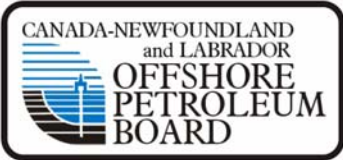
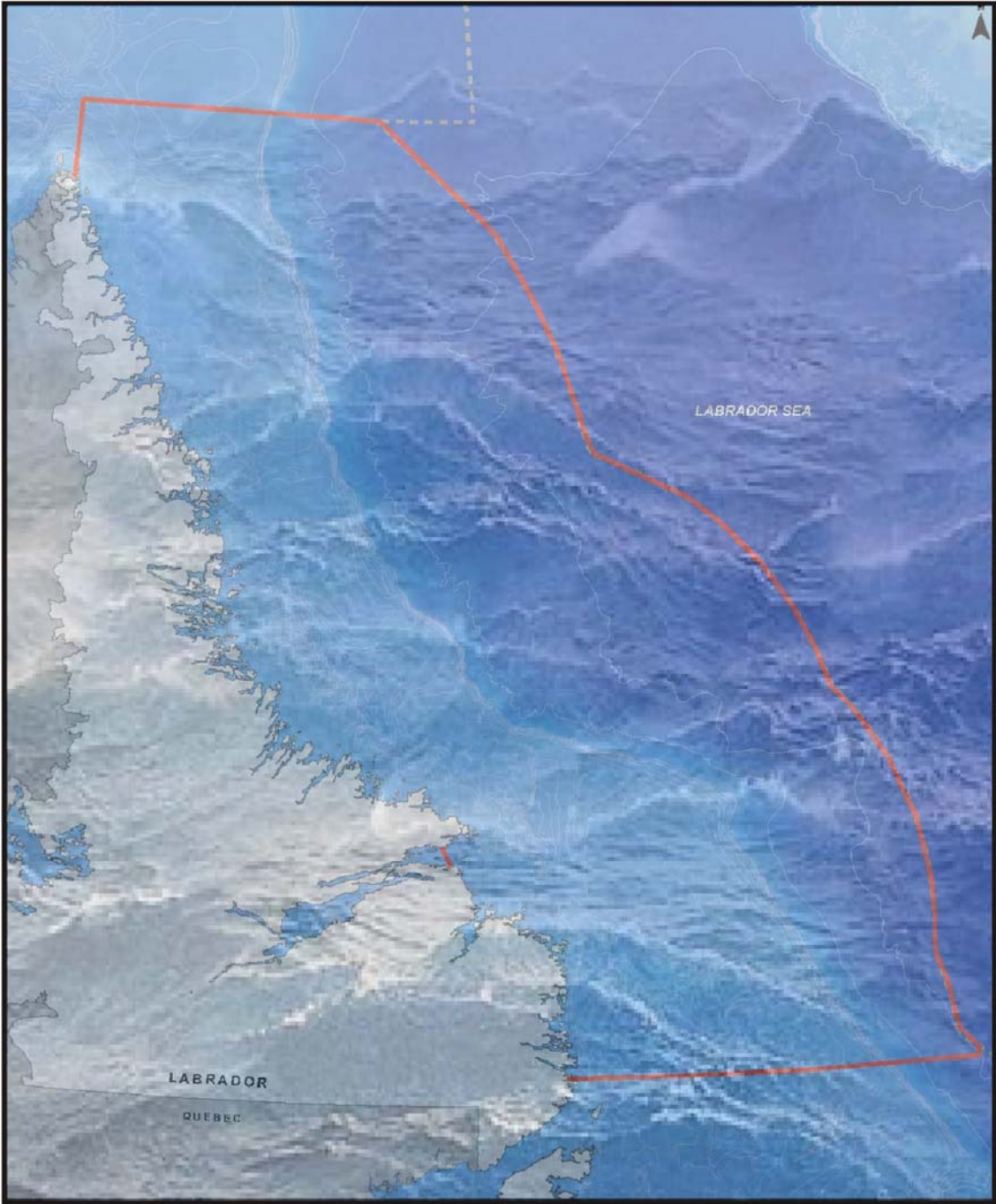


STRATEGIC ENVIRONMENTAL ASSESSMENT LABRADOR SHELF AREA



Summary Document

TABLE OF CONTENTS

| | | |
|------------|---|-----------|
| 1.0 | Introduction | 1 |
| 1.1 | Objectives and Purpose of the Labrador Shelf Area Strategic Environmental Assessment..... | 4 |
| 1.2 | Valued Environmental Components | 4 |
| 1.3 | Call for Bids | 5 |
| 1.4 | History of Oil and Gas Activities in Labrador Shelf Offshore Area | 5 |
| 1.5 | Consultations | 6 |
| 1.6 | Traditional Resource Use | 6 |
| | | |
| 2.0 | Exploration and Production Activities | 7 |
| 2.1 | Exploration Activities | 7 |
| 2.2 | Production Platforms and Facilities | 8 |
| | | |
| 3.0 | Physical Environment | 8 |
| 3.1 | Geology | 8 |
| 3.2 | Sea Conditions | 8 |
| 3.3 | Air Temperatures..... | 9 |
| 3.4 | Ice Conditions..... | 9 |
| | | |
| 4.0 | Biological Environment | 9 |
| 4.1 | Species at Risk..... | 9 |
| 4.2 | Benthic Invertebrates..... | 10 |
| 4.3 | Fish..... | 10 |
| 4.4 | Marine Mammals and Sea Turtles..... | 11 |
| 4.5 | Polar Bear..... | 11 |
| 4.6 | Marine Birds | 11 |
| 4.7 | Sensitive Areas..... | 13 |
| | | |
| 5.0 | Summary and Conclusions | 15 |
| 5.1 | Potential Issues | 15 |
| 5.2 | Data Gaps | 16 |
| 5.3 | Addressing Data Gaps | 17 |
| 5.4 | Planning Considerations..... | 18 |
| 5.5 | Conclusion..... | 18 |

1.0 INTRODUCTION

The Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) is responsible, on behalf of the Government of Canada and the Government of Newfoundland and Labrador, for petroleum resource management in the Newfoundland and Labrador offshore area. The C-NLOPB's mandate is to interpret and apply the provisions of the *Canada-Newfoundland Atlantic Accord Implementation Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* to all activities of operators in the Newfoundland and Labrador Offshore Area; and to oversee operator compliance with those statutory provisions. In the implementation of its mandate, the role of the C-NLOPB is to facilitate the exploration for and development of the hydrocarbon resources in the Newfoundland and Labrador Offshore Area in a manner that conforms to the statutory provisions for:

- worker safety;
- environmental protection and safety;
- effective management of land tenure;
- maximum hydrocarbon recovery and value;
- Canada/Newfoundland and Labrador benefits.

While the legislation does not prioritize these mandates, worker safety and environmental protection will be paramount in all board decisions.

The C-NLOPB conducts Strategic Environmental Assessments (SEAs) for those portions of the Newfoundland and Labrador Offshore Area that have the potential for offshore exploration and production activities. In 2007 the C-NLOPB started the SEA for an area of offshore Labrador known as the Labrador Shelf SEA Area.

A Working Group comprised of 10 members representing federal and provincial government agencies, local Regional Economic Development Boards, the fishing industry and non-governmental organizations was established to assist the C-NLOPB in developing the SEA. It is co-chaired by the C-NLOPB and the Nunatsiavut Government.

A copy of the full SEA for the Labrador Shelf SEA Area is available on the C-NLOPB website (www.cnlopb.nl.ca) and in community offices. This summary document has been developed to provide the main findings of the SEA and to assist readers in understanding the issues in exploration for oil and gas in the Labrador Shelf SEA Area.

The exploration activities considered within the scope of the SEA include: exploratory and delineation drilling; seismic surveys, geohazard surveys and well site abandonment.

If one or more exploratory drilling programs are successful in the identification of petroleum deposits with commercial potential, production activities may follow.

Production activities may include:

- drilling of wells
- installation and operation of sub-sea equipment;
- installation and operation of production facilities; and
- production abandonment activities.

The area for the SEA is shown in Figure 1.1. The SEA considers oil and gas activities that may occur in the next 10 years. The report will be reviewed in five years to determine if updates are required.

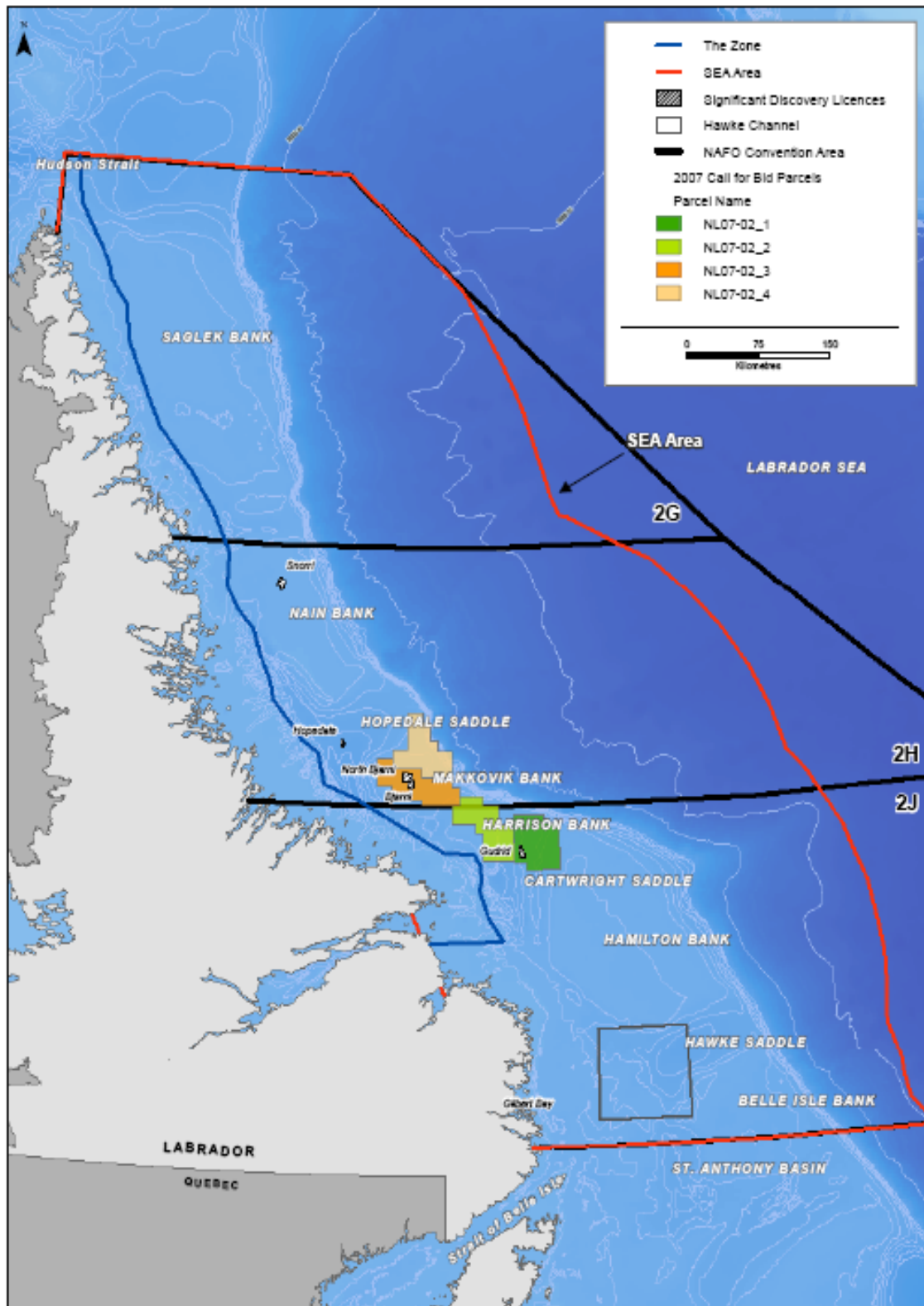


Figure 1.1 Labrador Shelf SEA Area Strategic Environment Assessment Area

1.1 Objectives and Purpose of the Labrador Shelf SEA Area Strategic Environmental Assessment

A SEA represents a broader, more proactive approach to assessing and managing environmental effects than traditional project-specific environmental assessments. A SEA:

- allows environmental issues to be identified and addressed at the earliest stages of planning, and typically focuses on “regional-scale” environmental concerns;
- can facilitate the consideration of stakeholder issues and concerns early in the planning process;
- can also help to focus subsequent project-specific environmental assessments; and
- can help establish a basis for consideration of cumulative effects from multiple projects.

In this particular case, information from the SEA will help the C-NLOPB to:

- determine whether or not an exploration licence should be offered in whole or in part within the SEA Area;
- determine what mitigative measures or restrictions should be applied to offshore oil and gas exploration activities in the SEA Area.

Within the Labrador Inuit Settlement Area (LISA), the C-NLOPB and the Nunatsiavut government will jointly determine what mitigative measures or restrictions should be applied.

Exploration and production activities require specific approval of the C-NLOPB, including a project specific assessment of its associated environmental effects in accordance with the *Canadian Environmental Assessment Act (CEAA)*. The Labrador Shelf SEA Area SEA is not intended and will not replace the requirement for project-specific environmental assessments.

1.2 Valued Environmental Components

It is generally acknowledged that an SEA must focus on those components of the environment that are valued by society and/or that can serve as indicators of environmental change and have the most relevance to the final decision regarding the environmental acceptability of offshore exploration and production activities within the Labrador Shelf SEA Area. These components are known as Valued Environmental Components (VECs).

The seven VECs selected for this project are:

- **Invertebrates and Invertebrate Habitat;**
- **Marine Fish and Habitat;**
- **Commercial Fisheries;**
- **Marine Birds;**
- **Marine Mammals and Sea Turtles;**
- **Species at Risk;** and
- **Sensitive and Special Areas**

The SEA examines the potential environmental effects associated with offshore exploration and production activities for each of these VECs. Data gaps and suggested mitigations are provided where appropriate.

1.3 Call for Bids

The C-NLOPB normally issues a call for nominations in the fall of each year. A call for nominations is a preliminary step prior to holding a competitive call for bids by allowing interested parties the opportunity to nominate lands of interest that may be included in a subsequent call for bids. The C-NLOPB is not bound to proceed with a call for bids in respect of any lands nominated. The C-NLOPB can also nominate lands for inclusion in a call for bids.

.For the Labrador Shelf SEA Area, the call for bids closes in September, 2008 to allow for the completion of the SEA. If the call for bids is successful, exploration licenses will likely be issued within 45 days.

1.4 History of Oil and Gas Activities in Labrador Shelf SEA Area

Interest in oil and gas offshore Labrador dates back to the late-1960s. At that time, several companies were given exploration permits for the Labrador Shelf SEA Area. Drilling in the area started in 1971 and continued until 1983. During that period 28 wells were drilled. This early drilling proved the presence of 4.2 trillion cubic feet (tcf) of recoverable natural gas in five separate wells.

The focus of exploration in the 1970s and 1980s was on oil. With the major finds at the time being gas, no development or further drilling has occurred in the area since 1983. However, the increasing demand for clean energy in the Eastern US and Canada is setting the stage for a new cycle of exploration drilling for gas resources in Labrador.

1.5 Consultations

Consultations commenced on this project with a letter of introduction of the project and the SEA process from the C-NLOPB to the Innu Nation, Nunatsiavut Government, Labrador Metis Nation and a number of stakeholders.

Consultations were undertaken with communities, interest groups, regulatory agencies, and aboriginal groups. The collection of Traditional Knowledge was also undertaken.

Initial consultation sessions were held on the north and south coast of Labrador during from October to December, 2007 to obtain input into the preparation of the first draft of the report. Once the first draft of the report was prepared, a second round of consultation was held on that document in the spring of 2008 to verify the input and to receive further input into the process.

Collectively, these consultations helped to identify data gaps, concerns about commercial fisheries harvesting operations and aquaculture activities, as well as domestic harvesting, cultural and recreational activities within the Labrador Shelf SEA Area. The information gathered during these consultations has been used in assessing and recommending appropriate mitigative measures relevant to the activities present in the area.

In general, concerns were expressed in the following general areas:

- the call for bids parcels noted in the Labrador Shelf SEA Area are over prime crab grounds on the Hamilton and Makkovik banks;
- the effects of ice on exploration facilities;
- a variety of sea birds were identified in the area which could be affected by offshore activities;
- a number of seal species were noted as being present in the area; harp seals have become increasingly plentiful in recent years;
- wolffish, an endangered species, is present in the area; and
- tourism is an emerging business opportunity in the area and there are a number of special, sensitive areas in the Labrador Shelf SEA Area.

1.6 Traditional Resource Use

Given that the Nunatsiavut Government has formal responsibility in the Labrador Shelf SEA Area under the Labrador Inuit Land Claims Agreement and that the Inuit and Innu people have a long history of utilizing natural resources in the area, it is very important that their knowledge be used in planning offshore activities in the area. In order to obtain information on traditional resource use and other traditional information, a formal program of collection of Traditional Knowledge (TK) was undertaken.

The following main points were made during the collection of Traditional Knowledge.

- The area is used extensively for fishing. Key species noted were: crab; rock cod; Atlantic cod; arctic char; sculpins; mussels; clams; wrinkles; and sea urchins.
- It is noted that whales migrate through the area. Walrus have also been noted in the area.
- The islands in the area are used for traditional uses such as egging and berry picking.
- Harlequin ducks, a threatened species, migrate through the area.
- Ducks and geese are hunted in the area.
- Traditional activities are well dispersed throughout the Labrador Shelf SEA Area.

2.0 EXPLORATION AND PRODUCTION ACTIVITIES

2.1 Exploration Activities

Exploration activities include:

- seismic surveys - use of sound pressure to map rock layers and properties through the detection of differing reflections of sound passing through geological formations. These are typically undertaken from survey vessels;
- geohazard surveys – use of low resolution seismic, video, and sonar to identify potential shallow drilling hazards, such as pockets of ‘shallow gas’. Surveys are undertaken before drilling starts.
- geotechnical surveys - taking samples (cores) of the substrate prior to positioning a drilling rig over a potential exploration/delineation wellsite to ensure the substrate will pose no hazard to the drilling rig; and
- drilling a well - this activity penetrates the substrate to an oil- or gas-containing formation.

Typically, drilling operations on the East coast of Canada have been conducted from several types of platforms including (i) jack-up rigs, (ii) semi-submersible rigs or (iii) drillships. The type of rig chosen is based on the characteristics of the well site physical environment, well site water depth, expected drilling depth and the mobility required based on weather and ice conditions.

Drilling and production activities are supported by various offshore supply vessels, including helicopters and supply boats. They provide transportation services to offshore facilities, delivery of supplies, and provide emergency response services.

During drilling operations, a safety zone is set up around the drilling unit. It is a temporary exclusion set up for the duration of the 40- to 60-day drilling program. The safety zone is relatively small (0.5 km²) and can extend 500 m beyond the anchor points of a mobile drilling unit, or 500 m around a drillship. Information on the safety zone is provided to mariners via the *Fisheries Broadcast* and through the *Notice to Mariners*.

2.2 Production Platforms and Facilities

Production platforms and other facilities will be used within the Labrador Shelf SEA Area if commercially viable oil and/or gas deposits are discovered, and companies have approval from the C-NLOPB. The type of production facility that could be used on the Labrador Shelf will depend on available technologies and the quantity and location of the oil or gas reserves.

The following are production facilities that are currently used offshore Newfoundland.

- gravity based structure (GBS) - A stand-alone production facility that is bottom-founded
- floating production, storage and offloading vessel (FPSO) – A large ship-type production facility
- pipelines and flow lines between facilities and/or to shore. Flow lines may be used to collect oil or gas from wells and bring it to the platforms. An export pipeline may be used to transport oil or gas to shore.

Potential development options will be strongly influenced by the presence of ice and icebergs in the offshore Labrador environment, which make it considerably different than other regions with minimal or no ice considerations.

3.0 PHYSICAL ENVIRONMENT

3.1 Geology

The seabed and near-seabed material of the Labrador Shelf SEA Area is a combination of bedrock, till and marine sediments. The Labrador Shelf SEA Area has a moderate earthquake hazard.

The Labrador shelf is approximately 150 km wide, with water depths of less than 70 m within 2 km of shore. Deep saddles run in a northeast-south west direction and there are separate shallow offshore banks with water depths less than 200m. The banks extend to the edge of the shelf that rapidly drops off to depths greater than 3000m. The Labrador Shelf can be divided into four distinct regions: the coastal embayment, a shallow rough inner shelf, a marginal trough; and a smooth, shallow outer shelf consisting of banks and intervening saddles.

3.2 Sea Conditions

Sea surface temperatures in the Labrador Shelf remain relatively cold in the north and range from an average of 0°C during the winter months to an average of 10°C during summer.

Extreme wave heights range from 9.63 m on a 10-Year significant wave height to 12.36 m on a 100-Year significant wave height.

Extreme wind speeds range from 25.40 meters/second to 31.02 meters/second on a 10 year and 100 year basis.

The Labrador Current, originating in the Davis Strait, is a combination of the West Greenland Current, the Baffin Island Current and inflow from Hudson Bay. It flows along the Labrador coast and consists of two major streams, the inshore and offshore stream.

Current speeds range from a minimum mean speed of 3.1 centimeters/second to a maximum mean speed of 35.1 centimeters/second and are generally stronger over the steepest portion of the continental slope than over the continental shelf or locations further offshore.

3.3 Air and Sea Surface Temperatures

Air temperatures on land in the area are reported as follows and it is quite possible that offshore temperatures could be more severe. Temperatures on land range from an average low throughout the year of -20°C to an average high of 13°C. Extreme low temperatures have been recorded of less than -40°C. Wind chill conditions that would cause exposed skin to freeze occurs up to 50-60% of the time in January and February on the coast of Labrador. Visibility for marine transportation and flying can often be impaired in the area due to fog and snow conditions.

Sea surface temperatures in the Labrador Shelf SEA Area remain relatively cold in the north, typically -2°C to 0°C throughout the year. In the south the temperature ranges from 0°C during the winter to approximately 10°C in the summer.

3.4 Ice Conditions

The average start of the ice season ranges from mid-November in the north, to December, in the south. Ice growth typically continues until late spring, when the pack ice begins to melt and dissipate through the month of July. The ice season ends, on average, by late-June/early-July in the south but extends until late-July/early-August in northern regions.

Pack ice thickness in the area has been measured from a minimum of 1.5 m to a maximum of 14-17 m.

For the most part icebergs are most prevalent in the area from July to October and their drift is north to south following the shape of the Labrador coast. Icebergs range in size from 16 m to greater than 120 m.

Mean iceberg scour depths have been measured at 1.98 m. Scour depths generally increase with water depth, with a maximum scour depth measured at 6 m in 145 m of water.

4.0 BIOLOGICAL ENVIRONMENT

4.1 Species at Risk

The *Species at Risk Act* (SARA) species noted to be in the Labrador Shelf SEA area are:

- Atlantic Wolffish;
- Northern Wolffish;

- Spotted Wolffish;
- Barrows Goldeneye;
- Eskimo Curlew;
- Harlequin Duck;
- Ivory Gull;
- Peregrin Falcon;
- Blue Whale;
- Fin Whale; and
- Leatherback Turtle

4.2 Benthic Invertebrates

Benthic invertebrates are bottom dwelling organisms such as toad crabs, clams, and shrimp. Spatial variability of benthic communities can be attributed to physical habitat characteristics such as water depth, substrate type, currents and sedimentation.

4.3 Fish

The key fish species noted in the Labrador Shelf SEA Area are:

| Fish Species Present |
|--|
| Species with an * are commercially harvested |
| American Plaice* |
| Arctic Charr* |
| Atlantic Cod* |
| Rock Cod* |
| Capelin* |
| Snow Crab* |
| Spider Crab* |
| Yellowtail Flounder* |
| Greenland Halibut(Turbot)* |
| Roughhead Grenadier* |
| Silver Hake* |
| Atlantic Halibut* |
| Redfish* |
| Iceland Scallop* |
| Seal* |
| Skate* |
| Witchflounder(Grey sole)* |
| Northern Shrimp* |

| |
|-----------------|
| Whelk* |
| Porbeagle Shark |
| Herring |
| Lumpfish |
| Sand Lance |
| Spiny Dogfish |
| Black Dogfish |
| Atlantic Salmon |
| Wolffish* |
| Shrimp* |
| Haddock* |

4.4 Marine Mammals and Sea Turtles

The following marine mammals and sea turtles have been recorded as being present in the Labrador Shelf SEA area.

| | |
|----------------------------|--------------------------------|
| Beluga Whale | Harbour Seal |
| Humpback Whale | Harp Seal |
| Minke Whale | Hooded Seal |
| Sei Whale | Grey Seal |
| Bowhead Whale | Atlantic loggerhead Sea turtle |
| Harbour Porpoise | Kemp's Ridley Sea Turtle |
| Long-Finned Pilot Whale | Walrus |
| Atlantic White-sided Whale | Ring Seals |
| Sowerby's Beaked Whale | Bearded Seals |
| Killer Whale | |

4.5 Polar Bear

Polar bears are also present in the area.

4.6 Marine Birds

Five orders of Marine Birds with 30 species of marine associated birds have been identified in the area as follows:

| | |
|--------------------------------------|----------------------------|
| Ducks and Geese | |
| Canada Goose | White-winged Scoter |
| American Black Duck | Long-tailed Duck |
| Green-winged Teal | Common Goldeneye |
| Common Eider | Barrow's Goldeneye |
| King Eider | Common Merganser |
| Harlequin Duck | Red-breasted Merganser |
| Black Scoter | Hooded Merganser |
| Surf Scoter | |
| Shorebirds, Gulls, and Alcids | |
| Black-bellied Plover | Semipalmated Sandpiper |
| American Golden Plover | Least Sandpiper |
| Semipalmated Plover | White-rumped Sandpiper |
| Solitary Sandpiper | Whimbrel |
| Greater Yellowlegs | Red-necked Phalarope |
| Spotted Sandpiper | Red Phalarope |
| Ruddy Turnstone | Long-tailed Jaeger |
| Sanderling | Parasitic Jaeger |
| Dunlin | Pomarine Jaeger |
| Raptors | Tube-nosed Seabirds |
| Osprey | Northern Fulmar |
| Golden Eagle | Sooty Shearwater |
| Bald Eagle | Wilson's Storm Petrel |
| Merlin | Leach's Storm-Petrel |
| Rough-legged Hawk | |
| Red-tailed Hawk | |
| Owls | Loons |
| Short-eared Owl | Red-throated Loon |
| Snowy Owl | Common Loon |
| Great-horned Owl | |

4.7

Sensitive Areas

There are a number of areas and places in the Labrador Shelf SEA Area that are identified as **sensitive areas**.

Sensitive areas are defined as:

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

Potential sensitive areas in the Labrador Sea Area include:

- Potential National Marine Conservation Areas (NMCAs) at Nain Bight and Hamilton Inlet
- Battle Harbour
- Gilbert Bay
- Hawke Channel-Hamilton Bank
- Torngat Mountains National Park
- Proposed Mealy Mountains National Park
- Coral Communities
- Gannet Islands Ecological Reserve
- Important Bird Areas

These sensitive areas are noted in Figure 4.1

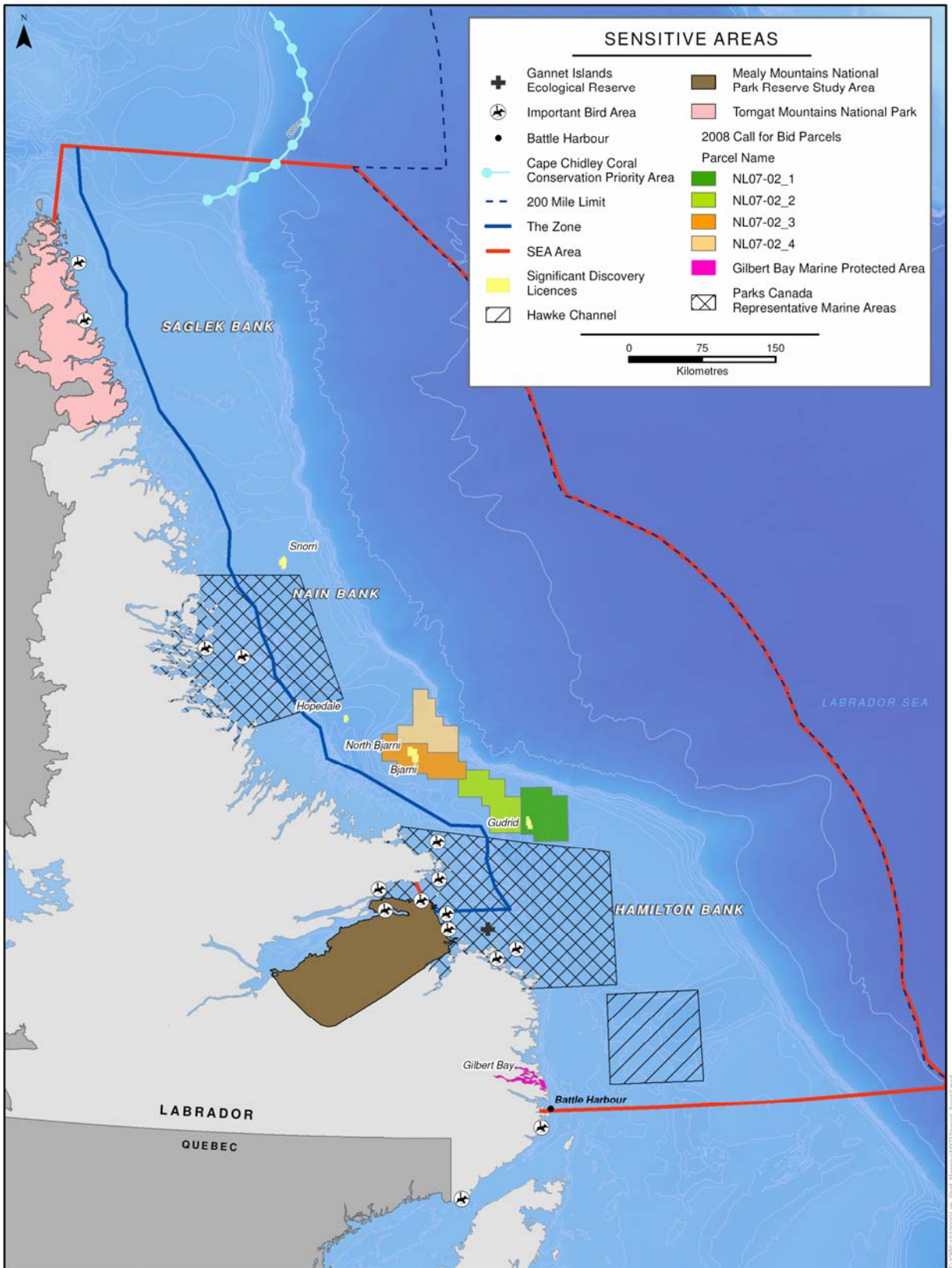


Figure 4.1 Sensitive Areas

5.0 SUMMARY AND CONCLUSIONS

The C-NLOPB will use the information presented in this SEA in decision-making for offshore exploration activities for the Labrador Shelf SEA Area.

5.1 Potential Issues

While there are a variety of potential issues that are generally applicable to offshore oil and gas exploration, the Labrador Shelf Sea Area is a sub arctic environment that has its own unique set of issues that may not be found in more temperate environments. Issues are not considered in isolation although they are provided below in a list for ease of identification. Associated with potential issues are data constraints that may in part be why an item is considered an issue in the first place. Issues and related data constraints result in the need for potential mitigations and having planning processes to address or mitigate the issue.

Potential issues that are associated with offshore oil and gas activities, regardless of the locale include:

- effects of sounds, including seismic surveys, on marine mammals including polar bears, sea turtles, seabirds, invertebrates, fish and species at risk;
- attraction of seabirds, particularly petrels, to drill rigs and survey and supply vessels;
- impacts of drill muds on the environment;
- fishery exclusion/safety zone;
- disturbances to benthic communities;
- smothering of benthic communities due to drill cuttings deposition;
- collision between surveys and support vessels and marine mammals (including species at risk);
- disturbance to sensitive areas such as migration routes, spawning areas and nurseries;
- the use of explosives to close well heads at the end of a drilling program (if conventional mechanical means fail);
- potential cumulative environmental effects from offshore oil and gas exploration activities and effects from other users in the same vicinity (e.g. commercial fishing, vessel traffic, traditional land and resource use by Aboriginal peoples, tourism and recreation-related activities);
- effects of routine discharges(produced water, storage displacement water, bilge and ballast water, deck drainage, cooling water, cement slurries, BOP fluid, sewage and food wastes) on birds, marine mammals, sea turtles, invertebrates, fish and related habitat, commercial fisheries and species at risk; and
- effects of accidental events on birds, marine mammals, sea turtles, invertebrates, fish and related habitat, commercial fisheries and species at risk.

Potential issues specific to the Labrador Shelf SEA Area that are identified include:

- potential sensitivity of eelgrass beds, shallow subtidal and intertidal areas to accidental events, as they are host to a variety of migratory birds (including species at risk);
- potential sensitivity of suspension and filter feeding benthic invertebrates, in particular bryozoans and soft and hard corals, to drilling discharges;
- the presence of a coral area, at Cape Chidley near the northern edge of the Labrador Shelf SEA Area;
- potential sensitivity of key fish spawning and nursery areas within the Labrador Shelf SEA Area, in particular the Hawkes Channel and Gilbert Bay.
- ice conditions (including pack ice, icebergs and iceberg scour) and related ice management issues are unique to the Labrador Shelf SEA Area and would greatly influence timing and type of exploration and drillings activities;
- two potential National Marine Conservations Areas have been identified in Nain Bight and Hamilton Inlet. Should either one or both Nain Bight and Hamilton Inlet become NMCCAs, then oil and gas exploration would be prohibited in these areas;
- presence of all three species of wolffish, in particular the northern and spotted wolffish, which are protected under SARA, throughout the Labrador Shelf SEA Area;
- the presence of fourteen Important Bird Areas; and
- tourism is a growing industry in the area.

5.2 Data Gaps

The availability of information varies considerably among the various components of the Labrador Shelf SEA Area. While there are data available for all VECs and issues identified and discussed throughout the Labrador Shelf SEA, there are a variety of data constraints associated with the existing data. These data constraints range from “limited or aged” data sets with respect to populations estimates, limited knowledge on the ecology of a species or species ecology for a species.

The key data constraints identified below are an overview of the data constraints that have been identified throughout the Labrador Shelf SEA report. The applicable data constraints sections in the main SEA report provide details with respect to species specific constraints. It must be recognized while at the time of the report these data constraints existed, studies and research are ongoing filling many existing data constraints on one hand and often identifying new constraints on the other hand. A review of data constraints will be required during project specific environmental assessments to ensure that the data constraints noted below and throughout the report are still valid.

While there were a number of data gaps identified for the area, the following are considered the key gaps:

- limited database of current measurements for the region;
- benthic species distribution, abundance and diversity;

- scientific assessments for commercial species are dated;
- the distribution of fish and shellfish eggs and larvae within the Labrador Shelf SEA Area are not well understood;
- location of spawning areas and other critical habitat for invertebrates and fish species;
- detailed information on locations of enhanced productivity for fish species, including areas of concentrations of feeding seabirds and marine mammals (e.g., Hawkes Channel), is limited;
- location and abundance of marine corals;
- the distribution and life-stages of some SARA-listed species including wolffish, leatherback sea turtles and various whale species is limited;

the migration routes, breeding grounds and feeding areas for marine mammals in the area is limited; and

oil spill trajectory modelling for the Labrador Shelf SEA Area.

5.3 Addressing Data Gaps

Some of the data gaps noted above can be addressed by government departments under their respective mandates, through collaborative efforts between industry and government, as part of site-specific environmental assessments and through site-specific monitoring programs associated with oil and gas activities. Some activities that could assist in addressing identified data gaps are as follows:

- The collection of spatial and temporal data on fish spawning, distribution of fish and shellfish eggs and larvae would be valuable for use in environmental effects assessments, as well as fisheries management. The collection of data and information with respect to SARA-listed species, including wolffish, leatherback sea turtles and various whale species, would be beneficial for fisheries and resource management.
- Verification of Aboriginal Traditional Knowledge would enhance existing scientific knowledge.
- Requirements for original site-specific data as part of the environmental assessment process may be required for certain components such as benthic invertebrates, seabirds and marine mammals, which could be collected opportunistically during seismic and drilling programs and during operations.
- Monitoring and observation programs undertaken during exploration drilling and production activities.
- Research through collaborative partnerships such as the Environmental Studies Research Fund, Petroleum Research Atlantic Canada and Program of Energy Research and Development
- The requirement for site-specific oil spill and cuttings deposition modelling as part of the environmental assessment process.
- Community based training in oil spill response capabilities.

5.4 Planning Considerations

A number of key environmental planning and management considerations related to future offshore exploration in the Labrador Shelf SEA Area are noted below.

- Several species at risk are known or likely to occur in or adjacent to the Labrador Shelf SEA Area. Mitigating potential effects to species and habitats protected by the SARA will be an important consideration in decisions related to future offshore exploration.
- A number of areas and times are particularly important to fish and fish habitat (including benthic invertebrates) in the region (e.g., spawning areas and periods, migration routes, areas of high productivity). Individual seismic programs should, where possible, be planned so as to reduce potential interactions during particularly sensitive times.
- The coastal areas (including islands) within the Labrador Shelf Sea Area are used by the Aboriginal peoples for traditional food gathering (including the harvest of most fish species, hunting of marine mammals (including polar bears) and birds, egging and berry gathering). Mitigating potential effects to traditional resource usage within the Labrador Shelf SEA Area will be an important consideration in decisions related to future offshore exploration.
- Ice conditions and ice management strategies will be a major planning consideration.
- The remote locale of the Labrador Shelf SEA Area is such that timeliness of any emergency response will be crucial. One planning consideration will be to assess and upgrade spill response capabilities within the Labrador Shelf SEA Area to support offshore oil and gas activities for that area. The appropriate equipment combined with locally trained people to conduct emergency response operations should be in place for activities planned within the Labrador Shelf SEA Area.
- Seismic surveys are, where possible, planned to coordinate program activities with the fishing industry to reduce potential conflict with commercial fishing activity during peak fishing times.
- Pre-spud ROV surveys could be a potential requirement to collect data regarding corals/benthic communities.
- Cumulative effects will need to be included at the project-specific environmental assessment stage and should consider activities occurring within the Greenland Offshore.
- The current fishery within the Labrador Shelf SEA Area is dominated by shellfish, particularly shrimp and crab. Historically the groundfish fishery played a vital role to the area. Future environmental assessments should consider appropriate mitigations for historical groundfish species as it is possible these fisheries could return to prominence in the future.

5.5 Conclusion

The Labrador Shelf Offshore Area SEA report provides a general overview of the physical and biological environment for the Labrador Shelf SEA Area. Data constraints and gaps are highlighted for certain environmental issues within the SEA Area, including

oceanographic, benthic invertebrates, marine mammals, commercial fisheries data, and traditional knowledge within the Nunatsiavut Zone. Within the SEA Area there are a number of sensitive areas. There are two potential candidate areas for a NMCA, sensitive fish habitat (Hawke Channel-Hamilton Bank area, and Nain Bight), the Gannet Island Ecological Bird Sanctuary, 14 IBAs, the Torngat Mountains National Park, the proposed Mealy Mountains National Park, as well as traditional hunting and harvesting areas within The Zone. Coral communities can be found in numerous locations throughout the Labrador Shelf SEA Area.

The SEA report discusses a number of data gaps. As the SEA Area is very large and diverse, these data gaps are described for the entire SEA Area rather than for specific locations within the Area. For some areas, in particular the Nunatsiavut Zone, the extent of the data gaps is unknown. The C-NLOPB, through its membership in the ESRF Management Board will advocate the allocation of research funds to undertake a gap analysis for the Zone.

For the identified data gaps within the Labrador SEA Area, the C-NLOPB will work with the Nunatsiavut Government to develop a work plan to address these gaps. The C-NLOPB will also promote the undertaking of research within the Labrador SEA Area through research organizations such as ESRF, the PERD, PRAC, and researchers at Memorial University. The C-NLOPB will enter into discussions with the DFO to identify fisheries research needs and priorities for Labrador. In addition, operators may be required to collect data as part of their program operations either opportunistically during program operations or prior to the start of program activities. The requirement and nature of the data collection will be determined during the project-specific environmental assessment stage.

The identification of an area as 'sensitive' in the SEA report does not, in itself, automatically imply that it will require the application of special or non-typical mitigations or restrictions. Within some sensitive areas, there may be a requirement for non-typical mitigations or restrictions on offshore oil and gas activities in order to prevent potential environmental effects. The timing, spatial extent, and nature of proposed oil and gas activities, in addition to mitigations prescribed by legislation, will determine the level of restriction or mitigation that will be required. The timing of these restrictions and/or the application of special mitigation measures are either highlighted below or will be determined during C-NLOPB's project-specific environmental assessment regulatory approval processes.

The SEA report identifies a number of sensitive areas adjacent to the 2007 Labrador Call for Bids parcels. For these areas, the following conclusions apply.

The Hawke Channel is a designated fishery management closure area. The timing of offshore oil and gas activities in areas adjacent to this area will be restricted to protect fish spawning.

Parks Canada has identified two potential candidate areas for a National Marine Conservation Area: Nain Bight and Hamilton Inlet. While Hamilton Inlet is the preferred candidate area, in keeping with the Parks Canada process for designation of NMCAs, the C-NLOPB will work cooperatively with Parks Canada

as it finalizes its selection and determines the study area for the proposed NMCA. The C-NLOPB is cognizant of the Parks Canada NMCA process and will consider this in future rights issuance for the Labrador Shelf SEA Area.

For areas that are identified as highly ecologically productive, such as the Hamilton Bank, the conduct of offshore oil and gas activities may require non-typical mitigations or restrictions on activities to prevent effects during sensitive life cycle times. Details regarding this will be determined at the project-specific environmental assessment stage. During the project-specific environmental assessment stage, the C-NLOPB will discuss with DFO, the Nunatsiavut Government and the fishing industry the potential requirement for non-typical or site-specific mitigation measures for offshore oil and gas activities.

Portions of the Labrador SEA Area have been identified as high in coral abundance and diversity. To prevent impacts to coral communities, prior to the commencement of drilling activities, the C-NLOPB will require operators to undertake sea-bottom surveys to determine presence of corals. Mitigations will be required to prevent impacts to sensitive coral communities that are identified.

Offshore oil and gas activities in or adjacent to the Gilbert Bay MPA, the Gannet Island Ecological Reserve, and future protected areas will be bound by the protection measures defined in the appropriate legislative framework for these areas. Additional mitigation, if required, will be determined at the project-specific environmental assessment stage.

With the exception of the foregoing, the SEA indicates that petroleum exploration activities can be undertaken in the Labrador Shelf area using the mitigations described in the document. A project-specific environmental assessment will be required for each proposed activity and this may identify additional mitigation measures in some cases. If it is determined during an assessment process that baseline information is required in order to assess effect predictions, the operator may then be required to undertake data collection. It is likely that during the early exploration phase, such data collection can be conducted opportunistically as part of an ongoing industry activity. In the event that petroleum resources with development potential are discovered, the C-NLOPB will discuss with the operator, the Nunatsiavut Government, federal and provincial government agencies and interested parties in the public the additional data collection that will be required to support a future development application.