ATTACHMENT 3

Polar Bear Interaction Plan

I. Summary

In support of Law of the Sea studies, a joint two-ship experiment will be conducted by Canada and the United States in August - September, 2010 in portions of the western Arctic Ocean north of Alaska and west of the Canadian continental margin. In tandem, USCGC *Healy* will collect multibeam bathymetry and gravity data and CCGS *Louis S. St. Laurent (Louis)* will collect seismic reflection and single-beam bathymetry data. This polar bear interaction plan was requested by FWS for *Healy* operations throughout the cruise, and *Louis* operations during operations inside the US Exclusive Economic Zone (EEZ). Chief Scientist aboard *Healy* will be Dr. Brian Edwards, U.S. Geological Survey. *Healy* will leave from Dutch Harbor, AK, on 2 August, 2010, and return to Barrow, AK on 6 September, 2010. Seismic data collection from *Louis* inside the U.S. 200 nautical mile limit will occur from approximately 7-12 August, 2010. Both *Louis* and *Healy* are self-contained icebreaker vessels with the crew living aboard the vessel for the entire cruise. There are no on-ice operations planned. The strategy outlined in this polar bear interaction plan utilizes US NOAA/NMFS strategy for marine mammal monitoring and mitigation while in the US EEZ. Each country uses its own monitoring and mitigation strategies when operating in international waters. In general, the Protected Resource Observers (PROs) use consistent approaches in their work. The *Healy* science crew will abide by the experimental approach and PRO responsibilities set forth in this document, as will Louis while it is operating in US waters.

II. Cruise Overview

During the summer of 2010, the Interagency Task Force for the U.S. Extended Continental Shelf (ECS) is conducting a geophysical data collection cruise in the Arctic Ocean from the U.S. Coast Guard vessel *USCGC Healy*. Much of the cruise will be cooperative with a similar ECS group in Canada using *CCGS Louis S. St-Laurent*. The purpose of the two-icebreaker experiment is to collect bathymetric data from the *Healy* and seismic data from the Canada Coast Guard vessel *Louis S. St-Laurent (Louis)* in support of defining the respective extended continental shelves of the U.S. and Canada in the Arctic Ocean per Article 76 of the Convention on the Law of the Sea. Proposed track lines for the 2010 experiment are shown in **Figure 1.** This collaboration saves millions of dollars for both countries, ensures data is collected only once over the same area, maximizes respective strengths, and increases scientific and diplomatic cooperation. The 2010 experiment is the third two-icebreaker survey conducted for ECS. The U.S. Geological Survey is the lead U.S. agency in the *Healy* cruise.

Healy and *Louis* will acquire data in the Canada Basin and along its edges (Alaskan margin, Northwind Ridge, Alpha Ridge, Canadian continental margin). In general, Healy will break ice ahead of *Louis*. In this configuration, the priority data collection is seismic reflection and refraction data from *Louis*. For the heaviest ice conditions expected in the northern and easternmost areas of surveying, the ships will reverse position so that *Louis* breaks ice for

Healy. In this configuration, the priority data collection is multibeam bathymetry data from *Healy*.

Healy Cruise: 2 August – 6 September, 2010 (Dutch Harbor – Barrow)
At the beginning of the cruise, Healy and Louis will rendezvous and operate for ~5-7 days inside the US 200-nmi limit in water depths greater than ~2000 m and more than 100 km from the Alaskan shoreline (**Figure 1**). While inside the US 200-nmi limit, *Healy* will break ice ahead of Louis if ice conditions require this configuration. Otherwise, Healy will collect multibeam data independently along the Alaskan Beaufort continental margin in water depths deeper than ~2000 m. The two ships will rejoin when ice conditions require a two-icebreaker configuration.

USCGC Healy will operate a multibeam echosounder, (Kongsberg EM122), a sub-bottom profiler (Knudsen 3.5 kHz Chirp) and a "piloting" echosounder (ODEC 1500) continuously when underway. Acoustic Doppler current profilers (75-kHz and 150-kHz) may be used on the *Healy*. In addition, as time and ice conditions permit, Healy may conduct coring near southern Alpha Ridge to sample the shallow seafloor sediments along survey lines.

Louis Cruise: 4 August – 15 September (Kugluktuk, NWT – Kugluktuk, NWT)
After *Louis* and *Healy* rendezvous (and marine mammal observers from *Healy* are transferred to *Louis*), seismic operations will commence for the cruise tracks that go within the US 200-nmi limit. The program within the U.S. 200-nmi limt consists of three lines totaling ~806 km (**Figure 1; Table 1**). U.S. priorities include another 997 km of survey lines north of the U.S. 200-nmi limit, for a total of 1803 km of tracklines of interest to the U.S. Table 1 lists all U.S. priority tracks. Water depths within the U.S. study area will range from ~1900 to 4000 m (Fig. 1). There may be additional seismic operations associated with airgun testing, start up, and repeat coverage of any areas where initial data quality is sub-standard. The tracklines that will be surveyed in U.S. waters include the southern 263.8 km of the line that runs North-South in the western EEZ, the southern 264.5 km of the line that runs North-South in the central EEZ, and 277.7 km trackline of the line that connects the two (**Figure 1; Table 1**).

Once these data are collected, *Louis* and *Healy* will proceed north to acquire data along the other proposed US-priority tracks and then proceed to collect data of Canadian priority (**Figure 1**). After *Healy* departs the two-icebreaker experiment to return to Barrow, *Louis* will proceed to collect seismic data independently where ice conditions allow, most likely along the southernmost lines within the Canadian 200-nmi limit.

Acoustic sources on board *Louis* will include an airgun array comprised of three Sercel G-guns and a Knudsen 320BR "Chirp" pulse echo sounder operating at 12 kHz. The airgun array consists of two 500 in^3 and one 150 in^3 airguns for an overall discharge of 1150 in^3. The airgun array is fired approximately every 20 s. The recorders are a 100-m long 16-channel multichannel streamer towed behind Louis, and sonobuoy hydrophones that are deployed approximately once every 8 hours behind the vessel during seismic shooting.

Coordination
In preparation for these cruises, a series of meetings have been held in both the U.S. and Canada between scientists, diplomats, and ship operators to ensure maritime safety and a successful mission compliant with all U.S. and Canadian law and practices. During the past

three years of Canadian seismic operations in the Arctic, Natural Resources Canada has conducted an assessment and subsequently received an authorization from the Canadian Department of Fisheries and Oceans for their seismic work. During the two-icebreaker experiments of 2008 and 2009 which were conducted outside the U.S. 200-nmi limit, both a native community observer and a protected resources observer were included in the science crew of *Healy*. For 2010, USGS is proposing three protected resource observers aboard *Healy* together with the three observers already aboard *Louis*. During operations in the US EEZ, two of the protected resource observers aboard *Healy* will transfer to *Louis* so that she is operating with five observers.

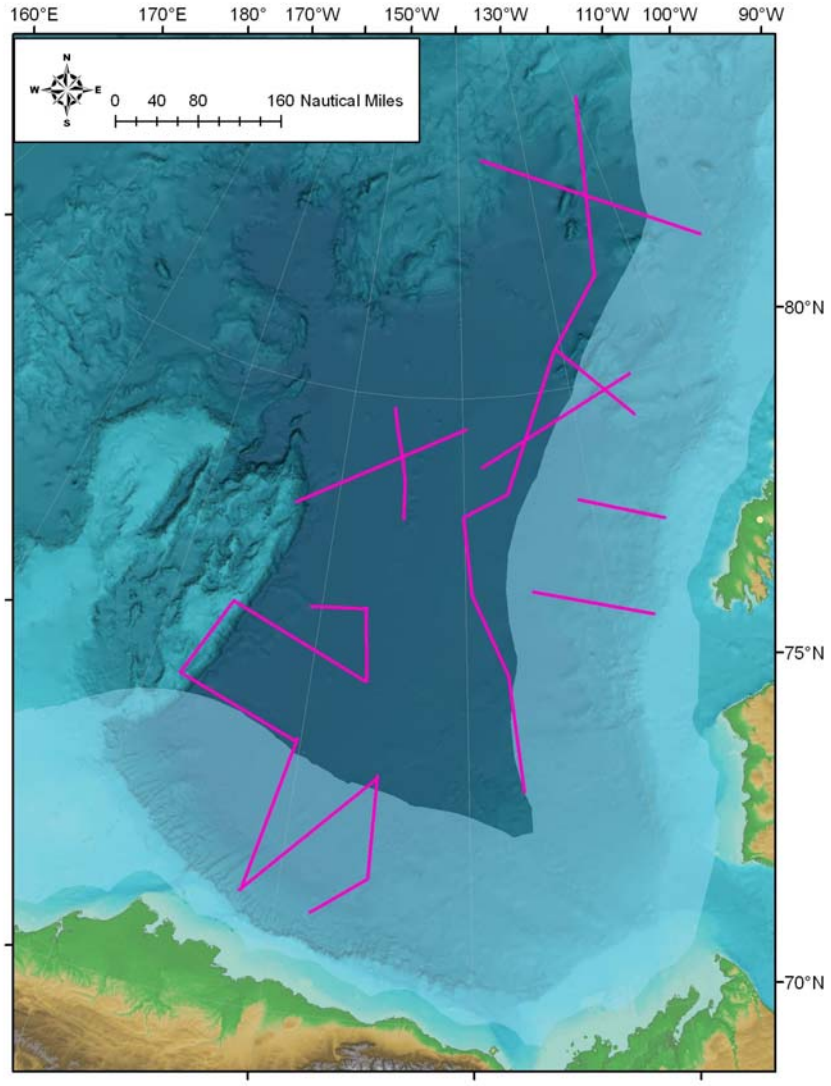

FIGURE 1. Proposed location of the USGS August–September 2010 seismic survey area. Light blue shading indicates the Exclusive Economic Zone out to 200 nmi.

TABLE 1. Proposed U.S. priority tracklines for USGS/Geological Survey of Canada (GSC) 2010 Extended Continental Shelf Survey in the northern Beaufort Sea and Arctic Ocean.

Location	End Point 1	End Point 2	km	n.mi.	Time (h) @ 4 n.mi./hr
NS in central EEZ	71.22° N ; 145.17° W	73.92° N ; 145.30° W	300	162	41
Central-western EEZ connector	73.92° N ; 145.30° W	71.84° N ; 151.82° W	317	171	43
NS in western EEZ	71.84° N ; 151.82° W	74.32° N ; 150.30°W	281	152	39
South Northwind Ridge	74.32° N ; 150.30°W	74.96° N ; 158.01° W	239	129	32
Northwind Ridge connector	74.96° N ; 158.01° W	76.30° N ; 155.88° W	161	87	22
Mid-Northwind Ridge	76.30° N ; 155.88° W	75.41° N ; 146.50° W	274	148	37
Northwind Ridge connector	75.41° N ; 146.50° W	76.57° N ; 146.82° W	129	70	17
Mid-Northwind Ridge	76.57° N ; 146.82° W	76.49° N ; 150.73° W	102	55	14
		Totals	1803	974	245

III. Polar Bears in the Study Area

Nineteen discrete populations of polar bears exist in the circumpolar North American Arctic (Aars et al., 2006). The proposed 2008 Healy cruise will occur within the range of two of these populations: the southern and northern Beaufort polar bear populations (Figure 2). The most up-to-date information about the southern Beaufort population is summarized in Regehr et al. (2006); information for the northern Beaufort polar bear population is summarized in Stirling et al. (2007). Much of the following information derives from these two reports.

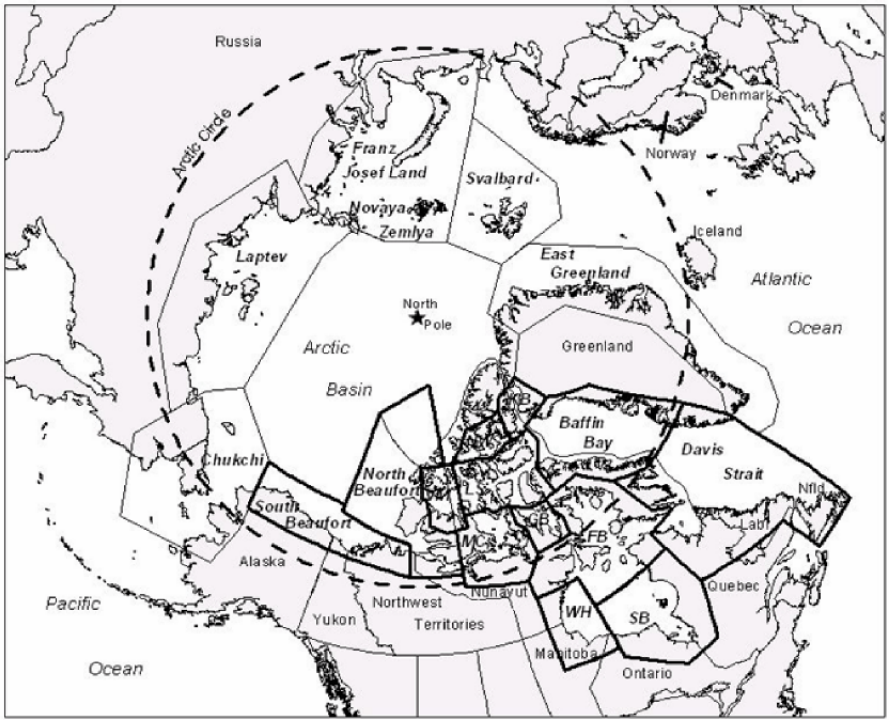

Figure 2: Circum-Arctic polar bear populations according to U.S. Fish and Wildlife Service (source: http://alaska.fws.gov/fisheries/mmm/polarbear/images/circumpolar-maplg.gif). GB=Gulf of Boothia; FB=Foxe Basin; KB = Kane Basin; LS=Lancaster Sound; MC=M'Clintock Channel; NW=Norweigian Bay; SB=Southern Hudson Bay; WH=Western Hudson Bay.

Polar bears are dependent upon sea ice for their survival, using it to hunt their primary food source, seals (Stirling, 1974; Stirling and Latour, 1978; Smith, 1980). Polar bear populations are generally most abundant on the annual ice over the relatively shallow waters of the continental shelf, which are more biologically productive than the offshore deep waters (Stirling et al., 1982; Kingsley et al., 1985; Stirling and Oritsland, 1995). Both the southern and northern Beaufort polar bear populations move north with the ice as it melts in the summer (Amstrup et al., 2000; Mauritzen et al., 2003; Wiig et al., 2003). More polar bears in the Beaufort Sea are also being found on land during the summer season, indicating not all bears move north with the ice (Schliebe et al., 2006).

On May 14, 2008, the polar bear was listed as a threatened species under the Endangered Species Act of the United States. Canada has not listed the polar bear as a threatened species. For many years, the United States and Canada have cooperatively managed hunting polar bears of the southern Beaufort population that encompasses northern Alaska, the Yukon, and
Northwest Territories (Brower et al., 2002). In response to the U.S. listing polar bears as threatened, U.S. Secretary of the Interior, Dirk Kempthorne, and his Canadian counterpart, John Baird, Minister of the Environment, have signed a Memorandum of Understanding for both conserving and managing polar bear populations that are shared by both countries.

Population Estimates

The total estimated size of the southern Beaufort polar bear population based on longterm capture/recapture statistics and population models is 1,526 individuals (±315, 95% CI) (Regehr et al., 2006). Because of uncertainties, this value can not be statistically differentiated from previous estimates of population size, suggesting that the population is stable. However, declining cub survival rates, and decreasing skull and body weight measurements for adult males from this population suggests these southern Beaufort polar bears are nutritionally stressed (Regeher et al., 2007).

Similar capture/recapture models used to estimate the northern Beaufort polar population give an estimate of 980 individuals (±155, 95% CI) (Stirling et al., 2007). These size estimates are also statistically indistinguishable from earlier estimates of the size of the northern Beaufort population. This population, however, is interpreted to be stable (Stirling et al., 2007). The smaller number of polar bears in this northern area (980 individuals versus 1,526 in the southern area), together with the larger areal size of the northern area (compare southern and northern Beaufort areas in Figure 2) indicates that the average density of polar bears in this northern area is considerably less than that of the southern area.

According to Lunn et al. (2002), the total population of circum-Arctic polar bears is ~21,000 - ~25,000. Therefore, the southern and northern Beaufort populations (±2506 individuals) comprise ~ 10 - ~12 % of the total polar bear population.

Potential Encounters

Healy may encounter polar bears from the southern Beaufort population while departing from and returning to Barrow at the start and end of the cruise, although open water conditions during this time of year when ice thaw is at its greatest will contribute to minimizing encounters. For the duration of the cruise, the tracks are primarily within the area of the distribution of the northern Beaufort population.

Polar bears expected to be encountered during the *Healy* 2008 cruise are likely to be few in number. On the *Healy* 2005 cruise with marine mammal observers, three polar bear were sighted along ~2,400 km of observed trackline during 14 days from 70° N to 81° N (Haley and Ireland, 2006). Similarly, for the 2007 Louis 42-day cruise in the Canada basin just north of the U.S. 200 nautical mile limit, less than 30 polar bears were sighted along the ~3,000 km of tracklines (H.R. Jackson, Chief Scientist aboard *Louis,* personal communication).

Effects on the polar bear are anticipated to be minor. Encounters are expected to be when the polar bears are on the ice, where underwater signals from *Healy* multibeam, Chirp systems, or engine noise will not be heard. The sea surface is an efficient reflecting horizon and underwater sound generally does not pass into the air. If any of the encountered polar bears are in the water, levels of *Healy* sound systems would be attenuated by the pressure release effect at the air/water interface (Greene and Richardson, 1988; Richardson et al., 1995). Polar bears generally do not dive much below the water's surface.

The icebreaking operation may change the geometry or width of open-water leads, and therefore affect habitat, but these changes are expected to be minor. *Healy* will make every attempt to follow existing leads rather than creating new leads during the profiling. Depending on wind and current conditions, the ice often closes behind the vessel returning the track path to its previous ice-covered state.

IV. Subsistence Harvest Considerations (from the draft IHA, by LGL)

Marine mammals are legally hunted in Alaskan waters by coastal Alaska Natives; species hunted include bowhead and beluga whales; ringed, spotted, and bearded seals; walruses, and polar bears. The importance of each of the various species varies among the communities based largely on availability. Bowhead whales, belugas, and walruses are the marine mammal species primarily harvested during the time of the proposed seismic survey. Subsistence remains the basis for Alaska Native culture and community, and subsistence activities are often central to many aspects of human existence, including patterns of family life, artistic expression, and community religious and celebratory activities.

The community of Barrow hunts bowhead whales in both the spring and fall during the whales' seasonal migrations along the coast . Often the bulk of the Barrow bowhead harvest is taken during the spring hunt. However, with larger quotas in recent years, it is common for a substantial fraction of the annual Barrow quota to remain available for the fall hunt. The communities of Nuiqsut and Kaktovik participate only in the fall bowhead harvest. The fall migration of bowhead whales that summer in the eastern Beaufort Sea typically begins in late August or September. Fall migration into Alaskan waters is primarily during September and October. However, in recent years a small number of bowheads have been seen or heard offshore from the Prudhoe Bay region during the last week of August (Treacy 1993; LGL and Greeneridge 1996; Greene 1997; Greene et al. 1999; Blackwell et al. 2004).

The scheduling of the 2010 two-icebreaker seismic survey has been discussed with representatives of those concerned with the subsistence bowhead hunt, most notably the AEWC, the Barrow Whaling Captains' Association, and the North Slope Borough (NSB) Department of Wildlife Management. The timing of the proposed geophysical survey in early – mid-August will affect neither the spring nor the fall bowhead hunt. The *Healy* is planning to change crew after completion of the geophysical survey through Barrow via helicopter or boat. That crew change is scheduled ~5-6 September, well before the fall bowhead whaling which typically begins late September or early October. All of the proposed geophysical activities will occur offshore between 71º and 84ºN latitude well north of Beaufort Sea whaling activities.

USGS continues to work with the people of Barrow to identify and avoid areas of potential conflict.

- The USGS initiated contact with NSB scientists and the chair of the AEWC in mid-December 2010 via an emailed description of the proposed survey that included components intended to minimize potential subsistence conflict.
- Invitations were extended on 31 December 2009 to members of the NSB, AEWC and North Slope Communities to attend a teleconference arranged for 11 January 2010. The teleconference served as a venue to promote understanding of the project and discuss shareholder concerns. Participants in the teleconference included Harry Brower, chair of the AEWC, and NSB wildlife biologist Dr. Robert Suydam.
- To further promote cooperation between the project researchers and the community, Dr. Deborah Hutchinson with USGS presented the proposed survey at a meeting of the AEWC in Barrow on 11 February 2010. Survey plans were explained to local hunters and whaling captains, including NSB Department of Wildlife Management biologists, Craig George and Robert Suydam. Dr. Hutchinson consulted with stakeholders about their concerns and discussed the aspects of the survey designed to mitigate impacts.
- Dr. Deborah Hutchinson of the USGS emailed a summary of the topics discussed during the teleconference and the AEWC meeting in Barrow to representatives of the NSB, AEWC and North Slope communities. These included:
    - Surveying within U.S. waters is scheduled early (~7-12 August) to avoid conflict with hunters
    - The EA and IHA application will be distributed as early as possible to NSB and AEWC
    - A community observer will be present aboard the *Healy* during the project
    - Mitigation of the one crew transfer near Barrow in early September will be arranged – probably through Barrow Volunteer Search and Rescue
- Representatives of the USGS attended the Arctic Open-water Meeting in Anchorage, 22-24 March.

- Dr. Deborah Hutchinson presented information regarding the proposed survey to the general assembly
- Dr.s Jonathan Childs and Deborah Hutchinson met with stakeholders and agency representatives while at the meeting

Subsequent meetings with whaling captains, other community representatives, the AEWC, NSB, and any other parties to the plan will be held if necessary to coordinate the planned seismic survey operation with subsistence hunting activity. The USGS has informed the chairman of the Alaska Eskimo Whaling Committee (AEWC), Harry Brower, Jr., of its survey plan.

In the unlikely event that subsistence hunting or fishing is occurring within 5 km (3 mi) of the project vessel tracklines, or where potential impacts could occur, the airgun operations will be suspended until the vessel is >5 km away and otherwise not interfering with subsistence activities.

V. Polar Bear Interaction Strategy

The objectives of the polar bear interaction strategy are to avoid situations where polar bears will be encountered at less than 1 km, and to minimize disturbance to their natural habitat. This strategy contains four parts: (a) survey designs that minimize encounters; (b) protected resource observer actions; (c) protected resource observer actions in support of *Louis* operations; and (d) steps to follow when an encounter occurs. Because no scientists are expected to work on the ice, there should be no human-bear interactions. Further, *Healy* does not have a helicopter aboard, so this interaction strategy does not include actions for hazing or moving polar bears on the ice.

Survey Designs that Minimize Encounters

- All of the proposed track lines are in water depths or greater than 1900 m, i.e., well beyond the continental margin and shallow-water habitats of the continental shelf where polar bear prefer to live (Stirling and Oritsland, 1995).
- The long, linear proposed tracks mean *Healy* (and *Louis)* will not be in any one area for an extended period of time. Therefore, any encounters with and presumed impacts on bears will be local and of short duration.
- Every attempt will be made to follow existing leads while fulfilling the objectives and safe operations of the cruise, and simultaneously avoiding any sighted polar bears. Conducting the experiment in existing leads should minimize disturbance of sea-ice habitat.
- The speed of proposed profiling (2-4 knots, depending on how heavy the sea ice is) should allow sufficient time to visually identify polar bears at a distance and take appropriate actions.
- The Chief Scientist of *Healy* will brief the ship and science crew of this plan at the beginning of the experiment and post copies of the plan on the bridge, lounge, and actively-used laboratories.

Protected Resource Observer (PRO) Actions

- There will be three protected resource observers aboard *Healy,* with training and

background in biological research as required by NOAA/NMFS; and a fourth community observer with indigeneous/traditional knowledge, experienced in the Arctic landscape and a background in subsistence hunting.
- The PROs will record all polar bear observations using the attached polar bear observation form (Attachment C).
- A response strategy for when a polar bear is encountered will be followed, as outlined in the polar bear interaction notification diagram (Attachment D).

Protected Resource Observer Actions in Support of Louis *Operations*

- When *Louis* is in US waters, two *Healy* PROs will join the three *Louis* PROs to monitor and mitigate for marine mammals, including polar bears, from aboard *Louis*. The proposed safety zone within the US EEZ is 500 m.
- While the two icebreakers work in tandem in international or Canadian waters, *Healy* PROs will make observations in support of PROs aboard *Louis* who will be recommending actions to be taken for *Louis* seismic operations. The safety radius for Louis seismic operations and marine mammals will be 500 m – 1 km.
- A copy of portions of the 2009 Canadian Environmental Assessment relevant to marine mammals and polar bears is given at the end of this document.
- *Healy* PROs will be in regular communication with PROs aboard *Louis* regarding any polar bear sightings.
- A wireless network and radio communications between the two ships will facilitate regular and on-demand communications between the PROs on both vessels.

Steps to Follow when an Encounter Occurs

- For the sighting of a polar bear at a distance greater than 1 km, the PRO will record all relevant details about the sighting on the polar bear observation form (Attachment C).
- When *Louis* is operating in the US EEZ and a polar bear is sighted near the 500-m safety zone, the PROs aboard *Louis* will decide the appropriate course of action to be taken for the seismic operations (for example, shutting down the seismic operations or altering course). The PROs will also record all details of the incident on the polar bear observation form (Attachment C).
- When *Healy* is operating inside the US EEZ and a polar bear is sighted near the 500-m safety zone, the PROs aboard *Healy* will decide the appropriate course of action to be taken (for example, contacting Louis PROs). The PROs will also record all details of the incident on the polar bear observation form (Attachment C).
- When the two icebreakers are operating in tandem outside of the US EEZ and an incidental encounter with a polar bear occurs within 500 m of *Healy,* the PROs will immediately notify the PROs aboard *Louis* who will decide the appropriate course of action to be taken for the seismic operations (for example, shutting down the seismic operations or altering course). The PROs will also record all details of the incident on the polar bear observation form (Attachment C).
- If there are any lethal encounters with a polar bear as a result of *Healy* operations, the PROs will immediately notify the U.S. Fish and Wildlife Service (Craig Perham) as well as recording details, relevant witness statements, and other information. The entire carcass will be transported to shore (Barrow, AK). The U.S. Fish and Wildlife Service (Craig Perham) will decide disposal of the carcass.

U.S. Fish and Wildlife Contacts:
Primary: Craig Perham
Polar Bear and Incidental Take Coordinator
U.S. Fish and Wildlife Service
Marine Mammals Management
1011 E. Tudor Road
Anchorage, Alaska, 99503
907-786-3810
Craig.Perham@fws.gov

Alternate: Tom Evans
907-786-3814
Thomas_Evans@fws.gov

VI. 2009 *Louis* Marine Mammal Monitoring and Mitigation Strategy

This section gives relevant sections of the DFO environmental assessment with respect to polar bears or to marine mammals when polar bears are not specifically cites. The source of information is:

Hawkins, C.M., 2008, Canadian polar margin seismic reflection survey in waters offshore of the western Canadian Arctic Islands in support of the Law of the Sea, Environmental Assessment - 2009 Survey: Dartmouth, NS., Administrative Report prepared for D. Mosher, July, 2009, 122 pp.

3.3.7 Polar Bears

Taylor and Lee (1995) have discussed the distribution and abundance of Canadian Polar Bear Populations. For the Canadian Arctic they have determined that there are 12 discrete polar bear populations based on movements of marked and recaptured as well as killed bears (Figures 7,8). Two populations are important with respect to the CPMSRS-09, the southern Beaufort Sea and Northern Beaufort Sea populations. Based on their data, they have estimated that the density of southern Beaufort Sea polar bear population is in the order of 7 bears per 10,000 km^2 and for the northern Beaufort Sea population a density of about 6.5 bears per 10,000 km^2. Given that the total area to be surveyed in this study is about 350,000 km^2 there could be potentially 250 polar bears within the entire survey area.

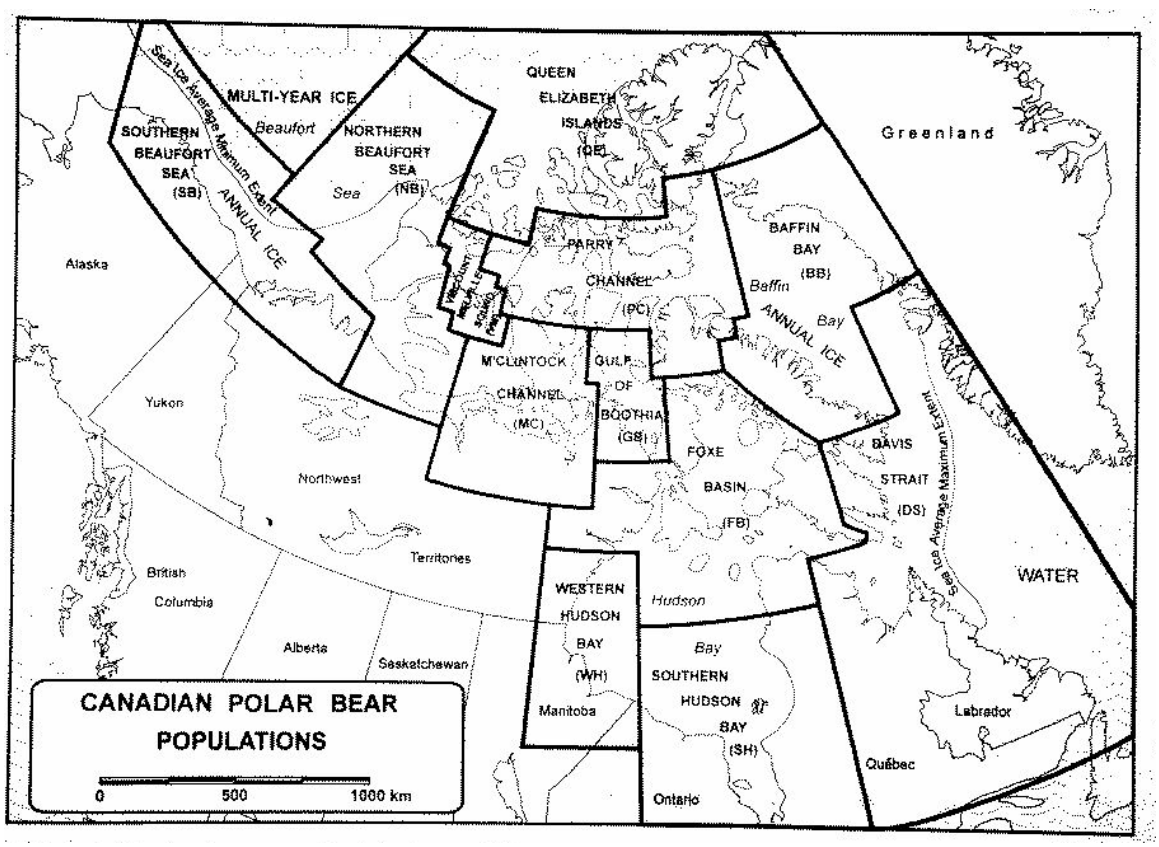

Figure 7. Polar Bear distribution in the Arctic, see text for discussion. (From Taylor and Lee 1995)

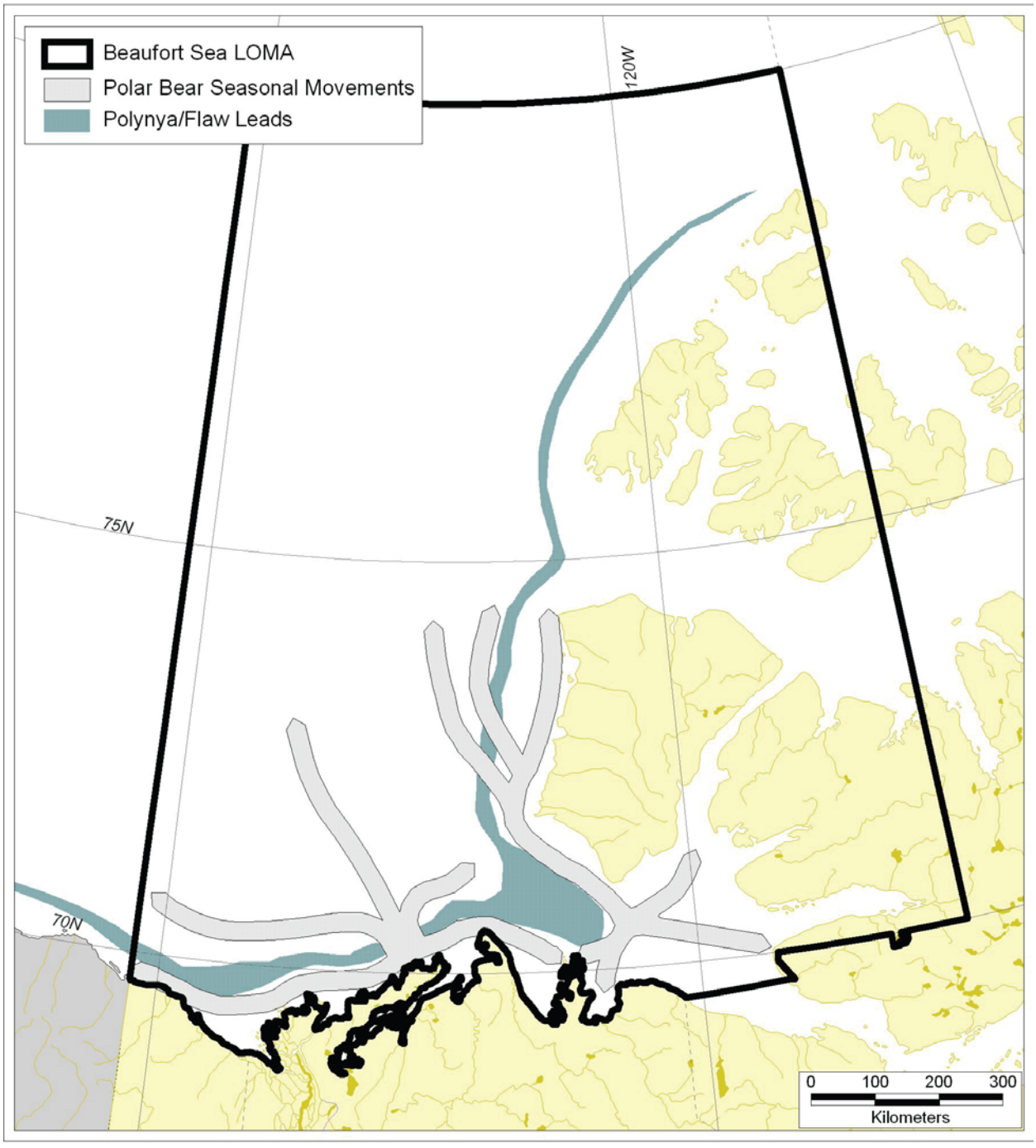

Figure 8. General pattern of seasonal polar bear movements in the Beaufort Sea (DFO 2007a).

4.4 Potential Impacts of Project ...

4.4.1 Marine Mammals

... With respect to polar bears, it is highly unlikely that the sub-sea sound produced will impact bears if they are encountered as the sound will be produced underwater.

8.0 Mitigation

...

All standard and industrially related mitigation measures pertaining to the use of seismic pneumatic energy source arrays for exploration will be adopted and followed by the CPMSRS-09. For the marine mammals, especially the whales, it has generally been accepted that a safety radius or zone of about 1000 m from the sound generating source be adopted to reduce received sound levels (LGL 2005, DFO 2007). This safety zone will be adopted for the CPMSRS-09. Note that this sound level of about 176_{rms} dB re 1 µPa at 500 m is about the same sound production level that is produced by cracking and breaking pack ice that is prevalent in this high Arctic environment (Greening and Zakarauskas 1984), and represents a background noise level. More mitigation measures with respect to potential marine mammal interaction with the project will be adopted. These include:

1. Alteration of vessel speed/course providing it will not compromise operational safety requirements.
2. Pneumatic energy sources will be shut down if any marine mammal enters or is anticipated to enter the 1000 m safety zone through observations by a trained marine mammal observer on the research vessel.
3. Pneumatic energy source start-up procedures will not commence unless a full 1000 m safety zone is clear of any marine mammal by visual inspection by a trained marine mammal observer for a continuous period of at least 30 minutes.
4. The pneumatic energy source array will be “powered down” during transit from one seismic line to another. All guns will be turned off except for one gun, which will function as a signal intended to alert marine mammals of the presence of a seismic vessel in the region.
5. Total shut down of all pneumatic energy source activity will occur and not resume until all marine mammals have cleared the 1000 m safety zone.

6 Pneumatic energy source start-up procedures will include a “ramping up” period. The rate of ramping up will be monitored so that it will not exceed more than 5 dB per 5 minute period.

7 The location of the CPMSRS-09 will not take place in the vicinity of any beluga harvest area or during the period of beluga harvest.

8 There will be 3 marine mammal observers on board the seismic research vessel. Note that there is about 24 hours of light in this region at the time of the proposed survey that will aid the observers.

With respect to polar bears, it is highly unlikely that the sub-sea sound produced will impact bears if they are encountered. If seen by a trained marine mammal observer within the 1000 m safety zone all of the above mitigation measures will be applied to ensure that no project interaction occurs.

…

Overall, by adopting all industrial mitigative standards as well as more stringent measures discussed above no anticipated measurable environmental impacts are predicted for the CPMSRS-09 project. .

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Attachment C: Polar Bear Observation Form

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. Tudor Road
Anchorage, Alaska 99503-6199

POLAR BEAR SIGHTING REPORT

Date: _____ Observer name: _____
Time: _____ Contact number/email: _____

Location: _____
_____
Latitude: _____ Longitude_____ Datum: _____

Weather conditions: Fog_____ Snow_____ Rain_____ Clear_____ Temperature_____F/C

Wind speed_____mph/kts Wind direction_____ Visibility: Poor
Fair
Good
Excellent_____

Number of bears:
_____ Adult M/F
_____ Sub-adult
_____ Unknown
_____ Sow/cub(s)
_____ Sow/yearling(s)
_____ Sow/2YO(s)

Estimated distance of bear(s) from personnel_____ (meters) and facility: ____ (meters)

Possible attractants present: _____

Bear behavior: Curious_____ Aggressive_____ Predatory_____ Passing through ____ Other____

Description of encounter: _____
_____
_____
_____

Duration of encounter: _____

Deterrents used/distance:
_____ Vehicle
_____ CrackerShell
_____ Rubber bullet
_____ Bean bag
_____ Horn/siren
_____ Spotlight/Headlight
_____Other
_____

Agency/Contacts:

USFWS_____ Time_____ Date_____
ADF&G_____ Time_____ Date_____
CLIENT_____ Time_____ Date_____

Attachment D: Polar Bear Interaction Notification Diagram