull, Great Shearwater, Sooty Shearwater, Herring Gull, Northern Fulmar, Northern Gannet, phalaropes, skuas and jaegers, storm-petrels and terns) aggregate along the inner shelf area and may be considered an

EBSA Name	Description and Importance to Marine Mammals and Seabirds
	indication of high, year-round, productivity in that area.
<i>Gilbert Bay</i>	<ul style="list-style-type: none"> • The Gilbert Bay EBSA extends from the head of Gilbert Bay out to the headlands of Salmon Point to the north, and also includes Alexis Bay and surrounding coastal areas to Spear Point in the south. It is a shallow-water, low-gradient, sub-arctic fjord located on the southeast coast of Labrador, composed of a series of basins separated by sills that become shallower towards the head. The bay is 28 km long and is less than 4 km at its widest point, covering approximately 60 km². • Productive source of food for marine mammals and seabirds; capelin are known to spawn in the area.
<i>Labrador Marginal Trough</i>	<ul style="list-style-type: none"> • Extends from the Cartwright Saddle south through the Labrador Marginal Trough and into the Hawke Saddle, just inside Hamilton Bank. • The trough area is a potential corridor for several species of mammals. Cetaceans aggregate in this area for feeding during the fall, and also frequent Hamilton Bank and out to the Labrador Slope at the same time. • The EBSA contains part of the area identified as having highest probability of use for harp seal whelping and feeding. Important area for several species of seabirds, including murre, Black-legged Kittiwake, Great Black-backed Gull, Herring Gull, Northern Fulmar, Atlantic Puffin, skuas and jaegers, Sooty Shearwater, and Ivory Gull.
<i>Labrador Slope</i>	<ul style="list-style-type: none"> • The Labrador Slope EBSA generally includes the slope from the 400 m to 2,000 m isobaths, and extends from the outer edge of Makkovik Bank, southward along the slope to the outer edge of Belle Isle Bank. • In general, the area is high in diversity; it supports juvenile and female hooded seals, as well as a variety of cetaceans and seabirds which occur in high relative numbers for feeding. (e.g. Black-legged Kittiwake, Dovekie, Great Black-backed Gull, Great Shearwater, Sooty Shearwater, Northern Fulmar, skuas and jaegers and phalaropes).
<i>Hamilton Inlet</i>	<ul style="list-style-type: none"> • Includes the coastal and inner shelf area (approximately out to the 200 m isobath) outside of Hamilton Inlet, Sandwich Bay and south to Black Tickle-Domino on Island of Ponds. The EBSA occurs at the outflow of Lake Melville, which drains most of the Labrador plateau and provides nutrients that are critical to initiate primary productivity blooms along the Labrador coast. • Several Capelin spawning beaches occur at the southern end of the EBSA, while Paradise River, Eagle River, White Bear and North Rivers (Sandwich Bay area) are highly productive for Atlantic Salmon. • Several bird species are found here in high concentrations, including two of the three highest density Atlantic Puffin colonies, and all four of the highest density Razorbill colonies occurring within the Newfoundland and Labrador Shelves bioregion. Colonies of great Black-Backed Gull, Herring Gull and Northern Fulmars also occur in the area. • Polynyas, large and productive areas of open water surrounded by sea ice, also form in this EBSA annually. • The main harp seal whelping concentration usually forms on the pack ice in this EBSA, and the western portion of Inlet is an important fall and early winter feeding area for ringed seals. • The area is important for several waterfowl species (dabbling ducks, geese and sea ducks, including Common Eider and Harlequin Duck). • High concentrations of many other seabird species (Northern Gannet, Razorbill, Dovekie, murre, skuas, jaegers, and Sooty Shearwater) occur within this EBSA.

Figure 4.112a Marine Mammal Sightings off Eastern Newfoundland

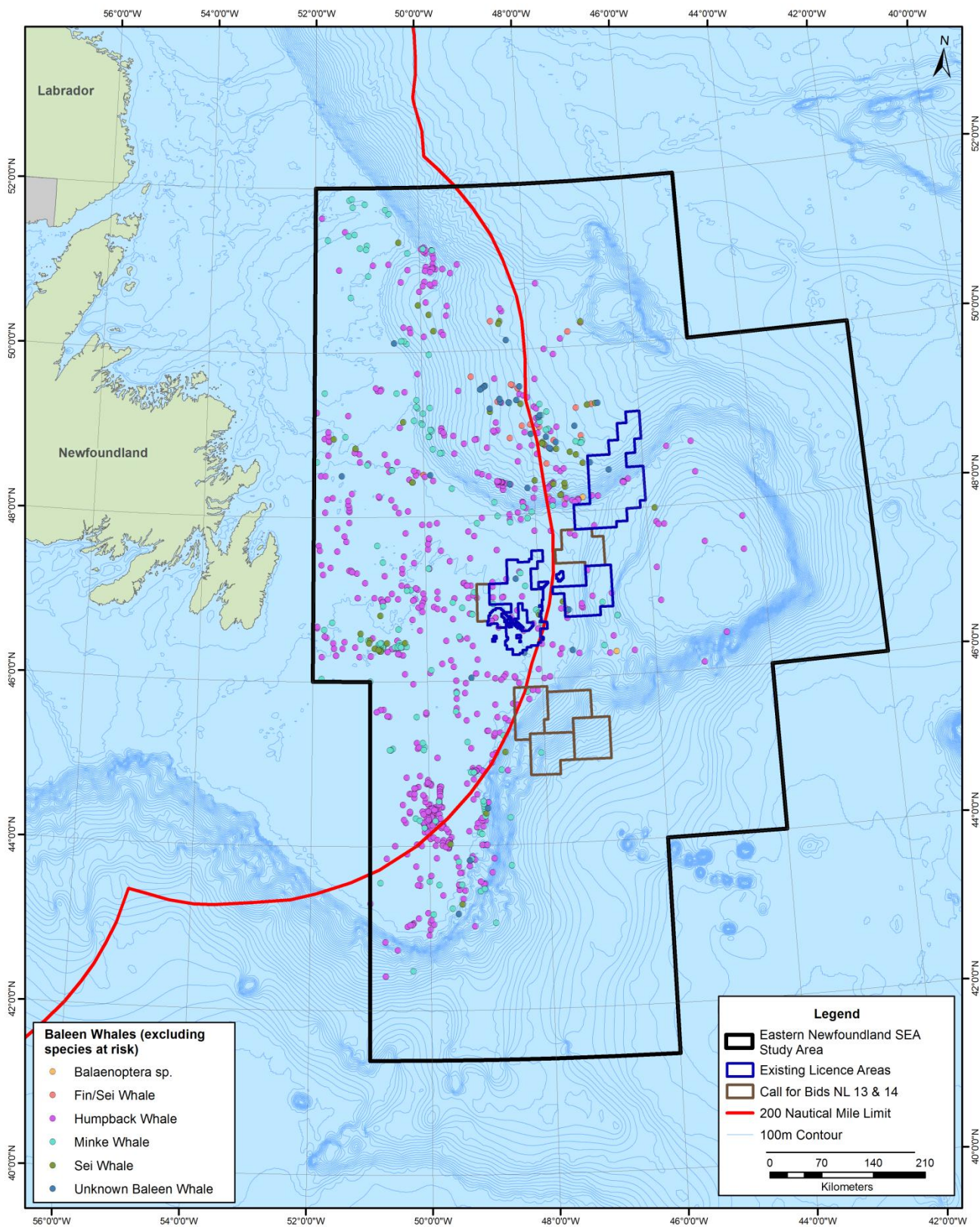


Figure 4.112b Marine Mammal Sightings off Eastern Newfoundland (Continued)

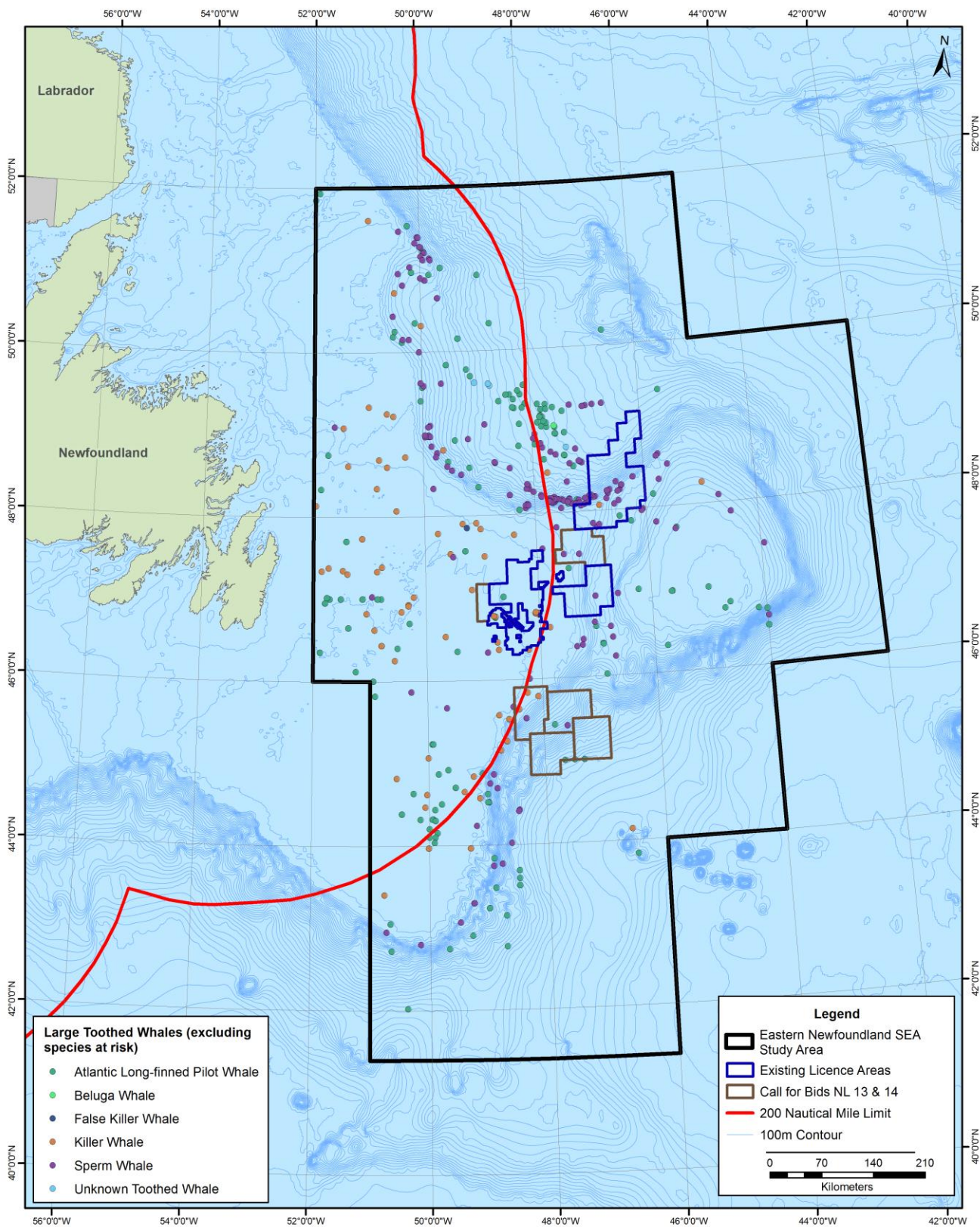


Figure 4.112c Marine Mammal Sightings off Eastern Newfoundland (Continued)

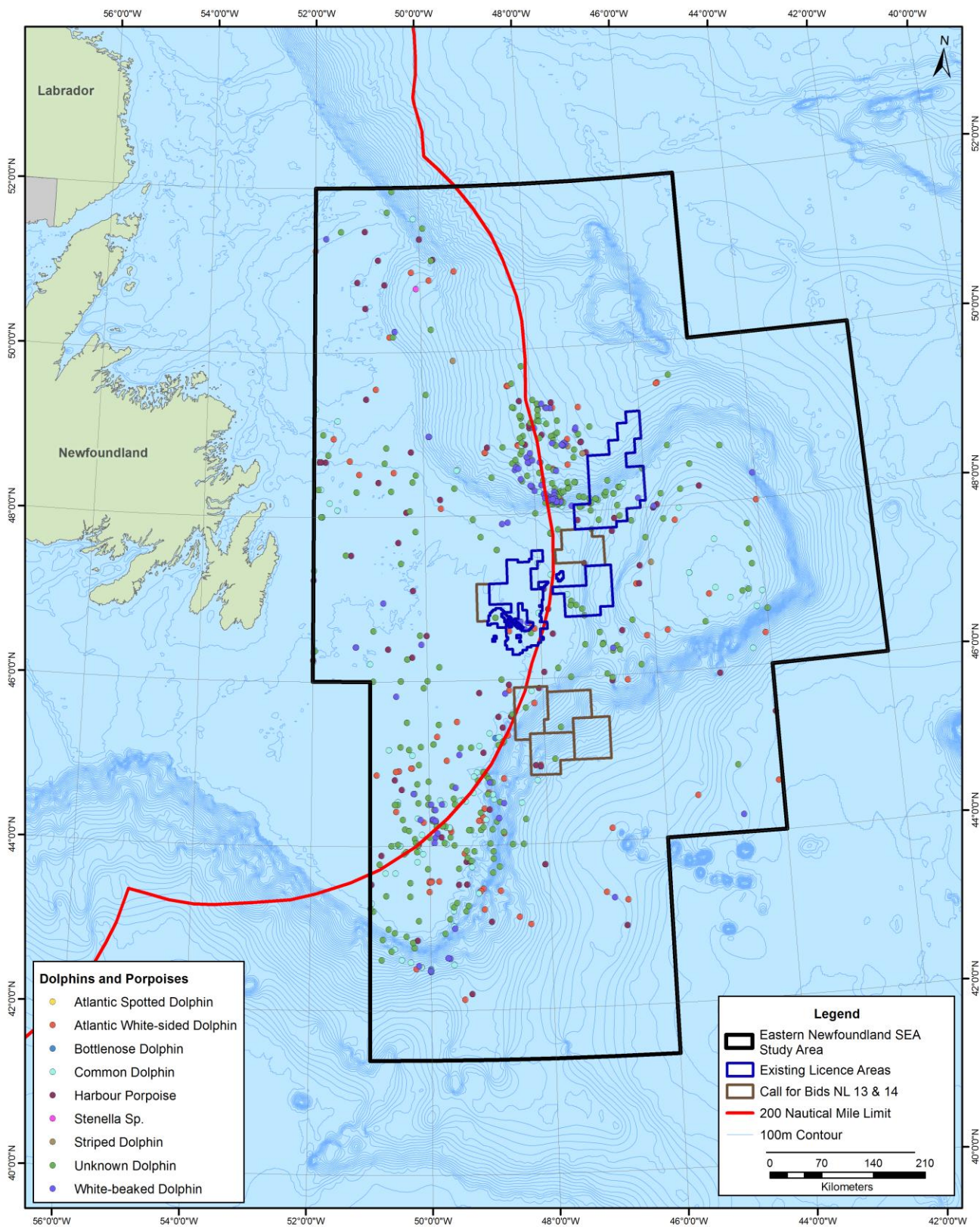
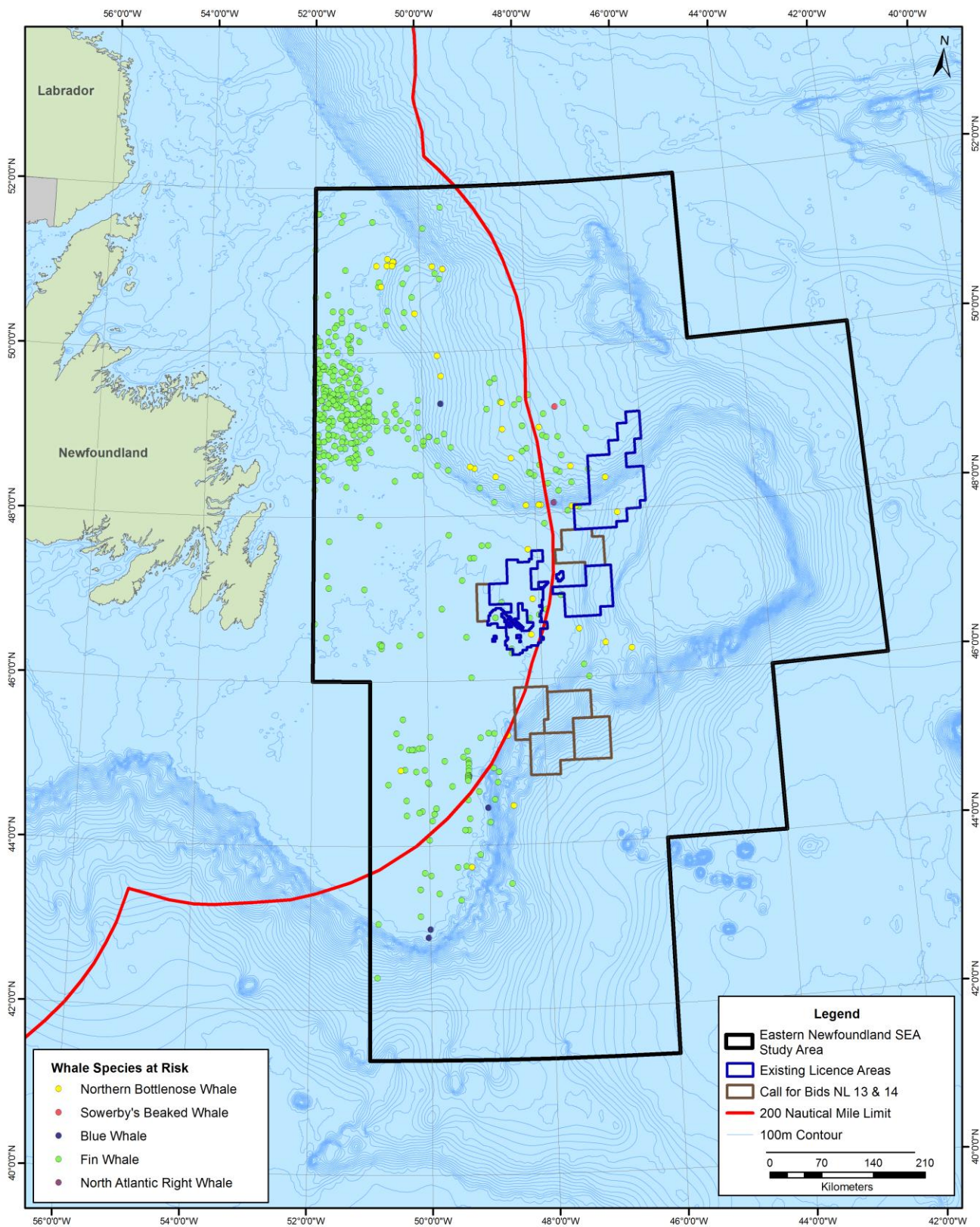


Figure 4.112d Marine Mammal Sightings off Eastern Newfoundland (Continued)



Critical habitat has been identified in the federal recovery strategies for two of the marine mammal species at risk that have been reported in the SEA Study Area: 1) the northern bottlenose whale (Scotian Shelf population); and 2) the North Atlantic right whale. Critical habitat for the northern bottlenose whale is located off the southern coast of Nova Scotia, along the Scotian Shelf (DFO 2010c). The North Atlantic right whale's critical habitat is located within the Bay of Fundy and off of southern Nova Scotia at Roseway Basin (Brown et al 2009). It is anticipated that the identification and delineation of critical habitat for the blue whale will be completed in 2014 (Beauchamp et al 2009).

Recovery strategies identifying critical habitat are not currently available for the other species at risk reported in the SEA Study Area. However, information from the COSEWIC species assessments indicate that sightings of the leatherback turtle and harbour porpoise occur throughout the Study Area (COSEWIC 2010d, 2012c). Analysis of data obtained from a tracking study show three high-use feeding areas for leatherback turtles: 1) waters east and southeast of Georges Bank, including the Northeast Channel near the southwestern boundary of the Canadian Exclusive Economic Zone; 2) the southeastern Gulf of St. Lawrence and waters off eastern Cape Breton Island, including Sydney Bight, the Cabot Strait, portions of the Magdalen Shallows and adjacent portions of the Laurentian Channel; and 3) waters south and east of the Burin Peninsula, Newfoundland, including parts of Placentia Bay (DFO 2012b). Information from this DFO tracking study is being used to inform the identification of critical habitat in a forthcoming amendment to the species' Recovery Strategy (DFO 2013d). The range of Sowerby's beaked whale encompasses much of the area as well (COSEWIC 2006c).

Although some marine mammal species are year-round residents (as detailed in the above sections), cetaceans and reptiles are most likely to occur in the SEA Study Area during the summer months, where the Grand Banks and surrounding waters provide important feeding habitat. With the exception of grey seals, which are present year-round, pinnipeds are most abundant in the winter.

4.2.4 Sensitive and Special Areas

In Canada, unique or sensitive environments may be designated as protected through federal or provincial legislation, with areas sometimes also being protected and/or managed by municipal or Aboriginal governments. These special places may be set aside to protect important or sensitive species and habitats, as representative natural areas, for cultural or historical reasons, and/or for human use and enjoyment.

This section describes various types of existing and proposed protected and designated sensitive and special areas in Eastern Newfoundland. Information was obtained from the Conservation Areas Reporting and Tracking System (CARTS) published by the Canadian Council on Ecological Areas, as well as through sources from and associated with Parks Canada, Environment Canada, Fisheries and Oceans Canada (DFO), the provincial Department of Environment and Conservation, the Placentia Bay / Grand Banks Large Ocean Management Area, Important Bird Areas Canada, the Convention on Wetlands of International Importance (Ramsar) and the Western Hemisphere Shorebird Reserve Network.

4.2.4.1 Eastern Newfoundland Protected Areas

Eastern Newfoundland currently has a number of protected areas, with other important and sensitive areas having been identified but not holding protected status.

National Parks

Parks Canada establishes National Parks (under the *National Parks Act*) to protect representative examples of Canada's 39 terrestrial natural regions. National historic sites commemorate significant historical locations or events.

Newfoundland and Labrador has three national parks and 45 national historic sites. Terra Nova National Park, located in Eastern Newfoundland, protects inland and coastal areas including offshore islands and estuarine and intertidal ecosystems (Figure 4.113 (Parks Canada 2013)). Terra Nova is a popular recreational area especially for golf, camping and hiking and is also located near other amenities such as the T'Railway, which is used for snowmobiling (Table 4.103). Camping areas are located in the Park and a number of accommodations (e.g. rental cottages and motels) are located throughout the Eastport Peninsula.

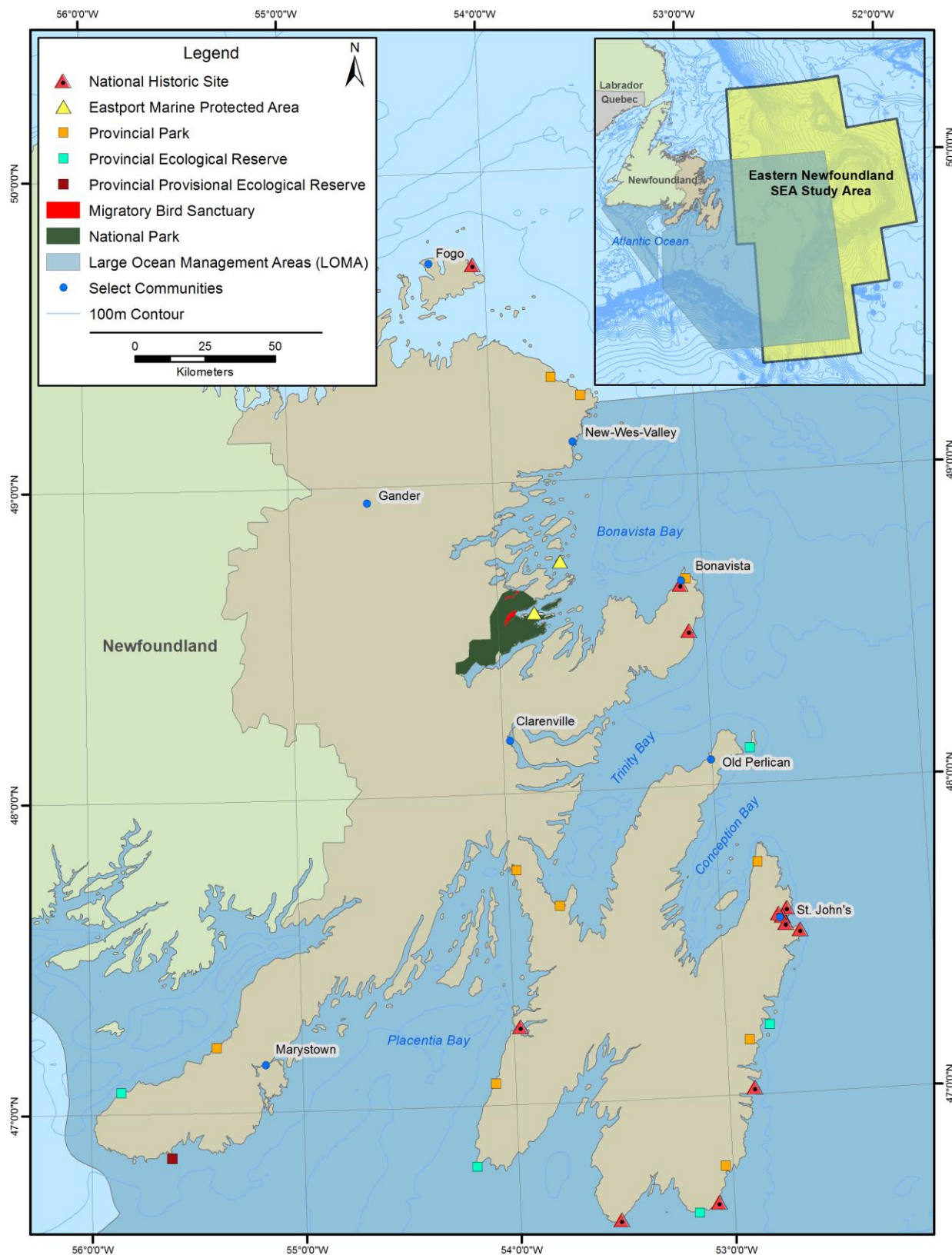
Of the nine National Historic Sites administered by Parks Canada, five are located in Eastern Newfoundland and four of these are located in coastal areas (Figure 4.113). The Ryan Premises, Signal Hill, Cape Spear and Castle Hill are located on the coast with property, elements and activities that occur in or near the marine environment (Table 4.103).

A number of National Historic Sites are managed by other entities, including provincial and municipal governments. Owing to the fact that the history of the province is rooted in the fishery and other seafaring activities, a number of these are located in coastal areas. In Eastern Newfoundland other historic sites include Boyd's Cove, Tilting, Port Union, Fort Amherst, Murray Premises, Colony of Avalon, Cape Race Lighthouse and Cape Pine Lighthouse.

Table 4.103 National Parks and National Historic Sites in Eastern Newfoundland

Park	Location	Key Characteristics and Features
Terra Nova National Park	Central, coastal Newfoundland	<ul style="list-style-type: none"> • Includes several offshore islands • Follows the coastline of Newman Sound and Clode Sound, both including rich estuarine and intertidal ecosystems • Bay du Nord Wilderness Reserve is located south of TNNP • Bay du Nord River is designated as a Canadian Heritage River • Kittiwake and Discovery Trail tourism regions • Provincial T'Railway system to the west • Two campgrounds and primitive camp sites • Terra Nova Resort and Golf Community • Trails including those in coastal areas
Ryan Premises National Historic Site	Bonavista Peninsula	<ul style="list-style-type: none"> • Restored merchant's premises on a Bonavista wharf • Includes the Bonavista Museum, displaying artifacts focusing on traditional Newfoundland seafaring life
Signal Hill National Historic Site	St. John's Harbour	<ul style="list-style-type: none"> • Historic site of military defence, marine communication and marine observation • Popular destination for residents and tourists • Whale, seabird and iceberg watching • Includes coastal hiking trails
Cape Spear Lighthouse National Historic Site	South of St. John's	<ul style="list-style-type: none"> • Restored historical lighthouse on most eastern point of North America • Follows the coastline and includes sections of the East Coast Trail system • Whale, seabird and iceberg watching
Castle Hill National Historic Site	Placentia Bay	<ul style="list-style-type: none"> • Site of 17th and 18th century French and English fortifications representing battles over Newfoundland fisheries resources • Hiking trails and picnic areas
Source: Parks Canada (2009, 2013)		

Figure 4.113 Marine and Coastal Parks, Other Protected Areas and Important Areas in Eastern Newfoundland



Provincial Parks and Protected Areas

The Newfoundland and Labrador Department of Environment and Conservation establishes and manages six types of provincial protected areas, each of which is designed to fulfill various conservation, recreation and / or cultural goals. The Parks and Natural Areas Division is responsible for wilderness and ecological reserves and provincial parks. The Wildlife Division manages wildlife reserves and an existing nature park. The Lands Branch and/or Parks and Natural Areas Division oversee Crown Reserves and other Special Management Areas (NLDEC 2013a, NLDEC 2013b). The Province has also developed a Parks and Natural Areas Systems Plan for Newfoundland and Labrador that has not yet been publicly released.

Existing provincial parks and protected areas in Eastern Newfoundland are listed and described briefly in Table 4.104. These include the marine and coastal parks and protected areas illustrated in Figure 4.113.

Table 4.104 Eastern Newfoundland Marine and Coastal Provincial Parks and Protected Areas

Park	Location	Purpose / Usage
Bellevue Beach Provincial Park Reserve	Isthmus of the Avalon	<ul style="list-style-type: none"> • Protects beach complex and saltmarsh • Habitat for migratory birds
Chance Cove Provincial Park	East of Trepassey	<ul style="list-style-type: none"> • Whale and seabird watching • Camping, picnicking
Deadman’s Bay Provincial Park	Northeast coast of Lumsden	<ul style="list-style-type: none"> • Iceberg watching • Day use
Dildo Run Provincial Park	Near Twillingate and Moreton’s Harbour	<ul style="list-style-type: none"> • Day and recreational vehicle camping • Hiking • Kayaking / canoeing
The Dungeon Provincial Park	Near Bonavista	<ul style="list-style-type: none"> • Scenic attraction • Day use, picnicking
Frenchman’s Cove Provincial Park	West side of the Burin Peninsula	<ul style="list-style-type: none"> • Day use • Camping, picnicking, swimming, golf, playground • Bird watching
Gooseberry Cove Provincial Park	South of Placentia	<ul style="list-style-type: none"> • Day use, sandy beach
Marine Drive Provincial Park Reserve	Pouch Cove	<ul style="list-style-type: none"> • Day use, sandy beach • Swimming, mini golf, picnicking • Hiking trails
Windmill Bight Provincial Park Reserve	Near Lumsden	<ul style="list-style-type: none"> • Protection for plateau bog
Source: NLDEC (2013a)		

Provincial Wildlife and Ecological Reserves

Ecological Reserves are created to protect and conserve ecosystems or ecoregions and/or to protect rare, unique or endangered species of plants, animals and other identifiable components of natural heritage. Seven existing Ecological Reserves are found in marine and coastal areas of Eastern Newfoundland (Table 4.105). Of these, four are Seabird Ecological Reserves and one is a provisional Seabird Ecological Reserve (NLDEC 2013b).

Table 4.105 Eastern Newfoundland Marine and Coastal Ecological Reserves

Name / Location	Description / Special Features
Cape St. Mary's Ecological Reserve	<ul style="list-style-type: none"> • Numerous species of seabirds, all of which can be seen from land • Bird Rock, a sandstone stack, is inhabited by Gannets • 24,000 Northern Gannet, 20,000 Black-legged Kittiwake, 20,000 Common Murre, and 2,000 Thick-billed Murre • Razorbill, Black Guillemot, Double-Crested and Great Cormorant and Northern Fulmar nesting areas • Offshore waters are important wintering areas for numerous species of ducks
Baccalieu Island Ecological Reserve	<ul style="list-style-type: none"> • Largest protected seabird island in the province • More breeding seabirds than any other area of the province • Largest Leach's Storm Petrel colony in the world • Second largest Puffin colony in North America • Access limited to researchers with valid permits during breeding season (April 1-October 30)
Fortune Head Ecological Reserve	<ul style="list-style-type: none"> • Rocks exhibit geological boundary between Precambrian era and Cambrian period • Fossils mark a historical change in marine organisms
Funk Island Ecological Reserve	<ul style="list-style-type: none"> • Historic nesting place of the extinct Great Auk • Smallest seabird ecological reserve in NL • Access limited to scientific researchers
Lawn Islands Archipelago Provisional Ecological Reserve	<ul style="list-style-type: none"> • Consists of three islands: Middle, Offer and Columbiar • Home to thousands of nesting seabirds of eight breeding species • Largest colony of Common Murres in the Western North Atlantic • Other species include Northern Gannet, Northern Fulmar, Atlantic Puffin, Razorbill, Thick-Billed Murre, Black-Legged Kittiwake, and Herring and Great Black-Backed Gulls • Middle Island is the only colony of Max Shearwater in North America • Area has been granted provisional status while a full site assessment is completed by Provincial Government
Mistaken Point Ecological Reserve	<ul style="list-style-type: none"> • One of the world's most significant fossil sites • Variety of fossils as more than 30 species have been identified • Fossils include Ediacara biota, organisms that lived 575-542 million years ago • On the Canadian Tentative List of potential UNESCO World Heritage sites
Witless Bay Ecological Reserve	<ul style="list-style-type: none"> • Contains four islands: Gull, Green, Great and Pee Pee • Home to a large number of bird species • North America's largest Puffin colony • Second largest Leach's Storm-Petrel colony in the world
Source: NLDEC (2013b)	

National Marine Conservation Areas

Parks Canada establishes National Marine Conservation Areas (NMCAs) under *the Canada National Marine Conservation Areas Act*. NMCAs are marine areas managed for ecologically sustainable use and contain smaller zones of protection. They include the seabed, the water column above it and they may also take in wetlands, estuaries, islands and other coastal lands (Parks Canada 2008). The NCMA program has generally subdivided the Atlantic Canada region into various subregions for the purposes of evaluation and the potential designation of additional areas for designation. No NMCAs have been established in the SEA Study Area or elsewhere in Eastern Newfoundland.

Representative Marine Areas (RMAs) are identified by Parks Canada for each of their 29 marine regions. Within each marine region, one of the representative marine areas would be selected as a preferred candidate for the establishment of a NMCA under the *Canada National Marine Conservation Areas Act*. Actual establishment is subject to consultations with governments, stakeholders and the public. There are four preliminary RMAs within the Grand Banks marine region (Figure 4.114), of which two fall within the SEA Study Area. Hydrocarbon exploration and exploitation are prohibited within National Marine Conservation Areas.

Marine Protected Areas (MPAs) and Areas of Interest (AOI)

Canada's *Oceans Act* mandates the Minister of Fisheries and Oceans to lead and coordinate the development and implementation of a national network of marine protected areas. These areas are ecologically significant, with species and / or properties that require special consideration. An *Oceans Act* Marine Protected Area (MPA) is a protective designation that protects the health of marine ecosystems and their resources. The first step in MPA establishment is the identification of Areas of Interest (AOI), which then undergo detailed evaluation and public consultation before a decision is made concerning whether to formally designate them as MPAs. There is one MPA located in Eastern Newfoundland (DFO 2013e). The Eastport MPA protects two marine and coastal areas of the Eastport Peninsula (Table 4.106). No AOIs have been identified within the SEA Study Area.

Table 4.106 Marine Protected Area in Eastern Newfoundland

Name	Description / Special Features	Purpose / Status
Eastport	<ul style="list-style-type: none"> • Coastline contains a number of headlands, coves and beaches, as well as islands that provide habitat for marine wildlife • Provides habitat to numerous species of pelagic fish, groundfish, shellfish, marine mammals, and aquatic plants • Contains two areas of lobster habitat closed to harvesting 	<ul style="list-style-type: none"> • Creation of the Eastport Peninsula Lobster Protection Committee has promoted the rejuvenation of lobster stocks with the closure of habitats and various community initiatives
Source: DFO (2013e)		

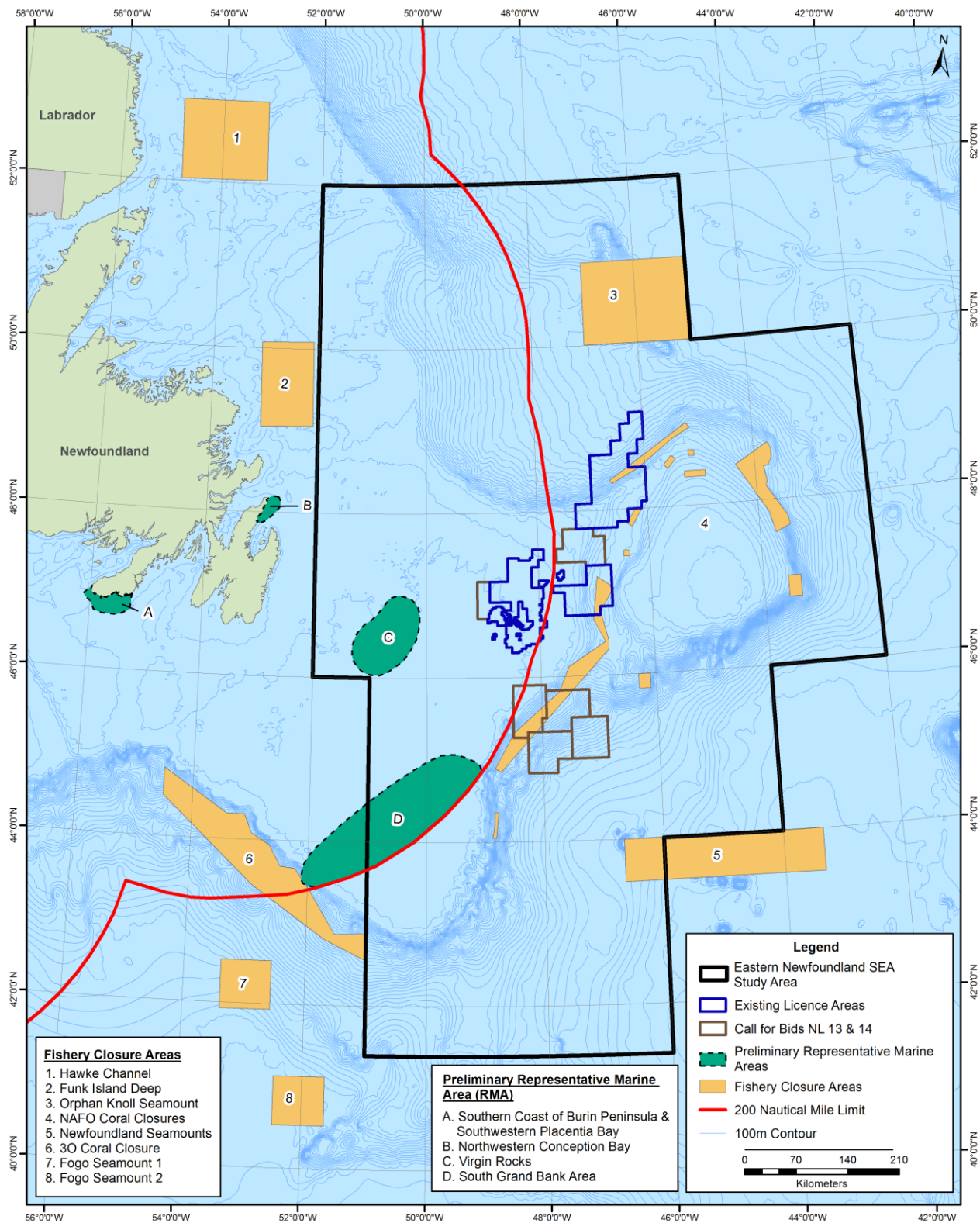
Fisheries Closures

Through the federal *Fisheries Act*, DFO has implemented various fisheries closures to help conserve ocean bottom (benthic) species, habitats and biodiversity. These fisheries closures restrict one or more types of bottom contact fishing gear (DFO 2009, 2011a). In response to the known sensitivity of coral and sponge grounds, several important coral and sponge areas have been designated as VMEs (DFO 2012c) and are protected from damaging fishing activities in Canadian and NAFO waters (Campbell and Simms 2009, NAFO 2013a). A number marine areas in Eastern Newfoundland are subject to such fisheries closures, several of these are located within the SEA Study Area (DFO 2011a, Table 4.107 and Figure 4.114).

Table 4.107 Fisheries Closures in Eastern Newfoundland

Name	Size (km ²)
Orphan Knoll Seamount	15,737
Newfoundland Seamounts	15,402
NAFO Coral Closures	8,844
Source: DFO (2011a)	

Figure 4.114 Other Sensitive / Special Areas Within and Adjacent to the SEA Study Area



National Wildlife Areas, Marine Wildlife Areas and Migratory Bird Sanctuaries

Through the *Canada Wildlife Act*, the Government of Canada has established 54 National Wildlife Areas on federally owned lands for the purposes of wildlife conservation, research and interpretation. These areas, some of which are relatively undisturbed, protect approximately one million hectares of nationally significant plant and animal habitats, with nearly half of this total area protecting marine habitats. No National Wildlife Areas and thus no Marine Wildlife Areas (MWAs) are located in Newfoundland and Labrador (Environment Canada 2013b).

In 1994, the *Canada Wildlife Act* was amended to allow identification of MWAs beyond the 12 nautical mile territorial sea limit out to the 200 nautical mile exclusive economic zone limit. No such MWAs have yet been identified, but several candidate sites are currently being evaluated in Canada (ACZISC 2013).

On the Island of Newfoundland, Migratory Bird Sanctuaries (MBS) are located on the east coast of the Northern Peninsula (outside of the SEA Study Area) and in Terra Nova National Park (Figure 4.113). The 1,178 hectare Terra Nova MBS is located in two areas along Southwest Arm and Newman Sound (Environment Canada 2013).

4.2.4.2 Other Identified Important and Sensitive / Special Areas off Eastern Newfoundland

A number of other important, sensitive or otherwise special areas have been identified in the marine and coastal environments off Eastern Newfoundland.

Large Ocean Management Areas

Large Ocean Management Areas (LOMAs) are established for integrated management planning. Boundaries are determined using a combination of ecological and administrative considerations. Management of the Placentia Bay / Grand Banks Large Ocean Management Area (PB/GB LOMA), which overlaps the SEA Study Area, is led by DFO under Canada's *Oceans Act* (Figure 4.113). This area was identified because it possesses important living and non-living marine resources, areas of high biological diversity and productivity and increasing development pressures and competition for ocean space and resources (PB/GB LOMA 2013).

Ecologically and Biologically Significant Areas

DFO has identified eleven Ecologically and Biologically Significant Areas (EBSAs) within the Placentia Bay / Grand Banks LOMA: 1) Southeast Shoal and Tail of the Banks; 2) Placentia Bay Extension; 3) Southwest Shelf Edge and Slope; 4) Laurentian Channel and Slope; 5) St. Pierre Bank; 6) Smith Sound; 7) Eastern Avalon Coast; 8) Northeast Shelf and Slope; 9) Lilly Canyon-Carson Canyon; 10) Virgin Rocks; and 11) Burgeo Bank. These areas have relatively high ecological or biological activity that is important to ecosystem structure and function within the LOMA (DFO 2007a), and have been described in Sections 4.2.1 – 4.2.3 of this SEA Report in relation to particular biophysical components of the marine environment.

Vulnerable Marine Ecosystems and Important Coral Areas

The United Nations, General Assembly has defined Vulnerable Marine Ecosystems (VMEs) and mandated regional fisheries management organizations to adopt conservation measures to protect these areas from bottom fishing activities. The NAFO Scientific Council has identified VME candidate areas for

corals, sponges and seamounts in NAFO areas 3LMNO (WWF 2012). DFO has also identified various important coral areas in Eastern Newfoundland, as described and illustrated in Section 4.2.1.

Important Bird Areas

The Important Bird Areas (IBA) Program is a global effort to identify and protect the world's most critical bird habitats. BirdLife Canada has identified 597 Canadian IBAs as having worldwide, continental or national significance. Of these, 80 are located partially or wholly in National Wildlife Areas or Migratory Bird Sanctuaries and all are included in science-based initiatives to identify, conserve and monitor a network of sites that provide essential habitat (BLI 2013). Seventeen IBAs are located in Eastern Newfoundland, some of which are also formally protected (see Section 4.2.2.6).

Convention on Wetlands of International Importance

The 1998 Convention on Wetlands of International Importance (also referred to as the Ramsar Convention) established an objective of sustaining important wetland habitats. In 1981, Canada became a contracting party to the Ramsar Convention. To date, Canada has designated 37 Ramsar Sites of which 17 are also National Wildlife Areas or Migratory Bird Sanctuaries (Environment Canada 2012). The only Ramsar site in Newfoundland (Codroy Valley Estuary) is located on the west coast of the Island (Ramsar 2013).

Western Hemisphere Shorebird Reserve Network

North and South American scientists established the Western Hemisphere Shorebird Reserve Network (WHSRN) conservation strategy in 1986 to protect key habitats to sustain healthy populations of shorebirds. Of the seven identified Canadian sites, only one (i.e. Bay of Fundy) is located in Eastern Canada (WHSRN 2013). There are therefore no such designated sites located in Eastern Newfoundland.

4.3 Human Activities

The following provides an overview of the existing human environment of the SEA Study Area. This includes, initially, a high-level overview of the various regions and communities that comprise the Eastern Newfoundland region, as overall background and context. This overview is followed by a description of those human activities that are particularly relevant to the scope of the SEA. This includes marine fisheries and other activities and elements that occur within or near the marine environment, and which therefore have the potential to interact with, and be affected by, future oil and gas activities in the SEA Study Area.

4.3.1 Regions and Communities

Newfoundland and Labrador is the easternmost province of Canada, and consists of the Island of Newfoundland (111,390 km²), as well as Labrador (294,330 km²) which is located to the northwest on the Canadian mainland. The province had a 2011 population of 514,536 residents (Statistics Canada 2013a). The Island of Newfoundland comprises less than 30 percent of the province's total land area, but is home to nearly 95 percent of its population. Residents live in approximately 250 municipalities and many unincorporated communities that range in population from fewer than five to more than 100,000 (NLDMA 2013). Communities are widely distributed along the coastline as well as throughout the interior of the Island.

The following provides general baseline information related to the eastern portion of the Island of Newfoundland, specifically along the coast, with a focus on various relevant socioeconomic characteristics such as population, economy, employment and business and housing.

This existing human environment is described in general for Eastern Newfoundland, including sub regions that are organized for various purposes such as government administration or data collection and dissemination. The discussion of population is based on Local Areas (Figure 4.115) as defined by the NL Department of Finance's Community Accounts system, and which correspond with Statistics Canada's Census Subdivisions. For the discussion of the regional economy, the focus is on the seven relevant provincial Regional Economic Zones (Figure 4.116):

- 1) *Economic Zone 14*: Gander - Fogo Island
- 2) *Economic Zone 15*: Clarenville - Bonavista
- 3) *Economic Zone 16*: Burin Peninsula
- 4) *Economic Zone 17*: Conception Bay North - Bay de Verde
- 5) *Economic Zone 18*: Whitbourne - St. Mary's
- 6) *Economic Zone 19*: Northeast Avalon
- 7) *Economic Zone 20*: Southern Shore - Trepassey

Although the Newfoundland and Labrador Regional Economic Zone Boards have been discontinued, much of the available local and regional socioeconomic information is based on these boundaries. Thus, they are a useful focus for presentation and analyses of data at the regional level for this SEA.

Figure 4.115 Eastern Newfoundland, Local Areas

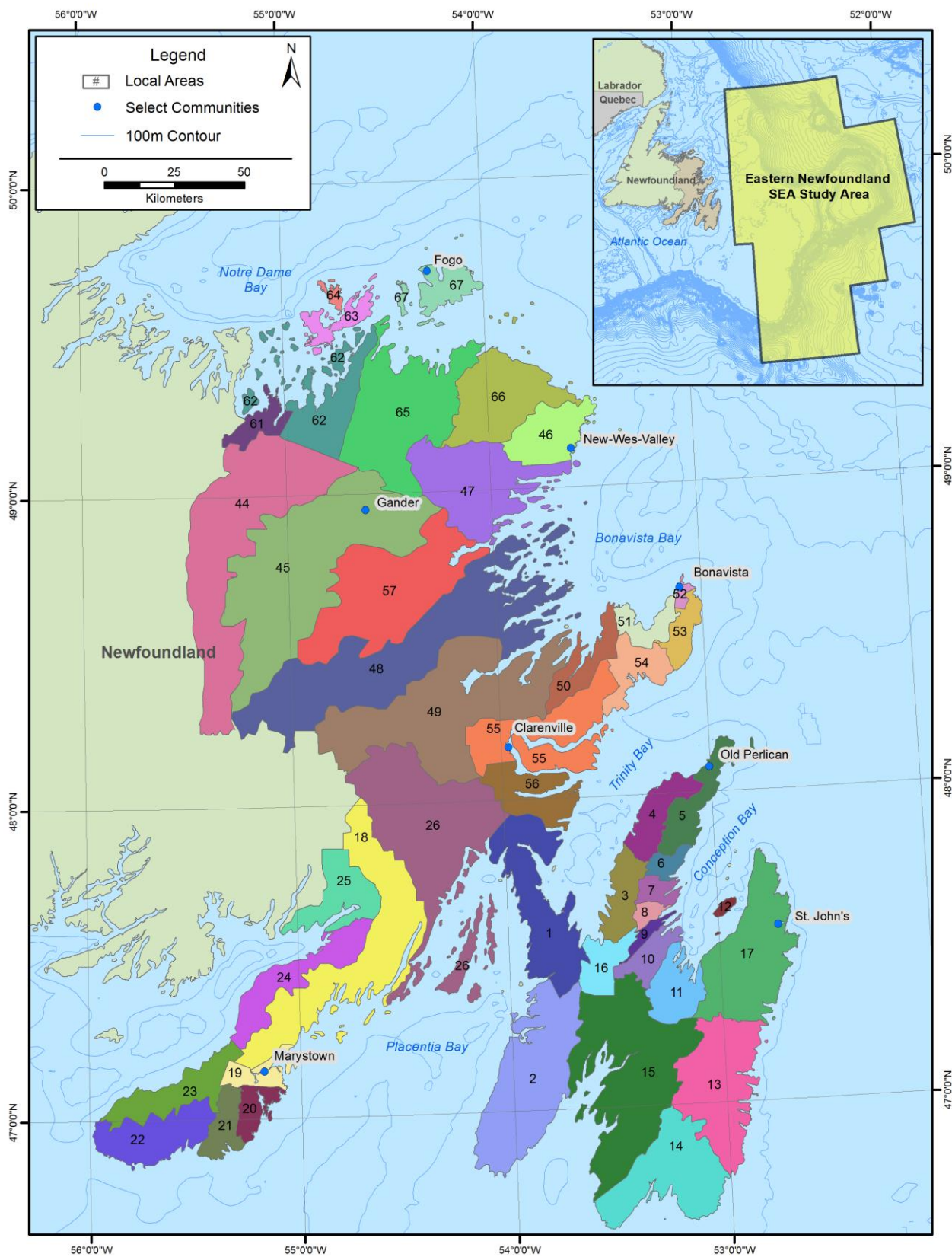
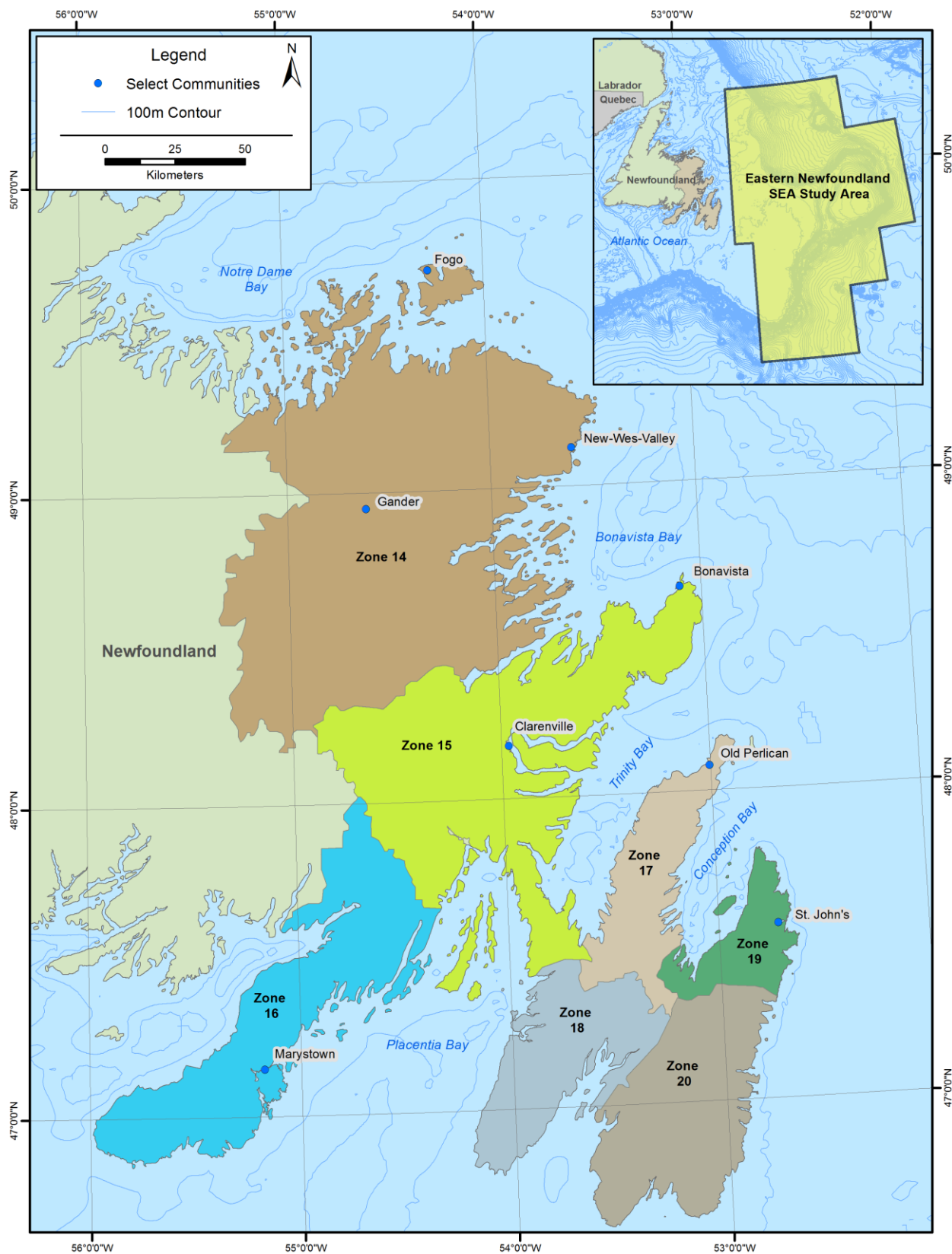


Figure 4.116 Eastern Newfoundland, Economic Zones



The most current and relevant available data and information are used to describe the existing (regional) human environment. Baseline data are drawn from various sources including:

- Federal government departments and agencies (e.g. Statistics Canada, Canada Mortgage and Housing Corporation, Marine Atlantic);
- Provincial government departments (e.g. Department of Finance, Department of Transportation and Works, Department of Fisheries and Aquaculture, Department of Municipal Affairs, Department of Tourism, Statistics Agency including Community Accounts); and
- Local businesses and associations involved in the seafood processing industry.

Depending on the topic (e.g. population or economy), data are compiled for Local Areas, Census Subdivisions, Economic Zones or a combination of these.

4.3.2 Population

The population of the Eastern Newfoundland region was 354,752 persons in 2011. The majority of the communities in the region are small coastal towns, with the most densely populated areas being located on the Northeast Avalon as well as a number of other smaller centres at Gander, Clarenville and Conception Bay North (NLSA 2013).

The populations of most areas of the province are declining but the overall population of Eastern Newfoundland increased by 3.6 percent between 2001 and 2011 (Table 4.108). Growth occurred in the Gander, Norris Arm, Clarenville, Bay Roberts, Holyrood and Northeast Avalon Local Areas, which include the greater St. John's area and other regional service centres. Some areas are experiencing growth mainly in the residential sector due to their proximity to these centres. The population has also been fairly stable in the Lewisporte, Gambo, Conception Bay North and Whitbourne Local Areas (Statistics Canada 2013a).

Table 4.108 Population, Eastern Newfoundland Region

Local Area (Census Subdivisions)	2001	2006	2011	% Change (2001 to 2011)
Local Area 64: Twillingate Island	3,055	2,850	2,683	-12.1%
Local Area 63: New World Islands	3,705	3,430	3,168	-14.5%
Local Area 67: Fogo and Change Islands	2,941	2,706	2,395	-18.6%
Local Area 61: Lewisporte Area	5,380	5,320	5,335	-1%
Local Area 62: Notre Dame Bay South	2,515	2,400	2,253	-10.4%
Local Area 65: Hamilton Sound	3,436	4,301	4,099	19.2%
Local Area 66: Straight Shore	2,125	1,810	1,763	-17%
Local Area 46: Wesleyville Area	3,000	2,710	2,409	-19.7%
Local Area 47: Greenspond Area	3,550	3,415	3,369	-5.1%
Local Area 57: Gambo Area	2,150	2,090	2,042	-5%
Local Area 45: Gander Area	11,255	11,575	12,683	12.7%
Local Area 44: Norris Arm Area	1,125	1,075	1,207	7.3%
Local Area 49: Chandlers Reach	4,070	3,955	3,836	-5.7%
Local Area 50: Southern Bay Area	1,225	1,075	971	-20.7%
Local Area 26: Placentia Bay North West	680	645	610	-10.3%
Local Area 53: Catalina Area	2,735	2,325	2,201	-19.5%
Local Area 51: Black Head Bay Area	790	675	616	-22%

Local Area (Census Subdivisions)	2001	2006	2011	% Change (2001 to 2011)
Local Area 52: Bonavista Area	4,140	3,865	3,654	-11.47%
Local Area 54: Trinity, Trinity Bay Area	1,440	1,200	973	-32.4%
Local Area 55: Smith Sound-Random Island	7,620	7,850	8,533	12%
Local Area 56: South West Arm Area	2,360	2,150	2,055	-12.9%
Local Area 1: Isthmus of Avalon	5,225	4,915	4,748	-9.1%
Local Area 18: Placentia Bay West Centre	1,675	1,530	1,342	-19.9%
Local Area 19: Mortier Bay	6,760	6,220	6,297	-6.8%
Local Area 5: North Shore of Conception Bay	3,985	3,725	3,433	-13.9%
Local Area 4: New Perlican-Winterton Area	2,350	2,115	1,961	-16.6%
Local Area 6: Carbonear Area	7,980	7,780	7,638	-4.3%
Local Area 7: Harbour Grace Area	5,450	5,375	5,392	-1.1%
Local Area 3: Heart's Delight Area	4,360	4,155	4,191	-3.9%
Local Area 8: Spaniards Bay Area	2,930	2,790	2,897	-1.1%
Local Area 9: Bay Roberts Area	5,405	5,705	5,864	8.5%
Local Area 16: Whitbourne Area	2,335	2,355	2,287	-2.1%
Local Area 10: Clarke's Beach Area	5,760	5,685	5,211	-9.5%
Local Area 11: Head of Conception Bay	6,300	6,705	6,748	7.1%
Local Area 2: Placentia-St. Bride's Area	6,305	5,620	5,063	-19.7%
Local Area 15: St. Mary's Bay	3,050	2,780	2,607	-14.5%
Local Area 12: Bell Island	3,075	2,780	2,690	-12.5%
Local Area 17: Northeast Avalon	172,980	181,145	197,081	13.9%
Local Area 13: Southern Shore	3,750	3,655	3,241	-13.6%
Local Area 14: Trepassey Bay	1,350	1,165	8,73	-35.3%
Local Area 25:Terrenceville Area	1,145	955	937	-18.2%
Local Area 24: Bay L'Argent Area	1,310	1,145	1,021	-22.1%
Local Area 23: Fortune – Grand Bank Area	5,425	4,995	4,713	-13.1%
Local Area 22: Lamaline Area	1,785	1,580	1,473	-17.5%
Local Area 21: St. Lawrence Area	1,705	1,485	1,374	-19.4%
Local Area 20: Burin Area	3,900	3,695	3,391	-13.1%
Local Area 19: Mortier Bay	6,760	6,220	6,297	-6.8%
Eastern Newfoundland Region (Total)	342,352	343,697	354,752	3.6%

Source: NLSA (2013), NLSA (2011), NLSA (2006)

4.3.3 Economy, Employment and Business

The following sections provide a general and relatively high-level description of the economy and associated employment and business activity in Eastern Newfoundland, as context for the SEA. Additional information on specific aspects of the regional economy that are especially relevant to the focus and scope of the SEA, such as fisheries and tourism, is provided in Sections 4.3.4 and 4.3.5.

4.3.3.1 Regional Economic Overview

The following paragraphs provide brief descriptions of economic activity within the seven economic zones most relevant to the Eastern Newfoundland area (see Figure 4.116).

Economic Zone 14 includes an area from the interior of Newfoundland to the coast and encompasses Gander, Twillingate and Fogo Island. Fishing remains an important economic activity here, and the area has at least 12 seafood processors mainly located on Bonavista Bay, in the Twillingate and Fogo Island

areas and on the Eastport Peninsula (ASP 2013; DFA 2013). Tourism is an emerging activity with Twillingate, Fogo Island, Change Islands and Terra Nova National Park being top destinations (NL Tourism 2013). Current major capital projects (greater than \$1 million in investment) include health care facilities in Glovertown and Lewisporte (NLDOF 2013).

Economic Zone 15 includes all of the Bonavista Peninsula along with Clarenville and the Isthmus of the Avalon, and thus borders on Bonavista Bay, Trinity Bay and Placentia Bay. Fishing is an important economic activity in the area, and seafood processors are located in the Bonavista area, Clarenville, Random Island and on the three bays (ASP 2013; DFA 2013). Bonavista, Trinity and the White Hills Ski Resort are key seasonal tourism destinations. A sealing industry interpretation centre is under construction at Elliston and the Terra Nova Golf resort is under redevelopment and expansion (NLDOF 2013). New healthcare facilities are being built in Clarenville and Bonavista. Major capital projects also include ongoing industrial infrastructure investments at the oil refinery at Come By Chance. The gravity based structure (GBS) for the Hebron Offshore Oil Project is being constructed at Bull Arm (NLDOF 2013).

Economic Zone 16 encompasses the whole of the Burin Peninsula. Commercial fish harvesting takes place in the area and seafood processors are located at Marystown, Lawn and St. Lawrence (ASP 2013). Major capital projects include the construction of offshore oil infrastructure and other marine vessels at Marystown. The Canadian Coast Guard is developing a search and rescue station at Burin. Newspar is currently redeveloping the fluorspar mine at St. Lawrence (NLDOF 2013).

Zone 17 includes all of the Northwest Avalon to the centre of the Peninsula. This area has at least 10 seafood processors located in both Trinity and Conception Bays (ASP 2013; DFA 2013) that process the catches of harvesters in the area. Brigus and Cupids are top tourism attractions (NL Tourism 2013). Major capital investments include a new business park at Spaniard's Bay and health care facilities in Carbonear and Harbour Grace (NLDOF 2013).

The larger towns of Placentia and Whitbourne are located in Zone 18, which also encompasses the eastern side of Placentia Bay and the west side of St. Mary's Bay. One seafood processor is located St. Bride's, Placentia Bay and two are situated on St. Mary's Bay (ASP 2013; DASP 2012; HSF nd, DFA 2013). Currently, two large capital investment projects are occurring in the region: the construction of Vale's nickel processing facility at Long Harbour and the replacement of the lift bridge in Placentia (NLDOF 2013). Placentia Bay is a busy industrial area with current activities such as fishing, oil and gas (Come By Chance and Whiffen Head), the Vale development at Long Harbour, the industrial port of Argentia and the Marine Atlantic terminal also at Argentia. The Cape St. Mary's Ecological Reserve is one of several major tourism destinations here (NL Tourism 2013).

The Northeast Avalon, Zone 19, is the location of the largest concentration of population and the largest and most diverse economy in the province. The provincial capital of St. John's and surrounding municipalities are home to a varied range of government services, industrial development, commercial and retail services, educational institutions and tourism activity. This area is also the supply base for the current offshore oil and gas industry, with related infrastructure and services in St. John's and Mount Pearl. St. John's harbour is also an important landing and unloading area for fish harvesters.

Of the current 208 major capital projects in Newfoundland and Labrador, 119 are located in Eastern Newfoundland, 96 are located in Zone 19 and another six are partly located in this area. Nearly half of these are residential developments, of which many are condominiums, followed by commercial /

industrial and retail investments. Governments are investing in health care and educational facilities, municipal infrastructure and transportation. Public bodies and private companies are also investing in recreational and cultural facilities (NLDOF 2013).

Fishing harbours are located throughout Zone 19, but the area has relatively limited seafood processing capacity, and landed raw material is transported to processors in other areas (ASP 2013; DFA 2013; NRL nd). The St. John's waterfront is a mixture of industrial marine activity as well as tourism, with boat tours and cruise ships operating seasonally. Top tourism destinations in Zone 19 include St. John's and George Street where the tourism season is fairly consistent throughout the year (NL Tourism 2013). The St. John's area has a strong market for tourism, particularly in meetings and conventions and general business activity. Major capital investments in Zone 19 include eight new hotel projects in the St. John's area (NLDOF 2013).

Zone 20 includes the Southern Shore located south of St. John's to Trepassey and to the east side of St. Mary's Bay. Many people from Southern Shore communities commute to the St. John's area and elsewhere on a daily basis. Within Zone 20, the fishing industry is active with six seafood processors located on the Southern Shore and one on St. Mary's Bay (ASP 2013; DFA 2013). An offshore oil and gas service base is located in Bay Bulls. Ferryland is a top tourism destination, and the area also provides whale watching boat tours and sea kayaking adventures (NL Tourism 2013). No major capital projects are currently taking place in Zone 20 (NLDOF 2013).

4.3.3.2 Employment and Business

Employment and unemployment rates in Eastern Newfoundland vary according to the economic base in the given area (Table 4.109), with larger, regional centres typically having higher employment levels than more rural areas. Economic Zone 19, which includes the capital city of St. John's and the Northeast Avalon, has the highest employment rate in Eastern Newfoundland. With a diversified economy, this area has a variety of employment opportunities in government agencies, post-secondary educational institutions, health care facilities, tourism, agriculture, the commercial / retail sector and an international airport. In contrast, Economic Zone 18, which has the highest unemployment rate, is a rural region with a larger seasonal workforce (e.g. fishing, seafood processing, tourism) (NLSA 2013).

Table 4.109 Employment Characteristics, Eastern Newfoundland

Economic Zone	Labour Force*	Participation Rate	Employment Rate	Unemployment Rate
Zone 14: Gander-Fogo Island	25,140	70.1%	53.2%	24.1%
Zone 15: Clarenville-Bonavista	15,320	69.3%	52.4%	24.3%
Zone 16: Burin Peninsula	11,590	68.0%	50.5%	25.8%
Zone 17: Conception Bay North-Bay de Verde	21,320	67.9%	54.0%	20.5%
Zone 18: Whitbourne-St. Mary's	3,860	67.8%	47.4%	29.9%
Zone 19: Northeast Avalon	115,290	76.1%	68.4%	10.2%
Zone 20: Southern Shore-Trepassey	4,900	73.4%	55.9%	23.8%
Newfoundland and Labrador	248,685	72%	58.7%	18.5%

*Labour force data is taken from 2010 statistics whereas other data used in this table are derived from the 2006 census.
Source: NLSA (2013)

The majority of the residents of Eastern Newfoundland are employed in occupations related to sales and services. Larger retail businesses and government services in regional service centres also contribute to

occupations in this sector. Jobs associated with construction also account for a large share of employment throughout Eastern Newfoundland (NLSA 2013) (Table 4.110).

Table 4.110 Labour Force by Occupation, Eastern Newfoundland (2006)

Occupation / Sector (Select)	Zone 14	Zone 15	Zone 16	Zone 17	Zone 18	Zone 19	Zone 20	Province
Health	925	475	350	910	155	6,395	180	13,320
Education	820	485	455	715	130	5,545	185	12,270
Primary industries	2,705	1,544	1,405	1,585	505	2,075	585	20,415
Sales and Services	6,155	3,305	2,750	4,625	750	26,195	860	70,465
Management	1,350	800	475	975	265	9,705	225	19,740
Office related	2,240	1,510	945	1,855	385	20,665	535	38,485
Construction related	4,375	2,945	1,985	4,140	785	12,265	975	44,300
Processing and Manufacturing	1,865	1,725	1,440	2,395	205	2,690	565	17,540
All Occupations	20,435	12,789	9,805	17,200	3,180	85,535	4,110	267,175

Source: NLSA (2013)

Income levels in Eastern Newfoundland are generally below the provincial average (Table 4.111), with the exception of the Northeast Avalon (Economic Zone 19) where the economy provides a wider variety of employment opportunities.

Table 4.111 Median Gross Annual Per Capita Income, Eastern Newfoundland (2010)

Economic Zone	Median Annual Per Capita Income
Zone 14: Gander-Fogo Island	\$25,000
Zone 15: Clarenville-Bonavista	\$25,300
Zone 16: Burin Peninsula	\$26,000
Zone 17: Conception Bay North-Bay de Verde	\$24,500
Zone 18: Whitbourne-St. Mary's	\$26,800
Zone 19: Northeast Avalon	\$33,700
Zone 20: Southern Shore-Trepassey	\$27,900
Province of Newfoundland and Labrador	\$28,900

Source: NLSA (2013)

Eastern Newfoundland (Economic Zones 14, 15, 16, 17, 18, 19 and 20) has nearly 12,000 businesses (Table 4.112) (NLSA 2013). Over half of these enterprises are located in Economic Zone 19, which includes the Northeast Avalon.

Table 4.112 Number of Businesses by Economic Zone, Eastern Newfoundland (2011)

Economic Zone	Number of Businesses	Percentage of Total
Zone 14: Gander-Fogo Island	1,574	9.3%
Zone 15: Clarenville-Bonavista	1,008	5.9%
Zone 16: Burin Peninsula	598	3.5%
Zone 17: Conception Bay North-Bay de Verde	1,128	6.7%
Zone 18: Whitbourne-St. Mary's	198	1.2%
Zone 19: Northeast Avalon	6,876	40.6%
Zone 20: Southern Shore-Trepassey	242	1.4%
Total	11,624	68.6%

Source: NLSA (2013)

Over 60 percent of businesses in Eastern Newfoundland provide services (e.g. retail, health care and social, construction, accommodations and food services and other services). Although the number of firms remained fairly consistent between 2000 and 2011, this is accounted for primarily by growth in the “other services,” “construction,” “professional, scientific and technical services” categories (Table 4.113). Otherwise, the number of enterprises in all categories has declined. Notable areas of decline are health care and social assistance, manufacturing and retail (NLDOF 2013).

Table 4.113 Number of Businesses by Type, Eastern Newfoundland (2000 and 2011)

Industry Sector	2000	2011	+/- Change (2000 to 2011)
Mining and oil and gas extraction	43	43	-
Utilities	6	7	+1
Other services (except public administration)	1,237	1,848	+611
Real estate and rental leasing	345	426	+81
Construction	1,320	1,581	+261
Management of companies and enterprises	105	104	-1
Public administration	290	285	-5
Finance and insurance	304	261	-43
Administrative and support, waste management and remediation services	418	426	+8
Professional, scientific, technical services	703	868	+165
Information and cultural industries	119	93	-26
Educational services	159	109	-50
Arts, entertainment and recreation	261	217	-44
Wholesale trade	652	503	-149
Transportation and warehousing	550	421	-129
Health care and social assistance	1,600	1,296	-304
Accommodation and food services	872	826	-46
Agriculture, forestry, fishing and hunting	359	280	-79
Manufacturing	566	336	-230
Retail trade	1,847	1,649	-198
Total	10,519	11,579	+1,060
Source: NLSA (2013)			

Although the overall number of businesses has increased (Table 4.114), the number of employees per business in the region has declined somewhat. This may indicate a degree of consolidation among firms, or the closure of some businesses and growth of others. The number of businesses with between five and 19 employees increased between 2000 and 2011, and there are few businesses with more than 500 employees in Eastern Newfoundland.

Table 4.114 Number of Businesses by Employment, Eastern Newfoundland

Employment Size Range	Number of Businesses	
	2000	2011
1 to 4 employees	7,173	6,310
5 to 19 employees	3,245	3,914
20 to 99 employees	1,100	1,088
100 to 499 employees	191	168
500 + employees	47	30
Source: NLSA (2013)		

4.3.3.3 Housing

The housing market is directly shaped and influenced by the economy and other associated factors such as population change. The population of Newfoundland and Labrador has been growing slowly except in large and mid-sized municipalities or areas that are otherwise regional service centres.

Due to the strength of the economy, which is mainly driven by energy, mining and other private sector activity, home (single family houses, multiple units and row houses) construction and sales have seen unprecedented and sustained growth in Newfoundland and Labrador. Recently, the number of new housing starts, as well as prices, has decreased. However, this decline has been occurring much slower than in the other Atlantic Provinces (CMHC 2013).

In the third quarter of 2013, new home starts in the St. John's Census Metropolitan Area (CMA) decreased by 23 percent compared to the same period in 2012. However, smaller centres such as Corner Brook, Gander and Grand Falls-Windsor, reported a higher number of new starts than in the same period in the previous year (CMHC 2013).

The number of homes sold in Newfoundland and Labrador during the third quarter of 2013 was also 23 percent below that of the same period in 2012. However, the price of houses sold in the province increased by eight percent overall (CMHC 2013). Rising housing prices are also related to increases in the costs of labour and materials as well as the number of large high-end homes and condominiums.

4.3.4 Marine Fisheries

The following sections give an overview of marine fisheries and related activities within and around the Eastern Newfoundland Offshore Area, with a key focus on commercial fisheries, as well as describing any relevant aquaculture and recreational fishing activity in or near the region. There are no known Aboriginal fisheries that occur within the SEA Study Area itself.

4.3.4.1 Data Areas and Sources

Two regulatory jurisdictions related to marine fish and fisheries exist within the SEA Study Area. The Government of Canada has jurisdiction over fish stocks and fishing activities within a 200 nautical mile limit and for sedentary species across the entire continental shelf. Beyond that 200 mile limit, the North Atlantic Fisheries Organization (NAFO) manages groundfish activities and other resources (such as corals, for example).

For administrative purposes, the Northwest Atlantic is divided into a series of NAFO Divisions, Subdivisions and Unit Areas (Figures 4.117 and 4.118), which are generally used to regulate and describe fishing activity throughout Eastern Canada. The SEA Study Area overlaps with a number of NAFO Divisions and Unit Areas, and although it does not correspond directly with any particular such zones, various combinations of these are used in this section to describe fishing activity in and around the region. The NAFO Divisions and Unit Areas that encompass most of the SEA Study Area are:

- a) NAFO Division 3k: Unit Areas 3Kc, 3Kf, 3Kg, 3Kk
- b) NAFO Division 3L: Unit Areas 3Lc, 3Ld, 3Le, 3Lg, 3Lh, 3Li, 3Ls, 3Lr, 3Lt
- c) NAFO Division 3M: Unit Areas 3Ma, 3Mb, 3Mc, 3Md, 3Mm
- d) NAFO Division 3N: Unit Areas 3Na, 3Nb, 3Nc, 3Nd, 3Ne, 3Nf, 3Nn

Commercial fish landings (weight and landed value) information for each of these NAFO Unit Areas is presented in the following sections for the period 2008 – 2012, and was provided by Fisheries and Oceans Canada (DFO) Statistical Services in Ottawa, ON. The DFO datasets record domestic and foreign fish harvests that are landed in Canada.

Figure 4.117 NAFO Divisions and Subdivisions

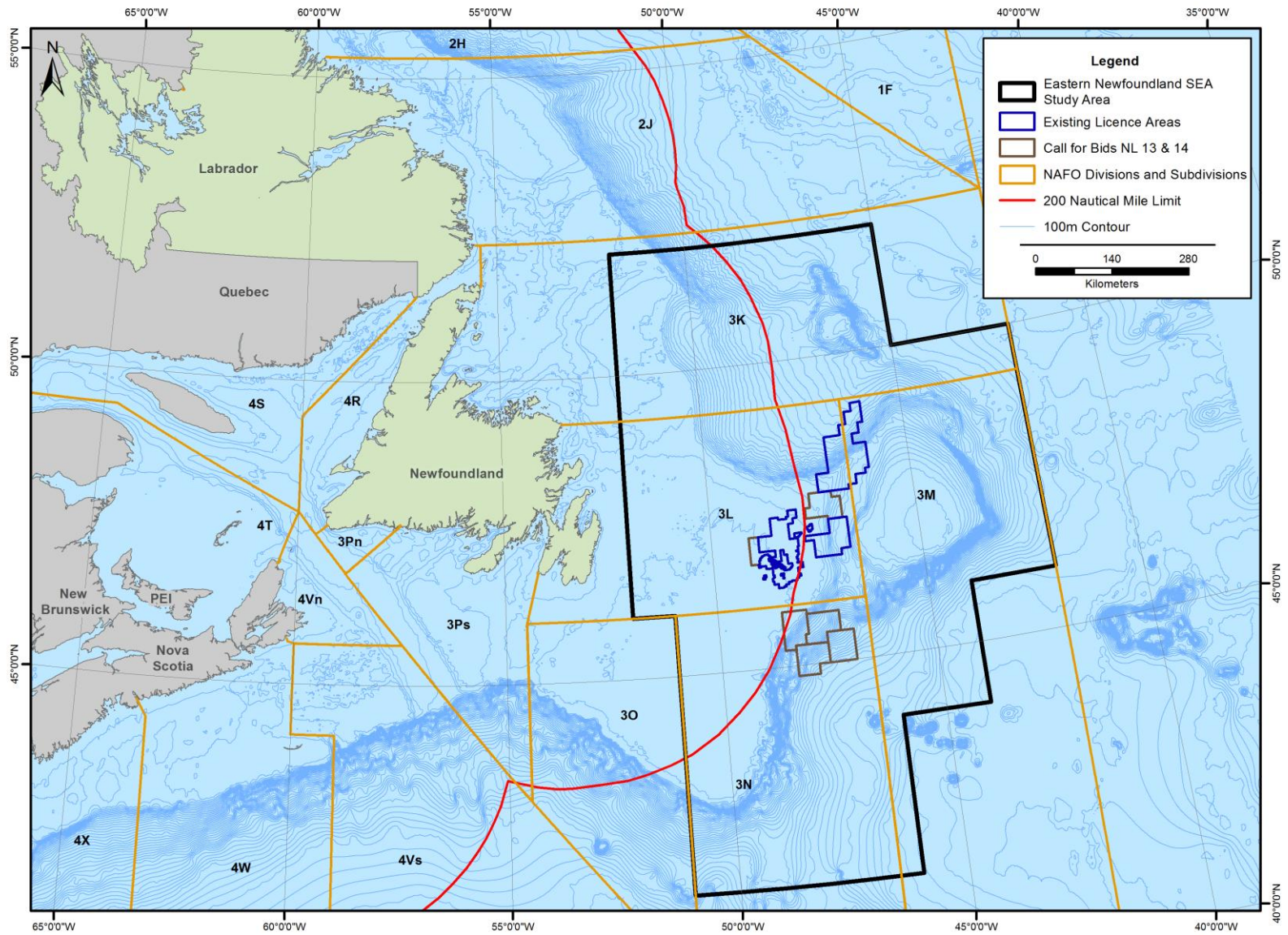
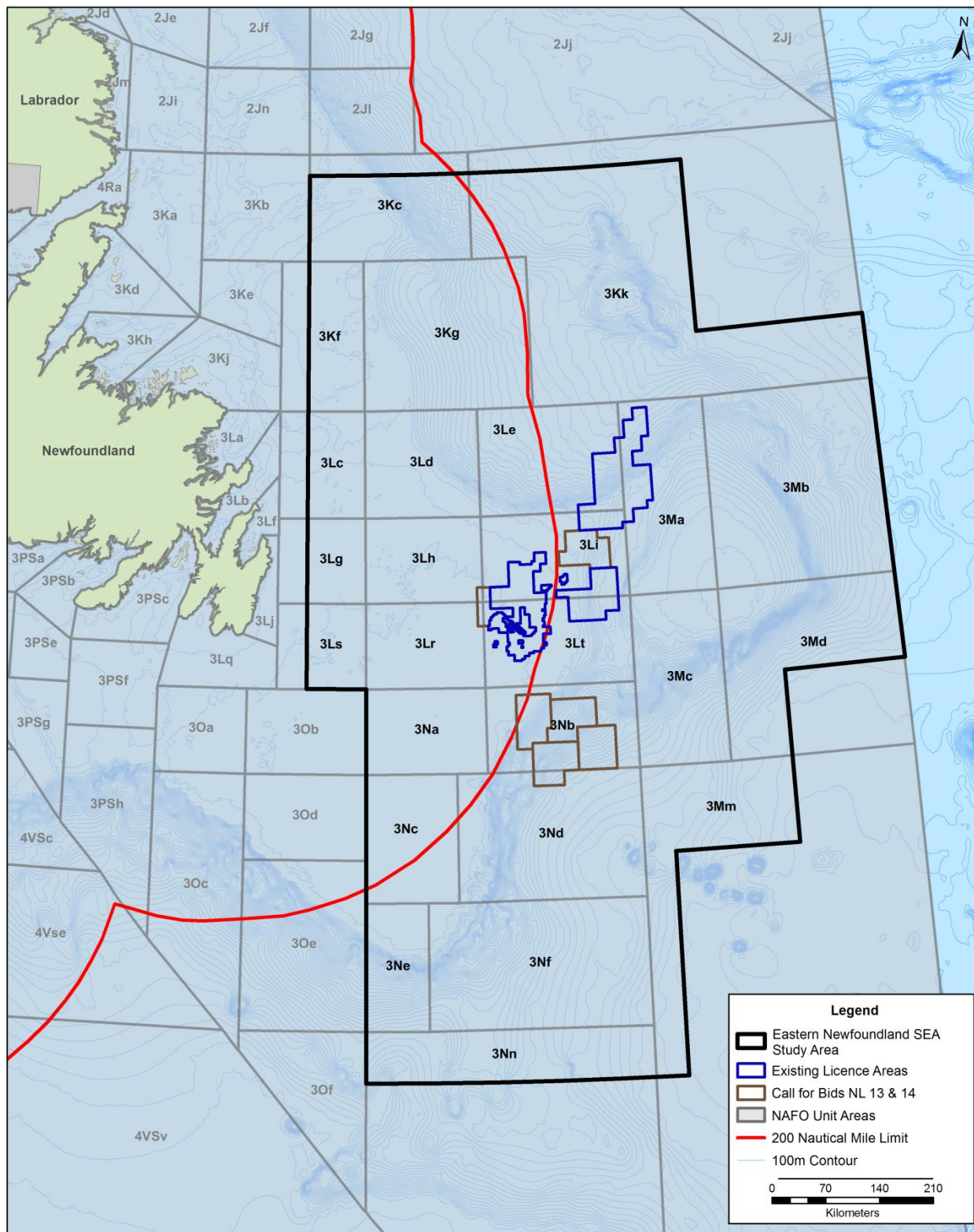


Figure 4.118 NAFO Unit Areas Within and Adjacent to the SEA Study Area



Fish landings by weight are reported in the Tables that follow in their original units (kg), although the text and associated graphs describe fish quantities in tonnes. The landed value is the value of the catch “at the wharf”, generally the price paid to the harvesting sector. It does not include or reflect, for instance, the “downstream” indirect or induced economic benefits of the fish harvest, during or after processing or other value-added manufacturing of fish products.

Mapping (geospatial) information on the location and timing of fishing activity was also provided by DFO Statistical Services in Ottawa, ON. In doing so, DFO has indicated that, in the interests of protecting commercially sensitive and/or personal information on fish harvesters, it is no longer able to provide specific locations (coordinates) for commercial fishing activity. Instead, DFO provides aggregated data sets which give a general indication of fishing areas (by species, gear types, fleet and other pre-determined categories and data classes) for defined geographic areas (in this case, for a series of “cells” that are approximately 6 x 4 nautical miles in size that together comprise a map grid that covers the area of interest).

The fishing activity maps that are included in these SEA sections generally indicate where and when fishing activity was recorded (at one or more locations) within a pre-determined grid block, but do not indicate the total amount or intensity of fishing effort or the amount of fish harvested (quantity / value) from a particular location. As has traditionally been the case, the DFO mapping dataset is also not comprehensive and typically accounts for a portion of total fishing activity in a region (in terms of total weight and value), and does not include specific locational information for certain fisheries (particularly for inshore fisheries undertaken by smaller vessels, such as those for lobster). Therefore, while useful as a tool to measure the overall commercial fishing activity in the Atlantic region, it is not comprehensive enough to measure every type of activity for each specific fishery.

The available information and associated mapping does, however, provide a general indication and overview of the nature and spatial and temporal distribution of commercial fishing activity within the region, at a level appropriate for SEA analysis and related planning. The various fisheries data sets referenced above were supplemented with other existing and available information related to fisheries in the area, including information received during the SEA consultation process (see Chapter 2 and Appendix A).

4.3.4.2 Commercial Fisheries

The fishing industry is an important and long-standing component of the Newfoundland and Labrador economy. In 2012, fish landings in the province totalled approximately 252,000 tonnes with a total landed value of nearly \$575 million and a total production value of approximately \$1 billion. The province’s fishing industry employed almost 20,000 persons in 2012, including 10,398 individuals working in fish harvesting and another 9,214 working in processing activities in the province’s over 120 licenced fish plants (NL DFA 2013c).

The following sections provide an overview of past and current commercial fishing activity in the Study Area (and particularly, for the NAFO Unit Areas described above). This begins with a brief overview of past fisheries and the general evolution of fishing activity in the region in past decades. This is followed by a description of the current commercial fishery, as reflected in the available fisheries data sets covering the period 2008 – 2012, for which both annual and multi-year (cumulative) information is provided in the text, tables and figures that follow. It should also be noted that reporting of fishing

information by NAFO Unit Areas in the DFO datasets used herein indicates the area in which fish is caught, rather than where it was landed.

Historical Overview

Early settlers along the eastern coast of Newfoundland came from Europe, primarily as participants in a seasonal fishery that focussed on groundfish, particularly Atlantic cod. This fishery provided a salted cod product to the global market by merchants who remained in home ports, most often in parts of England. Early harvesters in the 19th and 20th centuries were mainly independent, operating from small open boats based in their home communities. Fish processing consisted of families salting and drying the catch. Many harvesters also took part in the sealing industry during spring months. As settlement became more permanent for both harvesters and buyers, the merchants would outfit the harvester for the season on “credit” and then receive the catch as “payment” (MUN 1998).

The fishery remained the largest (and often, only) employer in coastal communities along the east coast of Newfoundland during the 20th century. After Confederation with Canada in 1949, markets for salt cod declined, while the global demand for frozen fish products increased. Long liners, freezer plants and trawlers all began to increase in numbers. Fish harvesting off Newfoundland and Labrador expanded into a global, industrialized industry involving both Canadian and foreign fleets. Canada declared a 200 mile limit in 1977 and took exclusive control over its coastal waters, including its fish stocks (MUN 1998), with an associated rapid expansion in the number of harvesters and allocations occurring during that time.

The cod fishery was halted in 1992 by a moratorium on the east coast of Canada as fish stocks had reached dangerously low levels. Landings of cod dropped from \$134 million in 1990 to \$50 million in 1992 (DFO 2013f). Although this moratorium was first thought to be short term in nature, another moratorium in 2003 was placed on the last remaining cod fishery after it was discovered cod stocks had not improved (DFO 2012d). This moratorium is still in place, although cod stocks have reportedly seen some improvement in certain locations, and small scale fisheries do take place in some areas.

Notwithstanding the decline of traditional groundfish harvests and their dominant position in the province’s fishing industry, the overall landed value of seafood products in Newfoundland and Labrador has, however, remained steady (and in fact, have actually increased) since the closures. Other species have since become the focus of harvesting activity, with snow crab and Northern shrimp having become the two most important species since the closure of the cod fishery (DFO 2013f) (see later Figures 4.121 and 4.122).

The first commercial snow crab landings in Newfoundland occurred during the late 1960s but the fishery gained an increased and significant economic importance after the collapse of the cod fishery. The landed value of snow crab in Newfoundland and Labrador, for example, increased from almost \$13 million in 1992 to nearly \$180 million in 2008. Many harvesters who now hold full time licenses for snow crab were issued the permits initially on a temporary basis in 1995. These temporary licenses were issued in response to the collapse of groundfish stocks (DFO 2010e). Northern shrimp have been harvested beyond the 200 mile limit of Newfoundland and Labrador’s shores since the 1970s by factory freezer trawlers, but a further reliance on the stock has occurred since the cod moratorium with allocations almost doubling from 85,000 tonnes in 1998 to 160,000 tonnes in 2007 (Street 2011). Experimental licenses were issued in the mid- to late-1990s with permanent licenses issued in 2007 to an inshore fleet. This fleet operates mainly in NAFO areas 2J3KL, of which 3KL are in, or adjacent to,

the SEA Study Area. The landed value of the product has increased from \$230 million in 1997 to \$350 million in 2005 (DFO 2010d).

Commercial Fish Harvests (Quantities and Values)

The 2012 commercial fish harvest within the SEA Study Area (namely, the combined NAFO Unit Areas referenced above) totalled approximately 51,000 tonnes and had a landed value of over \$163 million. Fish landings in that area over the past five year (2008 to 2012) period were at their lowest quantities in 2009, peaked at nearly 100,000 tonnes in 2008, and totalled approximately 363,000 tonnes over the entire period from 2008 to 2012. The landed value of fish harvested in the region during that time period ranged from approximately \$116.1 million (in 2009) to over \$205 million (in 2011) and totalled about \$815.6 million over the 2008 – 2012 period. The quantities and values of species landed are related to the quotas (Total Allowable Catch) set by DFO or NAFO, and can vary considerably from year to year.

Northern shrimp itself comprised approximately 54 percent of the total fish landings by weight in this region from 2008 – 2012, followed by queen / snow crab (32 percent) and turbot (five percent), with no other species accounting for greater than five percent of total landings by weight. In terms of landed value, queen / snow crab accounted for over half of the area's fishery from 2008 to 2012 overall, followed by Northern shrimp (36 percent), turbot (seven percent), and others.

Table 4.115 Fish Harvests by Weight and Value (1990 – 2012)

Year	Weight (kg)	Value (\$)
1990	127,493,363	75,906,611
1991	113,302,434	68,015,776
1992	46,563,824	30,560,162
1993	39,786,580	46,136,345
1994	30,721,265	55,187,553
1995	36,508,595	99,778,684
1996	38,441,585	73,065,803
1997	41,095,480	66,387,779
1998	39,880,396	70,231,064
1999	56,629,512	142,812,731
2000	70,370,621	177,776,707
2001	64,194,156	136,067,441
2002	66,834,431	136,231,102
2003	89,553,237	193,642,522
2004	110,809,985	235,178,205
2005	104,651,280	173,525,386
2006	105,843,597	147,242,321
2007	94,685,888	173,341,470
2008	98,310,800	179,969,595
2009	63,068,504	116,094,428
2010	83,115,185	151,339,846
2011	67,802,241	205,068,262
2012	51,028,931	163,132,892

Figure 4.119 Fish Harvests by Year by Weight (1990 – 2012)

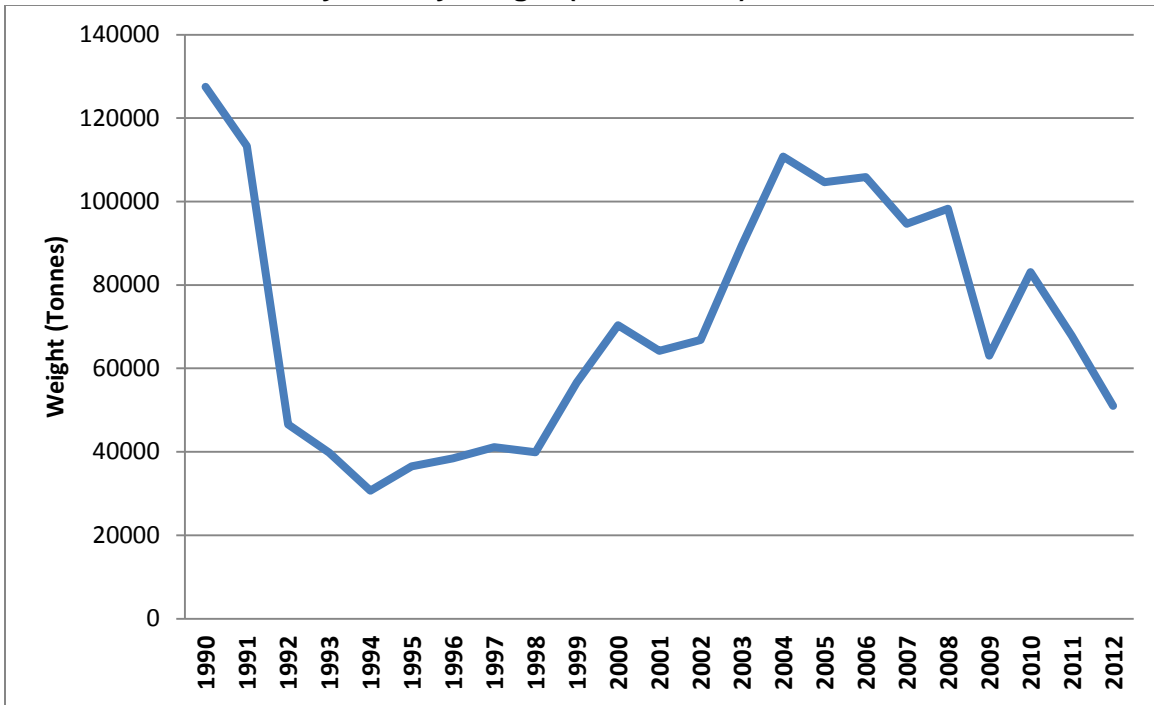


Figure 4.120 Fish Harvests by Year by Value (1990 – 2012)

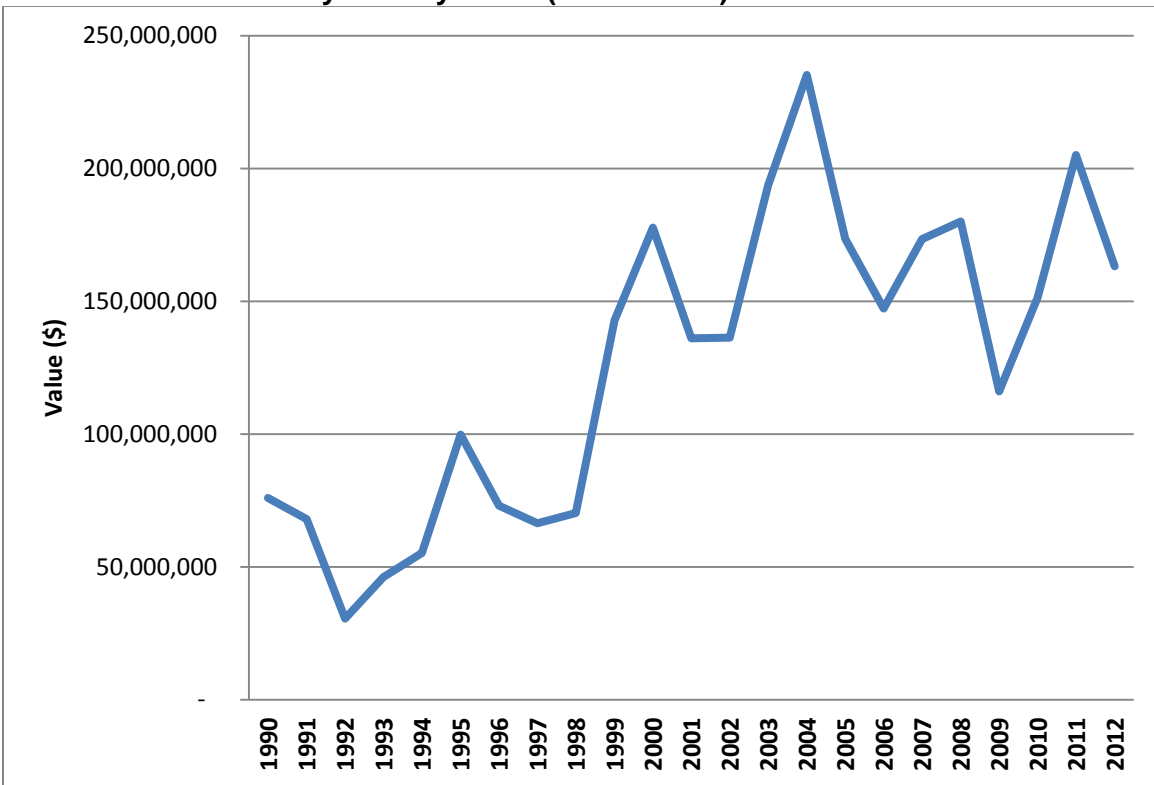


Figure 4.121 Fish Harvests by Weight by Species (2008 – 2012 Total)

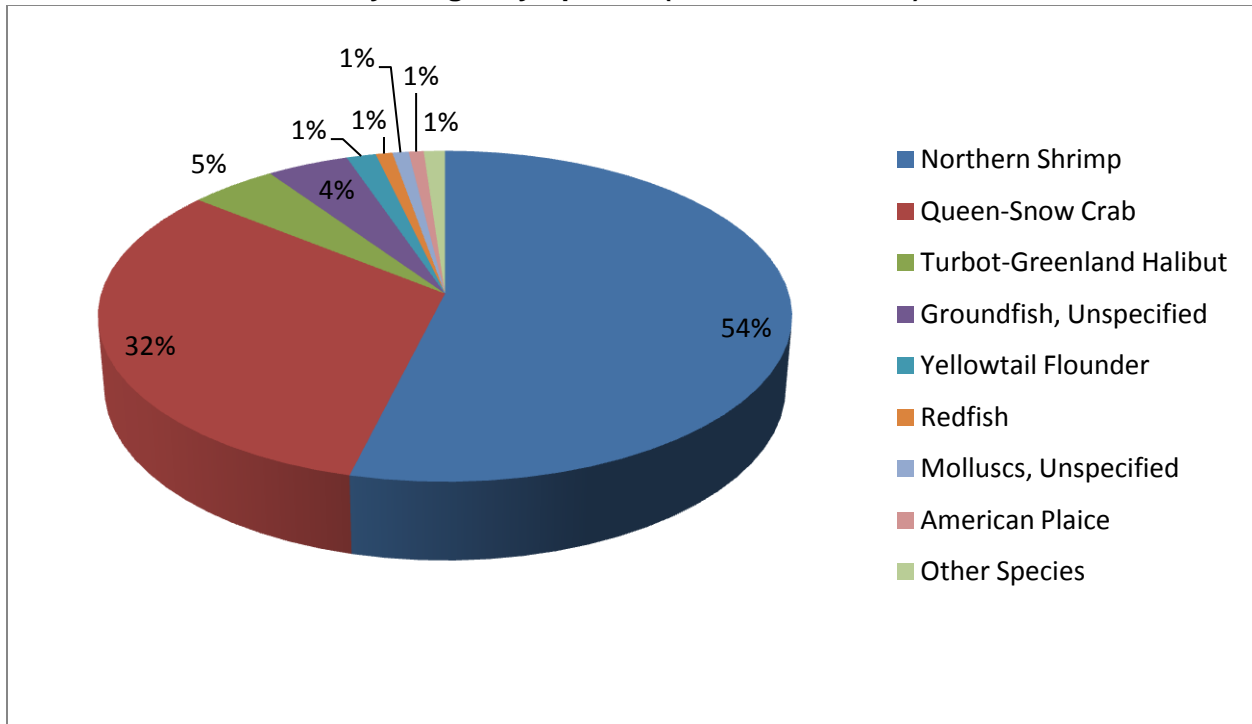


Table 4.116 Fish Harvests by Weight (kg) (2008 – 2012)

Species	2008	2009	2010	2011	2012	Total	# Seal Pelts (All Years)
American Plaice	61,1813	816,125	877,378	383,018	211,322	2,899,656	-
Atlantic Halibut	32,886	92,450	124,316	60,167	144,303	454,122	-
Capelin	22,514	17,229			165,042	204,785	-
Cod	124,600	41,033	89,248	240,284	23,213	518,378	-
Crustaceans, Unspecified		639				639	-
Greyscale-Witch Flounder	15,029	43,985	127,779	107,631	27,993	322,417	-
Groundfish, Unspecified	7,961,214	3,456,994	5,693	3,020,192	1,376,621	15,820,714	-
Haddock	473		22,260	33,618		56,351	-
Molluscs, Unspecified	10,181	1,134,365	974,480	995,608	16,907	3,131,541	-
Other Products, Unspecified	42,473	427,514	423,539	2,759		896,285	-
Northern Shrimp	64,592,674	32,311,726	48,232,625	30,922,148	19,659,435	195,718,608	-
Pelagics, Unspecified		34,089	126,052	103,263	36,594	299,998	-
Queen-Snow Crab	22,811,032	20,563,750	22,622,955	25,004,838	24,923,067	115,925,642	-
Redfish	13,003	32,681	170,911	2,016,792	983,739	3,217,126	-
Roughhead Grenadier	2,687	11,616	34,959	111,644	24,073	184,979	-
Seal Fat	59,980					59,980	-
Skate	13,050	51,031	4,860	2,045	1,769	72,755	
Turbot-Greenland Halibut	1,997,191	4,029,762	3,568,294	4,186,784	3,048,710	16,830,741	-

Species	2008	2009	2010	2011	2012	Total	# Seal Pelts (All Years)
White Hake		3,515	12,560			16,075	-
Yellowtail Flounder			5,697,276			5,697,276	-
Seal Products, Unspecified					28,947	28,947	-
Beater Harp Seal Skins (#)							58,587
Bedlamer Harp Seal Skins (#)							216
Ragged Jacket Harp Seal Skins (#)							38
Seal Flippers (#)							18,194
Seals, Unspecified							10,957
Seal Products, Unspecified							2756
Other				611,450	357,196	968,646	-
Total	98,310,800	63,068,504	83,115,185	67,802,241	51,028,931	363,325,661	90,748

Figure 4.122 Fish Harvests by Value by Species (2008 – 2012 Total)

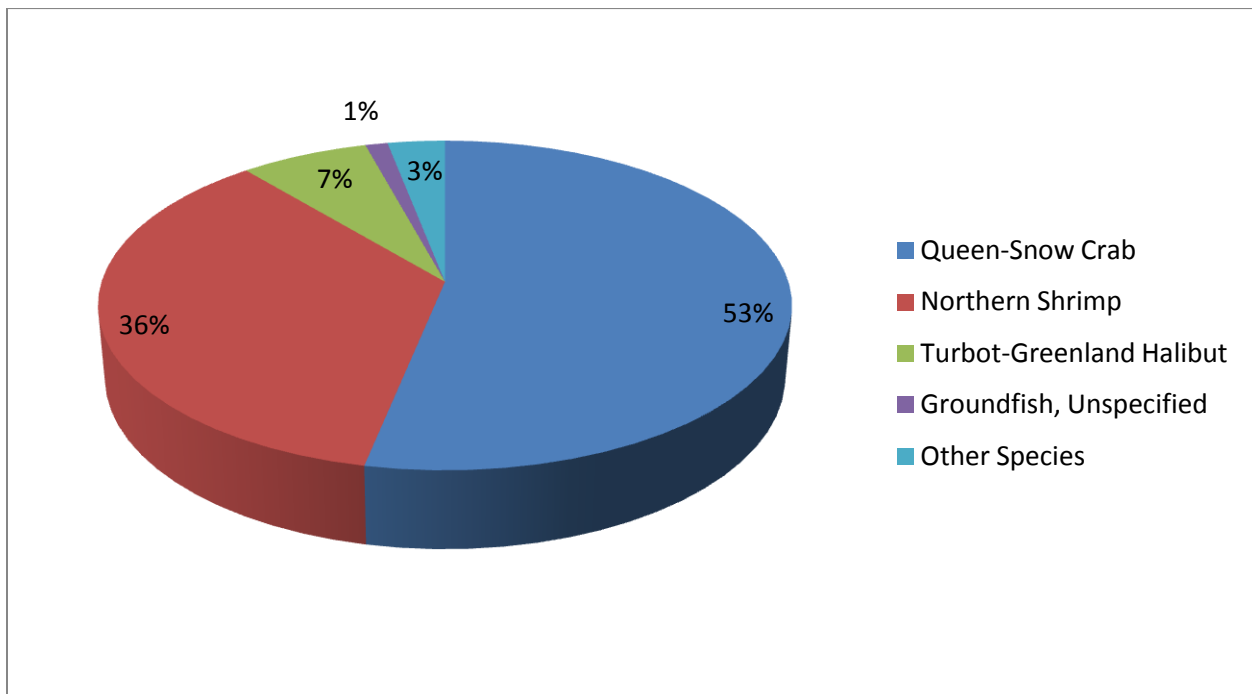


Table 4.117 Fish Harvests by Value (\$) (2008 – 2012)

Species	2008	2009	2010	2011	2012	Total
American Plaice	386,940	27,619	641,839	260,514	114,600	1,931,511
Atlantic Halibut	206,258	655,496	905,734	542,883	1,300,935	3,611,305
Capelin	5,753	2,659			35,294	43,706
Cod	188,719	44,651	92,410	278,626	25,937	630,342
Crustaceans, Unspecified		508				508

Species	2008	2009	2010	2011	2012	Total
Greyscale-Witch Flounder	12,135	38,089	90,879	94,512	27,373	262,988
Groundfish, Unspecified	4,991,762	2,080,051	5,323	1,902,234	720,817	9,700,187
Haddock	454		17,536	32,752		50,741
Molluscs, Unspecified	14,175	1,590,231	1,259,619	1,286,879	26,899	4,177,803
Other Products, Unspecified	113,791	1,671,014	1,425,664	11,013		3,221,481
Northern Shrimp	91,489,040	35,568,286	64,070,026	60,162,423	39,399,719	290,689,495
Pelagics, Unspecified		64,380	52,105	129,689	55,207	301,382
Queen-Snow Crab	77,520,093	63,425,039	67,611,402	118,521,316	107,144,938	434,222,788
Redfish	7,167	23,979	112,613	972,222	780,740	1,896,721
Roughhead Grenadier	1,248	7,646	22,321	34,989	8,422	74,626
Seal Fat	23,697					23,697
Skate	5,031	12,786	1,165	505	708	20,195
Turbot-Greenland Halibut	3,127,475	10,313,022	11,918,229	18,679,924	11,958,817	55,997,466
White Hake		3,790	7,012			10,801
Yellowtail Flounder			3,105,969			3,105,969
Seal Products, Unspecified					17,332	17,332
Beater Harp Seal Skins (#)	1,859,000					1,859,000
Bedlamer Harp Seal Skins (#)	1,208					1,208
Ragged Jacket Harp Seal Skins (#)	397					397
Seal Flippers (#)	15,242					15,242
Seals, Unspecified	10	65,184			152,812	218,005
Other				2,157,781	1,362,342	3,520,123
Total	179,969,595	116,094,428	151,339,846	205,068,262	163,132,892	815,605,022

Commercial Fish Harvests (Overall Geographic Distribution: 2008-2012)

The following Figures provide a general indication of the overall geographic distribution of commercial fishing activity within and adjacent to the SEA Study Area, initially for the year 2012 and then from 2008 to 2012 overall, for all species. As indicated above, the information provided in these maps is based on the geospatial data received from DFO, and shows the general presence of recorded fishing activity for a series of 6 x 4 nautical mile “cells” that together comprise a map grid that covers the region. For the multi-year fishing maps, where fishing activity occurred within a single cell in two or more years, the Figure indicates only the most recent year in which fishing activity occurred within that cell. Individual maps showing overall fishing activity for each year from 2008 – 2011 are provided in Appendix C.

Further information on commercial fishing activity by month / season, gear type, fleet, species and other parameters is also provided.

Figure 4.123 Commercial Fishing Locations: 2012

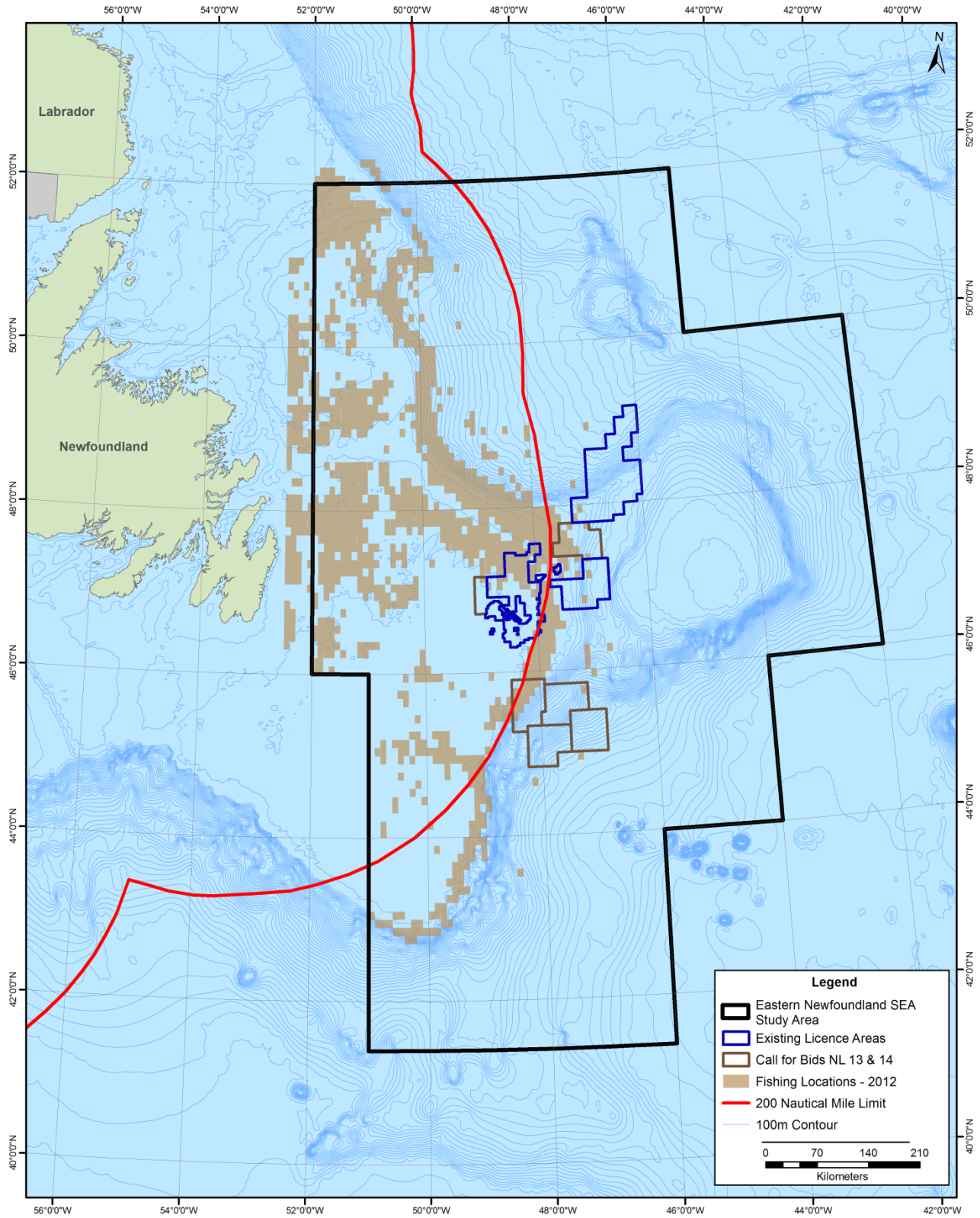
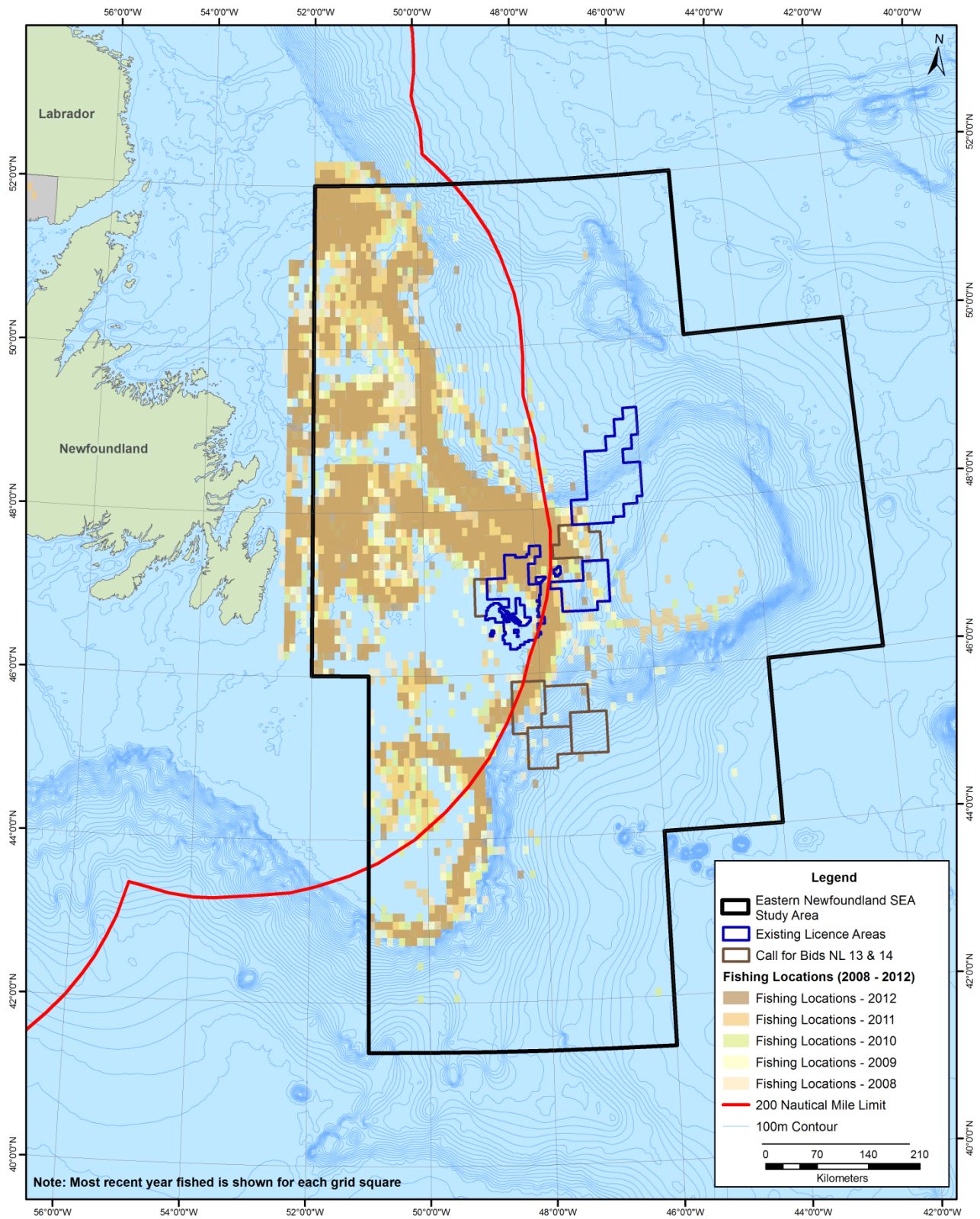


Figure 4.124 Commercial Fishing Locations: 2008-2012



Commercial Fishing - Seasonality

The timing of fishing activity varies by location and species, and is often dictated by such factors as weather and ice conditions, the availability of a resource in an area at a particular time, fisheries licencing and other regulatory and management considerations, as well as individual fishers' harvesting plans and preferences.

Fishing activity in the NAFO Unit Areas that correspond generally to the SEA Study Area (as listed above) during the 2008 to 2012 period occurred throughout the year, with the highest landings by weight occurring in the summer (May - August) period, which also accounted for approximately 75 percent of the total value of fish harvested.

Table 4.118 Monthly Fish Harvests by Weight and Value (2008 – 2012 Inclusive)

Month	Weight (kg)	Value (\$)
January	2,779,272	8,493,458
February	7,255,120	13,498,566
March	10,148,630	22,167,273
April	25,271,716	85,212,862
May	61,112,110	197,352,484
June	68,942,774	190,374,642
July	70,641,333	140,516,790
August	60,381,721	80,368,615
September	23,634,006	27,713,386
October	15,994,045	22,089,894
November	10,325,655	15,785,552
December	6,839,279	12,031,500
Total (All Months)	363,325,661	815,605,022

The Figures (maps) that follow also show the seasonal distribution (by quarter) of recorded fishing activity for 2012 and the period 2008 – 2012 overall. Monthly maps (for 2012 and the 2008-2012 period) are included in Appendix D.

Figure 4.125 Monthly Fish Harvests by Weight (2008 – 2012)

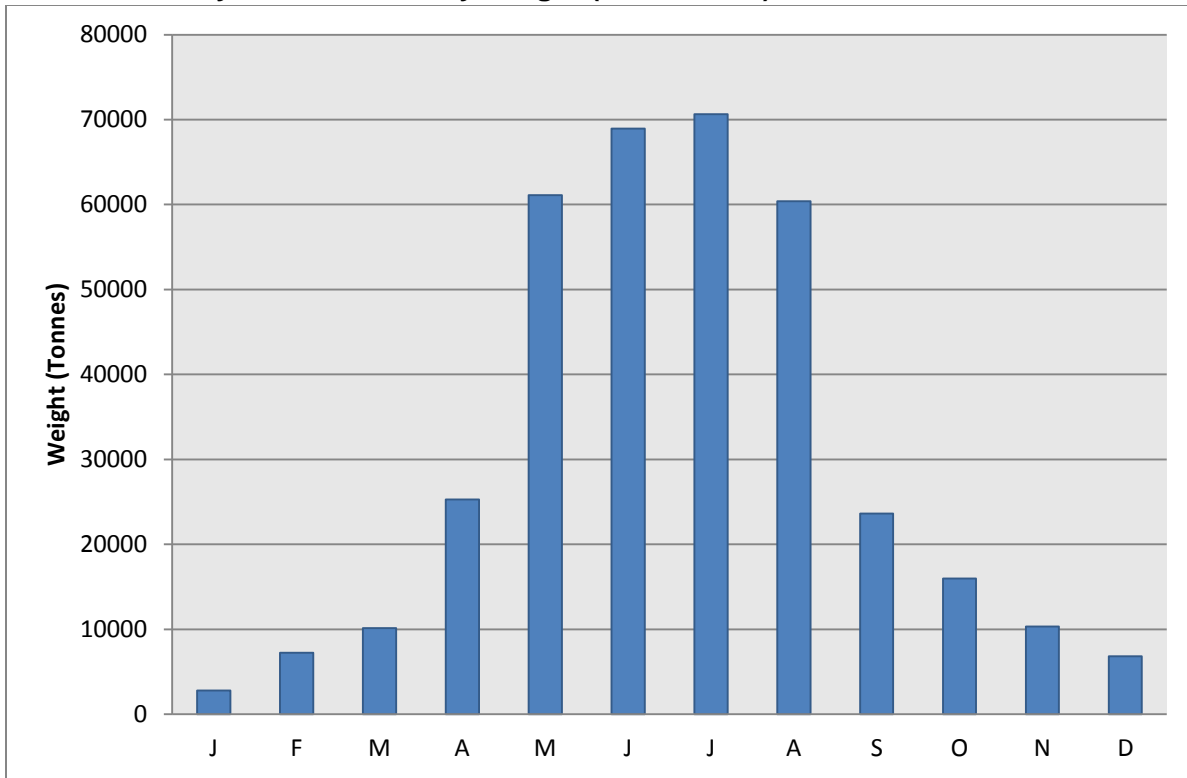


Figure 4.126 Monthly Fish Harvests by Value (2008 – 2012)

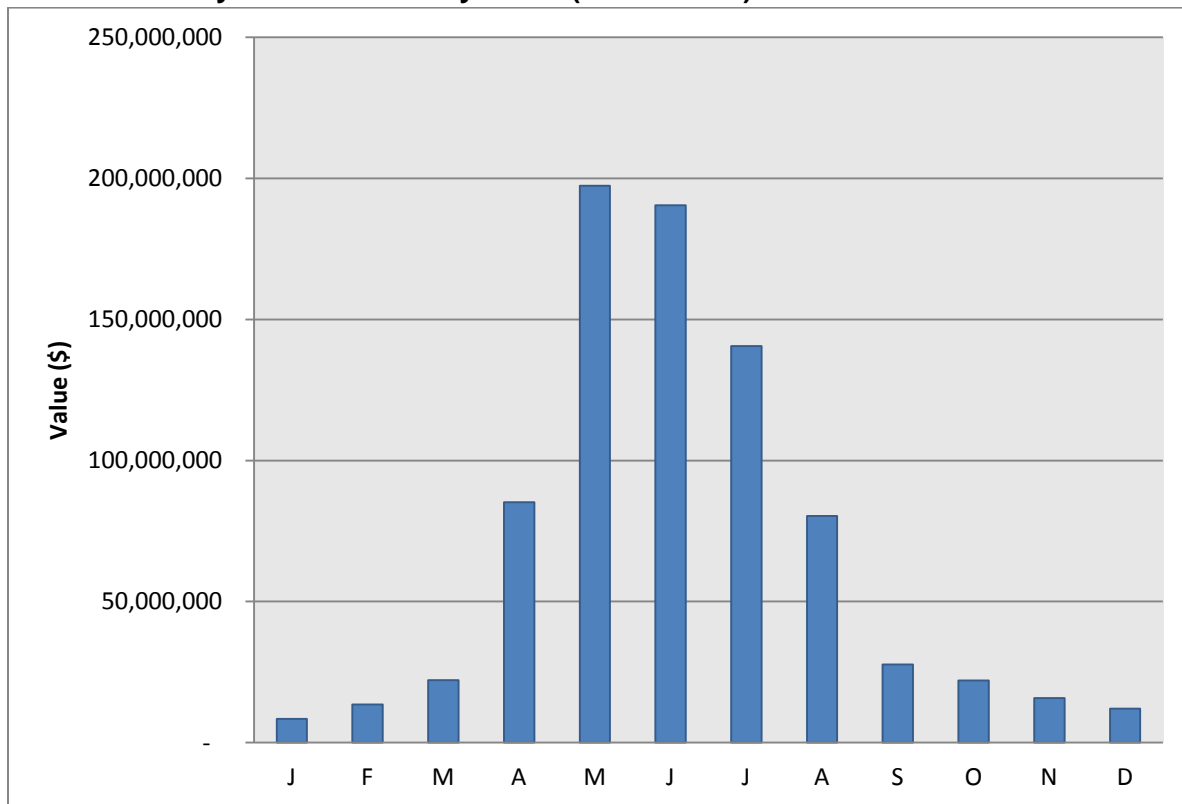


Figure 4.127 Commercial Fishing Locations: January – March 2012

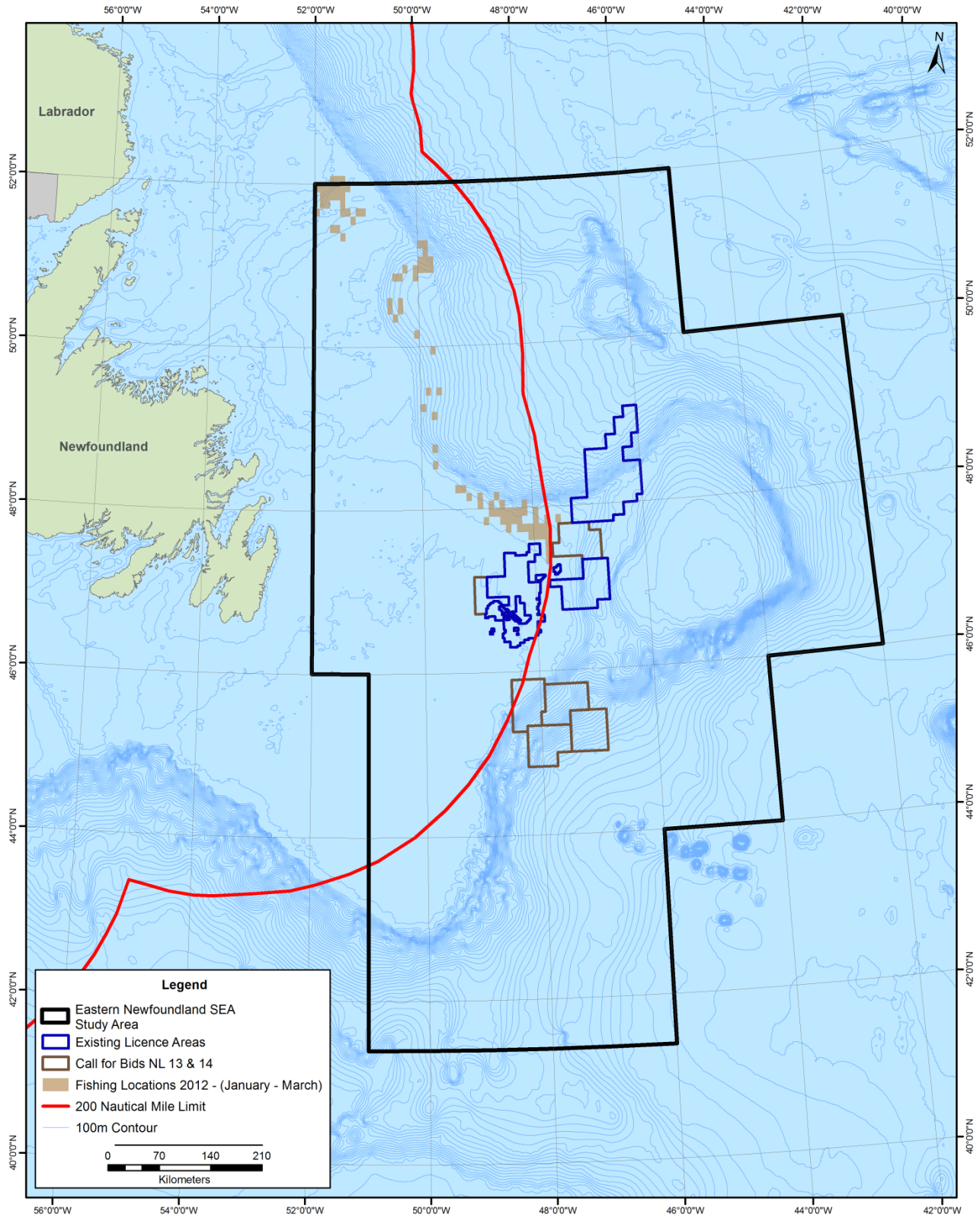


Figure 4.128 Commercial Fishing Locations: April - June 2012

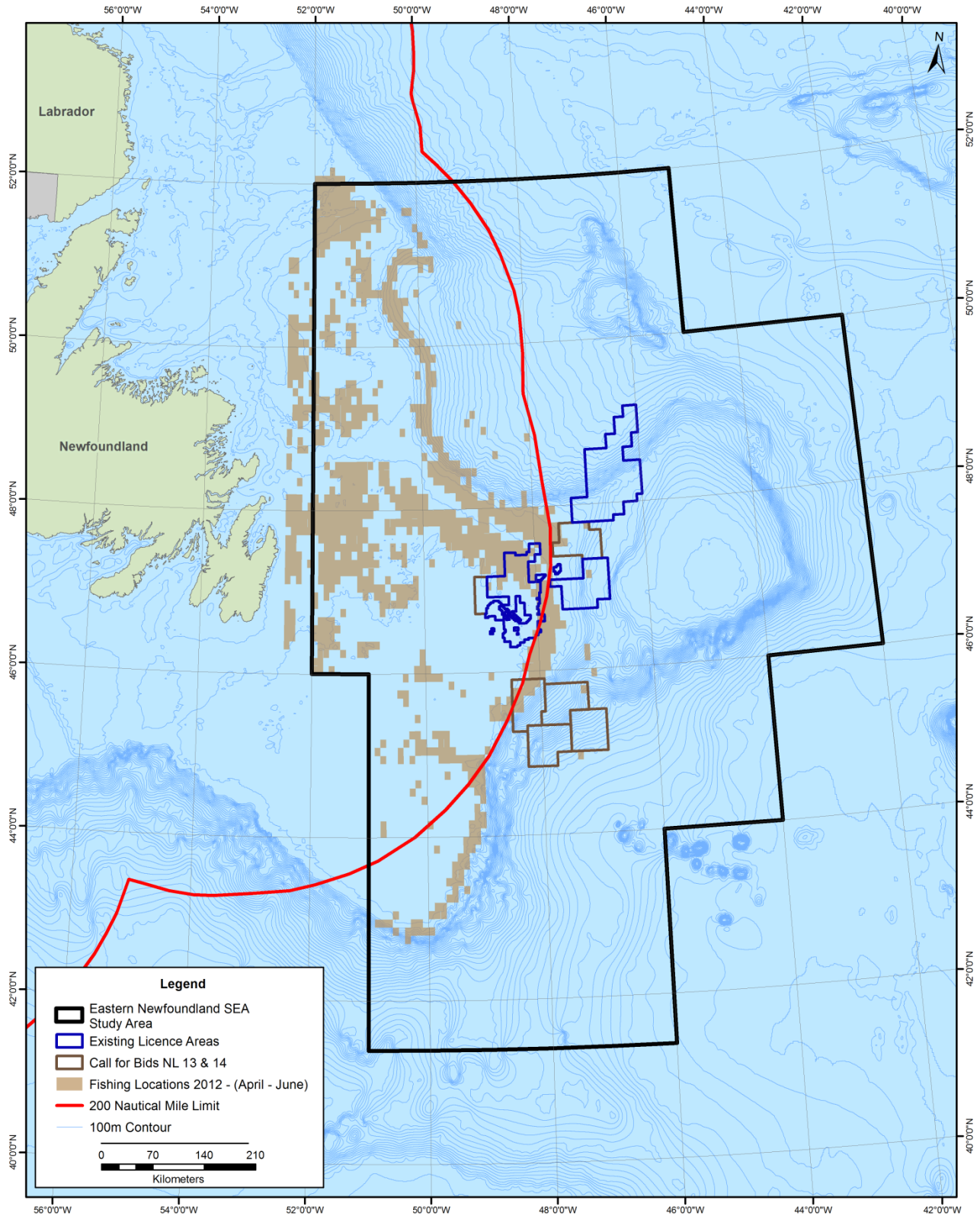


Figure 4.129 Commercial Fishing Locations: July - September 2012

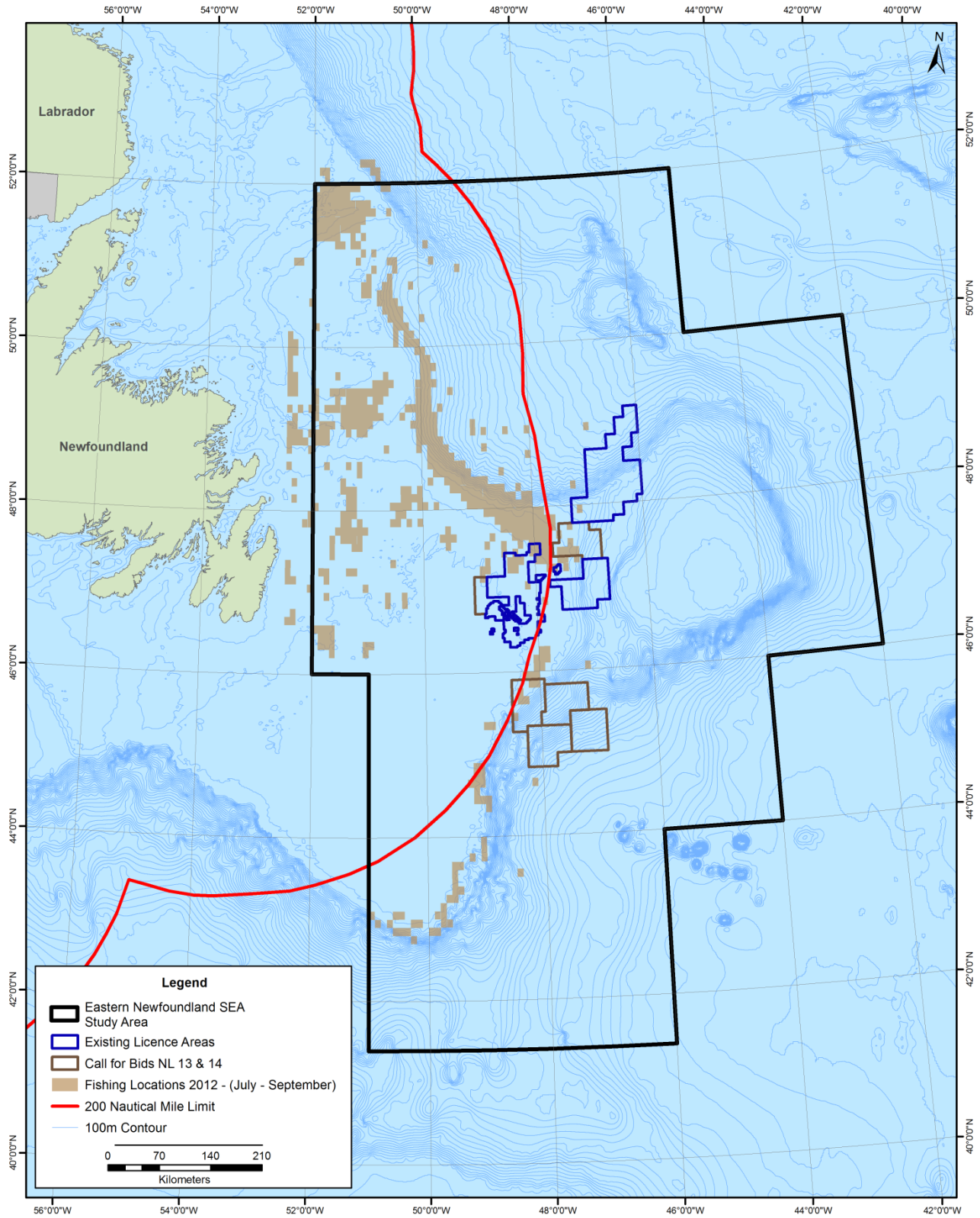


Figure 4.130 Commercial Fishing Locations: October – December 2012

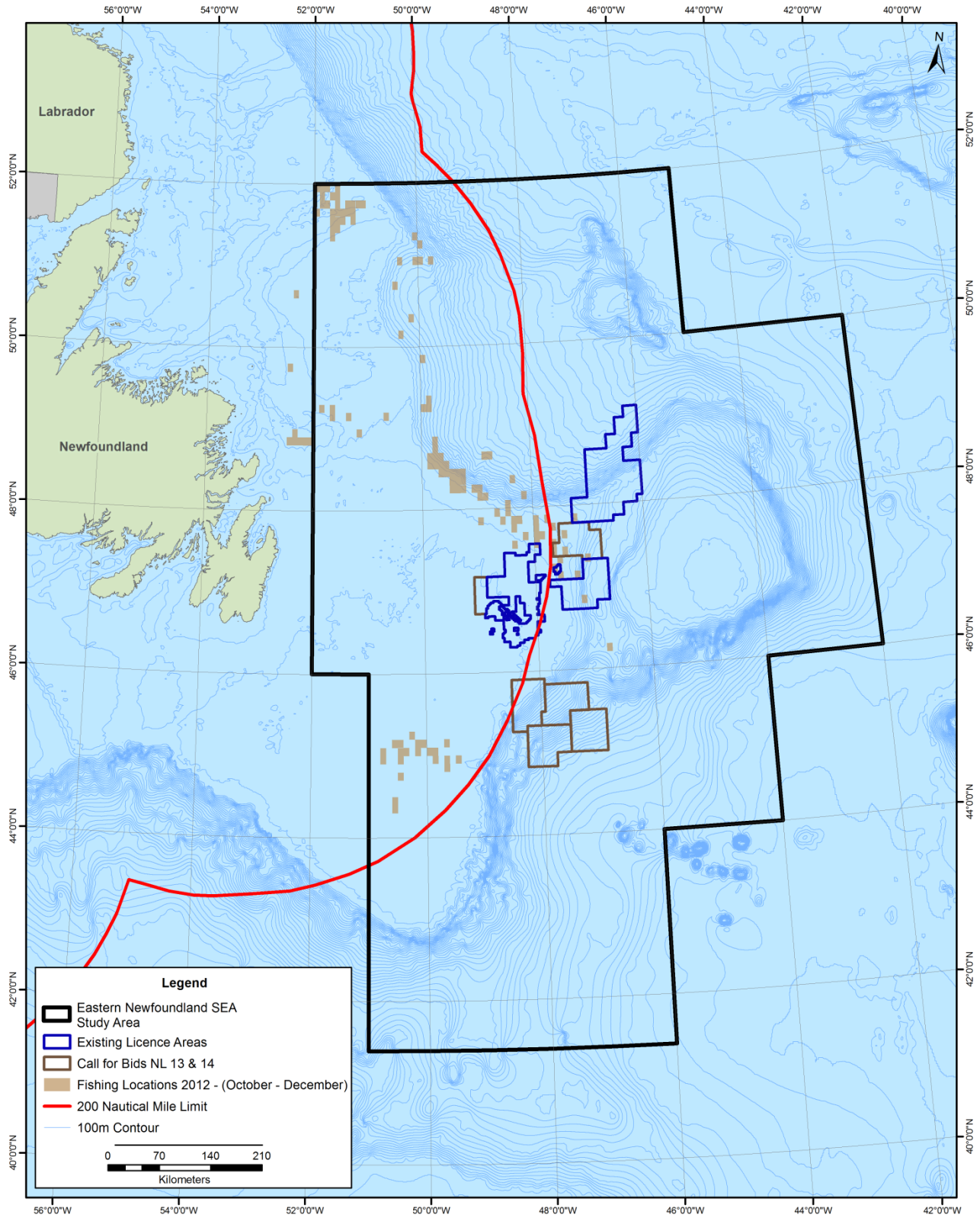


Figure 4.131 Commercial Fishing Locations: January – March 2008-2012

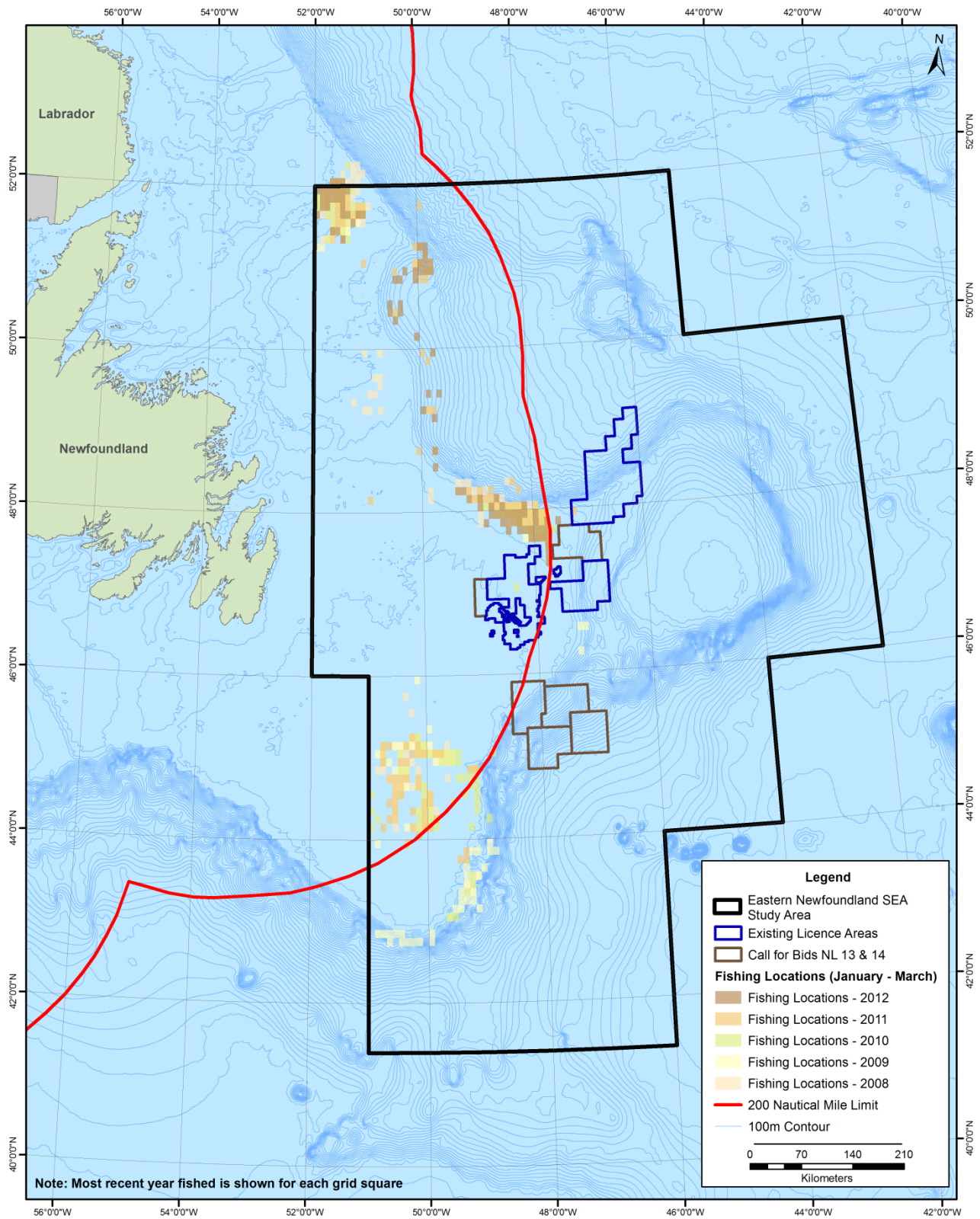


Figure 4.132 Commercial Fishing Locations: April - June 2008-2012

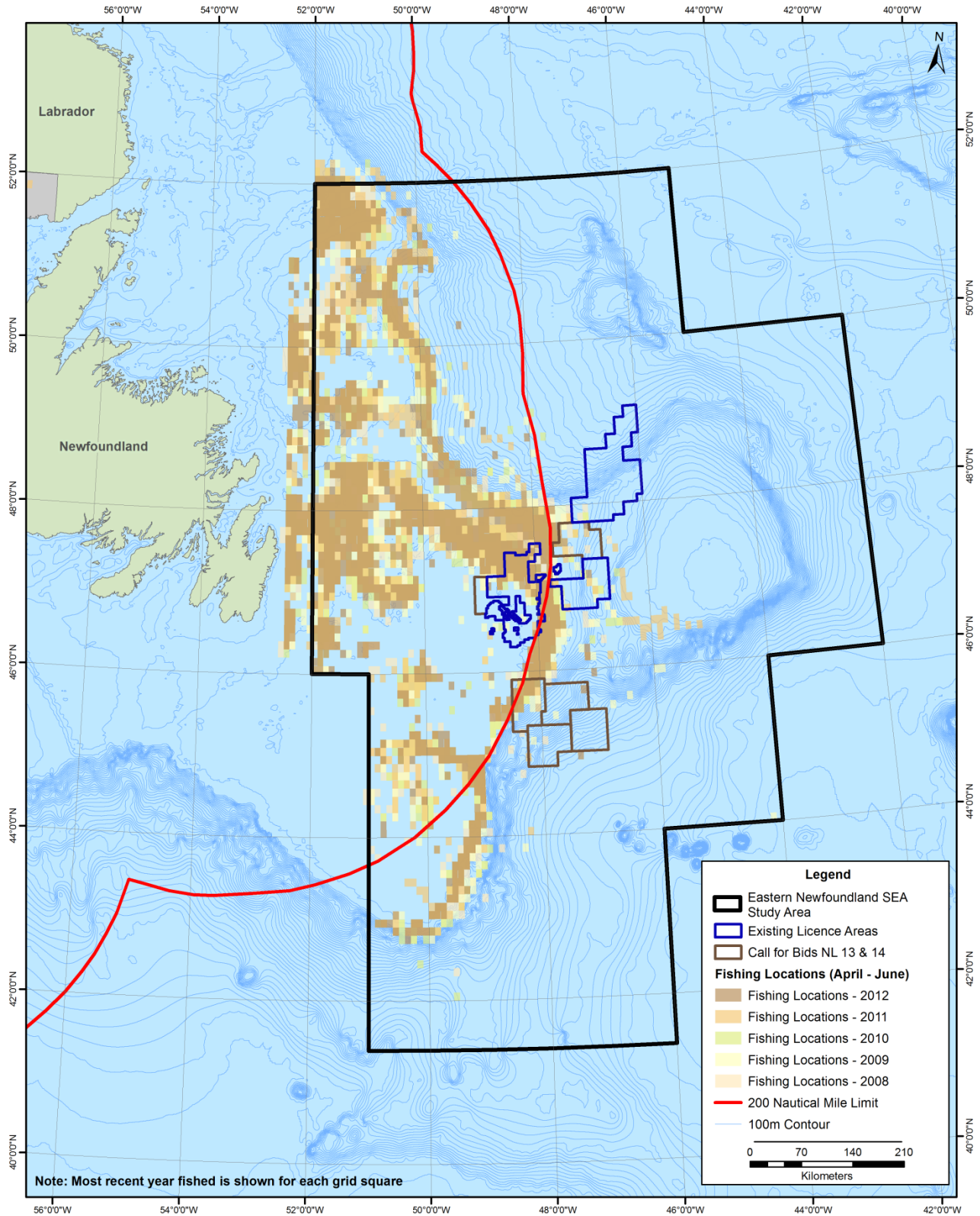


Figure 4.133 Commercial Fishing Locations: July - September 2008-2012

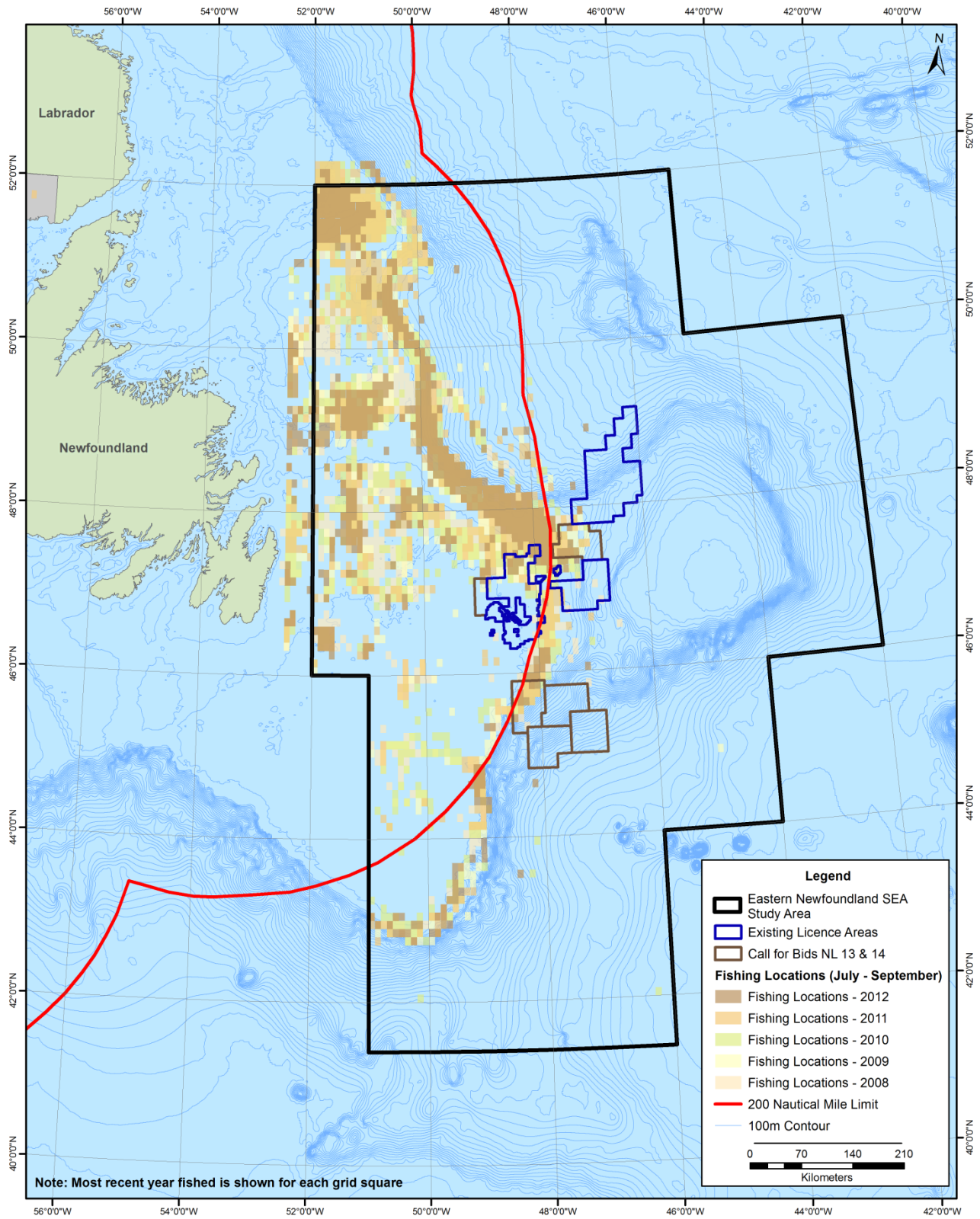
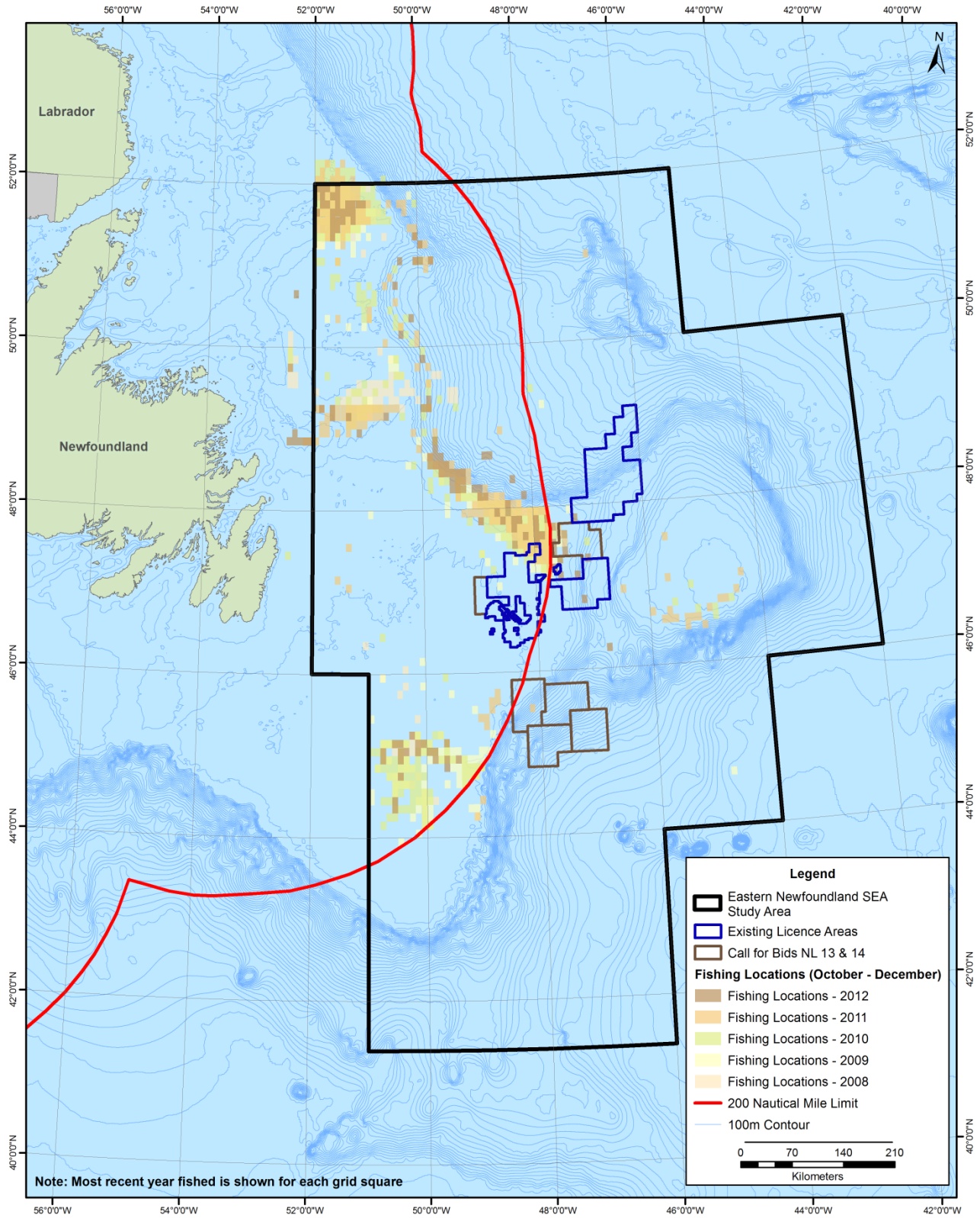


Figure 4.134 Commercial Fishing Locations: October – December 2008-2012



Commercial Fishing – Gear Types

Various types of fishing gear are used to harvest fish and shellfish off Eastern Newfoundland and elsewhere in Atlantic Canada. Indeed, the available DFO data reflect that a range of fishing gear types were used as part of the commercial fishery within the SEA Study Area from 2008 to 2012. Of these, shrimp trawls accounted for approximately 54 percent of the total fish landings over that period by weight, followed by pots (32 percent), bottom otter trawls (10 percent) and others.

In terms of fishing gear types by landed value, pots used in the shellfish (especially crab) fisheries accounted for over half of the total value of the fishery in that area over that time period, followed by shrimp trawls (36 percent), bottom otter trawls (six percent), gillnets (four percent) and others.

Figure 4.135 Fish Harvests (Weight) by Gear Type (2008 – 2012 Total)

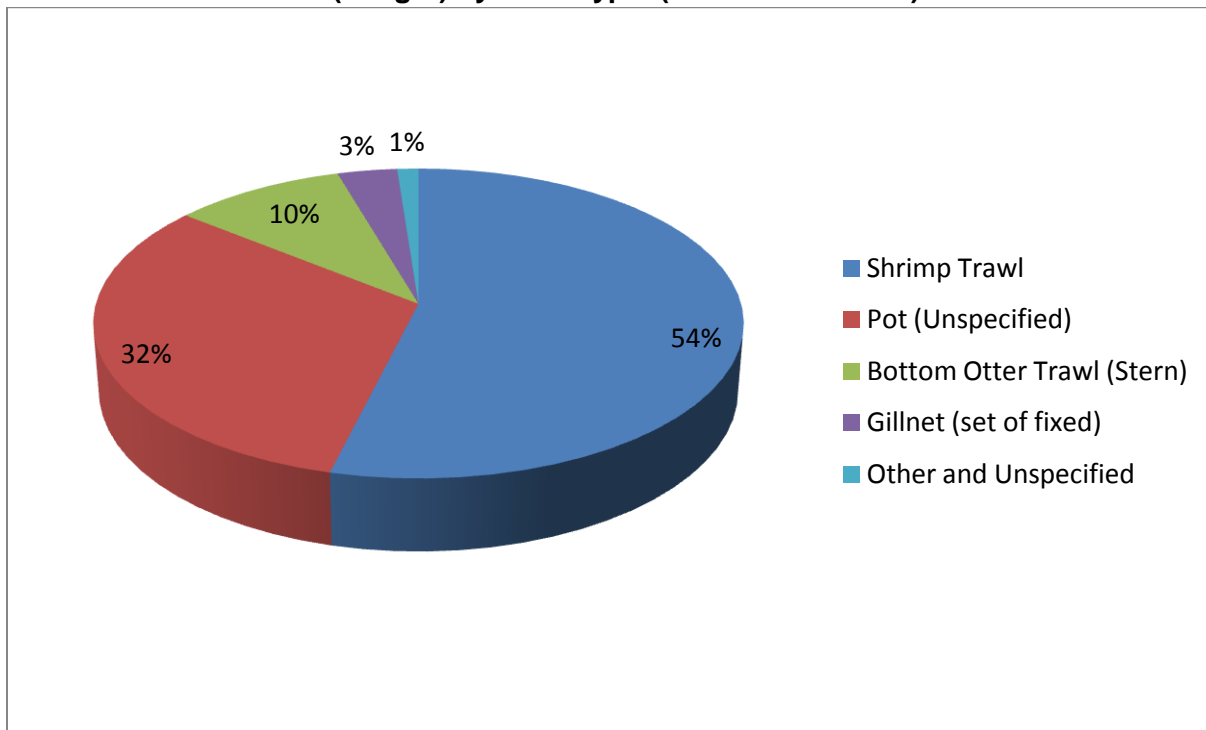


Table 4.119 Fish Harvests by Gear Type by Weight (kg) (2008 – 2012)

Gear Type	2008	2009	2010	2011	2012	Total
Bottom Otter Trawl (Stern)	8,775,863	6,011,847	8,521,335	7,957,652	3,889,682	35,156,379
Shrimp Trawl	64,592,674	32,311,726	48,232,625	30,922,148	19,659,435	195,718,608
Gillnet (set of fixed)	1,986,200	2,796,484	2,491,419	2,758,098	2,159,667	12,191,868
Longline		162,470	144,075			306,545
Pot (Unspecified)	22,811,032	20,564,389	22,622,978	25,004,838	24,929,293	115,932,530
Hunting	59,980					59,980
Unspecified Gear	85,051	1,221,588	1,102,753	1,159,505	390,854	3,959,751
Total	98,310,800	63,068,504	83,115,185	67,802,241	51,028,931	363,325,661

Figure 4.136 Fish Harvests (Value) by Gear Type (2008 – 2012 Total)

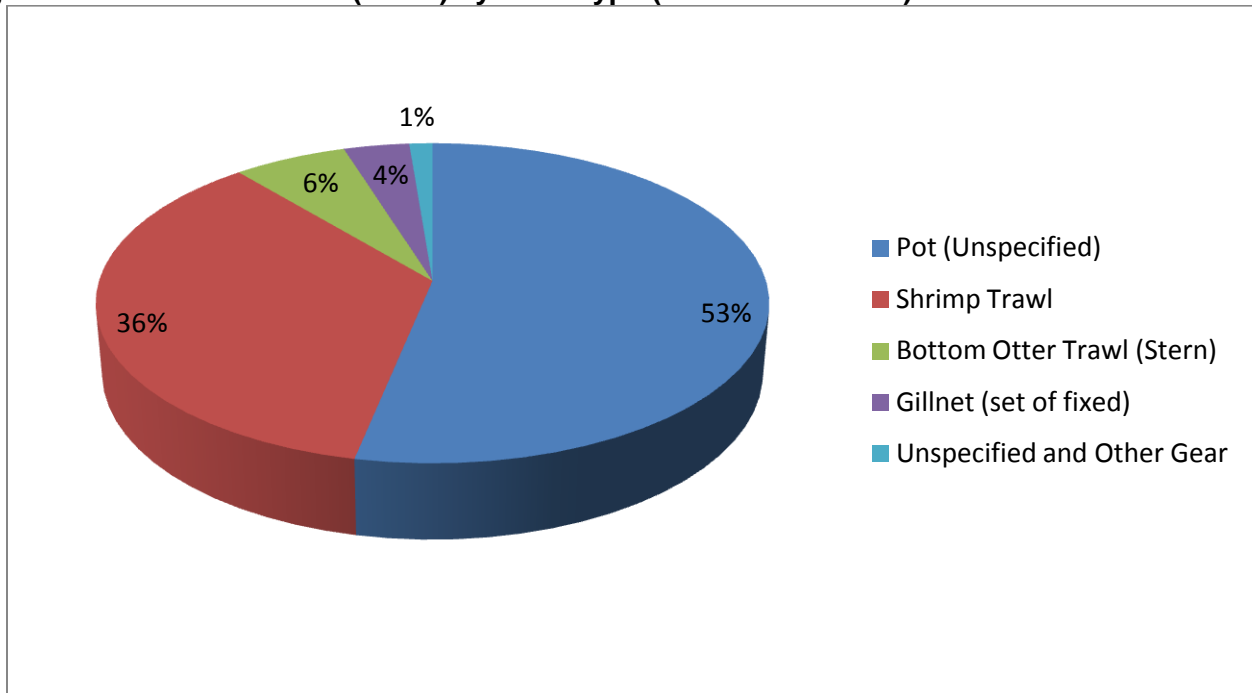
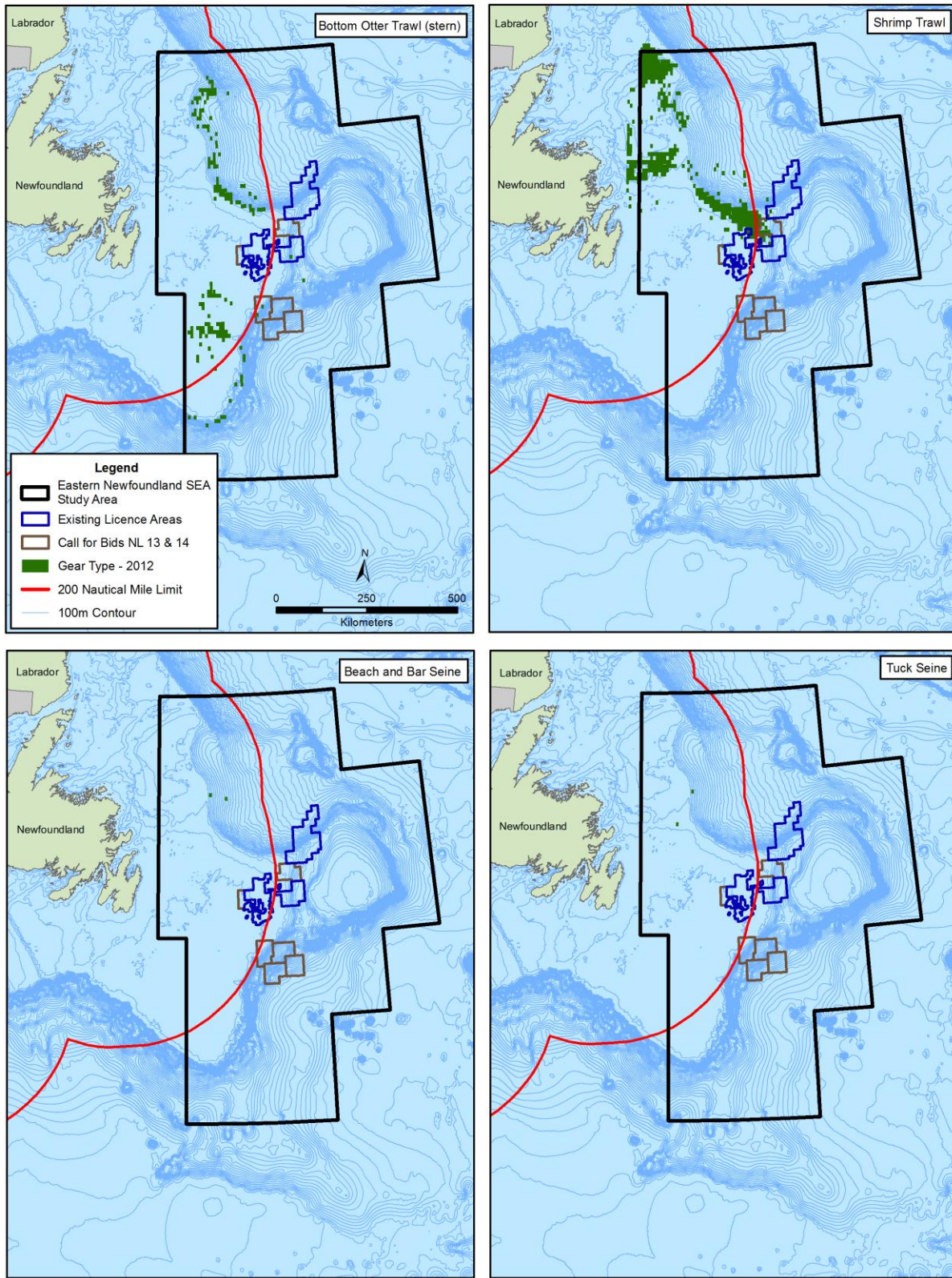


Table 4.120 Fish Harvests by Gear Type by Value (\$) (2008 – 2012)

Gear Type	2008	2009	2010	2011	2012	Total
Bottom Otter Trawl (Stern)	5,729,342	10,000,987	12,259,566	14,853,039	8,121,119	50,964,053
Shrimp Trawl	91,489,040	35,568,286	64,070,026	60,162,423	39,399,719	290,689,495
Gillnet (set of fixed)	3,094,770	4,512,432	5,188,692	9,643,368	6,924,270	29,363,531
Longline		714,027	890,746			1,604,773
Pot (Unspecified)	77,520,093	63,425,547	67,611,425	118,521,316	107,153,799	434,232,179
Hunting	1,899,555					1,899,555
Unspecified Gear	236,796	1,873,150	1,319,391	1,888,115	1,533,985	6,851,436
Total	179,969,595	116,094,428	151,339,846	205,068,262	163,132,892	815,605,022

The following Figures illustrate the general distribution of 2012 commercial fishing activity within and adjacent to the SEA Study Area by gear type. Maps illustrating commercial fishing activity by vessel size (length class) are provided in Appendix E.

Figure 4.137 Commercial Fishing Locations by Gear Type (2012)



Commercial Fishing Locations by Gear Type (2012) - Continued

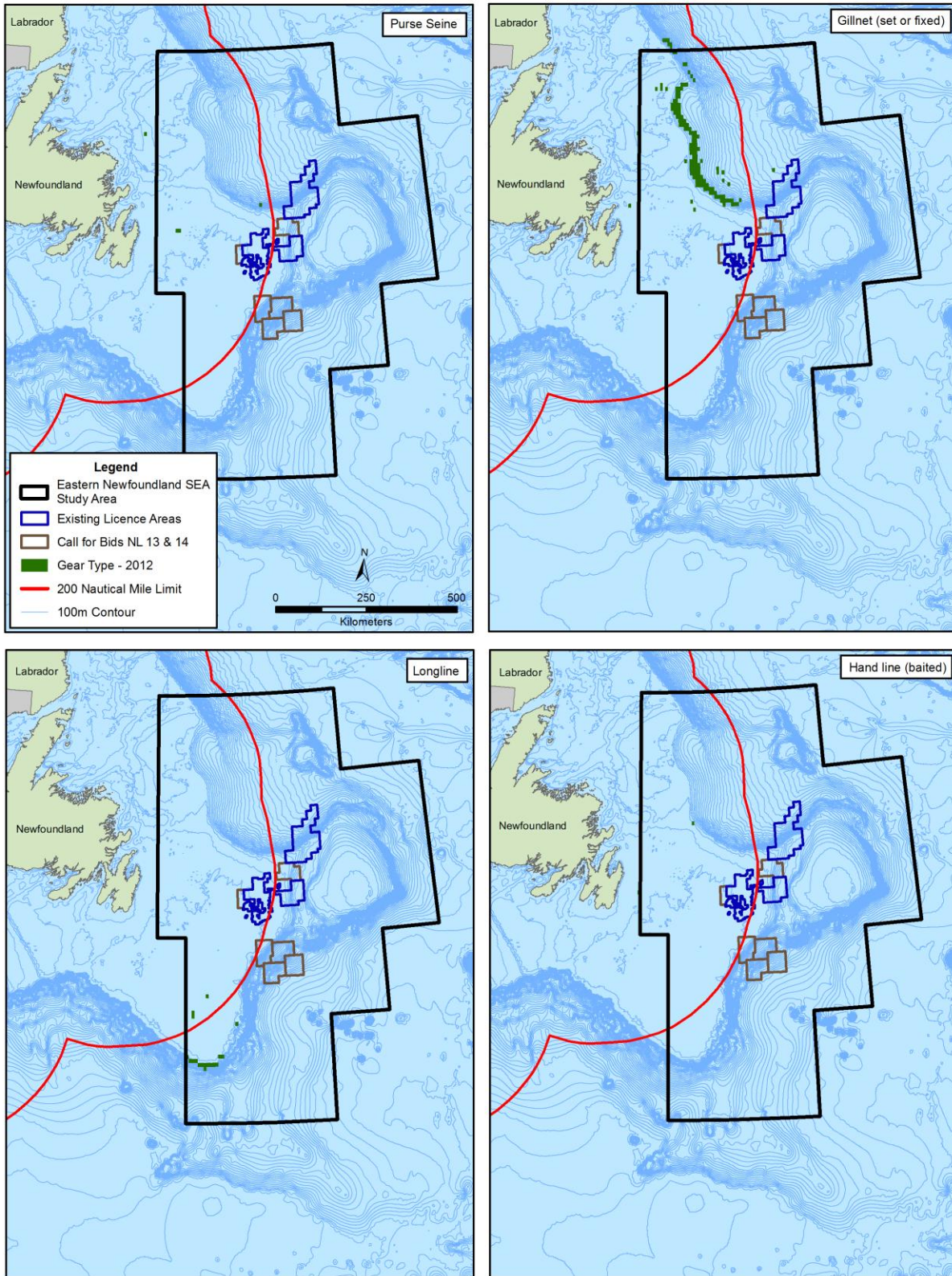


Figure 4.138 Commercial Fishing – Fixed Gear Types (2008 - 2012)

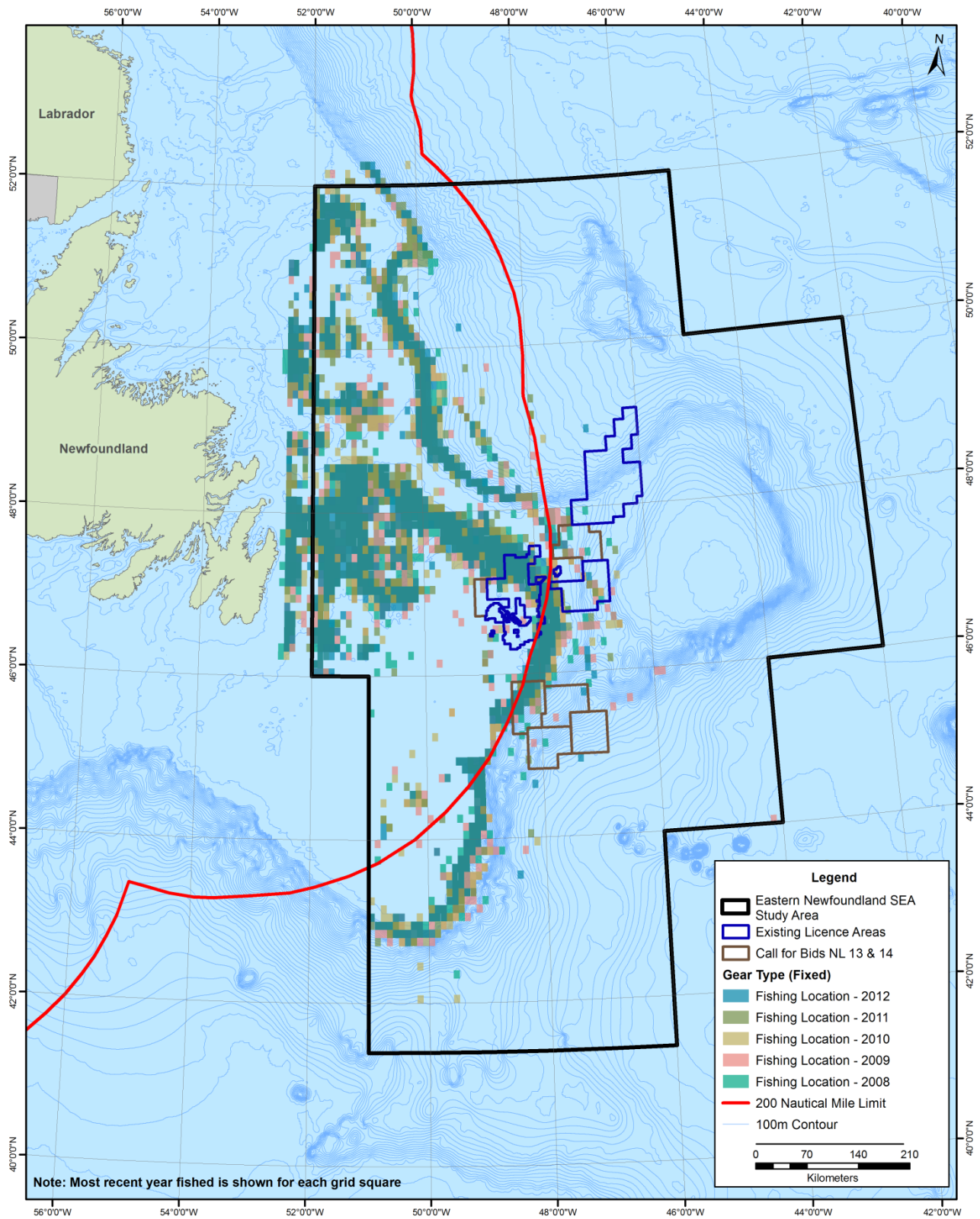
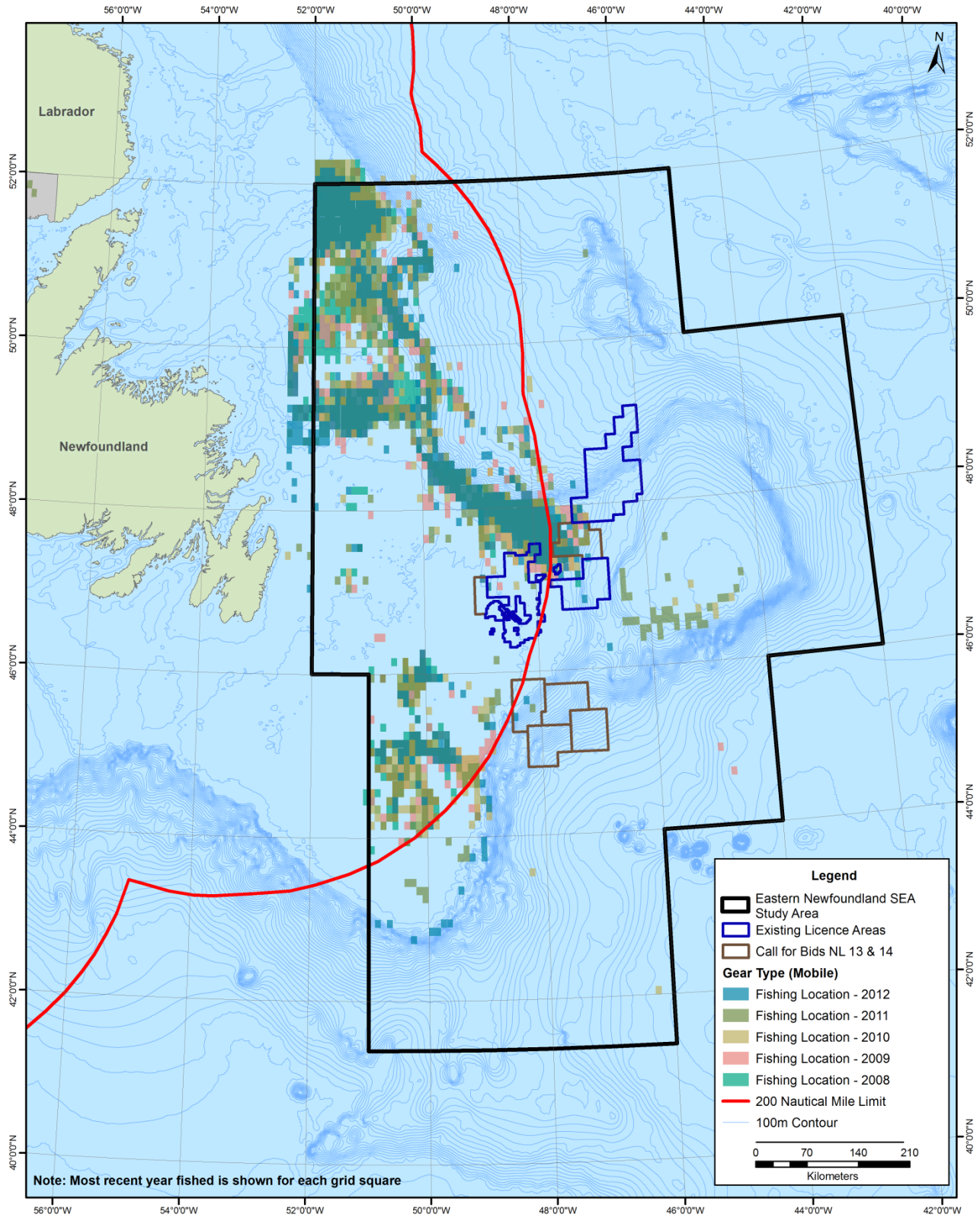


Figure 4.139 Commercial Fishing – Mobile Gear Types (2008 - 2012)



Principal Species Fisheries

A summary of several key fisheries in the region is provided below, focussing upon those species that have comprised a significant proportion of recent activity (in terms of landed weight and/or value), as derived from the fisheries statistics provided by DFO.

Table 4.121 Overview of Key Fisheries

Queen-Snow Crab	
<i>2012 Harvest</i>	24,923 tonnes, \$107.1 million
<i>2008-2012 Total Harvest</i>	115,926 tonnes, \$434.2 million
<i>Key Fishing Months / Season</i>	April-June
<i>Main Gear Type(s)</i>	Crab Pot
Northern Shrimp	
<i>2012 Harvest</i>	19,659 tonnes, \$39.4 million
<i>2008-2012 Total Harvest</i>	195,719 tonnes, \$290.7 million
<i>Key Fishing Months / Season</i>	May-August
<i>Main Gear Type(s)</i>	Shrimp Trawl
Turbot-Greenland Halibut	
<i>2012 Harvest</i>	3,049 tonnes, \$12.0 million
<i>2008-2012 Total Harvest</i>	16,831 tonnes, \$56.0 million
<i>Key Fishing Months / Season</i>	June-August
<i>Main Gear Type(s)</i>	Bottom Otter Trawl (Stern); Gillnet
Groundfish, Unspecified	
<i>2012 Harvest</i>	1,377 tonnes, \$0.7 million
<i>2008-2012 Total Harvest</i>	15,821 tonnes, \$9.7 million
<i>Key Fishing Months / Season</i>	Variable
<i>Main Gear Type(s)</i>	Variable
Molluscs, Unspecified	
<i>2012 Harvest</i>	17 tonnes, \$0.03 million
<i>2008-2012 Total Harvest</i>	3,132 tonnes, \$4.2 million
<i>Key Fishing Months / Season</i>	Variable
<i>Main Gear Type(s)</i>	Variable
Yellowtail Flounder	
<i>2012 Harvest</i>	0 tonnes, \$0
<i>2008-2012 Total Harvest</i>	5,697 tonnes, \$3.1 million
<i>Key Fishing Months / Season</i>	June
<i>Main Gear Type(s)</i>	Bottom Otter Trawl (Stern)
American Plaice	
<i>2012 Harvest</i>	211 tonnes, \$0.1 million
<i>2008-2012 Total Harvest</i>	2,900 tonnes, \$1.9 million
<i>Key Fishing Months / Season</i>	June, November - December
<i>Main Gear Type(s)</i>	Bottom Otter Trawl (Stern); Gillnet
Redfish	
<i>2012 Harvest</i>	984 tonnes, \$0.8 million
<i>2008-2012 Total Harvest</i>	3,217 tonnes, \$1.9 million
<i>Key Fishing Months / Season</i>	June - August
<i>Main Gear Type(s)</i>	Bottom Otter Trawl (Stern); Gillnet

Figures 4.140 to 4.145 illustrate the distribution of recorded commercial fishing activity for each of the above species (where available) within and adjacent to the SEA Study Area by season for 2012. Similar information for these and other select species (based on fishing presence and data availability) for all of the years from 2008 - 2012 combined is provided in the maps included as Appendix F.

Figure 4.140 Fishing Locations by Season – Queen-Snow Crab (2012)

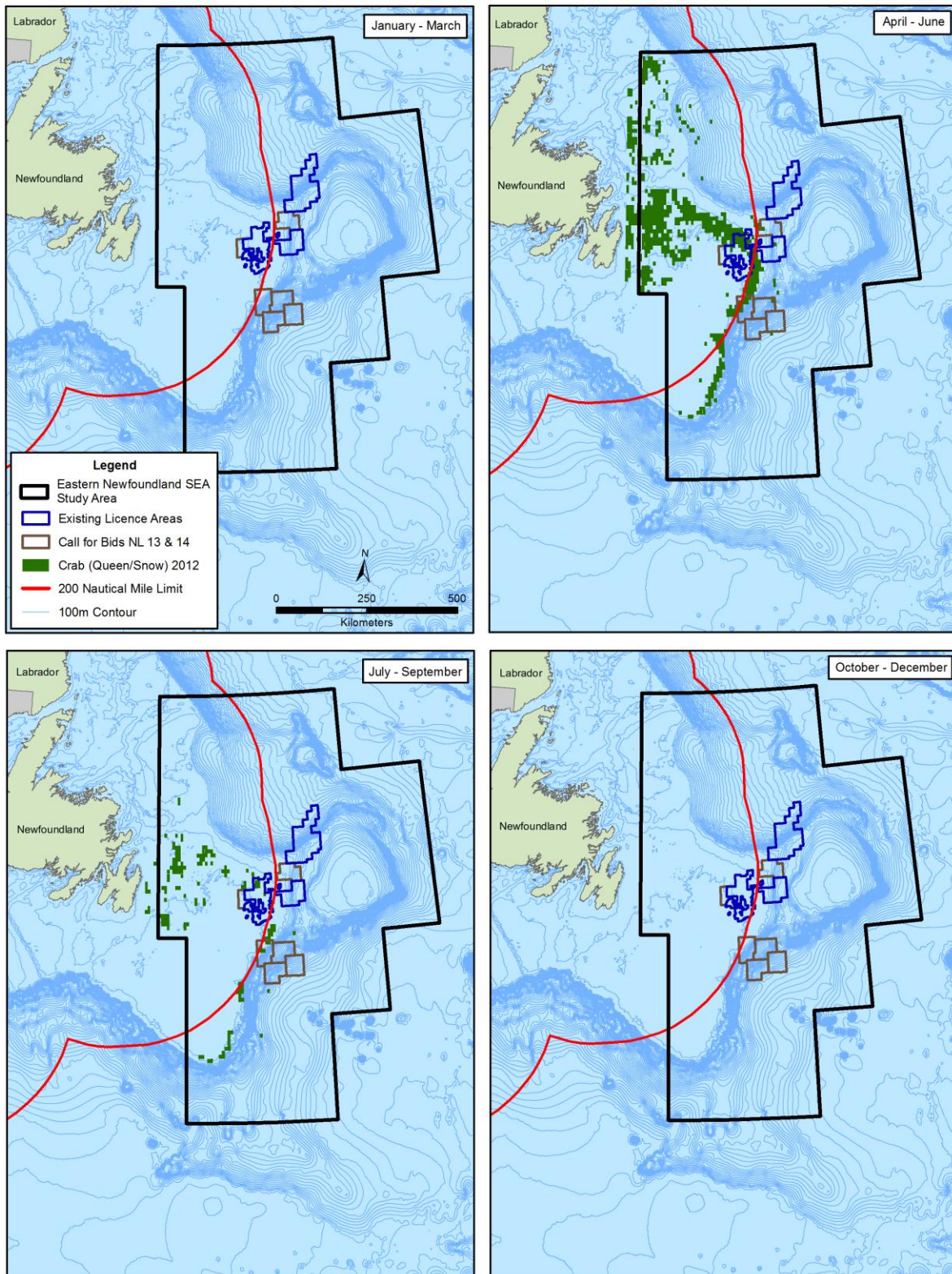


Figure 4.141 Fishing Locations by Season – Northern Shrimp (2012)

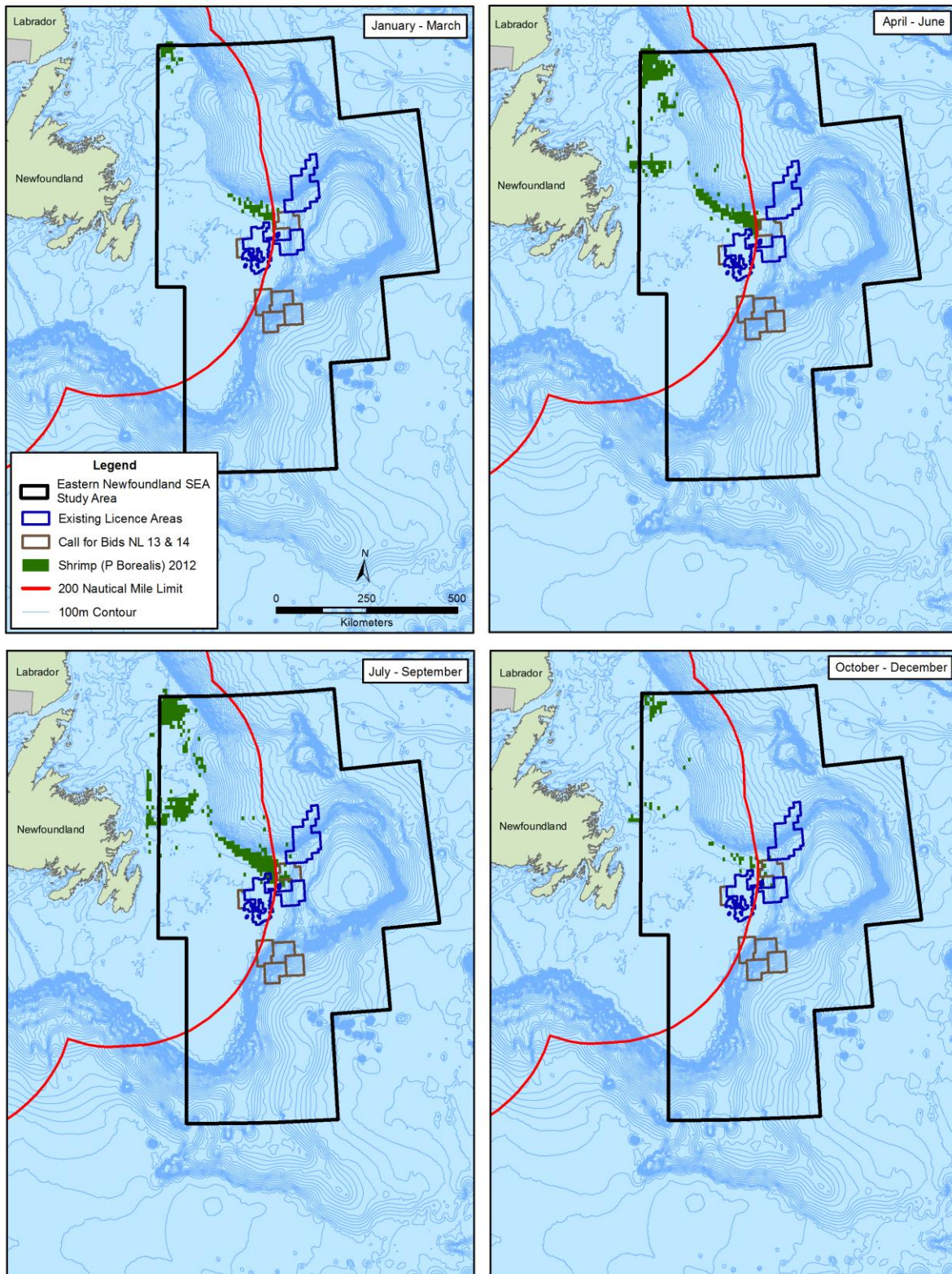


Figure 4.142 Fishing Locations by Season – Turbot-Greenland Halibut (2012)

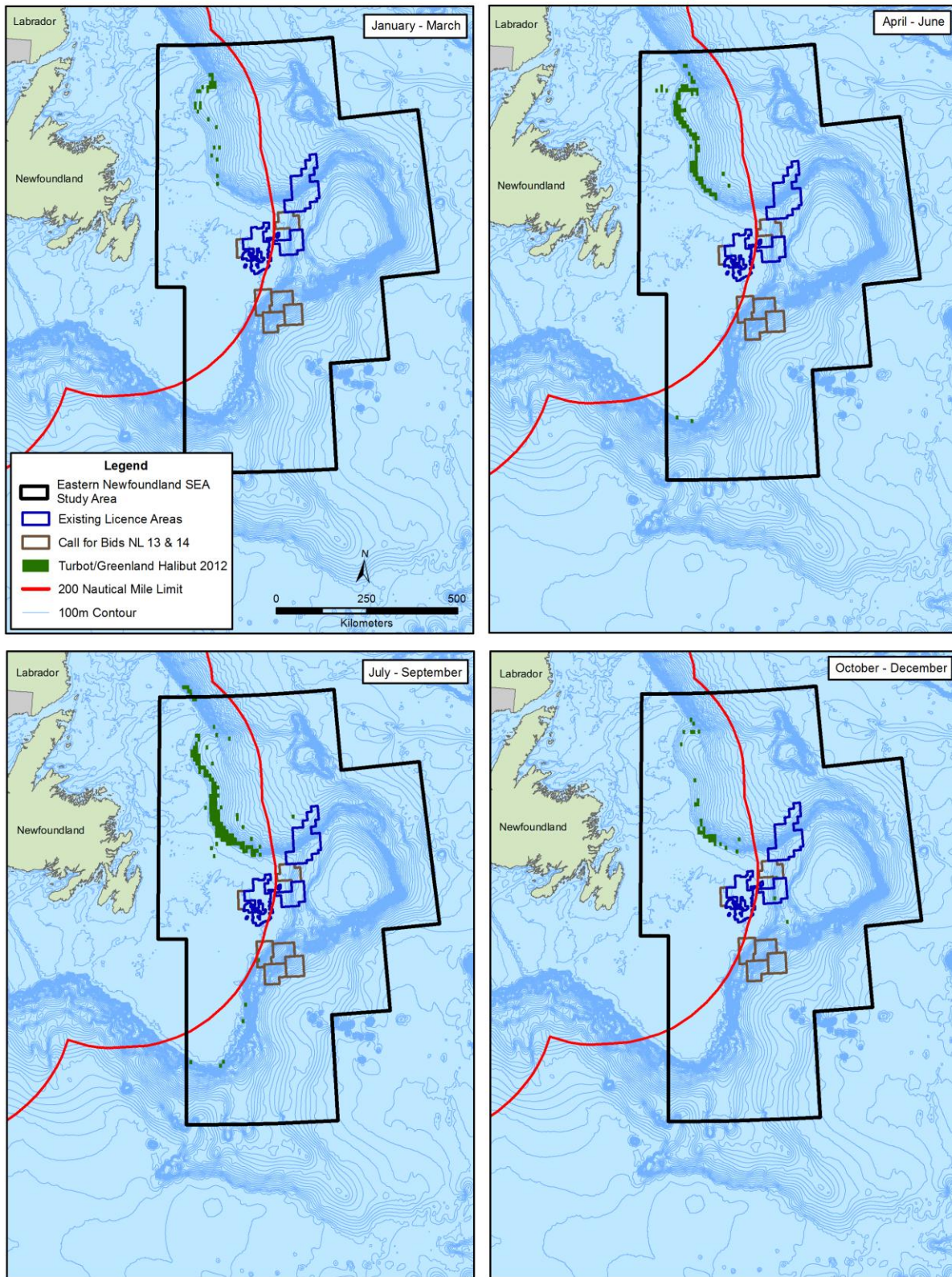


Figure 4.143 Fishing Locations by Season – Yellowtail Flounder (2012)

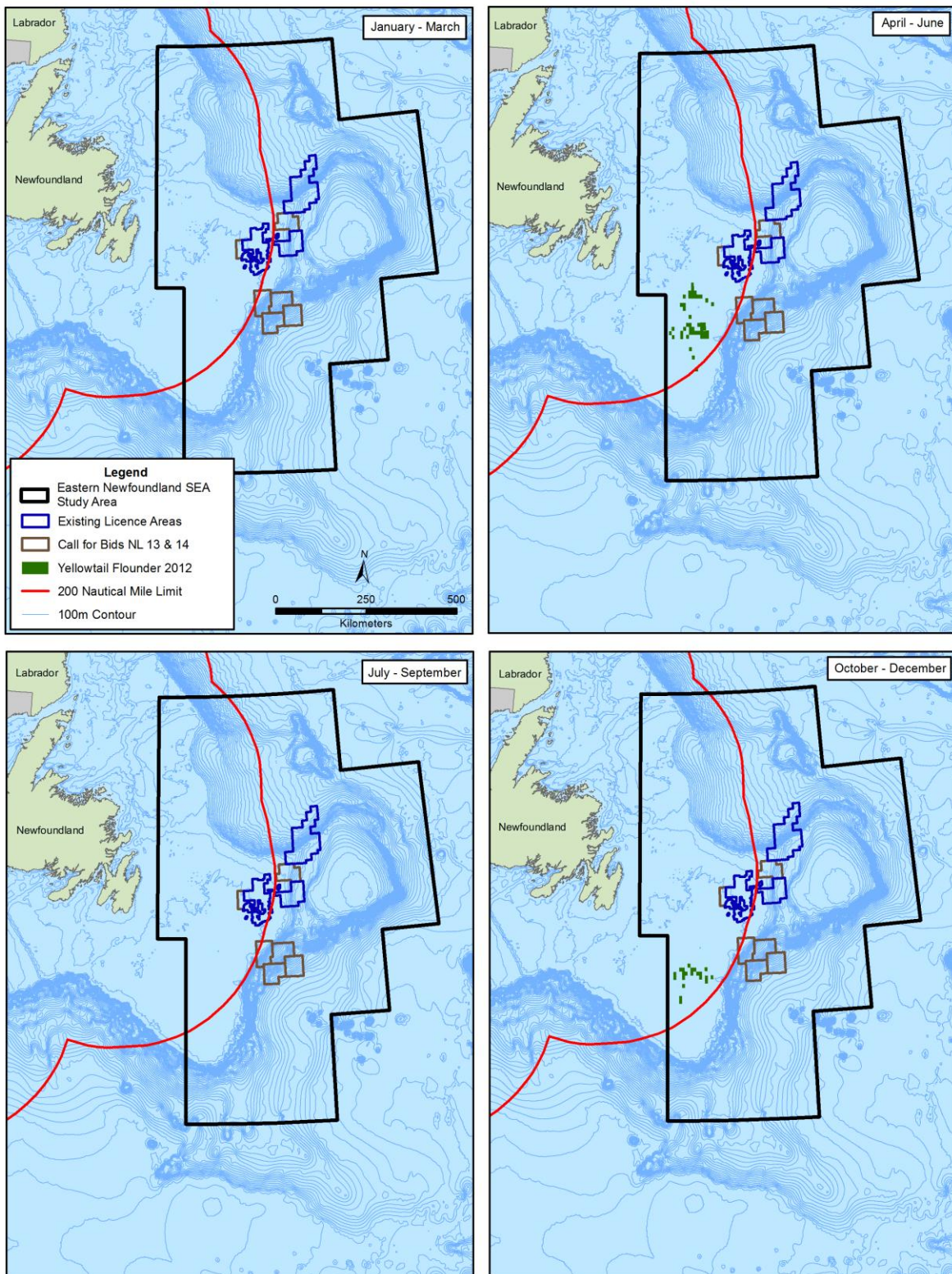


Figure 4.144 Fishing Locations by Season – American Plaice (2012)

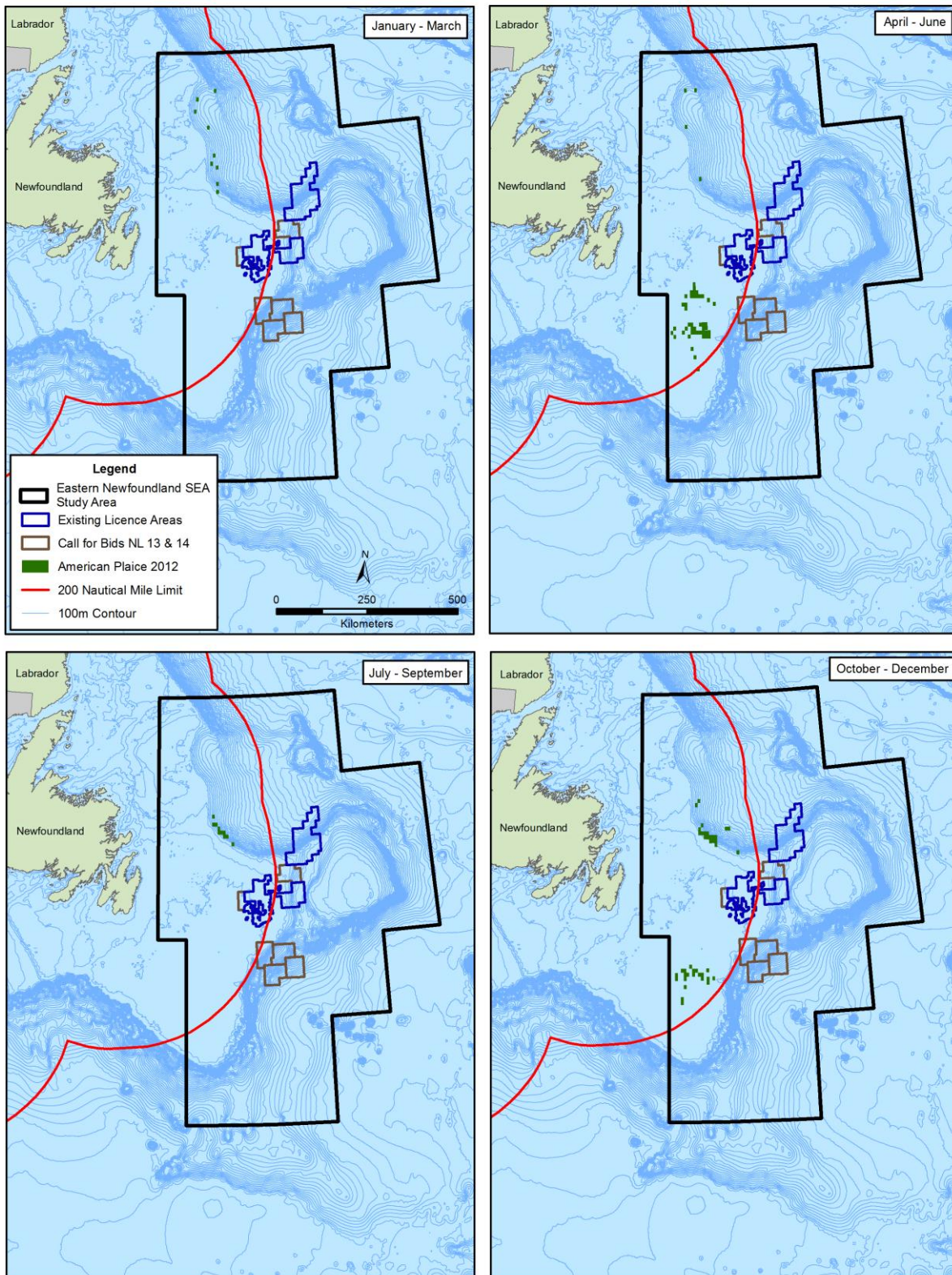
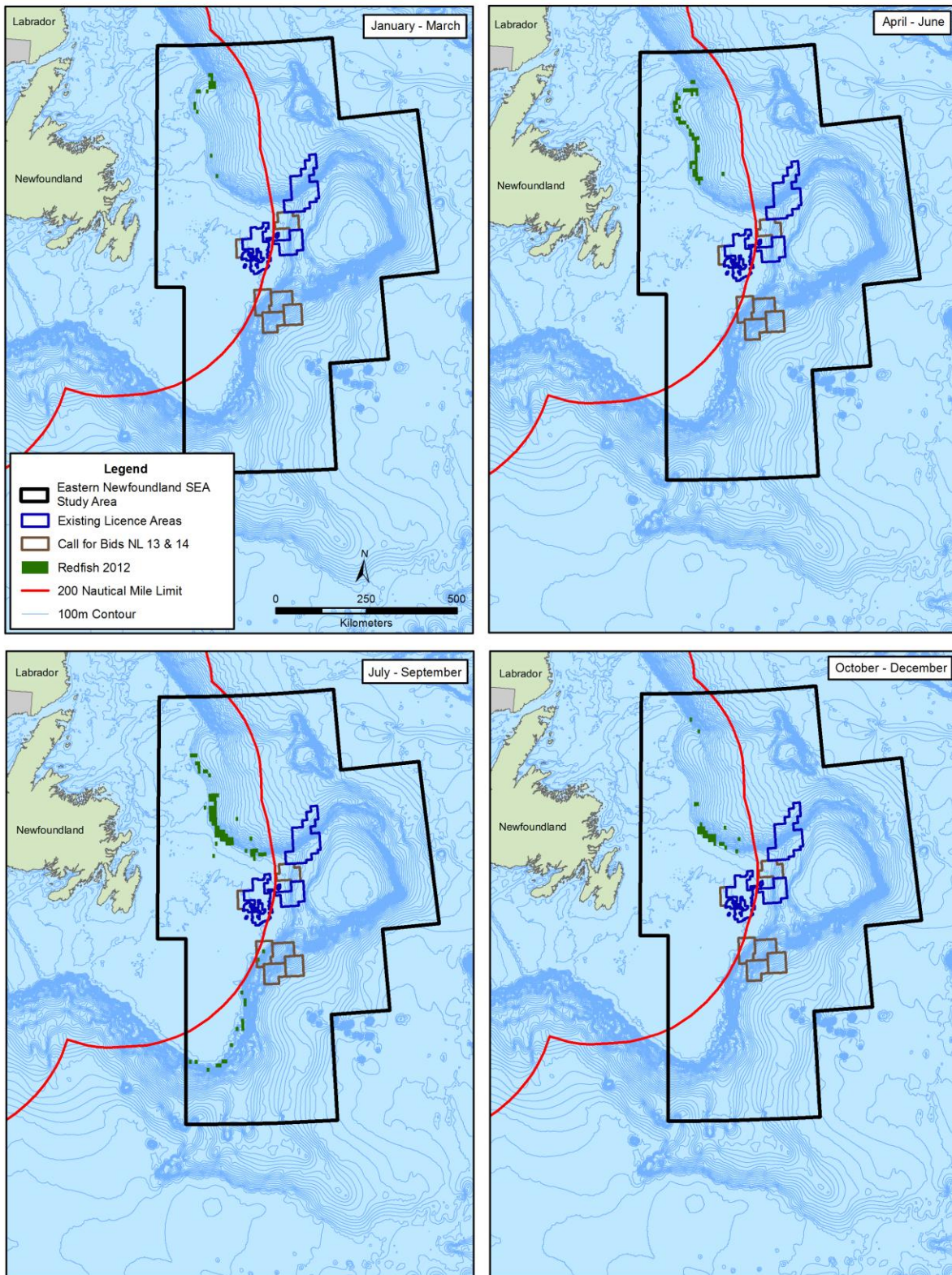


Figure 4.145 Fishing Locations by Season – Redfish (2012)



Fishing Activity by Foreign Countries

There are multiple regulatory jurisdictions that pertain to marine fish and fisheries within the SEA Study Area. The Government of Canada has jurisdiction over fish stocks and fishing activities within the 200 nautical mile limit and for benthic invertebrates (such as crab) across the entire continental shelf, with NAFO managing groundfish activities and other resources beyond that 200 mile limit (NAFO 2013a). NAFO currently manages 19 commercial stocks consisting of 11 species, and reports that in 2011 there were vessels from 13 flag states fishing in the Northwest Atlantic (NAFO 2013c). Other international agreements and conventions also apply to fishing and other human activities in international waters.

The preceding analysis has described recent commercial fishing activity within the various NAFO Unit Areas that occur completely or partially within the SEA Study Area. This analysis has been based on commercial fish landings (weight and landed value) and location information for the period 2008 – 2012, which was provided by DFO Statistical Services in Ottawa, ON. As indicated, the DFO datasets record domestic and foreign fish harvests that are landed in Canada only.

Given its location in the Northwest Atlantic and the variety and abundance of marine fish species that occur throughout the region, the waters off Eastern Newfoundland have long been subject to commercial fishing activity by the fleets of a number of countries. Although the specific participants in, and nature of (species, locations, timing, gear) such international fishing activity has inevitably evolved and changed over time, there continues to be considerable non-Canadian fishing activity that occurs within and near the SEA Study Area.

The NAFO Regulatory Area (NRA) is 2,707,895 km² in size (or 41 percent of the total NAFO Convention Area) and comprises that part of the Northwest Atlantic high seas located adjacent to Canada's 200 mile EEZ. Fishing activity in the NRA targets a range of species, including cod, redfish, Greenland halibut, shrimp, skates, and other finfish, and has an approximate landed value of \$200 million annually across all members. There are currently 160 fishing vessels that are authorized to fish in the NRA, which are primarily large vessels (30-100 m), and in 2013 a total of 64 vessels fished in the region (NAFO 2014).

Much of this fishing activity is, for the reasons outlined above, not likely to be reflected in the available DFO fisheries databases as presented in the preceding sections. Other, detailed information on the nature and scope of foreign fishing in the NAFO managed areas beyond the 200 mile limit, is, however, not readily available for use in the SEA, particularly at the level of detail and in the same formats as that obtained from DFO for fish landed in Canadian ports.

A general indication of this non-Canadian fishing activity for recent years can, however, be obtained through data available from a number of information sources. Fishing vessels operating in the NRA are, for example, required to have installed a fishing Vessel Monitoring System (VMS) that reports fishing positions and times via satellite to a designated national data management centre, and from there to the NAFO Secretariat (NAFO 2014). Information on fishing effort (in hours fishing, namely the time when boats were travelling at 1 -5 knots) can therefore be estimated from the VMS data for all vessels (including Canadian) in the NRA. Although confidentiality policies require that Flag States and Contracting Parties cannot be identified, NAFO is able to provide fishing effort information aggregated by Division (R. Federizon, pers comm). Fishing effort information is provided in Table 4.122 below for those NAFO Divisions that overlap with the SEA Study Area.

Table 4.122 Fishing Effort by NAFO Division (Hours) (2011 – 2013)

NAFO Division	2011	2012	2013
3K	85		10
3L	38,693	41,221	28,075
3M	30,197	33,498	29,394
3N	19,819	19,775	19,127
Total	88,794	94,494	76,606
Source: R. Federizon (pers comm)			

Fish catch information is provided under the FishStatJ program, which were identified and provided by DFO as the most detailed and accurate database available on international fish catches in this region, as well as through NAFO's STATLANT21A database (NAFO 2013d) which provides fishing information by NAFO Division. The most recent information provided by these databases (as of the time of writing) are from 2012, including fish harvest data by country (flag state), species, year and general fishing area. Data are available for the overall NAFO Divisions, of which 3KLMN overlap with (but extend beyond) the SEA Study Area. Table 4.123 provides a summary of international fishing activity (catches) in these NAFO Divisions in recent years.

Table 4.123 International Fish Catches by NAFO Division (tonnes) (2008 – 2012)

NAFO Division	2008	2009	2010	2011	2012	Total
3K	0	1	1	208	0	210
3L	14,606	14,822	9,442	12,949	11,902	63,721
3M	25,554	18,132	20,514	24,732	26,583	115,515
3N	10,318	6,996	12,424	11,467	12,753	53,958
Total	50,478	39,951	42,381	49,356	51,238	233,404
Source: NAFO (2013c)						

In 2013, approximately 88 percent of fishing activity within the NRA, accounting for 80 percent of total catches, took place within the SEA Study Area (NAFO 2014).

Table 4.124 summarizes the four most commonly harvested species by country in the Northwest Atlantic over the period of 2008 – 2012. Although other fish species are harvested in relatively small quantities, Northern shrimp, Greenland halibut, Atlantic cod and Atlantic redfish are the four species that have been harvested in the greatest volume, by the greatest number of international fleets in the Northwest Atlantic in recent years. Other commercially important species harvested by international fleets include queen / snow crab, a number of species of tuna, shark, flounders, rays and seals.

Northern Shrimp: International harvests of Northern shrimp in NAFO Divisions 3KLMN were on a steady decline between 2008 and 2012, decreasing by almost 17,000 tonnes over this period. Harvesters from the Faroe Islands and Estonia have remained the most frequent harvesters of shrimp in these areas. The majority of international harvesting for Northern shrimp occurs in Divisions 3L and 3M, with shrimp from NAFO 3K harvested primarily by fleets from Newfoundland and Labrador and Quebec. Small harvests were taken from 2K by Denmark in 2008-2009 (NAFO 2013d).

Greenland Halibut: Harvests of Greenland halibut in the area remained somewhat steady from 2008 – 2012. Spain, Russia and Portugal continue to be the most frequent harvesters of this species in NAFO areas 3LMN, whereas in 3K this species is harvested solely by fleets from Atlantic Canada (NAFO 2013d).

Atlantic Cod: There has been a considerable increase in the harvest of Atlantic cod in NAFO 3KLMN from 2008 – 2011, with a recent small drop in 2012. Portugal, the Faroe Islands and Spain are the most frequent harvesters of Atlantic cod in the area, whereas in 3K this species is generally harvested by fleets from Atlantic Canada (NAFO 2013d).

Atlantic Redfish: Redfish continue to be a relatively heavily fished species by international fleets in the region. Catches have increased since 2008, and remained relatively steady in recent years. Portugal and Russia are key fishers of Atlantic redfish in the area, with stocks in NAFO 3K again being harvested primarily if not exclusively by domestic, Atlantic Canadian fleets (NAFO 2013d).

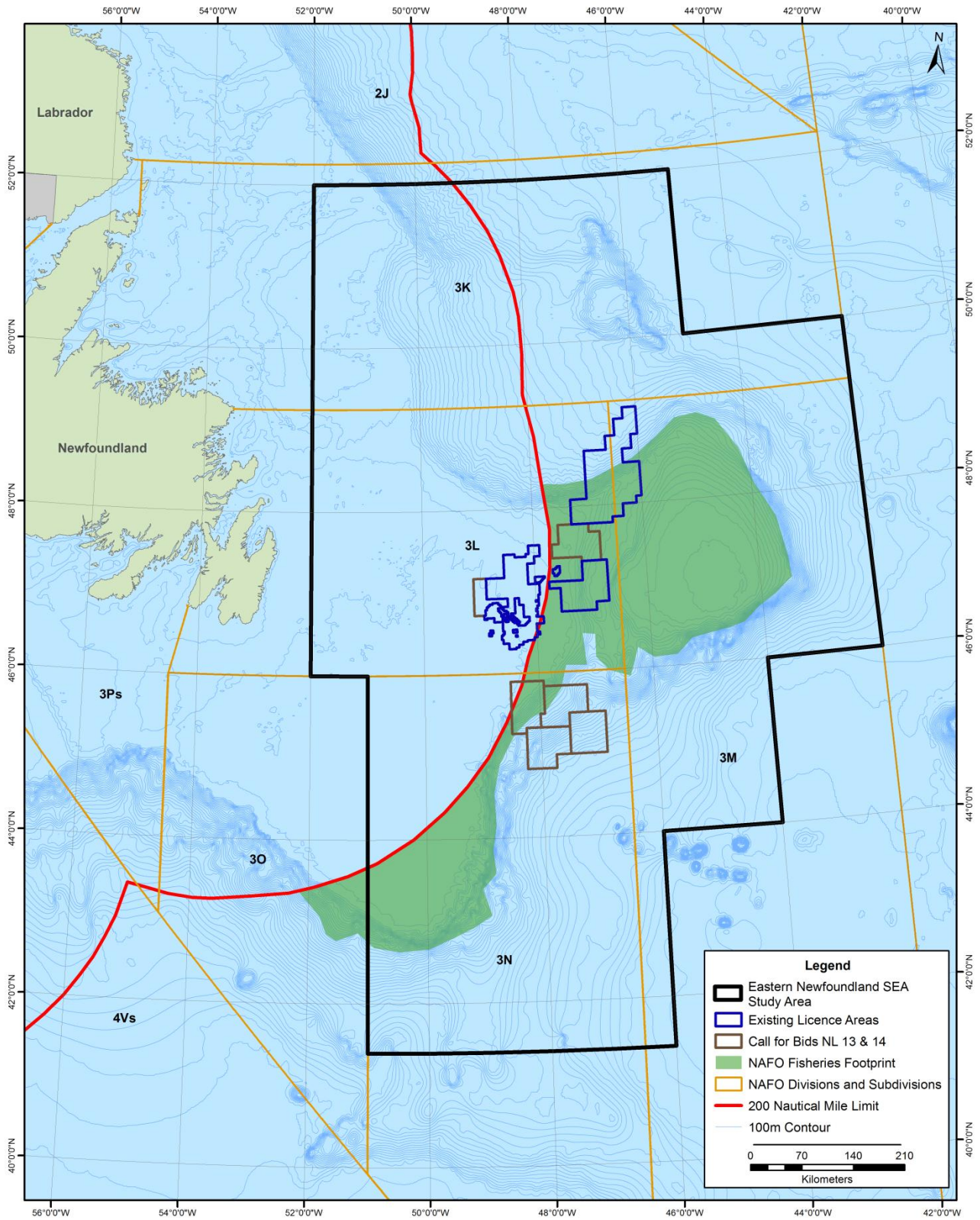
Table 4.124 Fish Harvests for Select Species in NAFO Divisions 3KLMN by Country (tonnes, 2008-2012)

Country	2008	2009	2010	2011	2012
Northern Shrimp					
Denmark	488	532	536	208	
Estonia	11,269	1,607	1,209	1,248	919
Faroe Islands	3,462	2,949	2,503	1,446	1,037
Germany				301	
Iceland			184	126	
Latvia	1,562	330	384	325	134
Lithuania	763				
Norway	606	664	320		
Portugal		329	15		5
Russia	299	335	28		
Spain	654	272	347	292	34
St. Pierre and Miquelon (France)	278	334	334		
United States			334		
Total	19,381	7,352	6,194	3,946	2,129
Greenland Halibut					
Cuba				54	3
Estonia	299	299	441	278	265
Faroe Islands	215	206	211	221	147
Japan	1,219				
Latvia				14	
Lithuania	6		25	39	206
Norway			2		
Portugal	1,964	1,806	2,250	2,491	1,969
Russia	1,543	1,615	1,514	1,626	1,543
Spain	4,592	4,505	4,550	4,667	4,667
St. Pierre and	199	192	116	243	198

Country	2008	2009	2010	2011	2012
Miquelon (France)					
Total	10,037	8,623	9,109	9,633	8,998
Atlantic Cod					
Cuba				200	209
Estonia	69	122	91	98	56
Faroe Islands		25	1,185	2,238	2,049
Japan	24				
Latvia					3
Lithuania	3		63	47	59
Norway			514	1,301	809
Portugal	300	925	1,426	2,642	2,867
Russia	88	94	403	764	815
Spain	235	325	1,388	2,058	1,917
St. Pierre and Miquelon (France)	19		11	204	154
United Kingdom			761	1,063	868
Total	738	1,491	5,842	10,615	9,806
Atlantic Redfish					
Cuba				1,169	734
Estonia	962	1,648	1,237	953	187
Faroe Islands	215	1	141	425	179
Japan	632				
Latvia		58		71	
Lithuania			377	759	463
Portugal	3,918	5,089	6,688	5,977	5,300
Russia	1,233		1,654		3,299
Spain	1,277	925	1,011	379	821
St. Pierre and Miquelon (France)	17			76	38
United Kingdom			1	2	5
Total	8,254	7,721	11,109	9,811	11,026
Source: NAFO (2013d)					

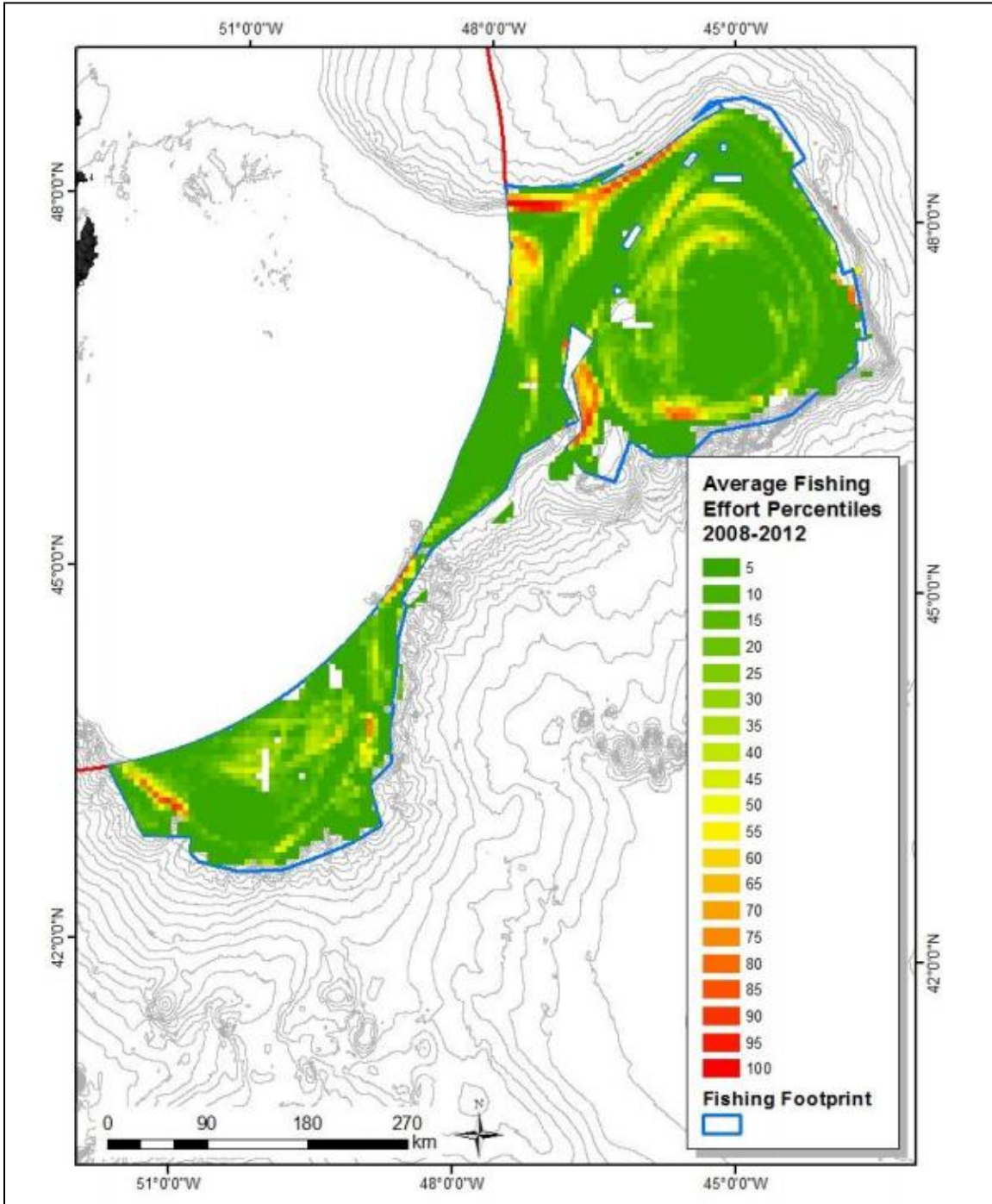
As a result of the 2007 United Nations General Assembly (*UNGA Res. 61/105, paragraph 83*) request that Regional Fisheries Management Organizations regulate bottom fisheries that cause a significant adverse impact on VMEs, NAFO undertook an exercise to identify bottom fishing areas in the NRA, and in doing so, to identify and map NAFO's bottom fishing footprint in the area (NAFO 2009). The NAFO fisheries footprint is 120,048 km² in size (of which 5.4 percent is closed to bottom fishing), and is illustrated in Figure 4.146 (NAFO 2014).

Figure 4.146 NAFO Divisions / Subdivisions and the Fisheries “Footprint”



NAFO also recently conducted an analysis of VMS records for the period 2008-2012 to identify the nature and extent of all fishing activity in the NRA, the results of which are illustrated in Figure 4.147 below (WGEAFM 2012; NAFO 2014).

Figure 4.147 Average Fishing Effort in 5th Percentile Categories using Gridded VMS Data (2008-2012)

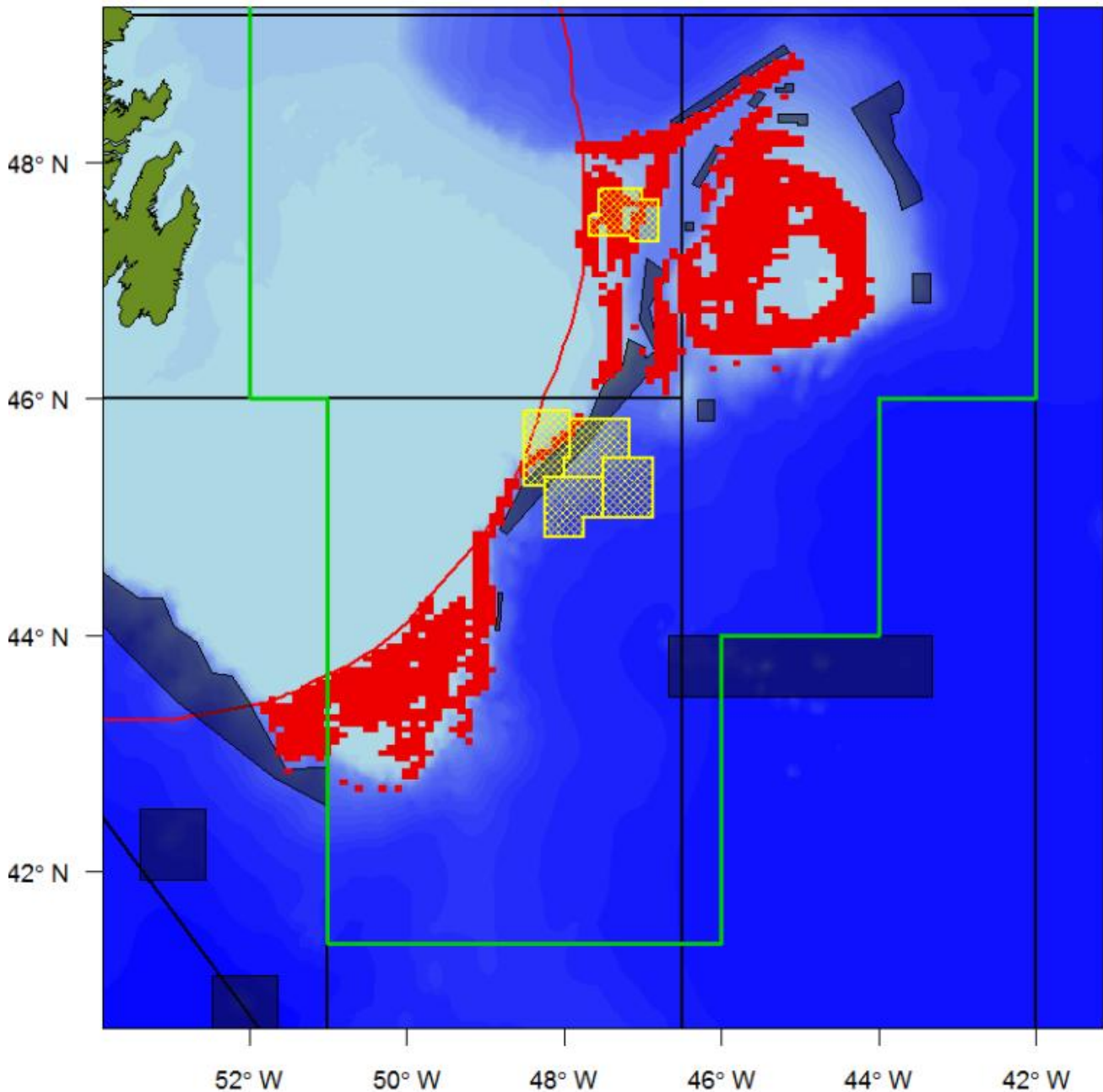


Sources: WGEAFM (2012); NAFO (2014).

The Figure indicates a number of areas within the NRA that are particularly important to fishing activity, including some parts of the Sackville Spur and Flemish Pass (NAFO 2014).

Figure 4.148 provides a general overview of fishing activity in the NFA based on VMS data, encompassing 95 percent of respective fishing effort in the cod, redfish, Greenland halibut, skate, yellowtail flounder and shrimp fisheries (red cells). The Figure also illustrates the areas closed to fishing for the protection of VMEs (grey polygons), areas covered by the recent C-NLOPB calls for bids (as of March 2014, yellow areas), and the SEA Study Area (green lines) (NAFO 2014).

Figure 4.148 Overview of Fishing Activity in the NAFO Regulatory Area



Sealing

The seal harvest has been and remains an important source of income for commercial fishers in Newfoundland and Labrador and elsewhere, contributing as much as 25 to 35 percent of fishers' annual incomes in many communities (NL DFA 2013a). Since its inception in the early 1800s as a source of oil, the hunt subsequently evolved into a diverse product industry. Six species of seals (harp, hooded, grey, ringed, bearded and harbour) are commonly found along the coasts of Atlantic Canada. Harp, grey and hooded seals are harvested to produce leather, handicrafts, oil and meat for human and animal consumption (DFO 2011c).

The total value of seal landings in Canada has decreased since 2006, when it was valued at more than \$34 million and sealers received more than \$100 per pelt. The industry has experienced significant declines in both the quantity of and prices for harvested pelts, the latter being driven by changing global demand for seal products (DFO 2011c). The value of the harvest remained considerably low in 2010 (\$1.3 million) with pelt prices of approximately \$20. Due to concerted marketing efforts and new market development, there was a modest increase in pelt prices (\$32.50 / pelt) in 2013 (D. Dakins, pers comm. 2013).

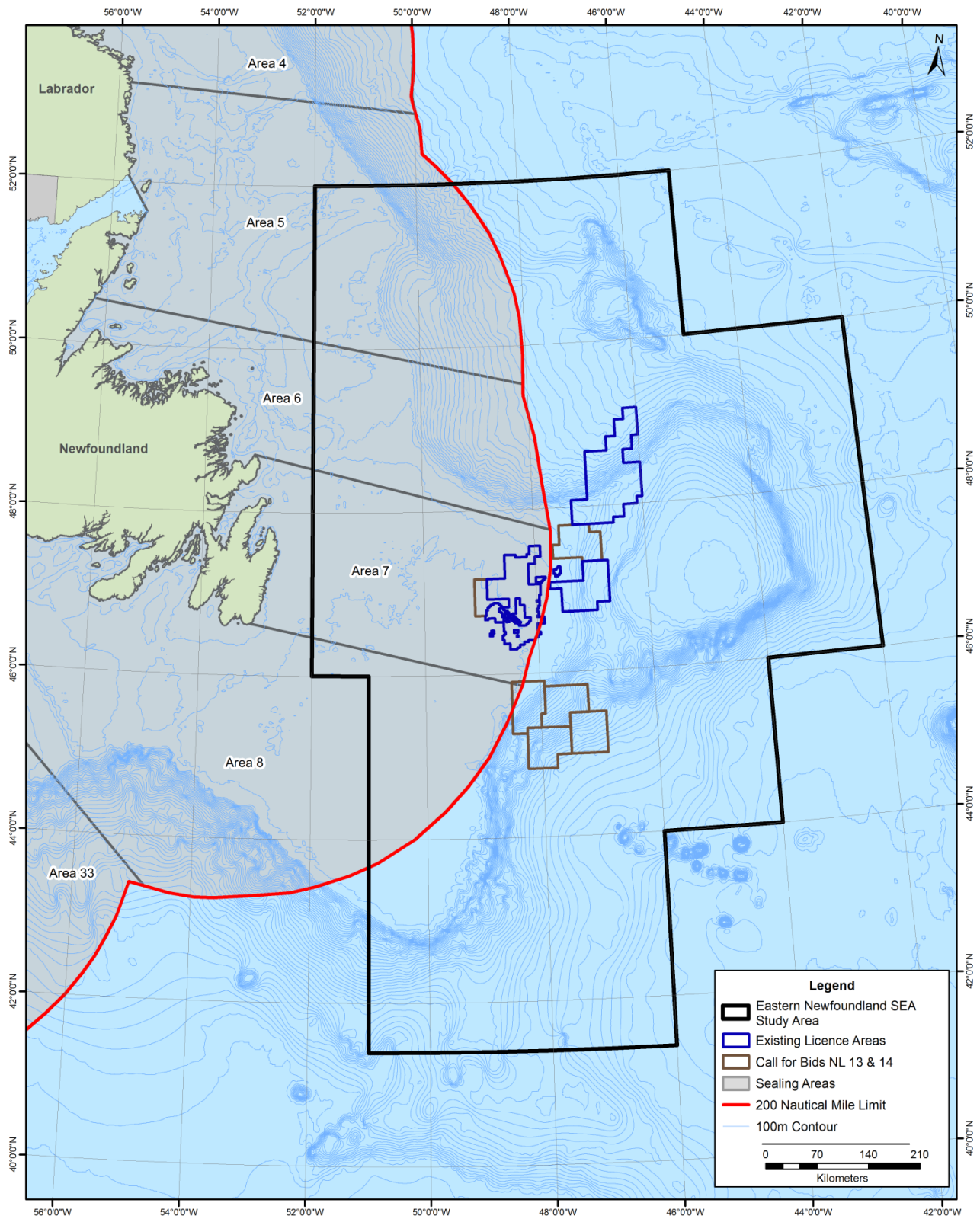
The Canadian seal harvest is managed by DFO, under Canada's *Marine Mammal Regulations*. An Integrated Management Plan is updated annually with input from DFO's Science Branch, Provincial Fisheries Departments and seal harvesters' organizations. The seal quota is allocated to provincially-based fleets in accordance with historical landings. DFO issues an average of 16,000 seal harvester licenses annually in Atlantic Canada and 12,500 licensed harvesters reside in Newfoundland and Labrador. It is estimated that only 390 hunters participated in the 2010 Atlantic Canadian hunt, due primarily to weak markets and poor ice conditions. Many harvesters continue to renew their licenses in anticipation of improved markets and a desire to remain active in the seal hunt (DFO 2011c).

In Atlantic Canada, harp seals are concentrated primarily off Southern Labrador, the Gulf of St. Lawrence area and off Northern Newfoundland. Grey seals are found mostly off Northern Labrador and in the Gulf of St. Lawrence, Scotian Shelf and Bay of Fundy. Hooded seals are located off the coast of Northeast Newfoundland, in the Gulf of St. Lawrence and in the Davis Strait area (DFO 2011c).

Harp seals are the principal focus for the commercial Newfoundland and Labrador harvest. Approximately 70 percent of the Canadian seal harvest occurs in an area known as "the Front" which receives an allocation of over 65 percent of Canada's total harp seal quota. Since 2005, there has been significant growth in overall seal populations at the Front. The harp seal population has nearly tripled in size – from less than two million animals in the 1970s to a current estimate of more than seven million (DFO 2011c).

The Eastern Newfoundland harvest commences at The Front around the second week of April. The Front quota includes hunting in four Sealing Zones: 5, 6, 7 and 8, which are all adjacent to the Eastern Newfoundland coastline and located partially in the SEA Study Area (Figure 4.149). Eastern Newfoundland is home to historically important seal landing ports. However, there has been relatively little activity in recent years for the reasons outlined above.

Figure 4.149 Eastern Newfoundland Seal Harvesting Zones



4.3.4.3 Aquaculture

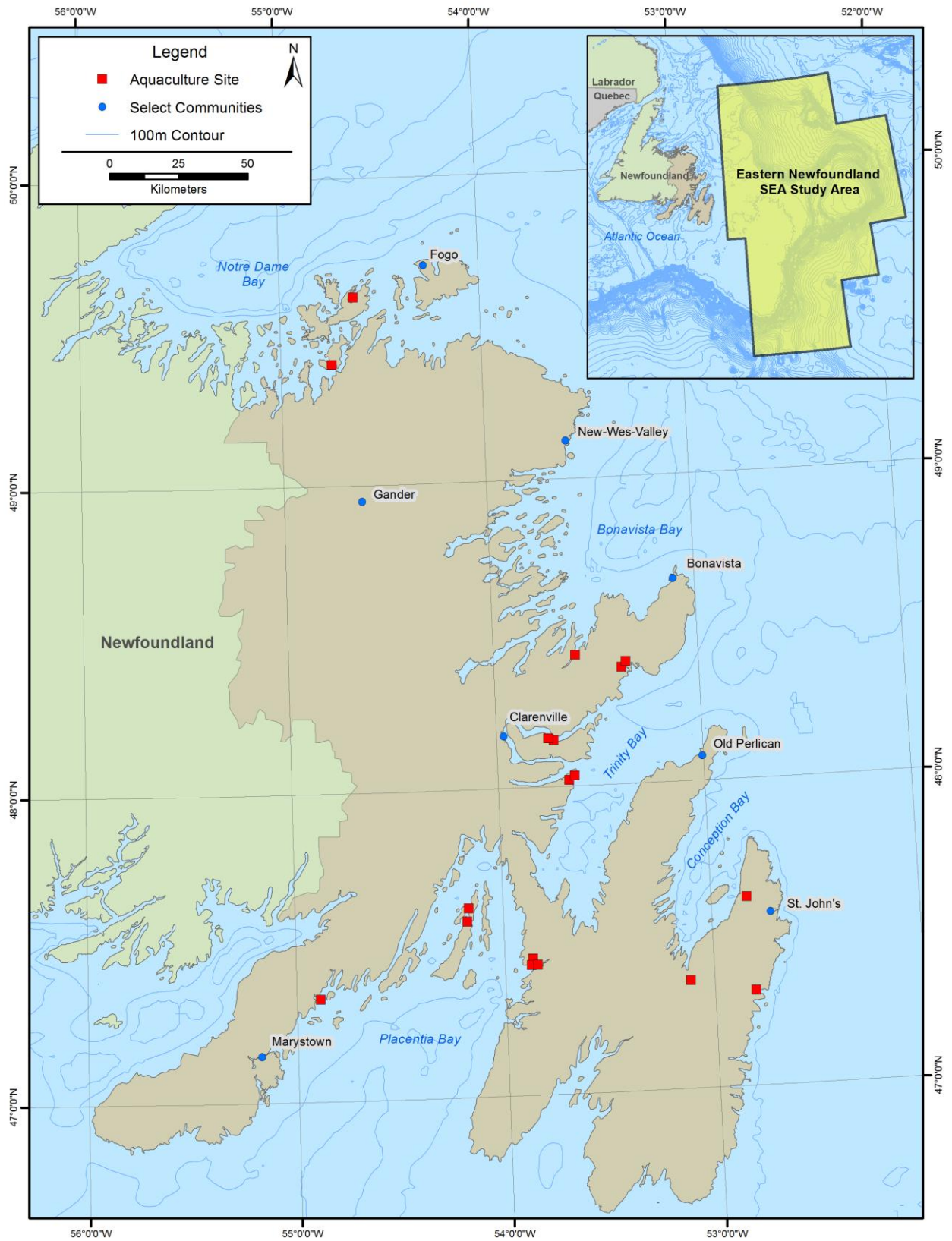
Aquaculture has become an increasingly important component of Newfoundland and Labrador's seafood industry and economy. Seafood production from this sector has increased steadily in recent years, from fewer than 1,000 tonnes and less than \$8 million in value in 1995 to more than 17,000 tonnes and a value of more than \$120 million in 2011. The primary fish species farmed in Newfoundland and Labrador are blue mussels, Atlantic salmon and steelhead trout (NLDFA 2013b). At present, aquaculture sites are located primarily around Bay D'Espoir, the Connaigre Peninsula and Notre Dame Bay. Smaller numbers of sites are located near St. Anthony and in Placentia Bay, Trinity Bay and Bonavista Bay.

There are various existing aquaculture sites in Eastern Newfoundland (and specifically, within Economic Zones 14 to 20) (Table 4.125, Figure 4.150). These include blue mussel farms in Burnt Arm North, St. Croix Bay, Crawley's Island, Cap Cove, Little Indian Cove, Northwest Arm, Big Island, Coal All Island and Merasheen Island. There are also Atlantic cod hatcheries at Ship Cove, Princeton, Jerseyman Island, Bay Bulls, Square Cliff and Aspen Cove. A rainbow trout hatchery is located on the Holyrood Access Road (T. Budgell, pers comm 2013).

Table 4.125 Eastern Newfoundland Aquaculture Operations

Operator	Location	Description
International Enterprises Ltd.	Burnt Arm North, Goshen's Arm	Blue mussel farming facility
Joseph Keating (Baie Sea Farms Ltd.)	St. Croix Bay	Blue mussel farming facility
Joseph Keating (Baie Sea Farms Ltd.)	Crawley's Island	Blue mussel farming facility
Nfld. Game Fish Protection Society Ltd.	Murray's Pond	Rainbow trout hatchery
Claude Seaward	Ship Cove, Heart's Ease Inlet, TB	Atlantic cod grow-out facility
Robert Power	Holyrood Access Road	Rainbow trout hatchery
Merasheen Mussel Farms Inc.	Merasheen Island	Blue mussel and oyster farming facility
Shells and Fins Incorporated	Cap Cove, Lockston	Blue mussel farming facility
Gerald Prince	Princeton, Bonavista Bay	Atlantic cod grow-out facility
Merasheen Mussel Farms Inc.	Big South West Cove, Merasheen Island	Blue mussel farming facility
Notre Dame Bay Mussel Farms Inc.	Little Indian Cove	Blue mussel farming facility
Shells and Fins Incorporated	Northwest Arm, Trinity Bay	Blue mussel farming facility
Bernard Norman	Jerseyman Island, Placentia Bay	Atlantic cod grow-out facility
Sapphire Sea Farms Ltd.	Bay Bulls	Atlantic cod grow-out facility
Claude Seaward	Square Cliff, Heart's Ease Inlet	Atlantic cod grow-out facility
Paul, Wilson and Everett Watton	Aspen Cove	Atlantic cod grow-out facility
Cross Bay Mussel Farms Ltd.	Big Island, Notre Dame Bay	Blue mussel farming facility
Atlantic Pacific Trading Inc.	Coal All Island	Blue mussel farming facility
Source: T. Budgell, pers comm. (2013)		

Figure 4.150 Eastern Newfoundland Aquaculture Sites



4.3.4.4 Recreational Fisheries

In Newfoundland and Labrador, recreational fishing may take place in coastal and inland waters. For specified periods during the summer and fall, residents and non-residents are permitted to participate (with licences or tags not being required) in a recreational / food fishery for groundfish. The sale of catch from the recreational fishery is not permitted and commercial fishing operations are not allowed to participate (DFO 2013g).

Table 4.126 Eastern Newfoundland Recreational Groundfish Fishery (2013)

Species	Season(s)	Individual Retention Limit	Boat Retention Limit
Groundfish (with some fish prohibited)	<ul style="list-style-type: none"> • July 20- August 11 • September 21-29 	5 groundfish (including cod) per fisher per day	15 groundfish when 3 or more persons are fishing in one boat (including tour boats)
Source: DFO (2013h)			

Smelt angling in coastal waters is permitted throughout the year, and there is no bag limit or possession limit for this species. Angling in coastal waters for salmon and trout is also permitted according to applicable regulations and guidelines (DFO 2013h).

Newfoundland and Labrador has 186 scheduled salmon rivers. These rivers are subject to specific angling (fly fishing) regulations and requirements, which vary depending on the river, with special management measures applied to some rivers or sections of rivers. The 2013 angling season for scheduled salmon rivers in Eastern Newfoundland was from June 1 to September 7. Fall angling occurred on the Gander River from September 8 to October 7. More than 55 scheduled salmon rivers are located in Eastern Newfoundland within Economic Zones 14 to 20, an area that extends from the Lewisporte area to the west side of Placentia Bay (DFO 2013h).

4.3.4.5 Government and Industry Fisheries Research Surveys

As described in Section 4.2.1, DFO conducts annual standardized bottom-trawl surveys to collect information for managing and monitoring fish resources in the Newfoundland and Labrador Region. Spring surveys have been conducted in NAFO Divisions 3LNOPs since 1975, while fall surveys commenced in NAFO Divisions 2HJ3KLMNO in 1977. The spring and fall surveys take place in different but overlapping areas. While the survey design has remained somewhat consistent, additional bottom types have been surveyed in recent decades (Bishop 1994). Since 1995, government surveys have been conducted by Canadian Coast Guard research vessels using a Campelen 1800 shrimp trawl. The tentative 2014 schedule for DFO RV surveys in the Study Area is indicated below. .

Table 4.127 Tentative Timing of DFO RV Surveys (2014)

Vessel	Activity	NAFO Division	Tentative Start Date	Tentative End Date
CCGS <i>Needler</i>	NL Spring Survey	3P	March 28	April 15
		3P + 3O	April 16	April 29
		3O + 3N	April 30	May 14
		3L + 3N	May 15	May 27
		3L	May 28	June 16
	NL Fall Survey	3O	September 17	September 30
		3O + 3N	October 1	October 14

Vessel	Activity	NAFO Division	Tentative Start Date	Tentative End Date
		3N + 3L	October 15	October 28
		3L	October 29	November 11
		3K + 3L	November 12	November 25
CCGS <i>Teleost</i>	NL Spring AZMP ¹	3P + 3KLMNO	April 11	April 29
	Greenland Halibut Survey	2J + 3KL	April 30	May 9
	Capelin Survey	3KL	May 10	May 27
	NL Fall Survey	2J + 3K	October 28	November 11
		3K	November 12	November 25
		3K + 3L Deep	November 25	December 9
1 Atlantic Zone Monitoring Program Source: G. Sheppard, pers. comm (2014)				

In 2003, an Industry - DFO Collaborative Post-season Trap Survey was developed and implemented for snow crab in NAFO Divisions 2J3KLOPs4R, in order to more accurately assess and manage that resource. The annual survey is conducted using commercial and modified snow crab traps. The 1,500 trap stations across all management areas are determined by DFO and do not change from year to year. The survey usually starts in late August or early September after the commercial snow crab season has ended. It continues until all the stations are finished, sometimes into late November.

The start and end dates of past surveys in each NAFO Division are presented below. Not all stations are sampled annually, and DFO relies on a subset of stations that are referred to as “core” stations.

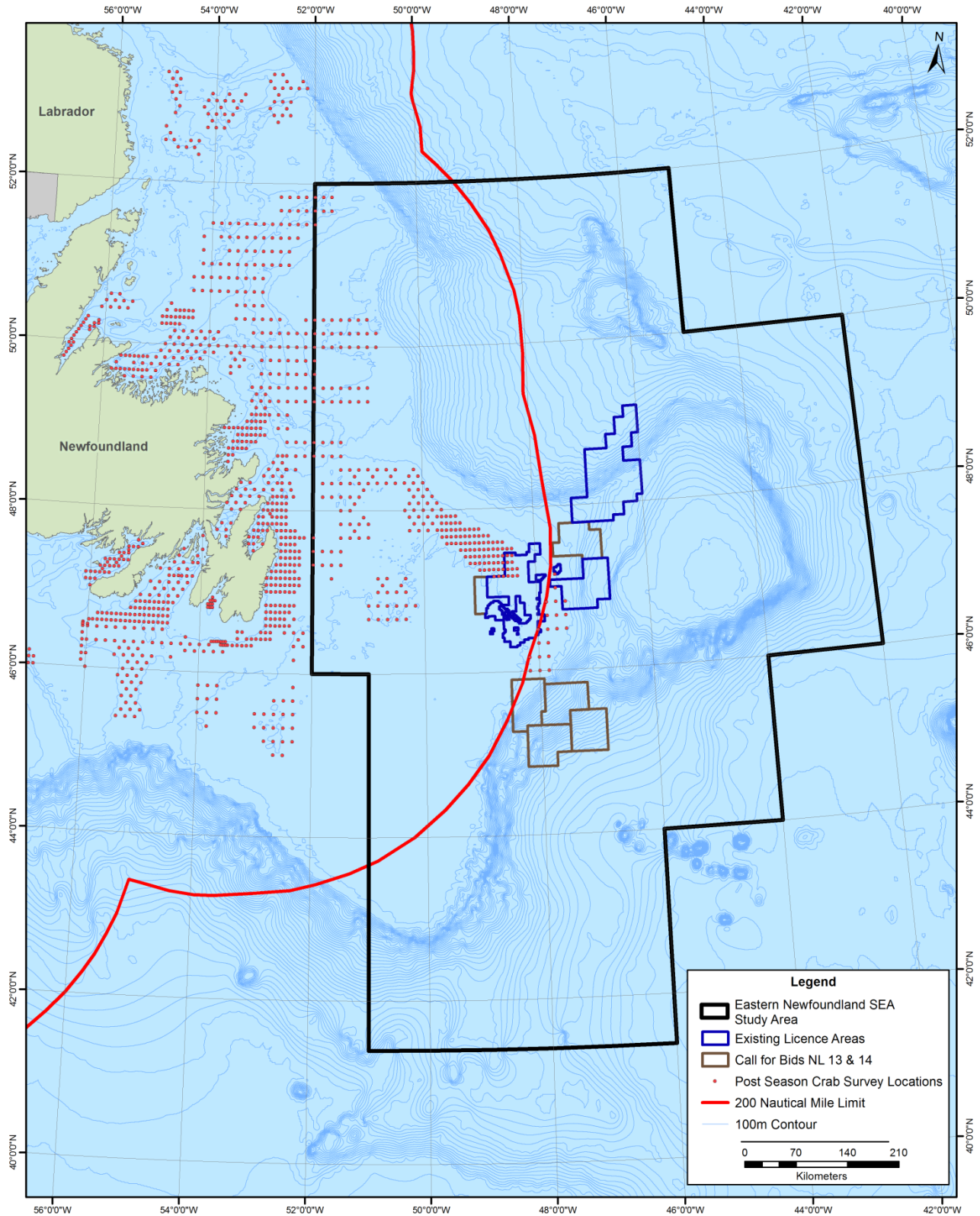
Figure 4.151 illustrates the “core” survey stations for the snow crab survey in relation to the Study Area (D. Stansbury, pers. comm. 2014).

Table 4.128 Timing of the Industry-DFO Collaborative Post Season Crab Survey (2003 – 2012)

NAFO Division	Year	Start Date	End Date	No. of Days
2J	2005	October 1	October 2	1
	2007	August 21	October 27	67
	2008	September 26	October 27	31
	2009	September 27	October 20	23
	2010	September 2	October 29	57
	2011	September 21	October 21	30
	2012	August 29	November 17	80
3K	2003	October 1	November 17	47
	2004	September 7	October 9	32
	2005	August 28	October 20	53
	2006	September 6	October 17	41
	2007	August 20	October 25	66
	2008	August 3	October 25	83
	2009	September 1	October 21	50
	2010	September 2	October 21	49
	2011	August 30	November 9	71
	2012	September 3	October 22	49
3L	2003	October 8	November 19	42
	2004	September 6	November 23	78

NAFO Division	Year	Start Date	End Date	No. of Days
	2005	August 29	November 1	64
	2006	September 7	November 7	61
	2007	August 20	September 26	37
	2008	September 1	October 27	56
	2009	September 1	November 27	87
	2010	August 30	November 9	71
	2011	August 29	November 4	67
	2012	September 2	October 30	31
30	2004	September 24	November 12	49
	2005	August 31	September 21	21
	2006	September 26	October 9	13
	2007	September 6	September 21	15
	2008	September 4	October 21	47
	2009	September 5	September 23	18
	2010	August 31	September 29	29
	2011	August 31	September 23	23
	2012	September 13	September 16	3
3Ps	2003	October 12	November 14	33
	2004	September 6	November 25	80
	2005	August 28	October 6	39
	2006	September 7	November 6	60
	2007	August 21	October 31	71
	2008	September 1	November 6	66
	2009	September 2	November 14	73
	2010	August 30	November 5	67
	2011	August 30	September 24	25
	2012	September 2	September 20	18
Source: D. Stansbury, pers. comm. (2014)				

Figure 4.151 Locations of Industry - DFO Collaborative Post-Season Snow Crab Trap Survey Stations



4.3.5 Other Human Activities

A number of other human activities and components occur within or near the marine environment, and therefore have the potential to interact with, and be affected by, future offshore oil and gas activities in the SEA Study Area. This overview focuses primarily upon the area of the Eastern Newfoundland coastline nearest to the SEA Study Area, generally corresponding with Economic Zones 14 to 20 as described in Section 4.3.1.

Data and information were obtained from Canadian government departments and agencies such as Statistics Canada, Transport Canada, DFO / Canadian Coast Guard, the Department of National Defence (DND) and Canadian Forces. Provincial government sources include the Departments of Transportation and Works, Environment and Conservation, Tourism, Culture and Recreation and Finance. In addition, information was obtained from the websites of various other agencies and groups including the St. John's Port Authority, Marine Atlantic, Greg's Cables, Cruise NL, Propel Research, Imperial Oil, Irving Oil, MI Swaco, A. Harvey and Company Ltd., North Atlantic Refining Ltd and Oceanex, as referenced below.

4.3.5.1 Marine Shipping and Transportation

Marine shipping and transportation have played an important role in the location and activities of coastal communities throughout Newfoundland and Labrador. Traditionally, small to medium sized vessels transported goods and people to and from coastal communities. Currently, the road system is the primary mode of transportation, and marine shipping is limited mainly to sea ports with the required infrastructure and services for larger vessels. Ferries move people and goods between Newfoundland and Nova Scotia and to islands and other communities that are not connected by road.

Harbours are regulated under federal jurisdiction of Canada's *Fishing and Recreational Harbours Act*. DFO, through Canadian Coast Guard (CCG) Marine Communications and Traffic Services (MCTS), provides communications and traffic management services in certain Canadian ports.

The Eastern Newfoundland region has 17 shipping ports, of which St. John's has the most diverse shipping activity and industrial infrastructure (Figure 4.152). Nine of these ports (Argentia, Bay Roberts, Come By Chance, Holyrood, Lewisporte, Long Pond, Marystown, St. John's and Newfoundland Offshore (St. John's)) have both domestic and international shipping activity, four (Fortune, Harbour Grace, Long Harbour and Bay Bulls) are used for international shipping, and four (Arnold's Cove, Carmanville, Catalina, Clarenville) have domestic shipping only. Smaller harbours are maintained primarily for fishing and recreational activities.

Come By Chance and Fortune are also key international shipping ports in Newfoundland and Labrador. Fortune is the Newfoundland port of entry / exit for the nearby French islands of St. Pierre and Miquelon, and Come By Chance has a large number of shipping movements associated with the transfer of petroleum products.

Table 4.129 summarizes international cargo shipping to and from Eastern Newfoundland ports, which represents approximately 12 percent of the total marine shipping conducted to and from Newfoundland and Labrador ports (Statistics Canada 2013b).

Figure 4.152 Marine Shipping in Eastern Newfoundland

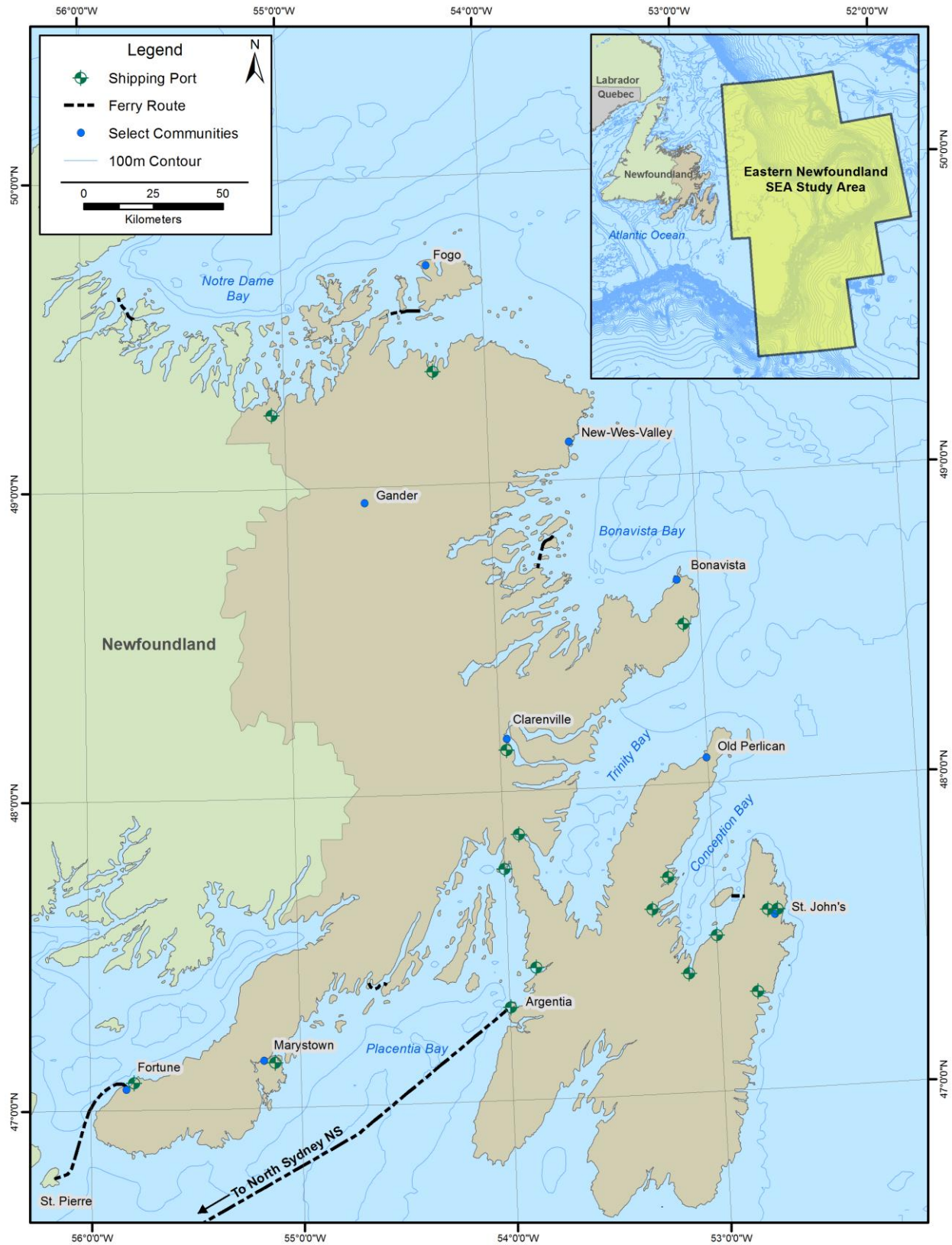


Table 4.129 International Shipping in Eastern Newfoundland (2011)

Selected Ports	Ballast			Cargo			Total Tonnage Handled ('000 t)
	Number of Movements	Gross Tonnage ('000 t)	Net Tonnage ('000 t)	Number of Movements	Gross Tonnage ('000 t)	Net Tonnage ('000 t)	
Argentia	37	235.4	103.6	74	541.7	247.0	45.0
Bay Roberts	3	18.0	9.0	4	20.2	10.0	4.0
Come By Chance	210	10,703.3	5,705.7	223	11,027.3	5,863.1	14,911.1
Fortune	736	155.6	56.6	336	30.7	11.2	7.0
Newfoundland Offshore (St. John's)	7	547.6	276.2	12	924.0	438.1	1,272.0
Harbour Grace	9	39.1	18.3	13	44.7	20.0	8.8
Holyrood	8	202.9	87.6	8	202.9	87.6	246.3
Lewisporte	8	185.4	80.8	7	147.7	66.2	114.7
Long Harbour	16	43.4	16.5	4	29.7	12.0	1.8
Long Pond	2	15.8	7.1	2	15.8	7.1	15.9
Marystown	2	1.0	0.3	0	0.0	0.0	0.0
St. John's	43	701.1	364.7	6	42.1	20.7	8.1
Bay Bulls	8	51.3	23.5	9	59.4	26	19.3
Total	1,089	12,899.9	6,749.9	698	13,086.2	6,809	16,654

Source: Statistics Canada (2013b)

Annually, Eastern Newfoundland and Labrador ports experience a larger number of domestic shipping movements than international movements (Table 4.130). Domestic activity includes a large amount of shipping attributed to Eastern Newfoundland's offshore oil and gas industry. Placentia Bay, in particular, sees substantial oil tanker traffic each year along with other marine activities at several zones of convergence. The potential for, and possible effects of, an associated oil spill or other accidental event in the Bay has been identified as a concern (Transport Canada 2007).

Table 4.130 Domestic Shipping in Eastern Newfoundland (2011)

Selected Ports	Ballast			Cargo			Total Tonnage Handled
	Number of Movements	Gross Tonnage ('000 t)	Net Tonnage ('000 t)	Number of Movements	Gross Tonnage ('000 t)	Net Tonnage ('000 t)	
Argentia	28	148.2	75.5	16	97.5	58.4	35.9
Arnold's Cove	1	0.8	0.4	0	0.0	0.0	0.0
Bay Roberts	5	54.9	24.0	4	52.6	23.0	49.3
Carmanville	3	13.3	8.7	3	13.3	8.7	15.1
Catalina	1	4.4	2.9	1	4.4	2.9	3.4
Clarenville	14	385.4	162.6	14	385.4	162.6	513.8
Come By Chance	143	9,784.8	5,018.9	131	9,045.0	4,614.1	12,476.5
Newfoundland Offshore (St. John's)	138	10,621.2	5,455.0	1,268	13,707.6	6,338.1	12,391.4
Holyrood	8	4.0	1.2	4	28.6	16.9	18.0
Lewisporte	64	424.4	199.8	35	151.8	69.9	150.4
Long Pond	49	325.7	164.9	40	215.2	134.3	229.9
Marystown	5	6.0	3.3	1	4.4	2.9	6.8

Selected Ports	Ballast			Cargo			Total Tonnage Handled
	Number of Movements	Gross Tonnage ('000 t)	Net Tonnage ('000 t)	Number of Movements	Gross Tonnage ('000 t)	Net Tonnage ('000 t)	
St. John's	62	968.0	406.5	1,527	10,593.3	3,547.7	1,357.7
Total	521	22,741.1	11,523.7	3,044	34,299.1	14,979.5	27,248.2

Source: Statistics Canada (2013b)

St. John's

St. John's Harbour, operated by the St. John's Port Authority, is one of a series of Canada Port Authorities, meaning it has been deemed to be an important Canadian port for domestic and international shipping (Westac 1999; TC 2013). The Port of St. John's is the busiest of the domestic shipping ports, the key characteristics and capacity of which are summarized in Tables 4.131 and 4.132.

Table 4.131 St. John's Port Capacity

Parameter	Details
Berthage / Length	45-180 m
Deck Elevation	3 m
Minimum Dockside Depth	6 m
Channel Width	91 m
Channel Depth	11.8 m
Tidal Range	1.38 m (spring)

Source: J. McGrath, pers. comm. (2013)

Table 4.132 St. John's Port Berthage by Pier

Pier Number	Berthage Length
1	175 m
2	165 m
3	180 m
4	120 m
5	160 m
6	150 m
7	100 m
8	150 m
9	150 m
10	150 m
11	180 m
18	45 m
19	115 m
20	162 m
21	58 m

Source: J. McGrath, pers. comm. (2013)

The Port of St. John's is an important centre of activity for a number of industries. It is the primary supply center for the offshore oil and gas industry in Atlantic Canada, as well as an important container terminal and a fishing port. Other activities include Canadian Coast Guard communications operations, fuel wholesale, military activity by the Department of National Defence, ship repair and refitting,

industrial fabrication, oil and gas research and seafood unloading. Some of the key industrial operators that utilize the Port of St. John's are listed in Table 4.133.

Table 4.133 Industrial Marine Activity in St. John's Harbour

Company	Activities
Mobil Oil Canada	Oil and gas exploration and development
DFO / Canadian Coast Guard	Regional operations centre for the Canadian Coast Guard
Imperial Oil Limited	Oil and gas exploration and development
Irving Oil Limited	Wholesale fuels
A. Harvey and Company Limited	Logistic services to the offshore oil and gas industry, trucking services
Department of National Defence	Military Activity
NewDock / St. John's Dockyard	Ship repair / refit, offshore services, industrial fabrication
Suncor	Oil and gas exploration and production
MI Swaco	Oil and gas exploration and production
Oceanex	Container shipping
DWI Services Limited	Offloading in-season seafood catch from vessels, ice supply
Propel Research	Oil and gas research
Sources: SJPA (2013a); NewDock (2013); Suncor (2013); A. Harvey and Company Limited (2013); Irving Oil Limited (2013); MI Swaco (2013); Imperial Oil Limited (2013); PR (2013); CCG (2013a)	

Oceanex offers two direct weekly connections from St. John's to Montreal and Halifax, year round. The company operates two ice-class, roll-on roll-off (Ro-Ro) vessels and one ice-class container vessel out of St. John's (SJPA 2013b). Offshore oil and gas exploration is ongoing, as is production from the Hibernia, Terra Nova and White Rose Projects (SJPA 2013c).

Come By Chance

The Port of Come By Chance, operated by North Atlantic Refining Ltd., is the second-busiest domestic shipping port in the Eastern Newfoundland due to the movement of oil and gas products. The Come By Chance refinery is one of the largest in North America, with 500 employees producing 115,000 barrels per day. The refinery produces gasoline, ultra low sulphur diesel, stove oil, #6 oil, arctic fuel, bunker c, furnace oil, jet fuel, marine diesel and propane (NARL 2013).

Small Craft Harbours

As many Eastern Newfoundland coastal communities have traditional fishing economies, a large number of small harbours exist throughout the region. These harbours may have some level of fishing as well as recreational boating and marine tourism.

In Newfoundland and Labrador, a total of 264 harbours are operated by 214 Harbour Authorities, a large number of which are located in Eastern Newfoundland (Table 4.134). Core fishing harbours, owned by DFO and managed by Harbour Authorities, are critical to the fishing and aquaculture industries (Figure 4.153). Non-core harbours may have some level of fishing (D. Boutilier, pers. comm. 2013). As well as the transshipment of fish and seafood products, small craft harbours are often used extensively for recreational boating and marine tourism activities.

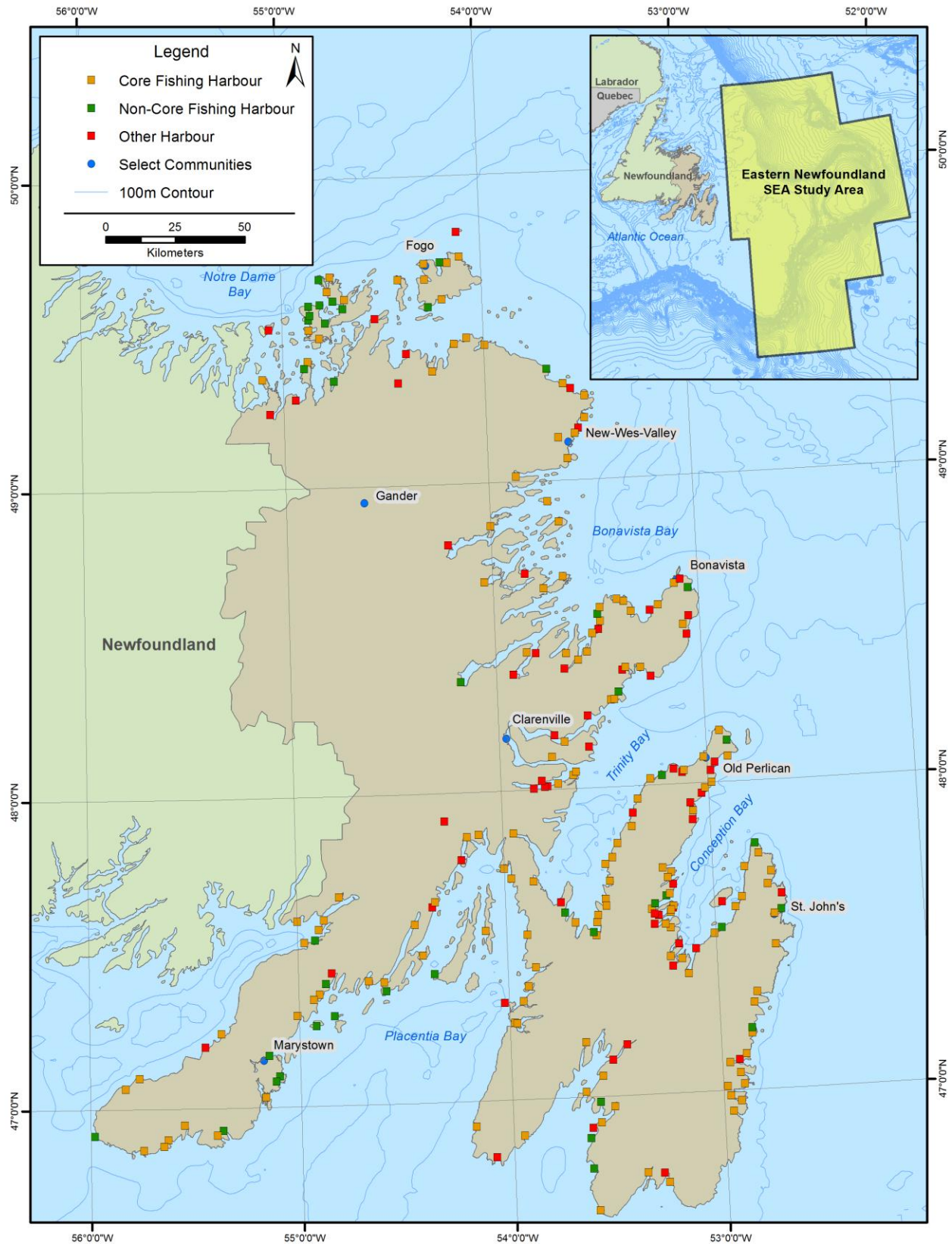
Table 4.134 Eastern Newfoundland Harbour Authorities and Core Fishing Harbours

Harbour Authorities	Managed Harbours
Admiral's Beach	Admiral's Beach
Aquaforte	Aquaforte
Arnold's Cove	Arnold's Cove, Isle Valen, Tack's Beach
Baine Harbour and Rushoon	Baine Harbour, Rushoon
Bauline	Bauline
Bay Bulls	Bay Bulls
Bay de Verde	Bay de Verde
Bay Roberts	Bay Roberts
Bonaventures	New Bonaventure, Old Bonventure
Bonavista	Bonavista
Branch	Branch
Brigus	Brigus
Brigus South	Brigus South
Burin	Burin
Calvert	Calvert
Canning's Cove	Canning's Cove
Cape Freels	Cape Freels North
Carbonear	Carbonear
Carmanville	Carmanville
Catalina	Catalina
Champney's West and Trinity East	Champney's West, Trinity East
Chance Cove	Chance Cove
Change Islands	Change Islands
Comfort Cove	Comfort Cove
Conception Harbour	Conception Harbour
Cupids	Cupids
Davis Cove	Davis Cove, Monkstown
Dildo	Dildo, Dildo South
Duntara, Keels and King's Cove	Duntara, Keels, King's Cove
English Harbour East	English Harbour East
Fair Haven	Fair Haven
Fermeuse / Port Kirwan	Fermeuse, Port Kirwan
Ferryland	Ferryland
Flatrock	Flatrock
Fogo Island	Deep Bay, Fogo, Joe Batt's Arm, Seldom Come By, Tilting
Fort Amherst Small Boat Basin	St. John's (Prosser's Rock)
Fortune	Fortune
Fox Harbour	Fox Harbour
Foxtrap	Foxtrap
Frenchman's Cove	Frenchman's Cove
Garden Cove	Garden Cove
Garnish	Garnish
Glovertown	Glovertown
Gooseberry Cove	Gooseberry Cove
Grand Bank	Grand Bank
Grand le Pierre	Grand le Pierre
Grates Cove	Grates Cove
Green's Harbour	Green's Harbour

Harbour Authorities	Managed Harbours
Greenspond	Greenspond
Hant's Harbour	Hant's Harbour
Happy Adventure	Happy Adventure
Harbour Mille	Harbour Mille
Heart's Content	Heart's Content
Heart's Delight-Islington	Heart's Delight, Islington
Herring Neck	Herring Neck
Holyrood-Harbour Main	Harbour Main, Holyrood
Indian Bay	Centreville
Ladle Cove-Aspen Cove	Aspen Cove, Ladle Cove
Lamaline	Lamaline, Point Crewe
Leading Tickles	Leading Tickles West
Little Burnt Bay	Little Burnt Bay
Little Harbour East	Little Harbour East
Little Heart's Ease	Little Heart's Ease
Long Cove	Long Cove
Lord's Cove	Lord's Cove
Lower Island Cove	Lower Island Cove
Lumsden	Lumsden
Mount Arlington Heights	Long Harbour (Mount Arlington Heights)
Musgrave Harbour	Musgrave Harbour
New Harbour, T.B.	Hopeall, New Harbour
Newmans Cove	Newmans Cove
Newtown	Newtown
North Harbour	North Harbour (Placentia Bay)
O'Donnell's	O'Donnell's
Old Perlican	Old Perlican
Petit Forte	Petit Forte
Petty Harbour	Petty Harbour
Placentia Area	Jerseyside
Plate Cove	Plate Cove West
Point au Gaul	Point au Gaul
Port de Grave	Hibb's Cove, Port de Grave, Ship Cove (Conception Bay)
Portugal Cove-St. Philip's	Portugal Cove, St. Philip's
Pouch Cove	Pouch Cove
Princeton	Princeton
Random Island	Hickman's Harbour, Lower Lance Cove
Red Harbour	Red Harbour
Red Head Cove	Red Head Cove
Renews	Renews
Riverhead	Riverhead
Salvage	Salvage
Ship Harbour	Ship Harbour
Sibley's Cove	Sibley's Cove
South East Bight	South East Bight
Southern Harbour	Southern Harbour
Southport	Southport
St. Bernard;s	St. Bernard's
St. Brendan's	St. Brendan's (Shoal Cove and Dock Cove)

Harbour Authorities	Managed Harbours
St. Bride's	St. Bride's
St. Lawrence	St. Lawrence
St. Mary's	St. Mary's
St. Vincent's	Bragg's Island, Dover
Summerford	Summerford
Summerville	Summerville
Sunnyside	Sunnyside
Sweet Bay	Sweet Bay
Tickle Cove and Open Hall	Open Hall, Tickle Cove
Trepassey	Trepassey
Twillingate	Jenkin's Cove, Twillingate (Shoal Tickle)
Upper Island Cove	Upper Island Cove
Valleyfield-Badger's Quay-Pool's Island	Valleyfield
Wesleyville	Wesleyville
Western Bay-Jobs Cove	Job's Cove, Ochre Pit Cove
Whiteway	Whiteway
Winterton	Winterton
Witless Bay	Witless Bay
Source: D. Boutilier, pers. comm. (2013)	

Figure 4.153 Eastern Newfoundland Small Craft Harbours



4.3.5.2 Ferry Services

In Newfoundland and Labrador, the Department of Transportation and Works operates and/or administers the provincial ferry system. This service delivers passengers and freight to remote coastal communities that are not connected by road (NLDTW 2013). Four ferry services operate in the Eastern Newfoundland region (Tables 4.135 and 4.136).

Table 4.135 Eastern Newfoundland Ferry Services

Ferry Route	Operated By
Farewell - Change Islands / Fogo Island	Department of Transportation and Works
Burnside - St. Brendan's	Department of Transportation and Works
Portugal Cove - Bell Island	Department of Transportation and Works
Southeast Bight and Petit Forte	Department of Transportation and Works

Source: NLDTW (2013)

Table 4.136 Eastern Newfoundland Ferry Activity

Service	Year	Passengers	Passenger Vehicles	Commercial Vehicles
Farewell - Fogo Island / Change Islands	2010/11	165,299	76,162	4,944
	2011/12	165,568	82,315	4,690
	2012/13	166,396	77,896	4,463
Burnside - St. Brendan's	2010/11	14,327	7,313	233
	2011/12	17,572	8,624	193
	2012/13	18,040	8,993	188
Portugal Cove-Bell Island	2010/11	530,147	239,944	4,991
	2011/12	516,388	236,293	5,289
	2012/13	533,353	242,796	5,317
Southeast Bight - Petit Forte	2010/11	7,713	NA*	NA*
	2011/12	7,711		
	2012/13	7,676		

Source: K. Martin, pers. comm. (2013)
*The Southeast Bight to Petit Forte ferry does not take vehicle traffic

The interprovincial ferry service provides access to North Sydney, Nova Scotia from Port aux Basques year round and through Argentia from spring to fall. The Argentia ferry operates two to three times per week (MAI 2013). Most activity on the Argentia to North Sydney ferry is passenger traffic with between 24,000 and 31,000 passengers and approximately 10,000 to 13,000 passenger vehicles annually (Table 4.137). Commercial traffic includes tractor trailers moving goods between Newfoundland and Nova Scotia.

Table 4.137 Argentia / North Sydney Ferry Activity

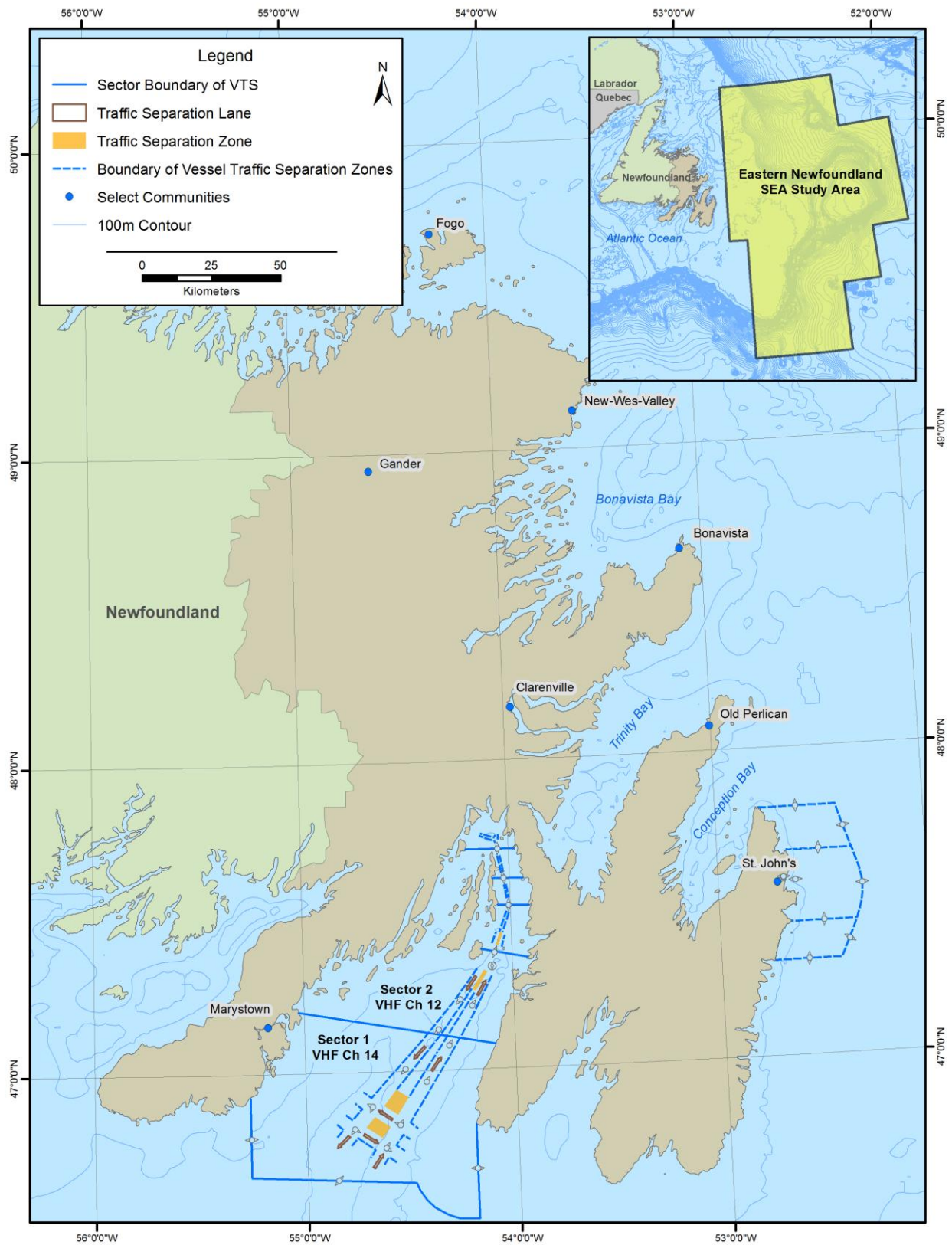
Season	Passengers	Passenger Vehicles	Commercial Vehicles
2008 (May 3 – October 7)	26,700	10,673	401
2009 (May 3 – October 7)	29,196	12,231	739
2010 (May 3 – October 7)	24,392	10,293	742
2011 (May 3 – October 7)	30,999	13,067	778
2012 (May 3 – October 7)	25,473	11,079	887

Source: K. Guiney, pers. comm. (2013)

4.3.5.3 Marine Traffic Management

Marine Communications and Traffic Service (MCTS) Centres are located in St. John's and Argentia. These centres are responsible for detecting marine distress situations and ensuring assistance is available. They broadcast safety information, direct and provide advice to marine traffic, ensure ports and traffic movements are efficient and optimized and assist in the operations of pilots (CCG 2013b). Vessel traffic separation zones are maintained in Placentia Bay and around St. John's harbour (Figure 4.154). The region also has a large number of navigational buoys, lights and fog signals.

Figure 4.154 Marine Traffic Management in Eastern Newfoundland



4.3.5.4 Marine Cables

Marine cables are laid on the seabed between land-based stations to carry telecommunication signals across stretches of ocean. Ten marine cables transect the SEA Study Area (Figure 4.155) (Mahlknecht 2013), several of which have multiple lines associated with them (Table 4.138). One of these is inactive and three are currently under development.

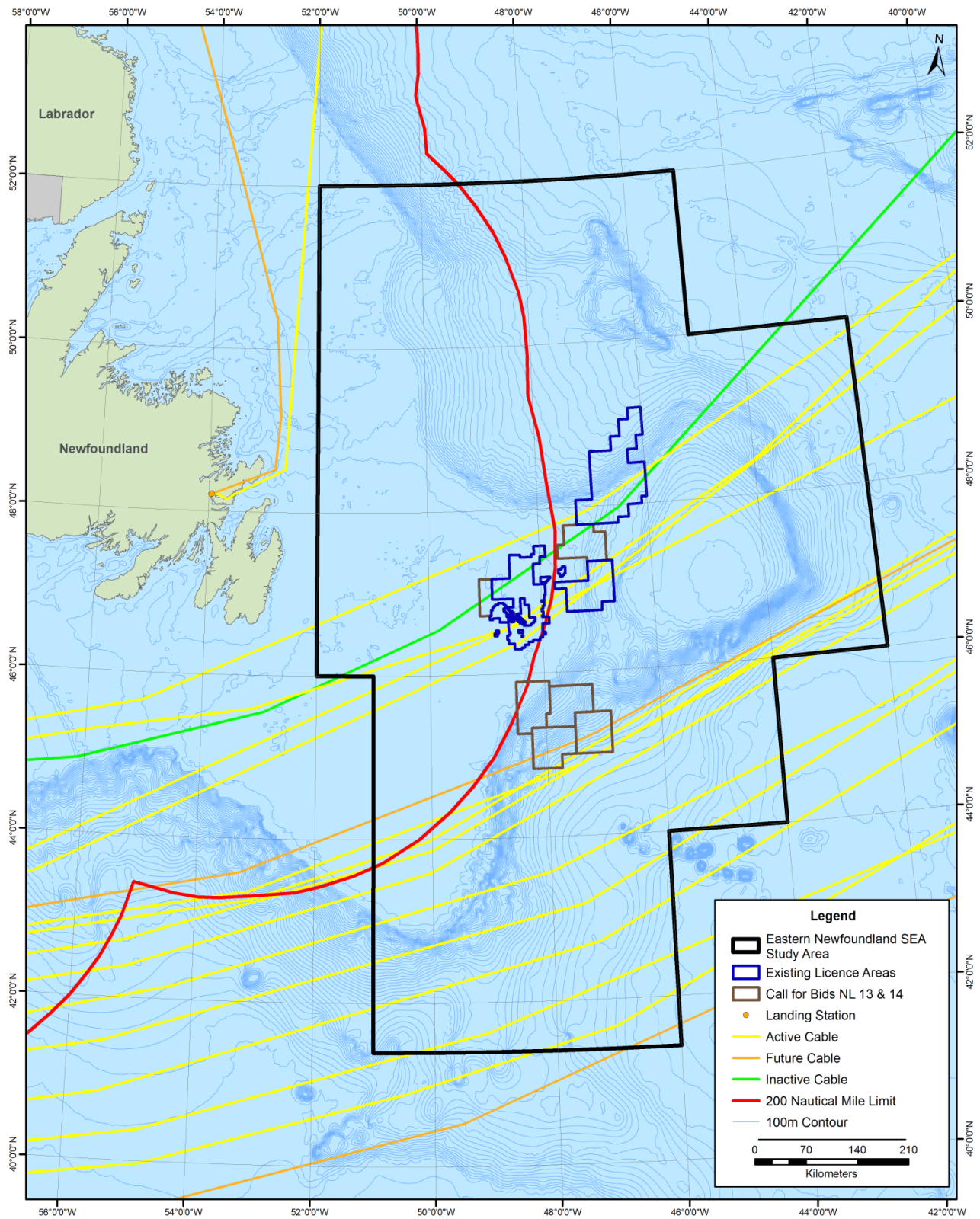
Table 4.138 Marine Cables

Name	Connecting	Capacity (G)	Distance (km)	In Service	# of Lines
CANTAT-3	Canada, UK, Denmark, Germany, Iceland, Faroe Islands	7.5	NA	1994-2010	1
FLAG Atlantic (FA-1)	USA, UK, France	4,800	14,500	1997	2
AC-1	USA, UK, Netherlands, Germany	120	14,000	1999	1
AC-2	USA, UK	640	6,400	2000	2
TGN Atlantic	USA, UK	5,120	12,935	2001	2
TAT-14	USA, UK, France, Netherlands, Germany, Denmark	3,200	15,428	2001	2
Hibernia-Atlantic	Canada, USA, Ireland, UK	1,920	13,2000	2001	2
Apollo	USA, UK, France	40,000	NA	2014	1
WASACE	USA, France	40,000	NA	2014	1
Emerald Express	Canada, USA, UK, Ireland, Germany, Netherlands, Portugal	40,000	5,200	2014	1

Sources: Mahlkecht, G. (2013); Submarine Cable Networks (n.d.); Wasace Cable Company (n.d.); Emerald Networks (2012)

One existing and one future marine cable are located near, but outside of, the SEA Study Area (Mahlknecht 2013). A portion of the Greenland Connect submarine communications cable system has a landing point in Milton, Newfoundland, but it is outside of the SEA Study Area. The future Arctic Fiber cable system will intersect near Clarenville but it will also be outside of the SEA Study Area (Figure 4.155).

Figure 4.155 Marine Cables in and Near the SEA Study Area



4.3.5.5 Unexploded Ordnances and Legacy Sites

Many locations across Canada have been used for military operations, training and weapons testing in the past. Wartime action along Canada's coasts and incidents involving ships, planes or vehicles carrying ammunition and explosives have also created legacy sites at which unexploded ordnance (UXO) may still remain today. A UXO legacy site is any property that was owned, leased or used by DND but no longer resides within DND's inventory and for which there exists a UXO risk associated with past Departmental activities. UXO shipwrecks are sites of known shipwrecks containing unexploded munitions. Several hundred UXO legacy sites are known to exist at locations spread across Canada's land mass. In addition, 1,100 sites are known to exist off Canada's east coast, with 26 more on the Pacific coast (DND 2013c).

DND's UXO and Legacy Sites Program was established in 2005, with the objective of reducing safety risks posed by UXO at all legacy sites across Canada. The program identifies and catalogues such sites, assesses risks, and works to reduce UXO risk through property controls, assessment surveys, UXO clearance operations, and public education. At some sites where the potential risk is great, public safety must be ensured by restricting access to the sites. In other locations where the risk is minimal, signage and information campaigns to alert the public to potential hazards may be the preferred action (DND 2013c).

Various known UXO legacy sites and shipwrecks exist within the NL Offshore Area, including locations within the SEA Study Area (Figure 4.156), the majority of which are shipwrecks (Table 4.139). Several explosive dumpsites (including the Sydney Shallow Disposal Site and areas south of the Halibut Channel) are also known to exist offshore Newfoundland but none are located within the SEA Study Area (C. Giffin, pers. comm. 2014; J. Kearney, pers. comm. 2013; LGL Limited 2010).

Table 4.139 UXOs and Legacy Sites

Site or Vessel Name	Type
U-520 Submarine	Legacy Site
U-658 Submarine	Legacy Site
Friar Rock	Shipwreck
Empire Celt	Shipwreck
Flynderborg	Shipwreck
Gretavale	Shipwreck
Broompark	Shipwreck
Arnish	Shipwreck
Balsam Lake	Shipwreck
Capitao Jose Vilareinho	Shipwreck
Diana	Shipwreck
Edward A. Cohan	Shipwreck
Empire Soldier	Shipwreck
Gigantic	Shipwreck
J. B. Kitchen	Shipwreck
Jean M. Madelin	Shipwreck
King Malcolm	Shipwreck

Site or Vessel Name	Type
Magnhild	Shipwreck
Mount Mycale	Shipwreck
Nokomis	Shipwreck
R. Bowers	Shipwreck
Rosland	Shipwreck
Royal Edward	Shipwreck
Thomas King	Shipwreck
W. T. White	Shipwreck
Source: J. Kearney, pers. comm. (2013)	

During offshore oil and gas activities that may result in contact with the seabed (such as drilling or mooring), DND typically recommends that a seabed survey be conducted to assess the potential presence of UXOs and to prevent unintentional contact with any unreported or undetected materials in the area. Due to the inherent dangers associated with UXO and the fact that the Northwest Atlantic Ocean was exposed to many naval engagements during WWII, should any suspected UXO be encountered during the course of offshore activities it should not be disturbed or manipulated, and the location should be marked and immediately reported to the CCG.

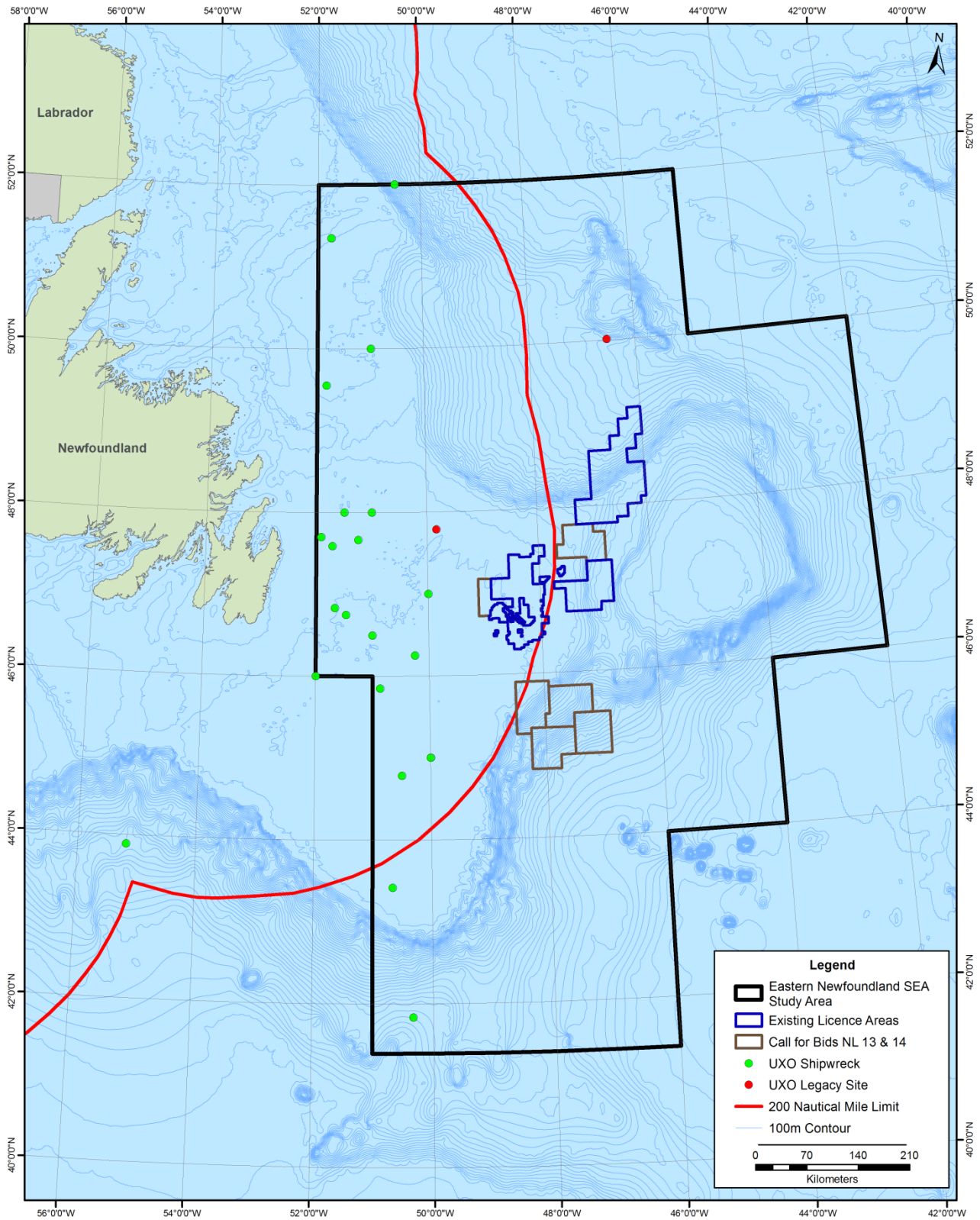
4.3.5.6 Military Activities

Under the *National Defence Act*, DND is responsible for several military and civilian organizations and agencies. DND oversees national security, including the defence and protection of Canada's marine jurisdiction. To meet national security obligations, Canada's Royal Navy and Air Force operate routine surveillance and monitoring operations throughout Atlantic Canadian waters, often with associated training operations. As a result, DND may operate aircraft or marine patrols in the region. In some instances naval frigates or coastal patrol vessels may operate training or other naval operations in the SEA Study Area. Navy vessels also sometimes provide support to DFO in conducting fishery patrols in Atlantic Canada, including the coastal waters of Newfoundland. Civilian security operations are conducted by the Canadian Coast Guard (DND 2013b, DND 2013c, CCG 2013a, RCN 2013).

The Canadian Armed Forces assist with Search and Rescue activities. Operations include aeronautical search and rescue, medical evacuations, ground search and rescue and provision of equipment and services to other humanitarian response efforts. The Canadian Rangers, reserve members of the Canadian Armed Forces, are active members in ground search and rescue operations in rural areas (DND 2013b).

The Royal Canadian Navy reservist fleet HMCS Cabot operates out of St. John's, NL. This fleet includes reservists who lead civilian lives as well as military careers. The fleet is mainly responsible for coastal surveillance and patrol, including search and rescue, law enforcement and natural resource protection (including fisheries resources) (RCN 2013).

Figure 4.156 UXO and Legacy Sites



4.3.5.7 Tourism and Recreation

The tourism industry, a key component of the Newfoundland and Labrador economy, has grown and evolved considerably in recent years. The tourism sector includes both residents who travel within the province and non-residents who visit the province, which together resulted in an estimated \$1 billion in spending in 2012 (NLDTCR 2013). The resident market continues to be a substantial contributor to the province’s tourism sector, representing nearly 60 percent of total tourism spending in 2011. In 2012 the number of non-resident visitors increased by 9.9 percent over 2011 to 504,400 (NLDOF 2013).

Eastern Newfoundland has a number of key tourism attractions, including provincial and national sites that protect and exhibit key areas of ecological, natural heritage, cultural and / or recreational importance. This region also has a large number of cultural and heritage attractions that commemorate important people, places and events. These are mainly museums and interpretation centres with various themes. Annual festivals celebrate seasonal activities (e.g. winter activities or summer / fall harvests), provide cultural enrichment (e.g. music, theatre), celebrate seasonal foods (e.g. berries, lobster, crab) or provide community events such as come-home-years. Musical festivals draw large numbers of people (NLT 2013a). Eleven golf courses are located in the Eastern Newfoundland region and the White Hills ski area is located near Clarenville (NLT 2013b).

In Eastern Newfoundland, tourism generally occurs within a four-month period (June to September) with the peak months being July and August. The exceptions are business and convention travel and winter activities such as those undertaken at the White Hills Ski Resort. Related infrastructure and facilities are also well developed in the region.

The following sections further describe select coastal and marine-based tourism areas and activities in Eastern Newfoundland (Figure 4.157). The tourism industry relies, at least in part, on the existence and nature of coastal communities, the availability of fresh seafood and opportunities to view wildlife and participate in marine-based activities such as boat tours and sea kayaking.

Eastern Newfoundland’s tourist attractions include national and provincial coastal parks (as described in Section 4.2.4) and marine-based activities (as well as inland areas and land-based activities). Provincial and National Parks provide important recreational opportunities, as do other beaches and coastal areas.

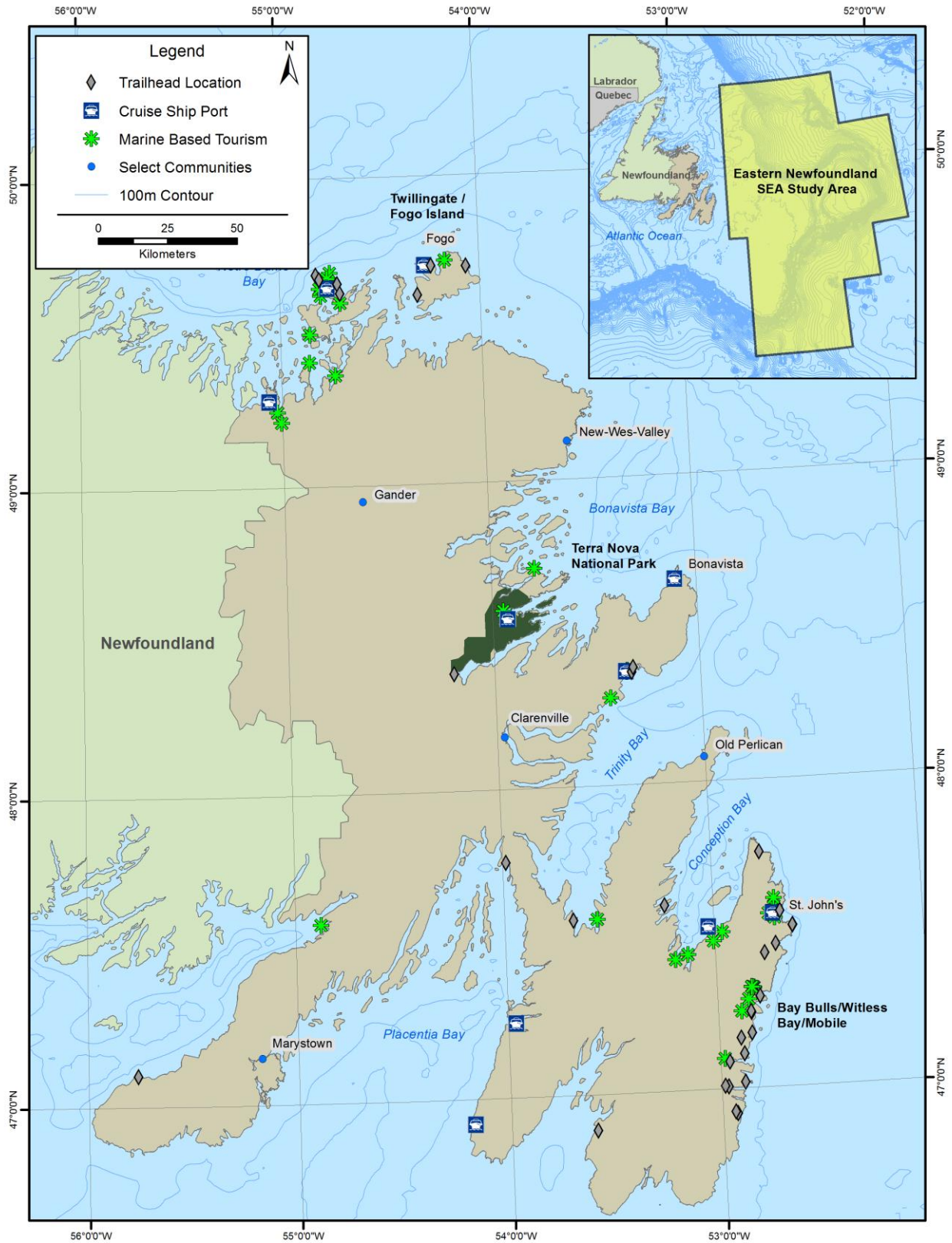
Eastern Newfoundland has many kilometres of coastline and marine-based recreational activities occur on the open ocean and in sheltered bays. For many tourists, taking a boat tour and viewing marine life are essential parts of any trip to Newfoundland and Labrador. Businesses offer ocean adventures and marine related activities such as sea kayaking for residents and tourists. Eastern Newfoundland has a variety of marine-based tourism activities (Figure 4.157). These are clustered in three main areas: 1) the Twillingate / Fogo Island region; 2) Terra Nova National Park; and 3) the Southern Shore (Bay Bulls / Witless Bay / Mobile). Boat tours and sea kayaking are among the most commonly offered activities (Table 4.140).

Table 4.140 Eastern Newfoundland Marine Tours and Activities (Select, Illustrative Examples)

Operator	Location	Activities
Ocean Treasures Adventures	Lewisporte	Catamaran boat tours
Choice Adventures	Comfort Cove	Boat tours
Whales and Birds Inc.	Birchy Bay	Sea kayaking, sail boat and motor boat tours

Operator	Location	Activities
Captain Dave's Fishing and Personalized Tours	Twillingate	Boat tours
Iceberg Quest Ocean Tours	Twillingate	Boat tours
Skipper Jim Boat Tours	Twillingate	Boat tours
Twillingate Adventure Tours	Twillingate	Boat tours
Twillingate Island Boat Tours	Twillingate	Boat tours
Fogo Island Heritage Boat Tours	Joe Batt's Arm	Boat tours
Burnside Heritage Foundation, Archeological Boat Tours	Burnside	Boat tours
Coastal Connections	Terra Nova Park	Boat tours
Atlantic Adventures Boat Tours	Trinity	Boat tours
Sea of Whales Adventures	Trinity	Boat tours
Trinity Eco Tours	Trinity	Sea kayaking, SCUBA diving and Zodiac boat tours
Rugged Beauty Boat Tours	New Bonaventure	Boat tours
Lancaster Boat Tours	Bonavista	Boat tours
Newfoundland Coastal Safari	Harbour Mille	Sea kayaking
Dildo Island Adventure Tours	Dildo	Boat tours
Sail Newfoundland	Avondale	Sail boat tours
Ocean Quest Adventures	Long Pond	Sea kayaking, SCUBA diving and snorkelling
Adventure Newfoundland	St. John's	Boat tours
Dee Jay Charters Boat Tour	St. John's	Boat tours
Iceberg Quest Ocean Tours	St. John's	Boat tours
Captain Wayne's Marine Excursions	Bay Bulls	Boat tours
Gatherall's Puffin and Whale Watch	Bay Bulls	Catamaran boat tours
Muldowney's Puffin and Whale Tours	Bay Bulls	Boat tours
O'Brien's Whale and Bird Tours	Bay Bulls	Boat tours
The Outfitters Adventures	Bay Bulls	Sea Kayaking
Eco Tours – Witless Bay Wonders	Witless Bay	Zodiac boat tours
Molly Bawn Whale and Puffin Tours	Mobile	Boat tours
Colbert's Puffin and Whale Tours	Bauline East	Boat tours
Stan Cook Sea Kayaking	Cape Broyle	Sea kayaking
Source: NLT (2013c)		

Figure 4.157 Some Select Eastern Newfoundland Marine-Based Tourism Activities



Cruise Ship Activity

Each year from May to October, Newfoundland and Labrador ports are visited by large cruise ships on trans-Atlantic routes or small ships that tour the Province, the Maritimes and/or Quebec. In 2013, 20 cruise ships visited 23 Newfoundland and Labrador ports bringing a total of 10,533 passengers (Cruise NL 2013). In Eastern Newfoundland, St. John's is the main port-of-call (Table 4.141), and September is the busiest month for cruise ships.

Table 4.141 Eastern Newfoundland Cruise Ship Activity (2013)

Port(s)	Date	Ship	Itinerary	Passengers
St. John's	May 8	Silver Whisper	Fort Lauderdale, FL, USA to Southampton, UK	358
St. John's	May 30	Crystal Symphony	Atlantic Canada	402
St. John's	July 20	Akademik Ioffe	Supply stop enroute to Greenland	0
St. John's	July 24	MS Delphin	Greenland and southeastern Canada	394
St. John's	Aug. 14	Veendam	Boston to Viking areas (e.g. Newfoundland, Iceland, Norway)	1,252
St. John's	Aug. 19	Amadea	Canada and Greenland	573
St. John's	Sept. 1	Astor	Canada and Greenland	360
St. John's	Sept. 7	National Geographic Explorer	Greenland, Baffin Island, Newfoundland and Labrador	294
Eastern Newfoundland	Sept. 8	National Geographic Explorer	Canadian Maritimes	156
St. John's	Sept. 8	Eurodam	Baltic and Viking areas	1,913
St. John's	Sept. 11	Caribbean Princess	Iceland, Greenland, British Isles	2,973
St. John's	Sept. 14	National Geographic Explorer	Canadian Maritimes	150
Terra Nova National Park	Sept. 17	Sea Adventurer	Newfoundland Circumnavigation	125
St. John's	Sept. 18	Sea Adventurer	Greenland, Labrador, Newfoundland	250
St. John's	Sept. 18	AIDAbella	Trans-Atlantic	1,974
Tilting, Fogo Island	Sept. 19	Sea Adventurer	Newfoundland Circumnavigation	129
St. John's	Sept. 27	Sea Adventurer	Newfoundland Circumnavigation	129
St. John's	Oct. 7	Carnival Legend	Trans-Atlantic	2,089

Source: Cruise NL (2013)

Coastal Trails

Eastern Newfoundland has a number of hiking trails. located primarily in coastal areas (Table 4.142).

Table 4.142 Eastern Newfoundland Coastal Trails (Select and Illustrative Examples)

Identified Coastal Trails	Location
Codjacks Cove Trail	Twillingate
French Beach Trail	Twillingate
Lower Little Harbour Trail	Twillingate
Sleepy Cove Trail	Twillingate
Spencer's Park Trail	Twillingate
Fogo Walking Trails	Fogo Island
Tilting Walking / Hiking Trails	Fogo Island
Island Harbour Hiking Trails	Fogo Island
The Old Trails	Eastport Peninsula
Terra Nova National Park Trails	Newman's Sound, Bonavista Bay
Fort (Admiral's) Point	Trinity
British Harbour Trail	New Bonaventure
Skerwink Trail	Trinity East
Fox Island Trail	Champney's West
Marine Hike	Grand Bank
Bordeaux Walking Trail	Arnold's Cove
Truce Sound Coastal Trail and Peace Garden	Sunnyside
Ocean View Hiking Trail	Long Cove
Bay Roberts East Shoreline Trail	Bay Roberts-Mad Rock and French's Cove
Newfoundland Coastal Walking	Topsail
Natural Walking Trails	Bell Island
East Coast Trail-Biscan Bay Path	Cape St. Francis to Pouch Cove
East Coast Trail-Stiles Cove Path	Pouch Cove to Flatrock
East Coast Trail-Cobbler Path	Torbay Point to Logy Bay
East Coast Trail-Sugarloaf Path	Logy Bay to Quidi Vidi Village
East Coast Trail-Deadman's Bay Path	Fort Amherst to Blackhead
North Head Trail	Signal Hill
East Coast Trail-Blackhead Path	Blackhead to Cape Spear
East Coast Trail-Cape Spear Path	Cape Spear to Maddox Cove
East Coast Trail-Motion Path	Petty Harbour to Shoal Bay Road
East Coast Trail-Mickeleens Path	Bay Bulls to Witless Bay
East Coast Trail-Spout Path	Bay Bulls to Shoal Bay
East Coast Trail-Beaches Path	Witless Bay to Mobile
East Coast Trail-Tinkers Point Path	Mobile to Tors Cove
East Coast Trail-La Manche Village Path	La Manche Provincial Park
East Coast Trail-Flamber Head Path	La Manche village to Brigus South
East Coast Trail-Brigus Head Path	Brigus South to Admiral's Cove
East Coast Trail-Cape Broyle Head Path	Cape Broyle to Calvert
East Coast Trail-Sounding Hills Path	Ferryland to Aquaforte
East Coast Trail-Mudder Wet Path	Aquaforte
East Coast Trail-Spurwink Island Path	Aquaforte to Port Kirwin
East Coast Trail-Bear Cove Point Path	Kingman's Cove to Renew's
East Coast Trail-Island Meadow Path	Renews to Cappahayden
Hare Hill Hiking Trail	St. Mary's

Source: NLT (2013d)

The East Coast Trail extends along the east coast of the Avalon Peninsula from Cape St. Francis to Cappahayden. This 275 km system of hiking trails links to 32 communities that have a variety of services and accommodations (NLT 2013d).

Marinas

There are also a number of marinas located throughout coastal Newfoundland and Labrador, including at the following locations in Eastern Newfoundland (NLT 2013e; Bruce, D and D n.d.):

- Lewisporte
- Seldom Harbour
- Musgrave Harbour
- Terra Nova National Park
- Bonavista
- Trinity Harbour
- Clarenville
- Old Perlican
- Harbour Grace
- Bonavista
- Port de Grave
- Bay Roberts
- Holyrood (2 marinas)
- Long Pond
- St. John’s
- Fortune
- Grand Bank

Beaches

Recreational beaches are also found throughout Eastern Newfoundland (Table 4.143), some of which are located in coastal parks.

Table 4.143 Eastern Newfoundland Beaches (Select and Illustrative Examples)

Identified Beaches	Location
Musgrave Harbour Beach	Musgrave Harbour
Eastport Beaches	Eastport Peninsula
Golden Sands Amusement Park	Marystown
Salmon Cove Sands	Salmon Cove
Northern Bay Sands	Northern Bay
Rotary Topsail Beach	Topsail
Middle Cove Beach	Middle Cove
St. Vincent’s Beach	St. Vincent’s
Source: NLT (2013b)	

Coastal Bird Watching

Eastern Newfoundland also has a number of noteworthy bird habitats, including coastal sites, that may be used for bird watching. These areas may be completely or partially protected by federal (i.e. Terra Nova National Park) or provincial parks and protected areas (i.e. Cape St. Mary’s Ecological Reserve, Baccalieu Island Ecological Reserve, Funk Island Ecological Reserve, Mistaken Point Ecological Reserve, Witless Bay Ecological Reserve and Lawn Islands Archipelago Provisional Ecological Reserve), which may or may not permit human access. Protected areas and identified sensitive marine bird habitats (that may be used for bird watching) are also discussed in Section 4.2.2.

Table 4.144 Coastal Bird Watching Areas

Identified Bird Areas	Description / Key Features	Location
Deadman’s Bay Provincial Park	<ul style="list-style-type: none"> Shorebirds 	Lumsden
Funk Island Ecological Reserve	<ul style="list-style-type: none"> More than one million common murres in largest colony of common murre in the western North Atlantic 	East of Fogo Island
Lawn Islands Archipelago Provisional Ecological Reserve	<ul style="list-style-type: none"> Seabirds, only breeding colony of Manx shearwater in North America 	3 islands off Lawn
Cape St. Mary’s Ecological Reserve	<ul style="list-style-type: none"> Many seabirds including the 2nd largest nesting colony of gannets in Newfoundland and 3rd largest in North America 	Cape St. Mary’s
Baccalieu Island Ecological Reserve	<ul style="list-style-type: none"> 11 seabird species breed on the island including over 300 million pairs of Leach’s Storm petrels (world’s largest) 	Off Bay de Verde
Witless Bay Ecological Reserve	<ul style="list-style-type: none"> Millions of seabirds including puffins 	4 small islands off Witless Bay
Source: NLT (2013b); NLDEC (2013a)		

4.3.5.8 Other Current or Traditional Uses of the Marine and Coastal Environments

In Canada, bird hunting is permitted under the *Migratory Birds Hunting Regulations*. Environment Canada provides annual hunting regulations, including season dates and bag limits, for each province and territory (CWS 2013). The particular species hunted in marine and inland areas differ by province, region and habitat type. Residents of Newfoundland and Labrador hunt various migratory bird species in marine and inland areas. These birds (including species of waterfowl and murres) have long been an important source of food in traditional diets.

The SEA Study Area is nearest to the Northeastern Coastal and Avalon – Burin Coastal Migratory Game Bird Hunting Zones, as well as Murre Hunting Zones 2, 3 and 4 (Figure 4.158, NLDEC 2013b). Table 4.145 summarizes the bag and possession limits for coastal areas in Eastern Newfoundland. There is no spring / summer bird hunting season and birds are hunted in fall and winter, from October to March (NLDEC 2013b; CWS 2013).

Table 4.145 Waterfowl and Murre Hunting (2013-2014)

Species	Management Areas	Spring / Summer Seasons	Fall / Winter Seasons	Bag and Possession Limits*
Waterfowl Ducks including Mergansers, Geese and Snipe	Northeastern Coastal / Avalon – Burin Coastal	No season	November 23, 2013 to February 28, 2014	Ducks (6 daily, 18 possession with other limitations) Mergansers (6 daily, 12 possession) Geese (5 daily, 10 possession) Snipe (10 daily, 20 possession)
Waterfowl Long-tailed Ducks, Eiders and Scoters			4 th Saturday in November to last day in February	6 daily, 12 possession
Murre (Turr)	Hunting Zone 2		October 6, 2013 to January 20, 2014	20 per hunter per day / 40 per hunter at any one time
	Hunting Zone 3	November 25, 2013 to March 10, 2014		
	Hunting Zone 4	November 3, 2013 to January 10, 2014 / February 2 to March 10, 2014		
Source: NLDEC (2013b), CWS (2013)				

Eastern Newfoundland residents and visitors also gather shellfish such as mussels in coastal areas, but specific and detailed information is not available on where, when and how much is harvested.

Figure 4.158 Eastern Newfoundland Waterfowl and Murre Hunting Areas

