### Atlantic Cod

Within the SEA Area Unit Areas as a whole, cod typically makes up nearly 25 percent of the harvest by quantity (see Table 4.3). However, the relative importance of this fishery varies within this SEA Area. Whereas it accounts for more than half the 3Pn harvest (54 percent), it makes up just 19 percent of the 3Ps portion of the SEA Area Unit Areas (based on 2003 to 2005 landings; see Table 4.4). In these areas, redfish is the most important groundfish harvest overall, especially in the western 3Ps Unit Areas.

The Atlantic cod fishery within this area includes two cod stocks and two management areas. The Subdivision 3Pn fishery is managed as part of the northern Gulf of St. Lawrence 3Pn/4RS (Divisions 4R, 4S and 3Pn) stock, while the 3Psa, 3SPe and 3Psd fisheries are part of the 3Ps stocks. These areas have different quotas and management plans.

Details of the 2006 quotas by vessel and gear types for 4R3Pn portion are provided in Table 4.8. As it indicates, a portion of this area's cod quota is taken as bycatch in other directed fisheries (e.g., halibut in 3Pn (during March 2006).

**Table 4.8 4R/3Pn Cod Quotas, 2006**

| Quota Definition | Quota (Tonnes) |
|---|---|
| 4R3Pn - Based in 4T | 0 |
| 4R3Pn - Mobile Gear 45'-64' /4S,4T | 0 |
| 4R3Pn - Fixed Gear <65' (July) | 2385 |
| 4R3Pn - Fixed Gear <65' (September) | 800 |
| 4R3Pn - Fixed Gear <65' (October) | 127 |
| 4RS3Pn - Fixed Gear 65'-100' | 0 |
| 4RS3Pn - Mobile Gear 65'-100' | 0 |
| 4RS3Pn - Vessels > 100' | 0 |
| 4R3Pn - Sentinel Fishery | 400 |
| 4R3Pn - Winter Flounder (bycatch) | 5 |
| 4R3Pn - American Plaice (bycatch) | 18 |
| 4Rd- Greysole Mobile Gear (bycatch) | 18 |
| 4R3Pn - Atlantic Halibut (bycatch) | 18 |
| 4R3Pn- Greenland Halibut (bycatch) | 5 |
| 4R3Pn - Lump Roe Fishery (bycatch) | 0 |
| 4R3Pn - Queen Crab (bycatch) | 0 |
| 4RS3Pn - Unit 1 Redfish FG (bycatch) | 0 |
| 4R - Unit II Redfish MG (bycatch) | 3 |
| 4R - Skate/ 3Pn White Hake (bycatch) | 3 |
| 4R/3Pn Total | 3,782 |
| Source: NL Region Species Quota Reports, Atlantic Cod (DFO 2006i). | |

DFO 2006i (SAR 2006/010) notes that annual harvests of this stock reached more than 100,000 tons in the early 1980s, but a rapid decline led to the establishment of a moratorium from 1994 to 1996. A reduced fishery was allowed in 1997, with a TAC of 6,000 tonnes. This was reduced to 3,000 tonnes for 1998 and increased again to 7,500 tonnes in 1999. During the 2000s, it has varied between 3,500 and 7,000 tonnes. Sentinel fisheries also make up part of the annual harvest in 3Ps.

In 3Ps, DFO 2005f (SAR 2005/047) reports that the cod stock was exploited heavily in the 1960s and early 1970s by foreign fleets, mainly from Spain, with catches peaking at 84,000 tonnes. After the extension of Canadian jurisdiction in 1977, catches averaged approximately 30,000 tonnes until the mid-1980s, when fishing effort by France increased and total landings reached approximately 59,000 tonnes. Catches then declined gradually and the moratorium was established in 1993. The 3Ps fishery opened again in May 1997 with a TAC of 10,000 tonnes, increasing to 30,000 tonnes in 1999. In 2000, the

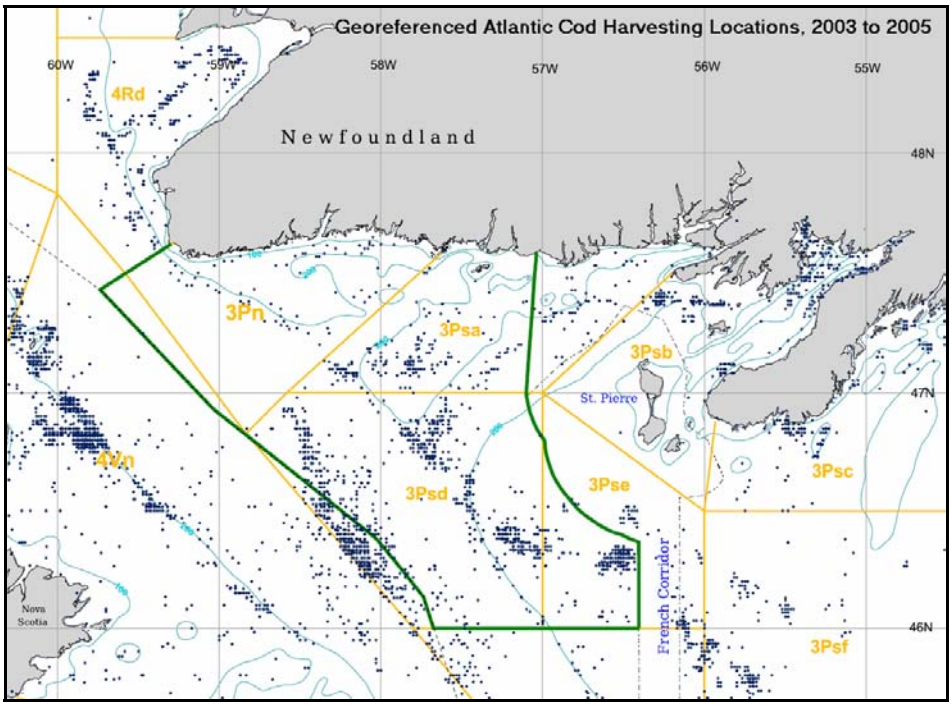
management year was changed to start 1 April; the fishery is closed during March because it is the spawning season. For 2000, the TAC was 20,000 tonnes and for the next five management years ending 31 March 2006 the TAC was set at 15,000 tonnes. 3Ps quota details for 2006 are provided in Table 4.9.

**Table 4.9 3Ps Cod Quotas, 2006**

| Area / Quota Definition | Quota (Tonnes) |
|---|---|
| 3Ps - Mobile Gear < 65', based in 3Ps | 246 |
| 3Ps - Mobile Gear < 65', based in 3KL (overlaps) | 215 |
| 3Ps - Mobile Gear < 65' based in 4R3Pn (overlaps) | 65 |
| 3Ps - Fixed Gear <65', based in 3KL (overlaps) | 344 |
| 3Ps - Fixed Gear <65', based in 3KL (equivalents) | 190 |
| 3Ps - Fixed Gear <65', based in 3Pn (Overlap) | 190 |
| 3Ps - Fixed Gear < 65', Area 9 Overlaps | 160 |
| 3Ps - Fixed Gear < 65', based in Branch / Point Lance | 96 |
| 3Ps - Fixed Gear <35', PB - Area 10 | 3,010 |
| 3Ps - Fixed Gear 35'-64', PB - Area 10 | 1,142 |
| 3Ps - Fixed Gear <35', FB & West - Area 11 | 2,608 |
| 3Ps - Fixed Gear 35'-64', FB & West - Area 11 | 693 |
| 3Ps - Sentinel Fishery | 173 |
| 3Ps - Fixed Gear 65'-100' | 216 |
| 3Ps - Mobile Gear 65'-100' | 0 |
| 3Ps - Vessels >100' | 1,593 |
| **3Ps Total** | **10,941** |
| Source: NL Region Species Quota Reports, Atlantic Cod (DFO 2006i). | |

Recorded Atlantic cod harvesting locations based on the DFO georeferenced data in relation to the SEA Area and the relevant Unit Areas is presented in Figure 4.35. Three years (2003 to 2005) of aggregated data are shown to better represent harvesting patterns, though the harvesting locations tend to be quite consistent from year to year.

**Figure 4.35 Georeferenced Atlantic Cod Harvesting Locations, 2003 to 2005**



The 2004 season for 3Ps cod officially opened 1 April, but harvesting by inshore (vessels <65 feet) did not begin until 3 May. Offshore vessels commenced their cod fisheries 1 June. The 2004/2005 season ended on 28 February 2005 (J. Perry, pers. comm., June 2004). The 2004 TAC was 15,000 tonnes for all fleet sectors, as it was in 2003. The quota included a 2,340 tonne allocation to France and the remainder (12,660 tonnes) went to Canada. The Canadian portion includes small allocations to Aboriginal and sentinel fisheries, while the majority of Canada's share was for vessels <100 feet (9,733 tonnes). Offshore vessels >100 feet had a 2004 allocation of 1,839 tonnes.

The timing of the cod fishery, 2003 to 2005, is shown in Figures 4.36 to 4.37. The overall SEA Area Unit Areas harvest is shown in Figure 4.36, indicating that the great majority is harvested during the summer and early autumn (July to October). The harvest for 3Pn and the 3Ps portion of the SEA Area Unit Areas is shown separately in Figure 4.37. 3Pn fishers attending the SEA June consultation meeting report that their 2005 and 2006 cod harvest was completed in a three-week period during the month of June (see further discussion of these 3Pn cod fisheries in Appendix B).

As indicated in Table 4.8, in the 4R/3Pn area, the only quotas in the directed cod fishery are for fixed gear. In 2005 and in 2006, the 3Pn cod fishery was almost entirely a longline (i.e., hook and line) fishery, with a very small amount (<1 percent) taken using handlines. In the 3Ps SEA Area Unit Areas, the harvesting was divided among gillnetting (45 percent), longlining (41 percent) and stern otter trawling (13 percent). Approximately 1 percent was harvested with handlines.

**Figure 4.36 Strategic Environmental Assessment Area Unit Areas Cod Harvest by Month, 2003 to 2005 Average**

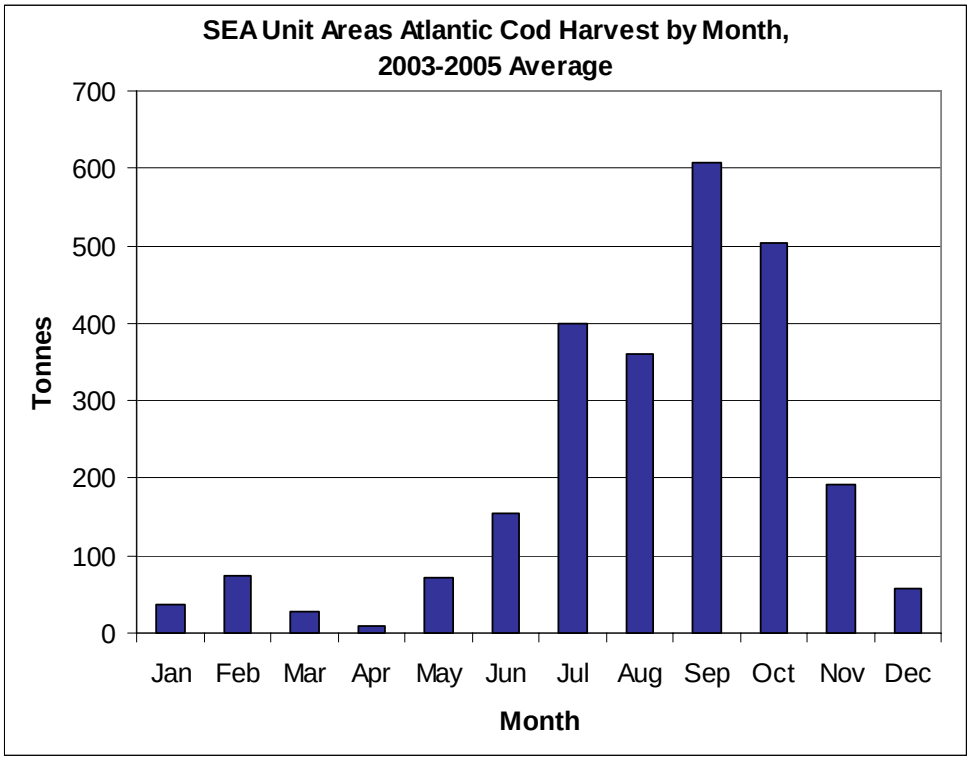
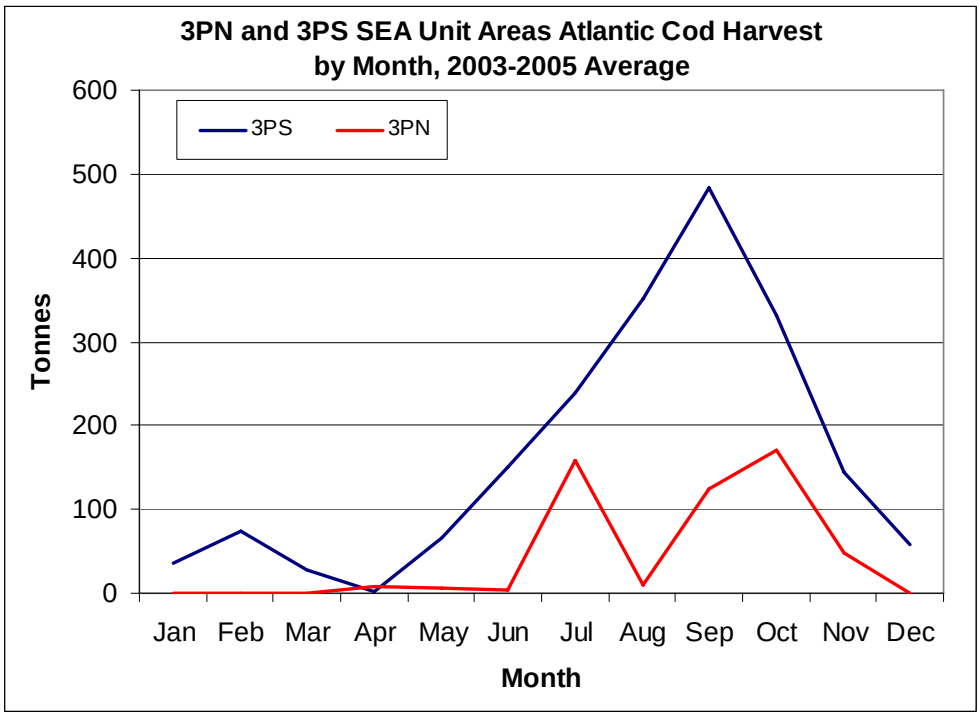


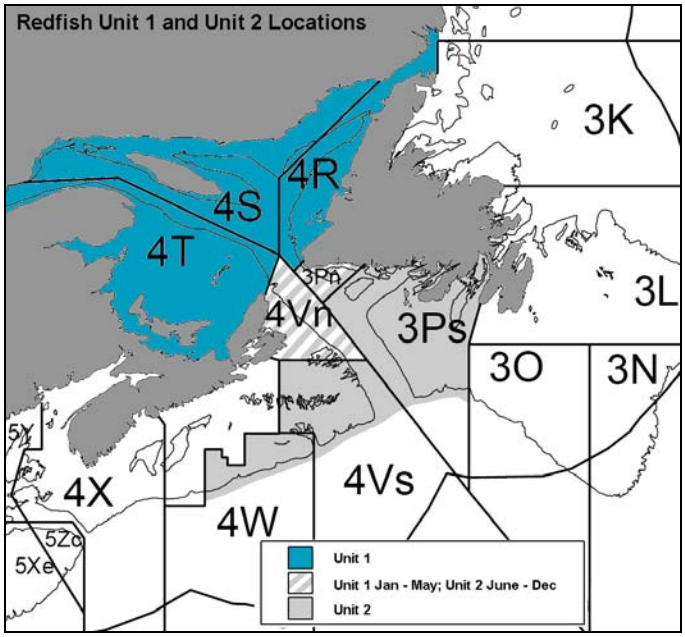
**Figure 4.37 Strategic Environmental Assessment Area Unit Areas Cod Harvest by Month, 3Pn vs 3Ps, 2003 to 2005 Average**




## Redfish

The redfish (ocean perch) fisheries were the largest (by quantity) within the SEA Area Unit Areas (Figure 4.38) in the 2002 to 2005 period, where they made up nearly 28 percent of the overall, all-species, harvest.

**Figure 4.38 Redfish Unit 1 and 2 Locations**



Though the fishery involves three species of redfish (Acadian, golden and deepwater), they are harvested as one. The 3Ps portion of the fisheries are part of redfish management Unit 2. This includes Divisions 3Ps4VS4WFG year-round, but also includes 3Pn4VN from June to December. From January to May, 3Pn is part of redfish management Unit 1 in the Gulf of St. Lawrence.

Regarding the Unit 1 redfish, DFO 2004a (SSR 2004/015), states "The redfish fishery in the Gulf of St. Lawrence has been characterized by two periods of high harvesting: the first at the beginning of the 1970s and the second in the 1990s. Both periods are closely linked to the recruitment of strong year-classes (Morin et al. 2001). In the early 1990s, landings dropped rapidly from 60,000 tonnes in 1993 to 19,500 tonnes in 1994. The TAC for Unit 1 redfish was set at 60,000 tonnes in 1993 and reduced to 30,000 tonnes in 1994. The directed redfish fishery in Unit 1 was closed in 1995 as a result of low stock abundance and the lack of recruitment. The Unit 1 biomass has stabilized at a low level since 1995 with no strong juvenile year-classes. The Redfish Industry Survey (RIS) program was established in 1998 and has two components: the index fishery, which is intended to gather data on trawlers catch per unit effort, and (systematic) scientific surveys for developing a new abundance index. The TAC for RIS purposes was 1,000 tonnes in 1998 and has been 2,000 tonnes since".

The Unit 2 redfish management unit has all three redfish species (*S. fasciatus*, *S. mentella* and *S. marinus*) occurring within the area (DFO 2004b). The fishery is believed to be dominated by the exploitation of the *S. mentella* species.

Seasonal and area closures were implemented in 1995 and 2000 as management measures to minimize mixed harvests with Unit 1 redfish and allow for peak spawning of females (Power and Mowbay 2000). A small fish protocol was introduced in 1996, to protect the 1988 year class, as it appeared this year class may be the major contributor to the exploitable population.

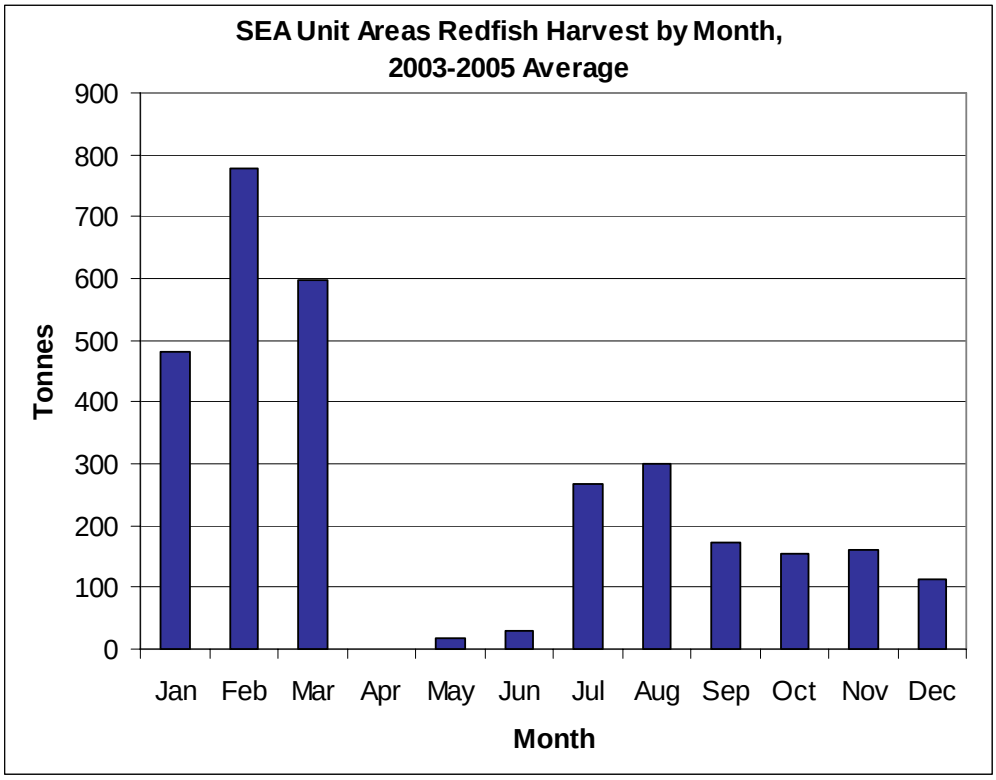
The biomass index derived from research survey suggest the stock size in Unit 1 remained stable between 1994 to 2002 (Power and Mowbray 2000; DFO 2004b). The 2001 to 2002 TAC was set at 8,000 tonnes and remained in effect for 2003 to 2004 (DFO 2004b). The reductions in TAC instituted since 1999 were based on concerns regarding lack of recruitment since the strong 1980 *S. mentella* year class.

In Unit 2, DFO 2004b (SSR 2004/016) notes "From 1960 to 1968, landings averaged about 20,000 t, but then increased to an average of 43,000 tonnes up to 1975, mainly due to increased catches by non-Canadian fleets, then declined to about 8000 tonnes in 1984. Since then, catches steadily increased to about 27,000 tonnes by 1993 then subsequently declined to about 11,000 tonnes by 1998. Catches were at 11,000 tonnes in calendar year 1999 before an additional 6000 tonnes was allocated and eventually caught to allow for the transition to the April-March TAC year beginning in 2000. The catch declined from 10,000 tonnes in 2000 to 8,000 tonnes in 2001 and has remained at about that level since. Up to mid-March 2004, approximately 6,600 tonnes had been taken from the 8,000 tonnes TAC for 2003 to 2004. Maritimes vessels have generally accounted for the majority of landings from Subdivisions 4VS and 4VN, whereas Newfoundland vessels concentrated in Subdivisions 3Ps and 3Pn".

The current 8,000 tonne Unit 2 TAC includes a small allocation (288-tonne) for French vessels and a 1,494 tonne allocation for Canadian vessels <100 ft. The latter allocation is divided among vessels in the mobile fleet based in 3Ps, 4RST, 3Pn and 4VWX. The majority of the Canadian share of the TAC is allocated to offshore vessels based in both Nova Scotia and Newfoundland and Labrador; these Offshore Enterprise Allocation holders were permitted to harvest 6,134 tonnes in 2004/2005. There is no directed

fishery for this species during the “pupping” (or larval extrusion) period, 1 April to 30 June, as reflected in Figure 4.39.

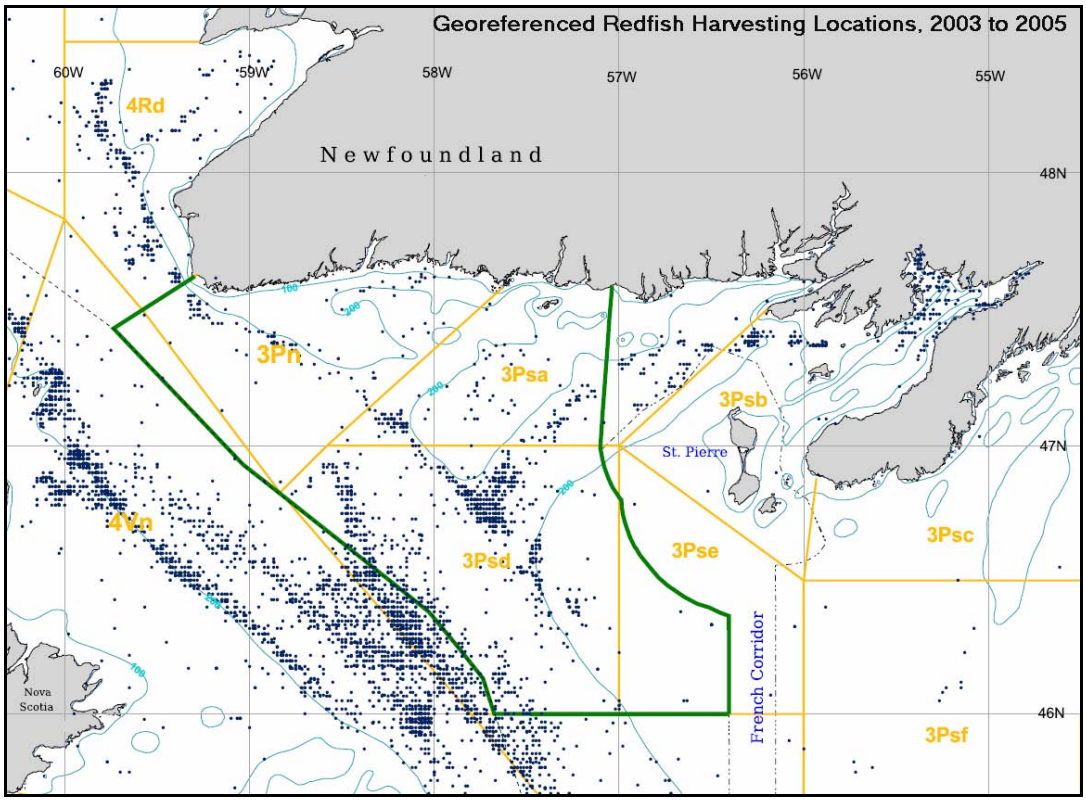
**Figure 4.39 Strategic Environmental Assessment Area Unit Areas Redfish Harvest by Month, 2003 to 2005 Average**




Reported redfish harvesting locations, based on the DFO georeferenced data in relation to the SEA Area and the relevant Unit Areas, are shown in Figure 4.40. This map shows three years (2003 to 2005) of aggregated data to better represent harvesting patterns, though the harvesting locations tend to be consistent from year to year.

The redfish harvest in these areas in 2005 was 73 percent with stern otter trawls and 23 percent with gillnets. Approximately 4 percent was taken with midwater trawls.

**Figure 4.40 Georeferenced Redfish Harvesting Locations, 2003 to 2005**




**White Hake**

White hake made up just over 4 percent of the 2003 to 2005 catch within the SEA Area Unit Areas. It was harvested in each area, but was least important in 3Pse. On the Newfoundland Grand Banks, white hake has not been regulated by quotas, but its relatively low market value and closures because of high by-catch of other species limit effort inside 200 nautical miles. Kulka et al. (2005b) note that a large year-class in 1999 led to a much expanded foreign hake fishery during 2002 and 2003 within the NAFO Regulatory Area (NAFO Divisions 3LNOPs; Canadian waters are those within 200 nautical miles). Non-Canadian harvesting made up approximately 85 percent of the total harvest in those years, which averaged 5,771 tonnes. However, by 2004, abundance had dropped to just 7 percent of the 2000 level, and a TAC of 8,500 tonnes was adopted for the 2005 fishing season and beyond, for the NAFO Regulatory Area. However, Kulka et al. (2005b) note that this quota "is far too large to be effective in sustaining this stock, given the lack of significant recruitment. …Therefore, at best, it will be at least several years before there are enough white hake on the Grand Banks again to support more than a minor by-catch fishery."

The timing of the harvest for the SEA Area Unit Areas over the past three years is shown in Figure 4.41. Reported white hake harvesting locations, based on the DFO georeferenced data for 2003 to 2005, aggregated, are shown on Figure 4.42.

In 2005, approximately 66 percent of the harvest in these areas was taken with gillnets and 33 percent using longlines.

**Figure 4.41 Strategic Environmental Assessment Area Unit Areas White Hake Harvest by Month, 2003 to 2005 Average**

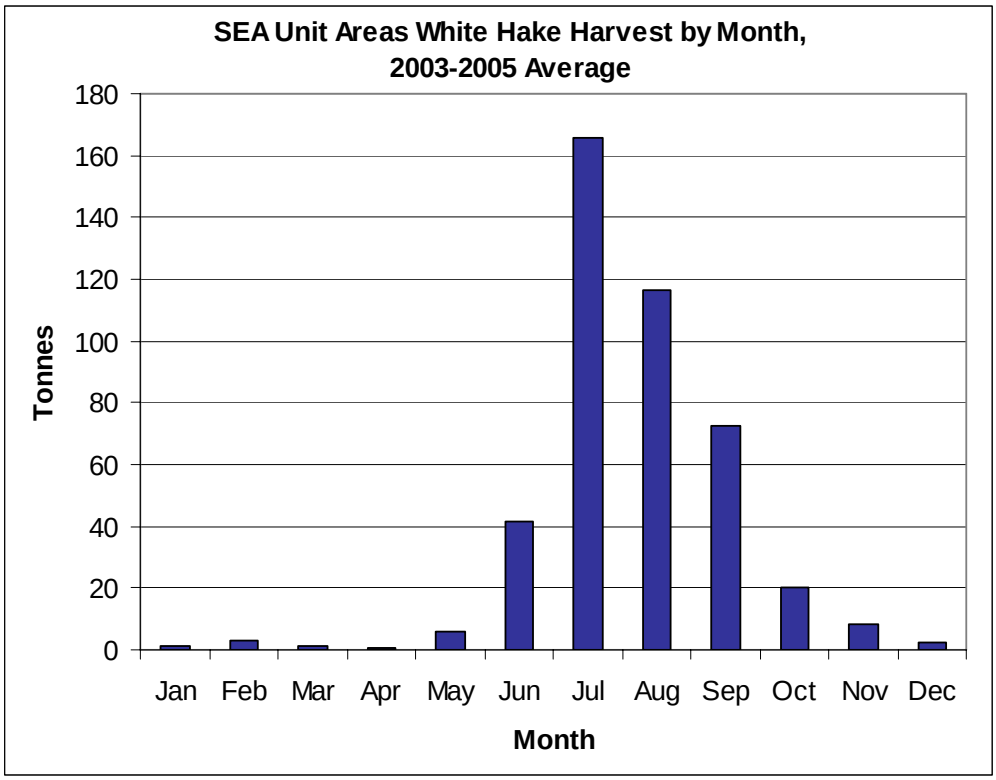
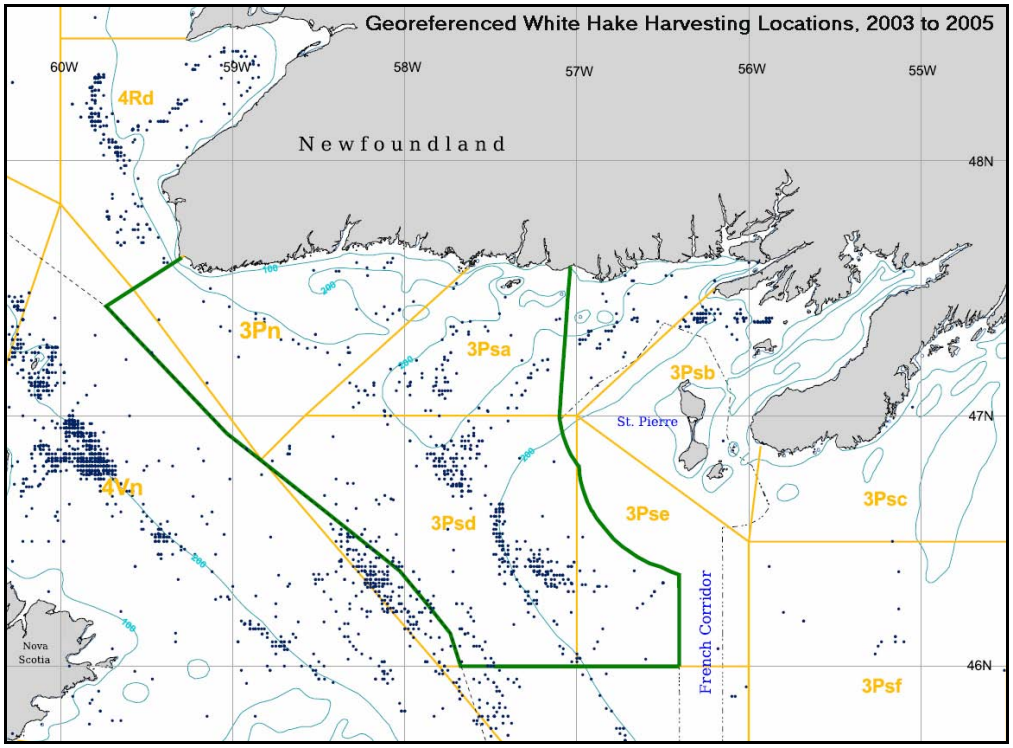



**Figure 4.42 Georeferenced White Hake Harvesting Locations, 2003 to 2005**



**Monkfish**

Monkfish (American angler or goosefish) made up 2 percent of the SEA Area Unit Areas harvest in 2003 to 2005. 3Ps fishery accounted to 29 percent of the Canadian catches from 1995 to 2003. There is no quota for monkfish and most of this species is taken as a by-catch of the skate and White Hake fishery by vessels using both fixed gear and mobile gear (Kulka and Miri 2003b). However, there has also been a directed fixed gear fishery for monkfish for <65 foot vessels as well as for those 65 to 100 feet in both 3Ps and 3NO (to the east). Vessels using mobile gear are not permitted to fish in areas close to shore (i.e., in 3Psa, 3Psb and 3Psc) (DFO 2003c (SSR 2003/045)).

Prior to 2001, 77 percent of monkfish landings were by-catch of directed fisheries for skate, witch flounder and American plaice. During 2001 to 2003, 86 percent of monkfish catches were as a result of a directed fishery. Seasonality associated with the fishery are related to regulatory restrictions rather than stock availability.

Landings have been low until 2002 to 2003, when catches increased markedly (six times) as a result of increased effort driven by market conditions (Kulka and Miri 2003b). Monkfish are not currently under quota restriction, resulting in the index of exploitation increased over the past five years.

Monkfish catches increased from 168 tonnes in 2000, to 2,511 tonnes in 2002 and 2,994 tonnes in 2003. The range of fishing effort has increased and extends over 60,000 $km^2$, covering a significant portion of the monkfish distribution. Exploitation levels prior to 2001 were sustainable, but current exploitation levels may no longer be sustainable.

Reported monkfish harvesting locations, based on the DFO georeferenced data for 2003 to 2005, aggregated, are shown in Figure 4.43.

The length of the monkfish season varies depending on when the skate quota is taken, as well as on market conditions. As indicated in Figure 4.44, during the past three years the harvest has been almost exclusively June to September.

In 2005, the harvest was almost entirely with gillnets in this area; less than 2 percent was harvested with longlines.

**Figure 4.43 Georeferenced Monkfish Harvesting Locations, 2003 to 2005**

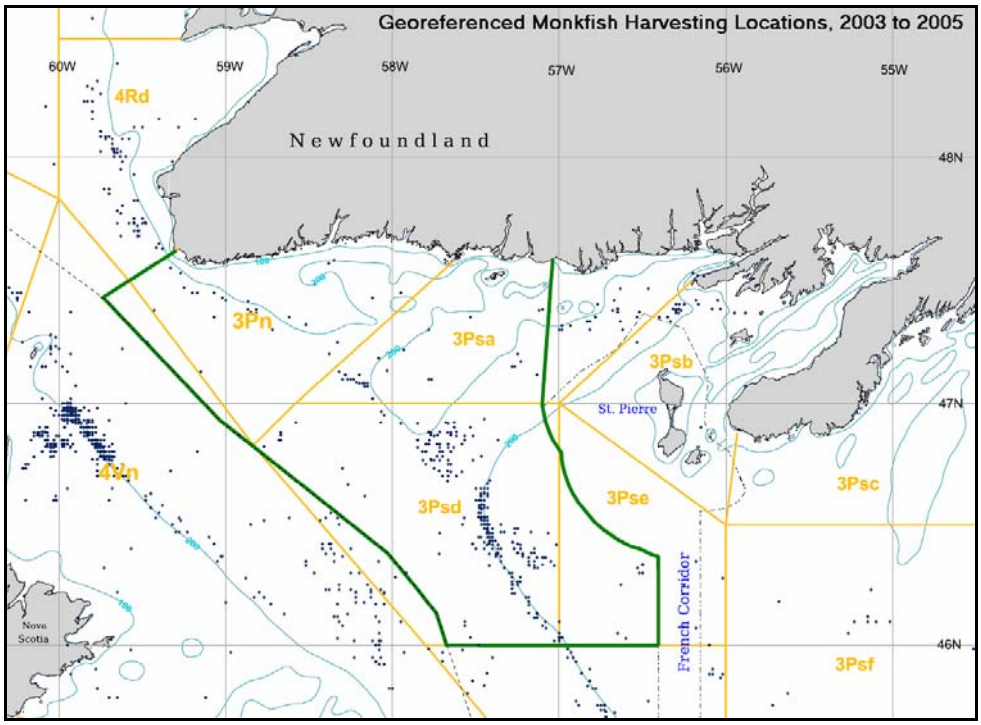
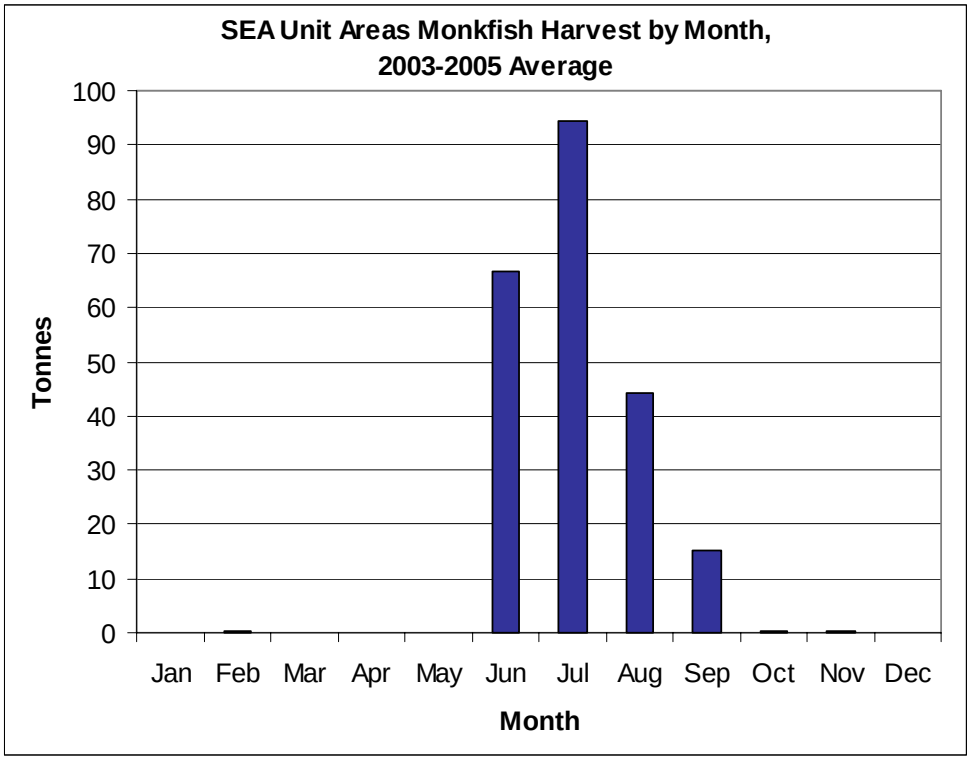



**Figure 4.44 Strategic Environmental Assessment Area Unit Areas Monkfish Harvest by Month, 2003 to 2005 Average**



### Herring

Herring made up just under 9 percent of the SEA Area Unit Areas harvest (2003 to 2005), though in Unit Area 3Psa it represented more than 19 percent of the harvest by quantity, presumably from catches taken in the Pass Island to Cinq Cerf quota area.

Historically, these herring resources have supported both commercial food and bait fisheries; most of the herring harvested in the bait fisheries is not recorded in the landings data (DFO 2003d) (2003/B2-01(2002)). Present (2006) herring quotas for 3Ps and 3Pn are provided in Table 4.10. Over the past few years, the quotas have varied slightly, but within a few hundred tonnes of these levels, in total.

**Table 4.10 3Ps and 3Pn Herring Quotas, 2006**

| Area / Quota Definition | Quota (Tonnes) |
|---|---|
| **3Ps** | |
| Placentia Bay - Gillnets/Traps | 205 |
| Placentia Bay - Bar Seines | 100 |
| Placentia Bay - Purse Seine <55' | 275 |
| Placentia Bay - Purse Seine >55' | 400 |
| Placentia Bay - Experimental Survey | 0 |
| Fortune Bay - Gillnets/Traps | 900 |
| Fortune Bay - Bar Seines | 2,200 |
| Pass Island/Cinq Cerf - Gillnets/Traps | 300 |
| Pass Island/Cinq Cerf - Bar Seines | 100 |
| 3Ps Total | 4,480 |
| **3Pn** | |
| Fixed Gear All Vessels | 0 |
| 3Pn Total | 0 |
| Source: NL Region Species Quota Reports, Herring (DFO 2006j). | |

Reported herring harvesting locations, based on the DFO georeferenced data for 2003 to 2005, aggregated, are shown in Figure 4.45. However, very little of the harvesting is georeferenced in the SEA Area, including none of the harvest in 3Pn or 3Pse in 2005.

The catch in the SEA Area Unit Areas in 2005 was taken using beach and bar seines (51 percent), trap nets (41 percent) and gillnets (8 percent).

As illustrated in Figure 4.46, the recorded herring harvest in recent years has been almost exclusively pursued in April and May.

**Figure 4.45 Georeferenced Herring Harvest Locations, 2003 to 2005**

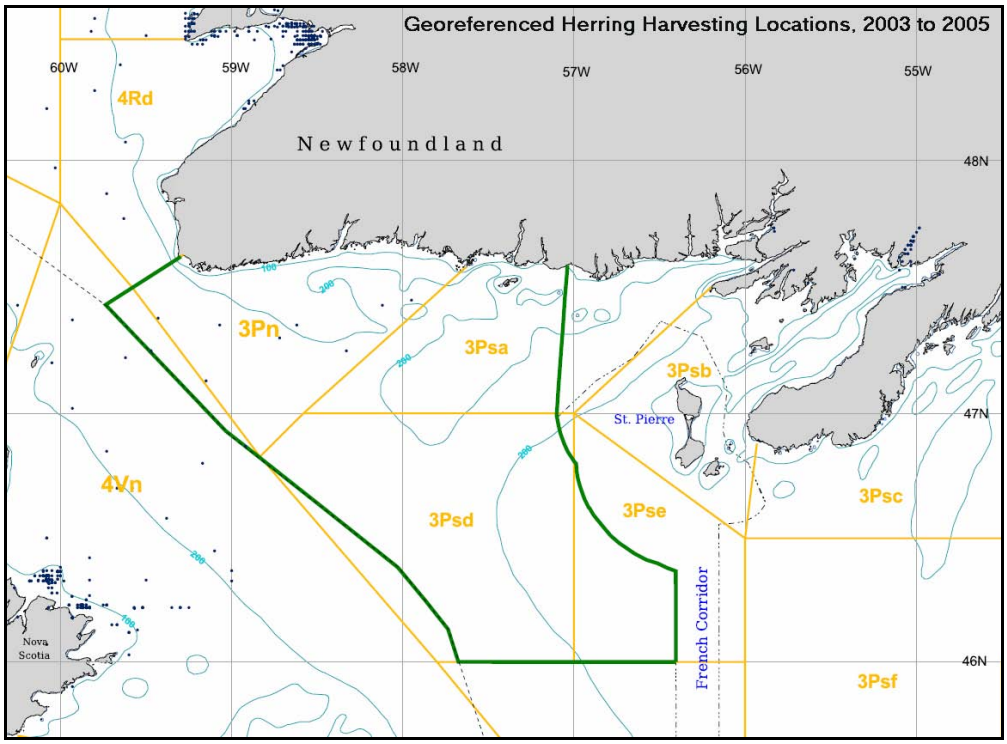
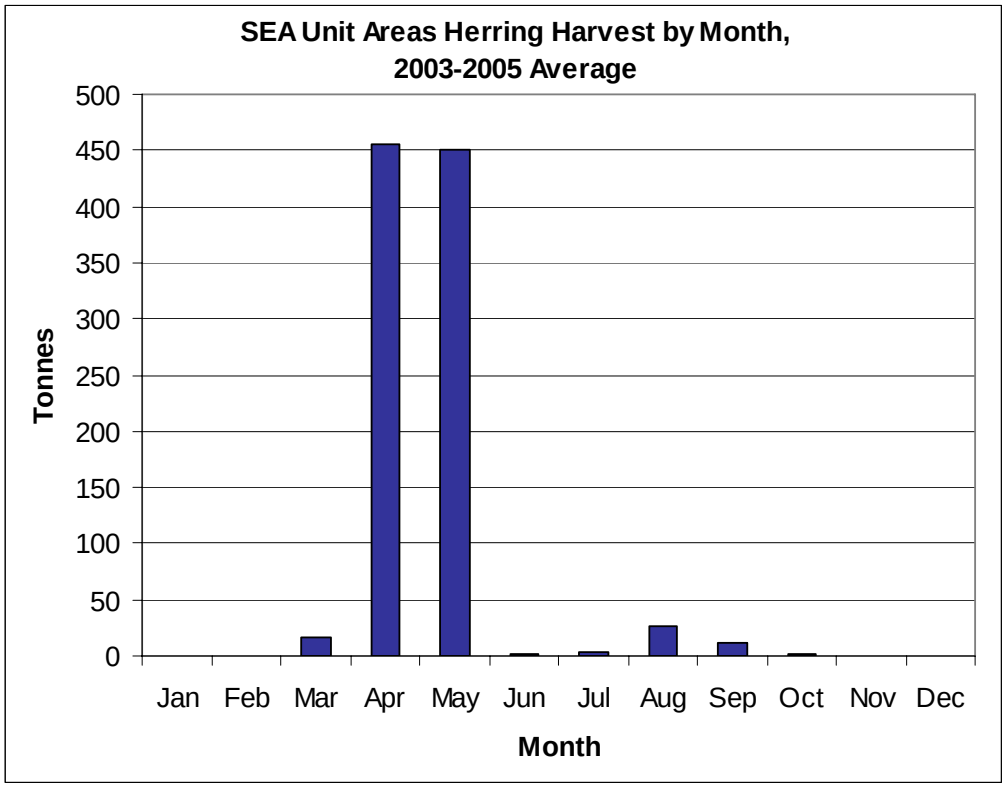



**Figure 4.46 Strategic Environmental Assessment Area Unit Areas Herring Harvest by Month, 2003 to 2005 Average**



### Scallop

Together, the harvests of Iceland and sea (deep-sea) scallops make up some 23 percent of the SEA Area Unit Area harvest. DFO 2001b (2001/C2-07) notes that "[T]he directed fishery for [Iceland Scallops] in Newfoundland began in the Strait of Belle Isle in 1969, but later expanded onto St. Pierre Bank and the Grand Banks. Aggregations within each area are now regulated by catch levels and by seasons. Cumulative removals from Newfoundland and Labrador have declined considerably and are now only about one quarter of what it was in 1996. In part this is due to the greater relative availability of other species, notably crab and shrimp, but also due to declines in scallop abundance throughout the areas once supporting lucrative fisheries. In 2000, the number of vessels participating remained unchanged (35 vs. 34), but well below the 171 recorded in 1996".

The Maritimes-based scallop fleet also occasionally fishes sea scallops in the St. Pierre Bank area (Figure 4.47), and this area is included in their Scallop Fishery Management Plan (DFO 2000a). In addition, Newfoundland-based vessels fishing for Iceland scallop may catch and retain sea scallop. DFO 2001b (2001/C2-07) notes that regulations currently allow a 10 percent bycatch of sea scallop (Figure 4.48). However, as that report notes, "[A]s scallops are shucked at sea and only 'meats' landed, species discrimination for monitoring purposes is fraught with difficulty".

**Figure 4.47 Georeferenced Scallop Harvesting Locations, 2003 to 2005**

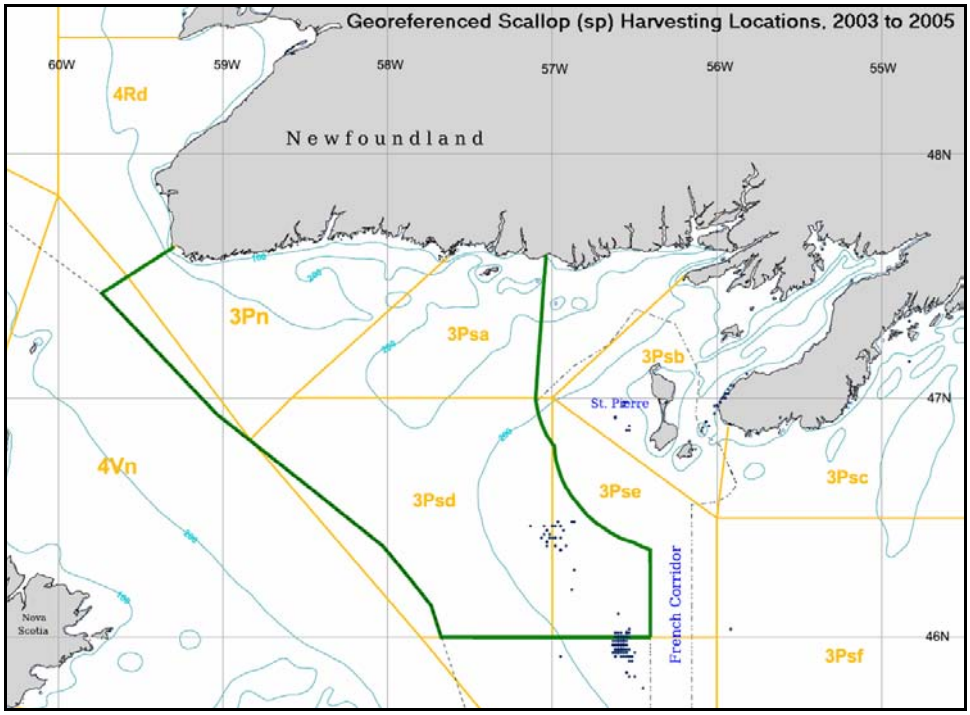
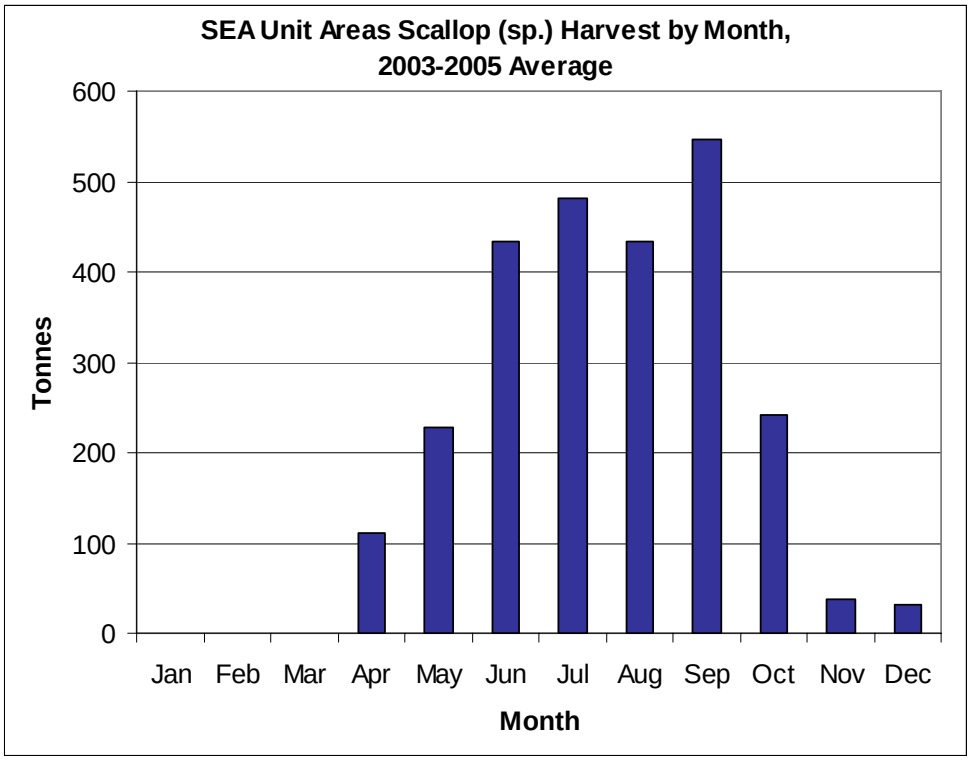


**Figure 4.48 Strategic Environmental Assessment Area Unit Areas Scallop Harvest by Month, 2003 to 2005 Average**




The 2005 Iceland and sea scallop quotas, the quantity taken by region and the total remaining (not taken) at the end of the year are shown in Table 4.11. Note that for sea scallops, the quota and catch figures are for meat weight only (i.e., it does not include the full shell (live) weight for this species). The 2006 quotas for Iceland scallops (there was no quota designated for sea scallops) are shown in Table 4.12. The quota was increased by about 13 percent for 2006 compared to 2005.

**Table 4.11 3Ps Iceland and Sea Scallop Quotas and Harvest, 2005**

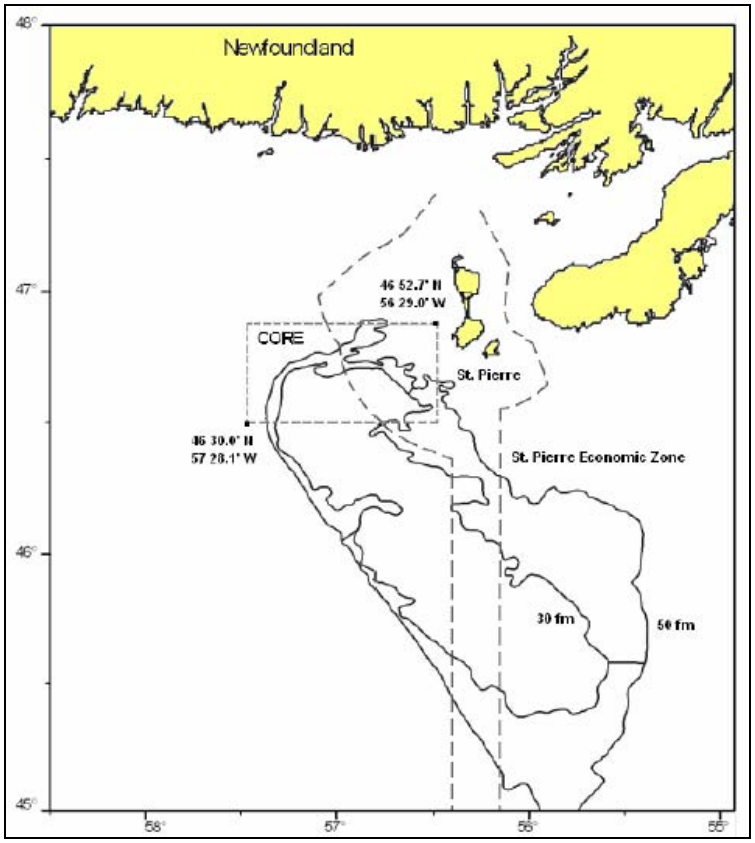
| Species/ Division | Details | Quota (tonnes) | NS Harvested | NL Harvested | Total Harvested | Total Remaining |
|---|---|---|---|---|---|---|
| **Iceland Scallops** | | | | | | |
| 3Ps | Core Area | 30 | | | 0 | 30 |
| 3Ps | Eastern St. Pierre Bank | 300 | | | 0 | 300 |
| 3Ps | N West St. Pierre Bank | 500 | | | 0 | 500 |
| 3Ps | Perch Rock Keys < 45' | 350 | | 2 | 2 | 348 |
| 3Ps | Perch Rock Keys > 45' | 350 | | 1 | 1 | 349 |
| 3Ps | Inshore - Area 10 | 0 | | 12 | 12 | -12 |
| 3Ps | Offshore - Area 10 | 1,000 | | 9 | 9 | 991 |
| 3Ps | Inshore - Area 11 | 0 | | 52 | 52 | -52 |
| 3Ps | Offshore - Area 11 | 1,000 | | 1,910 | 1,910 | -910 |
| Total 3Ps Iceland | | 3,530 | 0 | 1,986 | 1,986 | 1,544 |
| **Sea Scallops** (Quotas & catches are meat weight) | | | | | | |
| 3Ps | SFA 10, 11, 12 St. Pierre Bank Offshore | 250 | 42 | 243 | 285 | -35 |
| Total 3Ps Sea Scallops | | 250 | 42 | 243 | 285 | -35 |
| Source: Statistical Services Canadian Atlantic Quota Reports, Scallops (DFO 2005g). | | | | | | |

**Table 4.12 3Ps Iceland Scallop Quotas, 2006**

| Area/ Quota Definition | Quota (tonnes) |
|---|---|
| 3Ps - Core Area of 3Ps - Mobile Gear | 495 |
| 3Ps - Eastern St. Pierre Bank (SFA10) - Mobile Gear | 300 |
| 3Ps - West St. Pierre Bank (SFA11) - Mobile Gear | 500 |
| 3Ps - Perch Rocks / Keys - Vessels < 45' | 350 |
| 3Ps - Perch Rocks / Keys - Vessels > 45' | 350 |
| 3Ps - Inshore Area 10 North of 46"30" - Mobile Gear | 0 |
| 3Ps - Offshore Area 10 South of 46'30" - Mobile Gear | 1,000 |
| 3Ps - Inshore Area 11 North of 46'30" - Mobile Gear | 0 |
| 3Ps - Offshore Area 11 South of 46'30" - Mobile Gear | 1,000 |
| Total | 3,995 |
| Source: NL Region Species Quota Reports, Scallops (DFO 2006k). | |

Although there is a scallop quota for the Canada-France transboundary zone (the "Core Area", see Figure 4.49), there has been no fishery there since 1997. This area is now under review. DFO 2006l (SAR 2006/008) describes the history of fishing in this area: following the settling of the Canada-France boundary around St. Pierre et Miquelon, an annual catch level (TAC) was established for an area called "the Transboundary area" or simply the "Core". The DFO report states, "Joint TACs have been in place for the CORE since 1995. France and Canada are allocated a fixed percentage of the TAC, 70 and 30 percent, respectively. A joint Canada-France research survey was completed in September, 2005, the first since 1998". That survey indicated that between 1993 and 2005, biomass decreased in the French zone and increased in the Canadian. The Maritimes-based sea scallop fleet is not permitted to harvest within the Core area (DFO 2000a).

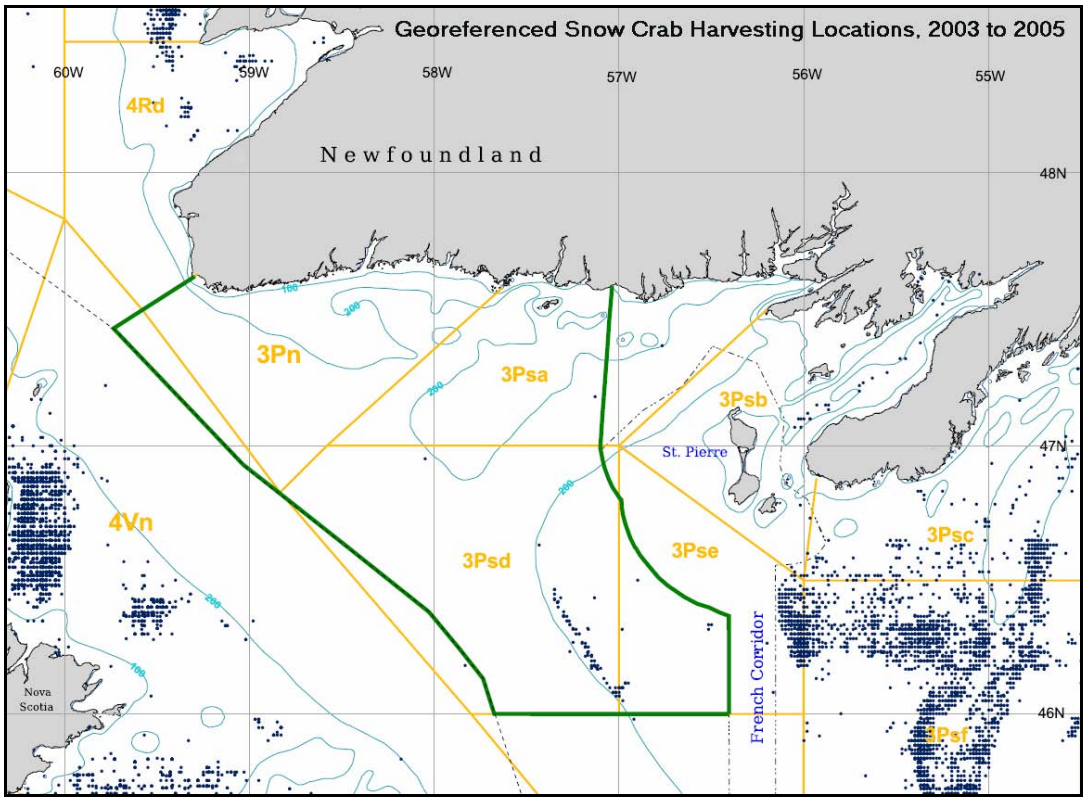
**Figure 4.49 Location of "Core" (Canada-France Transboundary) Scallop Area**



### Snow Crab

Although very important in many Newfoundland and Labrador waters, little snow crab is harvested within the SEA Area, as most of the important grounds are to the east, in 3Psf. During 2003 to 2005, it made up just 1.9 percent of the SEA Area Unit Area harvest. The relatively small amount of harvesting within the SEA Area occurs near the 200-m contour in 3Psd, as illustrated in Figure 4.50.

**Figure 4.50 Georeferenced Snow Crab Harvesting Locations, 2003 to 2005**




The Newfoundland and Labrador snow crab fishing area boundaries are shown in Figure 4.51. The SEA Area falls in Areas 11 (3Ps) and 12A (3Pn). Over the past three years, the harvest has occurred mainly May-July (see Figure 4.52). The 3Ps and 3Pn quotas for 2006 are shown in Table 4.13.

**Figure 4.51 Newfoundland and Labrador Snow Crab Fishing Areas**

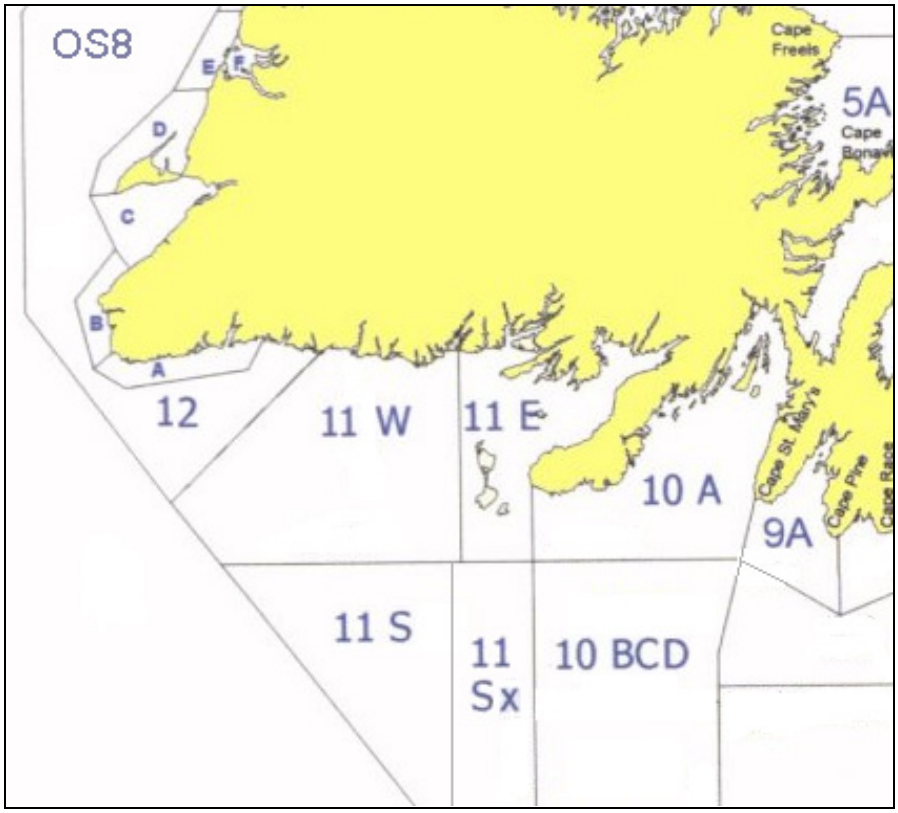



**Figure 4.52 Strategic Environmental Assessment Area Unit Areas Snow Crab Harvest by Month, 2003 to 2005 Average**

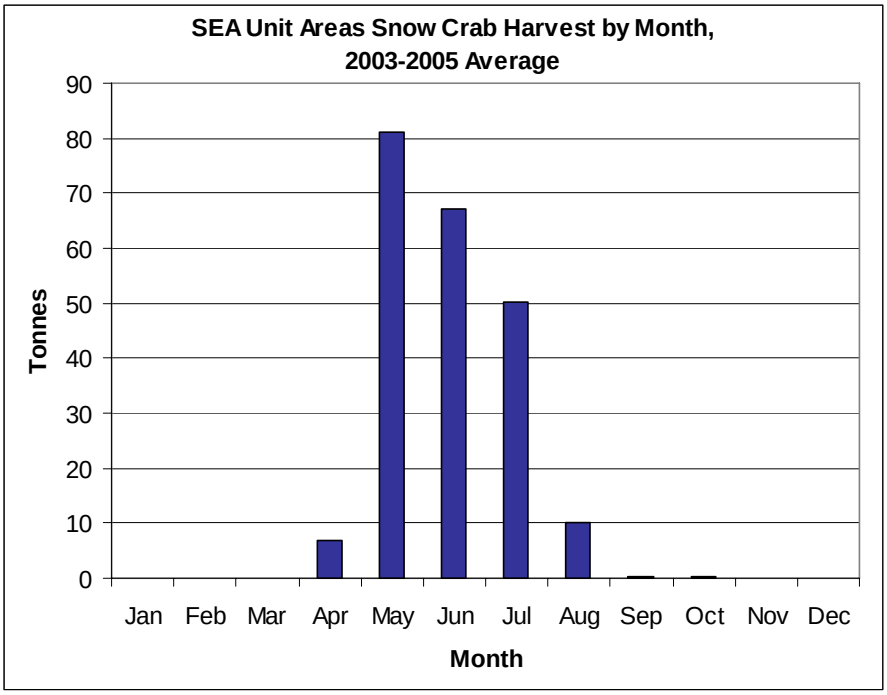


**Table 4.13 3Ps and 3Pn Snow Crab Quotas, 2006**

| Area | Category/Quota Definition | Quota (Tonnes) |
|---|---|---|
| **3Ps** | | |
| S-Supplementary | CFA 10 Between 46'30"N to 45'35"N (10BCD) | 1,885 |
| | CFA 10 Exploratory South of 45'35"N (10X) | 0 |
| | CFA 11 South of 46'30" N (11S) | 160 |
| Total Supplementary | | 2,045 |
| I-Inshore | CFA 10 North of 46'30"N (10A) | 450 |
| | CFA 10 North of 46'30"N Outside 12 miles (10A) | 525 |
| | CFA 11 East of Western Head < 35' (11E) | 0 |
| | CFA 11 South of 46'30"N > 35' (11S) | 25 |
| | CFA 11 S. of 46'30N / W. of 56'30W >35 Exp (11SX) | 0 |
| | CFA 11 West of Western Head Hare Bay (11W) | 0 |
| Total Inshore | | 1,000 |
| Total 3Ps | | 3,045 |
| **3Pn** | | |
| I-Inshore | LaPoile Bay (12A) - Index Fishery | 0 |
| Source: NL Region Species Quota Reports, Snow Crab (DFO 2006m). | | |

## Whelks

Although it accounted for only 0.3 percent of the harvest in the SEA Area Unit Areas in 2003 to 2005, this fishery has been increasing in importance since the early 2000s, particularly within Unit Areas 3Psa and 3Psd within the SEA Area. The harvest from the Subdivision 3Ps fishery over the last 20 years is shown in Figure 4.53. The recorded harvesting locations are shown in Figure 4.54. This species is fished using pots, mainly during June to September

**Figure 4.53 Subdivision 3Ps Harvest of Whelks, 1986 to 2005**

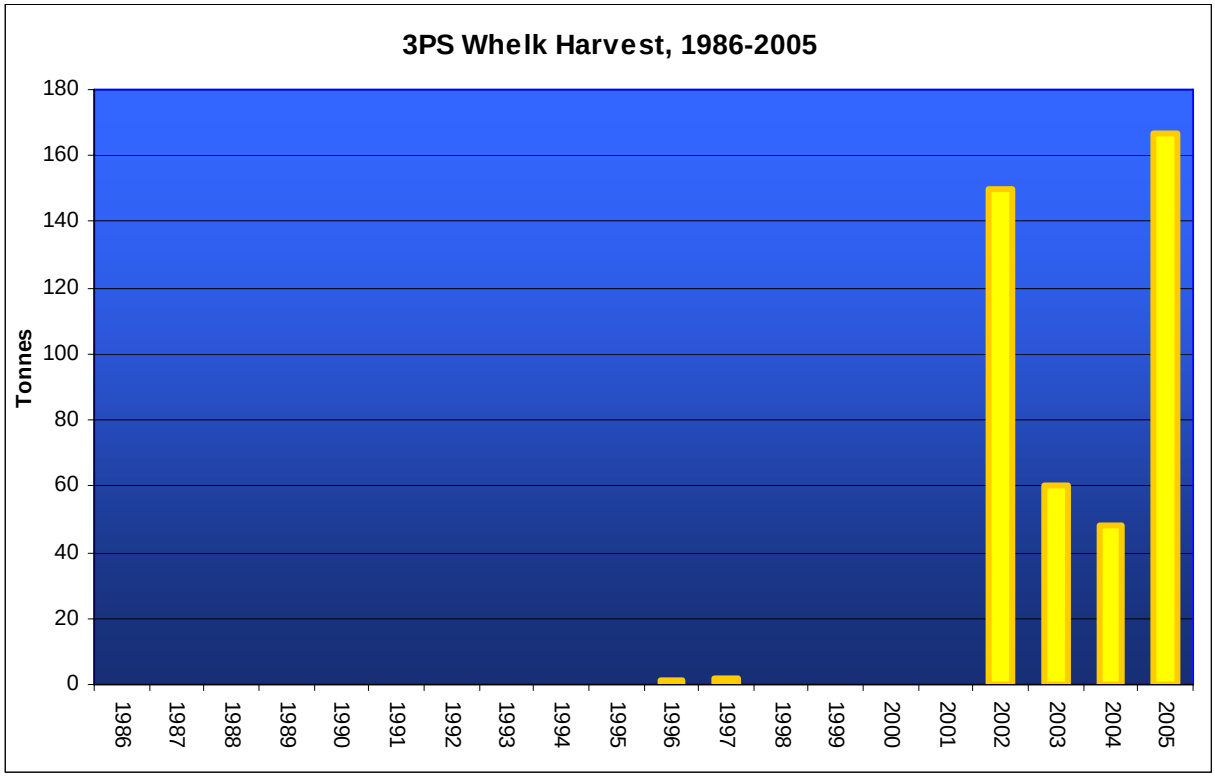
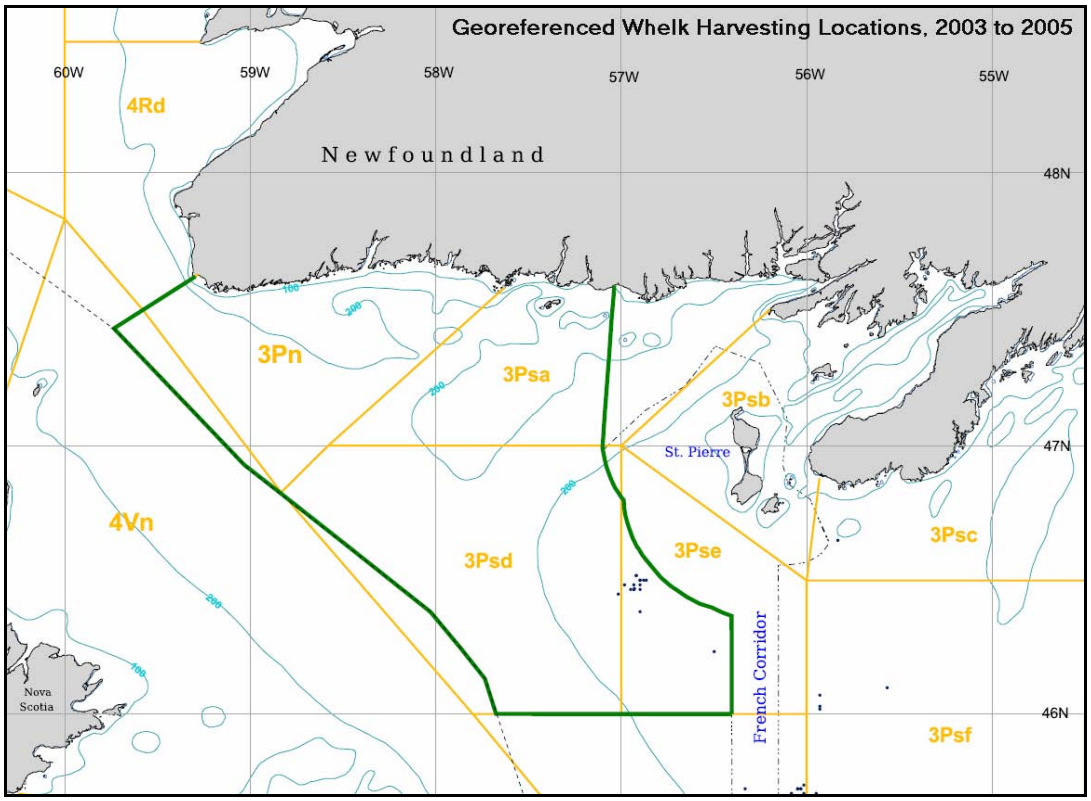


**Figure 4.54 Georeferenced Whelk Harvesting Locations, 2003 to 2005**




#### 4.4.3.5 Other Fisheries

**Witch Flounder**

The average annual catch for witch flounder in 3Ps during 1996 to 2004 is approximately 470 tons, which is approximately 60 percent of 1983 to 1990 average (800 tons) (Maddock-Parsons 2005b). The mean biomass index for 1996 to 2005 is approximately 79 percent of the biomass index for the 1983 to 1990 period. The biomass index achieved its lowest point in 1999 but has been continually increasing. The length frequency distributions have indicated little change in population size compositions for over 20 years. There has been no indication of change in recruitment over the same time period.

**Pollock**

The exploitation of 3Ps pollock is a result of cod fishery by-catches. Pollock catches have remained constant at less than 1,000 plus since the reopening of the cod fishery in 1997 (DFO 2006f). Available information is insufficient to assess stock levels. Data collected from bottom trawls are not appropriate for pollock indices due to their pelagic nature. The persistence of warmer conditions in 3Ps would improve overall potential for survival as pollock resident in 3Ps are at their most northern limit.

**Thorny Skate**

Commercial exploitation of thorny skate is located primarily in 3LNO and 3PS, with limited exploitation in 3K (Kulka and Miri 2003a). It is thought that significant by-catch of skate has occurred since offshore fishing commenced in the late 1940s (Kulka and Mowbray 1998) and most was discarded by the Canadian fleet. It is estimated that the Canadian fleet discarded 5,000 tons of thorny skate annually

during the 1980s and early 1990s. Thorny skate were retained as by-catch by foreign fleets until the mid 1980s. In 1985, Spain began targeting thorny skate in a non-regulated fishery outside the 200 mile limit of the tail of the Grand Banks. The thorny skate fishery is regulated by quota inside the 200 mile limit, thorny skate fishery outside the limit are unregulated (Kulka and Miri 2003a). This has resulted in thorny skate exploitation by Spain increasing its catches from 4,700 tons in 1999 to 10,700 tons in 2000 while possibly maintain catches in excess of 10,000 tons to date (Kulka and Miri 2003a). In 2000, Russia also commenced a directed fishery for thorny skate in the vicinity of the Spanish thorny skate fishery. The development of the thorny skate fisheries was a direct result of the collapse of groundfish stocks.

**Lumpfish**

The lumpfish fishery is directed at females for the caviar market (DFO 2006h). Demand for lumpfish flesh is weak due to high water content, low fat and protein levels. Lumpfish if exploration began in Newfoundland and Labrador in 1969 with the majority of fishery executed on the northern and southern coasts of Newfoundland and Labrador.

There have been two major peaks in lumpfish roe landing for 3Pn, the late 1980s and 1990s. The annual average roe landing for 3Pn is 144 tons for the period of 1980 to 2005. The trends in annual yields for 3Pn exhibited a peak in 1999 to 2000 followed by a low in 2002 and increase until 2005. However, as fishery performance is greatly influenced by market conditions, the annual yields may not reflect lumpfish abundance.

#### 4.4.3.6 Emerging Fisheries

A fishery for sea cucumber is emerging, or potentially developing, within parts of the SEA Area in recent years.

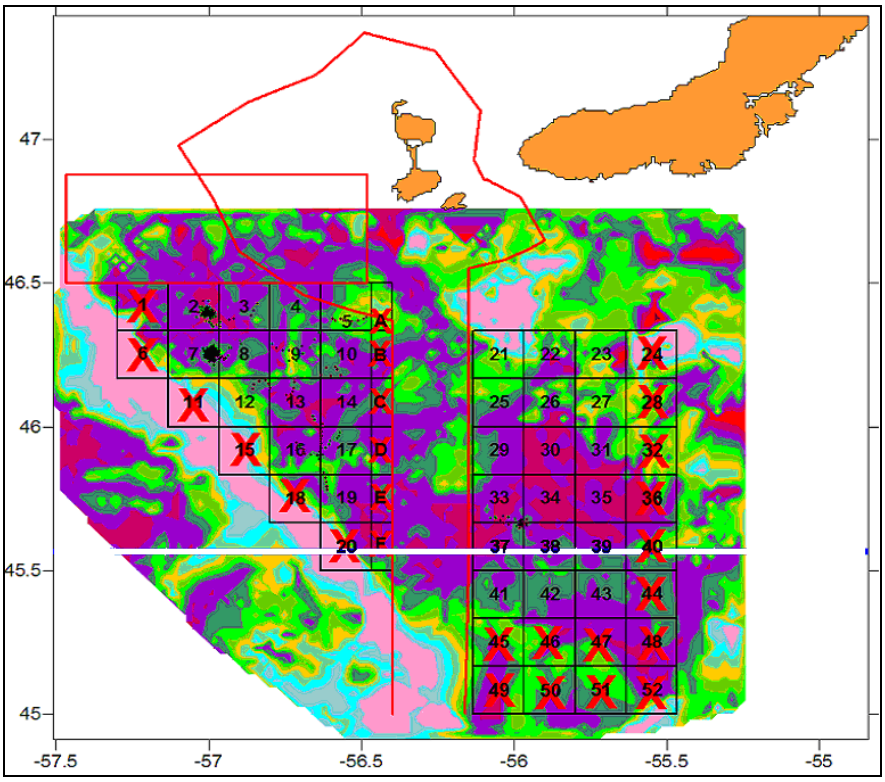
**Sea Cucumbers**

An experimental fishery for sea cucumber began in the St. Pierre Bank area in 2003 and continued in 2004. The experimental fishery is designed to obtain more scientific data on the species and investigate its potential in a commercial fishery. DFO reports that not much is known yet about the population and distribution of this species. Eight vessels were involved, with each enterprise assigned a specific area to harvest this species and undertake survey work. DFO established a tentative total catch of 454 tonnes for 2004 and increased this to 613 tonnes for 2005/2006. This fishery began in early June and some fishers harvested this species into November in 2003.

The gear (mobile) is a modified sea urchin drag approximately 6.5 feet wide to which a 15-foot bag is attached. The gear is towed along the seabed in much the same way as a scallop rake/dredge (E. Way, pers. comm.; D. Stansbury, pers. comm.).

The areas set aside for this experimental fishery are located on either side of the French Corridor. The overall experimental fishing area and the 52 grids are shown in Figure 4.55. The eastern grids are outside the SEA Area.

**Figure 4.55 2004 Sea Cucumber Harvesting Location and Grid**




FFAWU's biologist reports that the 2006 sea cucumber survey area and research locations will be the same as in previous years. These research activities will continue for at least two more years (i.e., until 2008) before sufficient biological/ecological data are available to determine if this species can be harvested on a commercial basis; in the meantime, these fisheries activities will continue to fall within the emerging fisheries program. The FFAWU notes that harvesters have been generally fishing sea cucumber between April and October and are required to sample the survey grids before they are permitted to harvest their compensatory allocations (K. Sullivan, pers comm.).

### 4.4.3.7 Fisheries and Oceans Canada Science Surveys

Fisheries research surveys conducted by DFO, and sometimes by the fishing industry, are important to the commercial fisheries to determine stock status, as well as for scientific investigation. The relevant 2006 DFO research survey schedule plan for Newfoundland and Labrador Region (B. Brodie, pers. comm.) that might overlap with the SEA Area is shown in Table 4.14, though this schedule might change from year to year in the future.

**Table 4.14 Fisheries and Oceans Canada Survey Schedule, Relevant Areas, Newfoundland and Labrador, 2006**

| Scientist | Survey | Start | End |
|---|---|---|---|
| B. Brodie | 3Ps Multi-Species Survey | 11 April | 23 May |

There is also a bi-annual industry-led redfish survey in Unit 2. As described in Appendix B (report on consultations), DFO's manager for redfish noted that it is somewhat difficult to predict its timing and location. The research is presently organized and undertaken by the fishing industry under the aegis of GEAC. At present, the survey is usually conducted in August. GEAC also conducts an annual cod survey

on the St. Pierre Banks in late November early December, and an annual halibut survey in the Laurentian Channel area which overlaps to a small extent with the SEA Area.

Other relevant research activities include a 3Ps hagfish survey organized by DFO (E. Way, pers. comm.) in conjunction with the fishing industry. This takes place in various locations within 3Ps.

Each project-specific EA will need to consult with DFO and industry groups, such as GEAC, about current-year plans for the relevant areas

### 4.4.4 Aquaculture

At present, there is no approved aquaculture site in the SEA Area (NFDLA review comment, pers. comm.).

### 4.4.5 Underused Fish and Shellfish Species

Underused/emerging fish and shellfish species in Subdivisions 3Pn and 3Ps identified by NLDFA and DFO include rock crab (*Cancer irroratus*), toad crab, sea urchin and shrimp. Exploratory licenses have been issued for smelt, salmon, eel, herring and sea cucumber, and licenses for a habitat survey and new gear technology have been issued (A. Rumbolt, pers. comm.). In addition, there are research activities underway to include an experimental 3Ps hagfish survey, organized by DFO (E. Way, pers. comm.), in cooperation with the fishing industry (Canning & Pitt 2006). Distribution of these species within the SEA Area will be included upon receipt of RV Data from DFO.

### 4.4.6 Data Gaps for Fish and Fisheries

There are a variety of uncertainties related to fish and fisheries that may affect the information provided on certain species and resource exploitation in the SEA Area. Description and details on a variety of fish species may be limited due in part to existing data gaps, including a paucity of information with respect to species life history and catch history. Uncertainties with respect to catch history data gaps are primarily related to uncertainty associated with the reliability of catch information outside of the 200 mile limit and for unregulated fisheries. The impact of environmental variations (in particular temperature variations) on natural mortality, production and recruitment is poorly understood.

The distribution of fish and shellfish eggs and larvae is not well understood in the SEA Area. Specific areas have been identified as spawning areas for species, but there is little information available regarding the passive movements of ichthyoplankton. Also, there is little scientific data regarding nursery areas within the SEA Area, although they are believed to exist on the western St. Pierre Bank (J. Brattey, pers. comm.; D. Mercer, pers. comm.).

Efforts to verify fisher observations in regard to cod spawning timing, wolffish abundance, wolffish diet and lumpfish distribution in the SEA Area (Canning & Pitt 2006) are required. A study has been conducted on the migration of Northern Gulf cod and the extent of it's mixing with 3Ps cod was conducted in 2005 and is due to be published later this year (M. Castonguay, pers. comm.).

It is difficult to accurately describe and assess the population size and structure of several species in the SEA Area, as several species have not been recently assessed by DFO. The last full assessment of Iceland scallop stock on St. Pierre Bank was conducted in 1992 and there is no assessment currently scheduled by DFO (DFO 2006b). DFO (2005a) states that there is insufficient independent snow crab

data for NAFO Subdivision 3Pn. Recent surveys of Atlantic salmon stocks have not included the south coast rivers in SFA11 and SFA12 that occur in the SEA Area, concentrating surveys on west coast rivers (O'Connell et al. 2006; Dempson et al. 2006; Poole 2004). There is little information relating to pelagic fishes in the SEA Area. An assessment of herring stocks on the south coast is ongoing (J. Wheeler, pers. comm.).

Addition information with respect to data gaps is identified for selected species in subsequent sections when these data gaps were specifically highlighted in the literature. Project-specific environmental assessments should confirm that data gaps are still relevant and have not been addressed or new data gaps identified.

#### 4.4.6.1 Atlantic Cod

A major source of uncertainty with respect to Atlantic Cod centers around the degree and extent of migration of northern Gulf cod into 3Ps. The uncertainties regarding northern Gulf cod migration into 3Ps has resulted in closure of 3Psd (portion of Burgeo Bank) to the cod fishery from November 15 to April 15 (DFO 2005b). The counting fence project (DFO 2005b) highlight the fact that a variable proportion of northern Gulf cod are still present in 3Ps during the April 3Ps abundance survey and as such may be bias as abundance estimates of cod in 3Ps.

#### 4.4.6.2 Redfish

Due to the uncertainty with redfish stock mixing (Unit 1 and Unit 2), identification issues with respect to redfish species and the implications related to the presence of introgressive hybridication individuals, it is not possible to determine the impact of late fall and winter in 3Pn and Cabot Strait on Unit 1 and Unit 2 stocks (DFO 2004a; 2004b). Conservation practices require continuation of fisheries closures in 3Pn and 4Vn from October to December to limit exploitation of redfish during the mixing period. The necessity of fisheries closure coupled with lack of genetic differentiation between units and similarities in year class production result in uncertainties with respect to current management strategies (two separate units versus Unit 1). The long term impact of the Unit 2 fishery on future recruitment to both Unit 1 and Unit 2 is unknown.

Recent water temperatures are more suitable for redfish, resulting in a possibility of improved recruitment. However, the possible impacts of environmental variations (warmer water temperatures) on redfish recruitment will not be known for several years.

#### 4.4.6.3 Skate

There are data gaps for skate associated with growth rates, age of maturity, population age structure and migration mechanisms (Kulka and Mowbray 1998).

#### 4.4.6.4 White Hake

There are uncertainties with respect to management practices for White hake that may bias stock status assessments considering that White hake from 3LNO + 3Ps may represent a single spawning unit (Kulka et al. 2005b). The use of different survey techniques and timing for 3Pn/4R may result in a bias with respect to juvenile fish when assessing 3LNOPs stock.

#### 4.4.6.5 Monkfish

Size, growth rates, ages, maturity, fecundity, stock structure and migration patterns are essentially unknown for monkfish as they are not routinely studied (DFO 2003c). Survey and commercial gear do not catch smaller fish and there is no information on the young Monkfish stages (Kulka and Miri 2003).

#### 4.4.6.6 Witch Founder

Age data from fishery and DFO surveys has not be collected since 1994, therefore information is not available on mortality, growth and maturity rates which are necessary for stock assessments (Maddock-Parsons 2005b).

### 4.4.7 Planning Implications for Fish and Fisheries

Sensitive times for fish include spawning periods and larval periods. The tables below outline the times when those fish species harvested commercially are spawning (Table 4.15) and times when pelagic larval stages are present (Table 4.16). Most commercial species spawn during the spring and summer, but cod and skate reproduce throughout most of the year. Most larval and juvenile pelagic life stages are present in the SEA Area in the late summer and fall. Timing of spawning and sensitive life stages are discussed in detail in the above species descriptions.

Directed cod and redfish fisheries in the SEA Area are each closed for several months each year due to declining stocks (Table 4.17). Specific mitigative measures for avoidance of sensitive times would likely be established in consultation with authorities for site-specific environmental assessments.

**Table 4.15 Spawning Times of Commercial Fish and Shellfish Species in the Strategic Environmental Assessment Area**

| Species | Spawning Period |
|---|---|
| American Plaice | April |
| Atlantic Cod | Year round |
| Atlantic Halibut | February to April |
| Greenland Halibut | January to March |
| Haddock | June |
| Herring | Unknown |
| Lobster | April to August |
| Monkfish | June to September |
| Pollock | Unknown |
| Redfish | April to June |
| Scallops, Iceland | August to October |
| Scallops, Sea | August to October |
| Skate | Year round |
| Snow Crab | May to July |
| White Hake | April to August |
| Witch Flounder | April |
| Wolffish | December to February |

**Table 4.16 Time of Year When Pelagic/Sensitive Life Stage is Present in the Water Column within the Strategic Environmental Assessment Area**

| Species | Pelagic/Sensitive Life Stage Period |
|---|---|
| American Plaice | Unknown – Temperature dependant |
| Atlantic Cod | Year round |
| Atlantic Halibut | May and June |
| Greenland Halibut | Unknown |
| Haddock | July to November |
| Herring | Unknown |
| Lobster | August to November |
| Monkfish | June to December |
| Pollock | June to September |
| Redfish | April to July |
| Scallops, Iceland | October to December |
| Scallops, Sea | October to December |
| Skate | Year round |
| Snow Crab | April, May, July to October |
| White Hake | Unknown |
| Witch Flounder | Year round |
| Wolffish | Unknown |

**Table 4.17 Closure Timing of Commercial Fisheries within the Strategic Environmental Assessment Area**

| Species | NAFO Subdivision Unit | Closure Period | Reason for Closure |
|---|---|---|---|
| Atlantic Cod | 3Ps d,e,g | November 15 – (May 31[a] for inshore 3Ps a, b, c or June 30 –offshore) | Mixing of Northern Gulf and 3Ps stocks<br>*Note a – Inshore fishery may be opened in May with catch limits* |
| Atlantic Cod | 3Ps | March - (May 31[a] for inshore 3Ps a, b, c or June 30 for offshore) | Spawning<br>*Note a – Inshore fishery may be opened in May with catch limits* |
| Atlantic Cod | 3Pn, 4R | April 1 – June 30 | |
| Redfish | 3Pn, 4R | January 1 – June 30 | Unit 2 mixing and spawning |
| Redfish | 3Ps | April 1 - June 30 | Spawning closure - < 65' vessels |
| Redfish | 3Ps, 3Pn | April 1 - June 30 | Spawning closure - >100' - GEAC, 65'-100' vessels |
| Redfish | 3Ps, 3Pn | October 1 – June 30 | Mixing closure - >100' - GEAC, 65'-100' vessels |

Events have shown over several years that gillnets and crab gear are the ones most often involved in a gear conflict in the Newfoundland and Labrador sector (even with chase boats and Fisheries Liaison Officers). Some surveys don't employ guard (chase) boats, and at night, in rough weather and with sea clutter (affecting radar) the buoys - even those using highflyers - are hard to see by anyone. Operators should understand the need for special precautions in fixed gear areas and the potential requirement for using a guard boat.

## 4.5 Marine Birds

The biodiversity of marine southwestern Newfoundland is greatly influenced by the upwelling of nutrient-rich water along the slopes of the offshore banks. This high primary production results in a large number of bird species visiting the region (Table 4.18).

**Table 4.18 Marine Bird Species List for the Strategic Environmental Assessment Area**

| Common Name | Species Name | Common Name | Species Name |
|---|---|---|---|
| **Order Anseriformes (Ducks and Geese)** | | **Order Charadriiformes (Shorebirds, Gulls, and Alcids) (cont)** | |
| Canda Goose | *Branta canadensis* | Lesser Yellowlegs | *Tringa flavipes* |
| American Black Duck | *Anas rubripes* | Whimbrel | *Numenius phaeopus* |
| Common Eider | *Somateria mollissima* | Ruddy Turnstone | *Arenaria interpres* |
| Harlequin Duck | *Histrionicus histrionicus* | Red Knot | *Calidris canatus* |
| White-winged Scoter | *Melanitta fusca* | Sanderling | *Calidris alba* |
| Black Scoter | *Melanitta nigra* | Semipalmated Sandpiper | *Calidris pusilla* |
| Long-tailed Duck | *Clangula hyemalis* | Least Sandpiper | *Calidris minutilla* |
| Common Goldeneye | *Bucephala clangula* | White-rumped Sandpiper | *Calidris fuscicollis* |
| Red-breasted Merganser | *Mergus serrator* | Pectoral Sandpiper | *Calidris melanotos* |
| **Order Gaviiformes (Loons)** | | Purple Sandpiper | *Calidris maritima* |
| Red-throated Loon | *Gavia stellata* | Dunlin | *Calidris alpina* |
| Common Loon | *Gavia immer* | Short-billed Dowitcher | *Limnodromus griseus* |
| **Order Podicepidiformes (Grebes)** | | Red Phalarope | *Phalaropus fulicari* |
| Pied-billed Grebe | *Podilymbus podiceps* | Red-necked Phalarope | *Phalaropus lobatus* |
| Red-necked Grebe | *Podiceps grisegena* | Laughing Gull | *Larus atricilla* |
| **Order Procellariformes (Tube-nosed Seabirds)** | | Ring-billed Gull | *Larus delewarensis* |
| Northern Fulmar | *Fulmarus glacialis* | Herring Gull | *Larus argentatus* |
| Cory's Shearwater | *Calonectris diomedea* | Iceland Gull | *Larus glaucoides* |
| Greater Shearwater | *Puffinus gravis* | Lesser Black-backed Gull | *Larus fuscus* |
| Sooty Shearwater | *Puffinus griseus* | Great Black-backed Gull | *Larus marinus* |
| Manx Shearwater | *Puffinus puffinus* | Glaucous Gull | *Larus hyperboreus* |
| Wilson's Storm Petrel | *Oceanites oceanicus* | Sabine's Gull | *Xema sabini* |
| Leach's Storm-Petrel | *Oceanodroma leucorhoa* | Black-legged Kittiwake | *Rissa tridactyla* |
| **Order Pelecaniformes (Pelicans and allies)** | | Common Tern | *Sterna hirundo* |
| Northern Gannet | *Morus bassanus* | Arctic Tern | *Sterna paradisaea* |
| Double-crested Cormorant | *Phalacrocorax auritus* | Great Skua | *Stercorarius skua* |
| Great Cormorant | *Phalacrocorax carbo* | Pomarine Jaeger | *Stercorarius pomarinus* |
| **Order Charadriiformes (Shorebirds, Gulls, and Alcids)** | | Parasitic Jaeger | *Stercorarius parasiticus* |
| Black-bellied Plover | *Pluvialis squatarola* | Long-tailed Jaeger | *Stercorarius longicaudus* |
| American Golden Plover | *Pluvialis dominica* | Dovekie | *Alle alle* |
| Semipalmated Plover | *Charadrius semipalmatus* | Common Murre | *Uria aalge* |
| Piping Plover | *Charadrius melodus* | Thick-billed Murre | *Uria lomvia* |
| Spotted Sandpiper | *Actitis macularia* | Razorbill | *Alca torda* |
| Willet | *Tringa semipalmata* | Black Guillemot | *Cepphus grylle* |
| Solitary Sandpiper | *Tringa solitaria* | Atlantic Puffin | *Fratercula arctica* |
| Greater Yellowlegs | *Tringa melanoleuca* | | |
| Source: from historical data and current distribution maps.<br>List includes species that breed, overwinter, or migrate through the SEA Area. | | | |

### 4.5.1 Seabirds

Seabirds that are known to occur in the SEA Area are listed in Table 4.19. Species composition and abundance within the SEA Area change seasonally, as many of these species are pelagic (return to land only to nest) and/or migratory. Most seabirds spend 90 percent of their lives at sea, foraging over hundreds or thousands of kilometres (Balance et al. 2001). Seabird observation data for this report was obtained from the Canadian Wildlife Service (CWS) and was collected from systematic, ship-based surveys as part of the Programme Intégré des Recherches sur les Oisseaux Pélagiques (PIROP) program since 1966. The data set used in analysis of the SEA Area (CWS PIROP Database) is in Appendix D; raw data was not used for the discussion.

## Table 4.19 Distribution and Abundance of Seabirds Known to Occur in Strategic Environmental Assessment Area

| Common Name | Scientific Name | General Distribution | Abundance | | | |
|---|---|---|---|---|---|---|
| | | | Summer (Jun-Sep) | Fall (Oct-Dec) | Winter (Jan-Mar) | Spring (Apr-May) |
| Northern Fulmar | *Fulmarus glacialis* | Offshore, coastal | Common | Uncommon | Common | Abundant |
| Cory's Shearwater | *Calonectris diomedea* | Offshore | Rare | Absent | Absent | Absent |
| Greater Shearwater | *Puffinus gravis* | Offshore, coastal | Abundant | Uncommon | Absent | Rare |
| Sooty Shearwater | *Puffinus griseus* | Offshore, coastal | Common | Rare | Absent | Rare |
| Manx Shearwater | *Puffinus puffinus* | Offshore, coastal | Scarce | Absent | Absent | Scarce |
| Wilson's Storm-Petrel | *Oceanites oceanicus* | Offshore | Uncommon | Absent | Absent | Absent |
| Leach's Storm-Petrel | *Oceanodroma leucorhoa* | Offshore | Common | Absent | Absent | Uncommon |
| Northern Gannet | *Sula bassanus* | Offshore, coastal | Common | Scarce | Absent | Common |
| Double-crested Cormorant | *Phalacrocorax auritus* | Coastal | Common | Common | Rare | Common |
| Great Cormorant | *Phalacrocorax carbo* | Coastal | Uncommon | Uncommon | Uncommon | Uncommon |
| Laughing Gull | *Larus atricilla* | Coastal, offshore | Rare | Absent | Absent | Absent |
| Ring-billed Gull | *Larus delawarensis* | Coastal, offshore | Common | Common | Rare | Common |
| Herring Gull | *Larus argentatus* | Coastal, offshore | Common | Common | Common | Common |
| Iceland Gull | *Larus glaucoides* | Coastal, offshore | Absent | Scarce | Common | Scarce |
| Lesser Black-backed Gull | *Larus fuscus* | Coastal, offshore | Rare | Rare | Rare | Rare |
| Great Black-backed Gull | *Larus marinus* | Coastal, offshore | Abundant | Common | Abundant | Common |
| Glaucous Gull | *Larus hyperboreus* | Coastal, offshore | Absent | Scarce | Common | Scarce |
| Sabine's Gull | *Xema sabini* | Offshore | Rare | Absent | Absent | Absent |
| Black-legged Kittiwake | *Rissa tridactyla* | Offshore, coastal | Common | Common | Abundant | Uncommon |
| Common Tern | *Sterna hirundo* | Coastal, offshore | Common | Absent | Absent | Rare |
| Arctic Tern | *Sterna paradisaea* | Coastal, offshore | Uncommon | Absent | Absent | Rare |
| Great Skua | *Stercorarous skua* | Offshore | Scarce | Rare | Absent | Absent |
| Pomarine Jaeger | *Stercorarius pomarinus* | Offshore | Uncommon | Uncommon | Absent | Uncommon |
| Parasitic Jaeger | *Stercorarius parasiticus* | Offshore | Uncommon | Uncommon | Absent | Uncommon |
| Long-tailed Jaeger | *Stercorarius longicaudus* | Offshore | Scarce | Scarce | Absent | Scarce |
| Dovekie | *Alle alle* | Offshore, coastal | Absent | Uncommon | Common | Absent |
| Common Murre | *Uria aalge* | Offshore, coastal | Uncommon | Uncommon | Common | Uncommon |
| Thick-billed Murre | *Uria lomvia* | Offshore, coastal | Uncommon | Uncommon | Common | Uncommon |
| Razorbill | *Alca torda* | Offshore, coastal | Uncommon | Uncommon | Uncommon | Uncommon |
| Black Guillemot | *Cepphus grylle* | Coastal | Common | Common | Common | Common |
| Atlantic Puffin | *Fratercula arctica* | Offshore, coastal | Uncommon | Uncommon | Rare | Absent |

Source: Elliot 1991; Mactavish et al. 2003.
From historical data and current distribution.

Greater Shearwater (*Puffinus gravis*), Northern Fulmar (*Fulmaris glacialis*), Black-legged Kittiwake (*Rissa tridactyla*), and Great Black-backed Gull (*Larus marinus*) were found abundant from the ship-based surveys (more than 2,000 individuals present in a season). The period of peak seabird vulnerability in the SEA Area is summer (June through September). This is a particularly sensitive time for seabirds like alcids and Storm-Petrels as they return to land to nest. During this time, they will forage closer to shore rather than far out at sea. Alcids, like the Murre species, are pursuit-divers and are consequently particularly sensitive to oil (Lock et al. 1994) because they spend significant time on the water surface in between dives. Summer is also a sensitive time for other colonial nesters like terns and gulls that congregate in high densities and forage close to shore. Outside of the breeding season, the pelagics like the Leach's Storm-Petrel (*Oceanogroma leucorhoa*) are typically found out at sea instead of on the coast, but Murre species overwinter along the coast in appreciable numbers from December to February (Elliot 1991), as well as several gull species.

#### 4.5.1.1 Seabird Foraging Ecology and Diet

Seabirds are intricately linked with a wide variety of physical marine features. They primarily associate with those that affect the abundance or availability of prey, such as large-scale regimes that affect temperature and primary production and small-scale features that affect prey dispersion (Balance et al. 2001). The primary diet for seabirds in the SEA Area includes fishes, crustaceans, cephalopods, copepods, amphipods and offal. Most seabird species take prey within 0.5 m of the sea surface (Balance et al. 2001), but different species occupy different foraging niches in the marine ecosystem, both in strategy and habitat. Foraging strategies of seabirds in the SEA Area include: (1) plunge diving, which can be deep aerial diving like a Northern Gannet (*Sula bassanus*) (aerial dive plunging) or flying into the water to continue flight-like movements below the surface (pursuit plunging) like the shearwaters; (2) pursuit diving, typical of murres (murres can dive to depths of up to 180 m to forage) (Piatt and Nettleship 1985); (3) dipping, or surface feeding (like gulls and phalaropes); (4) kleptoparasitism (i.e., stealing food from other animals) like jaegers and skuas; and (5) surface plunging typical of terns. Diet and foraging strategies by species group is outlined in Table 4.20.

Seabirds benefit from interactions with other organisms in the ecosystem in obtaining food. Subsurface predators like cetaceans and pinnipeds frequently force prey to the surface, where seabirds can take advantage of high density prey. Seabirds can also benefit by eating injured or disoriented prey from subsurface predators, or from the leftover scraps (Balance et al. 2001).

Seabirds also benefit from interspecific and intraspecific interactions. Most seabirds take advantage of clumped prey by feeding in multispecies flocks (Balance et al. 2001), which has several advantages: (1) diving birds drive prey to the surface for the dipping surface feeders; (2) jaegers and skuas can steal prey from other seabirds in the flock; and (3) flocks are highly visible allowing other seabirds to easily locate prey patches.

**Table 4.20 Foraging Strategy and Diet for Seabirds in the Strategic Environmental Assessment Area**

| Species (Group) | Foraging Strategy | Diet |
|---|---|---|
| **Procellariiformes** | | |
| Northern Fulmar | D | Fish, cephalopods, crustaceans, offal |
| Cory's Shearwater | D, PP | Fish, crustaceans, squid |
| Greater Shearwater | D, PP | Fish, squid, crustaceans, offal |
| Sooty Shearwater | D, PP | Fish, squid, crustaceans, offal |
| Manx Shearwater | D, PP | Fish, cephalopods, crustaceans, offal |
| Leach's and Wilson's Storm-Petrel | D | Fish, amphipods |
| **Pelecaniformes** | | |
| Double-crested and Great Cormorants | PD | Fish, squid |
| Northern Gannet | AP | Fish, squid |
| **Charadriiformes** | | |
| Black-legged Kittiwake | D | Fish, cephalopods, crustaceans, offal |
| Glaucous Gull | D | Fish, cephalopods, crustaceans, offal |
| Great Black-backed Gull | D | Fish, cephalopods, crustaceans, offal, eggs, chicks, birds |
| Herring Gull | D | Fish, cephalopods, crustaceans, offal, eggs, chicks, birds |
| Iceland Gull | D | Fish, cephalopods, crustaceans, offal |
| Jaegers and Skuas | K | Fish |
| Phalaropes | D | Copepods |
| Terns | D, SP | Fish, crustaceans |
| Atlantic Puffin | PD | Fish, invertebrates |
| Black Guillemot | PD | Fish, invertebrates |
| Dovekie | PD | Amphipods, copepods |
| Common Murre | PD | Fish, invertebrates |
| Razorbill | PD | Fish, invertebrates |
| Thick-billed Murre | PD | Fish, invertebrates |

Source: The Birds of North America Online (http://bna.birds.cornell.edu).
Foraging Strategy: D - Dipping (Surface Foraging); SP - Surface Plunging; PP - Pursuit Plunging; AP - Aerial Dive Plunging; K - Kleptoparasitism; PD - Pursuit Diving.

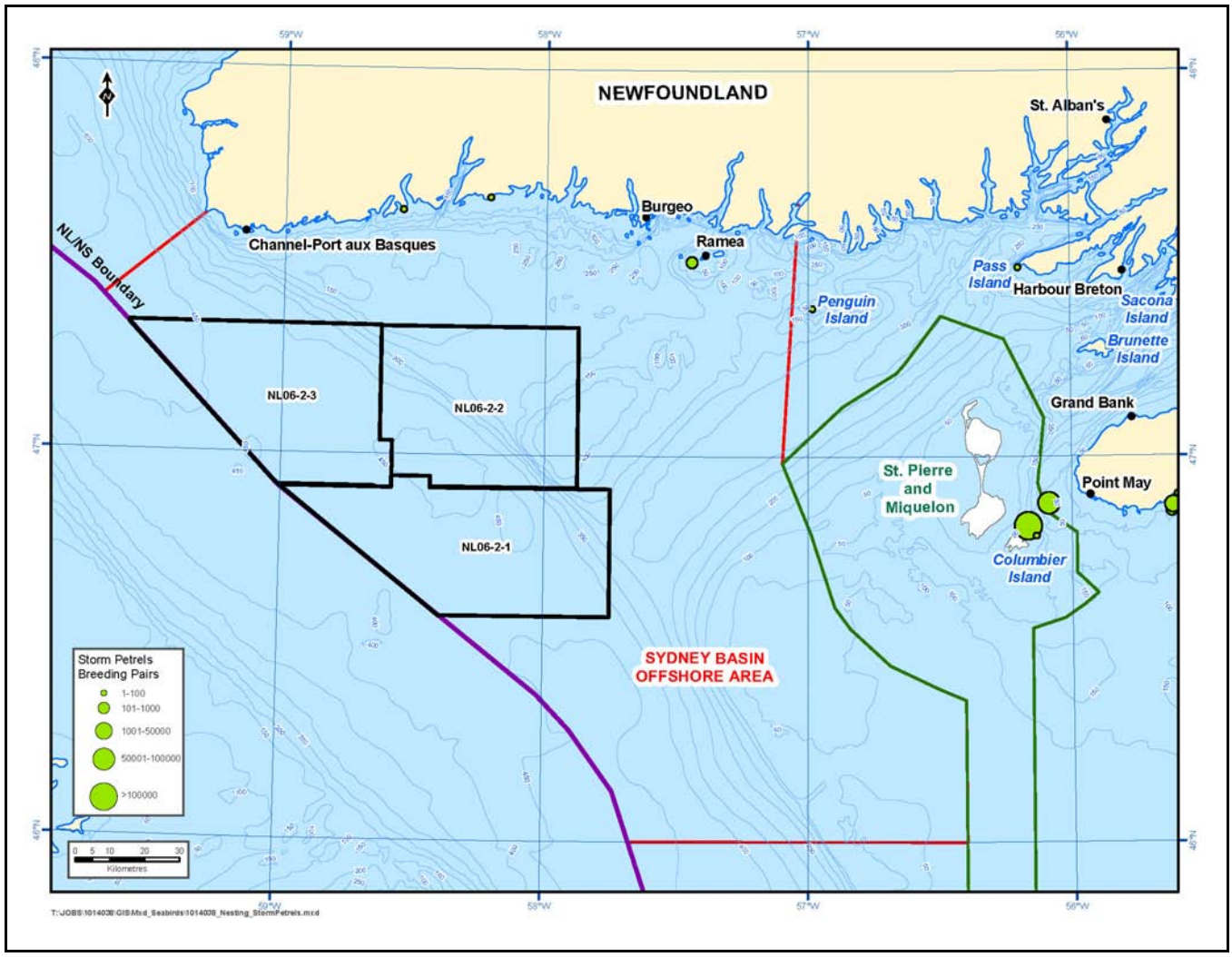
### 4.5.1.2 Seabird Distributions, Nesting Populations and Breeding Biology

Seabird non-breeding distributions are products of several factors. There is a strong relationship between seabird distribution and water masses, primarily through temperature and/or salinity profiles (Balance et al. 2001). Physical gradients (e.g., shelves) are often sites of elevated seabird abundance, especially seasonally. Gradients influence nutrient levels and primary production, which in turn concentrates zooplankton and fish, and consequently attracts higher trophic level organisms like seabirds.

Most of the seabirds in the SEA Area are colonial nesters, sharing breeding space with others of their own species and often with other species. This increased density during breeding season makes some species especially vulnerable to large-scale threats. Egg-laying for these species occurs from mid-May to mid-June, depending on the species. Incubation lasts from three to six weeks (depending on species) and eggs hatch in early summer.

Leach's Storm-Petrels breed in a variety of habitats on marine islands ranging from open raspberry (*Rubus*)/grass meadows to heavily-canopied coniferous forests (Huntington et al. 1996). Leach's Storm-petrels form the largest colonies in the SEA Area, with the largest on Green Island, historically consisting of over 70,000 breeding pairs (Robertson et al. 2002). Colombier Island and Ramea and Penguin Island also have small Storm-Petrel colonies (Figure 4.56). Pass Island and Middle Lawn Island are near the SEA Area, and each have a Storm-Petrel colony (Pass Island - 100 breeding pairs, Middle Lawn Island - >26,000 breeding pairs).

**Figure 4.56 Some Breeding Pair Estimates of Leach's Storm-Petrel in and Around the Strategic Environmental Assessment Area**



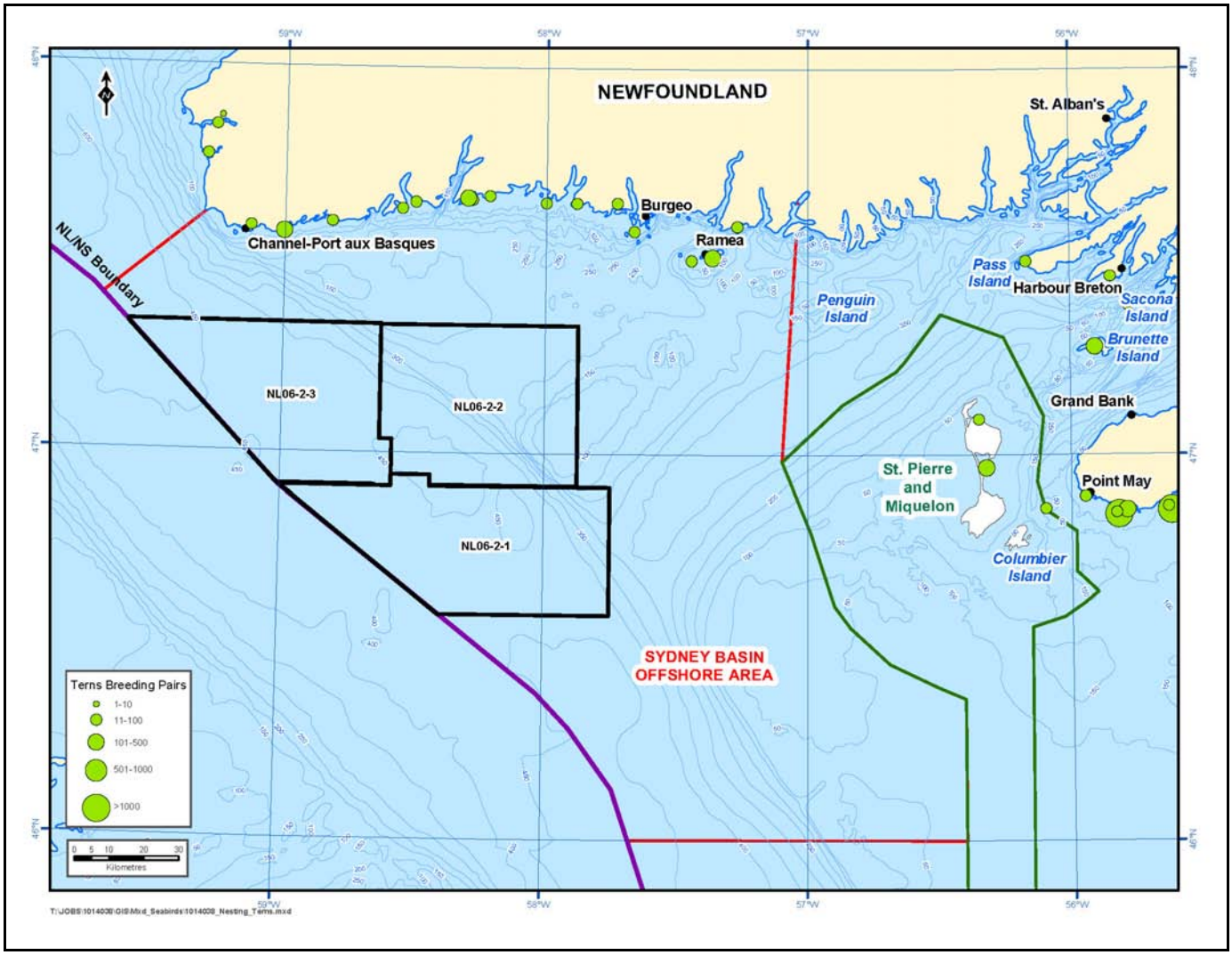

Source: CWS Dataset.

Terns, cormorants, alcids and gulls nest in small colonies along the coast in the SEA Area (Figures 4.57 to 4.59, respectively). Common Tern (*Sterna hirundo*) and Arctic Tern (*S. paradisea*) colonies are found on Ramea, Bird Island (Brunette Island), Sagona Island, St. Pierre et Miquelon and in many other areas along the south coast. Terns usually nest on beaches on coastal islands, in open areas above the high water mark (Nisbet 2002; Gudmundsson 1956). The listed gull species also nest on or near beaches, above high tide on marine terraces (Pierotti and Good 1994), except for the Black-legged Kittiwake, which is a cliff-nester.

There are also several seabird colonies on the islands of St. Pierre et Miquelon, not far from the boundary of the SEA Area. These islands have harbored colonies of Atlantic Puffin (*Fratercula arctica*) and Black Guillemot (*Cepphus grille*). The alcids vary in their nesting substrates, although all of their nests are on cliffs or slopes. Guillemots, dovekies and razorbills (*Alca torda*) usually nest under or between boulders or scree (Butler and Buckley 2002; Hipfner and Chapdelaine 2002; Montevecchi and Stenhouse 2002), while the Atlantic Puffin prefers to burrow in turf-covered slopes (Nettleship 1972). Common and Thick-

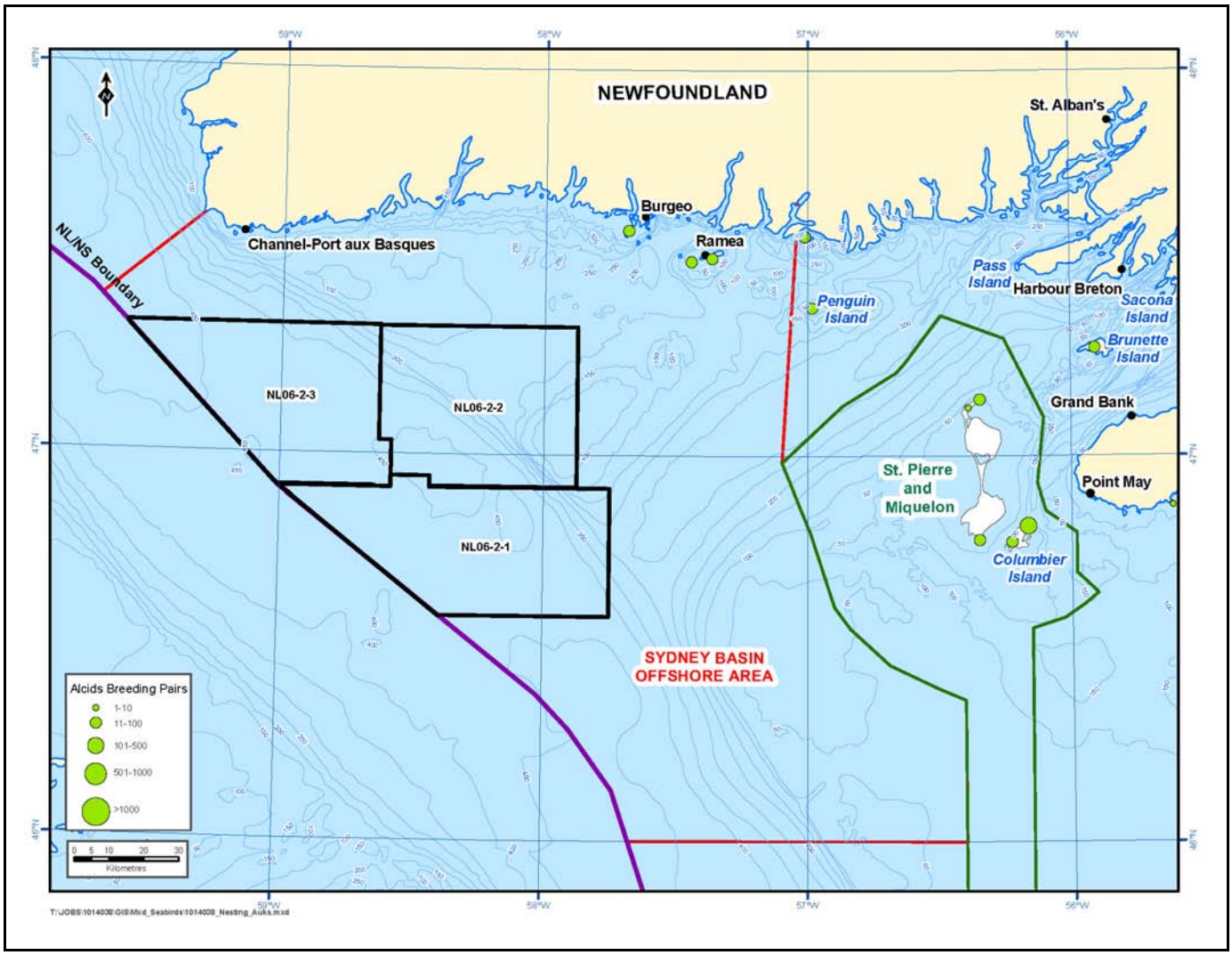
billed (*Uria lomvia*) Murres do not construct nests and lay their egg on the bare rock of a cliff ledge. Both murre species overwinter off the south coast of Newfoundland (Elliot 1991), including within the SEA Area.

**Figure 4.57 Some Breeding Pair Estimates of Common and Arctic Terns in and Around the Strategic Environmental Assessment Area**



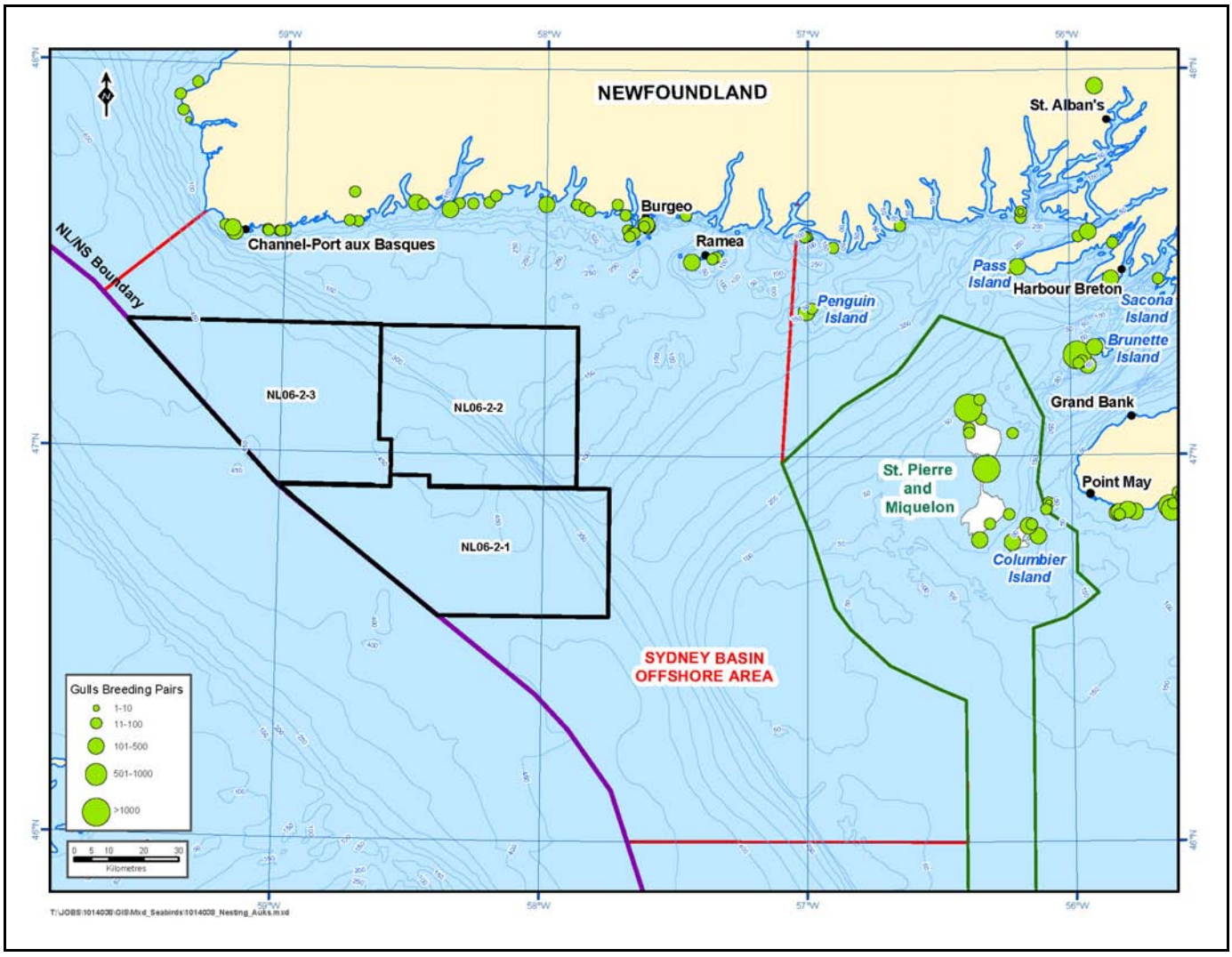

Source: CWS Dataset.

**Figure 4.58 Breeding Pairs of Alcids in and Around the Strategic Environmental Assessment Area**




Source: CWS Dataset.

**Figure 4.59 Breeding Pairs of Gulls in and Around the Strategic Environmental Assessment Area**

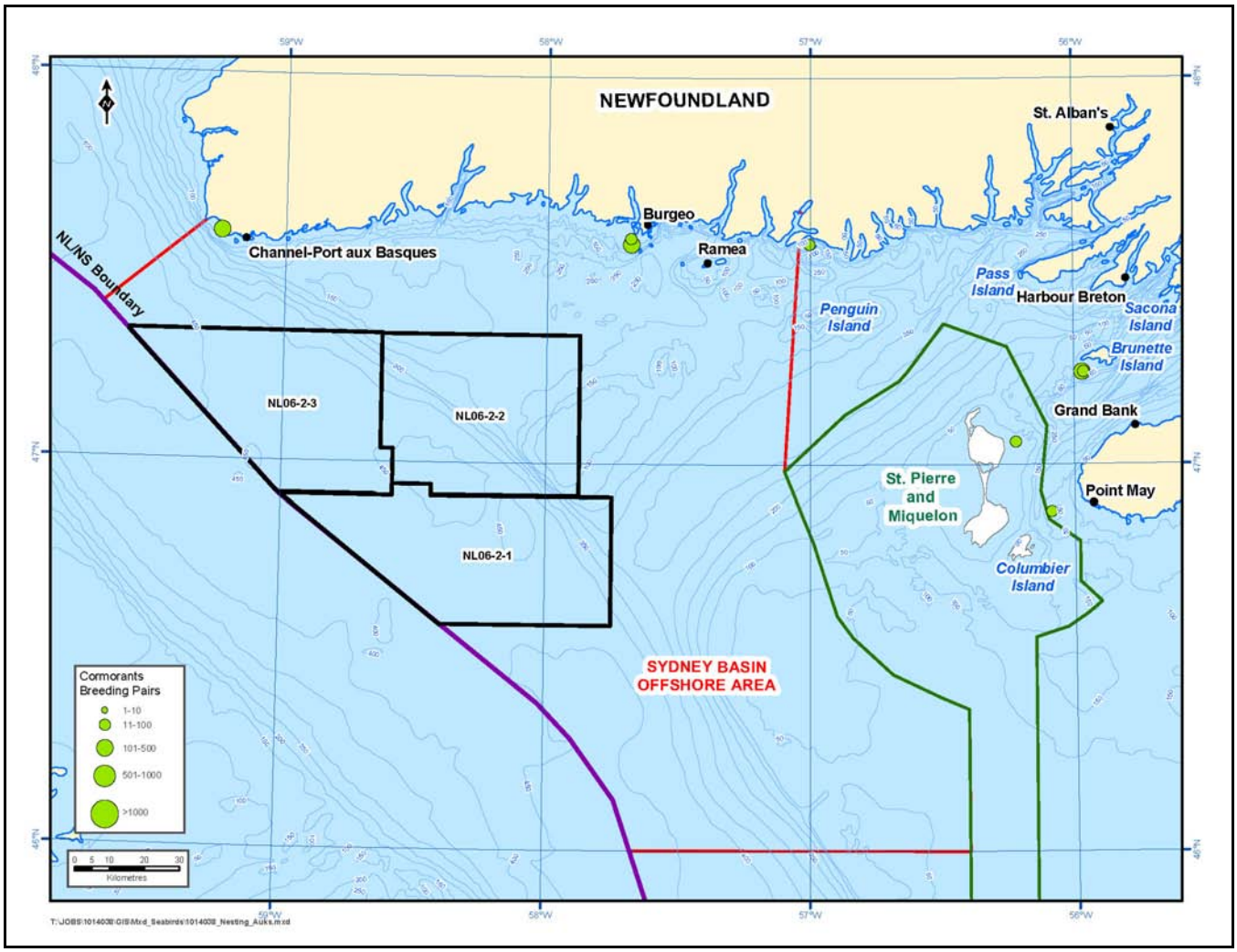



Source: CWS Dataset.

Manx Shearwater (*Puffinus puffinus*) is a seabird species of special interest potentially breeding near the SEA Area. The only known breeding colony in North America is located approximately 125 km east of the boundary of the SEA Area (on Middle Lawn Island). Since 1977, the colony has never been well-established, possibly because of a limiting breeding season or predation by gulls (Robertson 2002). There have been annual visits to Middle Lawn from 2000 to 2006, and the colony has not measurably changed, with a few hundred birds attending. An inspection of burrows in 2006 found a total of 13 eggs/chicks (G. Robertson, pers. comm.). Middle Lawn Island also harbors a colony of Leach's Storm-petrel (historically approximately 26,000 breeding pairs) (Robertson et al. 2002). Another species of interest is the Great Cormorant (*Phalacrocorax carbo*), which has been found on Colombier Island and St. Pierre et Miquelon. Uncommon in Newfoundland, this species breeds on the south and southwest coasts of Newfoundland (Cairns et al. 1989) (Figure 4.60). A third species of interest is the Ivory Gull (*Pagophila eburnea*) (listed as a Special Concern Species under Schedule 1 of SARA), which is sometimes found in small numbers off Newfoundland. However, this rare species is associated with polar pack ice at all times

of year (Gilchrist and Mallory 2005), so it is quite unlikely that this species would be found in the SEA Area.

**Figure 4.60 Breeding Pairs of Double-crested and Great Cormorants in and Around the Strategic Environmental Assessment Area**




Source: CWS Dataset.

## 4.5.2 Waterfowl, Loons, and Grebes

There are two Ducks Unlimited sites present within the SEA Area, one at the Penguin Islands and one at the Grand Bruit Islands. The Harlequin Duck (*Histrionicus histrionicus*) is a waterfowl species of concern in the SEA Area. It is discussed in Section 4.7.1.7.

### 4.5.2.1 Waterfowl, Loons, and Grebes: Foraging Strategies and Prey

Waterfowl, loons and grebes have varied diets, depending on their niche (Table 4.21). Many of these species, like the Common Eider (*Somateria mollissima*) and the scoters, will usually dive to the bottom to forage on mollusks and crustaceans. Others that specialize in catching fish, like the Red-breasted Merganser (*Mergus serrator*) and the loons and grebes, will dive under the surface and chase their prey.

**Table 4.21 Foraging Strategy and Diet for Waterfowl, Loons and Grebes in the Strategic Environmental Assessment Area**

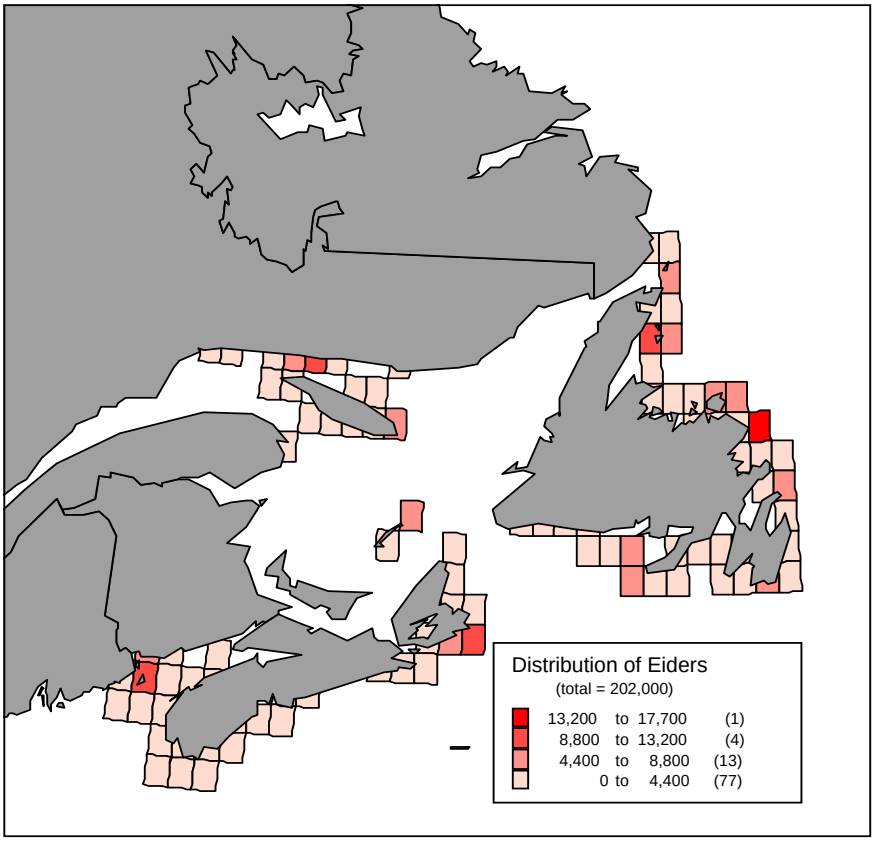
| Species (Group) | Foraging Strategy | Prey | Source |
|---|---|---|---|
| ***Order Anseriformes (Ducks and Geese)*** | | | |
| Canada Goose | Grazing | Grasses, sedges, grains and berries | Mowbray et al. 2002 |
| American Black Duck | Surface dabbling | Aquatic insects, crustaceans, mollusks, and fish | Longcore et al. 2000 |
| Common Eider | Diving | Mollusks, crustaceans, echinoderms | Goudie et al. 2000 |
| Harlequin Duck | Diving | Mollusks, crustaceans, barnacles, fish roe | Robertson and Goudie 1999 |
| White-winged Scoter | Diving | Mollusks, crustaceans, insects | Brown and Frederickson 1997 |
| Black Scoter | Diving | Mollusks, crustaceans | Bordage and Savard 1995 |
| Long-tailed Duck | Diving | Mollusks, crustaceans | Robertson and Savard 2002 |
| Common Goldeneye | Diving | Insects, mollusks, crustaceans | Eadie et al. 1995 |
| Red-breasted Merganser | Pursuit diving | Fish, crustaceans | Titman 1999 |
| ***Order Gaviiformes (Loons)*** | | | |
| Red-throated Loon | Pursuit diving | Fish, crustaceans, mollusks, insects | Barr et al. 2000 |
| Common Loon | Pursuit diving | Fish, crustaceans, leeches | Barr 1973 |
| ***Order Podicepidiformes (Grebes)*** | | | |
| Pied-billed Grebe | Pursuit diving | Fish, crustaceans, insects | Muller and Storer 1999 |
| Red-necked Grebe | Pursuit diving | Fish, crustaceans, insects | Stout and Nuechterlein 1999 |

#### 4.5.2.2 Waterfowl, Loons, and Grebes: Distributions, Nesting Populations and Breeding Biology

Eiders have fallen victim to overhunting, egg-collecting and nest predation and in Newfoundland and southern Labrador, breeding stocks have yet to recover to any extent (CWS website). There are several breeding colonies within the SEA Area but the data set is incomplete. The Common Eider is gregarious, travelling and feeding in flocks numbering from tens to thousands (Figure 4.61). The number of Eider nests on the Northern Peninsula and the coast of Labrador has shown strong positive trends since the early 1990s. Little monitoring has been done on the south coast for this species.

The other waterfowl, loons, and grebes would only use the SEA Area in winter, either having migrated from northerly climes or having come from inland freshwater to find open water for winter. This is true for the Canada Goose (*Branta canadensis*), American Black Duck (*Anas rubripes*), both species of scoter (White-winged (*Melinitta fusca*) and Black (*M. nigra)*, Long-tailed Duck (*Clangula hyemalis*), Common Goldeneye (*Bucephala elangula*), Red-breasted Merganser, both species of loon (Red-throated (*Gavia stellata*) and Common (*G. immer*)), and both species of grebe ((Pied-billed (*Podilmbus podiceps*) and Red-necked (*Podiceps grisegera*)).

**Figure 4.61 Estimated Flock Sizes of Common Eider Along the Newfoundland Coast**




Source: Atlantic Common Eider Survey 2006.

## 4.5.3 Shorebirds

Shorebirds are present in the SEA Area during migration in spring and fall, and some species breed in the area during summer. Plovers, yellowlegs, sandpipers, knots (i.e., Red Knot (*Calidris canutus*)) and phalaropes seasonally use the SEA Area. Two species of phalarope (Red Phalarope (*Phalaropus fulicari*) and Red-necked Phalarope (*P. lobatus*)) are pelagic outside of their breeding season. The SARA-listed Piping Plover is discussed in Section 4.7.1.1.

### 4.5.3.1 Shorebird Foraging Strategies and Prey

Shorebirds vary in their foraging strategies from pecking, probing, routing (manipulation of seaweed or stones by "bulldozing" or turning), plunging (head and neck enter water), sweeping (side to side movements of bill introduced in water), walking and stopping (Barbosa and Moreno 1999).

### 4.5.3.2 Shorebird Distributions, Nesting Populations and Breeding Biology

Near-shore oiling events and human disturbance can impact shorebird nesting behaviour and survival, in addition to breeding habitat loss, migratory stopover habitat loss and declines in food supply. Species that could be affected include the Black-bellied Plover (*Pluvialis squatarola*), American Golden Plover (*P. domiaica*), Piping Plover, Lesser Yellowlegs (*Tringa flavipes*), Solitary Sandpiper (*T. solitaria*), Whimbrel (*Numenius phaeopus*), Ruddy Turnstone (*Arenaria interpres*), Red Knot (*Calidris canatus*), Sanderling (*C.*

*alba*), Dunlin (*C. alpine*), Pectoral Sandpiper (*C. melanotos*), White-rumped Sandpiper (*C. fusciollis*), and Semipalmated Sandpiper (*C. pusilla*).

The Purple Sandpiper (*C. maritima*) differs from these other shorebirds in that it overwinters in the SEA Area. It has the most northerly distribution of all shorebirds in winter, occurring in small groups along exposed, rocky seacoasts of the North Atlantic. The Semipalmated Plover (*Charadrius semipalmatus*) is a species known to breed in the SEA Area in exposed gravel areas or grassy-tundra areas away from the coastline and is present in Newfoundland from April to October. Willet (*Tringa semipalmata*) is rarely found in Newfoundland but has occurred at the Burgeo Sandbanks and may breed there (J. Wells, pers comm.).

### 4.5.4 Data Gaps for Marine Birds

Many of the data used for this report are historical, covering decades in some cases. Bird populations can change drastically over such a time span, due to perturbations and/or natural cycles. Information is deficient on the distribution and abundance of coastal waterfowl on the southern coast of Newfoundland. However, data do exist for certain species. More recent data on seabirds on the southern coast of Newfoundland would be useful in assessing the current state of the distribution and abundance of our seabirds.

There is limited data available with respect to the effects of underwater sound on birds.

### 4.5.5 Planning Implications for Marine Birds

There is a high diversity of birds that use the SEA Area for breeding or overwintering, including two species under SARA and the Newfoundland and Labrador *Endangered Species* Act (2002). Vulnerability to disturbance primarily depends on the species and breeding cycle. Some species are most sensitive during spring/summer nesting time (e.g., Piping Plover, are discussed in Section 4.7.1.1) while others are most sensitive while congregating together in winter (e.g., Harlequin Duck, are discussed in Section 4.7.1.7).

#### 4.5.5.1 Seabirds

Seabirds can be affected by a variety of disturbance at any time of year but would be most sensitive during summer when they are nesting. It is during this time that the pelagic species will forage closer to shore. During drilling activities, a seabird monitoring program should be implemented to collect data on seabird abundance in the area.

#### 4.5.5.2 Waterfowl

A spill could affect the success of the Common Eider, which may be subjected to effects at any time of year (Common Eider breeds and winters in the SEA Area).

#### 4.5.5.3 Shorebirds

Most of the shorebirds in the SEA Area would be similarly affected by disturbance, including the endangered Piping Plover. These species rely on coastal habitat for foraging, and some species also nest there. Anthropogenic effects on the coastline could affect prey abundance or disrupt breeding/

nesting. Measures will have to be taken to ensure that detrimental effects are minimized, especially in areas of known Piping Plover nesting (listed in the Important Bird Areas (IBA) section).

## 4.6 Marine Mammals and Sea Turtles

This summary of marine mammals covers only the marine mammal species that are likely to occur within the SEA Area and are not listed under SARA. Marine mammal species at risk that could occur in the SEA Area include the endangered blue whale (*Balenoptera musculus*) (Section 4.7.1.2), endangered beluga whale (*Delphinapterus leucas*) (Section 4.7.1.5), endangered North Atlantic right whale (*Eubalaena glacialis*) (Section 4.7.1.3), species of concern fin whale (*Balaenoptera physalus*) (Section 4.7.1.11) and endangered leatherback turtle (Section 4.7.1.4).

Single individuals of harbour porpoise, humpback whale and minke whale have been sighted within the three bid parcels between 1979 and 2006 (Appendix E).

### 4.6.1 Mysticetes

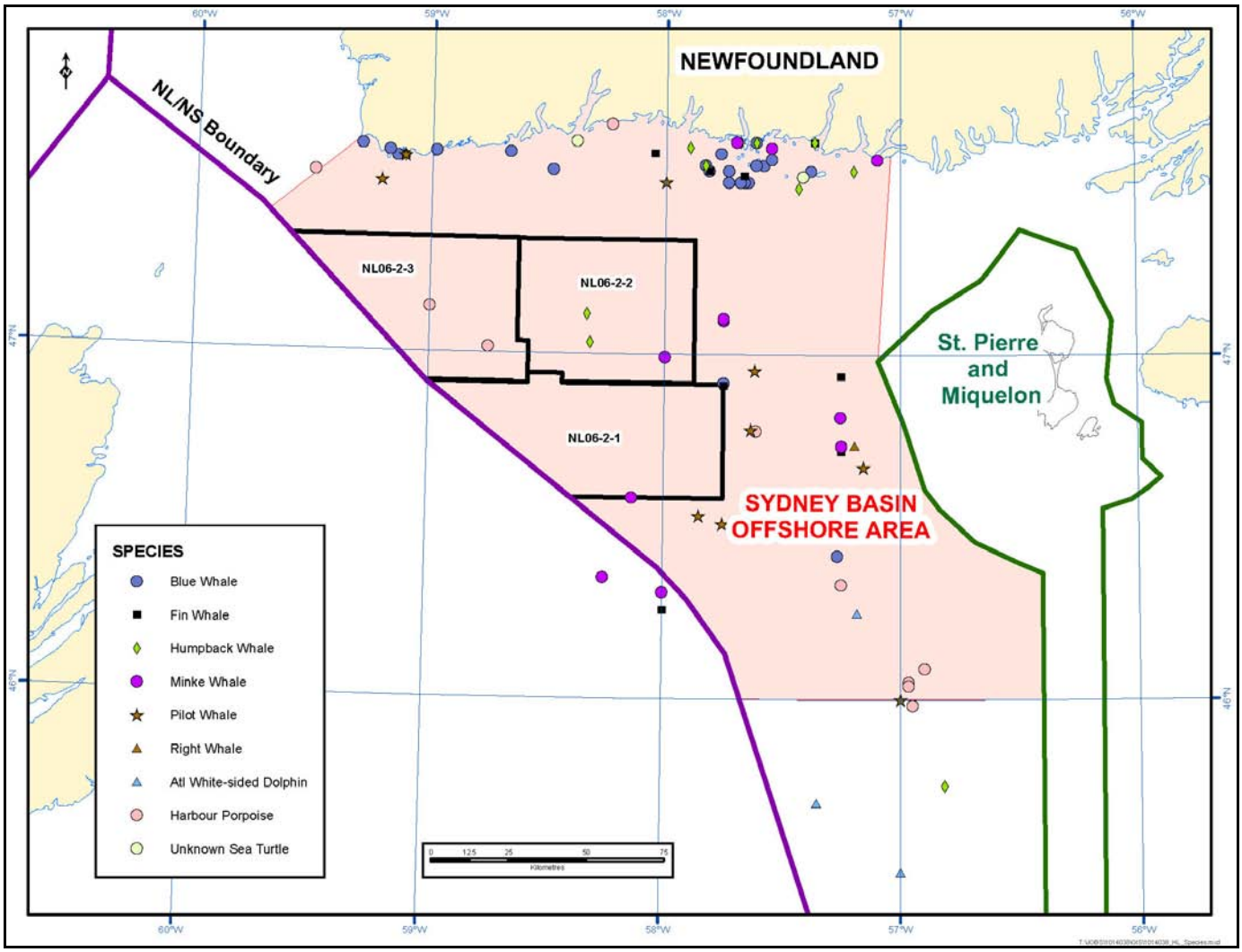
#### 4.6.1.1 Humpback Whale

The North Atlantic population of humpback whales is estimated at over 11,500 individuals and is considered “not at risk” by COSEWIC (COSEWIC 2003a) and they are not a species listed by SARA. The potential threats to humpback whales include reductions in preybase, incidental fishery’s mortalities, vessel collisions and disturbance or injury associated with vessel traffic and/or high-intensity underwater sounds (COSEWIC 2003). Currently, none of the threats are thought to jeopardize population growth. There are a number of potential natural mortality sources including predation, parasites, diseases, biotoxins and accidental beaching or intrapment (Baird 2003). Roughly 1/3 of humpbacks exhibit Killer Whale scars that are thought to have occurred while they calves. Within the SEA Area, humpbacks would likely feed near areas of upwelling, such as shelf breaks. Humpbacks are common on the south coast of Newfoundland. Twenty-six humpbacks have been spotted within the SEA Area between 1979 and 2004 (Appendix E) (Figure 4.62). The humpback whale is found in tropical, temperate and sub polar waters throughout the world (COSEWIC 2003a). Humpbacks are common in coastal waters, occurring in groups of several individuals while feeding on capelin, herring, krill and shrimp. Humpback whales undergo seasonal migrations from high-latitude feeding areas in the summer (i.e. Canadian Waters) to low-latitude breeding and calving grounds (COSEWIC 2003a).

Humpbacks from western and eastern North Atlantic use the west Indies as the primary breeding and calving grounds with small numbers breeding and calving in the Cape Verdes (COSEWIC 2003a). There are three feeding stocks located in Eastern Canada; the Gulf of Maine, the Gulf of St. Lawrence, and the Newfoundland and Labrador stocks. There is some interchange between feeding stocks and juveniles from all three stocks mix in mid-latitude feeding area.

Gestation is 11 to 12 months with a singe calve born every one to three years primarily between December and April (COSEWIC 2003a) with peak numbers of births occurring in January and February (Baird 2003). Calves are normally weaned by two years of age although some will remain with mothers until they are two years old (Baird 2003). In the North Atlantic sexual maturity for females is reached at five years of age.

**Figure 4.62 Marine Mammal Sightings, 1975 to 2006**




### 4.6.1.2 Minke Whale

Minke whales (*Balaenoptera acutorostrata*) occur worldwide and are the most common of the baleen whales. Minkes arrive in the inshore waters of Newfoundland and Labrador in April. Most stay only for the summer and fall as late as October or November; however some individuals remain into the winter. Minke whales are common in shallow water, less than 200 m deep, but may also occur offshore in deeper waters. They are often solitary in the western North Atlantic, but may occur in groups of two or three. They feed on capelin and sand lance (Naud et al. 2003), but also eat planktonic crustaceans, herring, mackerel and, occasionally, squid. An estimate of 1,000 minke whales was made in the Gulf of St. Lawrence during one summer, 600 of which were seen in the northern Gulf (Kingsley and Reeves 1998). Minke whales were accessed by COSEWIC in May 2006 as not at risk. Fourteen minkes have been spotted within the SEA Area between 1980 and 2006 (Appendix E) (Figure 4.62).

### 4.6.1.3 Sei Whale

Sei whales (*Balaenoptera borealis*) are located in all oceans making seasonal migrations from low-latitude wintering areas to high-latitude summer feeding areas (COSEWIC 2003b). The wintering ground

locations are unknown, summer distributions exhibit dramatic year-to-year variations. In Atlantic Canada, the Nova Scotian stock is presumed to be a separate stock from the eastern North Atlantic stock. The evidence supporting a second Atlantic Canada stock, the Labrador stock is uncertain

Sei whales use deep pelagic water as habitat and appear to be associated with the Continental Shelf edge in the Northwest Atlantic (COSEWIC 2003b). Sei whale feeding habitat is dominated by high concentrations of pelagic zooplankton, in particular copepods. Breeding ground habitat is unknown.

Sei whales reach sexual maturity between 5 to 15 years and may live to 60 years of age (COSEWIC 2003b). The gestation period is 10 to 12 months with conception and calving at lower latitudes. Population estimates based on catch percent effort data collected during commercial whale has population estimates at 1,400 to 2,250 individuals in the western Atlantic. However, due to lack of recent data, population estimates for Northwest Atlantic are unknown.

### 4.6.2 Odontocetes

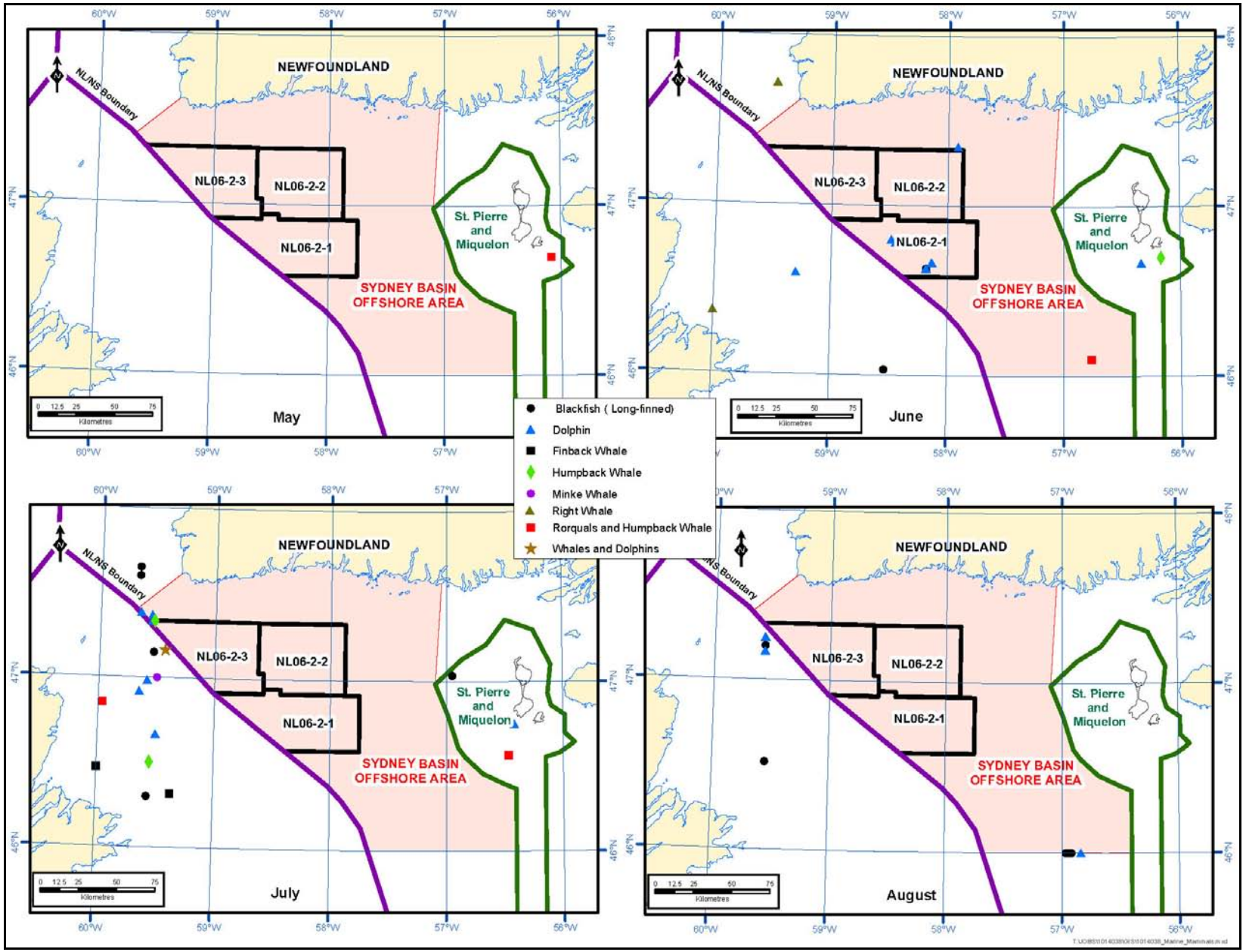
#### 4.6.2.1 Long-finned Pilot Whale

Long-finned pilot whales (*Globicephala macrorhynchus*) (or potheads) are commonly seen in small pods of approximately 10 to 20 individuals. Long-finned pilot whales would be common off the southwest coast of Newfoundland during the summer (Kingsley and Reeves 1998). They are frequently observed along shelf breaks, offshore, but may occur coastally as well. Groups of long-finned pilot whales are occasionally found stranded on beaches. They commonly come close to shore, especially if squid are abundant in the area. Squid is a primary prey item, along with pelagic schooling fish species. The long-finned pilot whale has not been assessed by COSEWIC and is not listed under SARA. One hundred and seventy-seven pilot whales have been spotted within the SEA Area between 1980 and 2003 (Appendix E) (Figure 4.62).

#### 4.6.2.2 Atlantic White-sided Dolphin

Atlantic white-sided dolphins (*Lagenorhynchus acutus*) number in the hundreds of thousands in the North Atlantic (Reeves et al. 1999). Distinct sub-populations of Atlantic white-sided dolphins may occur in the Gulf of Maine, Gulf of St. Lawrence and Labrador Sea (Palka et al. 1997). They are often seen in groups of 50 to 60 individuals and groups of several hundred may occur. A population estimate of 12,000 individuals was made during one summer in the Gulf of St. Lawrence, but the estimate varied greatly during the next summer (Kingsley and Reeves 1998). They are likely common within the SEA Area, especially along shelf breaks, as they occur in the Gulf (Kingsley and Reeves 1998). Their primary food is squid and herring. The Atlantic white-sided dolphin has not been assessed by COSEWIC and is not listed under SARA. Within the SEA Area, the PIROP data indicate “dolphins” are more common within the SEA Area in June than at any other time of year (Figure 4.63). It is assumed that these are Atlantic white-sided dolphins. Sixty-five Atlantic white-sided dolphins have been spotted within the SEA Area between 1975 and 1992 (Appendix E) (Figure 4.62).

**Figure 4.63 Summer Marine Mammal Distribution near the Strategic Environmental Assessment Area**




Source: PIROP data, 1969 to 1987.

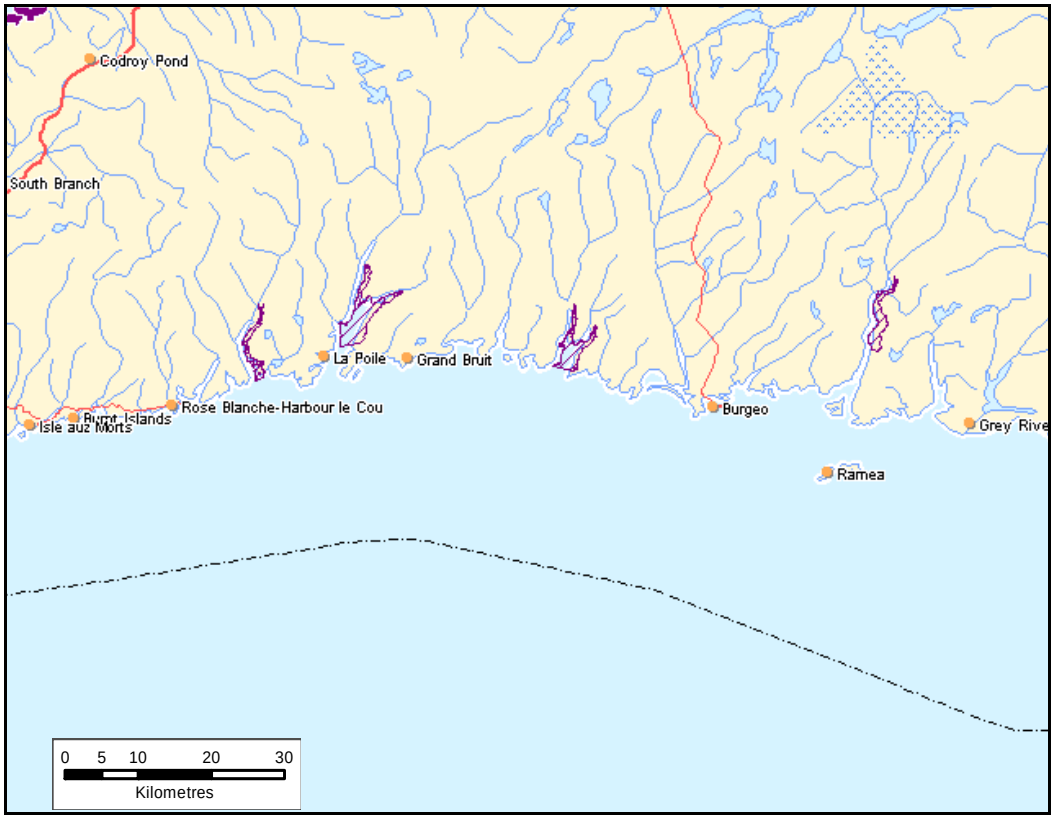
## 4.6.3 Pinnipeds

### 4.6.3.1 Harbour Seals

Harbour seals are year-round residents of the Gulf of St. Lawrence, the St. Lawrence estuary and coastal Newfoundland (Burns 2002). The primary prey of harbour seals in Newfoundland waters are winter flounder, Arctic cod (*Boreogadus saida*), shorthorn sculpin (*Myoxocephalus scorpius*) and Atlantic cod, with some regional variability (Sjare et al. 2005). Harbour seals are common in nearshore shallow waters near river mouths or at particular haul-out sites. Pupping is expected to occur in May or June and pups are nursed for approximately 24 days (Bowen et al. 2001). The pups spend time in the water with the mother following weaning. There have been reports of young of the year pups in the Burgeo area (Sjare et al. 2005).

They likely occur throughout the SEA Area year-round. Known locations of harbour seals are illustrated in Figure 4.64. Harbour seals are commonly seen in the Burgeo area (Sjare et al. 2005) The eastern Canadian population of harbour seals was estimated as 30,000 to 40,000 individuals in 1993 (Burns 2002). Harbour seals are not listed by SARA and considered to have data gaps by COSEWIC.

**Figure 4.64 Harbour Seal Distribution in the Strategic Environmental Assessment Area**




Areas of harbour seal distribution shown in purple (source E-Map http://www.e-map.gc.ca)

#### 4.6.3.2 Harp Seal

The harp seal (*Phoco groenbandica*) population in the Northwest Atlantic was estimated to be between 4 and 6.4 million in 2000 (Healey and Stenson 2000). This population size has been stable since 1996. Harp seals are abundant in the Gulf of St. Lawrence during the winter and, specifically, north of the Magdalen Islands during late winter, when they haul out on the ice and give birth in late February and March (DFO 2000b). Harp seal pups are nursed for approximately 12 to 14 days on the ice. Harp seals then disburse throughout the northern-most Gulf, northeastern Newfoundland and southern Labrador, where moulting aggregations may form in April and May, followed by a migration to Greenland and the eastern Arctic, where they spend the summer (DFO 2000b). Harp seals are likely to be common off western Newfoundland in late fall to early spring and rare at other times of the year (LGL 2005b). They would also likely occur within the SEA Area during the same time. While in this area, Atlantic cod is the primary food of the harp seal, comprising an estimated 42 percent of their diet from October to March.

#### 4.6.3.3 Hooded Seal

The southern Gulf of St. Lawrence is also one of several whelping habitats for the hooded seal (*Cystophora cristata*). Congregations occur in March and April near Prince Edward Island and the Magdalen Islands for pupping and breeding. The moulting migration to the waters off Greenland begins soon after, so hooded seals are widely distributed throughout the western North Atlantic in the summer and fall (Kovacs 2002).

Population estimates are on the order of 500,000 seals (Kovacs 2002), a small portion of which whelps in the southern Gulf (Hammill 1993). Hooded seals feed on benthic invertebrates, Greenland halibut, redfish, Arctic cod and squid.

#### 4.6.3.4 Grey Seals

The Northwest Atlantic stock of grey seals (*Halichoerus grypus)* occurs in the Gulf of St. Lawrence, off Nova Scotia and Newfoundland and Labrador. The largest pupping colony occurs on Sable Island, with a range of 208,000 to 223,000 individuals (Trzcinski et al. 2005); the Gulf of St. Lawrence population (which pups on the ice in the southern Gulf of St. Lawrence) is estimated at 52,500 (Hammill 2005). The Sable Island population will move north during July to September, returning to Sable Island in October to December (Stobo and Zwanenburg 1990). Grey seals may be born from September to March, but peak pupping occurs in January (Hall 2002). Grey seals also congregate in the Gulf of St. Lawrence, between the eastern end of Prince Edward Island and Cape Breton Island and on the ice in St. George's Bay, for pupping and breeding from mid-December to late February (Stobo and Zwanenburg 1990). Pups are weaned in approximately three weeks and soon after grey seals disperse throughout the Gulf, the Scotian Shelf, and along southern Newfoundland. Grey seals are benthic and pelagic predators of herring, cod, flounder, skate, squid, and mackerel (*Scomber scombrus*).

### 4.6.4 Sea Turtles

The leatherback sea turtle is discussed in Section 4.7.1.4.

#### 4.6.4.1 Atlantic Loggerhead Sea Turtle

The Atlantic loggerhead sea turtle (*Caretta caretta*) is the most common sea turtle in North American waters and the largest hard-shelled sea turtle in the world (Ernst et al. 1994). They are found from

coastal areas to more than 200 km out to sea. The North American population is declining, and has been estimated to be between 9,000 and 50,000 adults (Ernst et al. 1994).

Loggerheads are not observed as frequently as leatherbacks on the Scotian Shelf (Breeze et al. 2002). Individuals found in Canadian waters are smaller than those found in the US and are likely younger animals (Witzell 1999). Seventy percent of loggerheads captured accidentally by fishing gear (936 captures) from the Caribbean to Labrador between 1992 and 1995 were captured in waters on and east of the 200 m isobath off the Grand Banks, with captures peaking in September (Witzell 1999). In this area, loggerhead captures correspond closely with fishing effort, as the oceanographic features near the 200 m isobath results in a concentration of loggerhead prey species, such as jellyfish and crustaceans. Loggerheads are known to be primarily benthic feeders of crab, molluscs and gastropods (Plotkin et al. 1993).

#### 4.6.4.2 Kemp's Ridley Sea Turtle

Adult Kemp's ridley turtles (*Lepidochelys kempii*) are typically found in the Gulf of Mexico, where they nest in large numbers. Its population reached a low of 700 females in the late 1980s, but increased in the 1990s as a result of conservation measures (Marquez et al. 1999). Juveniles have an extended range and can be found as far north as Newfoundland (Ernst et al. 1994). Estimates as to the number of juvenile Kemp's ridley turtles occurring in eastern Canadian waters have not been made. They have been listed as 'accidental visitors' to eastern Canada and it is believed that the Scotian Shelf and Newfoundland waters are not important habitats for them (Breeze et al. 2002). Their diet is primarily crabs, but they are also known to feed on molluscs, fish, shrimp and vegetation (see Plotkin 1995)

### 4.6.5 Data Gaps for Marine Mammals and Sea Turtles

Basic life history including biological and ecological information are well known for a limited number of marine mammals and sea turtles. There is limited under standing of migration routes, breeding, calving and feeding areas.

The basic life history gaps lead to uncertainties in abundance estimates and trends. These result in major uncertainties associated with understanding regional and global marine mammal distributions. The main reason for the marine mammal and sea turtle data gaps may be attributable in part to the wide and varied geographical distribution and migration patterns they exhibit.

These data gaps impact the ability to assess the importance of anthropogenic activities on their behaviour and seasonal and geographical distributions. Vessel collisions and disturbances or injury-associated vessel traffic or high-intensity underwater sounds have been identified as threats (COSEWIC 2003a; 2003b). Although there is a variety of research conducted on noise and effects on marine mammals and sea turtles, our understanding is still limited. Understanding of the effects of sound on marine mammals, sea turtles and, in reality, most aquatic species, is affected by understanding actually how "noisy" the ocean is. There are data gaps with respect to subtle effects in behaviors as a result of masking, which, in turn, affects understanding of noise-induced stress and indicators of noise on hearing and resulting behaviors such as feeding, mating activities and calving activities.

There is no data regarding the density/occurrence of loggerheads and Kemp's ridleys in the southern Newfoundland offshore region.

Very little is known about the importance of hearing to sea turtles.

### 4.6.6 Planning Implications for Marine Mammals and Sea Turtles

Seismic/geohazard surveys may have to implement the mitigations listed in Appendix 2 of the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines, Newfoundland Offshore Area*, April 2004.

## 4.7 Species at Risk

The purpose of the SARA is to prevent species becoming extirpated, endangered or extinct; allow for the recovery of extirpated, endangered or threatened species; and to manage species of special concern preventing them from becoming endangered or threatened.

COSEWIC is a committee of experts responsible for the assessment and classification of species as extinct, extirpated, endangered, threatened, special concern, data deficient or not at risk. Species may be added to the SARA list within nine months of recoup of a COSEWIC assessment.

Species on or added to the SARA list are subject to immediate protection on all federal lands, if they are an aquatic species, if they are a migratory bird species, or receive protection through a safety net process. Recovery strategies are required for endangered species threatened and extirpated species, with management plans required for special concern species.

The SARA listed species discussed in subsequent section are based on the SARA listed species as of November 15, 2006. The status of any species within the SEA Area may be changed at any time, requiring project-specific environmental assessments to consider effects to all species, with special emphasis and consideration given to SARA and COSEWIC designated species.

### 4.7.1 *Species at Risk Act*

Schedule 1 of the SARA is the official list of wildlife and plant species at risk in Canada. It legally protects those species classified as extirpated, endangered, threatened, or of special concern. Once a species is listed on Schedule 1, measures to protect it and its critical habitat and help its recovery are implemented. Section 32 of SARA prohibits killing, capturing and destruction of critical habitat for those species listed on Schedule 1 as extirpated, endangered and threatened. These prohibitions do not apply to those listed as special concern (D. Osborne, pers. comm.). All SARA and/or COSEWIC species that may occur in the in the SEA Area are provided in Table 4.22. SARA is administered by Environment Canada, Parks Canada and DFO.

**Table 4.22 Species within the Strategic Environmental Assessment Area with *Species at Risk Act*/Committee on the Status of Endangered Wildlife in Canada Designations**

| Common Name | Scientific Name | Range/ Population | SARA Schedule/Risk Category | COSEWIC Risk Category |
|---|---|---|---|---|
| **Birds** | | | | |
| Barrow's Goldeneye | *Bucephala islandica* | Eastern Population | 1/Special Concern | Special Concern |
| Eskimo Curlew | *Numenius borealis* | Canadian Population | 1/Endangered | Endangered |
| Harlequin Duck | *Histrionicus histrionicus* | Eastern Population | 1/Special Concern | Special Concern |
| Ivory Gull | *Pagophila eburnea* | Northern Population | 1/Special Concern | Endangered |
| Piping Plover, *melodus* subspecies | *Charadrius melodus melodus* | Eastern Population | 1/Endangered | Endangered |
| Red Crossbill | *Loxia curvirostra percna* | Newfoundland Population | 1/Endangered | Endangered |
| **Marine Mammals** | | | | |
| Beluga Whale | *Delphinapterus leucas* | St. Lawrence Estuary Population | 1/Threatened | Threatened |
| Blue Whale | *Balenoptera musculus* | Atlantic Population | 1/Endangered | Endangered |
| Fin Whale | *Balenoptera physalus* | Atlantic Population | 1/Special Concern | Special Concern |
| Harbour Porpoise | *Phocoena phocoena* | Northwest Atlantic Population | None, under consideration for 1/Threatened | Special Concern |
| North Atlantic Right Whale | *Eubalaena glacialis* | Atlantic Ocean | 1/Endangered | Endangered |
| Sowerby's Beaked Whale | *Mesoplodon bidens* | Atlantic Ocean | 3/Special Concern | Special Concern |
| **Fish** | | | | |
| American Eel | *Anguilla rostrata* | Atlantic Population | None | Special Concern |
| Atlantic Cod | *Gadus morhua* | Laurentian North Population | 3/ Special Concern | Threatened |
| Atlantic Wolffish | *Anarhichas lupus* | Atlantic Population | 1/Special Concern | Special Concern |
| Banded Killifish | *Fundulus diaphanus* | Newfoundland Population (Freshwater/ Estuarine) | 1/Special Concern | Special Concern |
| Blue Shark | *Prionace glauca* | Atlantic Population | None | Special Concern |
| Cusk | *Brosme brosme* | Atlantic Population | None | Threatened |
| Northern Wolffish | *Anarhichas denticulatus* | Atlantic Population | Threatened | Threatened |
| Porbeagle Shark | *Lamna nasus* | Atlantic Population | None | Endangered |
| Shortfin Mako | *Isurus oxyrinchus* | Atlantic Population | None | Threatened |
| Spotted Wolffish | *Anarhichas minor* | Atlantic Population | 1/Threatened | Threatened |
| White Shark | *Carcharodon carcharias* | Atlantic Population | None | Endangered |
| Winter Skate | *Leucoraja ocellata* | Northern Gulf - Newfoundland Population | None | Data Deficient |
| | | Eastern Scotian Shelf Population | None | Threatened |
| **Reptiles** | | | | |
| Leatherback Turtle | *Dermochelys coriacea* | Atlantic and Pacific Populations | 1/Endangered | Endangered |
| Source: COSEWIC 2006a; SAR 2006. | | | | |

Endangered and threatened species on SARA Schedule 1 that may occur in the SEA Area include the following:

- Piping Plover *melodus* subspecies - endangered;
- blue whale - endangered;
- North Atlantic right whale - endangered;

- leatherback turtle - endangered;
- beluga whale (St. Lawrence Estuary Population) - threatened;
- northern wolffish - threatened; and
- spotted wolffish - threatened.

Species of special concern listed in Schedule 1 of SARA include:

- Harlequin Duck;
- Barrow's Goldeneye (*Bucephala islandica*);
- Ivory Gull;
- fin whale (*Balaenoptera phybalus*);
- Atlantic wolffish; and
- banded killifish (*Fundulus diaphanous*).

The Eskimo Curlew (*Numenius borealis*) and Red Crossbill (*Loxia curvirostra percna*) are listed as endangered on Schedule 1 of SARA and are known to occur in Newfoundland and Labrador; however, they are not expected to be found within the SEA Area (J. Goulet, pers. comm.).

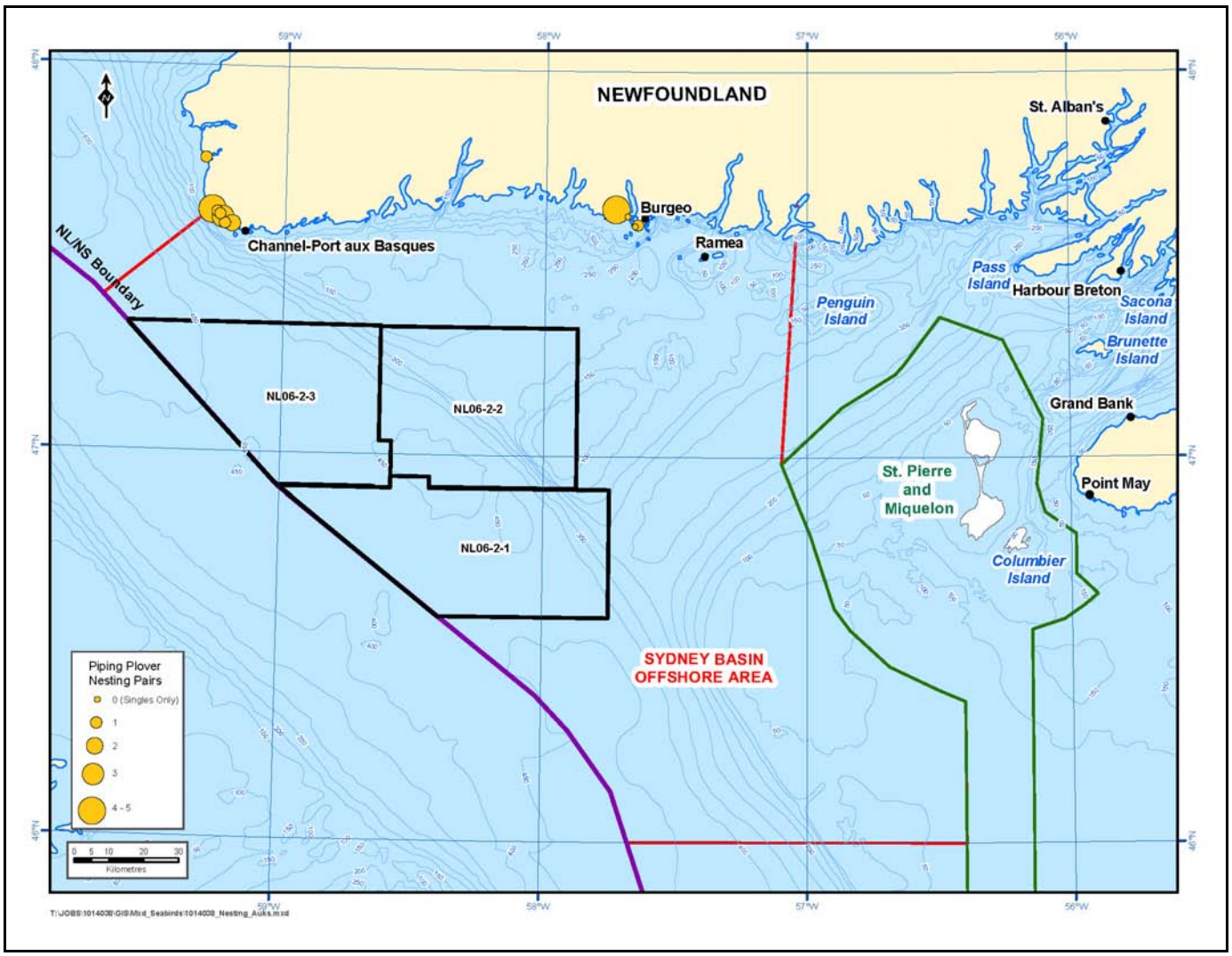
The Rusty Blackbird (*Euphagus carolinus*) has been assessed by COSEWIC as Special Concern (2006), but is not yet on the SARA list. The Rusty Blackbird is described as being widely distributed throughout the province in moist woodlands dominated by small conifers. Although the Rusty Blackbird will most likely not be found in the immediate SEA Area, its distribution does extend to the south coast of Newfoundland. Should the Rusty Blackbird be added to the SARA legal list, the prohibitions and protections under SARA would apply to these species.

The following is a brief description of the four endangered, three threatened and six species of special concern and one under consideration for SARA that may occur in the SEA Area.

#### 4.7.1.1 Piping Plover melodus Subspecies

The Piping Plover (*Charadrius melodus melodus*) is a small, stocky shorebird that nests locally in coastal areas on the southwest coast of Newfoundland (Amirault 2006). From a 2001 census, the eastern Canadian population was estimated at 481 adults. Piping Plovers nest in sand, gravel, or cobble, in open, elevated areas of the beach (Environment Canada 2006; Haig and Elliot-Smith 2004) on barrier island sandspits, or peninsulas in marine coastal areas. The Canadian Wildlife Service has identified several nesting sites for this species that are in the following main areas inside or near the SEA Area boundaries: Big Barasway; Sandbanks Provincial Park; Little Barasway; Seal Cove; and areas around J.T. Cheeseman Provincial Park; Grand Bay West, and Little Codroy (Figure 4.65). The maintenance of natural ecological processes along these coastal areas is essential to the protection of nesting areas (Environment Canada 2006). Piping Plovers that nest in Newfoundland generally overwinter along the southern Atlantic Coast of the United States.

**Figure 4.65 Nesting Pairs of Piping Plover in the Strategic Environmental Assessment Area**




Source: CWS Dataset.

The Piping Plover *medodus* subspecies is a migratory shorebird, breeding in eastern and central Canada and adjoining regions in the United States. The North American breeding population consists of approximately 5,900 birds, 2,100 breeding in Canada (Goosen et al. 2002). Approximately 400 to 500 Piping Plovers spend the summer in eastern Canada in the four Atlantic Provinces, Magdalen Islands and St. Pierre et Miquelon (Goosen et al. 2002; Newfoundland and Labrador Department of Environment and Conservation (NLDEC) 2006). It is estimated that there are 44 adult Piping Plovers nesting in Newfoundland and Labrador during the summer months. In 2006, Piping Plover *melodus* was also observed outside Seal Cove on Fortune Bay (J. Stewart, pers comm.). One of its largest breeding areas in Newfoundland and Labrador is the beach at Big Barasway Piping Plover Wildlife Reserve near Burgeo (Protected Areas Association of Newfoundland and Labrador (PAA) 2000), in addition to the adjoining Sandbanks Provincial Park in Burgeo. This range is inclusive of the SEA Area.

#### 4.7.1.2 Blue Whale

The blue whale is found globally and currently occurs in most oceans, although historically it was most abundant in the southern oceans. In North America, there are two stocks of blue whales, the eastern and western. In the North Atlantic, the eastern stock's range spans from Greenland to eastern Canadian waters. They inhabit both coastal and pelagic waters off Newfoundland during the summer months. They are often found feeding in aggregations at shelf edges where upwelling results in high concentrations of krill. The global blue whale population is estimated at 5,000 to 12,000 individuals, although to date there are no reliable estimates. The blue whale population of the western North Atlantic has been estimated to be in the low hundreds, with 321 individuals recorded photographically in the past 25 years. Current low numbers of blue whales can be attributed to past unregulated global whaling (Sears and Calambokidis 2002).

Blue whales enter the Gulf of St. Lawrence through the Cabot Strait by late March early April and commonly occur in the Gulf from May to December (Sears and Calambokidis 2002). Within the Gulf, blue whales feed primarily on euphausiid shrimp (krill) of the species *Thysanoessa inermis* and *Meganyctiphanes norvegica*, which occur near the 100 m contour (Sears et al. 1987). The exact migratory route through and south of the Cabot Strait has not been identified and likely varies among individuals and by year. Blue whales are likely within the SEA Area in late winter and spring (see Sears and Calambokidis 2002), and have been sighted (or could be expected to be sighted) in the SEA Area in all four seasons. They may use the SEA Area to feed in areas of upwelling along shelf breaks. Since 1979, 382 individual blue whales have been photo identified within the Gulf of St. Lawrence (Sears and Calambokidis 2002). Blue whales are listed as endangered on Schedule 1 of SARA. Twenty-seven humpbacks blue whales have been spotted within the SEA Area between 1976 and 2003 (Appendix E) (Figure 4.62).

#### 4.7.1.3 North Atlantic Right Whale

In the western North Atlantic, the right whale (*Eubalaena glacialis*) ranges from Florida to Newfoundland and Labrador and the Gulf of St. Lawrence. They congregate in the lower Bay of Fundy and on the Scotian Shelf during the summer and fall. This distribution is much narrower than the right whales historical range, which included the east coast of North America, including the Gulf of St. Lawrence, Atlantic Canada to Labrador, southern Greenland, Iceland, Norway and the European coast to northwestern Africa. The current population is approximately 322 individuals. The declining population in Newfoundland and Labrador can in part be attributed to historical coastal and pelagic hunting. The population appeared to be increasing in the 1980s and early 1990s, but began to decrease again in the mid-1990s (COSEWIC 2003c). Fujiwara and Caswell (2001) determined statistically that if the population growth rate observed in 1995 were maintained, North Atlantic right whales would become extinct within approximately 200 years. Current threats to the population include declines in reproduction, collisions with ships, entanglement in fishing gear, marine pollution, reduction in food sources and possibly disturbance from tourism (whale watching) boats (COSEWIC 2003c). One right whale was spotted within the SEA Area in 2006 (Appendix E) (Figure 4.62).

#### 4.7.1.4 Leatherback Turtle

Leatherback turtles occur globally and have the largest geographic range of any reptile species. They undertake extensive migrations throughout the temperate waters of the Atlantic, Pacific and Indian Oceans. As leatherbacks are largely pelagic, is has been difficult to determine their numbers. Current

population estimates are based on surveys of adult females observed on nesting beaches. In 1980, the global population was estimated to be approximately 115,000 nesting females (Pritchard 1982). In 1995, this estimate was revised to approximately 34,500 females (Spotila et al. 1996). Leatherbacks migrate into Canadian waters to feed. Their distribution includes slope waters east of the Fundian Channel, Scotian Shelf, the south coast of Newfoundland (including the SEA Area), Sydney Bight and the southern Gulf of St. Lawrence (DFO 2004d). Leatherback turtles have been recorded throughout the year in Canadian Waters (including off the coasts of Newfoundland (Goff and Lein 1988, in SAR 2006; Lawson and Gosselin 2003, in SAR 2006) and Labrador (Threfall 1978, in SAR 2006; DFO 2005b, in SAR 2006)) with the peak occurring August to September (James 2000 in SAR 2006; McAlpine et al. 2004, in SAR 2006; James et al. 2005a, in SAR 2006; James et al. 2005b, in SAR 2006). In 1998 and 1999, 300 leatherback sightings were recorded in Nova Scotian waters by the Nova Scotia Leatherback Turtle Working Group (NSLTWG), a group that study the distribution of leatherbacks in the Northwest Atlantic (James 2000). Threats to the leatherback occur both on nesting beaches and at sea. In eastern Canadian waters, threats would occur at sea and include entanglement in fishing gear, collisions with boats and marine pollution such as ingestion of marine debris (Atlantic Leatherback Turtle Recovery Team 2006).

#### 4.7.1.5 Beluga Whale

Belugas (*Delphinapterus leucas*) are a circumpolar species, found in Alaskan, Canadian, Greenlandic, Norwegian and Russian waters. The St. Lawrence Estuary population is estimated to be approximately 1,100 individuals and appears to be stable and possibly increasing in number; a recovery framework has been proposed for the population (Lawson et al. 2006). Belugas in this population are resident, and do not move far outside the estuary. It is unlikely, but possible, that an individual beluga could stray into the SEA Area at any time of year.

Belugas have a diverse diet based on seasonal variability consisting of fish such as capelin, Arctic cod and herring, as well as invertebrates such as shrimp, squid and marine worms (DFO 2006n).

#### 4.7.1.6 Wolffish

Wolffish, also known as catfish, are solitary bottom-dwelling fish. They typically occur over hard clay and sand substrates (Scott and Scott 1988). Three species of wolffish are found in the SEA Area: Atlantic wolffish (*Anarhichas lumpus*), spotted wolffish and northern wolffish. These three species have a large distribution in the Northwest Atlantic, inhabiting most of the Labrador and Newfoundland shelves from the Davis Strait south to the Gulf of Maine (Kulka and DeBlois 1996; DFO 2002g). Northern wolffish occur in the Laurentian Channel along the slope of the St. Pierre Bank at depths of 90 to 200 m and prefer water temperatures of 1.6°C to 4°C (Simpson and Kulka 2001; Gomes et al. 1992; Scott and Scott 1988). Spotted wolffish occur in the deep waters of the Laurentian and Hermitage Channels at depths of 475 m and deeper and prefer water temperatures of 3°C to 4°C (Simpson and Kulka 2001; DFO 2002g). Atlantic wolffish are found further south than either northern or spotted wolffish, occurring in low numbers at intermediate depths along the slope of the St. Pierre Bank, but have been found as deep as 350 m at temperatures as low as 0.4°C (Gomes et al. 1992; Simpson and Kulka 2001; Scott and Scott 1988; DFO 2002g). Tagging studies conducted in the 1960s have shown that wolffish are sedentary and undergo limited migration. Most individuals were recaptured within 8 km of release (Templeman 1984).

Wolffish are distributed at northern latitudes in moderately deep water in the Atlantic, Pacific and Arctic Oceans. The Atlantic Ocean populations of northern wolffish (*Anarhichas denticulatus*) and spotted wolffish (*Anarhichas minor*) are estimated to be one million and 2.7 million individuals, respectively.

Although the population size has been decreasing over the entire range of distribution, wolffish numbers have been increasing within the SEA Area. Two species of wolffish (northern and spotted) were added to SARA Schedule 1 in 2001 because their population declined more than 95 percent over three generations and the number of locations where they are found has decreased (D. Kulka, pers. comm.). Wolffish species have been reported by local fishers as being abundant in the SEA Area, and are reported to consume large amounts of shellfish (Canning & Pitt 2006).

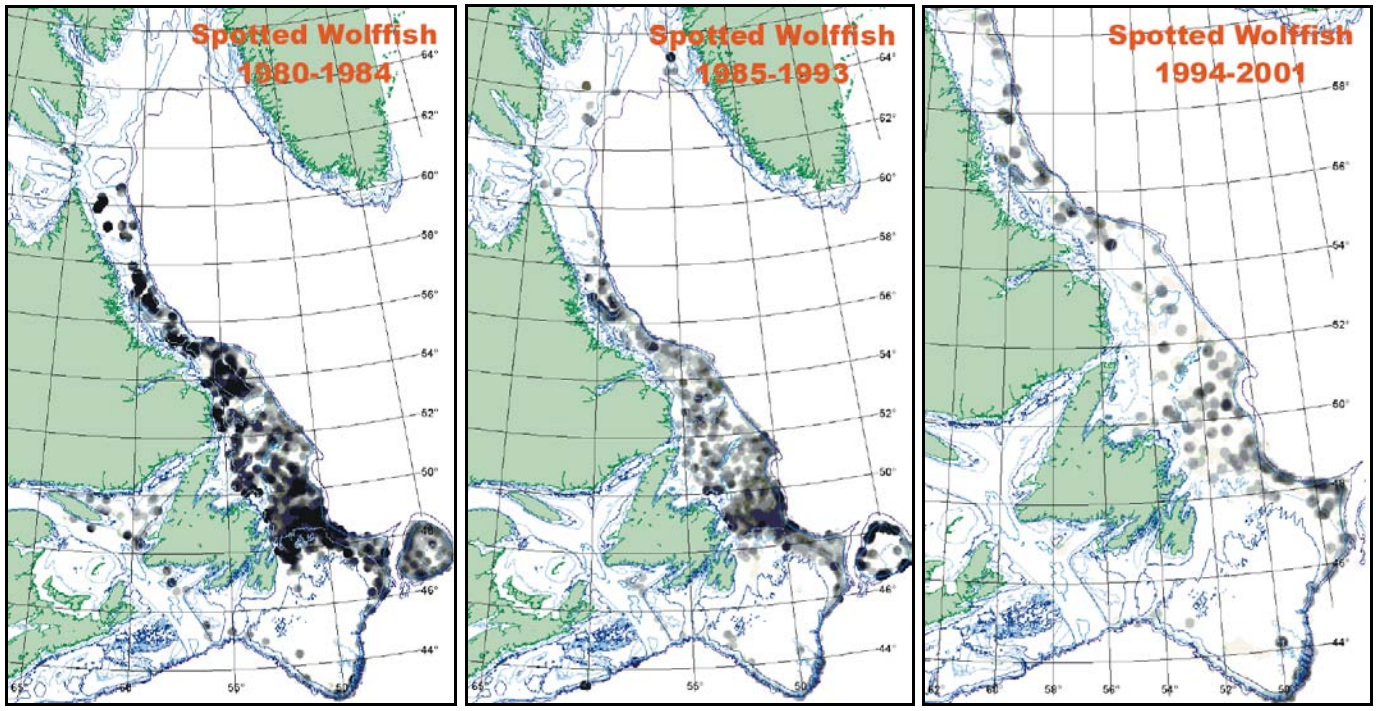
Wolffish are bathypelagic and benthic predators, preying on jellyfish, comb jellies, crabs, bivalves, echinoderms and fish (primarily those discarded by trawlers). There are few predators of wolffish species. Northern wolffish have been found in the stomachs of redfish and Atlantic cod. Spotted wolffish have been found in the stomachs of pollock, Atlantic cod, and Greenland sharks (*Somniosus microcephalus*). Predation of Atlantic wolffish has not been observed; however, juveniles have been found in the stomachs of Atlantic cod (Scott and Scott 1988).

Because wolffish are not the direct target of a commercial fishery, there is little information on their life history in Canadian waters. It is known that they have low productivity, with very few sperm and eggs produced per fish when compared with other fish species; although internal fertilization, nesting habits and egg guarding behavior increases the potential for survival of the large (2 cm long) larvae (Pavlov 1994; Keats et al. 1985; Wiseman 1997). As wolffish undergo limited migration, it is likely that they spawn within the SEA Area. Information regarding the spawning times and nesting and egg guarding behaviors of all wolffish is limited, but the northern wolffish appears to spawn in the late fall or early winter (Templeman 1985; 1986).

In the mid-1990s, a large decline in wolffish numbers was observed (Kulka and DeBlois 1996). An unpublished COSEWIC report determined northern and spotted wolffish had each declined in abundance by more than 90 percent over three generations and that their geographic distribution had significantly decreased (Figures 4.66 and 4.67) (D. Kulka, pers. comm.). The reasons for decline included mortality as bycatch and habitat alteration by trawlers. The northern and spotted wolffish were designated as 'threatened' by COSEWIC, and were subsequently added to Schedule 1 of SARA, in 2001, legally protecting the species and its critical habitat.

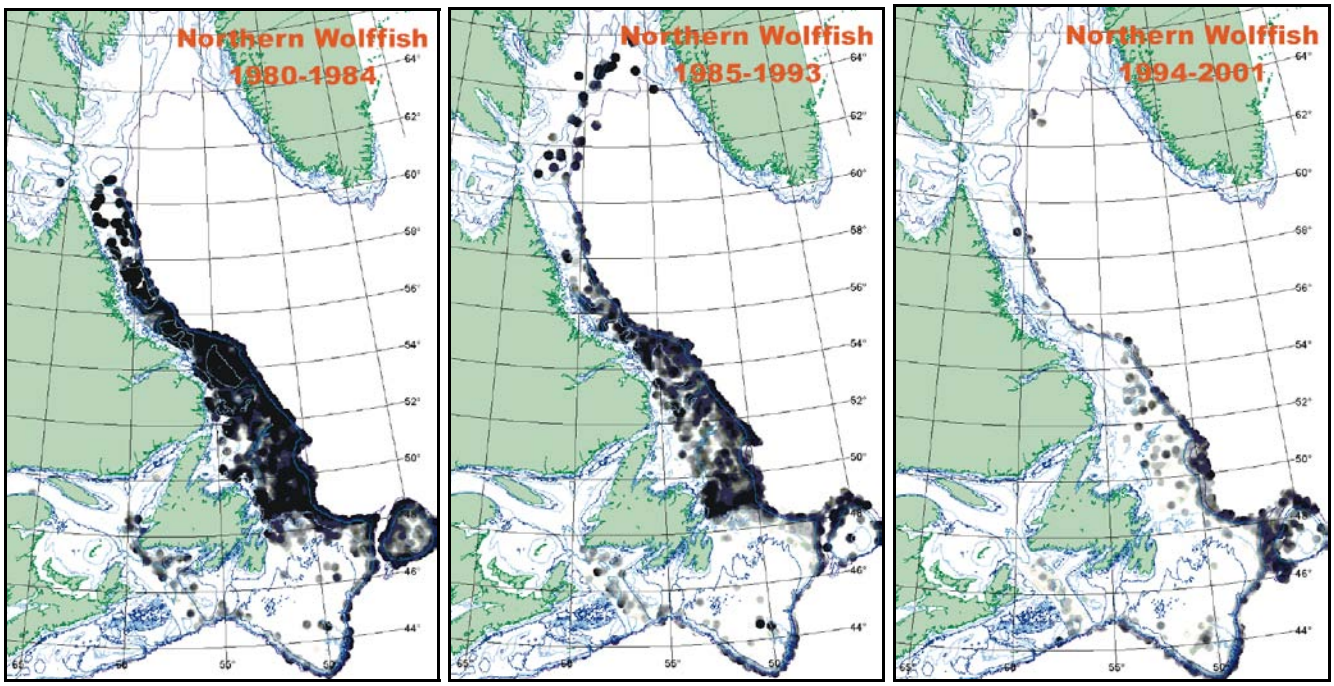
Fishers in the SEA Area report all three wolffish species on Rose Blanche Bank and Burgeo Bank (Canning & Pitt 2006).

**Figure 4.66 Spotted Wolffish Distribution, 1980 to 2001**




Source: Kulka and Simpson 2004.
Note: Darker Shades Denote Greater Distribution.

**Figure 4.67 Northern Wolffish Distribution, 1980 to 2001**

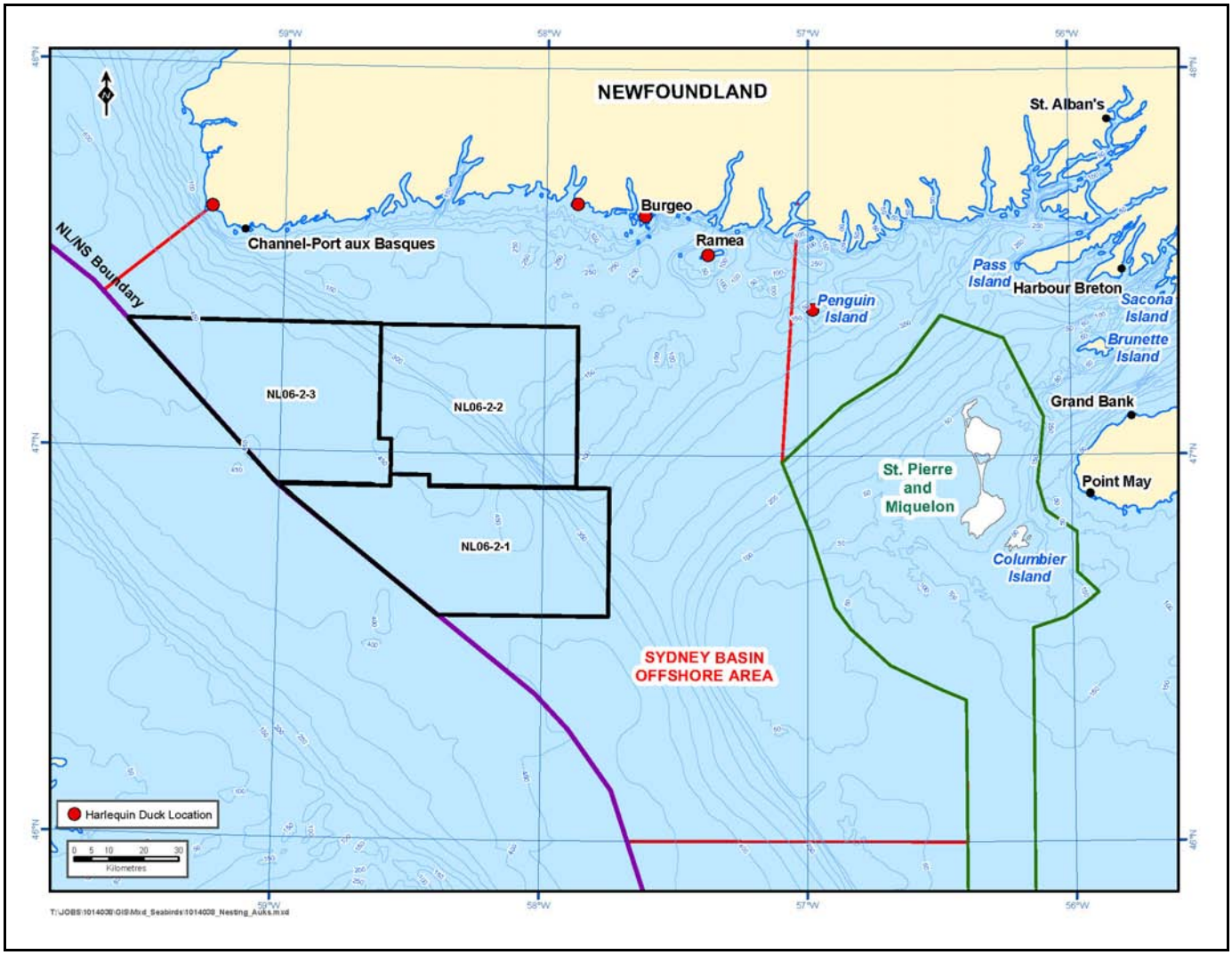



Source: Kulka and Simpson 2004.
Note: Darker Shades Denote Greater Distribution.

### 4.7.1.7 Harlequin Duck

The waterfowl species of conservation concern for the SEA is the eastern population of Harlequin Duck (SARA Schedule 1 Species of Special Concern and Vulnerable under the Newfoundland and Labrador *Endangered Species* Act (2002)), which has been known to overwinter on the coast in the SEA Area, near Ramea, Burgeo and Connoire Bay and just outside the SEA Area near the Penguin Islands (Figure 4.68).

**Figure 4.68 Known Overwintering Sites of Harlequin Duck in and Around the Strategic Environmental Assessment Area**




Source: CWS Dataset.

Moulting Harlequin Ducks are also found on the south coast of the Avalon Peninsula at Cape St. Mary's. No studies have been done within the SEA Area during the moulting period. Harlequins are also known to winter along the St. Pierre et Miquelon coast. Oiled Harlequins ducks have been found along the St. Pierre et Miquelon coast. This species has site fidelity in wintering sites, intensifying the threat posed by disturbance. This species is susceptible on migration north through the region until May and then again in later summer, when the birds return to the ocean from inland rivers where they breed.

During most of the year, these birds are found in such coastal marine environments, but in spring they leave the salt water to ascend to high-elevation rivers and streams to breed. The eastern population breeds in Labrador, northern Quebec, the Gaspé Peninsula, the island of Newfoundland and northern New Brunswick (CWS website). The threat posed by disturbances to overwintering habitat is intensified by the strong attachment of congregating Harlequin Ducks to specific wintering sites. They have been confirmed as breeding in central Newfoundland and it is expected that they breed in low densities on south coast rivers as well. To date there has been no systematic survey of Harlequin Ducks on the south coast.

#### 4.7.1.8 Barrow's Goldeneye

Barrow's Goldeneye breeds and winters primarily in Canada (most west of the Rock Mountains); the eastern Canadian population range is still unknown. An estimated 4,500 individuals (approximately 1,400 pairs based on a population of 30 percent adult females) occurs in Eastern North America; the population is believed to be in decline (SAR 2006). Barrow's Goldeneye are likely uncommon in the SEA Area.

#### 4.7.1.9 Ivory Gull

The ivory gull is generally associated with pack ice that occurs in late winter off Newfoundland and Labrador. The population in the Davis Strait (between Canada and Greenland) is estimated to be approximately 35,000 birds, which is much higher than the 1980s estimate of 2,400 breeding individuals in Arctic Canada. Yet surveys conducted in 2002 and 2003 suggest a population decline of 80 percent since the 1980s, occurring throughout the known breeding range and nesting habitat (Gilchrist and Mallory 2005). The apparent discrepancy could be a result of breeding outside North America, in Greenland or the European Arctic, or a much larger North American breeding population than currently estimated (SAR 2006). Ivory gulls are likely uncommon in the SEA Area. The Ivory Gull is listed as a Special Concern Species under Schedule 1 of SARA.

#### 4.7.1.10 Gray-cheeked Thrush

Gray-cheeked Thrush (*Catharus minimus minimus*) is listed as vulnerable by the Province, but is not listed on the SARA or COSEWIC lists. This subspecies is found in suitable habitat throughout most of the province of Newfoundland and Labrador (Lowther et al. 2001). On insular Newfoundland it has been reported as being most common on the Northern Peninsula and northeast coast. The Gray-cheeked Thrush prefers dense low coniferous woods, including young regenerating forest, open-canopy old-growth forests having a dense growth of shrubs and small conifers in the understory, and dense, stunted spruce and fir on windblown sites (Lowther et al. 2001). Since this is a terrestrial species the nearest suitable habitat in the SEA Area would be the onshore coniferous coastal habitat.

#### 4.7.1.11 Fin Whale

Fin whales are found in oceans world wide, making seasonal migrations between low-latitude wintering areas and high-latitude feeding grounds (COSEWIC 2005). The winter ground locales are uncertain. Summer concentrations of fin whales occur in the Gulf of St. Lawrence, Scotian Shelf, Bay of Fundy, in near and off-shore waters of Newfoundland and off Labrador. Based on historical data (primarily from whaling records), fin whales have been found to occur in 3Ps, 3Pn, 4R, 4S, 2J, 2H, 3K and 3L (Lawson 2006). A review of distribution and abundance of fin whales in Newfoundland and Labrador (Lawson 2006) indicates a temporal shift in harvested resource distributions that was most likely attributed to resource depletion.

Fin whales are associated with low surface temperatures, oceanic fronts and high concentrations of prey items, particularly euphausiids and small schooling fish (COSEWIC 2005). Fin whales in Newfoundland waters have been sighted over a wide range of depths (Lawson 2006), from shallow coastal waters out to the limit of sighting effort (<400 m). The data suggest that the northeast coast is a favoured locale for fin whales in recent years.

Fin whales reach sexual maturity between 5 to 15 years (COSEWIC 2005). Adult animals range from 20 to 27 m in length, with northern hemisphere whales being shorter (>24 m) and lighter (40 to 50 tonnes). Conception and calving are believed to occur in the winter at low-latitudes after a gestation period of 11 to 12 months.

A staged migration occurs with pregnant females moving into the feeding areas ahead of males and nesting females (COSEWIC 2005). However, not all individuals will migrate annually and other may spend extended periods on the feeding grounds.

The best available population estimates for the Western North Atlantic are 2,814 individuals between Georges Bank and the mouth of the Gulf of St. Lawrence (COSEWIC 2005). However, no good evidence of trend is available.

Fin whales are common within the Gulf of St. Lawrence during the summer (Kingsley and Reeves 1998). Fin whales may occur within the SEA Area year round, as they do off Nova Scotia (COSEWIC 2005), but are more likely to occur nearshore during the summer. The Atlantic population occurs throughout the Atlantic coast of Canada (Government of Canada 2006). Sightings of fin whales in Newfoundland waters within the SEA Area are mainly nearshore (J. Lawson, pers. comm., in COSEWIC 2005), but have been sighted offshore during recent surveys. Eleven fin whales have been spotted within the SEA Area between 1981 and 2006 (Appendix E) (Figure 4.62).

Fin whales feed primarily on capelin and euphausiids in eastern Canada, but herring is also a common prey. Prey items and, thus, fin whales commonly aggregate near ocean fronts and areas of upwelling, such as shelf breaks. Fin whales have been described as highly vocal during late August, through the fall and again in mid-winter, off the Scotian Shelf, which could be indicative of their migration southward in the fall and northward in the late winter and spring (see COSEWIC 2005). Fin whales are listed as a species of special concern on Schedule 1 of SARA.

#### 4.7.1.12 Atlantic Wolffish

From the late 1970s to the mid-1990s, Atlantic wolffish has declined by 87 percent in Canadian waters. Although this is a measurable decline, it is still thought to be widespread in large numbers (SAR 2006). Atlantic wolffish is listed as a species of special concern on Schedule 1 of SARA.

#### 4.7.1.13 Banded Killifish

The banded killfish is found in eastern North America, with seven known sites in Newfoundland and Labrador, primarily in clear lakes and ponds with a muddy or sandy bottom in coastal areas in the southwestern portion of the Island (SAR 2006).

The Newfoundland and Labrador population of banded killifish is also listed as a species of special concern on Schedule 1 of SARA. It has been found in seven locations throughout Newfoundland and Labrador, primarily on the west coast of the island (Chippett 2003). One population occurs on Ramea Island, within the SEA Area (Day 1993). Although it usually inhabits freshwater streams and lakes, it is

infrequently found in estuarine or marine waters (Fritz and Garside 1974). It is unlikely that it would occur in the offshore portion of the SEA Area.

#### 4.7.1.14 Species Under Consideration for Addition to Schedule 1 of the *Species at Risk Act*

**Harbour Porpoise**

There are three sub-population of harbour porpoise (*Phocoena phocoena*) in Canadian waters; Newfoundland and Labrador, Gulf of St. Lawrence and the Bay of Fundy-Gulf of Maine population Combined, the sub-populations total over 50,000 mature individuals (COSWEIC 2003d, 2006b). COSEWIC (2006b) provides estimates of 89,000 all-age individuals in the Bay of Fundy/Gulf of Maine in 1999 and greater than 22,000 in the Gulf of St. Lawrence in the 1990s. Harbour porpoise is currently not listed under SARA and undergoing further assessment by COSEWIC for addition to Schedule 1 of SARA as threatened. COSEWIC has assessed the harbour porpoise as a species of special concern (COSEWIC 2006a).

Harbour porpoise are most commonly found over continental shelves, frequenting bays and harbours. They are found throughout the Gulf of St. Lawrence during the summer, where densities are higher in the northern Gulf than the southern Gulf (Kingsley and Reeves 1998). Nineteen harbour porpoises have been spotted within the SEA Area between 1979 and 2004 (Appendix E) (Figure 4.62).

It is assumed that harbour porpoise winter along the coast of the US, as far south as North Carolina, but very little is known about the movements of the Newfoundland and Labrador and Gulf of St. Lawrence sub-populations (COSEWIC 2003d). Harbour porpoise presumably move through the Cabot Strait during fall and return in the spring. Based on nearshore fishery bycatch, harbour porpoise may occur within the SEA Area during spring, summer and fall (Lawson et al. 2004). Atlantic harbour porpoise are primarily fish eaters, consuming mainly cod, herring, capelin and sandlance. Squid are also eaten in Newfoundland waters. Unlike other marine mammals, groups of harbour porpoise are not formed to increase feeding efficiency, since they feed individually on small schooling fish and squid (Read 1999).

#### 4.7.1.15 Management Plans

For those species designated as extirpated, endangered and threatened, recovery strategies and action plans are developed through the advice of recovery teams and/or species experts. For species designated as special concern, management plans are completed and implemented (D. Osborne, pers. comm.). Management plans set goals and objectives for maintaining sustainable population levels. Recovery strategies are detailed plans which outline the short and long-term goals for protecting and recovering species at risk. Action plans summarize the projects and activities being undertaken to meet objectives and goals set out by the recovery strategy. Currently, recovery strategies and management plans are in draft form for the two species of wolffish, leatherback turtles and Piping Plover *melodus*. These documents are expected to be completed and posted to the SARA Public Registry by the end of 2006 (D. Osborne, pers. comm.) (Note that the Leatherback turtle recovery plan has been posted to the SARA website (but is currently on the “Delayed” list)).

### 4.7.2 Committee on the Status of Endangered Wildlife in Canada

COSEWIC is a committee of experts which assess and designate which Canadian wildlife species are in some degree of danger of disappearing. Under SARA, COSEWIC is responsible for identifying and providing scientific assessments for species considered as being at risk. These assessments are then

passed on to the federal Minister of the Environment. The federal government, through the Governor-in-Council, then decides which species are added to the official list after a review period and public notice. The following is a list of species that may be found in the SEA Area (in addition to those also listed under SARA) that have been assessed as either endangered or threatened by COSEWIC:

- porbeagle shark - endangered;
- white shark (*Carcharodon carcharias*) - endangered;
- Atlantic cod - threatened;
- cusk (*Brosme brosme*) - threatened;
- shortfin mako (*Isurus oxyrinchus*) - threatened;
- winter skate (*Leucoraja ocellata*) - threatened;
- Ivory Gull - endangered.

COSEWIC (and SARA-listed) marine species of all designations which may occur within the SEA Area are indicated in Table 4.22.

Assessment of a species by COSEWIC does not guarantee that the federal government will list it as recommended by COSEWIC. Species that may be assessed by COSEWIC in the future include (D. Osborne, pers. comm.):

- smooth, spinytail (*Bathyraja spinicanda*), and thorny skate;
- roughhead (*Macrouras berglax*) and roundnose (*Coryphaenoides rupestris*) grenadier;
- American plaice;
- loggerhead turtle;
- North Atlantic killer whale (*Orcinus orca*);
- blue (*Antimora rostrata*) and white hake ;
- bearded (*Erignathus barbatus*) and harbour seals;
- spiny dogfish;
- redfish; and
- basking shark (*Cetorhinus maximus*).

### 4.7.3 Government of Newfoundland and Labrador

Endangered species and their habitat are protected provincially under the Newfoundland and Labrador *Endangered Species Act*. The Newfoundland and Labrador *Endangered Species Act* is administered by NLDEC. The *Endangered Species Regulations* list those species considered endangered in the province. The Government of Newfoundland and Labrador has designated several wildlife and plant species as being ‘at risk’ under the Newfoundland and Labrador *Endangered Species Act*. Those that may occur in the SEA Area include the following:

- banded killifish – vulnerable (2002);
- Piping Plover *melodus* – endangered (2002);
- Harlequin Duck - vulnerable (2002);

- Barrow's Goldeneye - vulnerable (2002); and
- Gray-cheeked thrush (*Catharus minimus*) - vulnerable (a regular breeder in and around Burgeo).

### 4.7.4 Data Gaps for Species at Risk

NRC (2003a) indicates that migration routes, breeding grounds and feeding areas are known for relatively few marine mammal species. In order to predict the importance of noise effects on marine mammal behavior, the seasonal and geographic distribution of the mammals must be better known. Much of the basic biological and ecological information related to species at risk and marine mammals in general is lacking, such as identification of critical habitat, migration patterns, behaviour of critical life stages, effects of ongoing human activities on species and their habitat, effects of events outside SARA's geographical jurisdiction and inter-relationships with other species. The use of shutdown radii for seismic sound sources (i.e., safety zones) are intended to eliminate or limit sound energy exposure for marine mammals within a defined distance from the noise source (Lawson and McQuinn 2004). There are uncertainties determining the size of these shutdown radii as a result of the limited knowledge of marine mammal hearing capabilities, as well as understanding the intensity and characteristics of sound exposures that result in hearing changes or behavourial responses. Therefore, more scientific research is required to address gaps that prevent effective use of recovery strategies and the mitigation strategies for the protection of species at risks and other marine mammals.

There is a scarcity of data and knowledge regarding the presence of Harlequin Duck and Barrow's Goldeneye during all seasons within the SEA Area.

### 4.7.5 Planning Implications for Species at Risk

Operators may be required to use spatial and temporal mitigations to avoid critical life stages of species at risk. This applies to all invertebrates, fishes, birds, marine mammals and sea turtles. Critical habitats of species at risk are also protected under SARA and are a major component of SARA Recovery Strategies and Plans. For example, this includes the identified Piping Plover habitat at Big Barasway, Sandbanks and Seal Cove in the SEA Area.

Operators are required to comply with SARA over the lifespan of a project. Mitigations currently used for offshore projects include delayed timing or shutdown of seismic shooting when a marine mammal or sea turtle listed as endangered or threatened on Schedule 1 of SARA is within 500 m of the array. Any marine mammals or sea turtles that are added to Schedule 1 of SARA as either endangered or threatened during the life of a project would be subject to mitigations listed in the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines, Newfoundland Offshore Area*, April 2004.

The Harlequin Duck is listed as Vulnerable under the Newfoundland and Labrador *Endangered Species Act* (2002) and as a Species of Special Concern under SARA. Harlequin Duck has been observed near Cape Ray, Ramea and the Penguin Islands in the SEA Area, so these areas would be especially sensitive to disturbance. This species has site fidelity in wintering sites, a period when they would be most vulnerable. Harlequin Ducks are migrating north through the region until May and are susceptible during that time. The only time this species is not susceptible is spring and summer, when the birds go inland to rivers to breed.

## 4.8 Large Ocean Management Areas

Large Ocean Management Areas (LOMAs) are areas that have been designated by Canada's Ocean Action Plan (OAP), which acts as a framework to sustainably develop and manage Canada's ocean resources. These areas extend from the coast to the limits of Canada's jurisdiction and address large-scale ecosystem and economic development issues through the development and implementation of integrated ocean management plans. They incorporate ecosystem, socio-economic, cultural and institutional management objectives and indicators so that ocean resources may be used without depleting them or their environment (DFO 2005h; Legault and Firth 2006). They also incorporate Coastal Management Areas to allow integration of estuarine and coastal management plans (DFO 2005h).

The SEA Area is surrounded by three of the five designated LOMAs. These LOMAs are:

- Eastern Scotian Shelf;
- Gulf of St. Lawrence; and
- Placentia Bay/Grand Banks.

Each LOMA is at a different stage of development. The Eastern Scotian Shelf LOMA is presently the furthest along in the planning process.

Management of the Eastern Scotian Shelf as an ecological unit began in 1998 through the Eastern Scotian Shelf Integrated Management Initiative. The Initiative originally had an offshore focus, but has since evolved to include coastal areas through the establishment of the Eastern Scotian Shelf LOMA in 2002 (Oceans and Coastal Management Division (OCMD) 2003). It is administered by the Maritimes OCMD of DFO. OCMD are developing and will implement the Integrated Management Plan for the Eastern Scotian Shelf (DFO 2005h). The Eastern Scotian Shelf LOMA has been broken down into eight OMAs: the Western-Emerald; Misaine; Coastal; Sable-Banquereau; Laurentian Channel; Northeast Slope; Southwest Slope; and North Atlantic Central. Changes within these OMAs over the past 20 years have been studied and are being examined to determine how they have affected the ecosystem as a whole (OCMD 2003).

The Gulf of St. Lawrence Management Initiative (GOSLIM) has been managed by DFO since 2001 and there has been an inter-regional effort to assess Gulf-wide activities in the Gulf of St. Lawrence. The initial focus of GOSLIM is to describe the ecosystem of the Gulf and identify activities and issues from a broad Gulf-wide perspective (DFO 2005i). Thus far, GOSLIM has focused on the development of ecosystem objectives for ecosystem-based management of the fisheries within the LOMA. This has included consultation with Governments, First Nations and non-governmental organizations and identification of measurable parameters to track changes in carrying capacity, environmental quality, population dynamics and biodiversity as a measure of ecosystem stability (Legault and Firth 2006).

The Placentia Bay/Grand Banks LOMA initiative is in its initial stages. The overall goals of the Grand Banks-Placentia Bay LOMA are to maximize participation of all interests and establish an Integrated Management body whose role will be to provide decision makers with advice and assume part of the responsibility for implementation of an approved management plan (D. Mercer, pers. comm.).

In March 2005, Government, aboriginal groups and stakeholders participated in a workshop regarding the Placentia Bay/Grand Banks LOMA. Currently, DFO is preparing bilateral consultations with key stakeholders and aboriginal groups on engagement of Canada's OAP. The Placentia Bay/Grand Banks

LOMA falls under pillar three of the OAP (Integrated Oceans Management for Sustainable Development. Formation of a committee will be discussed during consultations (D. Mercer, pers. comm.).

As this initiative is in its initial stages, a timeline has not yet been developed. However, DFO is following the six stage process as outlined in the national Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada. These are (D. Mercer, pers. comm.):

1. Define and assess the area;
2. Engage affected interests;
3. Develop an Integrated Management plan;
4. Endorsement of plan by decision making bodies;
5. Implement Integrated Management plan; and
6. Monitor, evaluate and revise Integrated Management plan.

The Placentia Bay/Grand Banks LOMA is currently in stage one, progressing to stage two. The committee that is formed will address the issue of timelines. DFO Science is in the process of preparing an Ecosystem Overview and Assessment Report through the OAP (D. Mercer, pers. comm.).

## 4.9 Potentially Sensitive Areas

Potentially sensitive areas are described for fish and invertebrates and marine birds.

### 4.9.1 Fish and Invertebrates

#### 4.9.1.1 St. Pierre Bank and Burgeo Bank

The St. Pierre Bank is considered to be of special ecological and biological importance due to its high productivity (D. Mercer, pers. comm.). It contains the only commercial-sized aggregations of sea scallop and Iceland scallop within the SEA Area. It is also believed to be an important spawning and nursery area for Atlantic cod; however, this has not been specifically studied (J. Brattey, pers. comm.). Previous surveys have not assessed nursery-age cod (ages 1 and 2) on St. Pierre Bank, as the trawls used are not effective in catching the smallest fish (J. Brattey, pers. comm.). In addition, the highest concentrations of black dogfish and lumpfish (in the spring/summer) in the SEA Area occur on the St. Pierre Bank (D. Mercer, pers comm.). Local fishers also report an abundance of lumpfish on St. Pierre Bank.

During consultation meetings, fishers reported that Burgeo Bank was also a spawning ground for redfish and Atlantic cod. It was also reported that the three wolffish species are present on Burgeo Bank. Fishers report that Northern Gulf cod move to Burgeo Bank in the fall and remain on the Bank until spring, where they are fished at depths of approximately 183 m (100 fathoms). Overwintering of redfish was also reported to occur in the Hermitage Channel between Burgeo and St. Pierre Banks (Canning & Pitt 2006).

#### 4.9.1.2 Cabot Strait, the Eastern Slope of the Laurentian Channel and 3Pn

Both Atlantic cod and redfish migrate from the Gulf of St. Lawrence to their overwintering grounds in 3Pn and western 3Ps. During the fall, Atlantic cod migrate down the west coast of Newfoundland, through

Cabot Strait, to the overwintering area in the deep waters of 3Pn and 3Ps. In the early Spring, the migration reverses and the cod return to the Gulf (Yvelin et al. 2005). Cod from the northwest Gulf (4VTn), Strait of Belle Isle (2J3KL) and 3Pss have also been known to migrate 3Pn to overwinter (DFO 2005b; Yvelin et al. 2005). Due to concerns regarding stock mixing (Northern Gulf cod and 3Ps cod) areas 3Psa and 3Psd, both within the SEA Area, are closed to directed cod fishing during the winter, from November to April (J. Brattey, pers. comm.).

Similar to cod, redfish overwinter in the Cabot Strait, returning to the upper Gulf of St. Lawrence in the spring (DFO 2001c). Redfish in Unit 1 migrate south to Cabot Strait, specifically to subdivisions 3Pn, 4VN, and 3Ps in the fall months. Due to declining stocks, fishing has been closed in 3Ps and 4VN from October to December (DFO 2000c; Morin et al. 2001).

The eastern slope of the Laurentian Channel in 3Pn and 3Pss is an area of upwelling, resulting in high primary productivity during the spring (D. Mercer, pers. comm.). Various species of fish, marine birds and marine mammals are attracted to the high levels of plankton that occur along the slope during the spring and congregate to feed.

The slope is also an important area for fish spawning and migration. Atlantic cod, white hake, haddock, and redfish are among the species that spawn along the eastern slope of the Laurentian Channel (see Section 4.4).

#### 4.9.1.3 Corals

Corals are widely distributed within the SEA Area (refer to Section 4.3.3) and provide habitat on an often barren seafloor. The highest concentration of soft corals is in LaPoile Bay, with a density of 0.46 colonies/100 m². The greatest density of all corals in the SEA Area is in the Laurentian Channel, where the mean density is 0.78 colonies/100 m² (Mortensen et al. 2006).

#### 4.9.1.4 Potential National Marine Conservation Area

The National Marine Conservation Area (NMCA) program was initiated in 1986 and is administered by Parks Canada. NMCAs are established and managed under the *Canada National Marine Conservation Areas Act* for the purpose of protecting and conserving marine areas representative of each of the 29 marine regions in the Atlantic, Pacific and Arctic oceans and the Great Lakes, for the benefit, education and enjoyment of Canadians.

NMCAs are managed for sustainable use and contain zones that are highly protected. They are intended to demonstrate how protection and conservation practices can be harmonized with resource use in the marine environment (Parks Canada 2003). Ocean dumping and exploration and development of non-renewable resources are prohibited within NMCAs. There are five steps in the NMCA establishment process:

1) Identification of representative marine areas;
2) Selection of preferred NMCA candidate;
3) Assessing the feasibility of a new NMCA;
4) Negotiation of any agreements; and
5) Establishment in legislation.

Parks Canada currently manages two NMCAs: Fathom Five in Ontario and Saguenay-St. Lawrence in Quebec. In 2002, the federal government announced it would create five new NMCAs by 2008, including Gwaii Haanas, the Southern Strait of Georgia (both in British Columbia) and Lake Superior (Ontario). A fourth NMCA proposal adjacent to the Îles de la Madeleine (Quebec) was announced in 2004.

The location of the fifth NMCA has not yet been decided. The South Coast Fjords area off southern Newfoundland has been identified as a potential NMCA to represent the Laurentian Channel marine region. Along with NMCA candidates in other regions, it is a possible choice for the fifth NMCA proposal. If selected, it would undergo a feasibility study to determine if there is enough public support for an NMCA to be established (F. Mercier, pers. comm.). To support a potential South Coast Fjords NMCA, the BDDB submitted a report to Parks Canada in 2003 detailing the unique marine environment of the area and expressing their support for a study of the area (BDDB 2003). Although the South Coast Fjords area has not yet been approved for an NMCA feasibility study, Parks Canada is seriously considering its potential (J. Anderson, pers. comm.).

The initial area on the south coast currently identified as a representative marine area (and which would serve as a SEA Area for any potential NMCA feasibility study) extends from Couteau Bay to Baie d'Espoir and offshore approximately 75 km. Actual boundaries of a possible NMCA would be determined over the course of a feasibility study which includes extensive public consultations

Many of the distinct features of south coast described in the BDDB application were taken from a report by Meltzer (1996), prepared for Parks Canada. Sensitive features along the coastline include deep fjords, Atlantic salmon rivers, tidal flats, sandy beaches, eelgrass meadows, kelp beds, saltmarsh and developing marsh (Meltzer 1996). Of particular importance are Sandbanks Provincial Park and the area known as Big Barasway, west of Burgeo (Figure 4.69).

Sandbanks Provincial Park is named for its large area of sand dunes and long flat sandy beaches. The sand dunes are fragile environments that are easily eroded. They are bound together by the root systems of dune grass (*Leymus mollis*) and beach pea (*Lathyrus japonicus*). Another feature of the Park is that the freshwater outflow of Heron Pond and Greep's Head are intertidal. The animals and plant inhabiting the ponds are salt-tolerant. The Park is host to several varieties of migratory waterfowl and shore birds (NLDEC 2006).

Big Barasway is just west of Sandbanks Provincial Park. It contains large tidal sandflats and extensive eelgrass meadows (Environment Canada 2006). This area is the largest nesting/breeding area for the endangered Piping Plover in the Province (NLDEC 2006). Meltzer (1996) also describes a major saltmarsh in the Big Barasway area. Basically, potential critical habitat includes all beaches where Piping Plovers have nested in the last five years.

#### 4.9.1.5 Salmon Rivers

There are 15 scheduled Atlantic salmon rivers on the south coast of Newfoundland within the SEA Area. The two Atlantic Salmon Management Areas, SFA 11 and 12 in the SEA Area were discussed in Section 4.4.2.18.

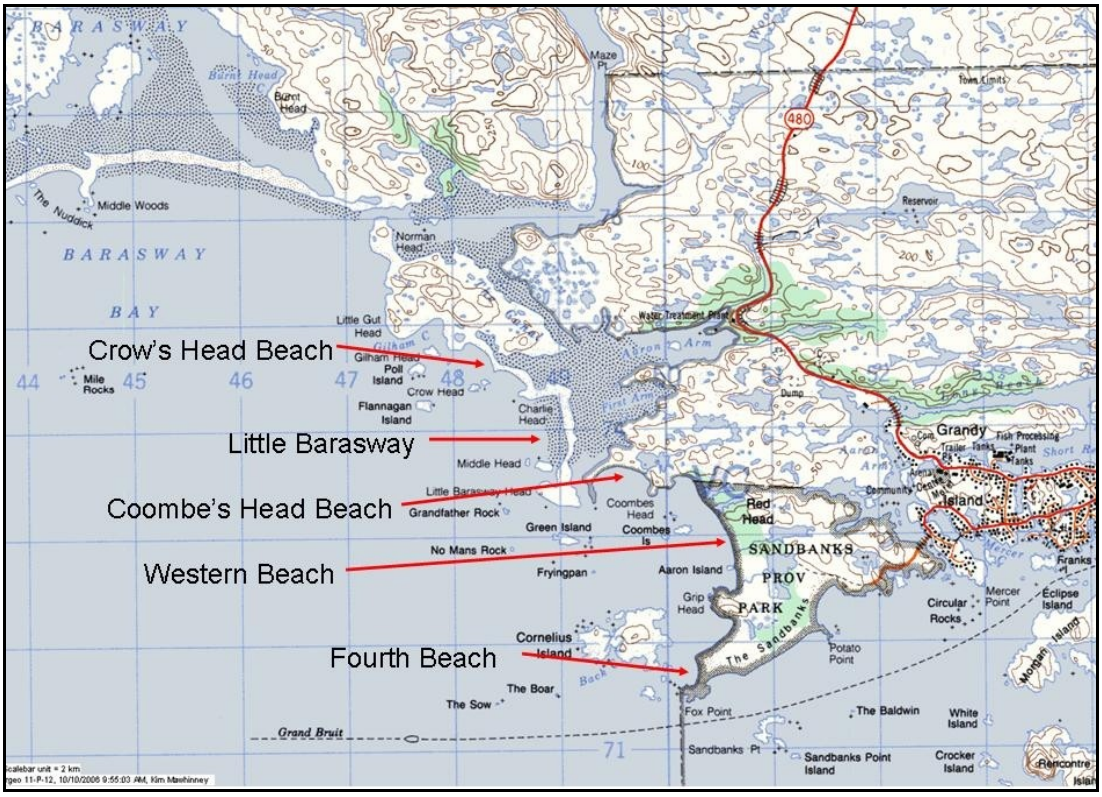
**Figure 4.69 Distribution of Kelp, Rockweed and Eelgrass in the Sandbanks Provincial Park and Big Barasway Region on the South Coast of Newfoundland**


Source: E-MAP 2006

### 4.9.2 Birds

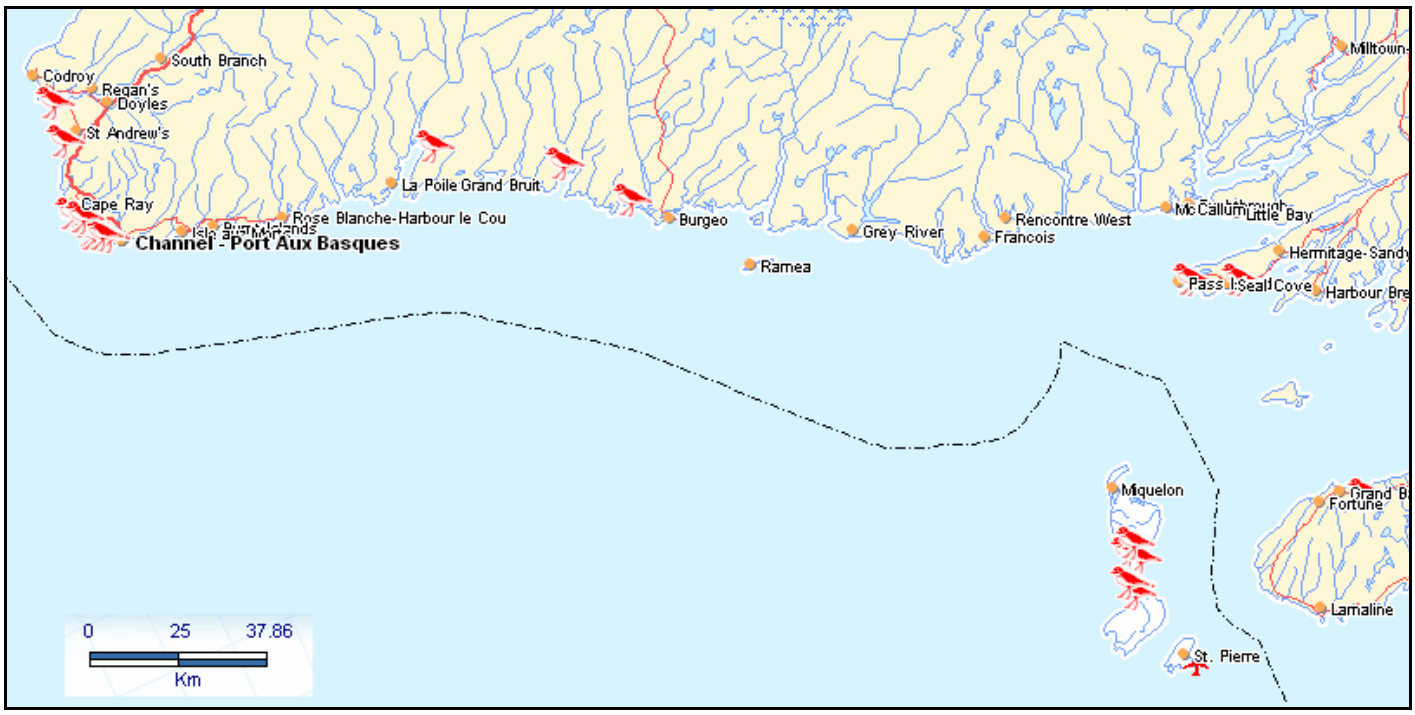
Potentially sensitive areas for birds will include all nesting areas of the endangered Piping Plover (Figures 4.70 and 4.71), all the IBAs identified by Birdlife International (www.ibacanada.com) and colonies of Common Eider (Figure 4.72) and pelagic and coastal seabirds.

**Figure 4.70 Some of the Potentially Critical Habitat Sites for Piping Plover in Southern Newfoundland**



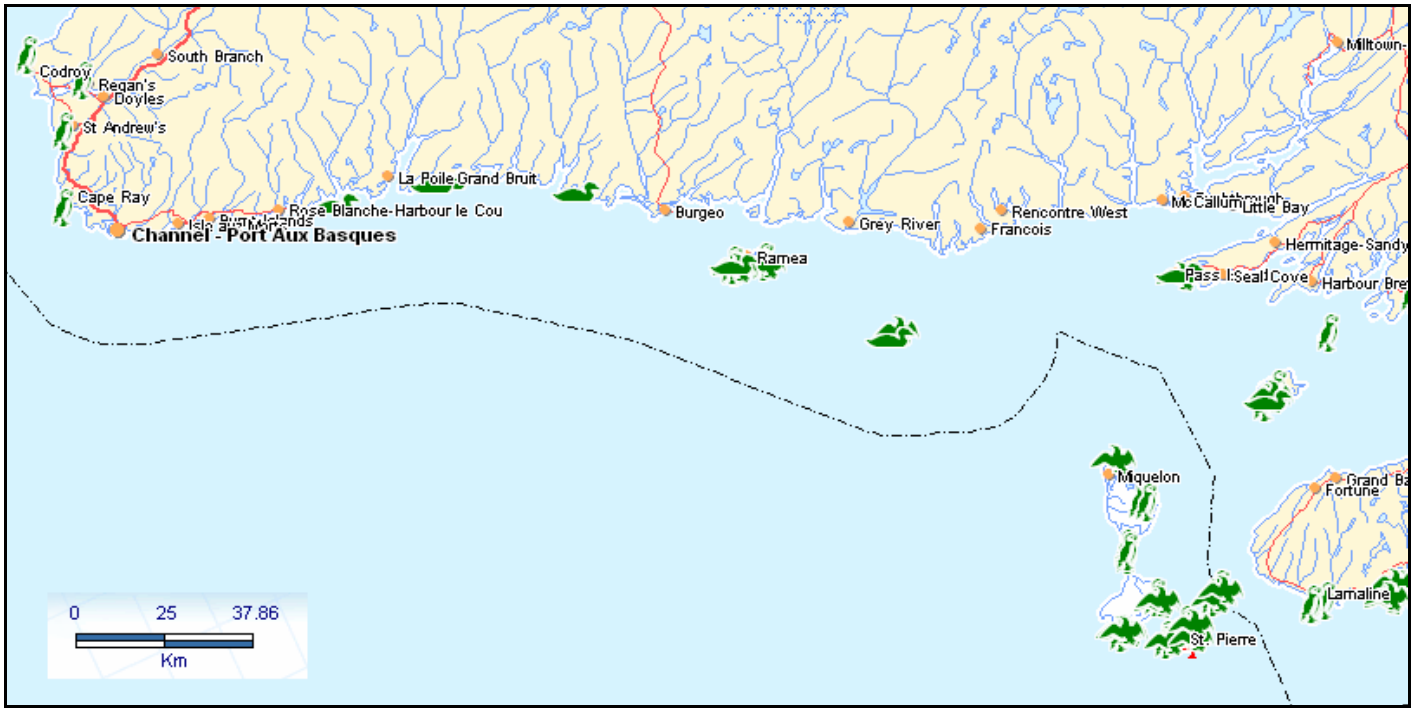

Source: .Environment Canada.

**Figure 4.71 Piping Plover Nesting Locations**




Source: E-Map 2006.

**Figure 4.72 Eider Colonies, Coastal Seabirds (e.g., terns and cormorants) and Pelagic Seabirds (Leach's-Storm Petrel)**




Source: E-Map 2006.

Note: Eider colonies are indicated by the "duck" icon, coastal seabirds by the "puffin" icon, and pelagics by the "wings outstretched" bird icon.

The list of Newfoundland Piping Plover sites in and near the SEA Area that are identified as *potentially* critical habitat (as of yet they have no legal designation) by Environment Canada are:

- Big Barachois;
- Big Barasway;
- Bottles Barachois;
- East of Windsor Point;
- Grand Bay West;
- Grand Codroy ;
- J.T. Cheeseman Provincial Park;
- Jerret Point - Windsor Point;
- Little Barasway (Burgeo Area);
- Little Codroy;
- MacDougall's Beach (Jerret Point-Windsor Point);
- Sandbanks (second beach);
- Sandbanks (third beach);
- Sandbanks (fourth beach);
- Sandbanks (Western beach);
- Coombe's Head Beach
- Crow Head Beach;
- Sea Cove;
- Searston;
- Second (Rocky Barachois Bight); and
- Short Sand Beach (east of Windsor Point).

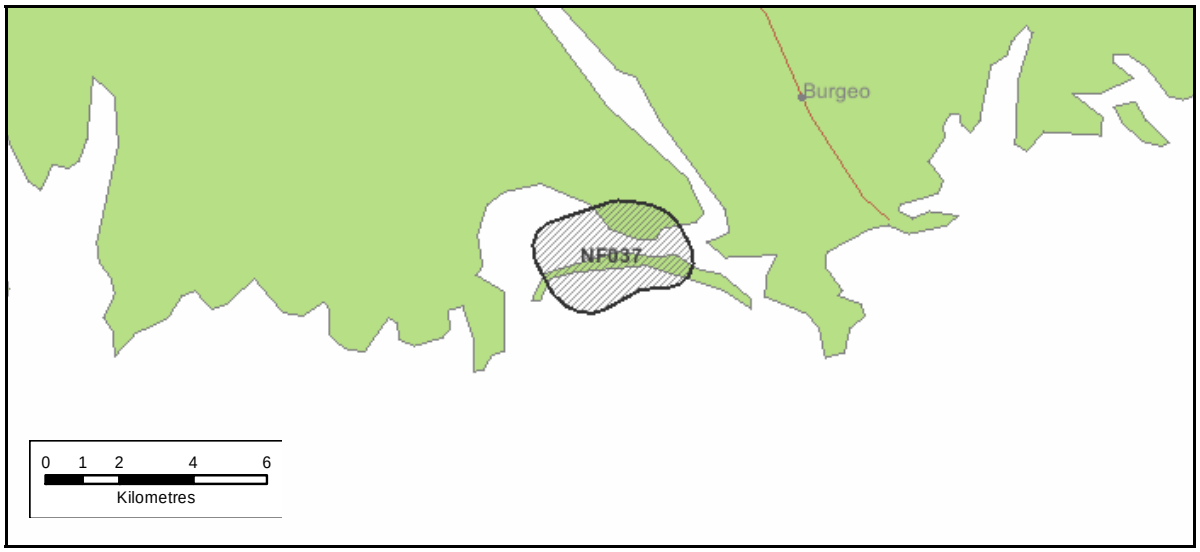
**Important Bird Areas**

The IBA program is an international conservation initiative coordinated by Birdlife International and its co-partners Bird Studies Canada and Nature Canada. An IBA is a site providing essential habitat for one or more species of breeding or non-breeding birds. These sites may contain threatened species, endemic species, species representative of a biome, or highly exceptional concentrations of birds. Sites are identified using a set of standardized and internationally agreed upon criteria. IBAs can be identified under four main categories: sites regularly holding significant numbers of threatened species; sites regularly holding endemic species or species with restricted ranges; sites regularly holding an assemblage of species largely restricted to a biome or a unique or threatened community type; and sites where birds congregate in significant numbers when breeding, in winter, or during migration. IBAs are identified according to their significance (based on specific bird population thresholds) as either globally, continentally, or nationally significant (IBA website).

There are two IBAs on the coast of the SEA Area, Big Barasway (Figure 4.73) near Burgeo and Grand Bay West to Cheeseman Provincial Park (Port aux Basques) (Figure 4.74). Big Barasway is also a

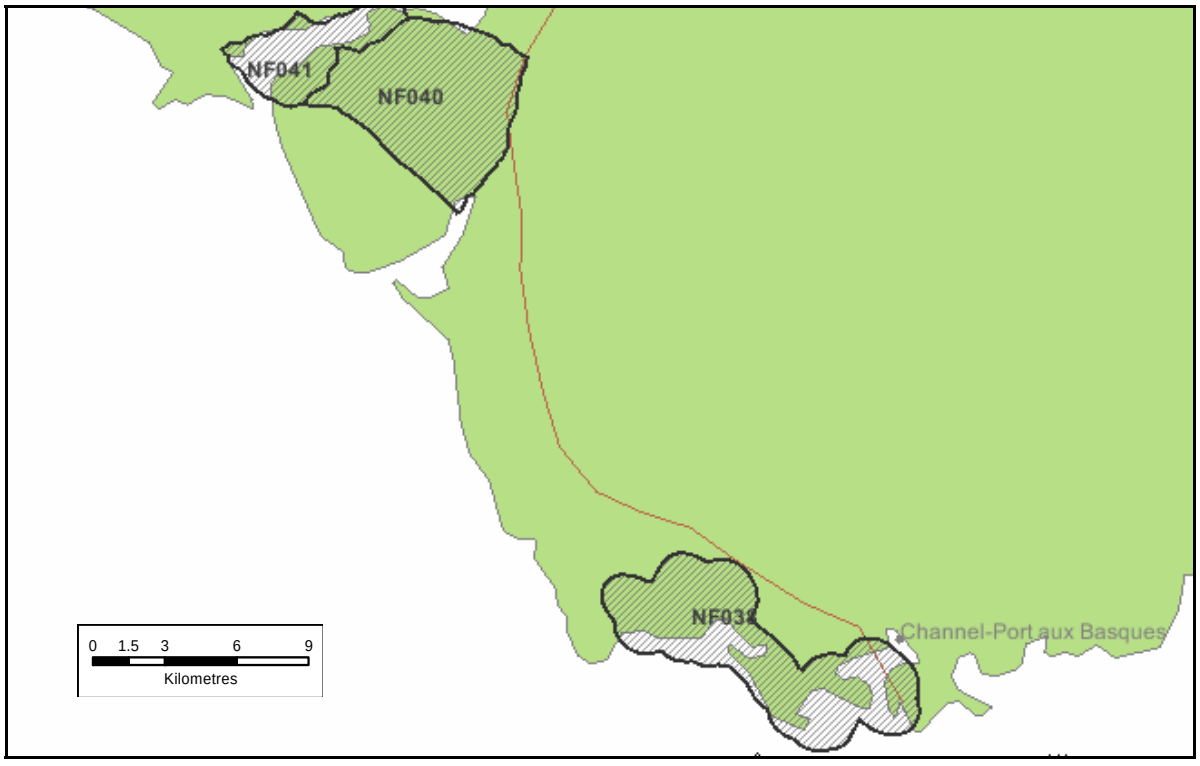
provincial Ecological Reserve and a Western Hemisphere Shorebird Reserve Network Endangered Species Reserve.

**Figure 4.73 Location of the Big Barasway Important Bird Area (NF037)**




Source: Source: Important Bird Areas of Canada 2006.

**Figure 4.74 Location of the Grand Bay West to Cheeseman Provincial Park Important Bird Area (NF038)**




Source: Source: Important Bird Areas of Canada 2006.
Note: NF040 (Codroy Valley Estuary IBA) and NF041 (Codroy Valley IBA) are outside the SEA Area.

Piping Plover nests at the Big Barasway IBA and also at the Grand Bay West to Cheeseman Provincial Park IBA (an average of seven adults at Big Barasway between 1985 and 1998 and an average of 18 adults at Grand Bay West between 1995 and 1998). Piping Plovers are designated as both globally vulnerable and nationally endangered by the IBA Program.

### 4.9.3 Data Gaps for Potentially Sensitive Areas

Research on spawning, nursery areas, migrations and species distribution on St. Pierre Bank and the Laurentian Channel will likely be undertaken within an "Ecologically and Biologically Sensitive Area (EBSA)" program currently being considered within the larger Placentia Bay/Grand Banks LOMA (Canning & Pitt 2006). This information will need to be considered in any future project-specific environmental assessment.

### 4.9.4 Planning Implications for Potentially Sensitive Areas

There are several potentially sensitive areas within the SEA Area. Current bid parcel areas overlap with the Burgeo and Rose Blanche Banks. Offshore oil and gas activities, in or adjacent to these sensitive areas, may be subject to various mitigations to minimize potential effects to these areas. These mitigations may be in additional to those discussed in this report and would depend on the timing and nature of the offshore petroleum activity in or adjacent to these areas.