



from St. Pierre and Miquelon are located outside the SEA Area and are thus omitted from the NAFO data analyses.

The DFO data are georeferenced in two ways: by latitude and longitude (degrees and minutes) of the gear set location, and by the Unit Area in which the catch was harvested. While much of the harvest carries the latitude and longitude information (83% by weight for all of SEA Area in 2007), virtually all the data carry a Unit Area designation. Georeferencing by latitude and longitude allows the mapping of specific harvesting locations. Areas farther from shore, fished generally by larger boats, tend to have a greater proportion of their catch georeferenced, while those closer to shore have less. Also, certain inshore species (e.g., lobster) are not georeferenced, while the GPS coordinates of the harvesting locations of deep water species (e.g., snow crab) are usually reported. For example, in 2007, 0% of lobster harvest was so referenced within the SEA Area while nearly 100% of the snow crab harvest was georeferenced. Unlike the DFO data, the NAFO landings data are georeferenced on the scale of Division or Subdivision and not by lat/long or Unit Area.

The Unit Area designation allows all the harvesting data to be tabulated according to these fisheries management sub-zones. The Unit Areas that most closely approximate the SEA Area occur in Div. 3Pn, 3Ps (a, d-h), 3O (a-f), and 4Vs (b, c, e) (see Figure 3.12). These are used in the SEA Area Unit Area analysis for this report. It is important to note that some of the Unit Areas occur partially within the boundaries of the SEA Area. For these Unit Areas, the harvesting locations occurring outside of the SEA Area were excluded from analysis, whenever possible. For example, georeferenced harvesting locations occurring north of 46°N in Unit Area 3Psf were omitted from fisheries data analysis.

The maps in the sections that follow show domestic harvesting locations, based on the latitude and longitude (lat/long) data, as dark points. The points are not “weighted” by quantity of harvest, but show where fishing effort was recorded. Such location data have been groundtruthed with fishers in many consultations (see Consultation Report, Appendix 1). As previously mentioned, not all landings data are geo-referenced by lat/long therefore the maps show the minimal number of harvesting locations occurring within the SEA Area over the time period examined. Despite missing some data, the maps have proven to be particularly useful for Operators in understanding the likely location of gear concentrations and timing of fisheries in order to eliminate or minimize potential mutual interference. Similar maps were also presented to area fishers during the consultations for this SEA (see Consultation Report, Appendix 1) and were found to be a good representation of fishing areas and patterns.

In most instances, the information used to characterize the fisheries in this SEA presents quantities of harvest rather than harvest values. Quantities are directly comparable from year to year, while values (for the same quantity of harvest) may vary annually with negotiated prices, changes in exchange rates and fluctuating market conditions. Prices paid may also vary from month to month and from area to area. Although some species vary greatly in price (e.g., snow crab vs. herring), in terms of interference between exploration activities and fisheries, it is the level of fishing effort and gear utilized (better represented by quantities of harvest) that is more important. Values are important in the case of a gear damage incident, and would be carefully evaluated at that time, based on then-current numbers, to calculate compensation (e.g., an impact mitigation during an exploration project).

Fisheries consultations were conducted with representatives of FFAWU, DFO and individual fishers living within the SEA Area. The consultations gather information about area fisheries and to determine any issues or concerns to be considered in the SEA. [Operators are encouraged to do likewise during the site specific EA process.] Other sources consulted for this assessment include DFO species management plans, stock status reports, and previous SEA reports (e.g., Laurentian Sub-basin SEA, Sydney Basin SEA) (see Consultation Report, Appendix 1).

### **3.3.1.1 Commercial Fisheries Overview**

This subsection provides an overview of the commercial fisheries within and/or adjacent to the SEA Area (depending on the datasets used). The first part provides the historical context, based largely on DFO data (from

Newfoundland and Labrador, Maritimes, Gulf, and Quebec Regions) for NAFO Div 3O for the period of 1988 to 2007. The historical fisheries of NAFO Subdiv. 3Pn, 3Ps, and 4Vs have been addressed in previous SEAs and are briefly described. The next section focuses on recent harvests (2000 to 2007) in the entire SEA Area. The period of 2000 to 2007 was chosen for analysis because some areas of the SEA Area have been reviewed for SEAs in the past and will be updated during this current SEA. The Laurentian Sub-basin SEA was completed in 2003 and described the fisheries of 3Ps and 4Vs from 1995 to 2001 (JWEL 2003) while the Sydney Basin SEA completed in 2007 described the fisheries of Unit Areas 3Pn, 3Psa, 3Pse, and 3Psd for the period 1986 to 2005 (JW 2007). Rather than treat each sub-area separately (i.e., Sydney Basin, Laurentian Sub-basin, and Div 3O) within the current SEA, it is best to select a time period that would describe the SEA Area as well as update previous SEAs. The final part of this fisheries overview section provides similar recent information for the georeferenced (lat/long) data specifically recorded within the SEA Area, and maps the locations of these fisheries for that period. The section following these (Principal Species) provides more detailed information on the important regional fisheries.

### **Historical Fisheries in the SEA Area**

This section describes the historical fisheries within the SEA Area, which includes NAFO Div./Subdiv. 3Pn, 3Ps (Unit Areas a, d - h), 3O (Unit Areas a - f), and 4Vs (Unit Areas b, c, e) (see Figure 3.12). The current section will focus primarily on fisheries in Div 3O from 1988 to 2007. The historical fisheries for NAFO Subdiv. 3Pn, 3Ps, and 4Vs have been described in detail in other SEAs (see JWEL 2003; JW 2007) and will be briefly summarized here.

As noted in JW (2007), commercial fish harvesting on many parts of the Newfoundland shelf has changed considerably over the last two decades, shifting from a groundfish-based industry to primarily invertebrate harvesting. In the early 1990s, a harvesting moratorium was declared following the collapse of several major groundfish stocks. Directed fisheries for Atlantic cod and some other groundfish species were no longer permitted in most areas. Subdiv. 3Ps and 3Pn remain the only Grand Banks areas with directed, though reduced, Atlantic cod fisheries. Compared to historical catches made in 3Ps and 3Pn over the last two decades, the current fisheries are greatly reduced, but more diversified in terms of number of species harvested. Non-groundfish fisheries, such as those that target shellfish (e.g., scallop) and small pelagic fishes (e.g., Atlantic herring), are becoming more prominent. In Subdiv. 4Vs, fisheries were historically dominated by groundfish catches, but are now becoming more diversified by targeting invertebrates, groundfish, and large pelagics (JWEL 2003).

A similar trend has been observed in Div. 3O over the last 20 years. The following graphs (based on DFO Newfoundland, Maritimes, Gulf, and Quebec Regions data and NAFO STATLANT21A data) show the overall (all species) harvest, groundfish harvest, and invertebrate harvest for the last 20 years in 3O (Figure 3.13). From 1988 to 2007, the domestic groundfish fisheries largely targeted (by weight) redfish, Atlantic cod, American plaice, yellowtail flounder, haddock, witch flounder (greysole), skate, white hake, monkfish, Greenland halibut, and Atlantic halibut. Over that same time period, NAFO nations have predominately harvested redfish and, to a much lesser extent, Atlantic cod, white hake, Greenland halibut, red hake, American plaice, witch flounder, and yellowtail flounder. Nations other than Canada participating in Div. 3O fisheries have largely included Portugal, USSR/Russia, Spain, Cuba, and South Korea. Overall, the fisheries in 3O continue to largely target groundfish species; however, since the collapse of many of the groundfish fisheries in the early 1990s, fisheries for invertebrates, predominately snow crab, have increased in importance. The increasing importance of snow crab as a target species is further emphasized in Figures 3.14 and 3.15 where the domestic harvest compositions (by quantity) in 1988 and in 2007 are shown, respectively. Since 1988, invertebrate catches have remained very low for other NAFO nations fishing in Div. 3O with roughly 202 t of squid, largely shortfin squid, harvested in total.

#### **3.3.1.2 SEA Area Commercial Harvest, 2000-2007**

Table 3.4 shows the average quantity of the domestic harvest recorded within the SEA Area from 2000 to 2007. The annual harvests recorded for 2006 and 2007 are also shown. As Table 3.4 indicates, the principal groundfish species are Atlantic cod and redfish, while snow crab and whelk are important invertebrate species. Other

important commercial species include yellowtail flounder, white hake, skate, monkfish, sea scallop, American plaice, and pollock. The contribution of these species to the overall harvest varies annually. The lobster fisheries, though comparatively low in quantity, are of high economic and social value, and are particularly important to local SEA Area-based fishers who typically harvest this species in waters near their home ports.

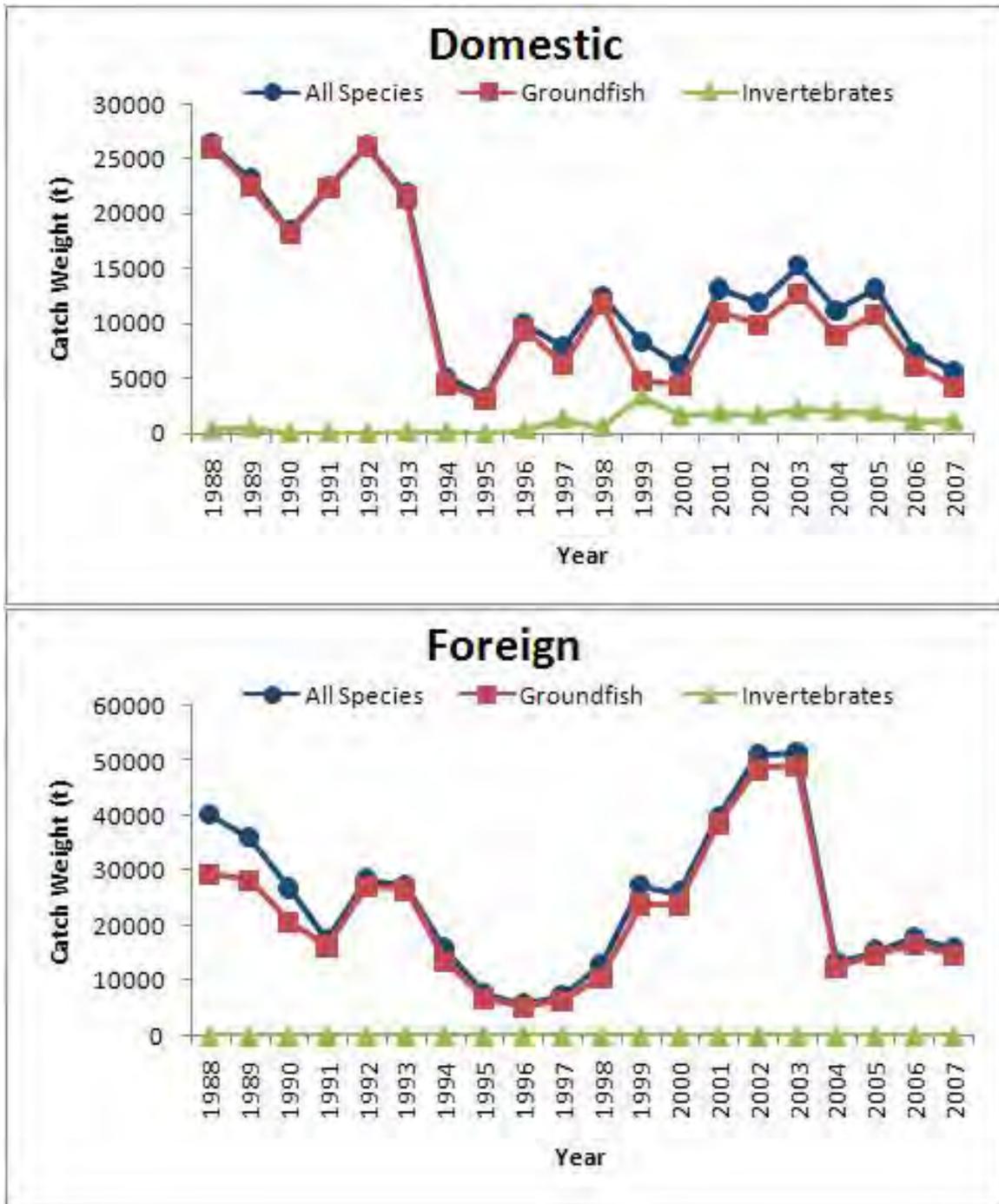
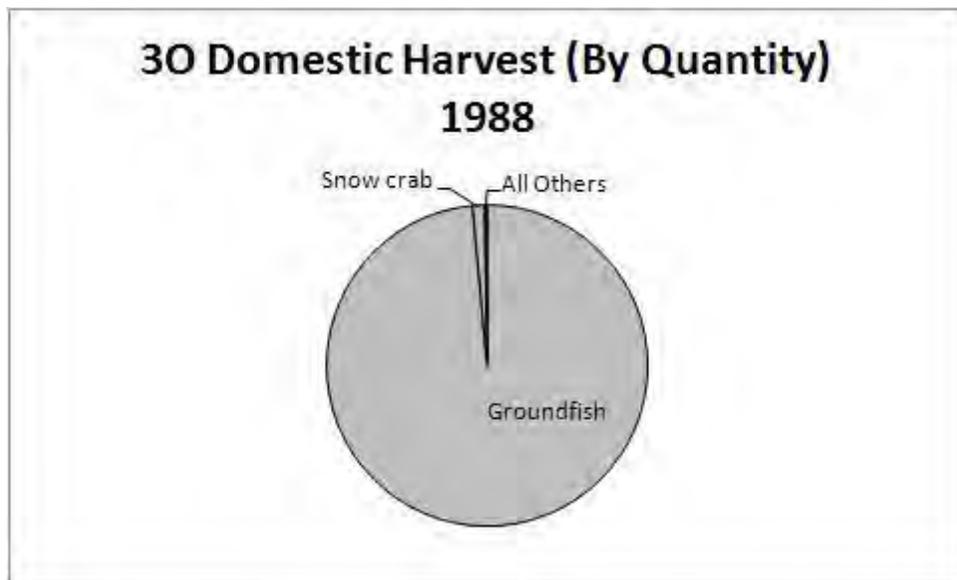
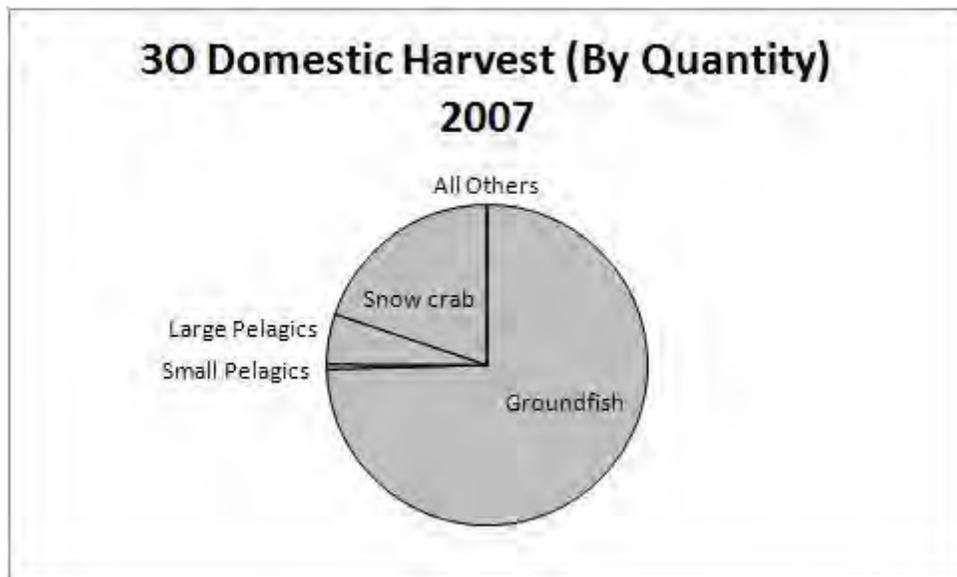


Figure 3.13. Domestic (upper) and Foreign (lower) Commercial Harvest from NAFO Div. 30 for All Species, Groundfish Species, and Invertebrate Species, 1988-2007.



**Figure 3.14.** Composition of the Domestic Harvest in 30, 1988.



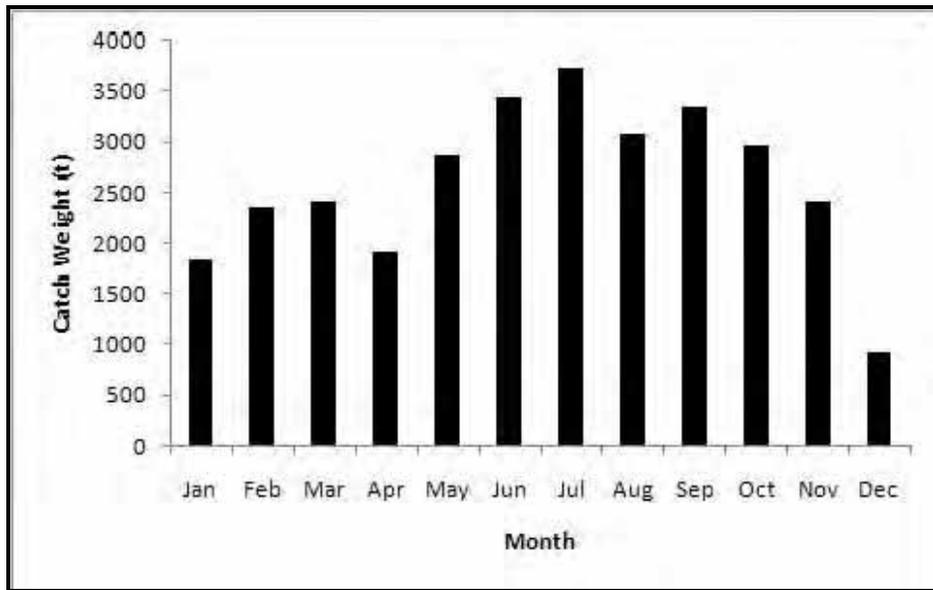
**Figure 3.15.** Composition of the Domestic Harvest in 30, 2007.

**Table 3.4. Average Harvest for 2000-2007 in SEA Area, and Annual Harvests for 2006 and 2007.**

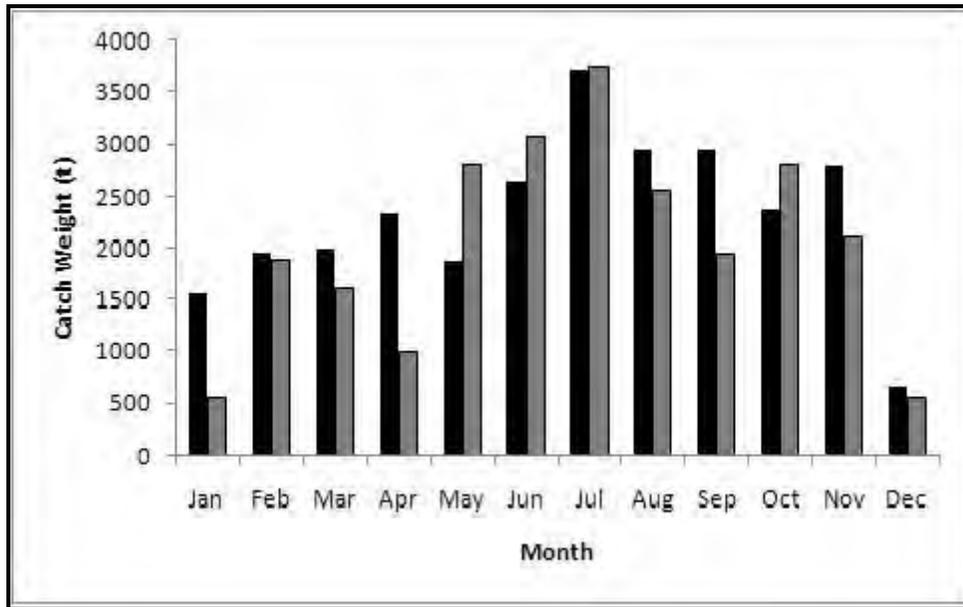
Species	2000-2007 Average		2006		2007	
	Catch Wt (t)	%	Catch Wt (t)	%	Catch Wt (t)	%
Redfish spp.	9099.6	<b>29.1</b>	8994.8	<b>32.4</b>	4840.6	<b>19.7</b>
Atlantic cod	6143.4	<b>19.7</b>	5388.3	<b>19.4</b>	5442.6	<b>22.1</b>
Snow crab	3577.1	<b>11.4</b>	2622.0	9.4	2687.6	10.9
Yellowtail flounder	2217.3	7.1	6.9	0.0	1646.2	6.7
White hake	1660.2	5.3	2326.8	8.4	1764.8	7.2
Skate spp.	1593.0	5.1	969.9	3.5	1164.0	4.7
Monkfish	1144.6	3.7	1153.0	4.2	179.9	0.7
Sea scallop	1039.2	3.3	415.5	1.5	322.2	1.3
Whelk	933.6	3.0	2928.5	<b>10.6</b>	3148.2	<b>12.8</b>
American plaice	627.2	2.0	242.5	0.9	433.7	1.8
Atlantic halibut	463.0	1.5	445.5	1.6	314.9	1.3
Pollock	446.8	1.4	635.3	2.3	841.2	3.4
Icelandic scallop	427.0	1.4	42.9	0.2	0.0	0.0
Greenland halibut (turbot)	365.1	1.2	165.0	0.6	284.3	1.2
Witch flounder (greysole)	285.9	0.9	130.6	0.5	40.1	0.2
Swordfish	237.6	0.8	255.0	0.9	336.6	1.4
Haddock	232.0	0.7	173.0	0.6	400.6	1.6
Hagfish	167.9	0.5	357.3	1.3	305.2	1.2
Atlantic herring	117.6	0.4	93.4	0.3	142.4	0.6
Atlantic mackerel	78.8	0.3	79.1	0.3	78.6	0.3
Lumpfish roe	63.4	0.2	59.3	0.2	4.6	0.0
Stimpsons surf clams	63.2	0.2	0.0	0.0	7.3	0.0
Porbeagle shark	49.4	0.2	3.9	0.0	7.3	0.0
Wolffish spp.	37.0	0.1	0.2	0.0	4.2	0.0
Bluefin tuna	33.3	0.1	15.5	0.1	19.5	0.1
Lobster	32.6	0.1	48.0	0.2	95.2	0.4
Sea cucumber	22.0	0.1	138.9	0.5	31.8	0.1
All Others	87.8	0.3	65.1	0.2	56.6	0.2
<b>Grand Total</b>	<b>31,245.8</b>	<b>100.0</b>	<b>27,756.4</b>	<b>100.0</b>	<b>24,600.3</b>	<b>100.0</b>

### **Seasonality**

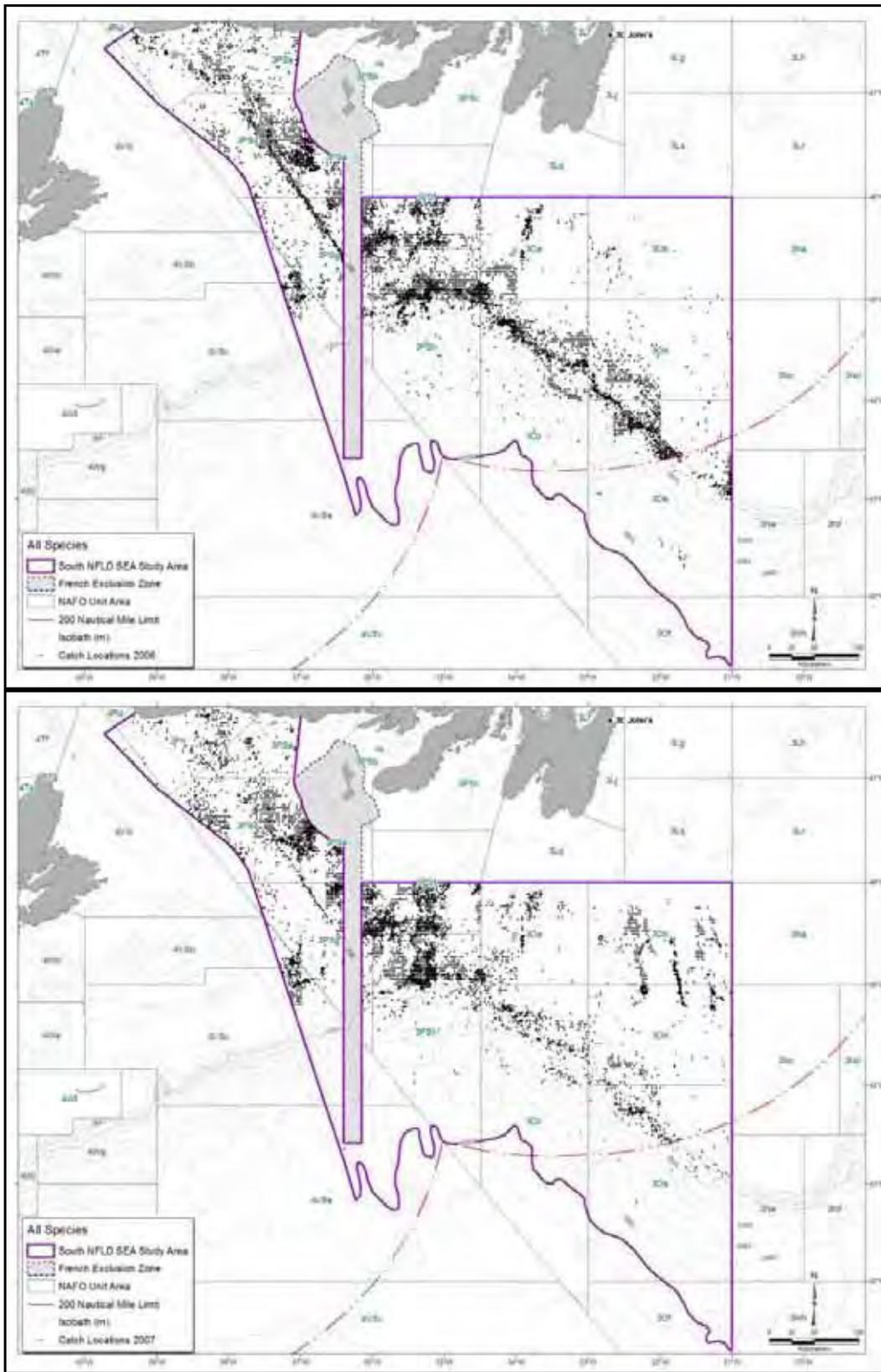
The timing of the harvest is dictated by weather and ice conditions, the availability of the resources, fisheries management plans and other resource conservation considerations, as well as individual fishers' harvesting plans (e.g., harvesting lobster before switching to snow crab). The following graph (Figure 3.16) shows the 2000 to 2007 average monthly harvest for all species within the SEA Area. As the graph shows, the majority of harvesting activity typically occurs from May until October, with comparatively reduced harvesting occurring from November to April. A similar trend is shown in Figure 3.17 where monthly harvest catch weights for all species are shown for 2006 and 2007. Figure 3.18 shows the locations of the SEA Area harvest for all species in all months for 2006 and 2007, respectively. More information on the timing and other aspects of the principal fisheries is provided in the following sections.



**Figure 3.16. Average Monthly Harvest, All Species, for the SEA Area, 2000-2007.**



**Figure 3.17. SEA Area Harvest by Month, All Species, 2006 (Black) and 2007 (Grey).**



**Figure 3.18. SEA Area Harvesting Locations, All Species, All Months, 2006 (upper) and 2007 (lower).**

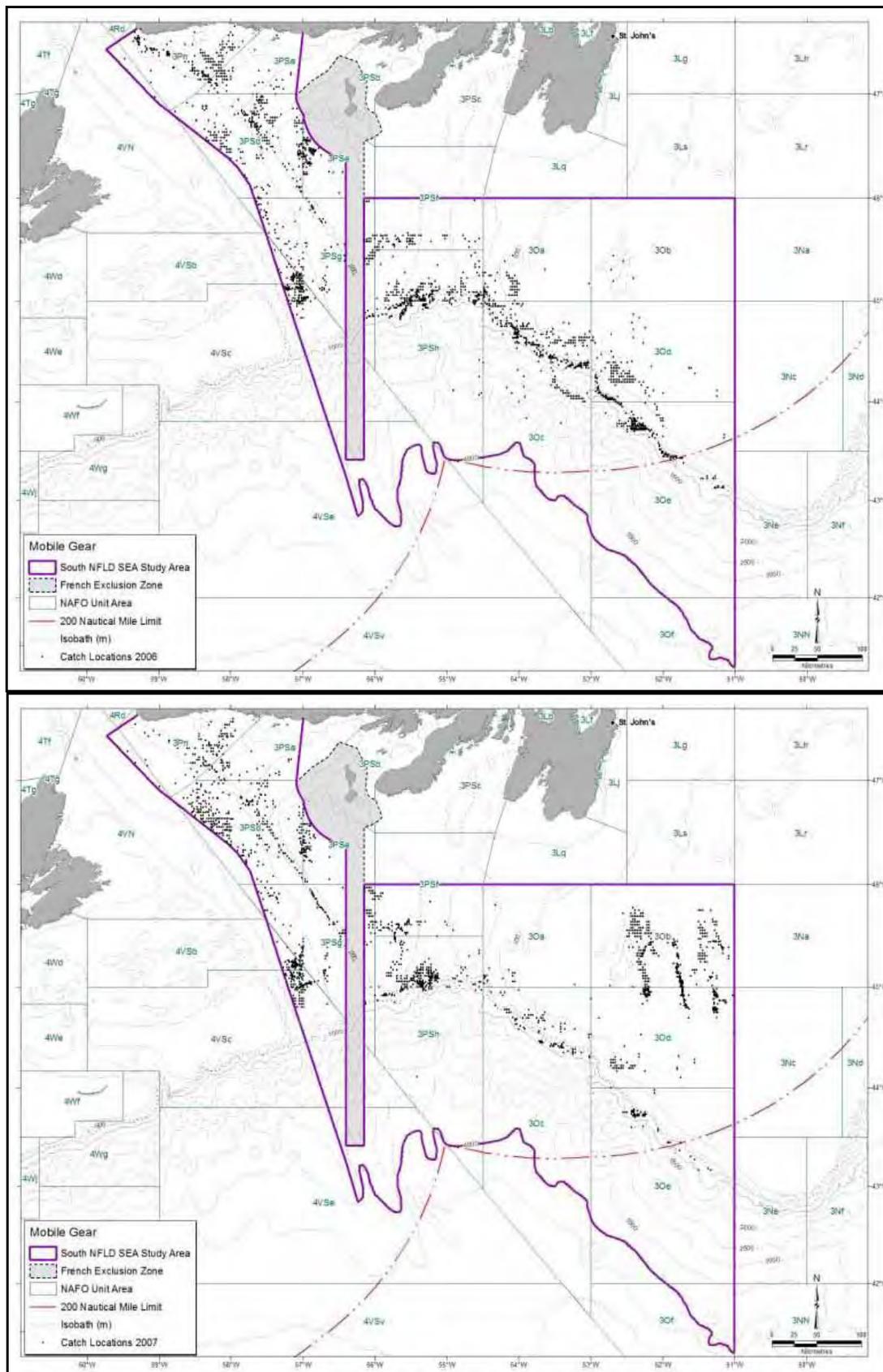
## Fishing Gear

The area's fisheries use both fixed (e.g., crab and lobster pots) and mobile (e.g., seines and trawls) fishing gear. The following table shows the breakdown of the harvest (quantities) by gear type (Table 3.5). Figure 3.19 shows locations of the SEA Area harvest by mobile gear type for 2006 and 2007 based on georeferenced (lat/long) data. The fixed gear harvesting locations for 2006 and 2007 are shown in Figure 3.20. In general, fixed gear has greater potential for conflicts with exploration activities (particularly seismic surveys) since it is often hard to detect when there is no fishing vessel nearby, and it may be set out over long distances in the water. Mobile gear poses less risk of conflict because it is towed behind a vessel which makes it more easily observable and easily located on the water.

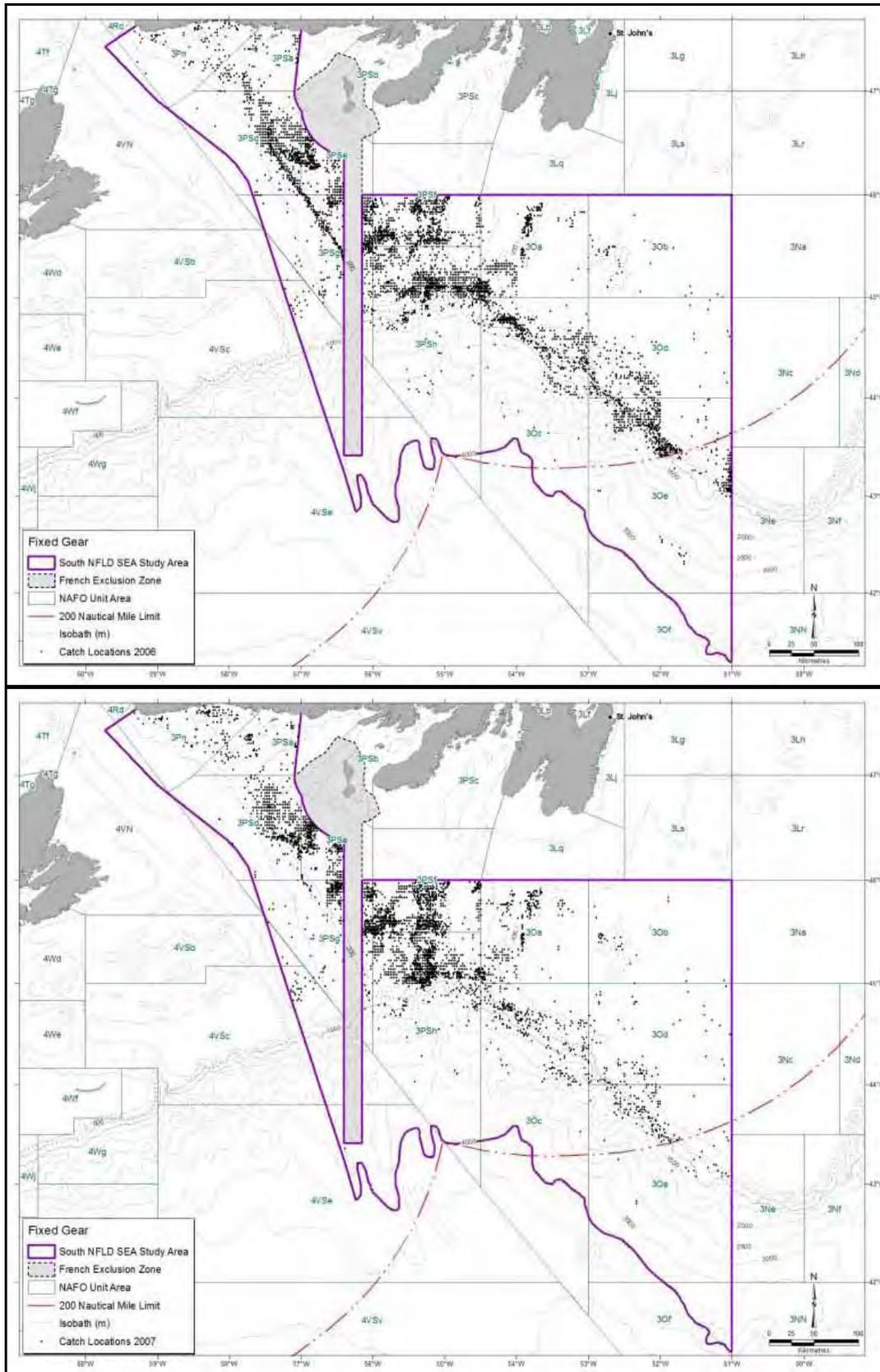
**Table 3.5. SEA Area Harvest by Gear Type, All Months, 2000-2007.**

Gear Type	2000-2007 Average		2006		2007	
	Catch Wt (t)	%	Catch Wt (t)	%	Catch Wt (t)	%
Bottom otter trawl (stern)	14,485.1	46.4	11,189.3	40.3	8825.4	35.9
Gillnet (set or fixed)*	5513.8	17.6	6406.7	23.1	4809.4	19.6
Pot*	4536.2	14.5	5599.0	20.2	5931.9	24.1
Longline*	3862.5	12.4	3581.8	12.9	4031.1	16.4
Dredge (boat)	1560.0	5.0	597.4	2.2	361.7	1.5
Midwater trawl (stern)	698.5	2.2	0.0	0.0	0.1	0.0
Scottish seine	288.9	0.9	0.0	0.0	0.0	0.0
Hagfish barrel*	167.4	0.5	357.3	1.3	305.2	1.2
Midwater trawl (side)	39.8	0.1	0.0	0.0	159.5	0.6
Rod and reel (trolling)	23.0	0.1	0.0	0.0	0.0	0.0
Hand line (baited)	20.7	0.1	5.4	0.0	10.0	0.0
Trap net*	15.2	0.0	3.6	0.0	89.4	0.4
Danish seine	11.4	0.0	0.0	0.0	32.9	0.1
Troll lines	6.9	0.0	10.6	0.0	12.9	0.1
Hunting	3.7	0.0	0.0	0.0	0.0	0.0
Purse seine	3.7	0.0	2.2	0.0	27.2	0.1
Gillnet (drift)*	3.3	0.0	0.0	0.0	0.0	0.0
Fyke net*	2.2	0.0	3.0	0.0	0.4	0.0
Beach and bar seine	2.0	0.0	0.0	0.0	0.0	0.0
Shrimp beam trawl	0.6	0.0	0.0	0.0	0.0	0.0
Eel pot*	0.3	0.0	0.0	0.0	2.2	0.0
Diving	0.2	0.0	0.0	0.0	0.0	0.0
Tuck seine	0.2	0.0	0.0	0.0	1.2	0.0
Shrimp trawl	0.1	0.0	0.0	0.0	0.0	0.0
Harpoon	0.0	0.0	0.1	0.0	0.0	0.0
<b>Grand Total</b>	<b>31,245.8</b>	<b>100.0</b>	<b>27,756.4</b>	<b>100.0</b>	<b>24,600.3</b>	<b>100.0</b>

\*fixed gear



**Figure 3.19. SEA Area Harvesting Locations, All Species, Mobile Gear 2006 (upper), Mobile Gear 2007 (lower).**



**Figure 3.20. SEA Area Harvesting Locations, All Species, Fixed Gear 2006 (upper), and Fixed Gear 2007 (lower).**

## **Landed Value**

Table 3.6 shows the landed value of the domestic harvest recorded within the SEA Area during 2007 (all DFO Regions data). The estimated monetary value for each landed catch was provided with the commercial landings data obtained from DFO. The values provided in Table 3.6 are an approximation of the annual landed values, since prices for some species may vary slightly from area to area and from province to province, depending on where the harvest was landed and sold. In addition, the prices for some species vary throughout the fishing season so that the value of the same quantity of a species landed at the beginning of its harvest season may be higher or lower than that landed at season's end.

**Table 3.6. Landed Value for the SEA Area in 2007.**

<b>Species</b>	<b>Catch Wt (kg)</b>	<b>Catch Value (\$)</b>	<b>\$/kg</b>
Snow crab	2,687,562	\$9,464,019	\$3.52
Atlantic cod	5,442,572	\$8,044,009	\$1.48
Whelk	3,148,165	\$3,025,637	\$0.96
Redfish spp.	4,840,610	\$2,984,664	\$0.62
Swordfish	336,627	\$2,816,311	\$8.37
Atlantic halibut	314,938	\$2,767,269	\$8.79
White hake	1,764,760	\$1,424,528	\$0.81
Lobster	95,234	\$1,196,904	\$12.57
Yellowtail flounder	1,646,236	\$1,103,440	\$0.67
Greenland halibut (turbot)	284,253	\$668,848	\$2.35
Pollock	841,217	\$531,332	\$0.63
Hagfish	305,191	\$504,619	\$1.65
Sea scallop	322,206	\$492,469	\$1.53
Skate spp.	1,164,025	\$470,371	\$0.40
Haddock	400,594	\$410,943	\$1.03
American plaice	433,730	\$330,037	\$0.76
Monkfish	179,946	\$197,972	\$1.10
Bluefin tuna	19,492	\$185,979	\$9.54
Bigeye tuna	3407	\$38,997	\$11.45
Witch flounder (greysole)	40,055	\$34,404	\$0.86
Groundfish heads	17,885	\$31,147	\$1.74
Atlantic herring	142,433	\$29,626	\$0.21
Atlantic mackerel	78,604	\$23,867	\$0.30
Lumpfish roe	4630	\$20,586	\$4.45
Sea cucumber	31,752	\$17,500	\$0.55
Eel	2570	\$13,310	\$5.18
Stimpsons surf clams	7341	\$10,588	\$1.44
Mako shark	9336	\$10,588	\$1.13
Albacore tuna	616	\$7071	\$11.48
Fish fins	126	\$1984	\$15.74
Yellowfin tuna	426	\$3008	\$7.06
All other species	33,723	\$36,581	\$1.08
<b>Grand Total</b>	<b>24,600,262</b>	<b>\$36,898,608</b>	<b>\$1.50</b>

The landed value is the value of the catch “at the wharf”, generally the price paid to the harvesting sector. It does not show, for instance, the “downstream” indirect or induced economic benefits of the harvest, during or after processing or value-added manufacturing of fish-based products.

As shown in Table 3.6, at least nine species within the SEA Area generated greater than \$1 million in revenue in 2007. Three of the top eight species, snow crab, whelk, and lobster, were invertebrate species while Atlantic cod was the second most important species in terms of value. Other important economic species included groundfish (e.g., redfish, Atlantic halibut, white hake, yellowtail flounder, Greenland halibut, pollock, and hagfish), and large pelagics (e.g., swordfish).

### **Fishing Enterprises and Licences**

The following describes the numbers of Core and Non-Core/Recreational fishing licences for NAFO Subdiv. 3Pn and 3Ps for 2007, the most recent year for which these data are published. Licensing data in this section primarily relates to inshore enterprises with vessel lengths less than 65’ in length (DFO 2007c). In 2007, no vessels 65’ to 89’11” LOA were registered in the inshore fleet. The licensing data do not include experimental licences and emerging licences. In 2007, the number of licences held by core harvesters (vessels <65’ LOA) was 369 and 5209 in 3Pn and 3Ps, respectively (DFO 2007c). The majority of licences in 3Pn were for groundfish fixed gear (66), mackerel mobile gear (63), seal (63), bait (62), and mackerel fixed gear (44). In 3Ps, the licences were largely for groundfish fixed gear (901), bait (705), snow crab inshore (681), lobster (627), squid (440), scallop (397), mackerel fixed gear (386), whelk (382), and herring fixed gear (284).

The number of licences held by Non-Core and recreational fish harvesters in 3Pn and 3Ps was 302 and 1292, respectively, in 2007 (DFO 2007c). The majority of licences in 3Pn were for seal (206), scallop (recreational; 31), groundfish fixed gear (27), and bait (21). For 3Ps, the majority of licences were for scallop (recreational; 963), groundfish fixed gear (87), bait (57), lobster (32), and squid (22). In 2007, the number of Core enterprises for vessels <65’ was 75 in 3Pn and 905 in 3Ps (DFO 2007c). The number of Non-Core enterprises for vessel <65’ was 29 in 3Pn and 103 in 3Ps. There was a total of 38 offshore licences for vessels >65’ in the Newfoundland and Labrador Region during 2007 (DFO 2007c). The data provided in DFO (2007c) were categorized by NAFO Divisions so it is unknown how many offshore licences occurred in the SEA Area. The offshore licences were for shrimp (14), groundfish (13), scallop (5), crab (4 exploratory licences outside the 200 mile limit), and clam (2).

### **Georeferenced Commercial Harvest**

This section provides data and maps for the components of the 2000 to 2007 DFO datasets that are georeferenced by latitude and longitude (as described above). Overall, a large percentage of the SEA Area harvest has been georeferenced in recent years (e.g., 83% by weight for all of the SEA Area in 2007). However, some species harvested in the SEA Area, particularly those targeted by inshore fisheries, are not included (e.g., lobster and herring) or have a smaller portion of the actual harvest represented (e.g., cod and turbot).

The georeferenced data for the SEA Area, averaged over an eight year period (2000 to 2007), indicate that redfish, Atlantic cod, snow crab, and yellowtail flounder are principal harvest species (Table 3.7). These species collectively account for 67.7% of the overall catch within the SEA Area. These species continue to be important components during harvests of recent years though the interannual contribution to the overall catch can vary. Various species of groundfish, invertebrates, small pelagics, and large pelagics account for the remainder of the harvest. Some species, such as whelk, have become increasingly important during recent years. The following maps show the locations of the georeferenced harvest within the SEA Area for the years 2006 and 2007, summarized for all months and species.

## Principal Species Fisheries

As discussed, the dominant species harvested within the SEA Area are groundfish (primarily redfish, cod, yellowtail flounder, white hake, skate, monkfish, American plaice, and pollock) and invertebrates (snow crab, whelk, and sea scallop). Collectively, these species have, on average, made up approximately 92% of the SEA Area harvest by weight from 2000 to 2007 (Table 3.7). This section provides more detailed information on these fisheries. In addition, some fisheries, such as lobster, Atlantic halibut, Greenland halibut, hagfish, haddock, and swordfish, produce relatively low catch yields, but result in high catch values. These fisheries will also be discussed in detail. The maps presented are based on the georeferenced (lat/long) data for 2006 and 2007.

**Table 3.7. Georeferenced Harvest Within the SEA Area, Average 2000-2007.**

Species	2000-2007 Average		2006		2007	
	Catch Wt	%	Catch Wt	%	Catch Wt	%
Redfish spp.	9038.5	30.8	8923.0	34.3	4596.7	20.1
Atlantic cod	5093.9	17.3	4205.5	16.1	4380.6	19.2
Snow crab	3553.1	12.1	2596.7	10.0	2676.1	11.7
Yellowtail flounder	2216.6	7.5	6.8	0.0	1646.2	7.2
White hake	1543.9	5.3	2298.5	8.8	1725.3	7.6
Skate spp.	1517.0	5.2	936.2	3.6	1089.4	4.8
Monkfish	1119.7	3.8	1145.0	4.4	178.4	0.8
Sea scallop	1023.0	3.5	415.5	1.6	322.2	1.4
Whelk	928.2	3.2	2920.2	11.2	3148.2	13.8
American plaice	607.9	2.1	231.7	0.9	421.7	1.8
Pollock	443.3	1.5	626.8	2.4	838.7	3.7
Icelandic scallop	426.6	1.5	42.9	0.2	0.0	0.0
Atlantic halibut	424.2	1.4	424.7	1.6	278.3	1.2
Greenland halibut (turbot)	357.9	1.2	163.6	0.6	283.0	1.2
Witch flounder (greysole)	285.7	1.0	130.6	0.5	38.8	0.2
Swordfish	236.2	0.8	255.0	1.0	336.6	1.5
Haddock	229.6	0.8	168.0	0.6	399.7	1.8
Hagfish	131.0	0.4	353.5	1.4	305.2	1.3
Porbeagle shark	49.4	0.2	3.8	0.0	7.3	0.0
Bluefin tuna	32.0	0.1	15.5	0.1	15.9	0.1
Sea cucumber	22.0	0.1	138.9	0.5	31.8	0.1
All Others	99.5	0.3	48.3	0.2	117.8	0.5
<b>Grand Total</b>	<b>29,378.9</b>	<b>100.0</b>	<b>26,050.6</b>	<b>100.0</b>	<b>22,837.8</b>	<b>100.0</b>

### *Groundfish*

The groundfish harvest has been drastically reduced in the SEA Area over the last two decades. The decline of the groundfish fisheries off the south coast of Newfoundland has been described in JWEL (2003) and JW (2007) for the western portion of the SEA Area. A similar decline occurred in the eastern portion of the SEA Area, namely NAFO Div. 3O. The harvest locations for all groundfish species within the SEA Area for 2006 and 2007 are shown in Figure 3.21.

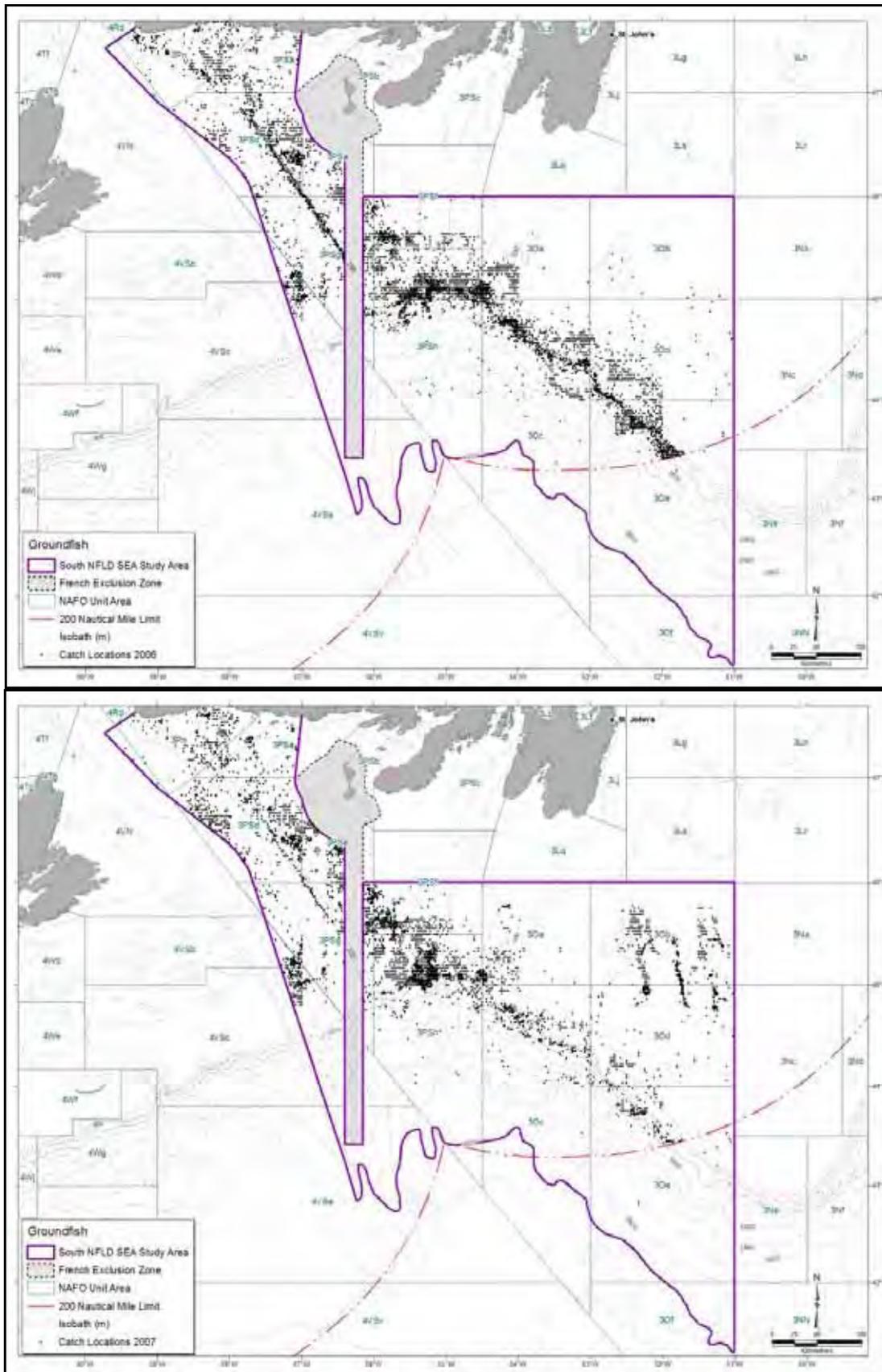


Figure 3.21. SEA Area Harvesting Locations, Groundfish, All Months, 2006 (upper) and 2007 (lower).

## Atlantic Cod

Within the SEA Area, Atlantic cod domestic landings have exhibited a decreasing trend between 2000 (~7804 t) and 2007 (~4381 t) (Figure 3.22). Atlantic cod catches may occur year-round (Figure 3.23). In recent years (2006 and 2007), Atlantic cod landings have been generally highest from July to November and in February within the SEA Area. Figure 3.24 shows the georeferenced harvest locations for Atlantic cod within the SEA for 2006 and 2007. A variety of gear types are used to harvest Atlantic cod within the SEA Area. From 2000 to 2007, the species was mainly targeted with longlines, gillnets, bottom otter trawls, and Scottish seines. Small catches have also been made using Danish seines, baited hand lines, midwater trawls, shrimp trawls, and pots/traps.

In Div. 3O, foreign cod fisheries have averaged roughly 416 t annually from 2000 to 2007 with a peak of ~782 t in 2002 and a low of ~128 t in 2005. Approximately 348 t was harvested outside Canada's EEZ in Div. 3O during 2007.

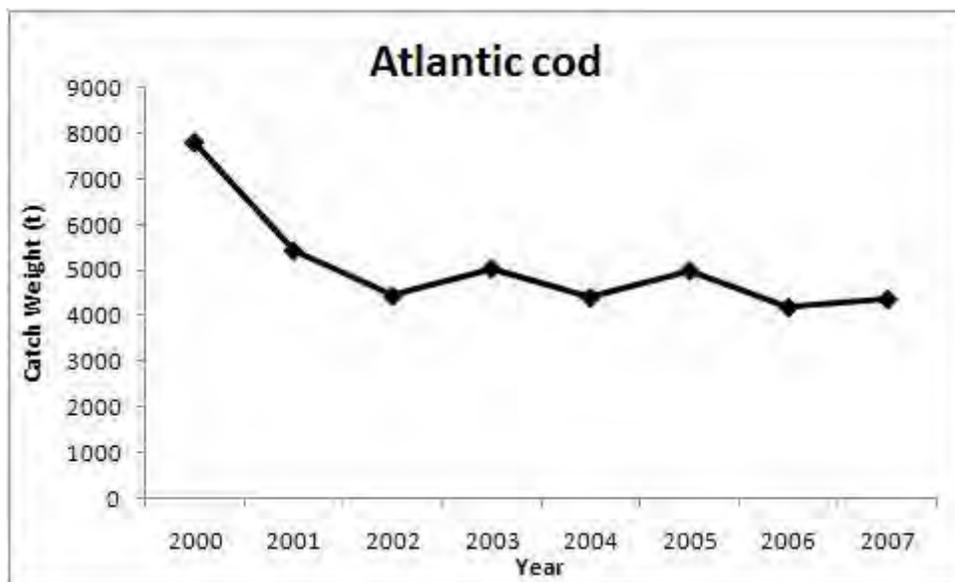


Figure 3.22. Annual Atlantic Cod Harvest, 2000-2007.

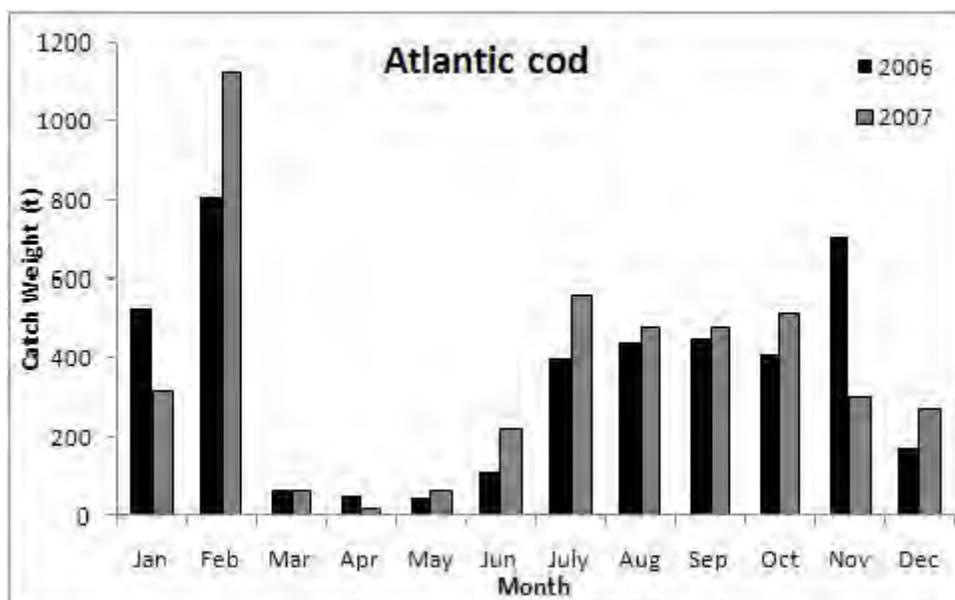
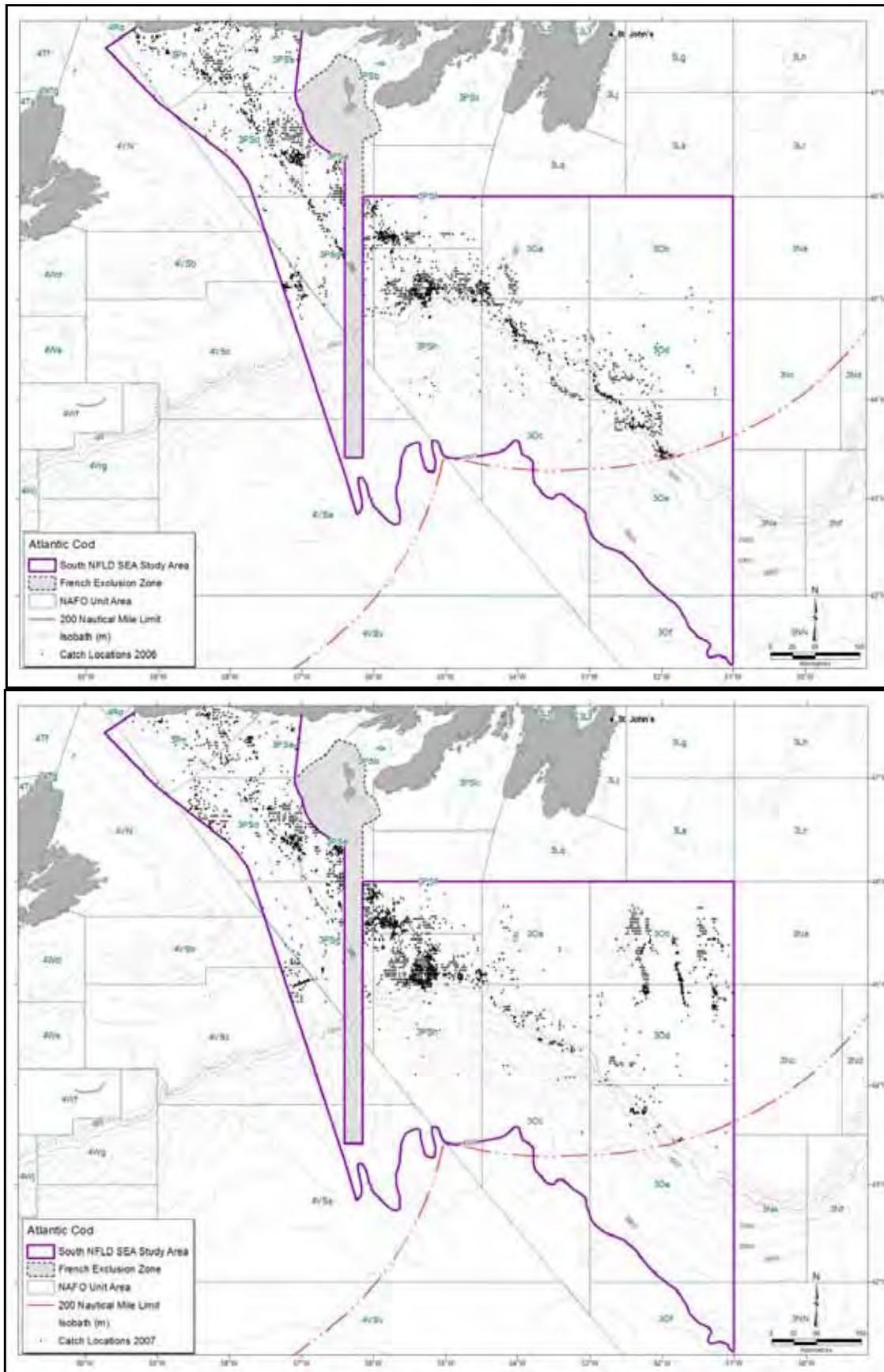


Figure 3.23. Monthly Atlantic Cod Harvest, 2006 and 2007.



**Figure 3.24. Atlantic Cod Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Redfish

Within the SEA Area, redfish landings have been declining annually between 2000 and 2007, decreasing from ~11,615 t to ~4597 t (Figure 3.25). Like Atlantic cod, redfish catches may occur year-round (Figure 3.26); however, the months with the highest catches may vary from year to year. Figure 3.27 shows the georeferenced harvest locations for redfish within the SEA Area for 2006 and 2007. From 2000 to 2007, redfish have been harvested mainly with trawls (bottom otter trawl, midwater trawls) and gillnets. Small catches have been made with seines (Danish, Scottish), baited handlines, longlines, pots, and shrimp trawls.

In Div. 3O, foreign redfish fisheries have averaged roughly 21,842 t annually from 2000 to 2007 with a high of ~35,362 t in 2001 and a low of 7696 t in 2004. In 2007, approximately 12,944 t of redfish were harvested outside Canada's EEZ in Div. 3O.

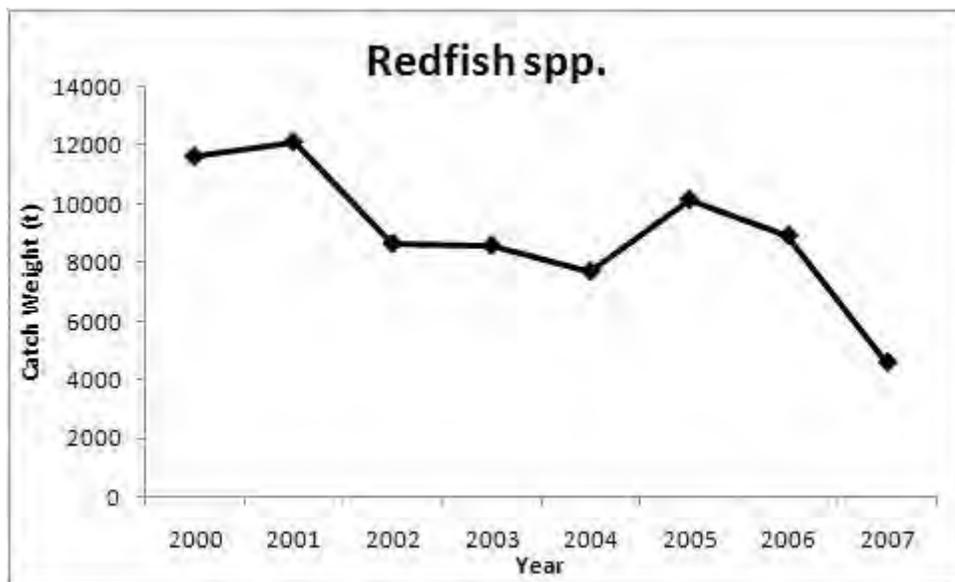


Figure 3.25. Annual Redfish Harvest, 2000-2007.

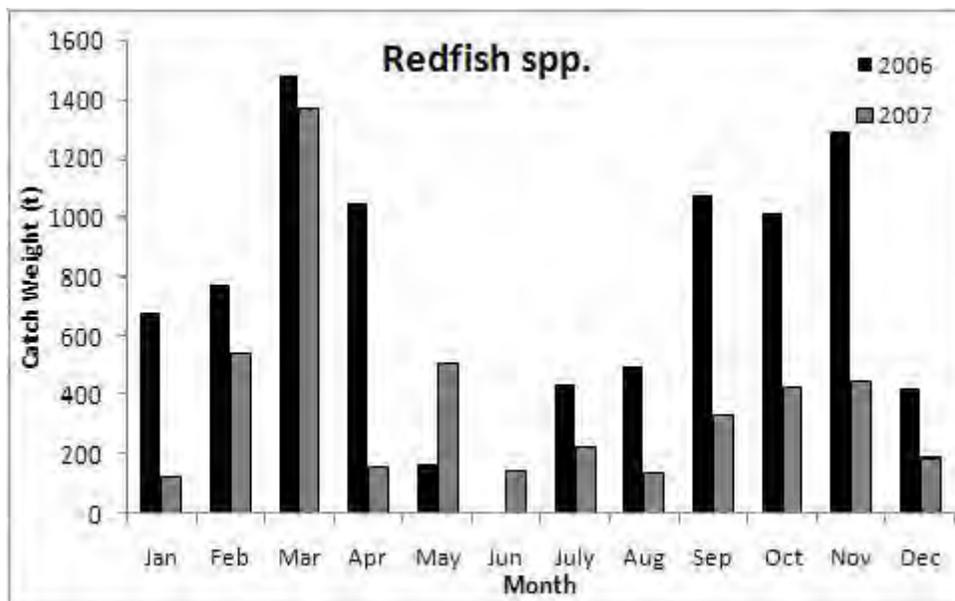
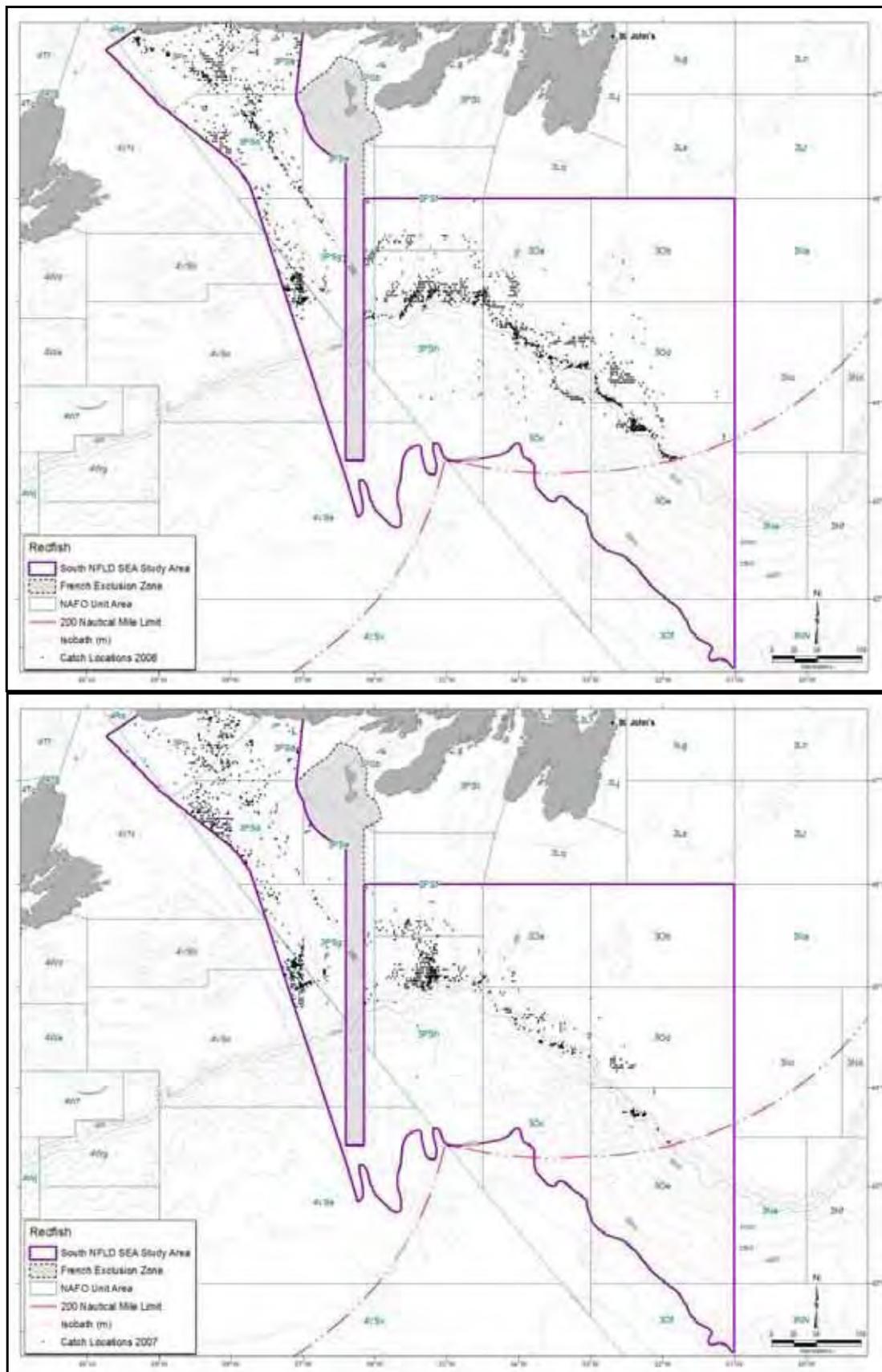


Figure 3.26. Monthly Redfish Harvest, 2006 and 2007.



**Figure 3.27. Redfish Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Yellowtail Flounder

Within the SEA Area, yellowtail flounder landings have been highly variable between 2000 and 2007 (Figure 3.28). Over that period, the landings have ranged from approximately 7 t in 2006 (due to industry restructuring) to roughly 4538 t in 2003. Very little or no yellowtail flounder catches have occurred from February to May in recent years (Figure 3.29). Landings have occurred from June through December, but were largely concentrated in October and November during 2007. Figure 3.30 shows the georeferenced harvest locations for yellowtail flounder within the SEA Area for 2006 and 2007. From 2000 to 2007, yellowtail flounder were predominately caught using bottom otter trawls. Other gear types used to harvest the species directly or indirectly included seines (Scottish, Danish), shrimp trawls, baited handlines, gillnets, longlines, and pots.

In Div. 30, foreign yellowtail fisheries have averaged roughly 145 t annually from 2000 to 2007. Catches declined from ~226 t in 2000 to 0 t in 2004, followed by an increase to ~266 t in 2005. In 2007, foreign yellowtail catches were ~84 t.

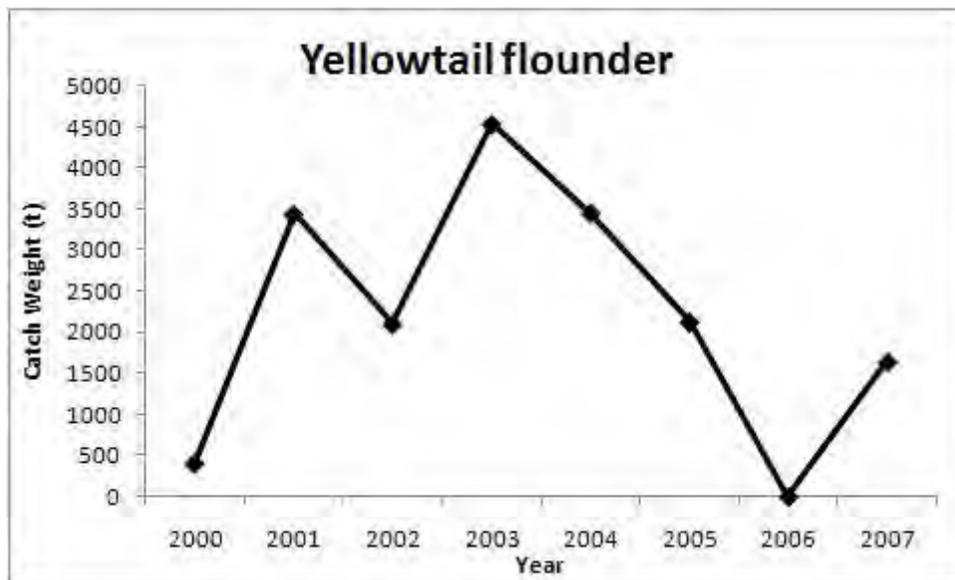


Figure 3.28. Annual Yellowtail Flounder Harvest, 2000-2007.

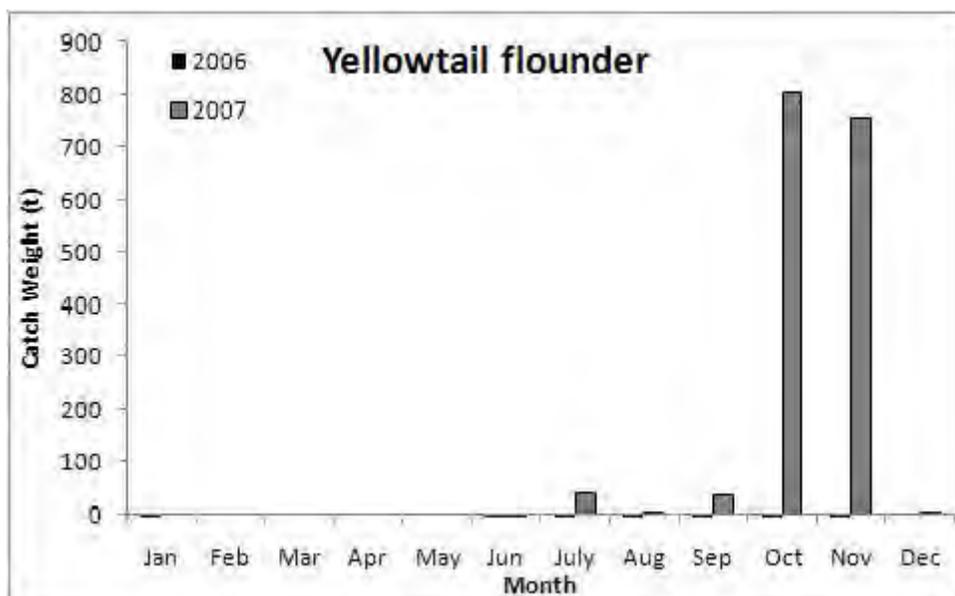
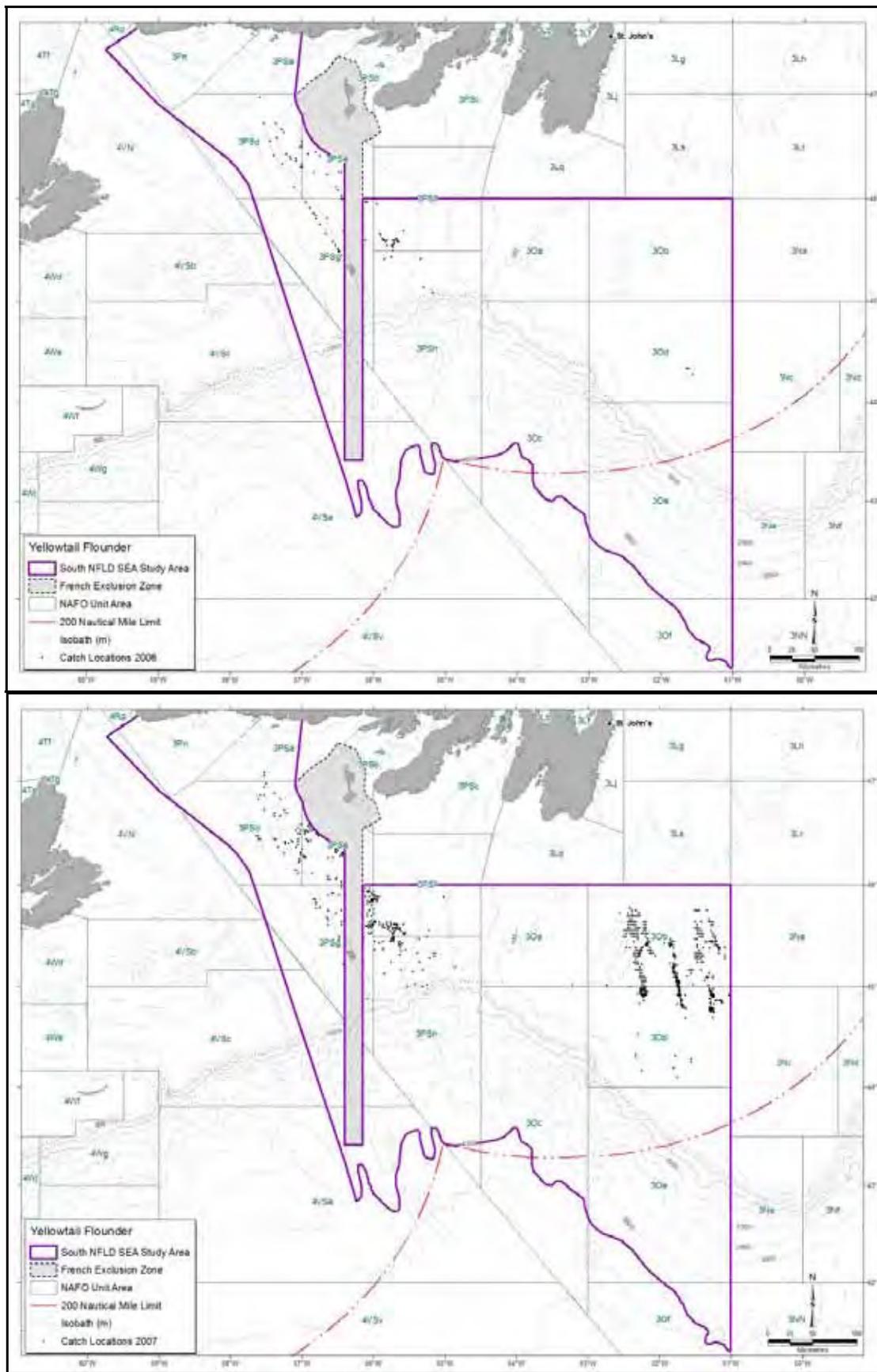


Figure 3.29. Monthly Yellowtail Flounder Harvest, 2006-2007.



**Figure 3.30. Yellowtail Flounder Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## White Hake

White hake is a groundfish species that has shown an overall increase in landings within the SEA Area between 2000 and 2007 (Figure 3.31). Annual landings of the species have gradually increased from ~1181 t in 2000 to ~2300 t in 2006. A slight decline to ~1725 t was observed in 2007. White hake landings may occur year-round with peak landings occurring in June and July (Figure 3.32). Comparatively low landings are observed during the rest of the year. Figure 3.33 shows the georeferenced harvest locations for white hake within the SEA Area for 2006 and 2007. From 2000 to 2007, white hake catches were almost evenly split between gillnets and longlines though a relatively large quantity was also captured with bottom otter trawls. Small quantities of white hake were also harvested directly or indirectly with seines (Danish, Scottish), baited handlines, midwater trawls, shrimp trawls, and pots.

In Div. 3O, foreign white hake fisheries have ranged from ~58 t (2000) to ~6264 t (2002) between 2000 and 2007. Catches declined from 6106 t in 2003 to 148 t in 2007.

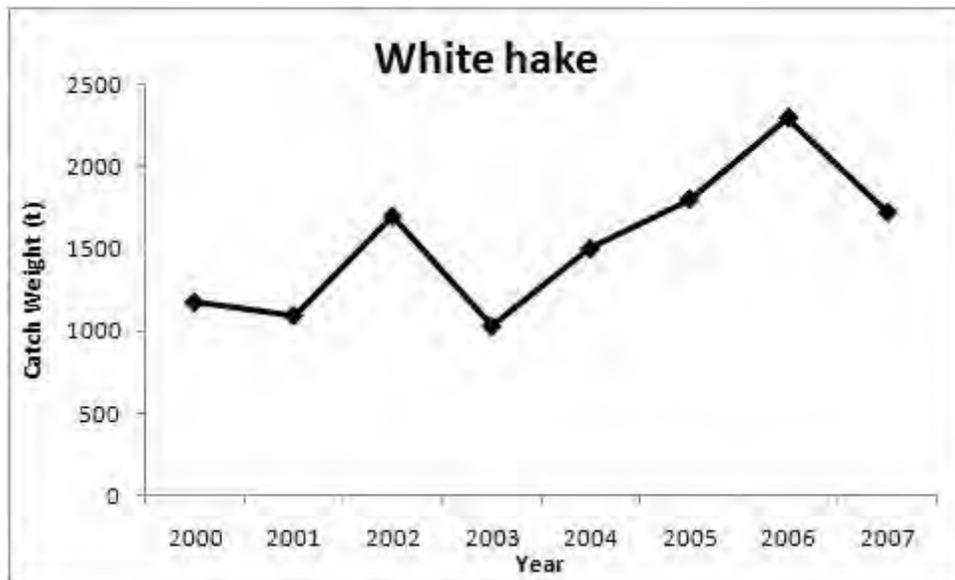


Figure 3.31. Annual White Hake Harvest, 2000-2007.

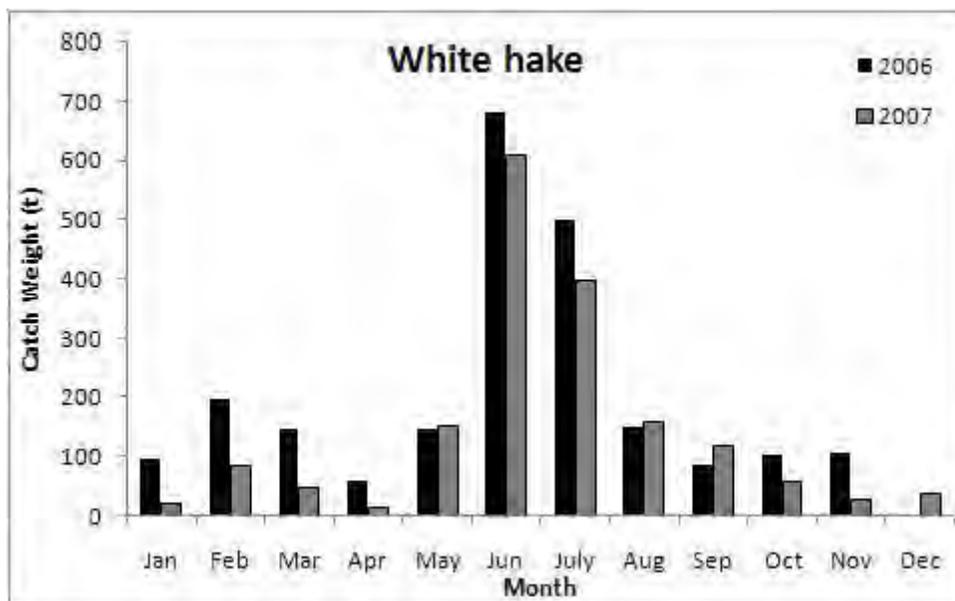
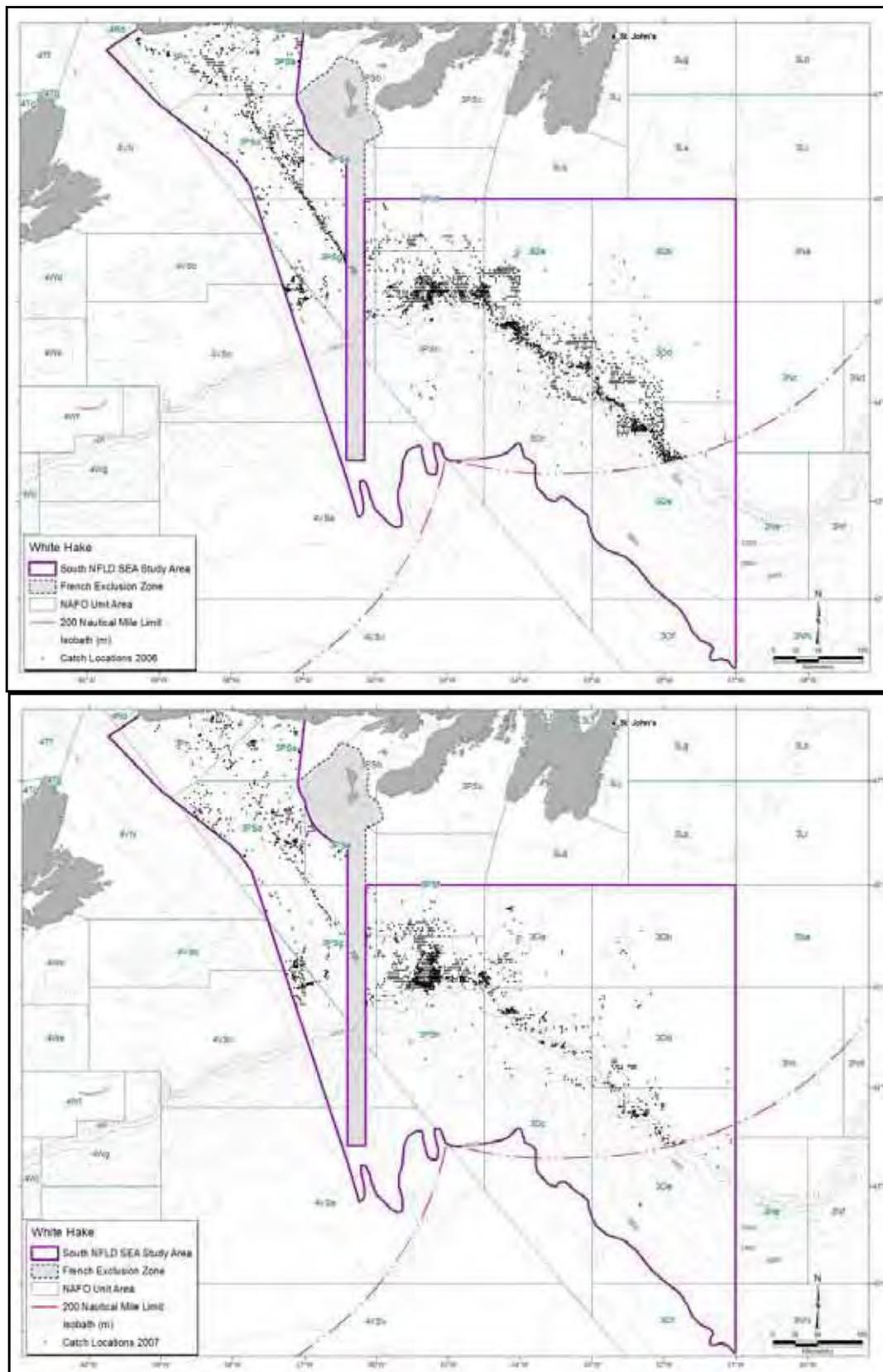


Figure 3.32. Monthly White Hake Harvest, 2006 and 2007.



**Figure 3.33. White Hake Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Atlantic Halibut

From 2000 to 2007, Atlantic halibut landings have ranged from ~246 t to ~603 t with an average of roughly 424 t annually (Figure 3.34). In 2007, landings of the species decreased to approximately 278 t. Atlantic halibut landings have occurred year-round in recent years (Figure 3.35). Figure 3.36 shows the georeferenced harvest locations for Atlantic halibut within the SEA Area for 2006 and 2007. From 2000 to 2007, Atlantic halibut were largely harvested using longlines, gillnets, and bottom otter trawls within the SEA Area. Other gear types used to harvest the species included seines (Danish, Scottish), baited handlines, midwater trawls, shrimp trawls, and pots.

In Div. 3O, foreign Atlantic halibut fisheries have averaged roughly 61 t annually from 2000 to 2007. Catches have ranged from ~24 t in 2005 to ~136 t in 2003. Approximately 36 t of Atlantic halibut were harvested in both 2006 and 2007.

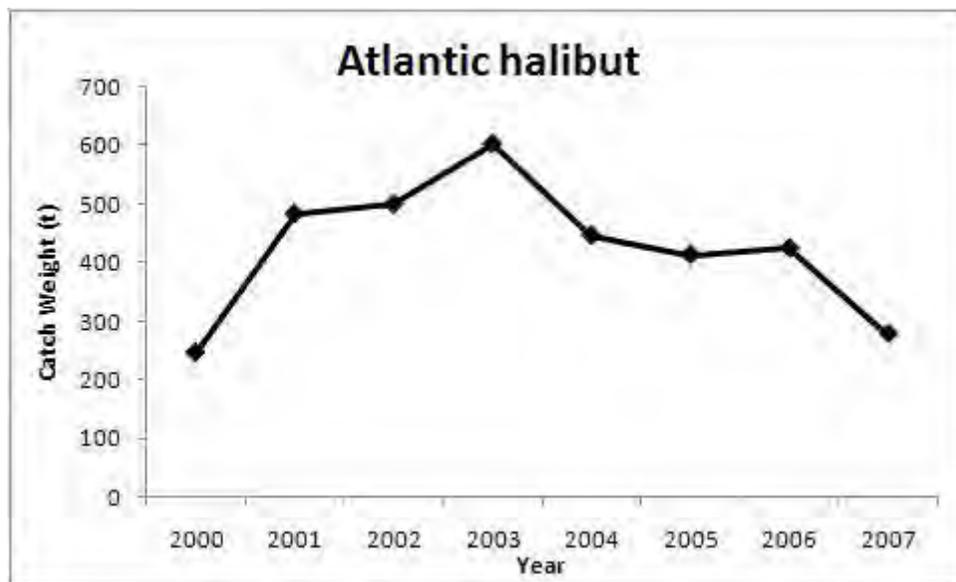


Figure 3.34. Annual Atlantic Halibut Harvest, 2000-2007.

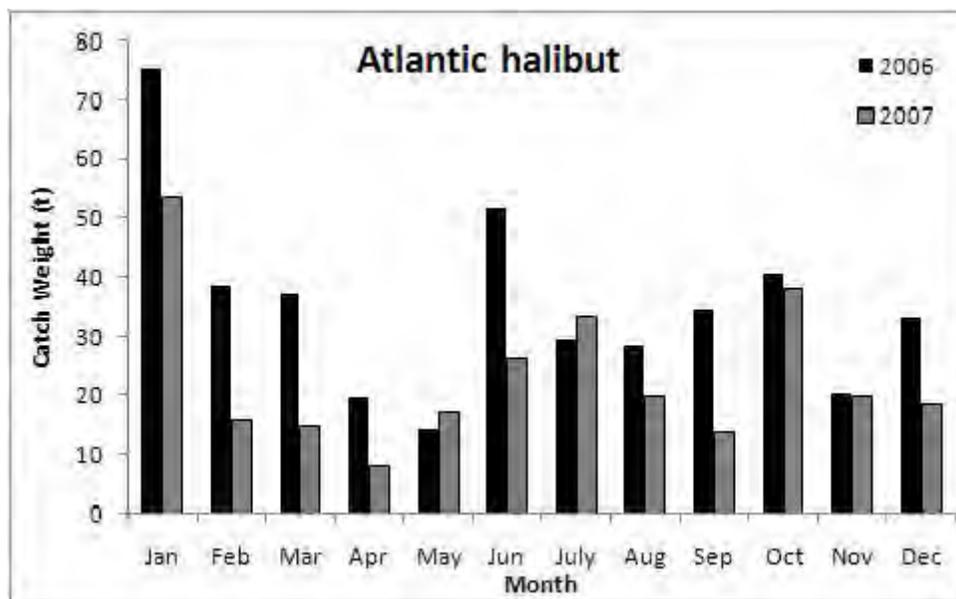


Figure 3.35. Monthly Atlantic Halibut Harvest, 2006 and 2007.

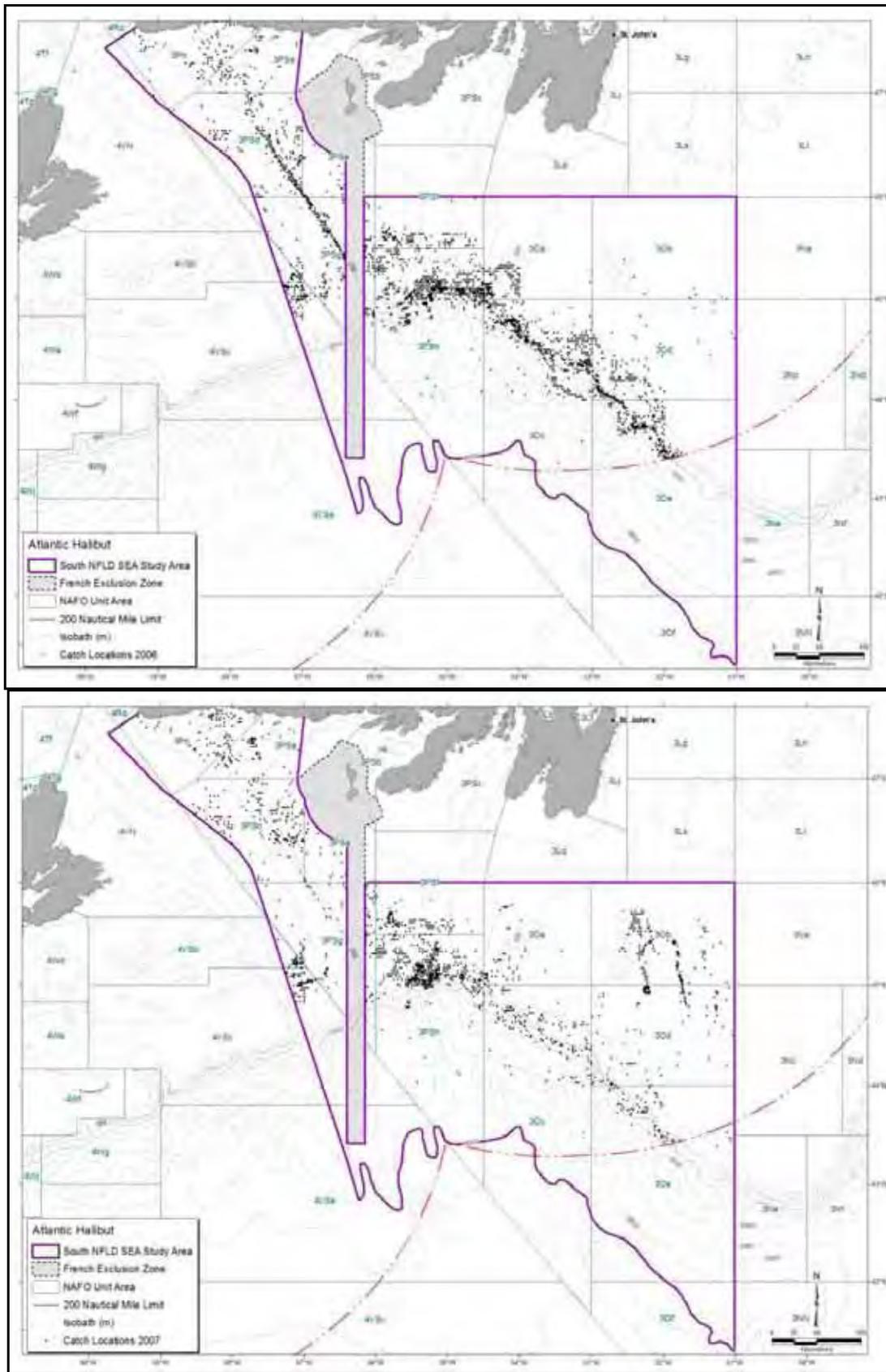


Figure 3.36. Atlantic Halibut Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).

## Skate

From 2000 to 2007, skate landings have ranged from a high of ~2310 t (2002) to a low of ~936 t (2006) (Figure 3.37). Since 2002, landings have been showing a decreasing trend, falling to ~1089 t in 2007. Like other groundfish, skate are generally harvested year-round though relatively few catches occur from October to February (Figure 3.38). Peak catches occurred from May to August in 2007 within the SEA Area. Figure 3.39 shows the georeferenced harvest locations for skate within the SEA Area for 2006 and 2007. From 2000 to 2007, the dominant gear types used to harvest species of skate within the SEA Area were bottom otter trawls, gillnets, and longlines. Relatively small quantities of skate were also harvested using Danish seines, baited handlines, midwater trawls, shrimp trawls, and pots.

In Div. 3O, foreign skate fisheries have averaged roughly 1401 t annually from 2000 to 2007 with a peak of ~2340 t in 2003 and a low of ~556 t in 2005. In 2007, foreign skate catches were 1220 t.

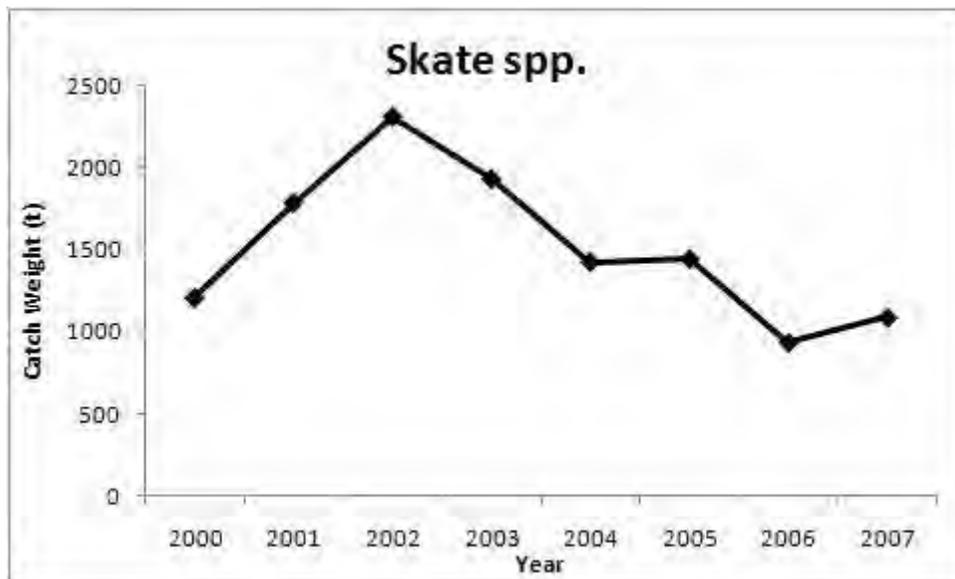


Figure 3.37. Annual Skate Harvest, 2000-2007.

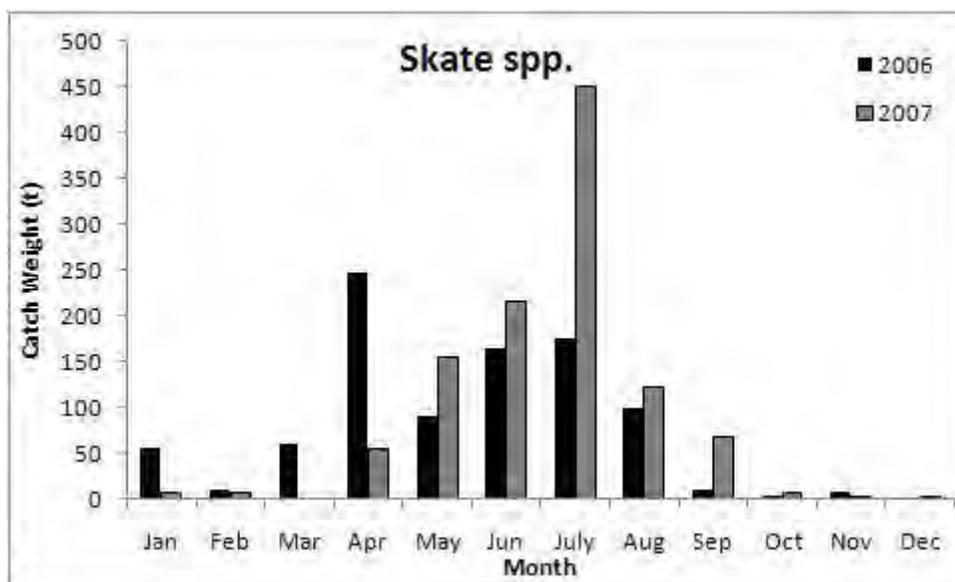
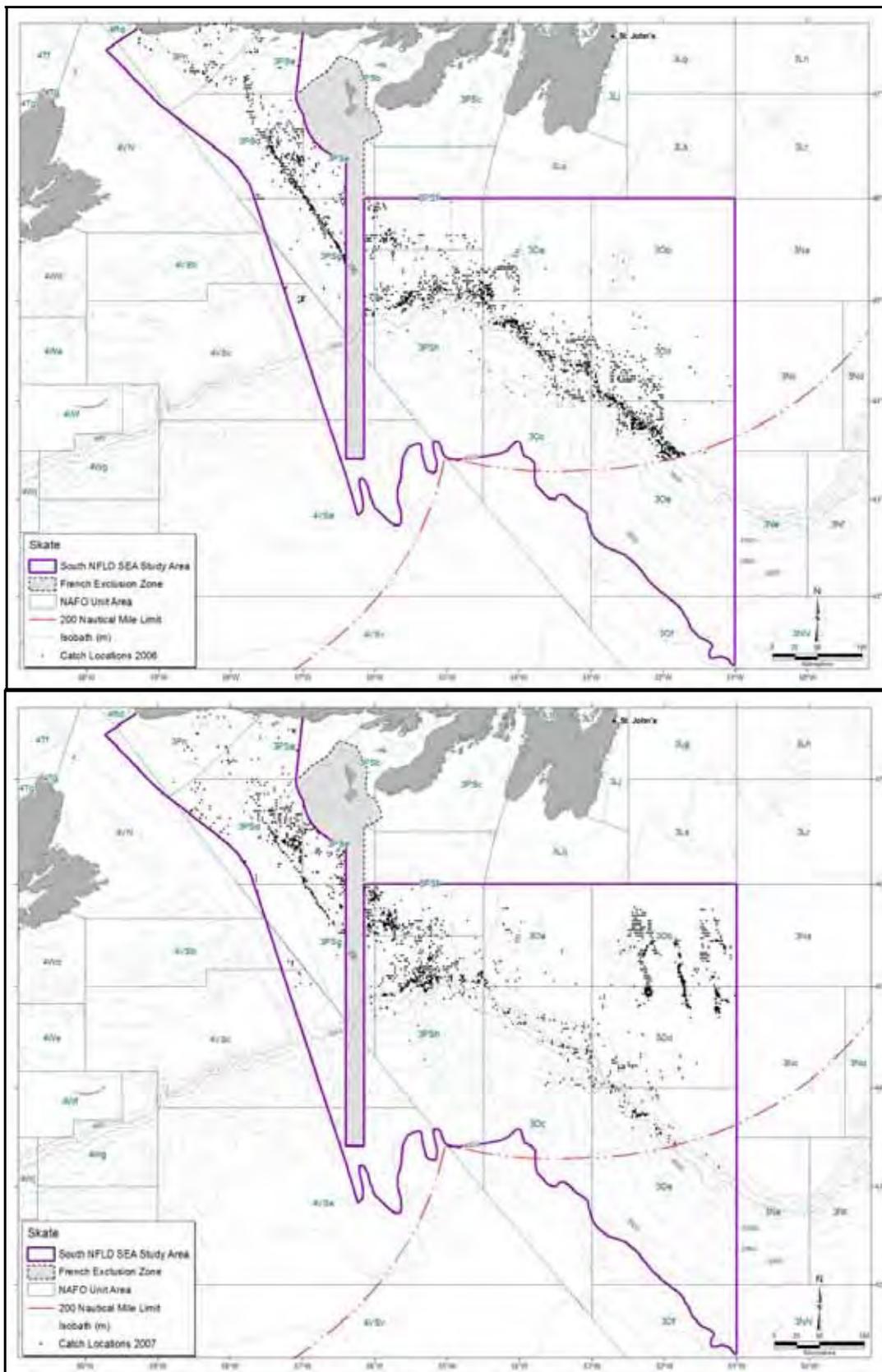


Figure 3.38. Monthly Skate Harvest, 2006 and 2007.



**Figure 3.39. Skate Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Monkfish

From 2000 to 2007, monkfish landings have ranged from ~124 t (2000) to ~2602 t (2003) (Figure 3.40). Since 2003, monkfish landings have largely declined annually with approximately 178 t landed during 2007. In recent years, monkfish have been largely harvested in June and July (Figure 3.41). Virtually no landings of the species have been made between September and April. Figure 3.42 shows the georeferenced harvest locations for monkfish within the SEA Area for 2006 and 2007. From 2000 to 2007, monkfish were mainly harvested with gillnet and, to a lesser extent, bottom otter trawl. Small quantities have been caught using Danish seine, dredge, baited handline, longline, midwater trawl, shrimp trawl, and pots.

In Div. 3O, foreign monkfish fisheries have ranged from a low of 4 t in 2000 to a peak of 486 t in 2003. Roughly 72 t were harvested in 2007.

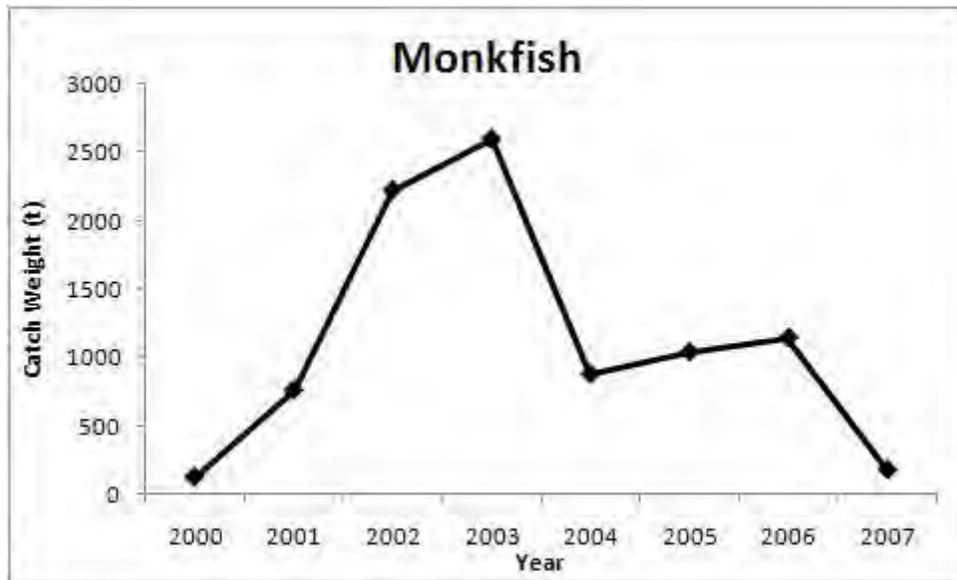


Figure 3.40. Annual Monkfish Harvest, 2000-2007.

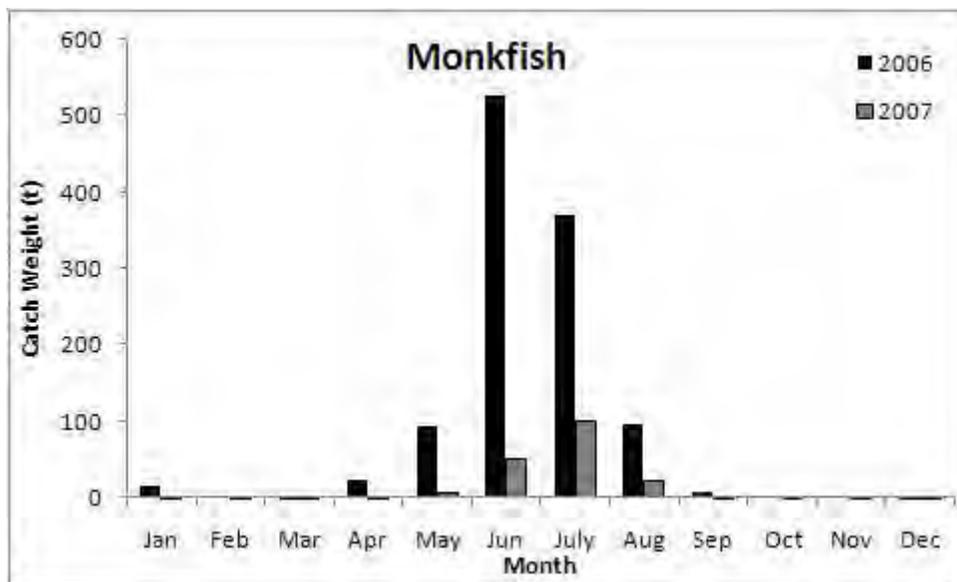
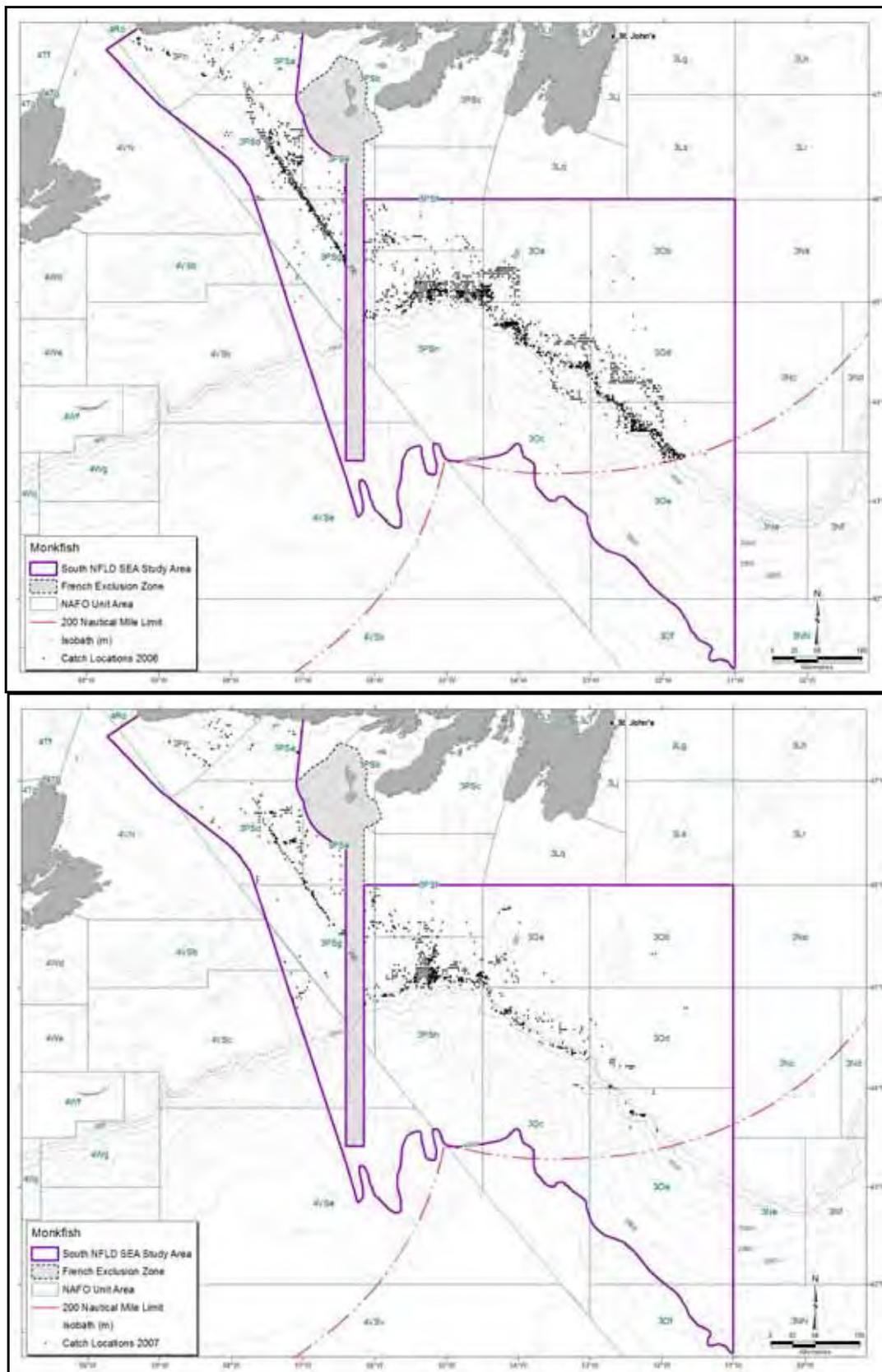


Figure 3.41. Monthly Monkfish Harvest, 2006 and 2007.



**Figure 3.42. Monkfish Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## American Plaice

From 2000 to 2007, American plaice landings have averaged roughly 608 t per year, ranging from ~232 t in 2000 to ~959 t in 2003 (Figure 3.43). American plaice have been landed year-round in recent years; however, catches in 2007 largely occurred from July through November (Figure 3.44). Figure 3.45 shows the georeferenced harvest locations for American plaice within the SEA Area for 2006 and 2007. From 2000 to 2007, American plaice have been primarily harvested with bottom otter trawls, longlines, gillnets, and Scottish seines. Small catches have been made using Danish seine, dredge, baited handline, midwater trawl, shrimp trawl, and pots.

In Div. 3O, foreign American plaice fisheries have averaged roughly 729 t annually from 2000 to 2007. Catches peaked at ~1118 t in both 2002 and 2003 after a low of ~494 t in 2001. In 2007, foreign American plaice catches were approximately 646 t.

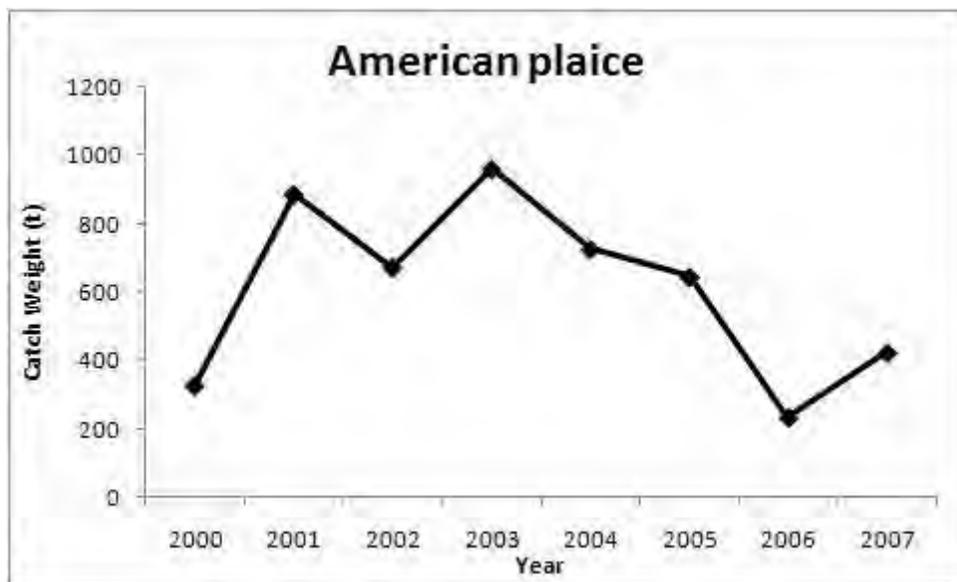


Figure 3.43. Annual American Plaice Harvest, 2000-2007.

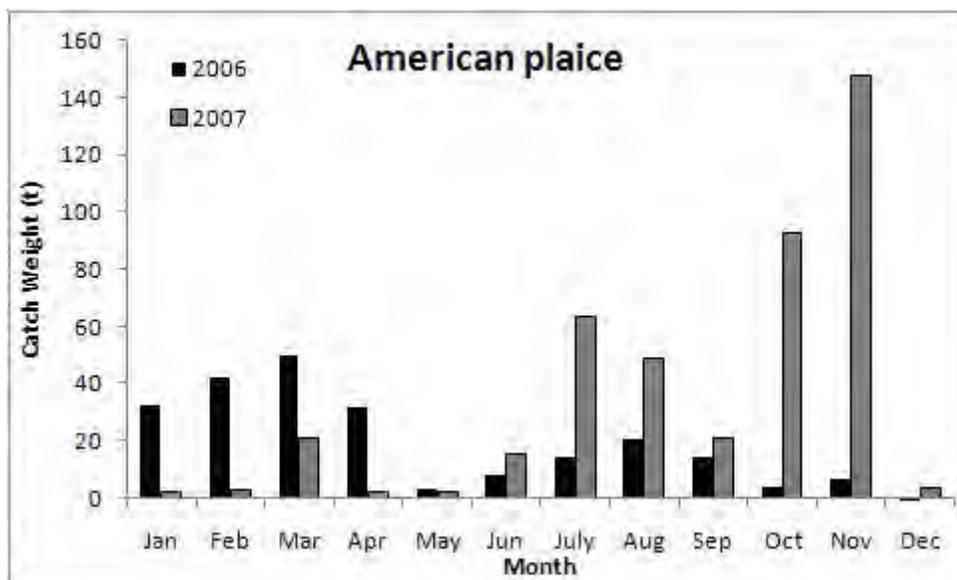
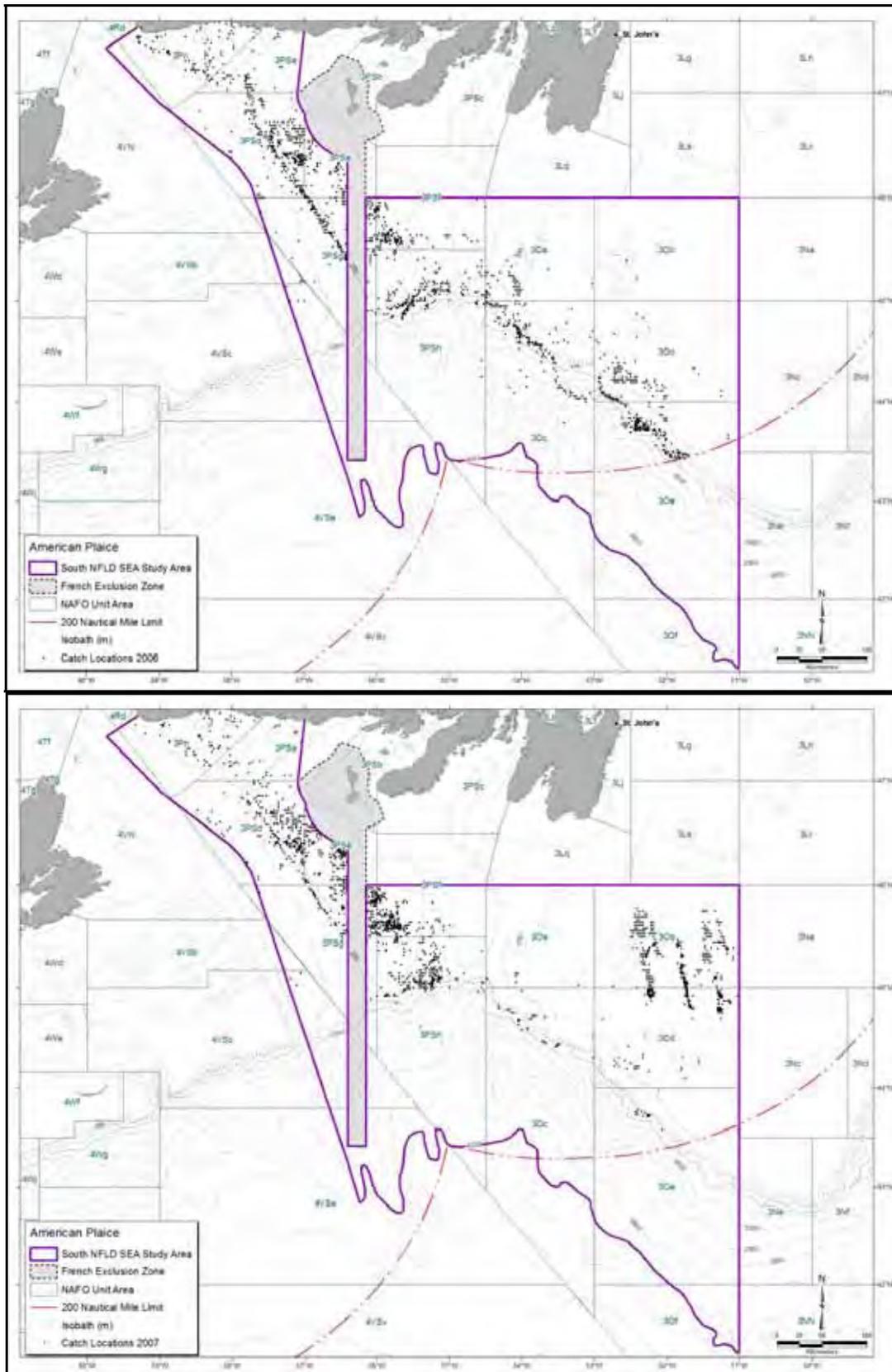


Figure 3.44. Monthly American Plaice Harvest, 2006 and 2007.



**Figure 3.45. American Pllice Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Pollock

From 2000 to 2007, pollock landings within the SEA Area have ranged from ~281 t in 2004 to ~839 t in 2007 (Figure 3.46). Annual landings have been increasing since 2005. The majority of pollock landings have occurred between June and October in recent years (Figure 3.47). With the exception of March in 2006, little or no landings occur from November to May. Figure 3.48 shows the georeferenced harvest locations for pollock within the SEA Area for 2006 and 2007. Pollock were largely harvested using gillnets and, to a lesser extent, bottom otter trawls from 2000 to 2007. Other gear types used to harvest the species included seines (Danish, Scottish), baited handlines, longlines, midwater trawls, shrimp trawls, and pots.

In Div.3O, pollock catches by foreign nations have been sporadic from 2000 to 2007. With the exception of 2003 (112 t) and 2004 (8 t), no pollock were harvested in areas of Div.3O located outside of Canada's EEZ in other years.

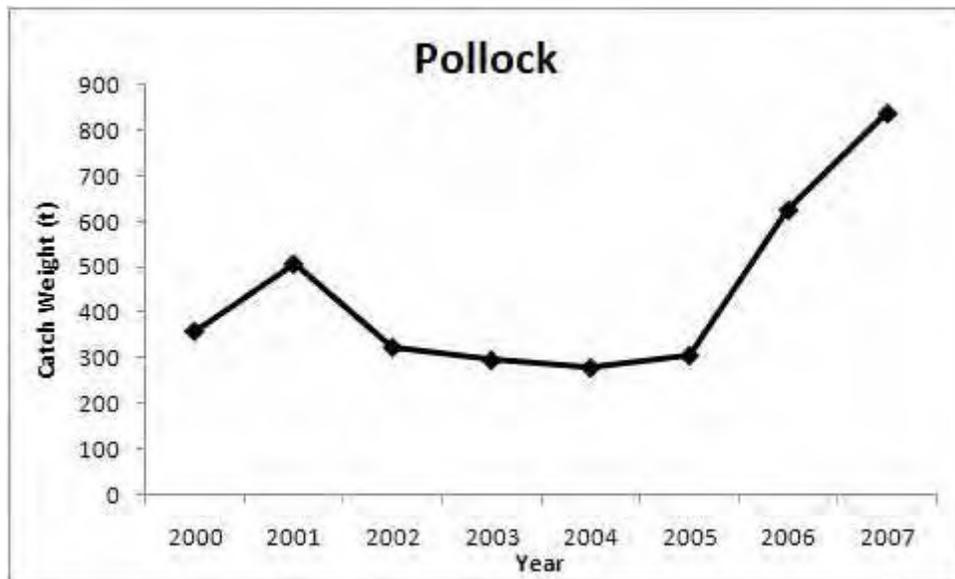


Figure 3.46. Annual Pollock Harvest, 2000-2007.

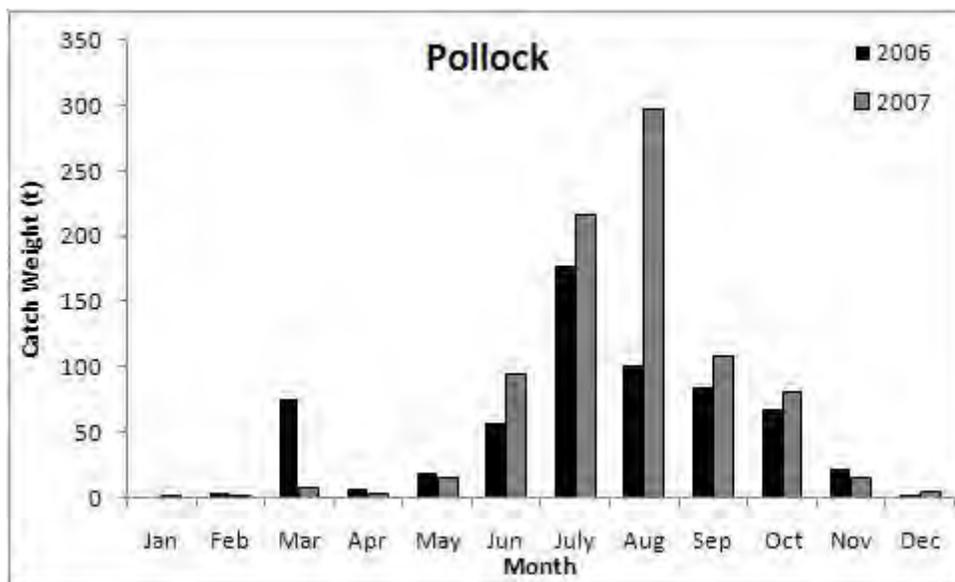
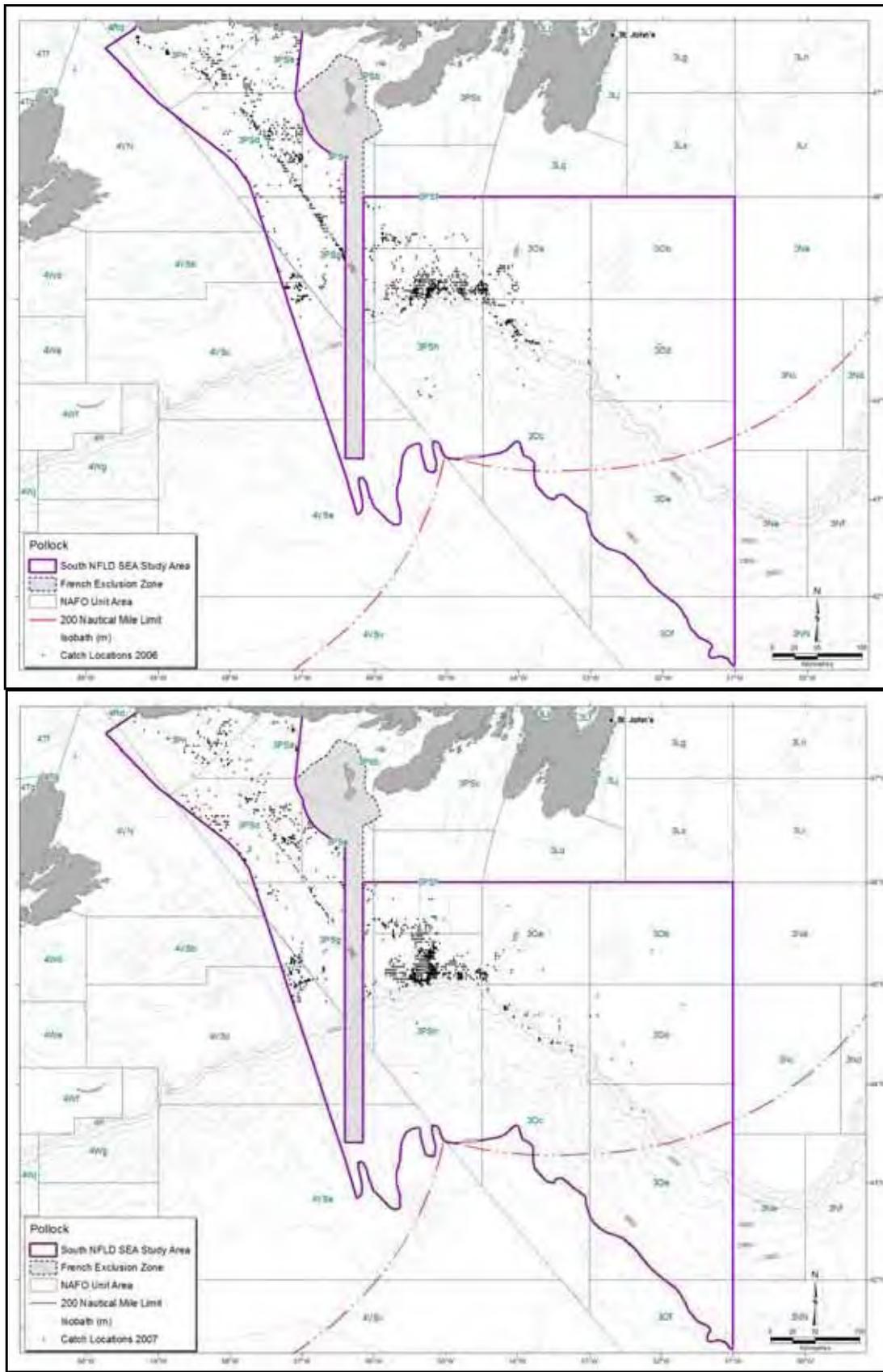


Figure 3.47. Monthly Pollock Harvest, 2006 and 2007.



**Figure 3.48. Pollock Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Greenland Halibut

From 2000 to 2006, Greenland halibut landings decreased from a high of roughly 751 t to a low of approximately 164 t within the SEA Area (Figure 3.49). Landings of the species increased to ~283 t in 2007. Greenland halibut landings occurred year-round in 2006 and 2007 (Figure 3.50). The lowest landings were reported from September to December while the highest landings were reported in winter (February, March) and in summer (June to August). Figure 3.51 shows the georeferenced harvest locations for Greenland halibut within the SEA Area for 2006 and 2007. Similar to Atlantic halibut, longlines, gillnets, and bottom otter trawls were the dominant gears used to target Greenland within the SEA Area from 2000 to 2007. Other gear types have also been used to target Greenland halibut directly or indirectly and they include: Danish seine; baited handlines; midwater trawls; shrimp trawls; and pots.

In Div. 3O, foreign Greenland halibut fisheries have averaged roughly 438 t annually from 2000 to 2007. A peak of ~878 t was harvested in 2002 with subsequent catches declining to 100 t by 2006. In 2007, 144 t of Greenland halibut were harvested by foreign NAFO countries in 3O.

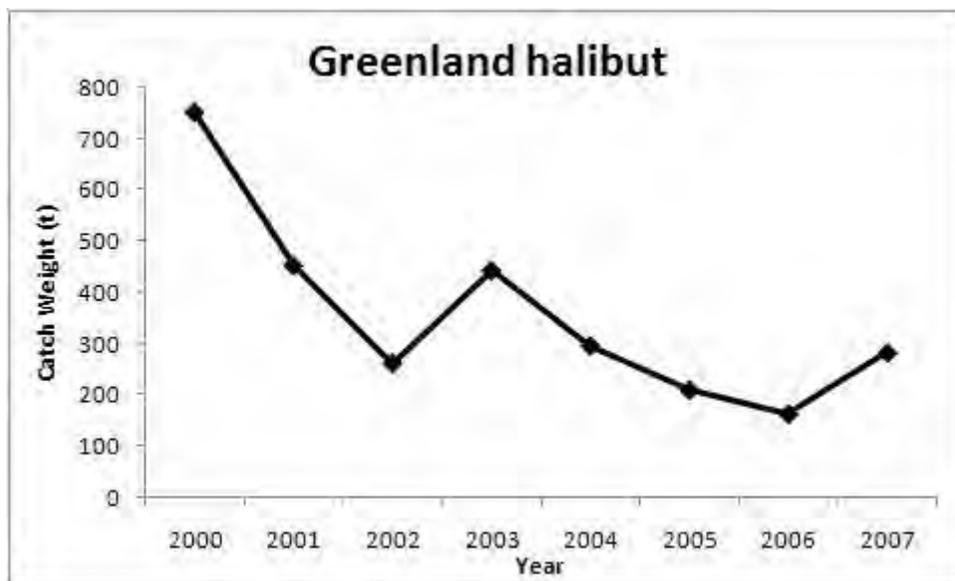


Figure 3.49. Annual Greenland Halibut Harvest, 2000-2007.

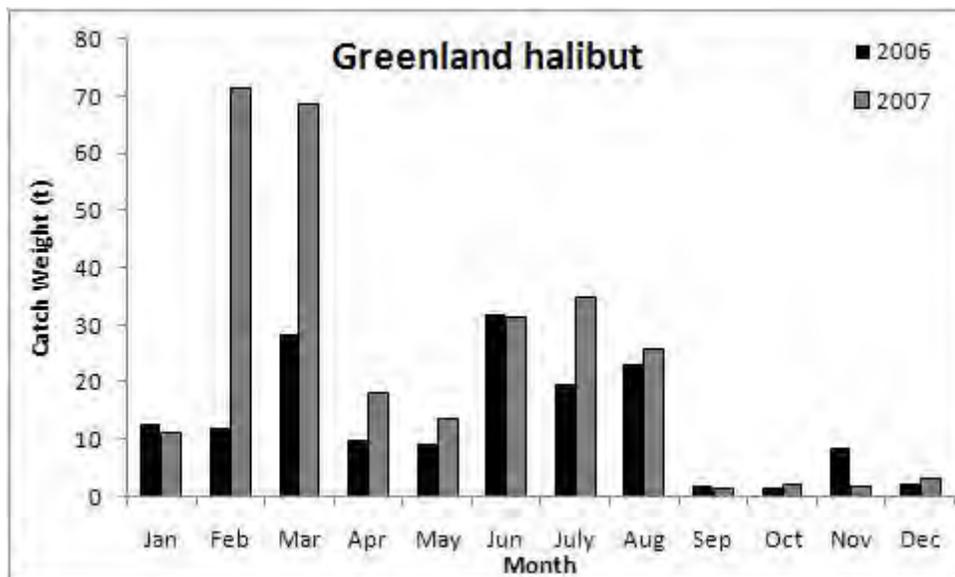
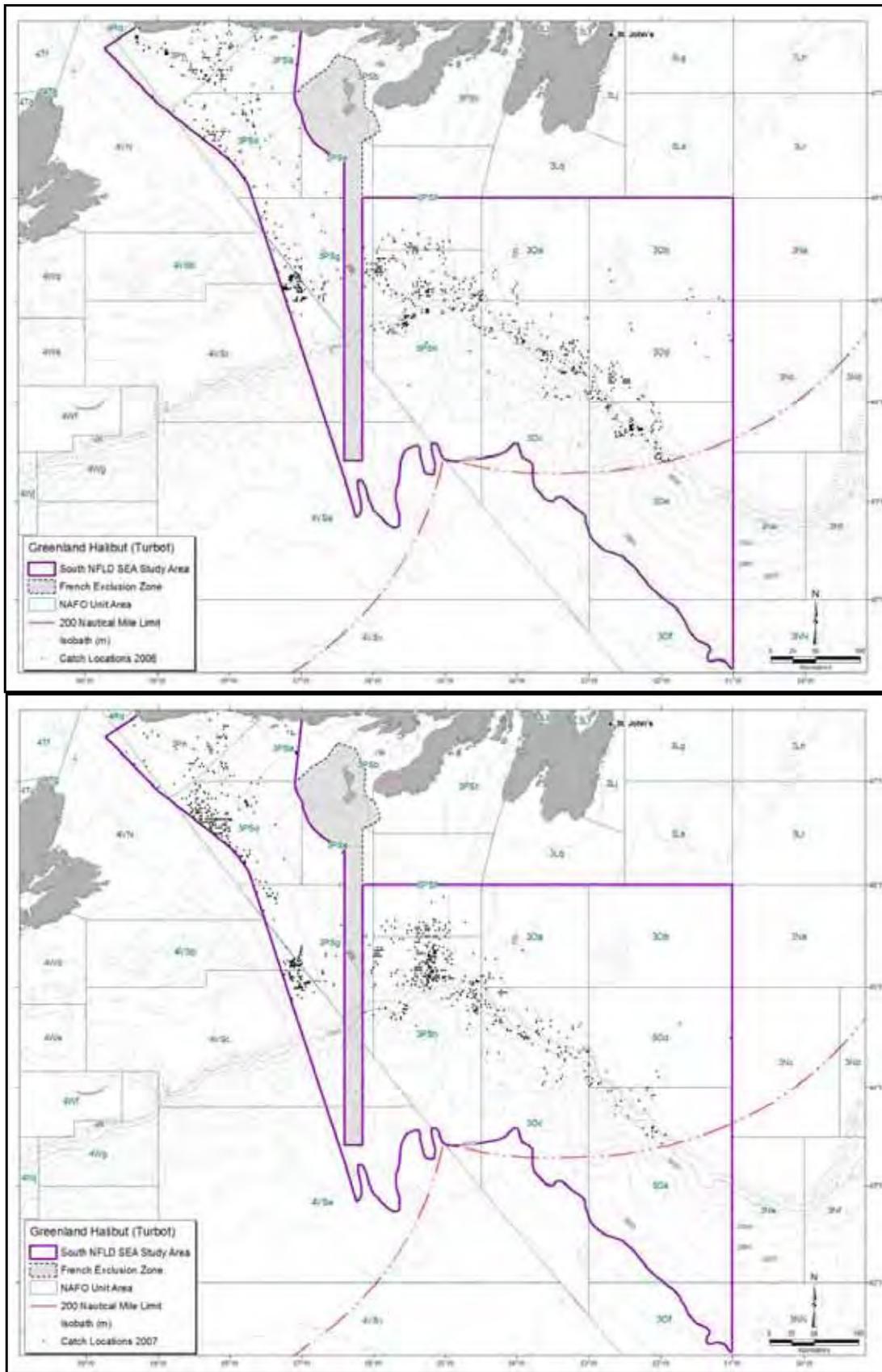


Figure 3.50. Monthly Greenland Halibut Harvest, 2006 and 2007.



**Figure 3.51. Greenland Halibut Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Hagfish

From 2000 to 2004, hagfish landings were relatively low, ranging from 0 t (2000 to 2001 and 2003 to 2004) to approximately 10 t in 2002 (Figure 3.52). Since 2004, hagfish landings have averaged ~346 t on an annual basis for the SEA Area. Hagfish have been generally harvested between September and November within the SEA Area (Figure 3.53). Very few or no hagfish have been landed between December and August in 2006 and 2007. Figure 3.54 shows the georeferenced harvest locations for hagfish within the SEA Area for 2006 and 2007. Within the SEA Area, hagfish were harvested with hagfish barrels and, to a much lesser extent, trap nets.

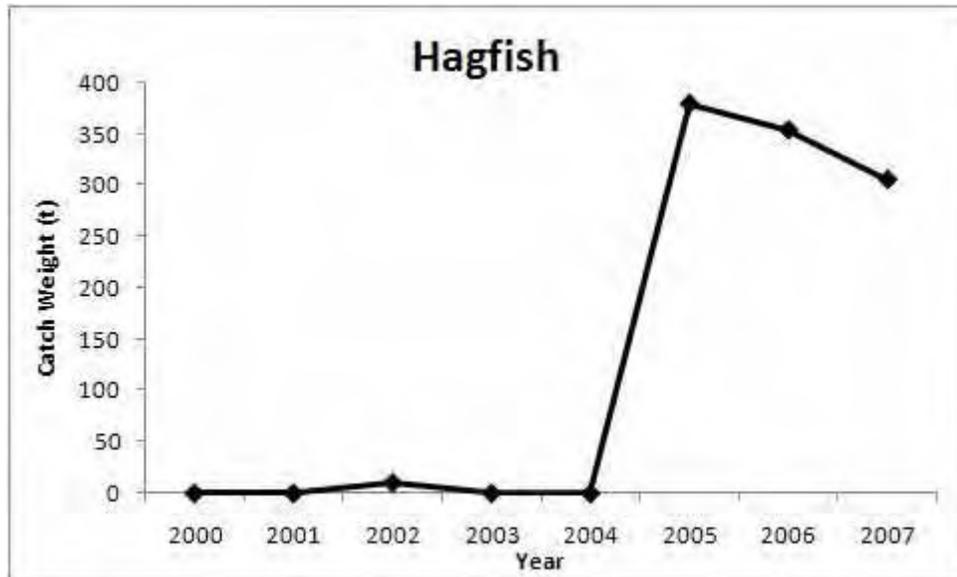


Figure 3.52. Annual Hagfish Harvest, 2000-2007.

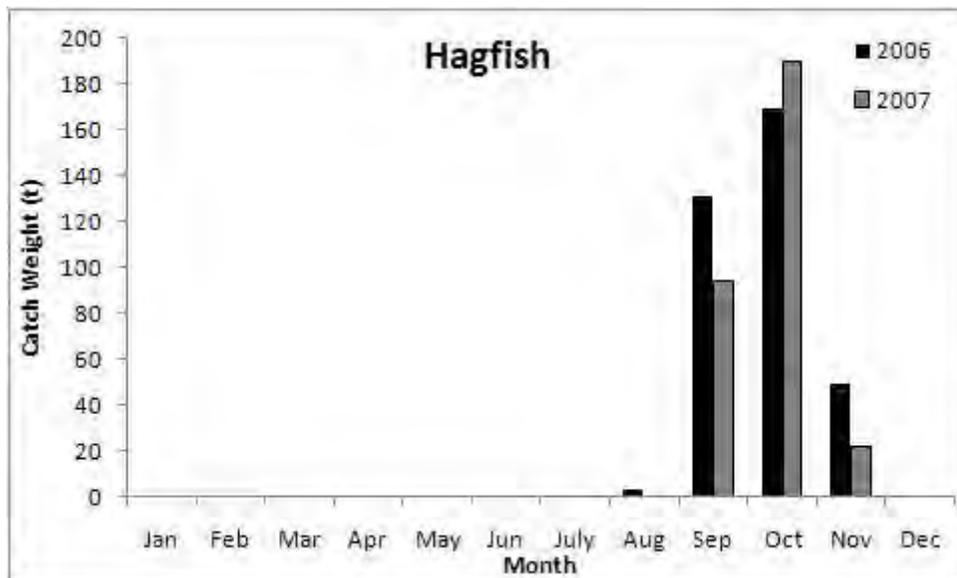
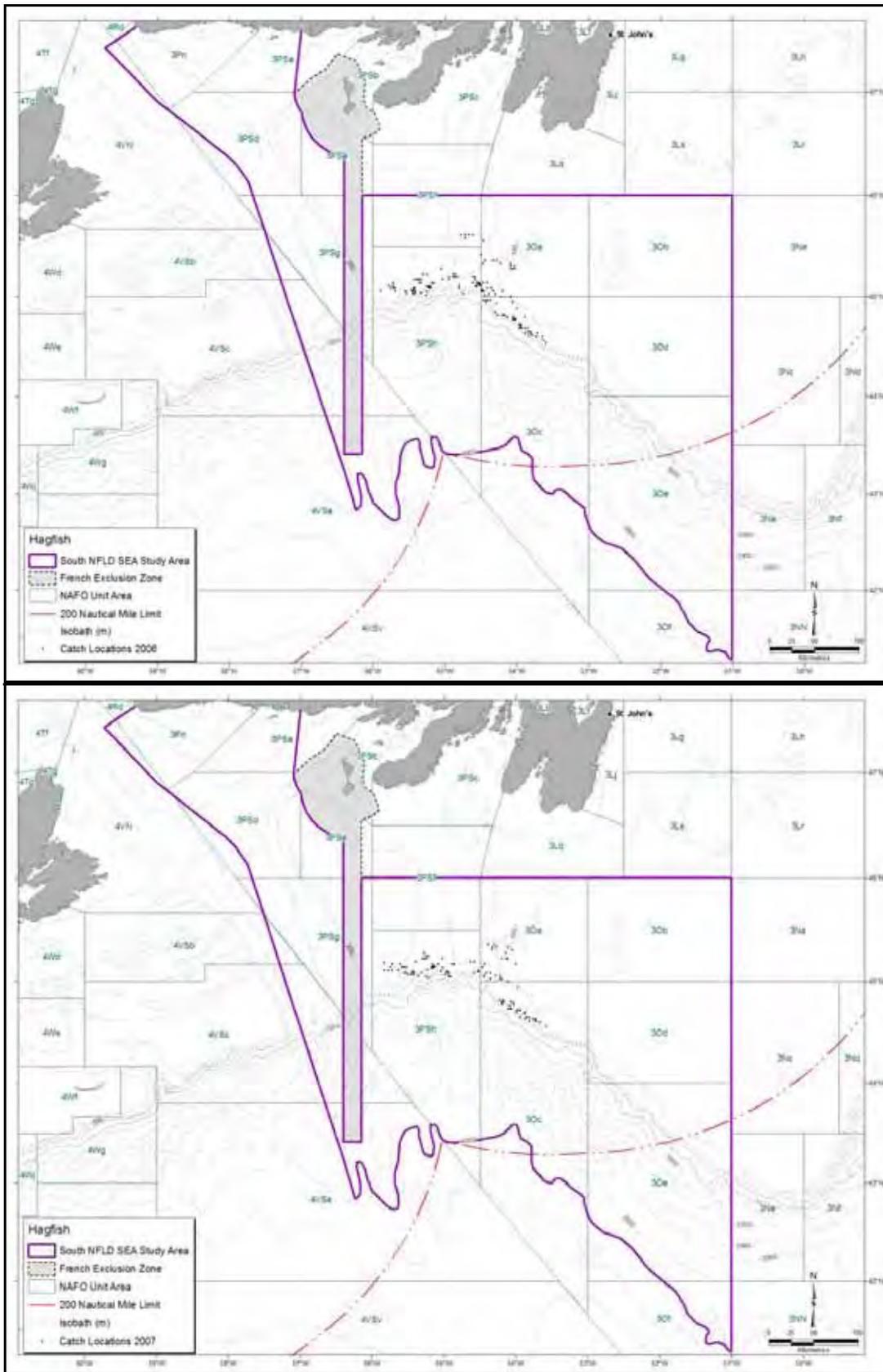


Figure 3.53. Monthly Hagfish Harvest, 2006 and 2007.



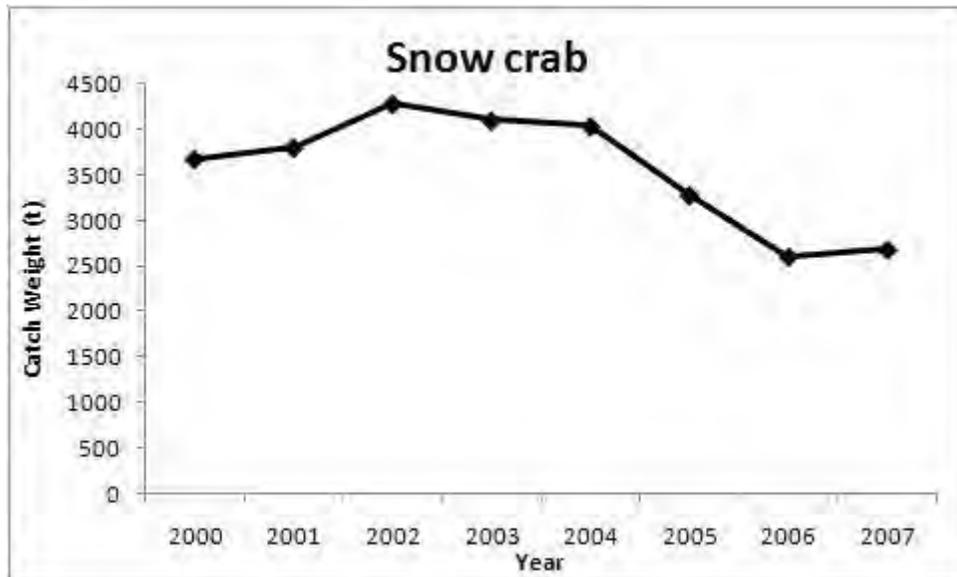
**Figure 3.54. Hagfish Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## ***Invertebrates***

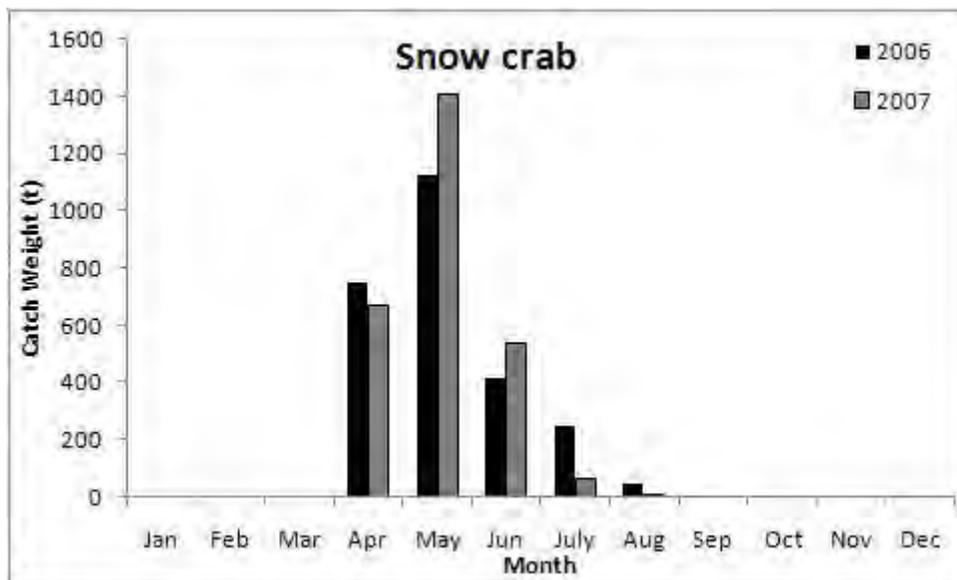
As indicated in Table 3.6, invertebrates currently account for a large proportion of commercial catch value in the SEA Area. Recent fisheries for some of the more valuable invertebrate target species are described below.

### ***Snow crab***

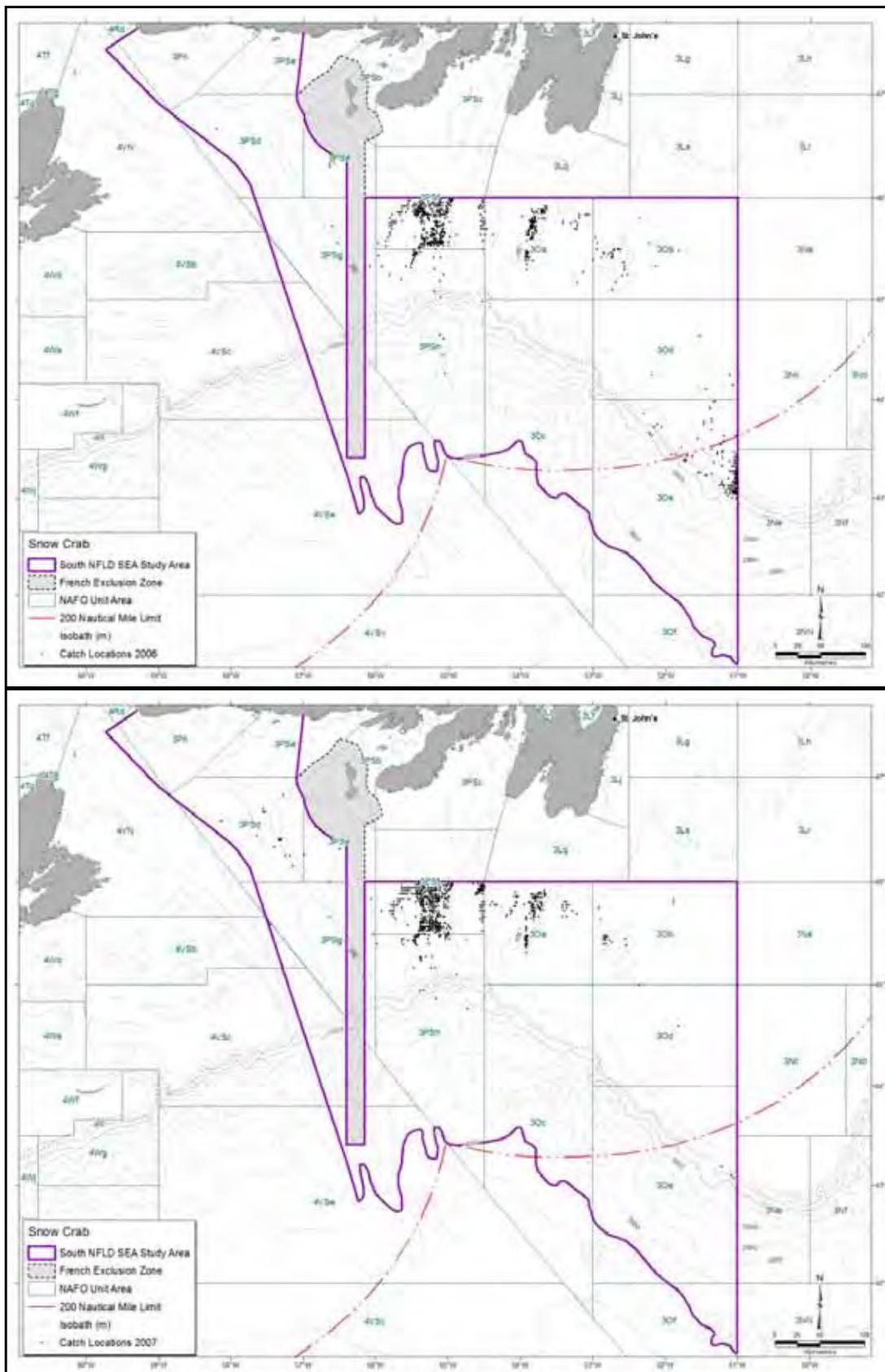
From 2000 to 2007, snow crab landings have averaged nearly 3553 t annually and have ranged from ~4279 t in 2002 to ~2597 t in 2006 (Figure 3.55). Snow crab is landed in spring and summer from April to August (Figure 3.56). Closing dates can vary depending on resource conditions (e.g., occurrence of “soft shell” and quotas). Landings do not typically occur between September and March. Figure 3.57 shows the georeferenced harvest locations for snow crab within the SEA Area for 2006 and 2007. Snow crab is harvested using bottom set crab pots marked at the surface with buoys and often highflyers.



**Figure 3.55. Annual Snow Crab Harvest, 2000-2007.**



**Figure 3.56. Monthly Snow Crab Harvest, 2006 and 2007.**



**Figure 3.57. Snow Crab Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Lobster

Overall, lobster landings (georeferenced by Unit Area) have increased annually within the SEA Area in recent years (Figure 3.58). From 2004 to 2007, catches have increased from ~14 t to a high of ~95 t. The lobster season within the SEA Area is focused in the spring, from ice-out (April) to June/early July. In 2006 and 2007, the majority of lobsters were harvested in May and June (Figure 3.59). As shown in the commercial fisheries data, the lobster fishery within the SEA Area uses lobster traps (or “pots”) exclusively. The traps are weighted to the bottom typically in rocky areas near to shore or around offshore islands, in depths generally less than 20 m. In Newfoundland, trap limits vary between LFAs from 100 to 350 traps. The SEA Area includes LFA 12 and the western portion of LFA 11. Although no maps of these locations are available, the gear is typically set in waters adjacent to or near the fisher’s home port.

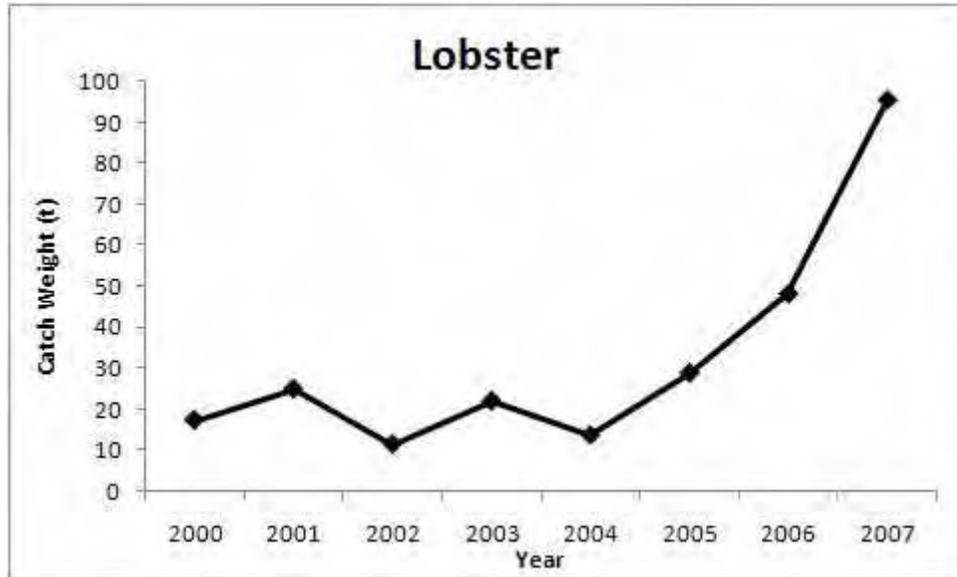


Figure 3.58. Annual Lobster Harvest, 2000-2007.

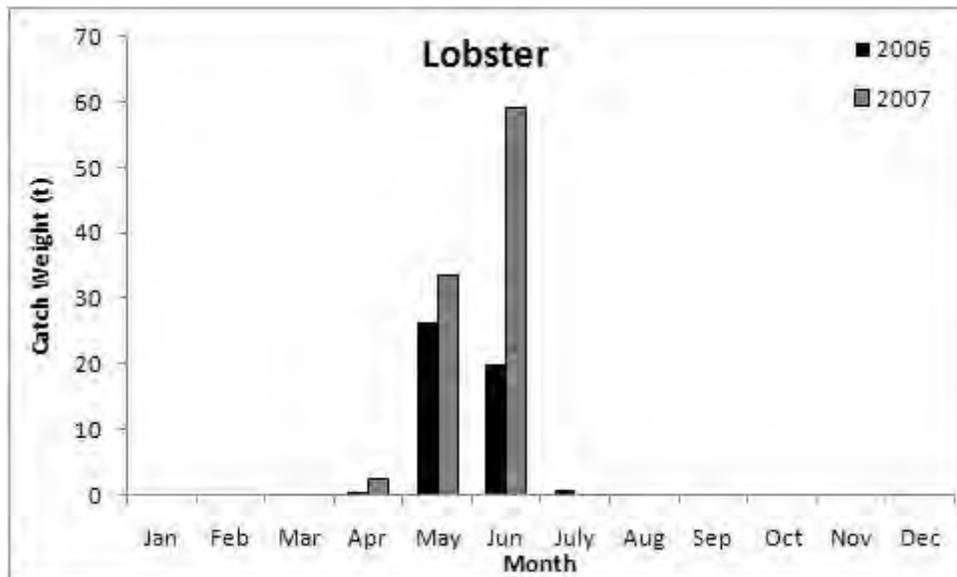


Figure 3.59. Monthly Lobster Harvest, 2006 and 2007.

## Whelk

Whelk has become increasingly important in terms of contribution to the overall catch, by weight, within the SEA Area. Since 2000, the catch weight has increased from 0 t in 2000 and 2001 to roughly 3148 t in 2007 (Figure 3.60). Whelk is largely harvested from June to September within the SEA Area (Figure 3.61). Small quantities have been harvested in May and from October to November. No landings have occurred from December to April in 2006 and 2007. Figure 3.62 shows the georeferenced harvest locations for whelk within the SEA Area for 2006 and 2007. From 2002 to 2007, whelk is primarily harvested using pots.

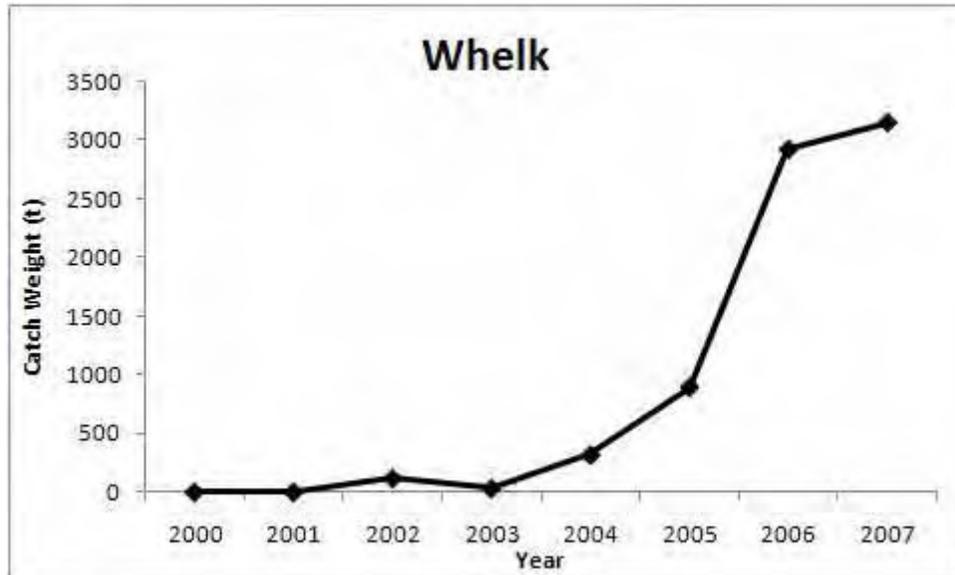


Figure 3.60. Annual Whelk Harvest, 2000-2007.

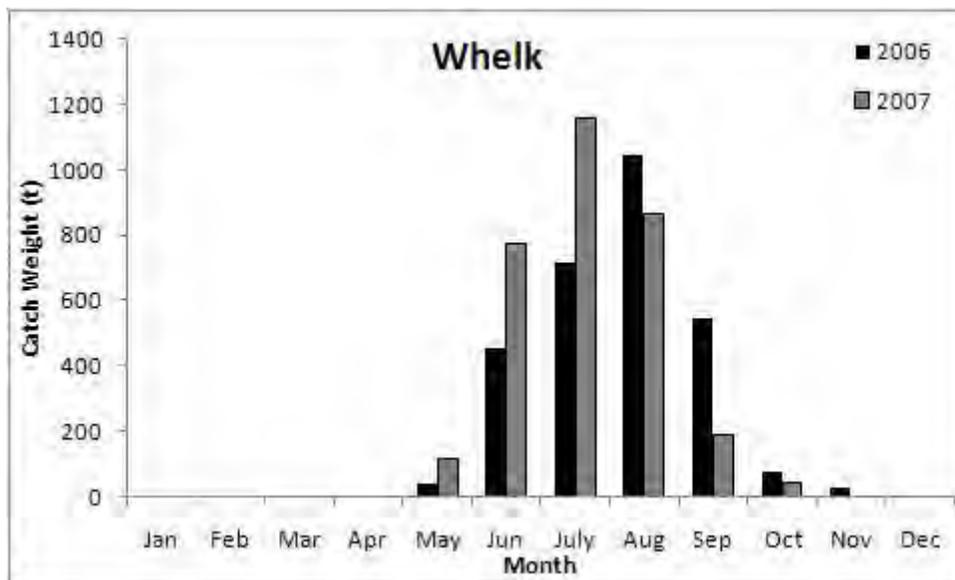
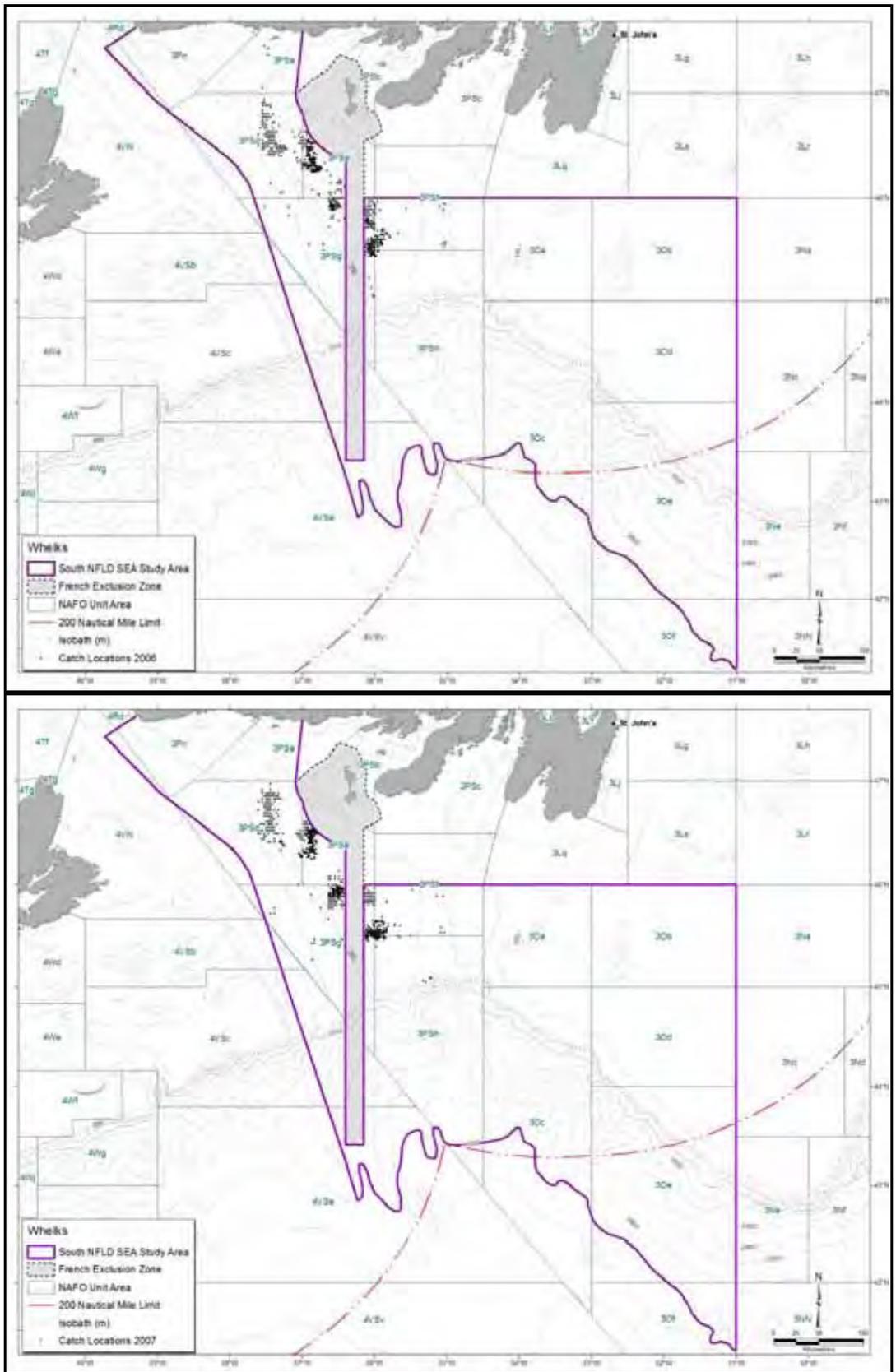


Figure 3.61. Monthly Whelk Harvest, 2006 and 2007.



**Figure 3.62. Whelk Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Sea Scallop

From 2000 to 2007, sea scallop landings have averaged 1022 t annually in the SEA Area. Annual landings can differ markedly as indicated by the relatively low catches observed from 2000 to 2003 and 2006 to 2007 and the high catches observed in 2004 and 2005 (Figure 3.63). This wide range in annual catches may be attributed to the discovery of new scallop grounds within the SEA Area. Sea scallops have been largely harvested from May to November in recent years within the SEA Area (Figure 3.64). Little or no landings were reported between December and April. Figure 3.65 shows the georeferenced harvest locations for sea scallop within the SEA Area for 2006 and 2007. From 2000 to 2007 sea scallops were harvested solely by boat-towed dredge within the SEA Area.

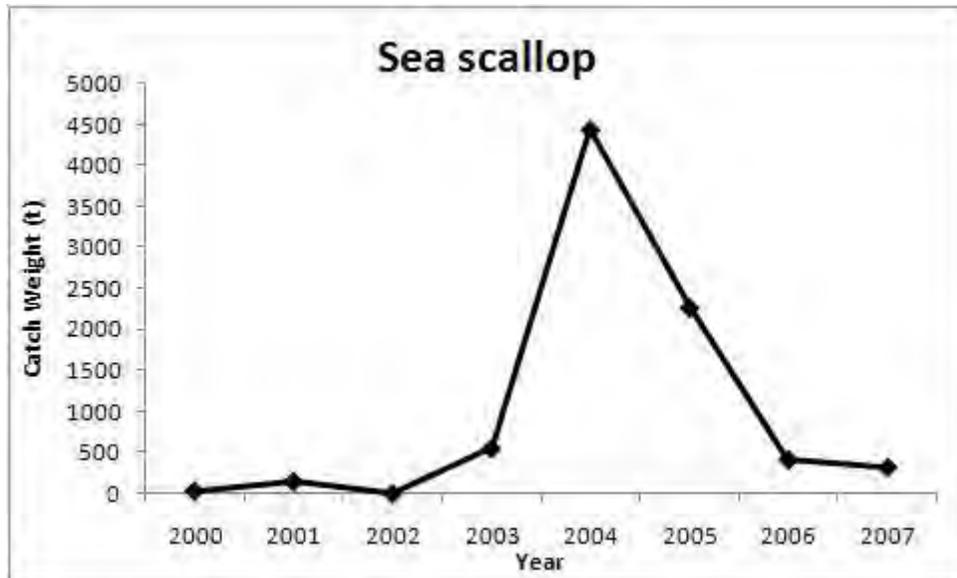


Figure 3.63. Annual Sea Scallop Harvest, 2000-2007.

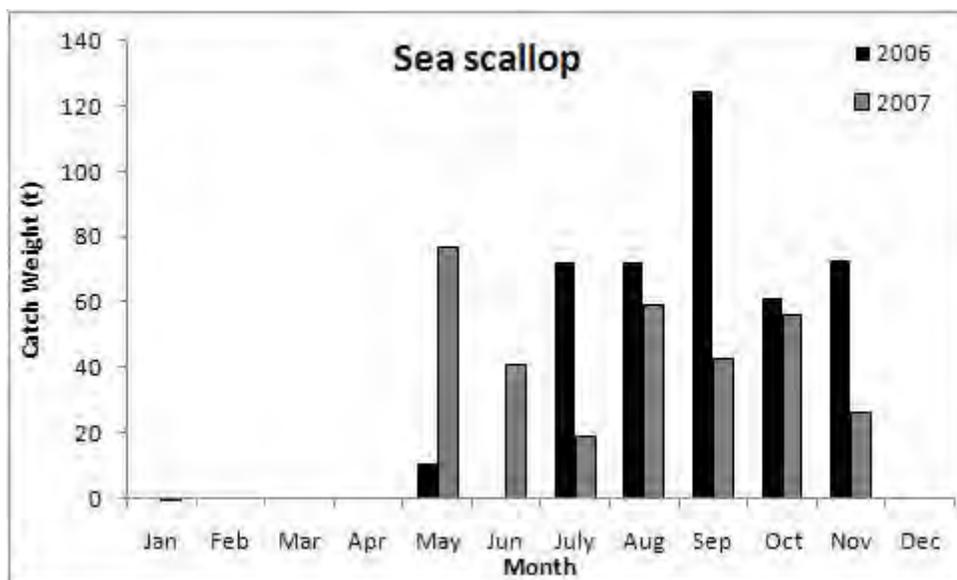
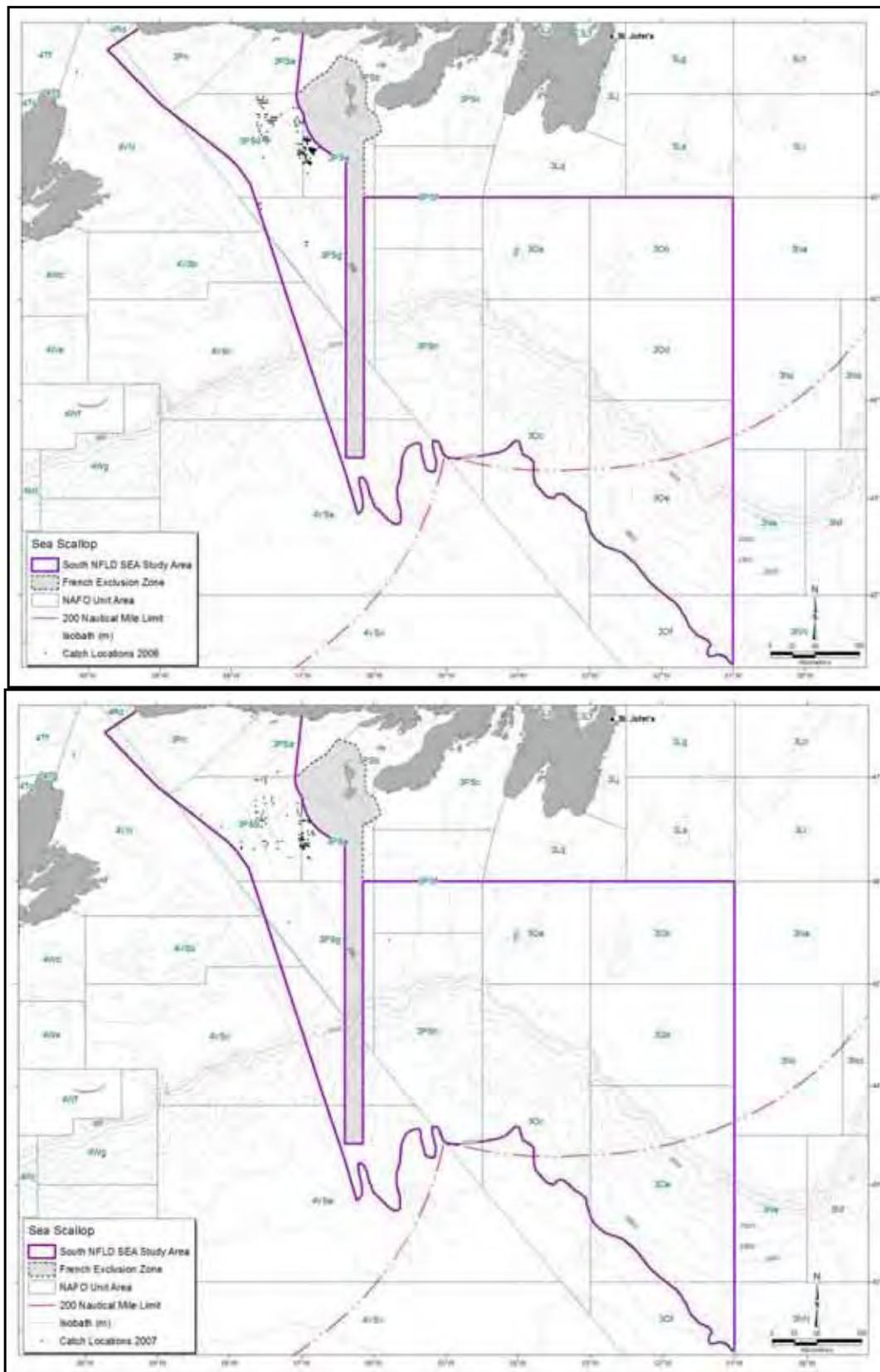


Figure 3.64. Monthly Sea Scallop Harvest, 2006 and 2007.



**Figure 3.65. Sea Scallop Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

## Large Pelagics

Various large pelagic fish species (e.g., tunas and swordfish) are reported in the DFO commercial fishery landings database. As indicated in Table 3.6, swordfish ranked highest in catch value in 2007.

### Swordfish

Swordfish have become increasingly important as a target species within the SEA Area during recent years. Since 2002, swordfish catch weights have increased from roughly 82 t to nearly 337 t (Figure 3.66). Swordfish landings have been largely confined to the months of August, September, and October in 2006 and 2007 (Figure 3.67). A small amount of the species was harvested in July and November of 2006. Virtually no landings occurred from December to June in recent years. Figure 3.68 shows the georeferenced harvest locations for swordfish within the SEA Area for 2006 and 2007. The dominant gear used to harvest swordfish within the SEA Area was longline. Small quantities have been harvested using bottom otter trawl, gillnet, and harpoon from 2000 to 2007.

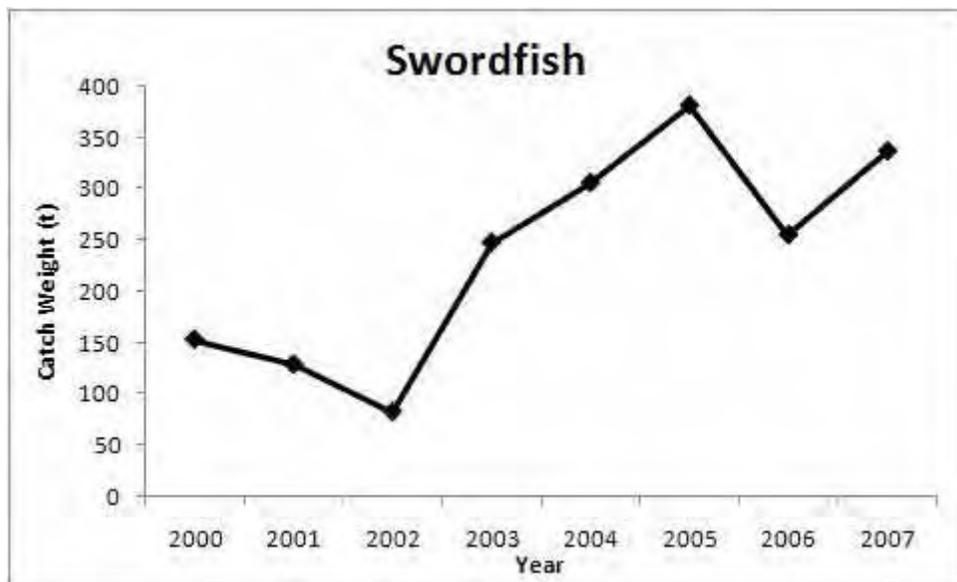


Figure 3.66. Annual Swordfish Harvest, 2000-2007.

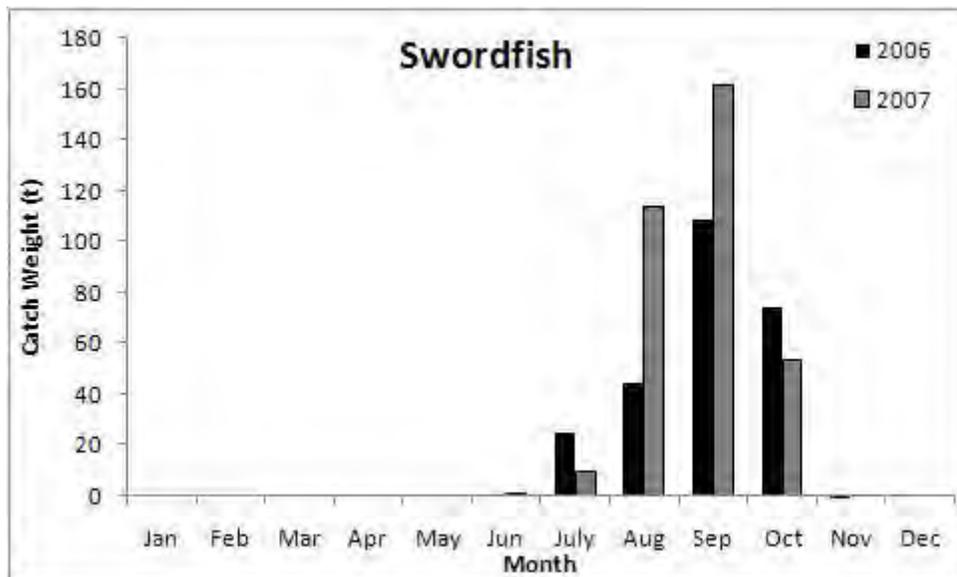
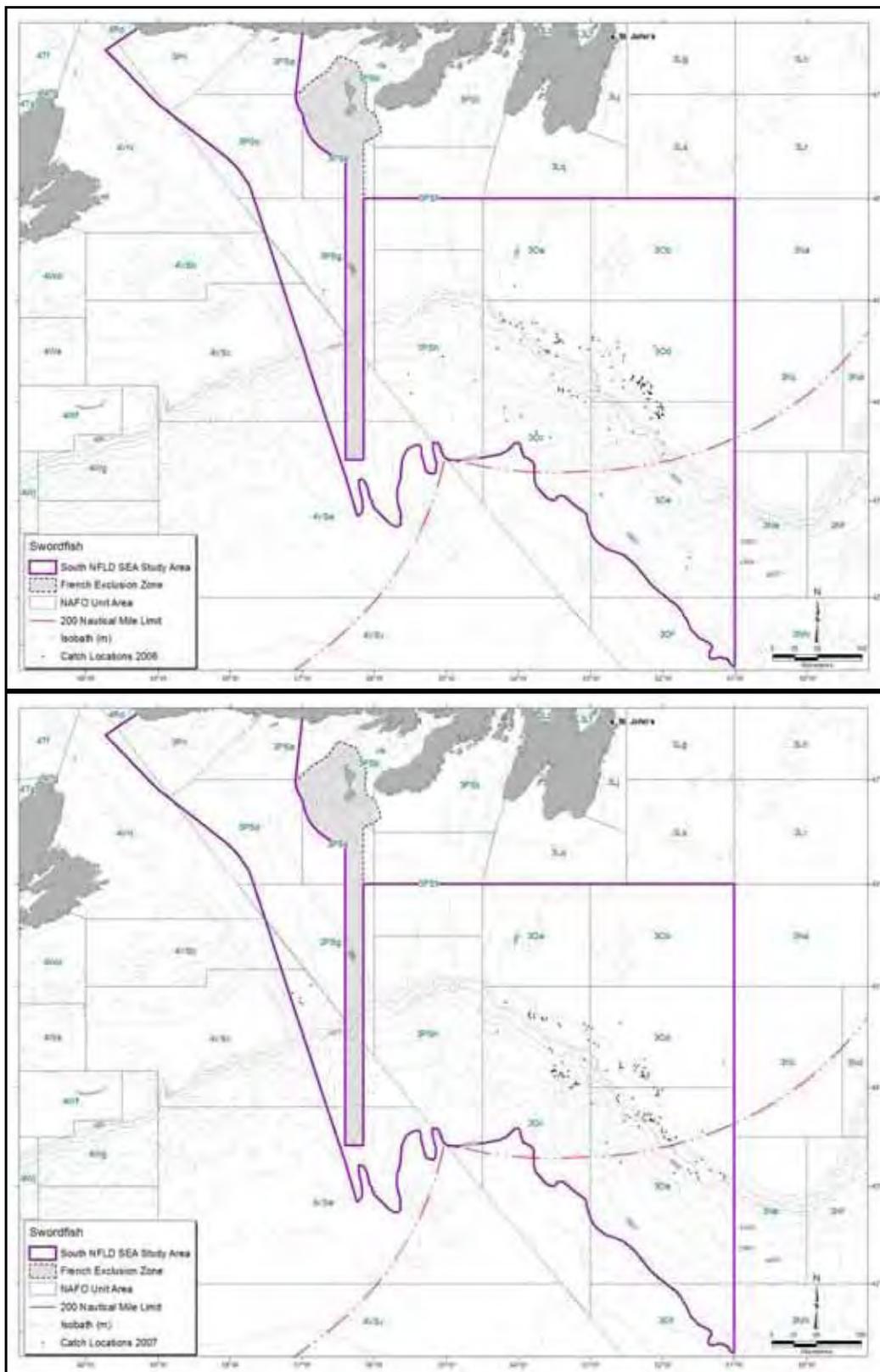


Figure 3.67. Monthly Swordfish Harvest, 2006 and 2007.



**Figure 3.68. Swordfish Harvesting Locations, All Months, 2006 (upper) and 2007 (lower).**

### **3.3.1.3 Emerging Fisheries/Under-utilized Species**

Some of the emerging fisheries in the SEA Area include sea cucumber, whelk, and hagfish. In terms of catch weight and catch value, the whelk and hagfish fisheries have both contributed significantly to the overall harvest in the SEA Area during recent years. These fisheries have been described in the previous section concerning principal fisheries. The sea cucumber fishery is described below.

#### **Sea Cucumber**

The sea cucumber fishery, described in JW (2007), began as an experimental fishery in the St. Pierre Bank area in 2003 and 2004. The experimental fishery was designed to obtain more scientific data on the species and investigate its potential in a commercial fishery. Initially, DFO established a total catch quota of 454 t for 2004 then increased the total to 613 t for 2005 and 2006. From 2005 to 2007, the annual sea cucumber catch averaged roughly 130 t from 2005 and 2007 and ranged from ~10 t to ~278 t according to commercial fisheries landings data (all DFO Regions). The areas set aside for the experimental fishery were located on either side of the French corridor. From 2005 to 2007, the majority of sea cucumber catches occurred in 3Pse (68% by weight), followed by 3Psd (16%), 3Psf (12%), and 3Psg (4%). Over that time period, all catches occurred between June and September with August having the highest catch total. The gear used to harvest the species consists of a modified sea urchin drag approximately 6.5 feet wide to which a 15-foot bag was attached. The mobile gear is towed along the seabed in a similar manner to a scallop rake or dredge. From 2005 to 2007, all sea cucumber catches were made by dredge. It was unknown at the time of writing if the species will be targeted as a commercial species in the future.

### **3.3.2 Aquaculture**

At the time of writing, there was no aquaculture activity in the SEA Area. Consultations with the provincial Department of Fisheries and Aquaculture revealed that a cod grow-out operation near Burgeo, identified in the previous SEA (JW 2007), has closed. However, the department has received applications for four salmonid grow-out sites just west of Grey River (T. Budgell, DFA, pers. comm., 2009) (see Consultation Report, Appendix 1).

### **3.3.3 Recreational Fisheries**

Several recreational fisheries occur in the SEA Area and are largely conducted in inshore waters. [Atlantic salmon are fished in freshwater.] The species that are harvested recreationally include brown trout, Atlantic mackerel, squid, capelin, and Atlantic cod (C. Boland, DFO, pers. comm., 2009). Scallops may also be harvested with a recreational licence.

#### **3.3.3.1 Brown Trout**

Sea-run brown trout, or sea trout, (*Salmo trutta*) is an anadromous species that is native to Europe and western Asia, but was introduced to North America, including Newfoundland, in the late 1800s (Scott and Scott 1988; Scruton et al. 2000). The species is now found in most Canadian provinces and in virtually all states of the U.S (Scruton et al. 2000). Both resident and anadromous populations may exist in the same area, but anadromous populations appear to be less common in North America. Brown trout spawn in the late fall or early winter, usually in running water, the exact timing varying with latitude and other factors (Scruton et al. 2000). Brown trout prefer areas dominated by large gravel substrates for spawning. In Newfoundland waters, brown trout tend to spend two to three months at sea, usually June to August, before returning to freshwater (Scott and Scott 1988).

In Newfoundland, there are approximately 45 rivers and estuaries, mostly on the Avalon Peninsula, which have been designated as sea-run brown trout waters (Smith 2000). This designation allows fishing outside of the regular brook trout season, and also after the salmon fishing is closed on some scheduled salmon rivers. Brown trout season typically extends from early February to late October (Smith 2000). In 2008, angling for brown trout on non-scheduled waters was permitted from February 1 to October 7 while angling in scheduled rivers was

permitted from September 8 to October 7 (DFO 2008f). Fishing is conducted with rod and reel and with either spinner or fly, night and day (Smith 2000).

### **3.3.3.2 Atlantic Mackerel**

In Newfoundland, Atlantic mackerel are recreationally harvested mainly inshore using gillnets, jiggers, handlines, purse seines, and traps (DFO 2009h). The type of gear used varies according to the region and time of the year. The recreational mackerel catch is largely for consumption purposes and occurs during summer months all along areas of the coast. There is also a bait fishery for mackerel in Newfoundland waters. A species profile of Atlantic mackerel is provided in Subsection 3.2 on the Fish VEC.

### **3.3.3.3 Shortfin Squid**

Shortfin squid are typically harvested from July to October on a recreational basis in Newfoundland waters (DFO 2009h). Little information is available for the fishery in the SEA Area; however, in other areas around Newfoundland, squid are harvested with hook and line as squid jiggers in coastal waters typically ranging in depth from roughly 3 to 37 m. The number of participants, as well as the catch weight taken annually, is unknown for the SEA Area. A species profile of shortfin squid is provided in Subsection 3.2 on the Fish VEC.

### **3.3.3.4 Capelin**

In Newfoundland, capelin are harvested recreationally when large numbers are distributed in shallow coastal waters for spawning; thus, the harvest time varies annually, but generally occurs from May to September (DFO 2009h). The number of participants, as well as the amount taken during the recreational harvest, is unknown for the SEA Area. A species profile of capelin is provided in Subsection 3.2.

### **3.3.3.5 Atlantic Cod**

Since 2006, a recreational (food) fishery for cod has been permitted in inshore Newfoundland waters. Generally, fishing is permitted for several weeks in July or August followed by one week in fall, usually late September or early October. Estimates of the number of people participating in the fishery in the SEA Area have not been published. Reliable estimates of effort have been difficult to obtain in other areas of Newfoundland thereby making estimates of recreational catch weight difficult (DFO 2008g). Approximately 42 t of cod were estimated to have been harvested in Subdiv 3Ps in 2006 and 2007 (DFO 2007d). Another 75.3 t was estimated to have been harvested in 2006 in 3Pn and 4RS combined (DFO 2008h). Little or no cod were recreationally harvested in 3O or 4Vs as these are considered offshore waters. Fishery restrictions usually include daily catch limits (e.g., 5 cod/person/day and 15/boat) and type of gear used (e.g., hand lines, rod and reel). A species profile of Atlantic cod is provided in Subsection 3.7.

### **3.3.3.6 Scallop**

Sea scallop and Iceland scallop are harvested recreationally in Newfoundland waters. A species profile of sea scallop is provided in Subsection 3.2 on the Fish VEC. Scallops may be harvested year-round; however, they are generally collected from spring to fall when weather conditions permit (DFO 2009h). Recreational harvesting is typically conducted in shallow waters ranging in depth from roughly 3 to 18 m. Scallops have been taken by hand, rake, scuba, and purse seine.

## **3.3.4 Aboriginal Fisheries**

The Conne River Band Council participates in Food, Social and Ceremonial fisheries as well as Communal/Commercial fishing activities within the SEA Area. Information describing these fisheries was provided for the Sydney Basin SEA in JW (2007) and is provided below. According to the Conne River Band Council, their activities have not changed (see Consultation Report, Appendix 1).

Communal/Commercial fish harvesting activities take place within 3Ps on the same grounds, during the same seasons and under the same regulations, as those which apply to other non-Aboriginal fisheries in this area. None of these harvesting activities fall within Div. 3Pn. Policies pertaining to these Aboriginal fisheries are described in an agreement between the Conne River Band Council and DFO and within a Canada-wide Aboriginal Fisheries Strategy. The agreement between the Council and DFO also provides for the designation of “Native Guardians” for monitoring and protecting both freshwater and coastal fisheries. In 2007, there were six Guardians involved in the fisheries program. The Council, and relevant individual fishers, also participate in a variety of scientific and research survey initiatives and sentinel fisheries programs undertaken in cooperation with DFO managers. It was noted that their fishers assist DFO scientists in their normal, ongoing research programs, and that members participate in sampling of any fish they harvest when requested by DFO scientists.

In 2007, Communal/Commercial fisheries involved five enterprises and four member-owned vessels (all of which were in the 45 foot vessel class). A fifth vessel was leased from another fishing enterprise based in the Bay d’Espoir area. Council fishers are permitted to harvest the same species usually taken by other SEA Area fishers. Species thus include: crab; cod and other groundfish; lobster; whelk; scallops; herring and mackerel. Tuna and swordfish may also be taken as part of an Atlantic-wide regional management plan for these two species.

Fisheries such as scallop, herring, and whelk, etc., are part of the regular competitive fisheries, while crab and cod are both individual quota (IQ) fisheries. In 2007, each of the Council members had a cod IQ of approximately 18,000 kg (40,000 pounds) (depending on the vessel size), while the crab IQ was just over 26,700 kg (59,000 pounds) per enterprise; these were the same IQ quantities available to other fishers in the Conne River/ Bay d’Espoir area. Catches are landed at processing plants or buyers based in Grand Bank and Fortune.

The Council’s food, social, and ceremonial (FSC) fisheries are organized and prosecuted under slightly different arrangements, rules and regulations compared to those that generally apply to non-Aboriginal fishing activities. FSC fisheries activities involve the same species as those undertaken in the Communal/Commercial sector. The Council can designate individual Band members to fish certain species but also has its own, dedicated vessel and crew that harvests various species on a communal basis. Catches taken under this communal arrangement are distributed to the elders or to disabled persons in the community. As part of the food fishery, individual Band members can fish cod and other groundfish, herring or mackerel; lobster may also be taken as part of the ceremonial fisheries. These lobster fisheries are usually pursued with a small number of pots per individual. There were approximately 30 participants involved in the food fishery in 2007. Cod harvested by the Council-owned vessel, or by Band members for food or ceremonial purposes, comes from an overall, approximately 45,400 kg (100,000 pound), quota allocated to the Council by DFO. There is no quota limit for herring and mackerel, but these species may only be taken by hook and line, though the dedicated vessel owned by the Council is permitted to use gillnets. The Council and DFO have agreed that these FSC fisheries will take place during the same seasons as other area fisheries. All of these harvesting activities take place on the grounds used by non-Aboriginal fishers (i.e., in the coastal/inshore and nearshore area in the vicinity of Conne River and various areas within Bay d’Espoir and Hermitage Bay).

### **3.3.5 Planning Implications**

The primary planning implication in regard to fisheries is for operators to be aware of the specific locations, gear types, and timing of fisheries in their areas of interest. There are a variety of potential mitigations to aid in avoiding or minimizing conflicts with fisheries gear and vessels including the use of picket vessels, safety times and zones, observers, special communications, compensation programs, and others.

### **3.3.6 Data Gaps**

There is a large database on fishery landings in the SEA Area and it is clear that the entire SEA Area is very important to the fishery, particularly for invertebrate species such as snow crab, lobster, whelk, and scallop and finfish species such as Atlantic cod, redfish, skate, monkfish, white hake, and several species of flounder. A high proportion of the catch locations for many species targeted within the SEA Area are georeferenced; however, for

some species (e.g., lobster), these data are severely lacking. A better understanding of foreign fisheries within the SEA Area may be possible if harvesting areas provided by NAFO were georeferenced by lat/long or even Unit Areas instead of just Division or Subdivision.