

### 3.3 Marine Mammals and Sea Turtles (Including Species at Risk)

The waters off Eastern Newfoundland support a diverse assemblage of marine fauna, including more than 20 marine mammals and as many as five sea turtle species that have been reported in and near the Study Area. Many of these are considered to be at risk or of conservation concern.

#### 3.3.1 Existing Environment

This section provides an updated overview of marine mammal and sea turtles (including species at risk) that have potential to occur in the Project and Study Areas. Detailed life history and habitat information for these species, as well as information about key areas and times of year, can be found in the original EA Report (Section 4.2.3) and the Eastern Newfoundland SEA (Amec 2014). New data, as well as key information specific to the Project Area, is summarized in the following subsections.

Sightings data for marine mammals and sea turtles within the Study Area were obtained from the Ocean Biogeographic Information System (OBIS) in October 2017 from the following sources, some of which contained sightings from as early as the 1940s:

- Bureau of Land Management (BLM) Cetacean and Turtle Assessment Program (CETAP);
- Canadian Wildlife Service – Environment and Climate Change Canada (CWS-ECCC) Eastern Canada Seabirds at Sea (ECSAS) (opportunistic sightings);
- Programme Intégré de recherches sur les oiseaux pélagiques (PIROP) Northwest Atlantic 1965–1992 (opportunistic sightings);
- DFO Maritimes Region Cetacean Sightings;
- National Oceanic and Atmospheric Administration records;
- NOAA Northeast and Southeast Fisheries Science Center surveys;
- Visual sightings from Song of the Whale 1993-2013;
- Lamont-Doherty/LGL/NSF cruises;
- UK Royal Navy Marine Mammal Observations; and
- HMAP Dataset 04: World Whaling

In addition to the OBIS data, cetacean observations from the DFO Marine Mammals Sightings Database, which includes sightings from the late 1940s to 2013, were obtained from Dr. Jack Lawson of DFO.

Although useful and informative at a regional scale, there are several caveats associated with these datasets which must be noted. Because the data collection is not standardized across surveys, and the sightings effort is not quantified, the data cannot be used to estimate species abundance or density. A lack of sightings may reflect a deficiency of survey effort in a given area and cannot be interpreted as absence of a particular species; similarly, a cluster of sightings may reflect high survey effort rather than a large number of individuals in a particular area. As well, observers may have varying degrees of experience and expertise in marine mammal identification, and the data have not been completely error-checked 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. Also, 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. 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.

### 3.3.1.1 Mysticetes

Mysticetes (the baleen whales) are characterized by having plates of baleen, which filter food items from seawater, in place of teeth. Baleen whales are typically solitary or clustered in small groups; within groups, 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). Baleen whales may be found in coastal as well as offshore areas, typically foraging at depths of 100 m to 150 m.

Six species of baleen whales regularly occur in the waters off Eastern Newfoundland (Table 3.10). The bowhead whale (*Balaena mysticetus*), an Arctic species, has been observed off the coast of Newfoundland but is such sightings are considered extralimital. Sightings of mysticete species obtained from OBIS and the DFO Marine Mammals Sightings database are shown on Figure 3.6.

**Table 3.10 Mysticete Species Known or Likely to Occur in the Study Area**

Type	Species
<i>Balaenidae – Right Whales</i>	North Atlantic Right Whale ( <i>Eubalaena glacialis</i> )
<i>Balaenopteridae – Rorquals</i>	Common Minke Whale ( <i>Balaenoptera acutorostrata</i> )
	Sei Whale ( <i>Balaenoptera borealis</i> )
	Blue Whale ( <i>Balaenoptera musculus</i> )
	Fin Whale ( <i>Balaenoptera physalus</i> )
	Humpback Whale ( <i>Megaptera novaengliae</i> )

Blue whales and common minke whales may be found in the area throughout the year, while the other four species are absent in the winter months.

### 3.3.1.2 Odontocetes

The suborder Odontoceti includes toothed whales, dolphins and porpoises. Like baleen whales, odontocetes rely heavily on acoustic means of communication. Their auditory range is much greater than that of baleen whales, ranging 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 to navigate and to locate prey (Richardson et al 1995). Toothed whales vary in habitat preferences; belugas and harbour porpoises favour coastal/estuarine habitats, some dolphins may be found in both coastal areas and open ocean, and other dolphins as well as beaked whales and sperm whales are seldom observed close to shore. Typical foraging depths range from 20 m for belugas to 1,000 m for Sowerby's beaked whale and Risso's dolphin (Perrin et al 2002).

In the waters off Eastern Newfoundland, 14 species of odontocetes have been regularly observed (Table 3.11). The Atlantic spotted dolphin (*Stenella frontalis*) has been reported in the area, (OBIS 2017), but this species is generally found in tropical and subtropical waters and is considered very

unlikely to occur in the Study Area. Sightings of odontocetes obtained from OBIS and the DFO Marine Mammals Sightings database are shown on Figures 3.7 (dolphins and porpoises) and 3.8 (other odontocetes).

**Table 3.11 Odontocete Species Known or Likely to Occur in the Study Area**

Type	Species
<i>Delphinidae – Dolphins</i>	Short-beaked Common Dolphin ( <i>Delphinus delphis</i> )
	Long-finned Pilot Whale ( <i>Globicephala melas</i> )
	Risso's Dolphin ( <i>Grampus griseus</i> )
	Atlantic White-sided Dolphin ( <i>Lagenorhynchus acutus</i> )
	White-beaked Dolphin ( <i>Lagenorhynchus albirostris</i> )
	Killer Whale ( <i>Orcinus orca</i> )
	Striped Dolphin ( <i>Stenella coeruleoalba</i> )
	Common Bottlenose Dolphin ( <i>Tursiops truncatus</i> )
<i>Phocoenidae – Porpoises</i>	Harbour Porpoise ( <i>Phocoena phocoena</i> )
<i>Monodontidae – Belugas and Narwhals</i>	Beluga Whale ( <i>Delphinaptera leucas</i> )
<i>Ziphiidae – Beaked Whales</i>	Cuvier's Beaked Whale ( <i>Ziphius cavirostris</i> )
	Sowerby's Beaked Whale ( <i>Mesoplodon bidens</i> )
	Northern Bottlenose Whale ( <i>Hyperoodon ampullatus</i> )
<i>Physeteridae – Sperm Whales</i>	Sperm Whale ( <i>Physeter macrocephalus</i> )

Most of these species are thought to be present in offshore Northwest Atlantic waters year-round, but belugas are a rare winter visitor to the area, and common bottlenose dolphin and Risso's dolphin are only seen in the summer months (Amec 2014).

### 3.3.1.3 Pinnipeds

Pinnipeds, or seals, may be found in coastal environments (e.g. harbour seal and occasionally grey seal), but generally prefer open ocean habitats. Typical foraging depths range from less than 4 m for harbour seals (Perrin et al 2002), up to as high as 600 m for hooded seals (Kovacs 2008). Four seal species are known to occur regularly in the Study Area (Table 3.12). Two additional seal species, the bearded seal (*Erignathus barbatus*) and ringed seal (*Pusa hispida*), are typically Arctic dwellers but are known to occasionally occur in the area in the winter months. A single extralimital sighting of walrus (*Odobenus rosmarus*) has been reported off Eastern Canada (OBIS 2017). Sightings of pinniped species obtained from OBIS are shown in Figure 3.9.

**Table 3.12 Pinniped Species Known or Likely to Occur in the Study Area**

Type	Species
<i>Phocidae – Earless Seals</i>	Harp Seal ( <i>Pagophilus groenlandicus</i> )
	Harbour Seal ( <i>Phoca vitulina</i> )
	Hooded Seal ( <i>Cystophora cristata</i> )
	Grey Seal ( <i>Halichoerus grypus</i> )

Harp and hooded seals are most common in the Study Area from December to April, while harbour and grey seals may be present year-round. The populations of all four seal species regularly found in the Study Area are considered secure or even increasing (Hammill et al 2012).

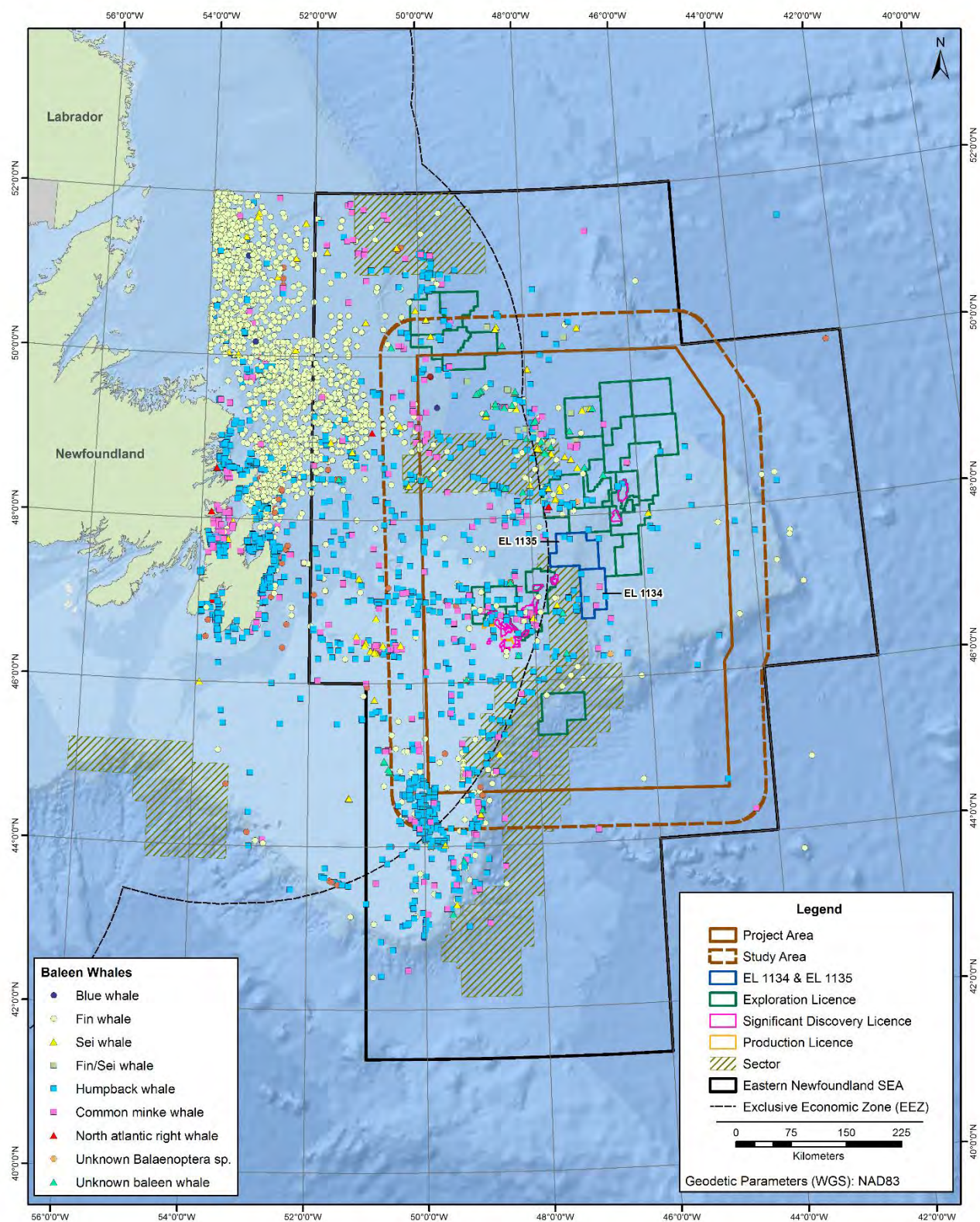
### 3.3.1.4 Sea Turtles

Sea turtles are rarely seen in coastal areas, preferring offshore habitats (COSEWIC 2010, 2012b). They spend much of their time at the ocean surface, and foraging depths are typically less than 100 m (Wyneken et al 2013). Five species of sea turtles have been reported in the waters of the Northwest Atlantic; however, of these, only the Leatherback Turtle and the Loggerhead Sea Turtle are regularly found in the Study Area (Table 3.13). Green Sea Turtle (*Chelonia mydas*), Hawksbill Sea Turtle (*Eretmochelys imbricata*) and Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) frequent tropical and subtropical waters, but have occasionally been found in the waters off Eastern Canada in the summer months. Sightings of sea turtle species obtained from OBIS are shown on Figure 3.10.

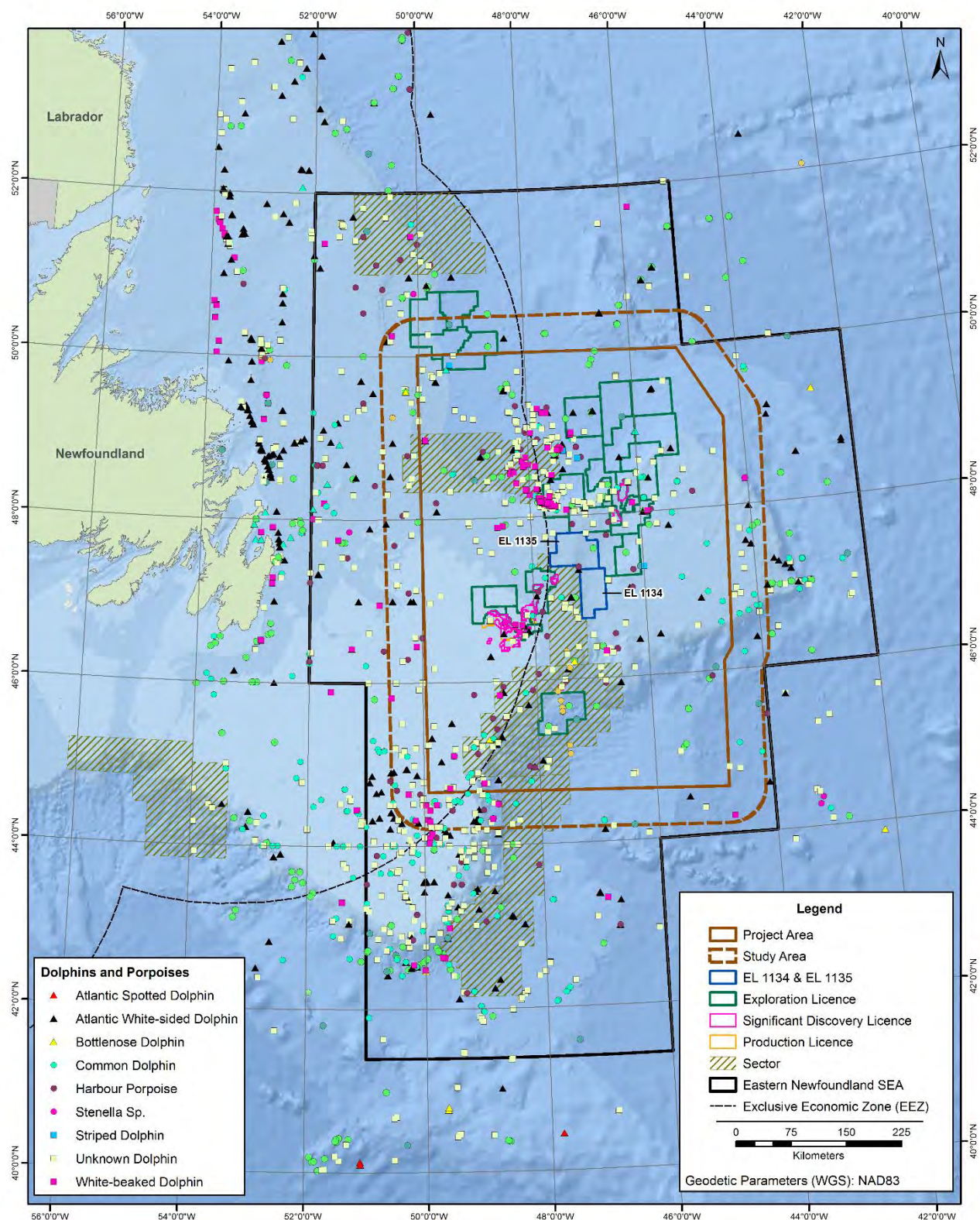
**Table 3.13 Overview of Sea Turtles that are Known or Likely to Occur in the Study Area**

Type	Species
<i>Dermochelyidae</i> – Leatherback Turtle	Leatherback ( <i>Dermochelys coriacea</i> )
<i>Cheloniidae</i> – Sea Turtles	Loggerhead Sea Turtle ( <i>Caretta caretta</i> )

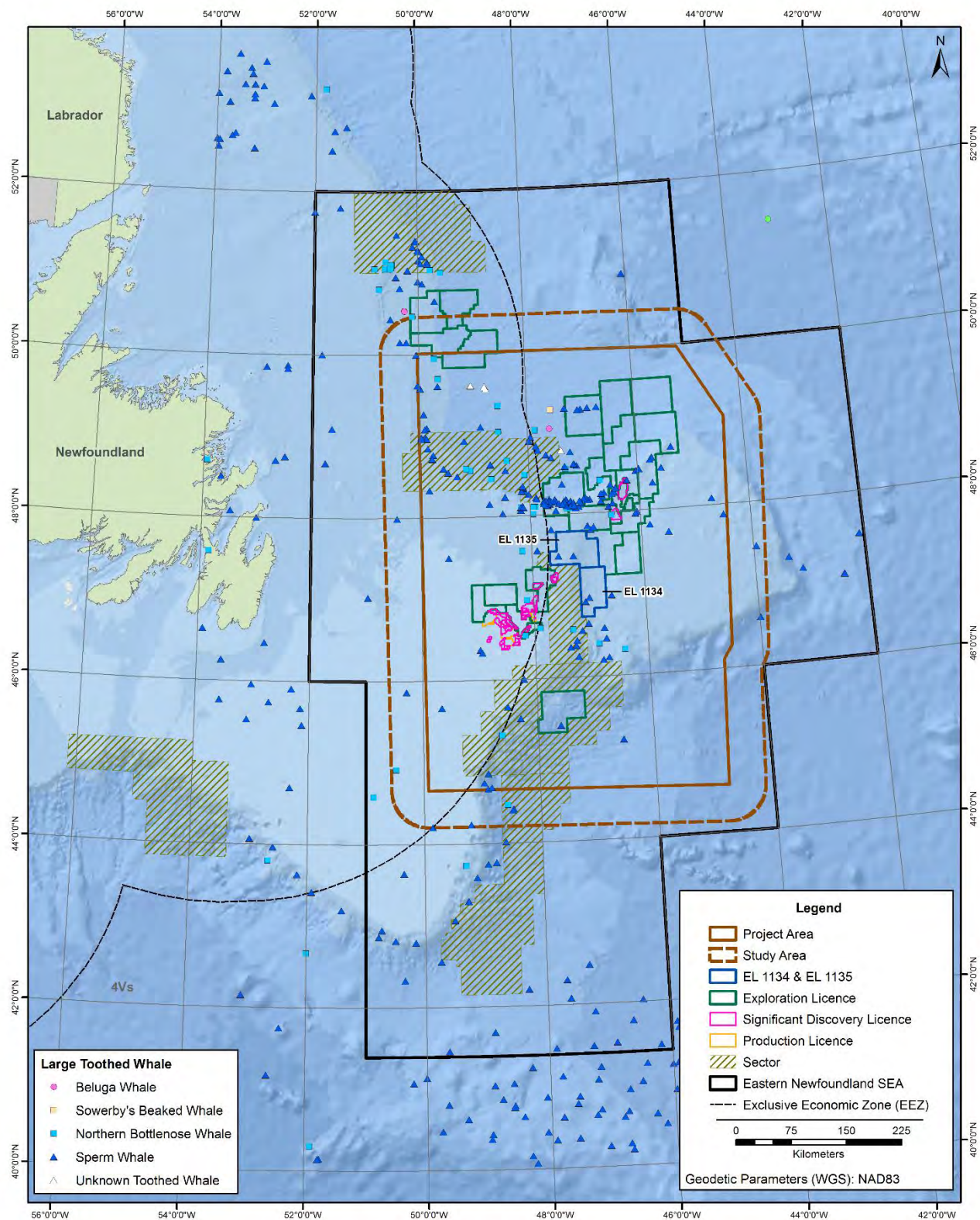
Leatherback and loggerhead sea turtles may be found in the Study Area from April to December, but are absent in the winter months.

**Figure 3.6 Baleen Whale Sightings off Eastern Newfoundland**

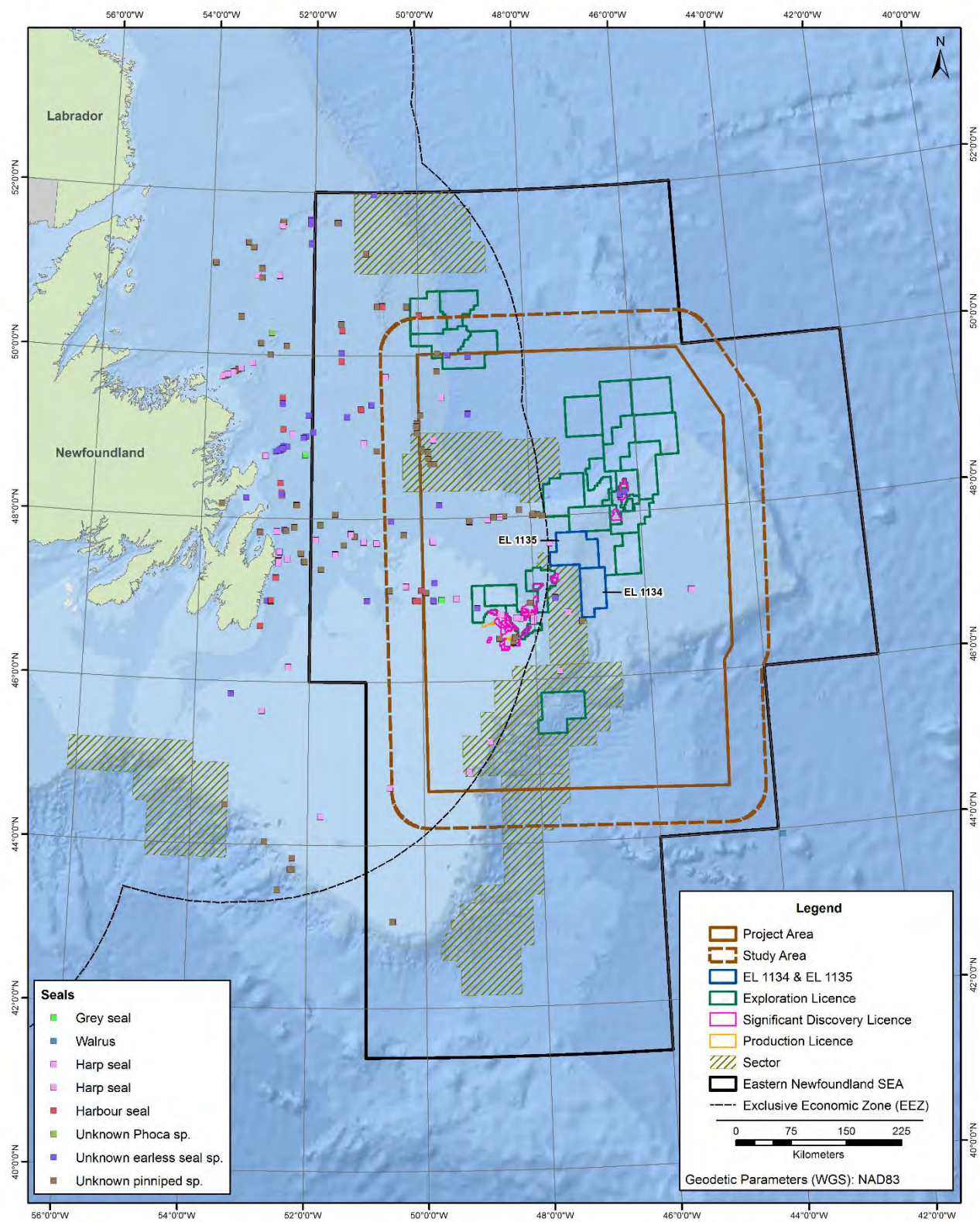


**Figure 3.7 Dolphin and Porpoise Sightings off Eastern Newfoundland**

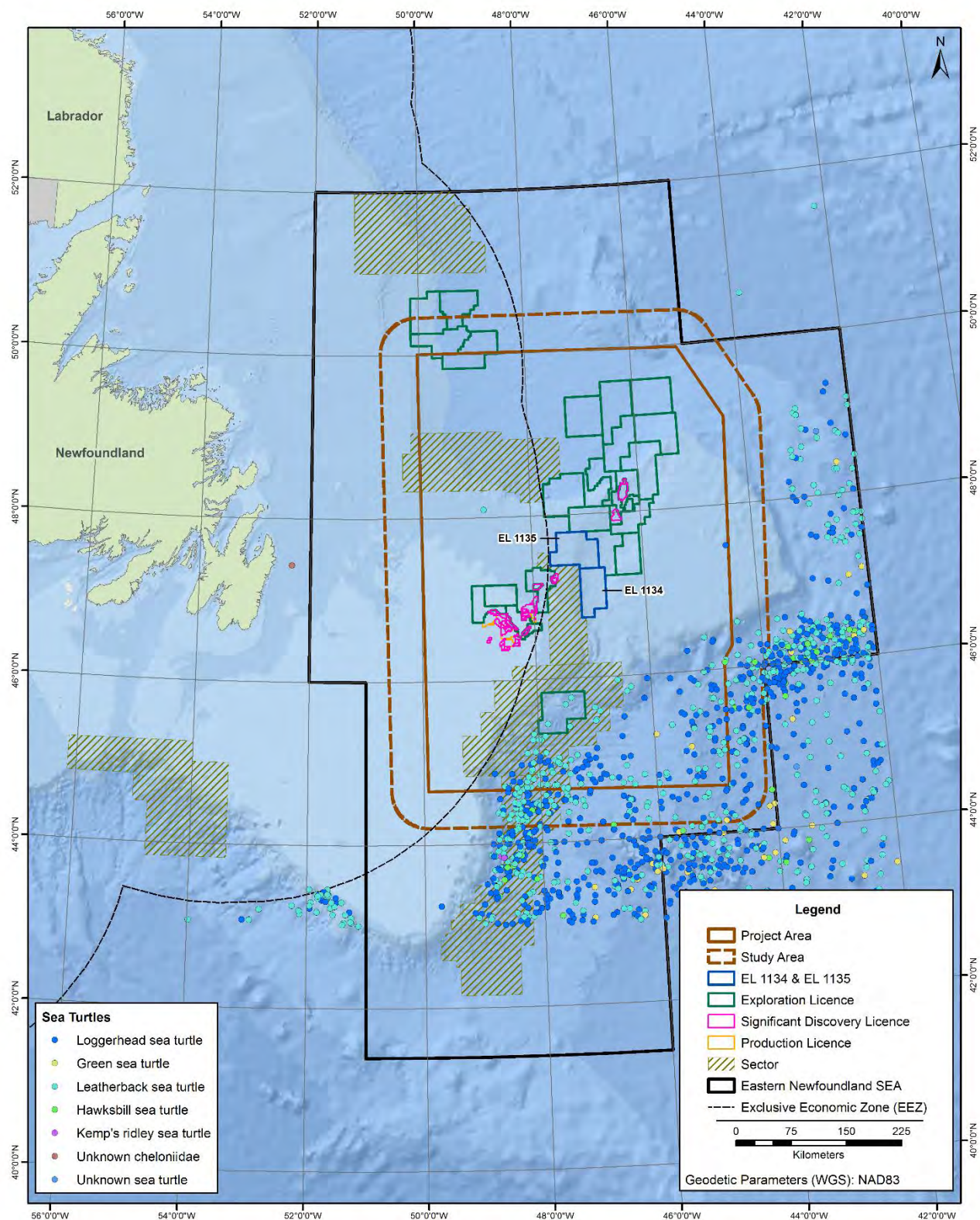


**Figure 3.8 Other Large Toothed Whale Sightings off Eastern Newfoundland**



**Figure 3.9 Pinniped Sightings off Eastern Newfoundland**



**Figure 3.10 Sea Turtle Sightings off Eastern Newfoundland**

### 3.3.1.5 Species at Risk

A number of marine mammal and sea turtle species at risk (protected under SARA) and species assessed by COSEWIC as being of conservation concern, occur in the waters offshore Eastern Newfoundland (Table 3.14). The provincial *NL ESA* does not list any marine mammals or sea turtles. Since the original EA Report was completed and submitted there have been changes in species designations for several species, as follows (see shaded rows in Table 3.14):

**Table 3.14 Marine Mammal and Sea Turtle Species at Risk and their Likelihood of Occurrence in the Study Area**

Species	Federal Status		Habitat and Distribution	Potential Presence in Study Area
	SARA Schedule 1 Listing	COSEWIC Assessment		
Blue Whale (Atlantic Population)	Endangered	Endangered	<ul style="list-style-type: none"> <li>Found in coastal and pelagic waters, frequently at shelf edge where food production is high (Schoenherr 1991).</li> <li>Present in all oceans except the Arctic (Reilly et al 2008).</li> <li>Critical habitat in the estuary and Gulf of St. Lawrence is currently being identified for the species (DFO 2016a).</li> </ul>	Present in small numbers throughout the year; most common in the winter and early spring.
Fin Whale (Atlantic population)	Special Concern	Special Concern	<ul style="list-style-type: none"> <li>Coastal shelf edge and offshore (COSEWIC 2005).</li> <li>World-wide distribution; most abundant at temperate and polar latitudes (Reeves et al 2002).</li> <li>Typically found in areas with high prey concentration (e.g., the Grand Banks) in the summer months.</li> </ul>	Present year-round, most common in the summer months.
North Atlantic Right Whale	Endangered	Endangered	<ul style="list-style-type: none"> <li>Prefers waters 100 – 200 m deep with surface temperatures between 8 and 15°C (Kenney 2001).</li> <li>Distribution related to presence and abundance of prey species.</li> <li>Aggregate in five seasonal habitat areas along the east coast of North America, including two designated critical habitat areas in Canada: the lower Bay of Fundy and Roseway Basin on the Scotian Shelf (Brown et al 2009).</li> </ul>	Uncommon in Study Area; most likely to be present in the summer months.
Northern Bottlenose Whale (Davis Strait-Baffin Bay-Labrador Sea population;	none (Davis Strait-Baffin Bay-Labrador Sea population)	Special Concern (Davis Strait-Baffin Bay-Labrador	<ul style="list-style-type: none"> <li>Deep-diving species found in waters 800 - 1500 m deep.</li> <li>In western North Atlantic, occur from Baffin Island to New England (Taylor et al 2008a).</li> </ul>	Potentially present in small numbers in the area year round; most sightings have been in the

Species	Federal Status		Habitat and Distribution	Potential Presence in Study Area
	SARA Schedule 1 Listing	COSEWIC Assessment		
Scotian Shelf population)	Endangered (Scotian Shelf population)	Sea population) Endangered (Scotian Shelf population)	<ul style="list-style-type: none"> <li>It is unclear to which population individuals observed in the Study Area belong; however, a recent observation of 50 individuals in the Sackville Spur area suggest there may be potentially a previously unknown population (CBC 2016).</li> <li>Davis Strait population seemingly tends to migrate north to south, although patterns are not consistent (Reeves et al 1993), whereas Scotian Shelf population is apparently non-migratory.</li> <li>Three marine canyons, all along the Scotian Shelf, have been identified as critical habitat for the Scotian Shelf population (DFO 2010).</li> </ul>	spring and summer.
Sowerby's Beaked Whale	Special Concern	Special Concern	<ul style="list-style-type: none"> <li>Deep-diving species found at continental edges and slopes in depths of 550 - 1500 m or more.</li> <li>Seasonal movements unknown.</li> <li>Found in cold North Atlantic waters, from Massachusetts to Labrador (Taylor et al 2008b).</li> </ul>	May be present year round in deep water habitats.
Beluga Whale (St. Lawrence Estuary population)	Endangered	Endangered	<ul style="list-style-type: none"> <li>Coastal species (ACS 2006).</li> <li>Concentrated near the outlet of the Saguenay River in summer; in the winter months, they disperse from estuarine habitats, regularly occurring as far downstream as the western end of Anticosti Island (COSEWIC 2014).</li> <li>Critical habitat has been identified in the St. Lawrence Estuary and lower reaches of the Saguenay River (DFO 2012a).</li> </ul>	Very rare in the Study Area; seldom range far from the St. Lawrence estuary.
Killer Whale (Northwest Atlantic / Eastern Arctic population)	none	Special Concern	<ul style="list-style-type: none"> <li>Nearshore and pelagic environments.</li> <li>Cosmopolitan distribution, concentrated in areas of high productivity (Forney and Wade 2006).</li> </ul>	Likely present; small numbers have been observed in the area at all times of year.
Harbour Porpoise	none	Special Concern	<ul style="list-style-type: none"> <li>Coastal shelf, bays and estuaries, but occasionally offshore (Hammond et al 2008).</li> </ul>	Fairly common in the Study Area, possibly present year round.



Species	Federal Status		Habitat and Distribution	Potential Presence in Study Area
	SARA Schedule 1 Listing	COSEWIC Assessment		
			<ul style="list-style-type: none"> <li>Found in cold waters throughout the northern hemisphere (Hammond et al 2008).</li> <li>Seasonal movements poorly known.</li> </ul>	
Atlantic Walrus (Central - Low Arctic population)	none	Special Concern	<ul style="list-style-type: none"> <li>Require shallow open areas with substrate supporting a productive bivalve community, and suitable ice or land nearby upon which to haul out (COSEWIC 2017a).</li> <li>Nova Scotia-Newfoundland-Gulf of St. Lawrence population extinct; species is now restricted to Arctic to sub-Arctic regions.</li> </ul>	Extremely unlikely. Single extralimital report in Study Area (OBIS 2017).
Leatherback Sea Turtle (Atlantic population)	Endangered	Endangered	<ul style="list-style-type: none"> <li>Typically in coastal shelf waters with depths of less than 200 m.</li> <li>Ranges from tropical to sub-polar regions (COSEWIC 2012), and undertakes extensive migrations between feeding areas and to tropical nesting areas (Wallace et al 2013).</li> <li>To date, critical habitat has not been identified; however, DFO (2012b) observed three high-use feeding areas in Canadian waters, none within the Study Area.</li> </ul>	Likely present in small numbers in the Study Area from April to December.
Loggerhead Sea Turtle	Endangered	Endangered	<ul style="list-style-type: none"> <li>Found in oceanic and near-shore zones of temperate and tropical Atlantic, Pacific and Indian Oceans, and nest on beaches in subtropical and tropical climates (COSEWIC 2010).</li> <li>In Atlantic Canada, most abundant in spring to fall, and generally associated with the Gulf Stream.</li> </ul>	Potentially present in small numbers in the spring and summer months.

While not assessed by COSEWIC, the Kemp's Ridley, Green and Hawksbill sea turtle are all considered to be of conservation concern by the IUCN (IUCN 2017). All three of these sea turtle species are unlikely to be present in the Study Area, as they are associated with tropical and sub-tropical areas; however, vagrants may occur in the summer months.

Critical habitat has been identified in the federal recovery strategies for the beluga (St. Lawrence Estuary population), northern bottlenose whale (Scotian Shelf population) and the North Atlantic right whale. The North Atlantic right whale's critical habitat is located in the Grand Manan Basin within the Bay of Fundy, and off southern Nova Scotia at Roseway Basin (DFO 2014). Critical habitat for the

beluga (St. Lawrence Estuary population) is restricted to the St. Lawrence estuary (DFO 2012a), and critical habitat for the northern bottlenose whale (Scotian Shelf population) is located in three deep underwater canyons off the southern coast of Nova Scotia, along the Scotian Shelf (DFO 2010). Researchers discovered at least 50 northern bottlenose whales in the Sackville Spur area in 2016; this significant find (in size, numbering 30 percent or more of the entire Scotian Shelf population) is thought to represent a previously undiscovered population of the species (Northern Bottlenose Whale Project 2018). Recovery strategies identifying critical habitat are not currently available for the other species at risk reported in the Study Area. A study intended to aid in the identification and delineation of critical habitat for the blue whale is underway; recent studies have identified important feeding grounds in the estuary and Gulf of St. Lawrence, and these that will be used to inform the identification of critical habitat areas (Beauchamp et al 2009; DFO 2016a).

DFO (2012b) observed three high-use feeding areas of the leatherback turtle: 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. Information from the DFO tracking study is being used to inform the identification of critical habitat in a forthcoming amendment to the species' Recovery Strategy (DFO 2013a).

### **3.3.1.6 Key Times for Marine Mammals and Sea Turtles in the Study Area**

Baleen whales are present in the area throughout the year, but are most abundant in the summer months; most species are migratory and absent from the Study Area in winter, but common minke whale and blue whale may occur in the area year-round. Most toothed whales are thought to be year-round residents of the Study Area, with the exception of Risso's and common bottlenose dolphins, which are found only in the summer months, and beluga, which is only observed in the winter months. Pinnipeds are most abundant in the winter months, although grey and harbour seals may be present year-round. Sea turtles are most abundant in the area during the summer months, when the Grand Banks and surrounding waters provide important feeding habitat, and they are absent from the area between December and April.

### **3.3.2 Environmental Effects Assessment**

As illustrated previously in Section 2.2, the 2018 survey activities that will be undertaken as part of the Project are in keeping with the nature and scope of those described and assessed in the original EA., and will occur within the previously defined and considered Project Area and surrounding EA Study Area.

The 2015 EA Report (Section 4.2.3) summarized the distribution and abundance of marine mammals and sea turtles (including species at risk) in the overall Study Area, and describes these species' relevant life history characteristics, with updated baseline information being provided in the preceding section. The updated marine mammal and sea turtles presence and distribution information summarized above indicates that although a number of species have been observed to occur in this particular part of the Study Area (in and around ELs 1134 and 1135) at least seasonally, the planned 2018 survey area is again not known or likely to be used by new or different species (including those at risk) or contain particularly important or sensitive habitats that were not considered and addressed in

the original EA, nor to increase the potential for or degree of any such environmental interactions and effects. All of the mitigation measures and commitments outlined in the EA Report remain applicable and will continue to be implemented and adhered to by ExxonMobil in planning and implementing this Project.

The nature and scale of the planned 2018 activities and the updated baseline information provided above therefore do not change the results of the original (2015) environmental effects assessment for this VEC, and the Project is still not likely to result in significant adverse environmental effects on marine mammals and sea turtles.

### **3.4 Protected and Sensitive Areas**

A number of marine and coastal areas in Newfoundland and Labrador have been designated as protected under provincial, federal and/or other legislation or agreements due to their ecological, historical or socio-cultural characteristics and importance. Other areas have been formally identified as being special or sensitive through other relevant processes and initiatives.

#### **3.4.1 Existing Environment**

Protected and sensitive areas within or near the Study Area were described and mapped in Section 4.2.4 of the original EA Report, with additional details provided in the Eastern Newfoundland SEA (Amec 2014). Where overall information on the nature and definition of various types of areas, and the processes for their identification and designation was provided in the original EA Report and the SEA, it is not repeated in this section.

This current section focuses on providing an update on protected and sensitive areas in and around the Project Area and Study Area, as well as in other adjacent marine (offshore and coastal) areas of Eastern Newfoundland, to provide context and to illustrate the general proximity of the Project to these areas in the larger surrounding environment.

##### **3.4.1.1 Canadian (Federally) Identified and Designated Areas**

A number of processes are used to identify and potentially protect marine and coastal ecosystems in Canada, as illustrated in the sections that follow. These protective measures are led by various federal government departments and agencies including DFO, Parks Canada and Environment and Climate Change Canada.

#### **Ecologically and Biologically Significant Areas**

A number of ecologically and biologically significant areas (EBSAs) have been identified in marine areas of Eastern Newfoundland. In 2007, DFO identified 11 EBSAs within the Placentia Bay/ Grand Banks (PB/GB) Large Ocean Management Area (LOMA) using a ranking process based on criteria for fitness consequence, aggregations, uniqueness, naturalness and resilience (Templeman 2007). The 2007 PB/GB LOMA EBSAs are discussed in the original EA Report and the Eastern Newfoundland SEA. Using a refined process, DFO identified 15 additional EBSAs in the Newfoundland and Labrador Shelves Bioregion north of the PB/GB LOMA in 2013 (DFO 2013b).



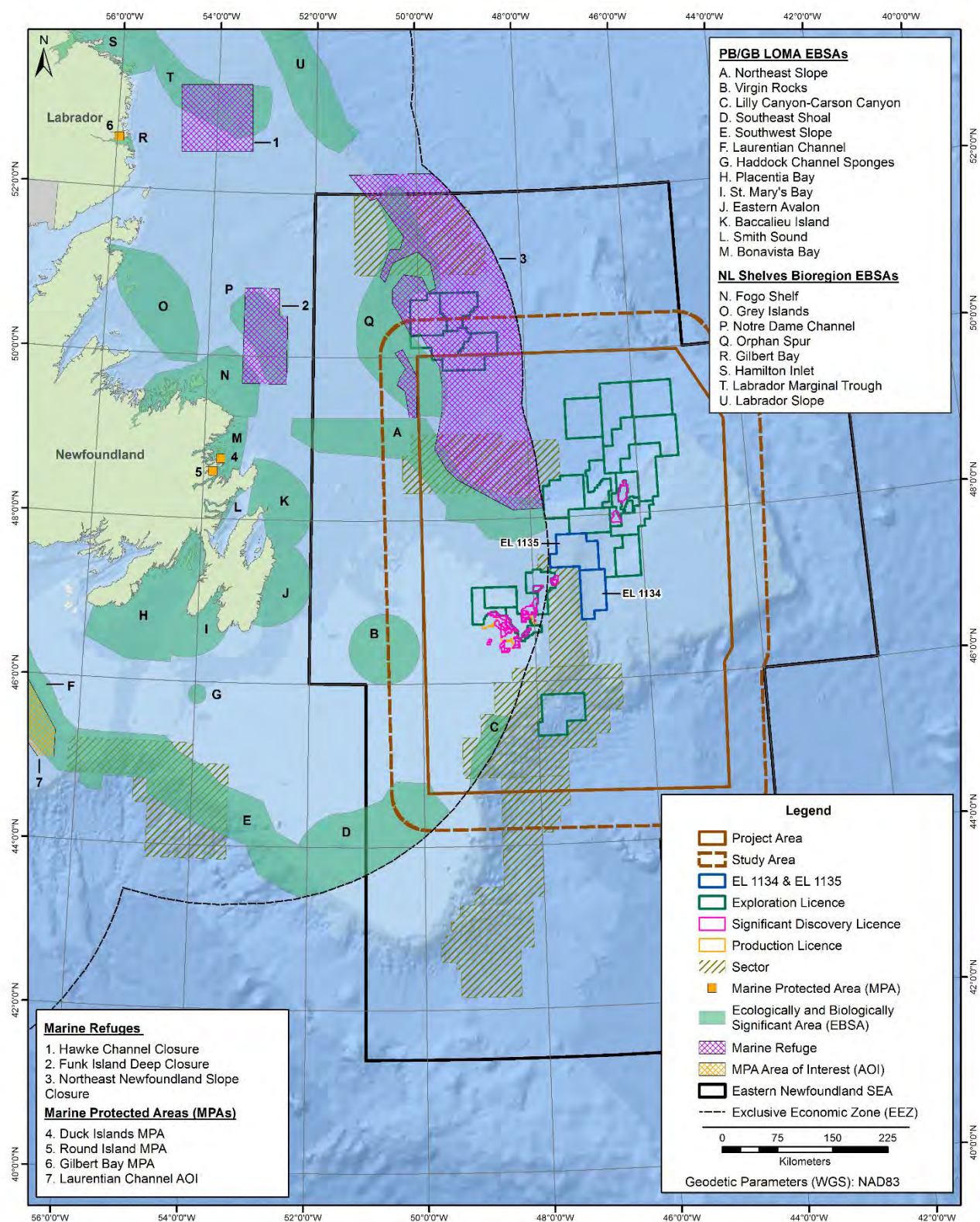
Subsequent to the 2015 EA Report, DFO has undertaken a process to re-evaluate the PB/GB LOMA EBSAs to align with the rest of the Newfoundland and Labrador Shelves Bioregion EBSAs. The 2017 revised PB/GB LOMA EBSA areas have not yet been released publicly (N. Wells pers comm 2018).

Based on the draft information available, the existing PB/GB LOMA EBSAs have generally increased in area, five new EBSAs have been delineated, two areas are no longer listed as EBSAs and the total combined EBSA area has been increased by 26 percent (Table 3.15). Figure 3.11 shows the draft revised boundaries and new EBSAs in the PB/GB LOMA, along with other NL Shelves Bioregion EBSAs in Eastern Newfoundland. Portions of the PB/GB LOMA EBSAs that extended beyond the Canadian EEZ into the NAFO regulatory area are no longer considered to be within EBSA boundaries (although they may still be identified and/or protected through international processes). The Southeast Shoal EBSA has been reduced in area as a large portion was outside of the EEZ prior to the refinement exercise. Portions of the Northeast Slope and the Lilly Canyon-Carson Canyon EBSAs, beyond the EEZ, are now also considered to be outside of the EBSA boundaries although the overall areas of these EBSAs have been increased within the EEZ. Descriptive information is not yet available for the newly identified EBSAs: Haddock Channel Sponges, St. Mary's Bay, Bonavista Bay, Baccalieu Island and South Coast, the latter of which is off southwest Newfoundland well outside the Study Area.

**Table 3.15 Refined PB/GB LOMA EBSAs in Eastern Newfoundland**

EBSA	Approximate Delineated Area	
	2007	2017
Northeast Slope	13,885 km <sup>2</sup>	19,731 km <sup>2</sup>
Virgin Rocks	6,843 km <sup>2</sup>	7,294 km <sup>2</sup>
Lilly Canyon-Carson Canyon	1,145 km <sup>2</sup>	2,180 km <sup>2</sup>
Southeast Shoal	30,935 km <sup>2</sup>	15,402 km <sup>2</sup>
Eastern Avalon	1,683 km <sup>2</sup>	5,948 km <sup>2</sup>
Southwest Slope	16,644 km <sup>2</sup>	25,181 km <sup>2</sup>
Smith Sound	148 km <sup>2</sup>	547 km <sup>2</sup>
Placentia Bay	7,693 km <sup>2</sup>	13,539 km <sup>2</sup>
Laurentian Channel	17,140 km <sup>2</sup>	19,545 km <sup>2</sup>
Haddock Channel Sponges	n/a	490 km <sup>2</sup>
South Coast	n/a	6,876 km <sup>2</sup>
St. Mary's Bay	n/a	3,989 km <sup>2</sup>
Bonavista Bay	n/a	3,141 km <sup>2</sup>
Baccalieu Island	n/a	6,922 km <sup>2</sup>
Source: Templeman (2007); Amec (2014); DFO (2016b); N Wells pers comm (2018)		

As a result of the above described EBSA changes, the Project Area and Study Area intersect with the revised boundaries of PB/GB LOMA EBSAs: Northeast Slope, Virgin Rocks, Lilly Canyon-Carson Canyon and Southeast Shoal. As EBSAs no longer extend beyond the EEZ, none intersect with EL 1134 and EL 1135. Note that the overall Project Area and Study Area overlap with the Orphan Spur EBSA, which is not within the PB/GB LOMA and has not changed since the 2015 EA Report.

**Figure 3.11 EBSAs, MPAs / AOIs and Marine Refuges off Eastern Newfoundland**

## Marine Protected Areas and Areas of Interest

Marine Protected Areas and associated Areas of Interest (AOIs) are discussed in the original EA Report and in the Eastern Newfoundland SEA (Amec 2014).

The Laurentian Channel AOI is located off the south coast of Newfoundland (Table 3.16). This area is a deep submarine valley of approximately 35,840 km<sup>2</sup> in area and more than 1,200 km in length that stretches from the intersection of the St. Lawrence and Saguenay Rivers to the edge of the continental shelf off southern Newfoundland (Figure 3.11). In 2017, the Government of Canada published draft regulations for the proposed Laurentian Channel MPA for public comment (DFO 2017a). The results of this consultation have not yet been released.

**Table 3.16 Laurentian Channel AOI (Proposed MPA)**

AOI	Area
Laurentian Channel AOI	11,619 km <sup>2</sup>
Source: DFO (2017a)	

## Marine Refuges

In December 2017, DFO designated seven Marine Refuges off the coast of Nunavut and Newfoundland and Labrador to protect portions of sensitive and productive habitat (DFO 2018). Three of these Marine Refuges are located off Eastern Newfoundland (Table 3.17 and Figure 3.11).

**Table 3.17 Marine Refuges off Eastern Newfoundland**

Marine Refuge	Rationale for Identification/Designation	Area
Northeast Newfoundland Slope Closure (formerly known as Tobin's Point)	Dense aggregations of large, structure-forming cold-water corals provide niche space for other organisms. Prohibitions for all bottom contact fishing activities.	46,833 km <sup>2</sup>
Hawke Channel Closure	The Hawke Channel seafloor is an important habitat for groundfish including Greenland halibut. The Refuge also protects habitat of depleted species such as Atlantic wolffish. Bottom trawl, gillnet and longline fishing activities are prohibited.	8,837 km <sup>2</sup>
Funk Island Deep Closure	Conserves seafloor habitat important to Atlantic cod. Bottom trawl, gillnet and longline fishing activities are prohibited.	7,274 km <sup>2</sup>
Source: DFO (2018)		

The Project Area and Study Area intersect with the Northeast Newfoundland Slope Closure Marine Refuge. As the Marine Refuges are located within the EEZ, they do not overlap with exploration licences including EL 1134 and EL 1135.

## Federal Fisheries Closure Areas within Canada's Exclusive Economic Zone (EEZ)

Within the Canadian EEZ, a number of marine areas off Eastern Newfoundland have been closed to particular types of fishing activities through various means including voluntary closures, co-management approaches, licencing restrictions and/or under the *Fisheries Act* to protect and conserve productive fish and shellfish habitat for commercially important species (Figure 3.12). Fisheries closures off Eastern Newfoundland include areas closed to fishing activities to protect sensitive and productive



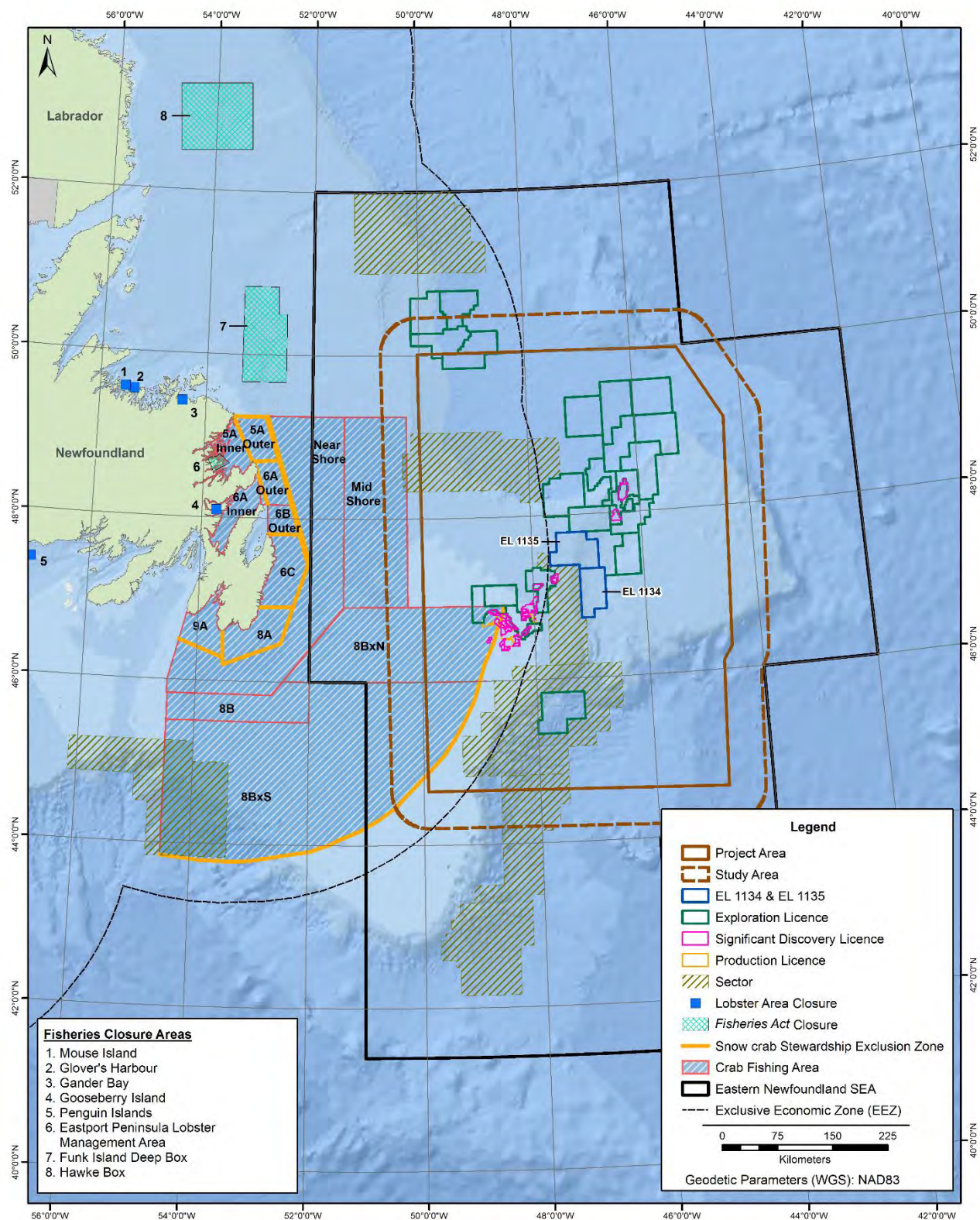
habitat for cod, crab and lobster (Table 3.18) (DFO 2007, 2015, 2017b; EMPAAC 2013). Most of these closures are located in inshore to mid shore areas.

Fisheries closures include several portions of NAFO 3LNO that have been closed to snow crab fishing (Figure 3.12). These Stewardship Exclusion Zones are 0.5 or 1.0 nautical mile (NM) wide corridors along the length of various crab fishing area boundaries to delineate fishing areas and provide a refuge area for snow crab (DFO 2015).

**Table 3.18 Federal Fisheries Closure Areas in Eastern Newfoundland**

Closure Area	Rationale for Identification/Designation
Funk Island Deep Box	7,272 km <sup>2</sup> area closed though the <i>Fisheries Act</i> to protect bottom habitat. Also designated as Funk Island Deep Closure Marine Refuge
Eastport Peninsula Lobster Management Area	400 km <sup>2</sup> area closed under the <i>Fisheries Act</i> , to protect prime lobster habitat. Two portions of the area are MPAs under the <i>Oceans Act</i> .
Hawke Box	8,837 km <sup>2</sup> area closed under the <i>Fisheries Act</i> to sustain habitat for crab and cod. Also designated as the Hawke Channel Closure Marine Refuge.
Mouse Island	Lobster fishing has been prohibited in 7 areas (totaling 94 km <sup>2</sup> ) around coastal Newfoundland to protect lobster spawning habitat and increase egg production. Five of these Lobster Area Closures are located in Eastern Newfoundland.
Glover's Harbour	
Gander Bay	
Gooseberry Island	
Penguin Islands	
Crab Fishing Area 5A (2 Exclusion Zones)	Snow crab fishing is currently not authorized in various Stewardship Exclusion Zones including portions of Bonavista Bay, Trinity Bay, Conception Bay, the Eastern Avalon and St. Mary's Bay as well as in mid shore fishing areas.
Crab Fishing Area 6A (2 Exclusion Zones)	
Crab Fishing Area 6B	
Crab Fishing Area 6C	
Crab Fishing Area 8A	
Crab Fishing Area 9A	
Crab Fishing Area – 8BX	
Near Shore	
Source: DFO (2007, 2015, 2017b); EMPAAC (2013)	

The Project Area and Study Area intersect with the Stewardship Exclusion Zone along the boundary of 8BX. As the closed areas are within the EEZ, none overlap with exploration licences including EL 1134 and EL 1135.

**Figure 3.12 Federal Fisheries Closure Areas in Eastern Newfoundland**

### 3.4.1.2 Internationally Identified Areas

In addition to areas identified and designated under applicable Canadian (federal and/or provincial) legislation and processes, various areas have also been identified under international jurisdictions and processes. In addition, some coastal and inland areas of Eastern Newfoundland have been identified as globally, continentally or nationally significant.

#### UN Convention on Biological Diversity EBSAs

In 1992 Canada ratified the United Nations Convention on Biological Diversity, which came into force in December 1993. The Convention is an important step towards conservation of global biodiversity. Identified EBSAs include ocean habitat areas off eastern Newfoundland and Labrador (Table 3.19, Figure 3.13).

**Table 3.19 Convention on Biological Diversity EBSAs**

<b>EBSA</b>	<b>Rationale for Identification/Designation</b>	<b>Area</b>
Labrador Sea Deep Convection Area	The only North-West Atlantic site where winter convection exchanges surface and deep ocean waters. Provides mid-water overwintering refuge for pre-adult <i>Calanus finmarchicus</i> , a key species for zooplankton populations of the Labrador Shelf and downstream areas. Annual variability in convection results in significant yearly change through ecosystems of the North-West Atlantic.	Not a fixed geographic area but delineated annually by physical oceanographic properties
Seabird Foraging Zone in the Southern Labrador Sea	Supports globally significant populations of marine vertebrates, including an estimated 40 million seabirds annually. Important foraging habitat for seabirds, including 20 populations of over-wintering black-legged kittiwakes ( <i>Rissa tridactyla</i> ), thick-billed murre ( <i>Uria lombia</i> ) and breeding Leach's storm-petrels ( <i>Oceanodroma leucorhoa</i> ). Encompasses the pelagic zone of the Orphan Basin, continental shelf, slope and offshore waters inside and outside the Canadian EEZ.	152,841 km <sup>2</sup>
Orphan Knoll	Seamounts typically support endemic populations and unique faunal assemblages. This seamount is an island of hard substratum with uniquely complex habitats that rise from the seafloor of the surrounding deep, soft sediments of the Orphan Basin. Although close to the adjacent continental slopes, Orphan Knoll is much deeper and appears to have distinctive fauna. Fragile and long-lived	12,742 km <sup>2</sup>



<b>EBSA</b>	<b>Rationale for Identification/Designation</b>	<b>Area</b>
	corals and sponges have been observed and a Taylor Cone circulation provides a mechanism for retention of larvae.	
Slopes of the Flemish Cap and Grand Bank	Contains most of the aggregations of indicator species for VMEs in the NAFO Regulatory Area. Includes NAFO closures to protect corals and sponges and a component of Greenland halibut fishery grounds in international waters. A high diversity of marine taxa, including threatened and listed species, are found within the EBSA.	87,817 km <sup>2</sup>
Source: UNCBD (2017)		

The Project Area and Study Area intersect with three EBSAs: Seabird Foraging Zone in the Southern Labrador Sea, Orphan Knoll and Slopes of the Flemish Cap and Grand Bank. The Slopes of the Flemish Cap and Grand Bank EBSA overlaps with EL 1134 and EL 1135.

### Vulnerable Marine Ecosystems

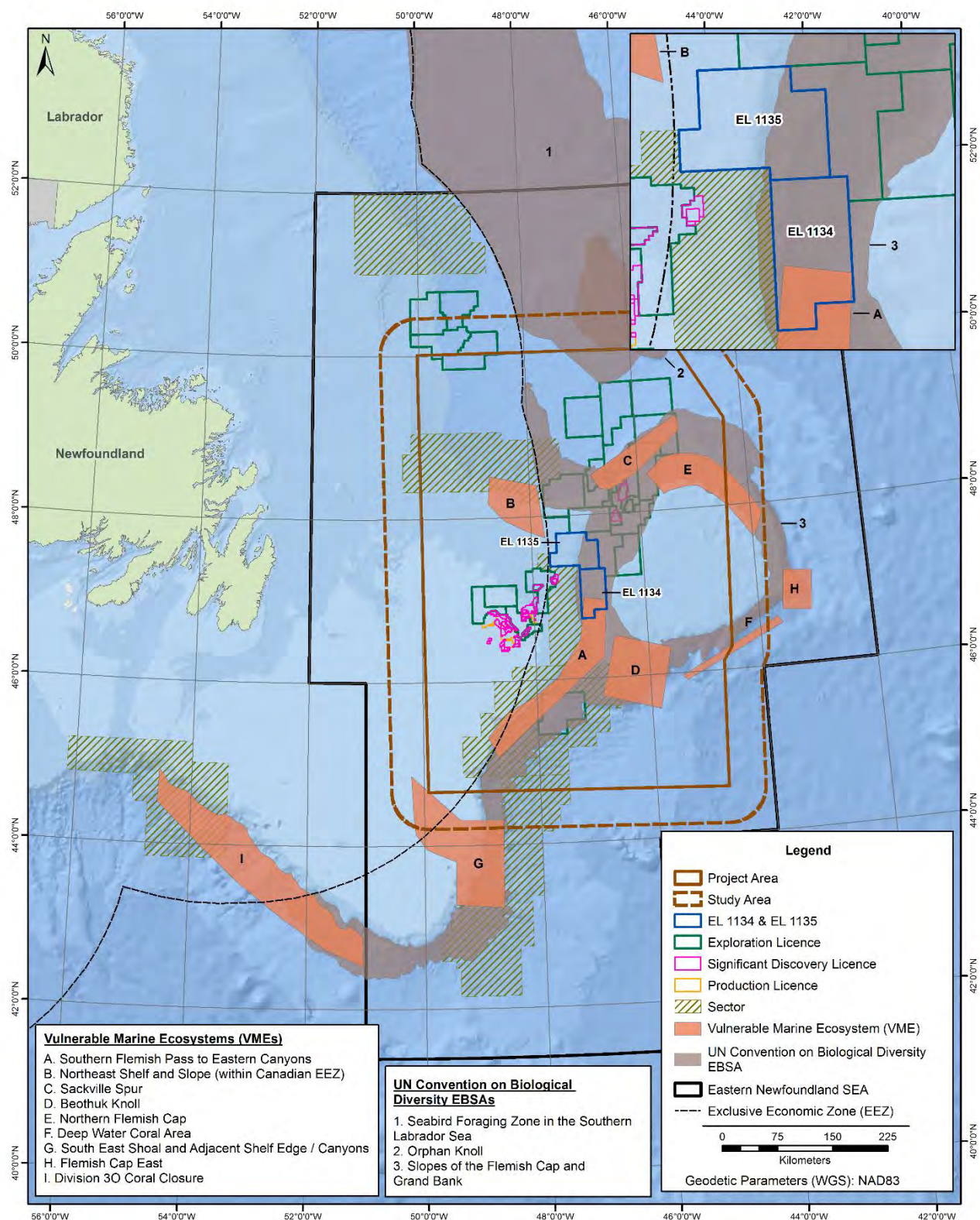
Nine Vulnerable Marine Ecosystems (VMEs) containing VME indicator species and features have been identified within NAFO regulatory footprint area off Eastern Newfoundland (WG-EAFM 2008; WWF 2012; FAO 2016). These are summarized in Table 3.20 and illustrated in Figure 3.13.

**Table 3.20 VMEs off Eastern Newfoundland**

<b>VME</b>	<b>Approximate Area</b>
Southern Flemish Pass to Eastern Canyons	7,928 km <sup>2</sup>
Northeast Shelf and Slope (within Canadian EEZ)	4,150 km <sup>2</sup>
Sackville Spur	3,961 km <sup>2</sup>
Beothuk Knoll	6,685 km <sup>2</sup>
Northern Flemish Cap	6,650 km <sup>2</sup>
Deep Water Coral Area	1,502 km <sup>2</sup>
South East Shoal and Adjacent Shelf Edge/Canyons	11,930 km <sup>2</sup>
Flemish Cap East	2,098 km <sup>2</sup>
Division 30 Coral Closure Area	16,877 km <sup>2</sup>
Source: WG-EAFM (2008)	

The Project Area and Study Area intersect with Southern Flemish Pass to Eastern Canyons, Northeast Shelf and Slope (within Canadian EEZ), Sackville Spur, Beothuk Knoll, Northern Flemish Cap, Deep Water Coral Area and South East Shoal and Adjacent Shelf Edge/Canyons VMEs. The Southern Flemish Pass to Eastern Canyons VME overlaps with EL 1134.

**Figure 3.13 Convention on Biological Diversity EBSAs and Vulnerable Marine Ecosystems off Eastern Newfoundland**



## NAFO Fisheries Closure Areas

Approximately 380,511 km<sup>2</sup> (15 percent) of the NAFO Regulatory Area is closed to bottom fishing (NAFO 2017) (Figure 3.14). This includes areas closed to protect corals, sponges and VME features such as seamounts. NAFO FCAs are discussed in the original EA Report (Section 4.2.4) and the Eastern Newfoundland SEA (Amec 2014). Subsequently, the Eastern Flemish Cap (14) NAFO FCA was closed to bottom fishing in 2017 (Table 3.21). This new FCA overlaps with the Project Area and Study Area but does not intersect with EL 1134 or EL 1135. Note that 13 other previously described NAFO FCAs (surrounding the Flemish Cap) overlap with the Project Area and Study Area and the Flemish Pass / Eastern Canyon (2) FCA, which was discussed in the original EA Report and Eastern Newfoundland SEA, intersects with EL 1134.

**Table 3.21 Eastern Flemish Cap (14) NAFO Fisheries Closure Area**

Closure Area	Area
Eastern Flemish Cap (14)	239 km <sup>2</sup>
Source: FAO (2016); NAFO (2017)	

### 3.4.1.3 Other Special Areas

A number of areas in Newfoundland and Labrador have been identified as special due to their ecological and/or societal importance. While several of these have formal protection through legislation, others do not have formal protection.

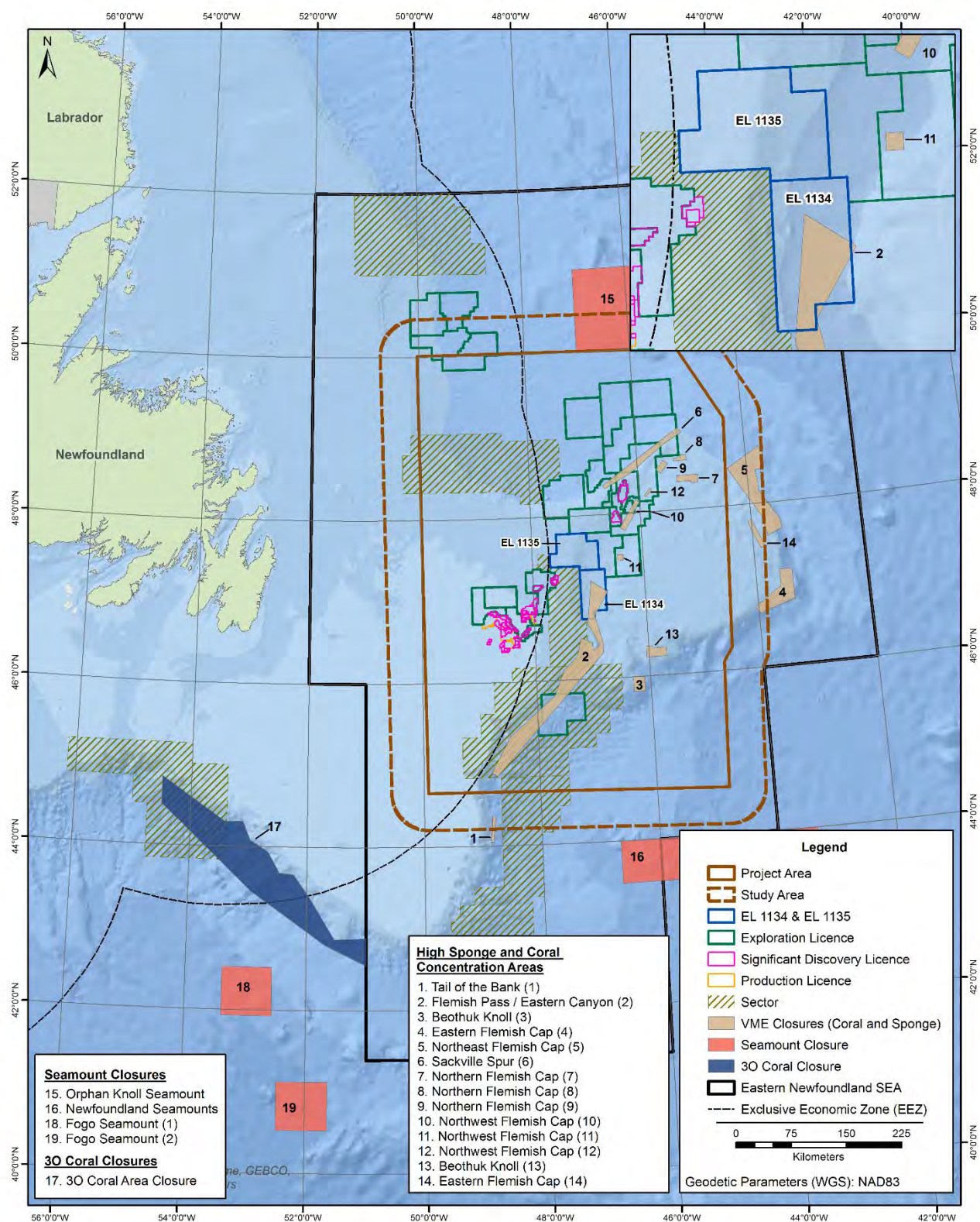
Migratory Bird Sanctuaries (MBS) are designated by Environment and Climate Change Canada. The *Migratory Bird Sanctuary Act* and Regulations prohibits the taking, injuring or destruction of migratory birds or their nests or eggs, and hunting migratory species, within an MBS. Three MBS have been established in Newfoundland and Labrador: Shepherd Island, Île aux Canes and Terra Nova, which is part of Terra Nova National Park. No MBS are located in the Project Area or Study Area (Environment Canada 2016).

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 the total area protecting marine habitats. No National Wildlife Areas are located in Newfoundland and Labrador (Environment Canada 2016).

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

Preliminary Representative Marine Areas (RMAs) have been identified throughout Canada and may be established as National Marine Conservation Areas (NMCAs) in the future (Parks Canada 2017). In Eastern Newfoundland, such areas include Virgin Rocks, South Grand Bank Area, Northwestern Conception Bay and Southern Coast of Burin Peninsula and Southeastern Placentia Bay (CPAWS 2009). Information on RMAs is provided in the original EA Report and the Eastern Newfoundland SEA (Amec 2014).



**Figure 3.14 NAFO Fisheries Closure Areas off Eastern Newfoundland**

Parks Canada establishes National Parks (under the *National Parks Act*) to protect representative examples of Canada's 39 terrestrial natural regions, and National Historic Sites to commemorate significant historical locations or events. Newfoundland and Labrador has three national parks and 45 national historic sites nine of which are managed by Parks Canada and the rest by other agencies (Parks Canada 2008, 2009, 2016). Some of these sites (including Signal Hill, Fort Amherst and Cape Spear) are located along the shoreline of Eastern Newfoundland but distant from the Project Area and Study Area.

The Government of Newfoundland and Labrador has established a system of protected areas which includes 31 Provincial Parks, 16 Ecological Reserves, three Wildlife Reserves, two Wilderness Reserves, one Wildlife Park and one Public Reserve. Provincial Parks are established for environmental conservation and recreation purposes. Wilderness and 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 (NLDME 2016). The Province has also designated various locations as Provincial Historic Sites and in Eastern Newfoundland (DBTCRD 2016). A number of Provincial parks (including La Manche and Chance Cove), Ecological Reserves (such as Witless Bay, Mistaken Point, Baccalieu Island and Funk Island) and Historic Sites (Cape Bonavista Lighthouse and Heart's Content Cable Station) exist along the coastline in Eastern Newfoundland but these are all well outside of the Project Area or Study Area.

Canada is also signatory to various international conventions, some of which identify important wildlife habitats in coastal and marine areas. A number of these have been designated as important bird habitats and may be protected in whole or in part through applicable provincial and national legislation.

The Important Bird Areas (IBA) Program is an international partnership of 120 countries working together to implement science-based initiatives to identify, conserve and monitor a network of sites that provide essential bird habitat (BLC 2016). BirdLife Canada lists 325 sites in Canada, including 11 in Eastern Newfoundland all of which are outside of the Study Area. Seven of these (Baccalieu Island, Cape St. Mary's, Funk Island, Corbin Island, Green Island, Middle Lawn Island and Witless Bay Island) are also located within Provincial Protected Areas. The IBAs are located in coastal and inland areas.

Newfoundland and Labrador has four United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites, which are managed by the Federal or Provincial Governments. These include Red Bay Basque Whaling Station in Labrador, L'Anse aux Meadows and Gros Morne on the Northern Peninsula and Mistaken Point on the southeastern tip of the Avalon Peninsula (UNESCO 2017). These sites are located in coastal or inland areas, well outside of the Study Area.

Canada is a member of the 1975 Convention on Wetlands of International Importance (also referred to as the Ramsar Convention) and the 1986 Western Hemisphere Shorebird Reserve Network (WHSRN). Ramsar has identified 37 Sites in Canada, of which 17 are also NWAs or MBSs. The only Ramsar site in the province is the Grand Codroy Estuary in Western Newfoundland (Environment Canada 2010). Of the seven identified WHSRN site in Canada, none are located in Newfoundland and Labrador (WHSRN 2009). Canada is also signatory to the 1971 UNESCO Man and the Biosphere Programme. Canada has 18 World Biosphere Reserves (WBRs) and none are located in Newfoundland and Labrador (UNESCO 2016).

### 3.4.2 Environmental Effects Assessment

Identified protected and sensitive areas within and near the Study Area were identified, described and mapped in Section 4.2.4 of the original EA Report, with updated information (where available and relevant) being provided in the preceding section. As discussed in Section 5.9 of the 2015 EA Report and re-confirmed herein (Chapter 2), planned Project activities will occur in an offshore area that is located hundreds of kilometres from shore. They will therefore not occur within, or otherwise interact directly with, any of the existing provincial or federal Parks, Ecological Reserves, Wildlife Reserves, MPAs, MBSs, IBAs or other locations that have been designated as protected or sensitive on or around the Island of Newfoundland. The overall Project and Study Areas do, however, overlap with a number of identified protected or sensitive areas in the offshore environment, including several EBSAs, Marine Refuges, FCAs, VMEs, and a preliminary RMA, for which there are no associated prohibitions of marine activities such as those being proposed as part of this Project, and with the Project having little or no potential to result in adverse environmental effects upon these areas (see Section 5.9.2 of the original EA Report).

In terms of the planned 2018 Project activities within ELs 1134 and 1135, these ELs do not overlap with most of the types of protected and sensitive areas outlined above. However, EL 1134 does overlap with one VME (Southern Flemish Pass to Eastern Canyons) and one NAFO FCA (Flemish Pass / Eastern Canyon), as described and assessed in the original EA.

As described in the EA Report (Section 5.9.2), the VMEs and FCAs that overlap with the Study Area have been designated as such in order to identify ecologically important and sensitive areas, and/or to help protect benthic areas from further disturbance from certain types of (bottom dragging) fishing activity. Many of the offshore survey activities that will be undertaken as part of this Project - including those planned for 2018 - will not result in any direct contact with the seabed, and will therefore not physically disturb benthic animals or their habitats. Although some seabed sampling may occur in 2018, those surveys which involve contact with the seabed will have a very small footprint. As referenced in the EA Report and further described in the EA Addendum and Amendment, ExxonMobil will undertake representative seabed reconnaissance prior to any intrusive seabed sampling work in areas that have been identified as having a high probability of occurrence of sensitive corals and sponges, and will implement appropriate mitigations in any cases where these sensitive benthic organisms are found to be present at these locations. It should also be emphasized that the planned cold water corals surveys that are being implemented as part of the 2018 Project activities are intended to help further mitigate possible effects on these species resulting from any future exploration drilling activity that may be undertaken within these ELs by ExxonMobil.

As described for the various preceding biophysical VECs, the Project is not expected to result in any significant adverse effects upon marine fish, birds, mammals, sea turtles or their habitats. It will therefore not adversely affect the ecological features, processes and integrity of any marine or coastal areas, including the protected and sensitive areas that are part of this VEC. The implementation of the various environmental protection measures and procedures outlined throughout the EA Report, including those which are designed to avoid or reduce Project-related discharges and/or disturbances and their associated environmental effects, will also serve to help address any direct or indirect potential effects on overlapping or adjacent protected and sensitive areas. All of the mitigation measures and commitments outlined in the EA Report would remain applicable and will continue to be implemented and adhered to by ExxonMobil in planning and implementing this Project, including the planned 2018 survey activity.



The nature and scale of the planned 2018 activities and the updated baseline information provided above therefore do not change the results of the original (2015) environmental effects assessment for this VEC, and the Project is still not likely to result in significant adverse environmental effects on protected or sensitive areas.

### **3.5 Marine Fisheries and Other Activities**

#### **3.5.1 Existing Environment**

The EA Report provided an overview of the existing socioeconomic environment of the Study Area, including marine fisheries and a number of other anthropogenic components and activities that occur in the region and which may potentially interact with the Project.

##### **3.5.1.1 Commercial Fisheries**

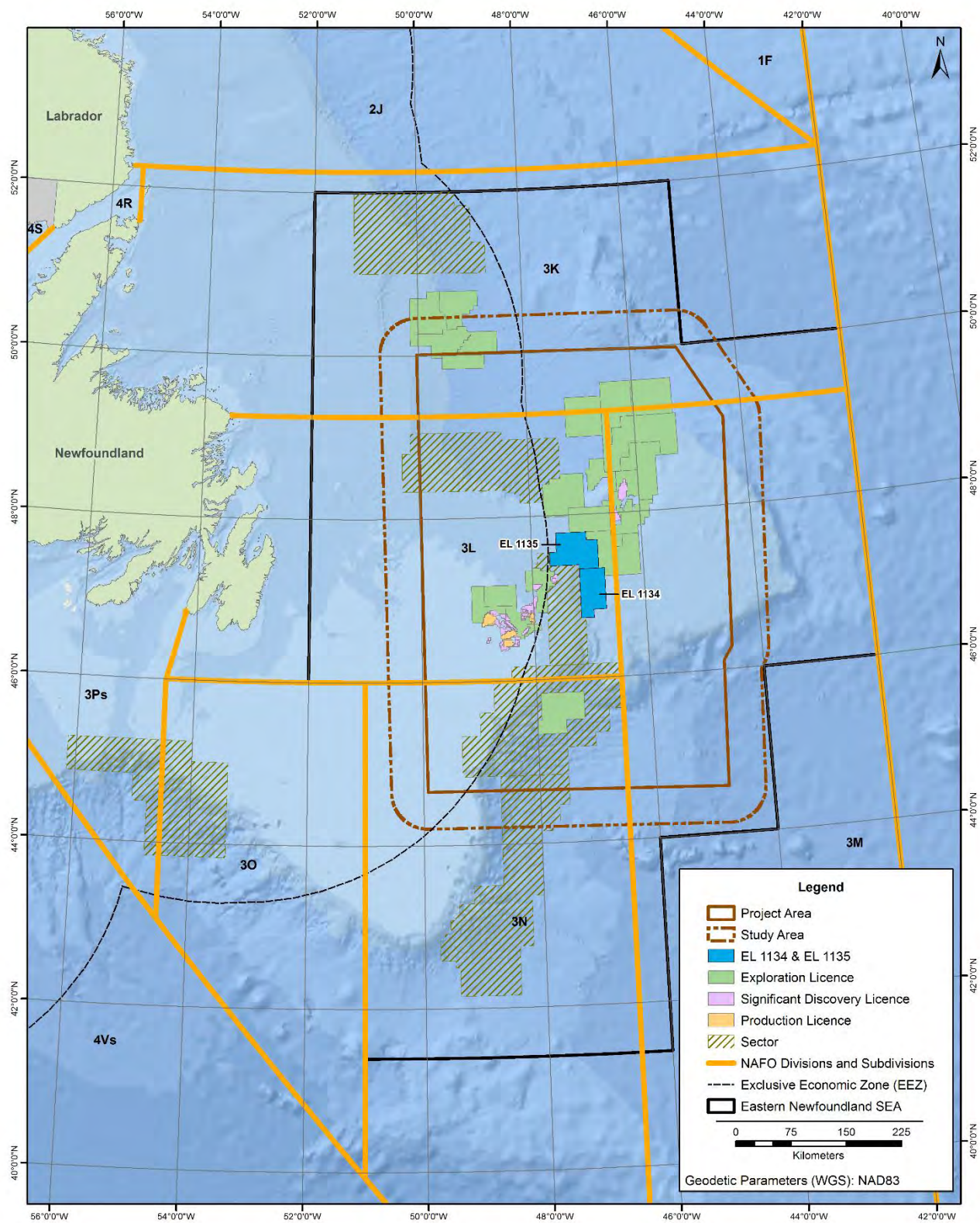
Fisheries were a key area of focus of the EA review for the Project, and on-going Project planning and implementation will continue to place a high degree of emphasis on addressing the potential for interactions with commercial fishing activity within and near the Study Area.

As described in the original EA Report (Section 4.3.1), there are several regulatory jurisdictions associated with marine fisheries within the Study Area. The Government of Canada has jurisdiction over fish stocks and fishing activities within the 200 nautical mile limit (EEZ) and for benthic invertebrates across the continental shelf. Beyond that 200 mile limit, the North Atlantic Fisheries Organization (NAFO) manages groundfish and other resources and activities.

For administrative purposes, the Northwest Atlantic is divided into a series of NAFO Divisions, Subdivisions and Unit Areas (Figures 3.15 and 3.16), and although fish harvesting activities and fisheries management responsibilities do extend across these areas and their boundaries, they are generally used to regulate and manage fishing activity. The Study Area overlaps with a number of NAFO Divisions and Unit Areas, which are listed below, and are used in this section to describe fishing activity in and around the region:

- *NAFO Division 3k*: Unit Areas 3Kg and 3Kk
- *NAFO Division 3L*: Unit Areas 3Ld, 3Le, 3Lh, 3Li, 3Lr, 3Lt
- *NAFO Division 3M*: Unit Areas 3Ma, 3Mb, 3Mc, 3Md, 3Mm
- *NAFO Division 3N*: Unit Areas 3Na, 3Nb, 3Nc, 3Nd

Commercial fisheries data are provided by Fisheries and Oceans Canada (DFO) Statistical Services in Ottawa, ON, including mapping information on the location of recorded fishing activity. The mapping information is currently provided by DFO as an aggregated data set which gives a general indication of fishing areas (by species, gear types, fleet and other pre-determined categories and data classes) for individual grid “cells” that are approximately 6 x 4 nautical miles in size. The DFO datasets record and report domestic and foreign fish harvests that are landed in Canada.

**Figure 3.15 NAFO Divisions and Subdivisions**







The original EA included a detailed description of commercial fisheries in the Study Area, based on existing data sources and other information that was available as of the time of EA Report preparation and submission. This included fisheries landings statistics and associated geospatial data up to 2013.

The following sections provide an updated overview of commercial fishing activity in the Study Area (and particularly, for the NAFO Unit Areas described previously), as reflected in the available fisheries data sets covering the period 2014 to 2015<sup>1</sup>. Fisheries catch statistics and mapping for the period 2009-2013 are provided in the original EA Report (Section 4.3.1) and are not repeated here <sup>2</sup>.

### Domestic Commercial Fish Harvests: Overall Landings (Weight and Value)

The available DFO data indicate that the average annual commercial fish harvest (finfish and shellfish) within the Study Area (namely, all of the NAFO Unit Areas referenced above) for the 2014 – 2015 period totalled approximately 15,000 tonnes, and had a landed value of almost 74.3 million (Tables 3.22 and 3.23). This reflects a change from the 2009-2013 landings data provided in the original EA Report, which is partly the result of the increasingly redacted harvest data, but also reflects the closure of the shrimp fishery in the area as described further below.

**Table 3.22 Fish Harvests by Weight and Value (2014-2015, All Study Area NAFO Unit Areas)**

Year	Weight (kg)	Value (\$)
2014	15,422,742	73,638,904
2015	14,211,366	74,923,051
<b>Total</b>	<b>29,634,108</b>	<b>148,561,955</b>
<b>Average</b>	<b>14,817,054</b>	<b>74,280,978</b>

**Table 3.23 Fish Harvests (All Species) by Weight and Value by NAFO Unit Area (2014-2015)**

Unit Area	2014 Weight (kg)	2014 Value (\$)	2015 Weight (kg)	2015 Value (\$)	Average Weight (kg) 2014-2015	Average Value (\$) 2014-2015	% Weight (kg)	% Value (\$)
3Kg	889,543	2,710,902	847,238	3,240,444	868,391	2,975,673	5.9	4.0
3Kk	-	-	-	-	-	-	-	-
3Ld	2,269,675	9,028,312	2,012,733	9,869,431	2,141,204	9,448,872	14.5	12.7
3Le	199,255	572,666	27,115	147,653	113,185	360,160	0.76	0.48
3Lh	3,404,484	17,563,155	3,258,562	17,744,250	3,331,523	17,653,702	22.5	23.7
3Li	3,202,805	15,612,350	3,367,207	18,335,833	3,285,006	16,974,092	22.2	22.9
3Lr	764,565	3,944,257	405,137	2,206,141	584,851	3,075,199	3.9	4.1
3Lt	2,180,668	11,249,745	1,980,964	10,787,228	2,080,816	11,018,486	14.0	14.8
3Ma	-	-	-	-	-	-	-	-

<sup>1</sup> The 2015 fisheries data remain the most current available from DFO as of the time of writing of the 2018 EA Update (J. Hosein, DFO, pers. comm.).

<sup>2</sup> It should also be noted that data for the most recent years - especially 2014 and 2015 - have been substantially redacted by DFO for confidentiality reasons. They are therefore not able to fully describe some important fisheries, nor to provide accurate and complete totals or facilitate direct comparison with similar landings data for previous years.

Unit Area	2014 Weight (kg)	2014 Value (\$)	2015 Weight (kg)	2015 Value (\$)	Average Weight (kg) 2014-2015	Average Value (\$) 2014-2015	% Weight (kg)	% Value (\$)
3Mb	-	-	-	-	-	-	-	-
3Mc	-	-	-	-	-	-	-	-
3Md	-	-	-	-	-	-	-	-
3Mm	-	-	-	-	-	-	-	-
3Na	-	-	-	-	-	-	-	-
3Nb	1,581,376	8,157,934	1,391,156	7,575,433	1,486,266	7,866,684	10.0	10.6
3Nc	-	-	-	-	-	-	-	-
3Nd	930,371	4,799,584	921,254	5,016,636	925,813	4,908,110	6.2	6.6
<b>Total</b>	<b>15,422,742</b>	<b>73,638,904</b>	<b>14,211,366</b>	<b>74,923,051</b>	<b>14,817,054</b>	<b>74,280,978</b>	<b>100</b>	<b>100</b>

### Domestic Commercial Fish Harvests: Overall Geographic Distribution

Figure 3.17 provides a general illustration of the overall geographic distribution of commercial fishing activity within and adjacent to the Study Area in 2014 and 2015 for the May to November period. As indicated previously, the information provided in the maps that follow 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 these multi-year (2014 and 2015) fishing maps, where fishing activity occurred within a single cell in both years the Figure indicates only the most recent year in which fishing activity occurred within that cell (i.e. the later year’s data overlays that from an earlier year).

Further information on commercial fishing activity by species, season, gear type and other parameters is provided in the sections that follow.

### Domestic Commercial Fish Harvests: By Species

In recent years, the Study Area’s fishery has been strongly dominated by queen / snow crab in terms of both landed weight and value (Table 3.24, Figures 3.18 and 3.19). This is well reflected in the DFO fish landings statistics for the most recent years available (2014 and 2015), as summarized below.

Queen / snow crab comprised approximately 87 percent of the total fish landings by weight in this region in 2014 and 2015, followed by turbot / Greenland halibut (11 percent), and Northern shrimp (also referred to herein as *Pandalus borealis* shrimp, two percent), with no other individual species accounting for greater than one percent of total landings by weight (Figure 3.18). Until 2013- 2014, the Northern shrimp fishery had been one of the most important commercial species harvests in the Study Area, as it continues to be in more northern fishing areas. However, recent quota reductions and closures have significantly reduced commercial shrimp fishing off Eastern Newfoundland (Parrill 2016), including in the Study Area.

In terms of landed value in 2014 and 2015 (Figure 3.19), queen / snow crab accounted for 92 percent of the area’s recorded fish landings overall, followed by turbot / Greenland halibut and Northern shrimp (seven and one percent, respectively).

Figures 3.20 to 3.26 show the overall geographic distribution of recorded commercial fishing activity for key fish species in 2014 and 2015, based on the DFO geospatial databases described above. This includes those species that comprised the highest proportion of the area's fishery over that period, as well as other species with recorded fishing activity in the area and/or which were mapped in the original EA Report.

**Table 3.24 Fish Harvests by Species by Weight and Value (2014 and 2015, All Study Area NAFO Unit Areas)**

Species	Weight (kg)	Value (\$)
Crab, Queen / Snow	25,734,202	136,407,355
Turbot / Greenland Halibut	3,172,014	10,462,928
Shrimp, <i>Pandalus Borealis</i>	720,386	1,684,917
Other	7,506	6,755
<b>Total</b>	<b>29,634,108</b>	<b>148,561,955</b>