

**SUMMARY OF POLAR BEAR MANAGEMENT IN ALASKA  
2009/2010**

**Report to the Canadian Polar Bear Technical Committee  
Winnipeg, Manitoba, Canada  
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Photo by Terry D. DeBruyn

**Submitted by**

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## **Listing of Polar Bears as a Threatened Species under the Endangered Species Act**

### **Critical Habitat**

The polar bear was listed as a threatened species under the Endangered Species Act (ESA) on May 15, 2008. At that time, critical habitat was not designated. The U.S. Fish and Wildlife Service (Service) concluded that given the complexity of determining which specific areas in the United States might contain physical and biological features essential to the conservation of the polar bear under rapidly changing environmental conditions, we required additional time to conduct a thorough evaluation and coordinate with species experts.

The Service proposed designation of critical habitat for the polar bear on October 29, 2009, and provided opportunity for public comment (74 FR 56058). On May 5, 2010, the Service published notice (75 FR 24545) requesting comment on the Draft Economic Analysis for the proposed designation of critical habitat, and, in response to requests from the public, held two public hearings on the proposed designation, one in Barrow, Alaska, and one in Anchorage, Alaska. There were two 60-day public comment periods, the first ending on December 28, 2009, and the second, following the release of the Draft Economic Analysis ending on July 6, 2010.

The Service received approximately 111,690 comments from Federal agencies, Alaska Native Tribes and tribal organizations, Federal commissions, State and local governments, commercial and trade organizations, conservation organizations, non-governmental organizations and private citizens. The comments from the State of the Alaska, Alaska Native Corporations and industry requested a number of areas be excluded from designation, including: areas that contain oil and gas infrastructure, lease sale areas, and areas owned by Alaska Native corporations but not currently developed. We also received comments from environmental groups that while generally supportive of the proposed designation of critical habitat requested additional areas such as the entire coastal plain of the Arctic National Wildlife Refuge, all of potential denning habitat in Alaska, including the west coast of Alaska, and all sea ice habitat over the deeper waters beyond the continental shelf be included in the Final Designation. The final rule summarizes and addresses the comments received. Further, after carefully reviewing the information received from the public, we have determined that the exemption or exclusion of 5 U.S. Air Force Radar Sites, the Alaska Native communities of Barrow and Kaktovik, and all manmade structures and the land that they are on, is appropriate. This final rule therefore excludes or exempts, as appropriate, such areas from designation.

The ESA defines critical habitat as areas that contain habitat with physical and biological features that are essential to the conservation of a given species and that may require special management considerations and protections. Such requirements include but are not limited to:

- 1) Space for individual population growth and for normal behavior;
- 2) Food, water, air, light, minerals, and other nutritional or physiological requirements;
- 3) Cover or shelter;
- 4) Sites for breeding, reproduction, or rearing (or development) of offspring; and
- 5) Habitats that are protected from disturbance or are representative of the historical, geographical,

and ecological distributions of a species.

Taking into account these elements, the final rule for polar bear critical habitat contains three types of areas: barrier islands, sea ice, and terrestrial denning habitat. Barrier Island habitat includes coastal barrier islands and spits along Alaska's coast which are used for denning, refuge from human disturbances, access to maternal dens and feeding habitat, and travel along the coast. Polar bears are completely dependent upon the sea ice for their survival. The sea ice habitat which provides a platform to hunt and feed upon seals, areas to seek mates and breed, offshore denning areas, to make long-distance movements to access feeding areas and terrestrial denning sites, is located over the continental shelf and includes ice over water up to 300m (984 ft). Approximately 96% of all the area designated as critical habitat is sea ice habitat. The terrestrial denning habitat includes coastal denning areas, along the north coast of Alaska, from the Canadian border to Barrow.

The Final Rule designating polar bear critical habitat in the United States was published in the Federal Register on December 7, 2010 (75 FR 76086) and became effective on January 6, 2011. The total area designated was approximately 484,734 square kilometres (187,157 square miles). The critical habitat designation allows us to work with our federal partners to ensure their actions within its boundaries do not harm polar bear populations. Non-federal entities, including private landowners, will only be affected where the federal nexus exists that involves federal funding, permitting, or authorization. Thus, activities conducted by the landowner or operator of a business not involving federal funding, permitting, or authorization would not be affected. In addition, the designation of critical habitat under the ESA does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. It does not allow the government or the public to access private lands.

The critical habitat area overlaps with areas where oil and gas exploration, development, and production activities currently or are proposed to occur. Section 7 of the ESA requires federal agencies to ensure that activities that they authorize, fund, or carry out (federal nexus) are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a federal action may affect the polar bear or its critical habitat, the action or permitting agency consults with the Service. Consultation is the process which Federal agencies and the Service work to identify potential impacts on listed species and their habitats, and identify ways to implement these actions consistent with species conservation. This applies to oil and gas activities and other activities that may have an adverse effect on the polar bears and their critical habitat.

You can view the final rule, the final economic analysis, and detailed, colored maps of critical habitat areas at <http://alaska.fws.gov/fisheries/mmm/polarbear/criticalhabitat.htm>.

### **Conservation/Recovery Plan**

The Service listed polar bears as a threatened species under the ESA on May 14, 2008. The ESA and U. S. Marine Mammal Protection Act (MMPA) both require the Service to develop recovery (ESA) and conservation (MMPA) plans for a similar purpose: to identify and implement future conservation, management and research activities. In 2010 we began the process to develop a single plan that would

meet requirements set forth under both the ESA and MMPA. In addition, this effort will help us meet our obligations to the other polar bear Range States (Canada, Denmark, Norway, and Russia). To address the growing concern over polar bear conservation in relation to climate change and other stressors, the polar bear Range States agreed in March 2009 to develop national “action plans” by 2011 that will lead to a coordinated approach to conservation and management of polar bears throughout their range. Our initial objective, therefore, is to complete a draft Conservation/Recovery Plan Outline that will complement the action plans under development in the other Range States and result in a focused approach to the conservation of Alaska’s polar bears.

Ultimately, the Conservation/Recovery plan will lead to coordinated conservation strategies prioritized by the threats that polar bears face now and into the future. By ensuring that management strategies are threats-based, scientifically sound, and based on collaborative efforts with our partners, the Service will help ensure that it most effectively uses available resources for polar bear conservation.

On October 29, 2011, the Service held its first public workshop in Anchorage to introduce the Conservation/Recovery Planning process to our conservation partners. Representatives from the State of Alaska, Alaska Native organizations, other federal agencies, NGOs, and the oil and gas industry all attended this meeting and provided valuable feedback to the Service. Such input is extremely important as we move forward to collaboratively develop this plan.

The next public workshops will be held in January and February 2011 in Anchorage. The main objective of the January workshop is to develop site-specific management actions necessary to achieve the Plan’s goal for mitigating climate change impacts to polar bears. The main topic of the February 8<sup>th</sup> workshop will be human-caused removals and how to develop mitigation strategies to address future impacts to Alaska’s polar bears as a result of human-caused removals. For more information, please contact Jim Wilder at 1-800-362-5148 or e-mail james\_wilder@fws.gov.

## **International Treaties and Conventions**

### **U.S./Russia Bilateral Agreement**

On January 12, 2007, implementing legislation for the *Agreement between the United States of America and the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population* (US-Russia Agreement) was signed. The primary purposes of the Agreement are to improve polar bear conservation and to safeguard the cultural and traditional use of polar bears by Native peoples. Implementation of the US-Russia Agreement is overseen by a Joint Commission consisting of one Federal and one Native representative from each nation. The Commissioners are: Charlie Johnson, Executive Director, Alaska Nanuuq Commission; Geoff Haskett, Regional Director, U.S. Fish and Wildlife Service Region 7; Amirkhan Amirkhanov (Deputy Chairman, State Committee for Environmental Protection in Russia) and Sergey Kavry (Representative, Native People of Chukotka). The US-Russia Agreement includes all US villages south of and including Point Lay that harvest polar bears. Wainwright and Barrow will continue harvest management practices as established under the

Inupiat-Inuvialuit Agreement for the Southern Beaufort Sea (SBS) polar bear population. Under the US-Russia Agreement, the following progress was made in 2009/2010:

- In September 2009 the inaugural meeting of the Joint Commission was held in Moscow, Russia. The Joint Commission appointed a scientific working group with a co-chair and five members from each country. The Joint Commission tasked this scientific working group with a number of objectives with specific priority given to the task of identifying a sustainable harvest level for the Alaska Chukotka (Chukchi Sea) polar bear population.
- In response to this directive, the scientific working group held their first meeting in March 2010 in Anchorage, and provided the Joint Commission with a peer-reviewed report of their recommendations regarding harvest and future research needs. This included a recommendation that total harvest for the two countries not exceed 45 polar bears per year.
- In June 2010, after reviewing subsistence needs and the recommendations from the scientific working group, the Joint Commission decided to place an upper limit on harvest from the CS population of 19 female and 39 male (total harvest =58) polar bears per year. Harvest will be split evenly between Native hunters of Alaska and Chukotka. The Alaskan share of the harvest is 29 polar bears per year, which is lower than the average of 37 polar bears harvested each year between 2004 and 2008. The Commission agreed that implementation of a regulated harvest will occur when legislative and enforcement mechanisms are in place.
- The Alaska Nanuuq Commission (ANC) and the Service are working together to develop a system for implementing a regulated harvest in the Chukchi-Bering Seas region.
- The US-Russia Commission will meet again in 2011 to discuss draft harvest implementation plans for each country.

In 2011, the ANC and the Service are planning to visit the primary hunting communities that are party to the US-Russia Agreement to engage residents in discussions related to polar bear conservation, including implementation of the harvest limit. The harvest limit will not go into effect until input from villages has been received and a harvest management plan has been finalized (another 1–2 years). In the meantime Alaska hunters are to continue to report and tag harvested polar bears within 30 days with their local tagger.

### **Memorandum of Understanding for the Shared Polar Bear Population**

The U.S. and Canada share the Southern Beaufort Sea population of polar bears. On May 8, 2008, Secretary Kempthorne and John Baird, Minister of the Environment Canada, signed the *Memorandum of Understanding between Environment Canada and the United States Department of the Interior for the Conservation and Management of Shared Polar Bear Population* (MOU).

The purpose of the MOU is to facilitate and enhance coordination and cooperation regarding the conservation and management of polar bears and to provide a framework for the development and implementation of mutually agreeable actions that focus on specific components of polar bear conservation. The MOU establishes a Bilateral Oversight Group (BOG) comprised of Federal, State/Territorial, and Aboriginal representatives.

The BOG continues to look to the voluntary Inupiat/Inuvialuit Agreement (1988) to manage subsistence harvest of polar bears in the Southern Beaufort Sea and considers this existing system fully capable of addressing future, potentially significant issues, related to likely downward population trends and shifting population distributions. Also, both the U.S. and Canada recognize the range-wide issue of negative polar bear/human interactions and are working with other Polar Bear Range States under the 1973 Agreement on the Management and Conservation of Polar Bears to develop responsive management actions.

### **Harvest Summary**

The Alaska harvest of polar bears by Alaska Native subsistence hunters from June 2009 to July 2010 was 34 bears, 13 males, 15 females, and 6 sex unknown (Table 1). The harvest in 2009/2010 was the lowest statewide polar bear harvest since 1980/1981, the first harvest year for which we have reliable harvest information. The number of bears taken from the Southern Beaufort Sea population was 16 ( $\bar{x} = 33$  from 2000/2001–2009/2010) and 18 from the Chukchi/Bering seas population ( $\bar{x} = 37$  from 2000/2001–2009/2010). Current management allows for a 2M:1F sex ratio of the harvest and thus no more than 33% of the harvest should be female. The sex ratio of known-sex bears harvested in 2009/2010 was 44% female and 38% male. If the six bears, for which sex was unknown, were designated as females, as is customary in Canada, then the percentage of females in the 2009/2010 harvest would be 62%. The high proportion of females in the harvest during 2009/2010 was opposite the trend noted during the previous harvest year (2008/2009) when the harvest was highly skewed for males. Sex was reported for 82% (28/34) of the harvest in 2009/2010. The mean annual harvest from the Chukchi/Bering Sea population during the past 10 years ( $\bar{x} = 37$ , 2000/2001–2009/2010) is less than during the previous two decades ( $\bar{x} = 92$ , 1980/1981–1989/1990;  $\bar{x} = 49$ , 1990/1991–1999/2000). The same trend is evident in the Southern Beaufort Sea but to a lesser degree than the harvest from the Chukchi/Bering Seas population ( $\bar{x} = 39$ , 1980/1981–1989/1990;  $\bar{x} = 33$ , 1990/1991–1999/2000;  $\bar{x} = 29$ , 2000/2001–2009/2010).

During 2009/2010 polar bears were harvested in every month except for March and June (Table 2). Since 1980/1981 fewer bears have been harvested during the months of July to October from the Chukchi/Bering Seas population and from the Southern Beaufort Sea population during June, July, and August. Ages from the teeth collected from the 2005/2006 to 2009/2010 are summarized in Tables 3a, 3b, and 3c. In the past five years the percentage of adults (53%), subadults (29%) and cubs (18%) is close to the long-term average of 50%, 33%, and 17%, respectively (Table 4). The long-term age class distribution of the harvest from the Southern Beaufort Sea is 45% adults, 40% subadults, and 14% cubs and from the Chukchi/Bering Seas population 52% adults, 31% subadults, and 18% cubs. Overall, the mean ages of both males and females, based on 3-year intervals, have remained fairly consistent in both populations (Table 5, Table 6). Analysis of sex/age data can be confounded by hunter selectivity and year-to-year variation in the availability of age and sex classes. Small sample sizes prevented meaningful results from an analysis of the proportion of bears greater than or equal to 10 yrs of age in the Alaska harvest. This lack of meaningful results emphasizes the importance of achieving 100% compliance in submission of location, age, and sex information of harvest samples.

Premolar teeth were obtained from 29% (10/34) of harvested bears during 2009/2010. With implementation of the quota for the Chukchi/Bering Seas population (29 for the US and 29 for Russia) we hope to reach our desired goal of 100% compliance for collection of samples, including teeth. To date, implementation of the Marking Tagging and Reporting Program regulations in 1988 has been the most significant action that increased the sample of premolar teeth for aging. Since 1988, premolar teeth have been collected from 55% of harvested bears. Since 1988, 36% and 68% have been collected from the Southern Beaufort Sea and Chukchi/Bering seas populations, respectively. Collecting complete and accurate harvest information continues to be fundamental need for making informed management decisions and understanding population dynamics. The observed under-reporting is indicative of a continuing trend in Alaska and improvement is needed.

### **Polar Bear Management Agreement, Southern Beaufort Sea**

The 2009/2010 harvest for villages of the North Slope that are party to the North Slope Borough/Inuvialuit Game Council (NSB/IGC) or the Inuvialuit/Inupiat Management Agreement (I/I), was 16 polar bears: 3 males, 9 females, and 4 of unknown sex (Table 1). The sex composition of known-sex animals harvested in 2009/2010 was 25% (3/12) male and 75% (9/12) female. Bears were harvested in all months except for March, May, and November. During 2009/2010 teeth were collected from 25% (4/16) of the bears harvested and complete sex information was provided for 75% (12/16) of the harvest.

At its July 2010 meeting, the Inupiat/Inuvialuit Commission, in response to recommendations made by the technical advisors and consultation among representatives from Inuvialuit in Canada and Inupiat in Alaska, agreed to reduce the harvest quota for the Southern Beaufort Sea population from 80 to 70, to be split evenly between Canada and the United States. The Service supports the Commissioner's decision to reduce the harvest in recognition of a declining population trends due to climate change.

### **Summer Ecology Studies in the Southern Beaufort Sea**

In 2009 the University of Wyoming, with support from the USGS and the FWS, continued its study initiated in 2008 to investigate the physiological and ecological response of polar bears to longer ice-retreat seasons in the Beaufort Sea. The purpose of the study is to evaluate polar bear health (nutritional status) and also to determine what (if anything) the bears are eating during a time when access to the sea ice platform is limited.

In 2009, bear were captured on shore in August and then re-captured in October prior to sea ice formation. Additionally, in 2009 polar bear were captured on the sea ice during spring (as part of the long-term USGS study), and then re-captured in October on the sea ice. The purpose of both these capture efforts is to compare how bears using ice habitat during the open water period fare, compared to those that chose to use terrestrial habitat.

This study will provide information on the physiological and ecological mechanisms available to polar bears to withstand longer ice-free periods, and is expected to help scientists refine models that predict the future status of polar bears in relation to climatic warming. Data from this study are currently being analyzed by the University of Wyoming (contact Dr. Merav Ben-David, BenDavid@uwyo.edu).

### **Community-based Conservation at Barter Island**

Because of the high density of polar bears on Barter Island during the fall open water period, the Service has maintained an annual presence in the village of Kaktovik (located on Barter Island, within the Arctic National Wildlife Refuge) since 2001. In 2010, the Service's Marine Mammals Management Office and Arctic National Wildlife Refuge (NWR) staff continued efforts to support the community of Kaktovik in reducing human-bear conflicts, and to engage local residents in polar bear conservation issues. Results from our efforts are summarized below.

Polar bear monitoring: We continued with daily bear counts which have been conducted annually during the fall open water period since 2002. In 2010, we monitored polar bears during September 7–29, 2010. We observed a minimum, maximum, and average of 1, 18, and 10 bears respectively. All polar bears observed in 2010 appeared to be in good body condition; we observed no emaciated bears as we had in 2009. During whaling, no problems with bears were reported or observed, as had occurred in 2009 and previous years.

When compared to previous counts during the core monitoring period of September 7–26, polar bear numbers in 2010 were lower (Table 7). This may have been the result of ice being present over the Continental Shelf into August, providing bears a platform for resting and feeding. Nuiqsut whalers reported bear use of nearby ice off shore of Cross Island, noting that bears would rest on ice during day and visit Cross Island at night. Bear use of off-shore ice was also noted on an aerial survey flown by the Service on September 6, 2010.

Community outreach/education: We continued to provide assistance to the Native Village of Kaktovik (NVK) in their efforts to reduce human-bear conflicts in and around the village. The NVK had previously (2007) received a tribal grant to address this issue, and in 2008, began implementing the grant by hiring a coordinator and creating a local Kaktovik Polar Bear Committee. The Kaktovik Polar Bear Committee met several times to address the best way to minimize attractants, implement a polar bear deterrence program (polar bear patrols), address polar bear viewing, and identify education/outreach needs. The Service assisted efforts by engaging in multiple community education and outreach activities, such as sharing information at City and Borough meetings, conducting classroom visits, providing briefings on bear safety to tourists and tour operators, and assisting with training for patrols. Additionally, we facilitated efforts by the World Wildlife Fund to provide Kaktovik with six bear-resistant storage containers to test this season.

Tourism/viewing: Polar bear viewing is only permissible if no take (including harassment) occurs. In 2009, the Service started developing viewing guidelines for safe and legal conduct while viewing bears

on Arctic NWR lands and waters. The guidelines were reviewed by the Kaktovik Polar Bear Committee and implemented in September 2010. Additionally, in 2010 Arctic NWR implemented a permit requirement for commercially-led polar bear viewing on Arctic NWR lands and waters. To help Kaktovik residents interested in commercial polar bear viewing prepare for this, the Service partnered with Ilisagvik College, the State of Alaska, and Circumpolar Expeditions to host a guide training workshop in March 2010 in Kaktovik. The workshop included sessions on polar bear viewing (safe and legal conduct), review of the permit process and requirements for commercial polar bear guiding, boat operator licensing (U.S. Coast Guard requirements), and a session on “how to run a guide business”.

Guided polar bear viewing is also occurring on non-Refuge lands around Kaktovik; the Service continued coordinating with the NSB and the village of Kaktovik to ensure that viewing guidelines are consistent across the state, regardless of where the activity occurs. In 2010, the Kaktovik Polar Bear Committee created its own “field card” to guide visitor conduct in its community areas during polar bear viewing and fall whaling. Committee members also constructed a wooden barrier and placed it near the whale remains in an effort to minimize close encounters between viewers and bears. Additionally, the City of Kaktovik passed an ordinance requiring parties interested in commercial filming activities on City lands to obtain a commercial filming permit.

During our field work we observed several instances of guides and their clients viewing polar bears in a manner that avoided disturbance to bears, and was consistent with the viewing guidelines developed by both the Service and the Kaktovik Polar Bear Committee. However, we also observed instances where guided groups observed polar bears in a manner that resulted in bear harassment, e.g., guides and clients getting out of boats/vehicles, or rapid vehicular approaches that caused bears to flush. A summary report was prepared at the end of the field season and provided to community leaders and Kaktovik Polar Bear Committee members. In early January 2011, Service staff visited Kaktovik and discussed these issues with the Kaktovik Polar Bear Committee; Committee members offered their observations as well as recommendations for improving viewing practices in 2011. These recommendations include moving the barrier further from the whale remains, and adding signage directing people to stay in their vehicles/boats. The possibility of hiring a local “meet and greet” person to provide verbal guidance to all visitors was also discussed, as well as a “guide refresher” meeting prior to the onset of next season.

### **Polar Bear-Human Information Management System**

Polar bear managers can help conserve polar bear populations by reducing lethal take of polar bears during bear/human interactions. To prevent escalating conflicts between polar bears and humans, bear/human interaction plans need to be developed and implemented, based on relevant data. To implement sound management strategies for polar bears, and to adequately protect people living, recreating, and working in polar bear country, it is imperative that polar bear managers assemble critical information related to bear/human interactions.

During the March 2009 Polar Bear Range States Meeting in Tromso, Norway the Parties agree on the need to develop comprehensive strategies to manage bear/human conflicts. Tor Punsvik, Environmental

Advisor, Office of The Governor of Svalbard, Norway and Dr. Terry D. DeBruyn, Polar Bear Project Leader, Service, Alaska were tasked with taking the lead on developing a polar bear/human interaction initiative to address the anticipated future increase in interactions due to climate change.

Objectives of the polar bear/human interaction initiative are:

1. Develop a user-friendly, range state-wide database of bear-human interaction and natural history information.
2. Display those bear-human interaction and natural history information in a GIS format, and link it with a database which is designed to analyze the important variables associated with bear-human interactions.
3. Develop specific guidelines for managing polar-bear human interactions at both site-specific and regional scales.
4. Develop consistent and scientifically based bear-human interaction safety messages adaptable to specific sites via the development of bear-safety brochures for use by member range states.

The Polar Bear/Human Information Management System (PBHIMS) has been developed to standardize the collection of polar bear data across the Range States. This system enables a data-based assessment of bear/human interactions and provides a scientific framework for preventing negative bear/human interactions in the future. The system provides a user-friendly data entry interface and the ability to analyze collected data. Data stored in the system includes bear-human conflicts, bear observations, bear harvests, and bear natural history data. Scanned images of the original bear forms, narratives, reports, and photos can be attached to each incident to provide additional information that may not be captured in the system. Data are also entered into Google Earth for subsequent spatial analysis, and can be exported to ArcGIS.

It is anticipated that a draft database, populated with data from the U.S. and Norway, will be ready by April 2011 for testing and comment by the Polar Bear Specialist Group (PBSG).

This version of PBHIMS is compatible with Access 2003 (XP) and was developed by Terry D. DeBruyn (U.S. Fish and Wildlife Service), James Wilder (U.S. Fish and Wildlife Service), Angela Southwold (National Park Service), Tor Punsvik (Norway), and Dag Vongraven (Norway).

### **Fall Coastal Surveys in the Southern Beaufort Sea**

In 2009 and 2010, FWS continued monitoring polar bear use of the Beaufort Sea coastline using aerial survey methods. The primary purpose of this project is to determine the spatial and temporal distribution of polar bears along the coast between Barrow and the Canadian border during the late summer open water period. Results from 2009/2010 efforts are summarized below.

- In 2009, we conducted three aerial surveys between August 24 and October 7 and had to cancel a fourth survey due to weather. This year was the first year that a Robinson R44 Raven II helicopter was used, replacing the previously used fixed wing aircraft. The helicopter provided an excellent survey platform; the increased maneuverability made it easier to estimate sex and age class of observed bears, and to evaluate body condition using a standardized fatness index that will allow comparisons among years of observed polar bear body condition. Observers were also able to see paint-marked bears associated with the University of Wyoming study, which is important because it allows us to extrapolate the data (using mark-resight statistical methods) and determine the actual numbers of bears using the shore during the open water period, vs. simply reporting the number of bears observed during a given survey.
- In 2009, the highest number of bears (n=88) was observed on October 5–7, 2009; count includes dependent young.
- The body condition of most of the bears was good (fatness index = 3). Similar to 2008, few sub-adults and yearlings were seen compared to previous surveys.
- The highest concentrations of polar bears were observed at Cross and Barter Islands, two locations where subsistence-harvested bowhead whale remains are present.
- Data for 2010 are not fully analyzed yet. For more information please contact Eric Regehr at 907-786-3913 or e-mail [Eric\\_Regehr@fws.gov](mailto:Eric_Regehr@fws.gov).

### **Polar Bear Tracking Devices**

In 2009, the Service and the U.S. Geological Survey (USGS) began investigating the use of ear-mounted and glue-on satellite radio-telemetry tags as a means to track movements and habitat use by polar bears as an alternative to using collars. Ear tags provide the opportunity to gather movement data on sex-age classes other than adult females who are the only segment of the population in which radio collars can be deployed. They also provide an alternate to tracking female polar bears using collars which is important because collars have the potential to injure the necks of polar bears that gain large amounts of weight, e.g. while feeding on whale carcasses. Additionally, the use of radio ear tags in combination with radio collars is being investigated as a means for obtaining survival information on adult females. In 2010, the following efforts were taken:

- Ear mounted and glue-on tags were deployed on polar bears in both the Southern Beaufort Sea (by USGS) and in the Chukchi Sea population of polar bears (by the Service). To date, they showed promising results for the collection of short-term data (up to 3 months), but were not retained long enough to determine year-round movements or habitat use by polar bears. Evaluation of these new tags is ongoing.
- The width of collars deployed on polar bears in the Chukchi Sea was reduced, and for 2011, we are working to further develop a lighter collar of reduced thickness with material mounted on collar

edges that will reduce the risk of abrasion for bears that gain large amounts of weight in the fall. For more information please contact Eric Regehr at 907-786-3913 or e-mail Eric\_Regehr@fws.gov.

### **Polar Bear Research in the Chukchi Sea**

Information on the size, status, and movement patterns of the Chukchi/Bering Sea polar bear population are currently needed to guide management under the US-Russia Agreement, protect bears under the US Endangered Species Act, and to mitigate any potential effects of oil and gas development. Currently the size of the population is unknown and minimal information exists regarding reproduction, survival, and health trends of polar bears in this region.

To address this need, the Service began a project in 2008 to capture polar bears with the objectives of:

1. Identifying the best methodology to estimate vital rates (i.e., breeding and survival probabilities) and population size (i.e., genetics, physical capture-recapture, aerial survey),
2. Evaluating the condition and health of bears in the population as a short-term indicator of population response to changing sea ice conditions,
3. Gathering data on the distribution, movement patterns, and habitat use of polar bears in this region.

Preliminary results from field studies conducted in 2008–2010 are summarized below.

- In March-May 2010 we captured, measured, sampled, and released 69 polar bears, bringing the three-year total since the start of the study to 140 bears. Of these, 12 polar bears were previously captured in the Chukchi Sea, and 4 polar bears were previously captured in the Southern Beaufort Sea.
- To-date , no cubs of the year (<1 year old) have been observed which is believed to be a result of polar bears denning primarily on land in Russia and therefore being unavailable for capture off the US coastline in the spring. This is supported by our observation that of 10 collared females that denned in the winter of 2008/2009 and 2009/2010, 8 denned on Wrangel Island, one denned on Herald Island, and one denned on the pack ice over 400 miles northeast of Wrangel Island.
- Overall, captured polar bears appear to be in good nutritional condition and females appear to be successfully reproducing and rearing cubs. In 2010 a large number of yearlings were captured in comparison to 2008 and 2009 when only four and one yearling(s) were captured, respectively. Of 19 females captured, 12 (63%) were accompanied by yearlings 75% of which were accompanied by two or three yearlings in good condition (condition score of 3 or greater). Two females were accompanied by two-year-olds and only 5 females were observed alone or with mates. This suggests that many females denned in the winter of 2008/2009 and subsequently were successful at rearing their cubs through the first year of life.
- In 2010 we deployed 16 satellite radiocollars and 20 satellite eartag transmitters. Eartag transmitters provided locations on average for approximately 60 days, though several transmitted locations through September for subadult and adult males—sex/age classes that have not previously been monitored in this population. All collars included an automatic release device,

programmed to release the collar one year after deployment.

- Our observations during the 2008–2010 capture seasons suggest that the offshore area between Kotzebue and Point Hope is good breeding and feeding grounds for polar bears in the spring. Numerous seals were observed, including bearded seal pupping, during the field season. This is further supported by the apparent return of many of our collared bears to this region each spring and blood chemistry data that demonstrate active feeding by nearly all bears captured.

Measurements and samples collected between 2008 and 2010 are currently being analyzed to assess the feeding ecology of bears in this region, bear condition and health, habitat use and movement patterns, and sex/age class distribution (along with harvest data) as an initial assessment of the status of the population. In addition, we will be evaluating, using data collected to date, the best strategy for long-term monitoring of this population, including assessments of population size, trends, and vital rates. Due to the logistical challenges of studying this wide-ranging and dispersed population and the need to monitor annual variation in response to changing sea ice conditions, this project is expected to continue through 2013.

In addition to the US-based capture program, we are also partnering with the Russian colleagues to collect hair and potentially biopsy samples from polar bears on the Chukotkan coast and Wrangel Island (note: samples from Wrangel would include hair only) to augment and investigate a genetics-based capture-recapture program and to provide samples for a stable isotopes based diet analysis over a broader geographic sample from the population. Discussions are ongoing to initiate a Russian-based capture program.

### **Co-Management**

The Alaska Nanuuq Commission (ANC) was formed in 1994 to represent Alaska Native hunters on issues related to the conservation and subsistence uses of polar bears. The ANC consists of representatives from 15 villages from northern and western coastal Alaska. Annually, the Service provides funding and enters into a cooperative agreement with the ANC—a mutual scope of work is developed and progress is reported during annual meetings. The three primary scopes of work in 2010 were: 1) co-management operations (maintaining a co-management office, staff, meetings, travel, and other operational expenses); 2) represent Native interests in the U.S./ Russia Bilateral Agreement for the Conservation of Polar Bears in the Chukchi/Bering Seas; and 3) human-polar bear conflict avoidance.

In 2010, most of the Service and ANC efforts were focused around the U.S. / Russia Bilateral Agreement, as noted elsewhere in this report. Additionally, the following activities occurred:

- A new Deputy Director was hired to assist ANC in completing its scopes of work. In May, An Executive Committee meeting was held to discuss various aspects related to the U.S. / Russia Bilateral Agreement, and to review/approve internal organization and staff changes.
- The ANC's Deputy Director visited Kaktovik and Barrow to learn about ongoing monitoring, detection, and deterrence activities that are in place to reduce human-bear conflicts.

- In October/November 2010, The ANC's Deputy Director participated in a recovery planning meeting hosted by the Service, as well as a de-oiling workshop which included efforts to increase agency response capabilities for polar bears in event of an oil spill.
- The ANC annual meeting was held in December 2010 to discuss the aforementioned activities, and to seek guidance from Commission members on how to proceed on various actions.

Another important co-management action for reducing human-bear conflicts in coastal villages occurred in 2010 through development of a cooperative agreement between the Service and the North Slope Borough. The purpose of the agreement is to implement a Polar Bear Patrol Program in coastal communities under Borough jurisdiction. In the past, the Borough has effectively administered a polar bear patrol (detection, avoidance, deterrence, and monitoring) program, but recently has lacked sufficient funding to continue its efforts to the extent necessary. The 2010 agreement provides the Borough with funding to implement the program in five coastal communities through 2012.

### **Incidental and Intentional Take Program**

Section 101(A)(5) of the MMPA allows for the incidental, non-intentional take of small numbers of marine mammals during specific activities. The MMPA also allows for intentional take by harassment of marine mammals for deterrence purposes. The Service authorizes intentional take under Sections 101(a)(4)A, 109(h) and 112(c) of the MMPA. The Service administers an Incidental and Intentional Take Program that allows polar bear managers to work cooperatively with various stakeholders working in polar bear habitat to minimize impacts of their activities on polar bears. Stakeholders seeking take authorizations from the Service include the oil and gas industry, the mining industry, the military, local communities, and researchers.

The oil and gas industry is the largest stakeholder that actively seeks incidental take authorizations from Service for operations on the North Slope of Alaska. Incidental take by the oil and gas industry is authorized under two sets of incidental take regulations—one for the Beaufort Sea and one for the Chukchi Sea. The regulations extend for a five-year period and the current regulatory period for the Beaufort Sea region is 2006 to 2011, while the regulatory period for the Chukchi Sea region is 2008 to 2013. The five-year regulatory duration is to allow the Service (with public review) to periodically assess if the level of activity continues to have a negligible impact on polar bears and their availability for subsistence uses. Authority to incidentally take is provided to individuals through specific Letters of Authorization (LOAs). The Service evaluates LOA requests with special attention to mitigating impacts to polar bears, such as limiting industrial activities around barrier island habitat, which are important for polar bear denning, feeding, resting, and seasonal movements.

Applications for an LOA include:

- (1) A description of the activity, the dates and duration of the activity, the specific location, and the estimated area affected by that activity, i.e., a plan of operation;

- (2) A site-specific plan to monitor the effects of the activity on the behavior of polar bears that may be present during the ongoing activities (i.e., a marine mammal monitoring and mitigation plan);
- (3) A site-specific polar bear awareness and interaction plan. A polar bear interaction plan for each operation outlines the steps an applicant will take to limit human/bear interactions, increase site safety, and minimize impacts to bear; and
- (4) A Plan of Cooperation (POC) to mitigate potential conflicts between the proposed activity and subsistence hunting, where relevant.

The Service mitigates impacts and incorporates monitoring programs to measure effects to polar bears from human activities. Recipients of LOAs must use methods and conduct activities in a manner that minimizes adverse impacts on polar bears, their habitat, and on their availability for subsistence uses. Dynamic management approaches, such as temporal or spatial limitations in response to the presence of bears in a particular place or time, must be used to avoid or minimize interactions with polar bears and subsistence users of these resources. In addition, all bears observed must be reported.

In 2010, in the Beaufort Sea region, 17 Letters of Authorization for incidental take were issued to oil and gas companies under regulations for marine, terrestrial, and on-ice activities. Three LOAs were issued for production activities, seven were issued for development activities, and seven were issued for exploratory activities. Companies observed 118 polar bears in 84 sightings on land and in the nearshore marine environment. Bear sightings in 2010 decreased from previous years. For example, in 2009, 420 bears were observed in 245 sightings. Localized ice conditions may have contributed to the decrease in sightings during the summer and fall months. Historically, the highest number of bears is recorded in the fall season due to a combination of variables—an increased number of repeat sightings of individual bears because of their extended use of terrestrial habitat as a result of changes in sea ice habitat, and continued intensive compliance and monitoring of industry projects. During 2010, unconsolidated pack ice remained in the central Beaufort Sea region throughout the summer and fall seasons. This ice may have allowed bears to use this ice habitat as a hunting platform, where they remained rather than traversing to the nearshore and coastal areas.

Additionally, oil and gas activities continued in the Chukchi Sea region during 2010. The Service issued three LOAs for exploratory activities—seismic, monitoring, and shallow hazards surveys. These activities are conducted during the open water period, hence monitoring and mitigation measures are directed primarily towards walrus as few polar bears are observed in the Chukchi Sea at this time. Two polar bears were observed during a research and support project.

In 2010, the Service issued 17 intentional take authorizations to various organizations, including industrial companies, such as mining and oil companies; the military: the U.S. Air Force and the U.S. Coast Guard; and local communities. Recipients of intentional take authorizations are required to report all bear observations as well. Of the 118 bears observed in 2010, nine bears (8%) were deterred from facilities and people.

In 2010 the Service also announced final deterrence guidelines that may be safely used to deter a polar bear without seriously injuring or causing the death of the animal. The deterrence guidelines are voluntary and are intended to reduce occurrences of interactions between bears and humans in manners safe for both. They provide clear guidance for minimizing incidental encounters with polar bears, but will not change the legal status for any activities in Alaska.

In 2009, the Service received a petition from the oil and gas industry to develop incidental take regulations for the Beaufort Sea region for the period of 2011–2016. We expect new incidental take regulations to be promulgated in 2011. Through the incidental and intentional take program, the Service continues to work with all stakeholders to improve polar bear monitoring and mitigation procedures within and around the North Slope in order to limit disturbance and minimize take of polar bears and limit interference with subsistence uses. These include polar bear education and awareness programs, such as safety training and deterrence training; improving den detection programs; guidance with industry community plans of cooperation; and creating train-the-trainer curriculum for both polar bear deterrence and den detection surveys. In addition, we are currently developing a polar bear deterrence training manual. This manual will create Service deterrence training standards, as well as provide guidance for a train-the-trainer program.

Table 1. Native subsistence polar bear harvest in Alaska by village for 2009/2010 harvest season.

Village	Male	Female	Unknown	Total
Kaktovik*	1	4	-	5
Nuiqsut*	-	-	2	2
Barrow*	2	5	2	9
Atqasuk*	-	-	-	0
Wainwright*	-	-	-	0
Point Lay	-	-	-	0
Point Hope	4	-	1	5
Kivalina	-	-	-	0
Shishmaref	-	-	-	0
Wales	1	-	-	1
Little Diomede	1	3	-	4
Savoonga	4	1	1	6
Gambell	-	2	-	2
Total	13	15	6	34
Percent	(38.2)	(44.1)	(17.6)	(100)

\* Villages party to the NSB/IGC management agreement. Harvest season extends from July 1, 2009 to June 30, 2010.

Table 2. Monthly polar bear harvest, Alaska 2009/2010.

Village	Month												Total
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Kaktovik*	-	1	3	1	-	-	-	-	-	-	-	-	5
Nuiqsut*	-	-	2	-	-	-	-	-	-	-	-	-	2
Barrow*	1	1	-	-	-	1	2	1	-	2	1	-	9
Atqasuk*	-	-	-	-	-	-	-	-	-	-	-	-	0
Wainwright*	-	-	-	-	-	-	-	-	-	-	-	-	0
Point Lay	-	-	-	-	-	-	-	-	-	-	-	-	0
Point Hope	-	-	-	-	2	-	2	1	-	-	-	-	5
Kivalina	-	-	-	-	-	-	-	-	-	-	-	-	0
Shishmaref	-	-	-	-	-	-	-	-	-	-	-	-	0
Wales	-	-	-	-	-	-	-	1	-	-	-	-	1
Diomede	-	-	-	1	-	3	-	-	-	-	-	-	4
Savoonga	-	-	-	-	-	-	-	1	-	-	5	-	6
Gambell	-	-	-	-	-	-	-	-	-	-	2	-	2
Total	1	2	5	2	2	4	4	4	0	2	8	0	34
Percent	(2.9)	(5.9)	(14.7)	(5.9)	(5.9)	(11.8)	(11.8)	(11.8)	(0.0)	(5.9)	(23.5)	(0.0)	(100)

\*Villages party to the NSB/IGC management agreement. Harvest season extends from July 1, 2009, to June 30, 2010.

Table 3a. Mean age of polar bears harvested in Alaska, 2005–2010. Ages based on cementum annuli of the first premolar. N = Number of bears analyzed. M = Mean age. SD = Standard Deviation.

Sex	2005/2006 <sup>a</sup>			2006/2007 <sup>a</sup>			2007/2008 <sup>ab</sup>			2008/2009 <sup>ab</sup>			2009/2010 <sup>a</sup>		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Male	(26)	6.8	5.6	(23)	8.0	5.9	(5)	10.6	5.6	(10)	6.2	4.6	(5)	3.2	1.8
Female	(14)	9.4	5.7	(12)	5.7	4.9	(4)	4.0	2.0	(2)	9.5	10.6	(5)	6.4	6.7
Unknown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<sup>a</sup> Harvest season extends from July 1 to June 30.

Table 3b. Mean age of polar bears harvested in the Southern Beaufort Sea, Alaska, 2005–2010. Ages based on cementum annuli of the first premolar. N = Number of bears analyzed. M = Mean age. SD = Standard Deviation.

Sex	2005/2006 <sup>a</sup>			2006/2007 <sup>a</sup>			2007/2008 <sup>a</sup>			2008/2009 <sup>a</sup>			2009/2010 <sup>a</sup>		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Male	(7)	1.9	1.6	(2)	4.5	0.7	(3)	11.6	4.7	(6)	5.3	4.6	(1)	1.0	-
Female	(4)	12.5	5.1	(1)	3.0	-	(1)	3.0	-	-	-	-	(3)	4.0	4.4
Unknown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<sup>a</sup> Harvest season extends from July 1 to June 30.

Table 3c. Mean age of polar bears harvested in the Chukchi/Bering Seas, Alaska, 2005–2010. Ages based on cementum annuli of the first premolar. N = Number of bears analyzed. M = Mean age. SD = Standard Deviation.

Sex	2005/2006 <sup>a</sup>			2006/2007 <sup>a</sup>			2007/2008 <sup>a</sup>			2008/2009 <sup>a</sup>			2009/2010 <sup>a</sup>		
	N	M	SD	N	M	SD									
Male	(19)	8.6	6.3	(21)	8.3	6.0	(2)	9.0	8.5	(4)	7.5	5.0	(4)	3.75	1.5
Female	(10)	8.1	5.9	(11)	5.9	5.0	(3)	4.3	2.3	(2)	9.5	10.6	(2)	10.0	9.9
Unknown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<sup>a</sup> Harvest season extends from July 1 to June 30.

Table 4. Age class of polar bears harvested from Alaska, 2005–2010. Ages based on cementum annuli of the first premolar. Two year old bears are considered sub-adults after April 30. ( ) = Percentage of known age bears by harvest year.

Age Class	2005/2006 <sup>a</sup>	2006/2007 <sup>a</sup>	2007/2008 <sup>a</sup>	2008/2009 <sup>a</sup>	2009/2010 <sup>a</sup>	Total
Adults (5+ yrs)	24(60)	18(51)	5(56)	6(50)	3(30)	56(53)
Sub-adults (2.3–5 yrs)	7(18)	9(26)	4(44)	6(50)	5(50)	31(29)
Cubs (0–2.3 yrs)	9(22)	8(23)	-	-	2(20)	19(18)
Unknown Age	49	36	26	23	24	158
Total	89	71	35	35	34	264

<sup>a</sup> Harvest season extends from July 1 to June 30.

Table 5. Mean ages of male and female polar bears in the Southern Beaufort Sea since 1980/81. The averages are calculated for all bears ( $\geq 1$  yrs) and for adult bears ( $\geq 5$  yrs). N = Number of known-age bears analyzed. M = Mean age. SD = Standard Deviation. Harvest season extends from July 1 to June 30.

Season	Females						Males					
	$\geq 1$ year			$\geq 5$ years			$\geq 1$ year			$\geq 5$ years		
	M	SD	N	M	SD	N	M	SD	N	M	SD	N
1980-1982	9.6	4.8	7	10.8	3.8	6	6.4	4.2	8	8.6	3.8	5
1982-1985	6.8	4.6	28	10.2	3.8	15	4.9	3.6	42	8.5	3.4	16
1985-1988	6.8	5.0	18	9.5	4.4	11	6.1	5.9	27	13.4	4.6	9
1988-1991	6.6	5.0	8	9.8	5.6	4	7.2	5.9	43	10.9	5.5	24
1991-1994	7.8	6.2	17	11.8	4.9	10	7.2	7.1	34	12.9	6.7	16
1994-1997	7.4	8.6	16	15.2	10.3	6	7.5	6.6	26	11.3	6.5	15
1997-2000	5.4	4.2	7	11.0	4.2	2	6.8	4.5	21	9.4	4.4	12
2000-2003	5.4	3.1	10	8.5	2.6	4	6.6	5.5	23	10.1	5.5	12
2003-2006	7.1	5.4	19	11.3	5.5	9	4.6	6.3	13	11.0	9.6	3
2006-2008	3.0	0.0	2	-	-	-	6.9	5.0	11	10.1	4.5	6

Table 6. Mean ages of male and female polar bears in the Chukchi/Bering since 1980/81. The averages are calculated for all bears ( $\geq 1$  yrs) and for adult bears ( $\geq 5$  yrs). N = Number of known-age bears analyzed. M = Mean age. SD = Standard Deviation. Harvest season extends from July 1 to June 30.

Season	Females						Males					
	$\geq 1$ year			$\geq 5$ years			$\geq 1$ year			$\geq 5$ years		
	M	SD	N	M	SD	N	M	SD	N	M	SD	N
1980-1982	6.8	4.6	43	10.2	4.8	33	5.1	4.0	63	8.6	3.9	27
1982-1985	6.4	4.5	88	9.7	3.4	48	5.9	4.7	181	10.2	4.4	79
1985-1988	6.3	4.8	84	9.8	4.4	42	6.1	4.9	126	9.9	4.6	61
1988-1991	9.4	6.8	50	12.1	6.2	36	7.3	6.4	114	11.6	6.1	60
1991-1994	8.3	5.7	48	12.0	4.5	29	9.8	7.6	65	14.3	6.4	40
1994-1997	7.5	6.5	27	12.8	5.4	13	6.9	6.2	56	12.2	6.0	25
1997-2000	6.8	5.2	42	9.1	5.2	27	6.5	5.4	66	10.4	6.0	30
2000-2003	8.5	7.0	28	12.6	6.1	17	7.8	5.6	64	11.2	5.0	37
2003-2006	7.6	5.4	21	12.0	3.7	11	8.0	4.1	41	10.7	5.6	28
2006-2009	6.1	5.3	16	11.1	3.9	7	8.3	5.8	27	11.8	5.0	16

Table 7. Minimum, maximum, and average (mean) numbers of polar bears observed during polar bear monitoring at Barter Island, Alaska, 2002–2010. # Count Days = number of days that weather conditions permitted a full count of the study area during the specified monitoring period. SD = Standard Deviation.

<b>Whole Island Count Summary for Barter Island, Core Monitoring Period</b>									
<b>September 7-26, 2002-2010</b>									
	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
# Count Days	17	18	18	19	17	20	20	19	20
Minimum	3	23	22	6	0	18	12	11	4
Maximum	51	61	65	36	25	37	29	35	18
Mean	26.24	38.72	41.33	18.63	11.71	28.2	22.55	22.63	10.4
SD	15.18	10.39	11.28	7.36	7.89	5.96	4.5	8.69	3.47
<b>Whole Island Count Summary for Barter Island, Entire Monitoring Period</b>									
<b>2002-2010</b>									
	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
# Count Days	22	33	26	28	22	22	31	30	23
Minimum	0	3	22	0	0	18	12	1	1
Maximum	51	61	65	36	31	37	33	35	18
Mean	22.77	33.58	40.88	13.18	13.27	28	23.07	16.83	9.78
SD	17.71	14.32	9.88	10.17	8.81	8.26	4.83	10.71	3.86
Monitoring Dates	9/3 to 9/29	8/29 to 10/3	9/7 to 10/4	8/29 to 9/26	9/6 to 10/2	9/6 to 9/27	9/3 to 10/4	8/20 to 9/28	9/7 to 9/29