

**SUMMARY OF POLAR BEAR MANAGEMENT IN ALASKA  
2008/2009**

**Report to the Canadian Polar Bear Technical Committee  
Ottawa, Ontario, Canada  
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**Submitted by**

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## **U.S. Proposal to Transfer from Appendix II to Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) the Polar Bear.**

The 15<sup>th</sup> Meeting of the Conference of the Parties (COP15) to CITES will be held in Qatar from March 13 – 25, 2009; the U.S. submitted a proposal for consideration at COP15 to up-list polar bears from Appendix II to Appendix I of the CITES. Under CITES, a species may be considered to be threatened with extinction and meet the biological criteria for inclusion in Appendix I, if it can be shown to be experiencing a decrease in area of habitat or a decrease in quality of habitat. Polar bear habitat is both decreasing in area and quality. The decrease in polar bear habitat exacerbates all other potential threats, including but not limited to, utilization and trade, disease or predation, contaminants, ecotourism, and shipping. Based on the information available on polar bear habitat that indicate the current and projected effects of various factors, including climate change, on the quantity and distribution of polar bear habitat, the United States has determined that the polar bear meets the biological criteria for Appendix I. The U.S. considered comments on the proposal from Canada, as well as other Range States prior to submitting the proposal; the proposal would require a two-thirds majority of Parties present and voting at CoP15 in order to be adopted. A copy of the proposal may be obtained from the Service's webpage at: [http://www.fws.gov/international/DMA\\_DSA/CITES/CITES\\_US\\_Submissions\\_CoP15.html](http://www.fws.gov/international/DMA_DSA/CITES/CITES_US_Submissions_CoP15.html)

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

### **Critical Habitat**

The U.S. Fish and Wildlife Service (Service), proposes to designate critical habitat for polar bear (*Ursus maritimus*) populations in the United States under the Endangered Species Act of 1973 (ESA), as amended.

In total, approximately 484,764 square kilometers (km<sup>2</sup>) (187,166 square miles (mi<sup>2</sup>)) fall within the boundaries of the proposed critical habitat designation. The proposed critical habitat is located in Alaska and adjacent territorial and U.S. waters.

For inclusion in a critical habitat designation, habitat within the geographical area occupied by the species at the time it was listed must contain the physical and biological features essential to the conservation of the species. Critical habitat designations identify, to the extent known using the best scientific data available, habitat areas that provide essential life cycle needs of the species discussed below. Occupied habitat that contains the features essential to the conservation of the species meets the definition of critical habitat only if those features may require special management considerations or protection. Under the ESA, we can designate unoccupied areas as critical habitat only when we determine that the best available scientific data demonstrate that the designation of that area is essential to the conservation needs of the species.

Based on polar bear needs and our current knowledge of the life history, biology, and ecology of the species, we have determined that the critical habitat types necessary for the polar bear in the United States are:

### **Sea-ice Habitat**

Sea-ice habitat consists of approximately 464,424 km<sup>2</sup> (179,314mi<sup>2</sup>) of the sea-ice habitat ranging from the mean high tide line to the 300-m (984.2-ft) depth contour. Because we are limited by 50 CFR 424.12(h) to designating critical habitat only on lands and waters under U.S. jurisdiction, sea-ice habitat does not extend beyond the U.S. 370.7 nautical-km (200 nm) EEZ zone or the United States–Canada border to the east. To delineate the southern boundary, we used the southern extent of the Chukchi and Bering Seas population as determined by telemetry data (Garner *et al.* 1990, p. 223), since the 300-m (984.2-ft) depth contour extends beyond the southern extent of the polar bear population. The vast majority (93 percent) of Unit 1 is located within Federal waters.

Sea-ice habitat is required for feeding, breeding, denning, and movements that are essential for the conservation of polar bear populations in the United States. Special management considerations and protection may be needed to minimize the risk associated with oil and gas development and production, oil and gas tankers, and the risk associated with commercial shipping within this region and along the Northern Sea Route.

### **Terrestrial Denning Habitat**

Terrestrial denning habitat consists of an estimated 14,678 km<sup>2</sup> (5,668 mi<sup>2</sup>) of land, located along the northern coast of Alaska, with the appropriate denning macrohabitat and microhabitat characteristics (Durner *et al.* 2001). The area proposed as critical habitat contains approximately 95 percent of the known historical den sites from the southern Beaufort Sea population (Durner *et al.* 2009). The inland extent of denning distinctly varied between two longitudinal zones, with 95 percent of the polar bear dens between the Kavik River and the Canadian border occurring within 32 km (20 mi) of the mainland coast, and 95 percent of the dens between the Kavik River and Barrow occurring within 8 km (5 mi) of the mainland coast. We did not identify critical terrestrial denning habitat for the Chukchi and Bering Seas population because most of the denning for this population occurs on Wrangel Island and Chukotka Peninsula, Russia.

Twenty percent, 74 percent, and 6 percent of terrestrial denning habitat is located within State of Alaska land, Federal lands, and Native owned lands, respectively. In addition, 52.4 percent of the land included within terrestrial denning habitat occurs within the boundaries of Arctic National Wildlife Refuge.

Terrestrial denning habitat contains the necessary topographic and macrohabitat and microhabitat features essential for the conservation of polar bears in the United States. Special management considerations and protection may be needed to minimize the risk of human disturbances and risk associated with oil and gas development and production, and the risk associated with commercial shipping.

### **Barrier Island Habitat**

Barrier island habitat consists of an estimated 10,588 km<sup>2</sup> (4,089 mi<sup>2</sup>) and includes the barrier islands themselves and associated spits, and the water, ice, and terrestrial habitat, where present, within 1.6 km (1 mi) of the islands. Sixty-four percent of barrier island habitat is located within State of Alaska waters. The remaining 36 percent is within Federal waters. The area within Federal jurisdiction is comprised of 28.0 percent, 21.3 percent, 4.0 percent, and 46.7 percent of the offshore marine waters included within

the boundaries of Arctic National Wildlife Refuge, Alaska Maritime National Wildlife Refuge, Selawik National Wildlife Refuge, and Yukon Delta National Wildlife Refuge, respectively.

Barrier island habitat is essential for the conservation of polar bear populations in the United States. Special management considerations and protection may be needed to minimize the risk of human disturbances, shipping, and crude oil spills associated with oil and gas development and production, oil and gas tankers, and other marine vessels

You can view detailed, colored maps of areas proposed as critical habitat in this proposed rule at <http://alaska.fws.gov/fisheries/mmm/polarbear/criticalhabitat.htm>. You can obtain hard copies of maps by contacting: Thomas J. Evans, Marine Mammals Management Office, U.S. Fish and Wildlife Service, 1011 East Tudor Road, Anchorage, AK 99503; telephone 907.786.3800; facsimile 907.786.3816. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800.877.8339.

## **International Treaties and Conventions**

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

The inaugural meeting of the U.S./Russia Polar Bear Commission established under the *Agreement between the United States of America and the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population* was held in September 2009 in Moscow, Russia.

The Commission is composed of four official members. Representatives from the United States are Geoff Haskett, Regional Director of the U.S. Fish and Wildlife Service Alaska Region and Charlie Johnson, Executive Director of the Alaska Nanuuq Commission. Russian representatives include Amirkhan Amirkhanov, Deputy Director of the Department of State Policy and Regulations in the Field of Environment Protection and Ecological Safety within the Ministry of Natural Resources and Environment, and Sergey Kavry, a representative of the Chukotka aboriginal people. The meeting was attended by an additional 23 individuals within the two country's delegations.

At their inaugural meeting, the Commission appointed a scientific working group with a co-chair and 5 members from each country. The Commission tasked this scientific working group with a number of objectives, but specifically identified the top priority as identifying a sustainable harvest level for the Alaska/Chukotka population. The scientific working group is scheduled to hold their first meeting March 1–5, 2010 in Anchorage, Alaska. A report from the working group is due to the Commission 30 days prior to their next meeting which is scheduled to be held in early June 2010 in Anchorage, Alaska.

The Commission decided at their Moscow meeting to await a recommendation from the scientific working group before suggesting any changes to current harvest management regimes in the two countries.

### **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.

On August 6, 2009, the inaugural teleconference for the MOU was held. Discussion amongst participants included the need for updates and future dialogue on: 1) status of on-going research in the two countries; 2) individual protections afforded polar bears under respective domestic laws as well as the Convention on International Trade of Endangered Species of Wild Fauna and Flora; 3) incorporating Traditional Ecological Knowledge into management actions; and 4) outreach and education.

On November 19–20, 2009, the BOG met in Inuvik, Canada, where discussion focused on a need to leverage rather than duplicate existing polar bear coordination and management efforts between agency and aboriginal people of both countries. For example, subsistence harvest of polar bears in the Southern Beaufort Sea is managed under the voluntary Inupiat/Inuvialuit Agreement (1988), with sustainable harvest guidelines providing for the take of polar bears split evenly between Canada and the U.S. The BOG considered this existing system fully capable of addressing future, potentially significant issues, related to likely downward population trends and shifting population distributions.

Another subject of discussion and joint concern is the need to develop strategies to address increased human/bear interactions resulting from changes in polar bear distribution. Both the U.S. and Canada recognize this as a range-wide issue 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 total Alaska harvest of polar bears by Alaska Native subsistence hunters from June 2008 to July 2009 was 36 bears comprised of 23 males, 4 females, and 9 sex unknown (Table 1). The harvest in 2009 was the second lowest harvest recorded and only exceeded the 2008 harvest by two bears. The number of bears taken from the Southern Beaufort Sea population was 25 ( $\bar{x} = 31$  from 2000/2001-2008/2009) and 11 from the Chukchi/Bering seas population ( $\bar{x} = 31$  from 2000/2001-2008/2009). The current management regime 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 during 2008/2009 was highly skewed toward males with 85% male and 15% female. If the nine bears, for which sex was unknown, were designated as females, as is customary in Canada, then the percentage of females in the 2008/2009 harvest would be 36%. Sex was reported for 75% (27/36) of the harvest in 2008/2009. The harvest from the Chukchi/Bering Sea population continues to decline (2000/2008,  $\bar{x} = 39.0$ , SE = 7.1, n = 9). The

2009 Chukchi Sea harvest was the lowest recorded since 1980/1981, the first year for which we have reliable data. This year one bear was taken at the inland location of Noatak (60 miles from the coast).

Although not as marked the Chukchi Sea harvest, the harvest levels in the Alaskan Southern Beaufort Sea were lower than normal. The Southern Beaufort Sea harvest has remained relatively constant since 1980 at 35 bears per year (SD = 11.9, n = 29, range 14–62). In the past, the Southern Beaufort Sea harvest has been managed using Maximum Sustainable Yield (MSY) model developed by Taylor et al. (1987). One of the assumptions for calculating the sustainable harvest using this method is that the population is stable or increasing. Recent evidence including reduction in population estimates from 1800 to 1526 (Regehr et al. 2006), decreased survival of cubs, and decreased weights and skull measurements in adult males suggests that the Southern Beaufort Sea population may be declining and thus the MSY model may not be appropriate model to determine harvest levels. The declines in vital rates in the Southern Beaufort Sea were attributed to declines in Arctic sea ice (Regehr et al. 2007). The continued acceleration of the sea ice melt in 2009 suggests that it is likely that the survival rates for the Southern Beaufort Sea population are tending toward a reduced level. In addition, by definition there cannot be a sustainable harvest if a population is declining. The previously established MSY quota of 80–82 bears, which is split evenly between the United States and Canada, was based on a population of 1800. If the current population estimate of 1526 is used the MSY would be approximately 72 bears which, if split equally, would be 36 per country.

During 2007/2008 polar bears were harvested in every month of the year. Typically few bears have been harvested during the summer months June, July, and August (Table 2). Ages from the teeth collected from the 2007/2008 harvest (8/34) and the 2008/2009 harvest (19/36) have not yet been determined and thus the 2006/2007 harvest is the last year with updated data summarized in Tables 3a, 3b, 3c, and 4. Data from the coastal surveys and capture work by the USGS continue to indicate a decrease in the number of young bears, yearlings, and subadults that have been seen during the past three capture seasons. Overall, the mean ages of both males and females in both populations have remained fairly consistent (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  $\geq 10$  yrs of age in the Alaska harvest. This emphasizes the importance of achieving 100% compliance in submission of location, age, and sex information of harvest samples.

Premolar teeth were obtained from 36% (13/36) of harvested bears during 2007/2008. This was an increase from the 23% the previous year, but still far short of the desired goal of 100% compliance. 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 all bears harvested. Since 1988, 36% and 68% have been collected from the Southern Beaufort Sea and Chukchi/Bering seas populations, respectively. Collecting complete and accurate harvest age information continues to be fundamental need for making informed management decisions and understanding population dynamics. The under-reporting observed is part of a continuing trend occurring in Alaska and improvement is needed.

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

The 2008/2009 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 25 polar bears: 16 males, 1 female, and 8 of unknown sex (Table 1). June was the only month with no reported harvest. The sex composition known-sex animals harvested in 2008/2009 was 94% (16/17) male and 6% (1/17) female. Harvest year 2005/2006 was the last year in which sufficient samples of teeth were collected to be able to evaluate age-class composition of the harvest. During 2008/2009 teeth were collected from 28% (7/25) of the bears harvested and complete sex information was provided for 76% (19/25) of the harvest.

The impact of the effects of different harvest levels on a declining population was presented at the I/I meeting held in Barrow on the April 28–29, 2009 to assist in the I/I Commissioners in setting harvest quotas. We recommend that a reduction in the harvest, which is currently set at 80 bears split evenly between Canada and Alaska, be considered.

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

Information on the status and trends of the polar bear population that inhabits the Chukchi/Bering Seas (referred to as the “Chukchi population”) are urgently needed. Polar bears in the Chukchi population face a number of conservation challenges including potentially unsustainable levels of human-caused mortality, sea ice loss due to climate change, and future petroleum exploration. A newly formed Commission established under the U.S./Russia Bilateral Treaty for the Conservation and Management of Polar Bears will require the best available science to make management decisions. To address these information needs, the Service and the U.S. Geological Survey (USGS) initiated a study on polar bears in the Chukchi Sea in 2008. The objectives of this study are to identify the best methodology to estimate vital rates (i.e., breeding and survival probabilities), evaluate the condition and health of bears in the population, and to understand the distribution of polar bears and their response to environmental changes.

In March–May 2009, the Service continued this study in the Chukchi Sea. Our activities included capture, measurement, sampling, and release of 39 polar bears. Of these, two polar bears were previously captured in the Chukchi Sea in 2008, and one polar bear was previously captured in the southern Beaufort Sea in 2004. The sex and age class distribution of captured bears in 2009 was similar to that encountered in the 2008 field season. It included: 6 single adult females, 3 adult females with dependent young, 18 adult males, 3 subadult females, 5 subadult males, 3 two-year-olds, and 1 yearling. Similar to the 2008 capture season, no cubs of the year (<1 year old) were observed. Tracks that appeared to belong to an adult female and two cubs-of-the-year were observed on 30 April, approximately 60 miles west of the Red Dog port facility.

Overall, captured polar bears appeared to be in good nutritional condition. Average body weights were: 453 lbs for adult females, 955 lbs for adult males, 386 lbs for subadult females, 522 lbs for subadult males, 330 lbs for two-year-olds, and 181 lbs for yearlings. We captured three adult males that weighed over 1200 lbs. We deployed 10 satellite radiocollars on adult females. Radiocollars provide information

on the distribution, habitat use, and movement patterns of polar bears in the Chukchi Sea population. This information can be used to determine how bears may be responding to changing sea ice conditions and human activities. All collars included an automatic release device, programmed to release the collar one year after deployment. Our observations during the 2008 and 2009 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.

Results from 2008 and 2009 provide the initial data necessary to inform management of polar bears in the Chukchi Sea by the joint U.S./Russia Commission. The first two years of data also provide the initial capture history patterns (i.e., when and where individuals were observed over multiple years) necessary to design longer-term population studies. The Service expects to continue polar bear studies in the Chukchi Sea in 2010 and 2011. Polar bears are long-lived animals, occurring at low densities in a rapidly changing environment. Therefore multiple years of study are necessary to understand and monitor population status and account for variability among years.

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

In August 2008, the University of Wyoming initiated a study to investigate the physiological and ecological response of polar bears to longer ice-retreat seasons in the southern Beaufort Sea. This project was funded by the National Science Foundation and included the U.S. Geological Survey, the University of Wyoming, and the Service as collaborators. Similar to 2008, in 2009 polar bears were again captured onshore in the southern Beaufort Sea in August, and then recaptured in October prior to sea ice formation. Additionally, in 2009 the offshore component of the study was accomplished, in which polar bears were first captured on the sea ice during spring capture-recapture operations by the USGS. These bears were targeted for recapture in October on the offshore pack ice of the southern Beaufort and Chukchi Seas. To access the remote regions of the Arctic Ocean where these bears occurred, the project used two Bell 206 helicopters based on the U.S. Coast Guard icebreaker the Polar Sea. Of 8 polar bears fitted with radiocollars in the spring that were identified as high priority bears, 4 were successfully recaptured during the Polar Sea cruise. Additionally, 2 polar bears that had been previously fitted with radiocollars by the USGS were recaptured, and 3 new polar bears were recaptured opportunistically, for a total of 17 individuals (including dependent young). The partial success in recapturing high priority polar bears was due in large part to poor ice conditions. Summer Arctic sea ice extent in 2009 was the third lowest on record since satellite imagery became available. Additionally, air and water temperatures were abnormally warm, which resulted in slow ice formation and difficulty in finding sea ice that was sufficiently thick to safely capture polar bears. Indeed, all 8 high priority polar bears were sighted, some multiple times, but unsafe ice conditions repeatedly prevented capture. 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).

### **Polar Bear Conservation Activities at Barter Island**

In 2009 the Service's Marine Mammals Management Office and Arctic National Wildlife Refuge staff continued efforts to support the community of Kaktovik in addressing bear/human interactions, and engage local residents in polar bear conservation issues. A new focus in 2009 involved addressing the increase in polar bear tourism/viewing.

Minimizing bear/human conflicts: the Native Village of Kaktovik (NVK) continued with initiatives started in previous years under a Service tribal grant to minimize bear/human conflicts in and around the village. Polar bear patrols were again implemented by the community, as well as efforts to minimize attractants during whaling. Polar bear patrols were successful in hazing polar bears (and brown bears) out of the village area; however, four bears were shot in August/September when patrols were not operational, further demonstrating the importance of these patrols as a polar bear conservation tool. Collared and paint-marked bears continue to be of concern to local residents; in 2009 the Service and the USGS conducted meetings and distributed posters and fact sheets to hear concerns and improve communication with residents.

Monitoring polar bear numbers: In 2009, two residents assisted in monitoring polar bear numbers at Barter Island. Polar bears were first reported in town on August 10; most (4/5) were adult males. The official monitoring period was 20 August–28 September 2009; the minimum, maximum, and average number of bears observed was 11, 35, and 23, respectively (Table 7). We plan to continue our efforts in 2010.

Development of viewing guidelines: polar bear viewing guided by both local residents and outside companies is increasing. In 2009 the Service developed draft viewing guidelines for Arctic NWR lands and waters (surrounding Barter Island) and shared them with guides and community leaders, soliciting their input. Polar bear viewing is only permissible if no take (harassment) occurs; the guidelines provide suggestions on how to avoid disturbance to bears. Guided polar bear viewing is also occurring on non-Refuge lands; the Service is coordinating with other entities to encourage them to adopt similar viewing practices. In 2010, a permit will be required to conduct polar bear viewing on Refuge lands and waters. Planning is currently underway to conduct a 10–14 day workshop in Kaktovik for those residents interested in guiding to become compliant with Refuge permit and other federal and state requirements (e.g., first aid training, boat operator licensing, business licensing).

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

As a result of on-going and predicted future habitat loss, polar bears are expected to spend longer periods of time on land where they are susceptible to human disturbance. At the same time, human activity in coastal areas of the Arctic is increasing (e.g., oil and gas exploration, tourism) in conjunction with an increased number of nutritionally stressed bears occurring on land. The increasing trend of both polar bear and human use of coastal areas has the potential to result in increasing polar bear/human interactions. Interactions with humans may threaten polar bears by: 1) displacement from preferred habitats, such as denning, feeding and resting areas; 2) ingestion of or exposure to contaminants or toxic substances; 3) association of humans with food (food-conditioning) resulting in bears being killed by

local residents/workers due to safety concerns. For example, data indicate that defense-of-life kills have been increasing (Service unpublished data) in Alaska. To date, polar bear attacks on humans have been rare, but when they do occur they evoke strong public reaction.

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. Another benefit of this system is a dynamic link to Arc View which displays a visual map of the incidents. The link tool can be used to query incidents in Access or Arc View and then display the corresponding data in the other application.

It is anticipated that a draft database, populated with data from the U.S. and Norway, will be ready by

April 2010 for testing and comment by the Polar Bear Specialist Group (PBSG). The draft database will be distributed to PBSG members, comment sought, and a request made that members populate the database with pertinent polar bear/human incidents (of primary interest, initially, are records from each country that relate to the use of bear spray and fatalities [both bear and human] resulting from bear/human interactions). At a subsequent meeting of the U.S. and Norway in spring 2010, the database will be updated and thereafter redistributed to the PBSG and Range States members. It is expected that data from all Polar Bear Range States will then be available for consolidation and validation in winter 2010 and ready to present at the Range States meeting in 2011. To ensure the success of the project, partnering with various agencies and pertinent groups in the range state countries will need to occur.

This version of PBHIMS is compatible with Access 2003 (XP) and was developed by Terry D. DeBruyn (FWS), James Wilder (FWS), Angela Southwold (NPS), Tor Punsvik (Norway), and Dag Vongraven (Norway).

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

The Service continued aerial surveys of polar bears on the barrier islands and coastline of the Southern Beaufort Sea during the fall of 2009. As in previous years the surveys were conducted to determine the spatial and temporal distribution of polar bears using coastal habitat and barrier islands during the late summer open water period. The surveys are designed to occur during the period between summer sea ice break-up and the beginning of ice formation in autumn. Surveys were conducted between Barrow and the Canadian border at a flight altitude of 300 ft (91 m) and a speed of 80–100 knots (148-185 km/h). Surveys were conducted between August 24 and October 7, 2009 using a Robinson R44 Raven II helicopter with fixed floats. This was a change from the fixed-wing aircraft used in previous surveys. Although we had scheduled 4 bi-weekly coastal surveys, we completed only 3 surveys because bad weather grounded the aircraft. The R44 helicopter proved to be an excellent survey platform. The increased maneuverability made it easier to estimate sex and age class of observed bears, to evaluate body condition using a standardized fatness index, and to read numbers on bears that had been captured earlier in the summer by the U.S. Geological Survey. Of the 17 bears captured and marked by USGS and the University of Wyoming in August, we were able to see all of the bears at least once during the surveys. Re-sightings of marked polar bears allowed us to move beyond simple counts, and attempt to estimate the abundance of polar bears onshore during the ice-retreat season, using mark-resight methods. At times the ability to hover in the helicopter also allowed us to determine whether the bears retained the experimental glue-on and ear-mounted radiotelemetry tags that were applied by the USGS during onshore capture efforts. A maximum of 88 bears, including dependent young, were observed on October 5-17, 2009 between Barrow and the Canadian border. The body condition of most of the bears was good (i.e., subjective fatness index of 3) and, similar to 2008, few subadults and yearlings were seen compared to previous surveys. Once again the highest concentrations of polar bears were seen at Cross and Barter Islands; two locations where subsistence-harvested bowhead whale remains are present. Data from the 2009 coastal mark-resight survey are currently being analyzed.

### **New Radiotelemetry Tags**

Satellite radiotelemetry provides critical information on the movement, ecology, and population dynamics of polar bears. Historically, radiocollars provided the only viable method to obtain satellite relocations of polar bears. While radiocollars remain an important research tool for polar bear studies, they also face several limitations, including: they cannot be attached to male and growing polar bears in a safe and effective manner, the potential for rubbing or cutting around the neck for polar bears that gain large amounts of weight, and a negative perception among some members of the public. To address these concerns, the Service and USGS began a new collaboration in 2009 to evaluate non-radiocollar satellite telemetry tags on polar bears. This collaboration is funded in part by the Minerals Management Service.

In 2009, the Service provided the USGS with non-radiocollar radiotelemetry tags for deployment during August and October onshore capture-recapture studies in the southern Beaufort Sea. The USGS deployed 11 glue-on PTT tags (S216C), 2 glue-on GPS tags (MK10AFB), and 10 ear-mounted PTT tags (S227B) manufactured by Wildlife Computers. Mounting hardware for the ear tags was provided by Mikkel Villum. Preliminary results suggest that non-radiocollar tags are a viable option for providing short-term relocation data for polar bears, and may be suitable for some study designs, such as onshore capture-recapture studies during the ice-retreat season. Tag retention and performance data are currently being analyzed by the Service.

### **Co-Management**

The Alaska Nanuq Commission (ANC) was formed in 1994 to represent Alaska Native hunters concerning 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. Every year, the Service provides funding to and enters into a cooperative agreement with the ANC, and develops mutual scopes of work; progress is reported during annual meetings. The three primary scopes of work in 2009 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) polar bear/human conflict avoidance.

The last annual ANC meeting was held in Nome, Alaska on August 25–26, 2009. The meeting was also attended by the Association of Marine Mammal Hunters of Chukotka (CHAZTO), as well as the FWS. On-going research, management, and the Bilateral Treaty were discussed. The Commissioner from Kotzebue reported an unusually high amount of polar bear activity around his community in 2008/2009. Representatives from Chukotka presented information on their efforts to monitor polar bears at walrus haulouts near communities to prevent bear-human conflicts (Umky Patrol). Near Vankarem, Chukotka, a historic walrus haulout (~30,000 animals in 2009) occurs annually during fall and attracts polar bears that feed on walrus carcasses that become trampled during disturbance events induced by both humans and polar bears. The Umky Patrols educate and restrict visitors, and move walrus carcasses away from the village to minimize conflicts with bears. They reported up to 200 bears near the village in 2009.

The ANC and CHAZTO also developed research and management recommendations on behalf of the

Native people of Alaska and Chukotka for the Joint Commission of the Bilateral Treaty to consider during their upcoming meetings regarding conservation of polar bears in the Chukchi/Bering seas.

The ANC also continued work with the Indigenous People's Council for Marine Mammals (IPCoMM), which represents Alaska Native Organizations that are involved in the co-management of marine mammals in Alaska. The ANC and IPCoMM continue to pursue changes to the MMPA that will enhance self regulation of marine mammals.

### **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 for 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 FWS include the oil and gas industry, the mining industry, the military, local communities, and researchers.

The oil and gas industry operating on the North Slope of Alaska actively seeks incidental take authorizations from Service. Incidental take by the oil and gas industry is authorized under two sets of incidental take regulations. 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 LOAs 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.

In 2009, in the Beaufort Sea region, 21 Letters of Authorization were issued to oil and gas companies under incidental take regulations for marine, terrestrial, and on-ice activities between Barrow and Kaktovik. Companies observed 420 polar bears during 245 sightings. Similar to 2007 and 2008, the highest number of bears was recorded in the fall season: August, when 77 bear sightings occurred, and September with 51 bear sightings. Sightings of bears has increased from previous regulatory time periods 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.

Oil and gas activities continued in the Chukchi Sea region during 2009. The Service issued two LOAs for exploratory programs. The activities continue to be 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. No polar bear interactions were reported under the two LOAs.

In 2009, the Service issued fourteen intentional take authorizations to deter bears from various organizations, including oil companies, the military, and local communities. Of the 245 bear sightings reported, 63 sightings (25%) were deterrence events.

The Service has 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. The Service is in the initial stage of analyzing the petition. 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.

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Table 1. Native subsistence polar bear harvest in Alaska by village for 2008/2009 harvest season.

Village	Male	Female	Unknown	Total
Kaktovik*	2	-	2	4
Nuiqsut*	-	-	-	0
Barrow*	13	1	5	19
Atqasuk*	-	-	1	1
Wainwright*	1	-	-	1
Point Lay	-	-	-	0
Point Hope	2	1	1	4
Kivalina	-	-	-	0
Noatak	1	-	-	1
Shishmaref	-	-	-	0
Wales	-	-	-	0
Little Diomede	3	2	-	5
Savoonga	1	-	-	1
Gambell	-	-	-	0
Total	23	4	9	36
Percent	(63.9)	(11.1)	(25.0)	(100)

\* Villages party to the NSB/IGC management agreement. Harvest season extends from July 1, 2008 to June 30, 2009.

Table 2. Monthly polar bear harvest, Alaska 2008/2009.

Village	Month												Total
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Kaktovik*	-	-	-	-	2	-	-	-	1	1	-	-	4
Nuiqsut*	-	-	-	-	-	-	-	-	-	-	-	-	0
Barrow*	-	1	6	1	2	2	1	2	2	1	1	-	19
Atqasuk*	-	1	-	-	-	-	-	-	-	-	-	-	1
Wainwright* 1	-	-	-	-	-	-	-	-	-	-	-	-	1
Point Lay	-	-	-	-	-	-	-	-	-	-	-	-	0
Point Hope	-	-	-	-	-	-	1	1	-	1	-	1	4
Kivalina	-	-	-	-	-	-	-	-	-	-	-	-	0
Noatak	-	-	-	-	-	-	1	-	-	-	-	-	1
Shishmaref	-	-	-	-	-	-	-	-	-	-	-	-	0
Wales	-	-	-	-	-	-	-	-	-	-	-	-	0
Diomede	-	-	-	-	-	3	2	-	-	-	-	-	5
Savoonga	-	-	-	-	-	-	-	-	-	1	-	-	1
Gambell	-	-	-	-	-	-	-	-	-	-	-	-	0
Total	1	2	6	1	4	5	5	3	3	4	1	1	36
Percent	(2.8)	(5.5)	(16.7)	(2.8)	(11.1)	(13.9)	(13.9)	(8.3)	(8.3)	(11.1)	(2.8)	(2.8)	(100)

\*Villages party to the NSB/IGC management agreement. Harvest season extends from July 1, 2008, to June 30, 2009.

Table 3a. Mean age of polar bears harvested in Alaska, 2004-2009. Ages based on cementum annuli of the first premolar. N = Number of bears analyzed. M = Mean age. SD = Standard Deviation.

Sex	2004/2005 <sup>a</sup>			2005/2006 <sup>a</sup>			2006/2007 <sup>a</sup>			2007/2008 <sup>ab</sup>			2008/2009 <sup>ab</sup>		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Male	(16)	5.2	3.3	(26)	6.8	5.6	(19)	8.0	5.9	2	8.0	5.9	-	-	-
Female	(13)	7.4	4.7	(14)	9.4	5.7	(11)	5.0	4.6	1	2.0	-	-	-	-
Unknown	(1)	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-

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

<sup>b</sup> 28 teeth have been submitted but not yet aged

Table 3b. Mean age of polar bears harvested in the Southern Beaufort Sea, Alaska, 2004-2009. Ages based on cementum annuli of the first premolar. N = Number of bears analyzed. M = Mean age. SD = Standard Deviation.

Sex	2004/2005 <sup>a</sup>			2005/2006 <sup>a</sup>			2006/2007 <sup>a</sup>			2007/2008 <sup>a</sup>			2008/2009 <sup>a</sup>		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Male	(3)	3.3	3.1	(7)	1.9	1.6	(2)	4.5	0.7	(2)	12.0	7.1	-	-	-
Female	(6)	6.0	3.9	(4)	12.5	5.1	(1)	3.0	-	(1)	2.0	-	-	-	-
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, 2004-2009. Ages based on cementum annuli of the first premolar. N = Number of bears analyzed. M = Mean age. SD = Standard Deviation.

Sex	2004/2005 <sup>a</sup>			2005/2006 <sup>a</sup>			2006/2007 <sup>a</sup>			2007/2008 <sup>a</sup>			2008/2009 <sup>a</sup>		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Male	(13)	5.6	3.3	(19)	8.6	6.3	(17)	8.4	6.1	-	-	-	-	-	-
Female	(7)	8.6	5.2	(10)	8.1	5.9	(10)	5.2	4.8	-	-	-	-	-	-
Unknown	(1)	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Table 4. Age class of polar bears harvested from Alaska, 2004-2009. 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	2004/2005 <sup>a</sup>	2005/2006 <sup>a</sup>	2006/2007 <sup>a</sup>	2007/2008 <sup>ab</sup>	2008/2009 <sup>ab</sup>	Total
Adults (5+ yrs)	16(53)	24(60)	15(50)	2(67)	-	57(55)
Sub-adults (2.3-5 yrs)	10 (33)	7(18)	7(23)	1(33)	-	25(24)
Cubs (0-2.3 yrs)	4(13)	9(22)	8(27)	-	-	21(21)
Unknown Age	36	49	41	32	36	194
Total	66	89	71	35	36	297

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

<sup>b</sup> 28 teeth have been submitted but not yet aged

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	6.6	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	12.0	3.4	3	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 <sup>a</sup>	2.5	0.7	2	9.0	-	1	8.2	6.0	4	9.7	6.4	3

<sup>a</sup>28 teeth have been submitted but not yet aged

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	5.2	4.8	10	10.2	3.3	4	8.4	6.1	17	12.2	5.2	10

Table 7. Minimum, maximum and average number of polar bears observed at Barter Island, Alaska, 2002-2008.

<b>Whole Island Count Summary Entire Study Period*, 2002-2008</b>							
	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Minimum</b>	0	3	22	0	0	18	12
<b>Maximum</b>	51	61	65	36	31	37	33
<b>Mean</b>	22.77	33.58	40.88	13.18	13.27	28	23.06
<b>SD</b>	17.71	14.32	9.88	10.17	8.8	8.26	4.83
<b>*Study Period</b>	Sep. 3-29	Aug. 29-Oct. 3	Sep.7-Oct. 4	Aug.29-Sep. 26	Sep. 26-Oct. 2	Sep. 6-27	Sep.3-Oct. 4
<b>Whole Island Count Summary for Core Monitoring Period of September 7-26, 2002-2008</b>							
	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Minimum</b>	3	23	22	6	0	18	12
<b>Maximum</b>	51	61	65	36	25	37	29
<b>Mean</b>	26.24	38.72	41.33	18.63	11.71	28.2	22.55
<b>SD</b>	15.18	10.39	11.28	7.36	7.89	5.96	4.5