Polar Bear News

January 2009

The US Fish and Wildlife Service (FWS) is responsible for management of polar bears in the United States. The US Geological Survey, and non-governmental local and international partners, including the Alaska Nanuuq Commission, work in collaboration with the FWS to gather biological information necessary to ensure management decisions regarding polar bears are based on sound science and take into consideration subsistence, cultural, and economic issues. (Photo c/o Dan Cox- Natural Exposures).

Polar bear Management in Alaska

The US Fish and Wildlife Service (FWS) has primary management responsibility for polar bears in Alaska. The objective of the polar bear program is to ensure that polar bear populations in Alaska continue to be healthy, functioning components of the Bering, Chukchi, and Beaufort seas ecosystems. The FWS' conservation activity is largely mandated by the Marine Mammal Protection Act (MMPA) and more recently, by the Endangered Species Act (ESA). The U.S. is also a member of several international treaties that call for coordinated polar bear conservation.

An important part of polar bear conservation is co-management with Alaska Natives who live in polar bear habitat and harvest polar bears for subsistence purposes. The Alaska Nanuuq Commission is FWS' primary co-management partner and was formed in 1994 to represent villages in Northern and Northwestern Alaska on matters concerning the conservation and sustainable subistence use of polar bears.

Another important part of polar bear conservation is having reliable scientific information on which to base sound management. The FWS works in partnership with the US Geological Survey (USGS), the agency primarily responsible for conducting polar bear research in Alaska. For decades, USGS's Alaska Science Center has provided critical scientific information that has been used as a basis for management decisions.

Currently, 19 polar bear populations are recognized throughout the circumpolar Arctic (Fig. 1). Based on movement data and genetic analyses, Alaska's polar bears are divided into two stocks or populations: the southern Beaufort Sea (SB) stock, shared with Canada, and the Chukchi/Bering seas (CS) stock, shared with Russia (Fig. 2). The SB stock of polar bears is currently estimated at 1,500 bears and thought to be declining due to loss of sea ice. At present, we do not have a reliable population size estimate for the CS population of polar bears; loss of sea ice habitat and potential over-harvesting from a combination of legal hunting in Alaska and illegal hunting in Russia are the main issues of concern for this population.

The purpose of this newsletter is to provide current information regarding polar bear research and monitoring studies, and on-going management activities.

Fig. 1. Polar bears occur throughout the circumpolar Arctic and are recognized as 19 populations based on movement patterns, genetics, and ecology.

Polar bear research and monitoring in the Southern Beaufort Sea

Biology of polar bears in the Southern Beaufort Sea

The SB population extends from west of Wainwright, Alaska (approximately 160°W) to east of Paulatuk, Northwest Territories, Canada (approximately 125°W; Fig. 2). People once believed that polar bears roamed throughout the Arctic in a random fashion, but data from radio collars show that many bears are faithful to the SB region. In the eastern portion of the SB a fairly distinct boundary exists between the SB population and the neighboring northern Beaufort Sea population. In the west, the population boundary is less distinct, and many polar bears move between the SB and the Chukchi sea. Understanding where polar bears spend their time allows populations to be managed appropriately. For example, movement information tells us where polar bears feed and den, and allows harvested polar bears to be assigned to the correct population for

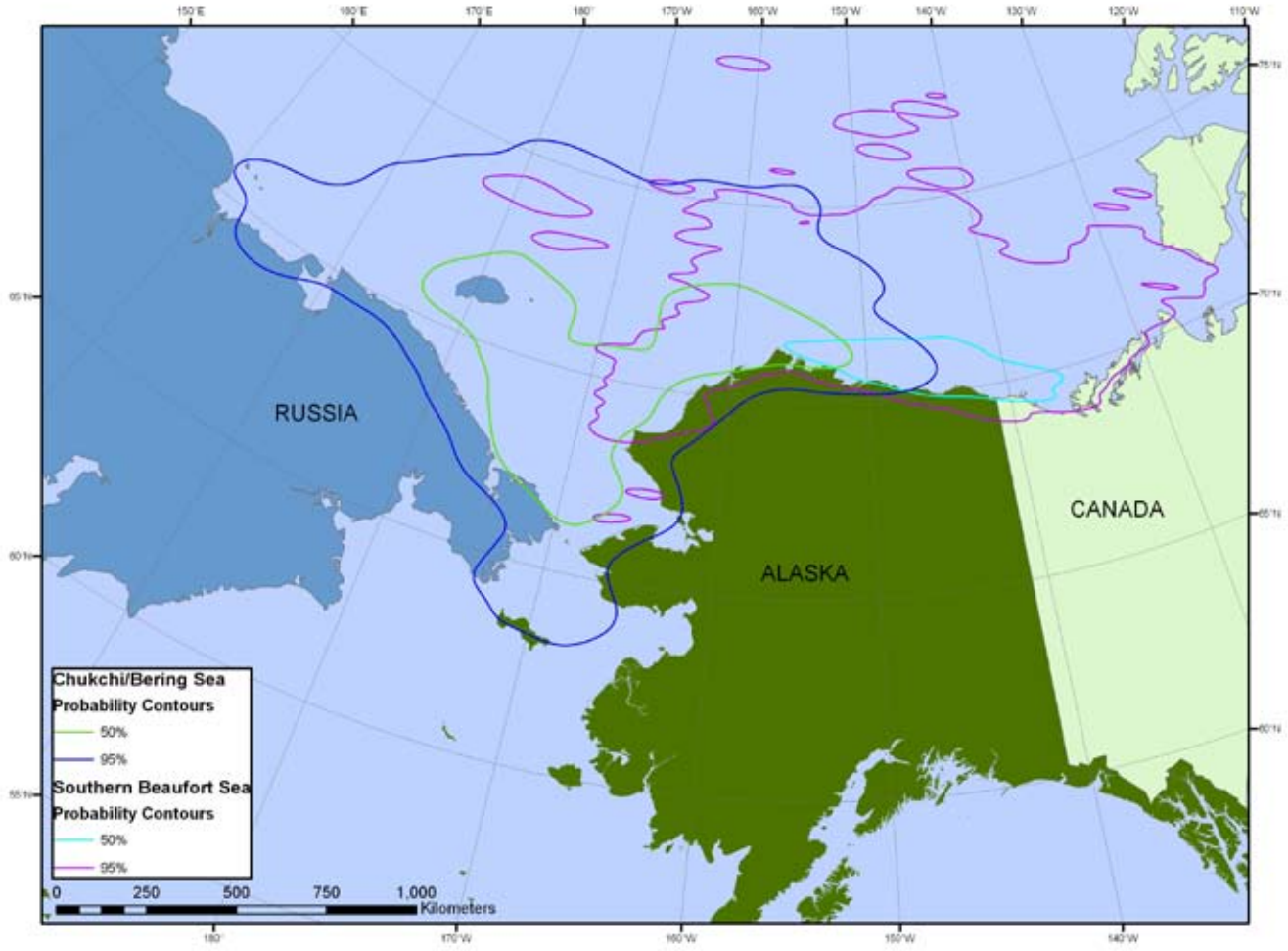


Fig. 2. The two polar bear stocks (or populations) managed by the USFWS: the Chukchi/Bering Sea stock and the Southern Beaufort Sea stock. This map shows where 50 and 95% of bear locations in each population occur.

Polar bears in the SB are born in snow dens at the beginning of the calendar year. The cubs, usually twins, emerge from the den in March or April, and remain with their mothers for the next two years. Females generally mate for the first time in the spring of their fifth year. Although males are capable of breeding by the age of four or five, competition for mates is fierce and most males probably don't breed until they are nearly full grown at the age of eight or ten. For polar bears, the first year of life is the most difficult; nearly half of the cubs die before the age of one. After that, their likelihood of survival increases. The average life expectancy of a polar bear in the SB is about 16 years, although some bears (usually females) live into their 30s.

Polar bears in the SB, and throughout their range, spend most of their lives on the sea ice and depend on it for access to their primary prey, ringed seals (*Phoca hispida*) and bearded seals (*Erignathus barbatus*). They also use the ice as a platform for resting and long distance movements between feeding areas, for mating in the spring, and sometimes for maternal denning. By overlaying the movements of radiocollared polar bears on maps of sea ice generated by satellites, we have learned that polar bears prefer certain types of sea ice. Specifically, bears prefer ice that occurs over the shallow waters of the continental shelf. They also choose areas with high concentrations of sea ice near areas of open water. This probably reflects the habitat preferences of the seals they hunt. Knowing how polar bears use their sea ice habitat helps us to understand how they are responding to declines in the sea ice due to climatic change.

How polar bears are studied

For decades, traditional knowledge and observations of hunters and other Arctic residents have been contributing important insights into the status of polar bears. Scientific studies allow us to understand what polar bears are doing when they occur in habitat that is inaccessible to humans, and to understand important parameters such as population size, birth, breeding, and survival rates, and whether these are changing over time. For example, scientific studies provide the information needed to address questions such as: how many polar bears are there? How is climate change affecting polar bears? Will polar bears be around for our grandchildren?

Capturing and handling polar bears is necessary to estimate survival, reproduction, condition, diet, and health. This information is necessary to conserve and manage polar bears (Photo c/o Dan Cox- Natural Exposures.)

Advances in radio-collars used on polar bears

Use of radio-collars allows managers and researchers to track the locations of bears. Since 2004, all collars have been equipped with an automatic device that drops the collar off the bear at a specified time, usually after 1-2 years. This reduces the risk of irritation to the bear's neck and ensures that collars are worn only as long as they are sending information. Though attempts have been made to find alternative ways to track polar bear movement patterns, none have yet been successful and collars remain the best method available for determining bear movement patterns and habitat use. However, the FWS and USGS continue to investigate new technologies that might reduce the need to capture and handle bears, but still provide information that is necessary for sound management of polar bears.

Although the SB polar bear population faces many challenges, we can be proud that it is one of the most understood populations in the world, and that relationships between government agencies and Native user groups are in place to safeguard the future of this population.

Polar bears in the SB region have been captured and studied by various wildlife agencies since as early as 1961. Much of what we know about polar bears comes from capture-recapture, which involves live-capturing bears and giving them unique markings in the form of small tattoos and plastic ear tags. In the spring of each year since 2001, and at less frequent intervals during the 1980s and 1990s, the USGS has used a helicopter to locate and capture from 10 to 100 polar bears out on the sea ice. Only as many polar bears are captured as is necessary to answer specific scientific questions. Biologists attempt to learn as much as possible from each captured bear by taking a number of measurements and samples while ensuring that we minimize the amount of time required for handling. The bears are weighed, their body condition (i.e., fatness) is evaluated, and body measurements are taken (Fig. 3). Samples of hair, blood, fat and feces are collected to look for contaminants and to determine what the bear has been eating. Some full-grown female bears are equipped with radio collars, which provide information on movements and habitat use.

Current status of polar bears in the southern Beaufort Sea

From capture-recapture studies, scientists have estimated that about 1500 polar bears currently exist in the SB population (2006 estimate). This is less than the estimate of 1800 polar bears that was derived in the 1980s and 1990s. Because of uncertainty in both estimates, statistical tests do not provide a clear indication of a significant decline in the population. However, recent studies have shown that SB polar bears are being affected by declines in the sea ice. Reduced survival of cubs and adult females and reduced body size of bears in this population, combined with the lower population estimate, suggest that the SB population is declining.

In years with long open-water seasons, polar bear survival and breeding rates are low. One explanation is that, in years with long open-water seasons, polar bears can spend less time hunting seals on sea ice over the biologically productive waters of the continental shelf. This limits the amount of fat they can store up, leading to nutritional stress and possibly starvation. Indeed, some sex and age classes of bears appear to grow more slowly and be thinner in years with long open-water seasons. Researchers have also encountered an unusual number of polar bears that have apparently starved to death or killed each other for food in recent years.

Do research activities have long-term effects on polar bears?

Great care is taken to ensure that research activities do not have long-term negative effects on polar bears and that the studies contribute to the long-term protection of Alaska's polar bears. First, research is limited to those individuals who have obtained a specialized permit through the FWS' Division of Management Authority. This process involves review of study plans and restrictions to minimize impacts of research on polar bears. Second, all studies require approval from an Animal Care and Use Committee (IACUC) as specified under the Animal Welfare Act.

A number of studies have investigated the effects of capturing, drugging, and handling bears on their health and behavior. Of a variety of methods used to capture bears, including foot snares, barrel traps, and darting from helicopters, the latter has been shown to be the safest method. In addition, a new drug, Telazol, was introduced in the 1980s and is currently used to capture bears. Bears respond well to this drug. Since its introduction, study results indicate no difference in the size and condition of bears that have been repeatedly captured and those captured for the very first time.

Information collected on polar bear cubs during capture operations is important for assessing reproduction and recruitment in Alaska's polar bear populations (Photo c/o Mike Lockhart)

What do I do if I find a dead polar bear?

Reports of dead polar bears provide extremely valuable information about factors other than harvest that may be affecting polar bear populations. If you find a dead polar bear, note its location, age/sex, and body condition, and call FWS to report it as soon as possible (1-800-362-5148). If possible, a photograph and collection of the skull (or a tooth with the root) and a femur bone would provide us the necessary information to assess the age, condition, and size of the bear. We will pay for sample shipment back to our office or another location where they can be analyzed. We appreciate your help!

Monitoring polar bear activity along the Beaufort Sea coast

Unlike many polar bear populations throughout the world, polar bears in Alaska are largely pelagic; the majority of individuals in the SB and CS populations remain out on the sea ice for most of the year. However, each fall, a portion of the SB population regularly comes to land. Because these bears have the potential to interact with local communities and areas of oil and gas activity, FWS began monitoring the number and distribution of these bears in 2000 by conducting aerial surveys along the coast between the Canadian border and Barrow (Fig. 3).

Results from surveys flown during September and October, 2000-2005 indicate that an average of 4% of the SB polar bear population come on shore during the fall open water period. The density of polar bears along the coast during this period was higher during years when the sea ice retreated further from the coastline. The majority of bears were observed within 15 km of Barter Island where bowhead whale (*Balaena mysticetus*) carcasses are available and ringed seals occur at the highest density offshore, once landfast ice is formed. Bears also concentrated at Cross Island near whale remains. Aerial surveys were resumed in 2007 and 2008.

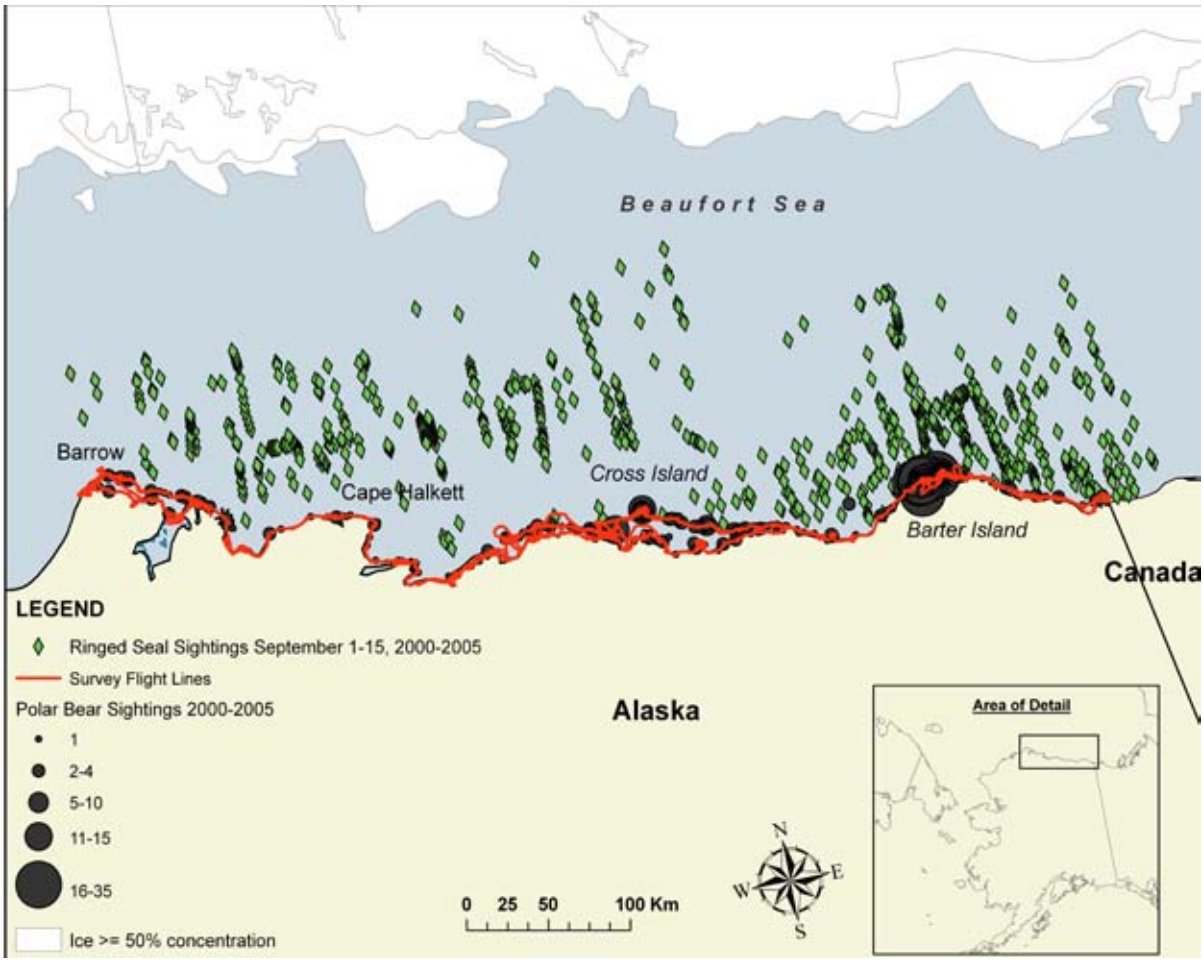


Fig. 3. Locations of fall surveys for polar bears (in red) and sighting results for polar bears (black circles) and ringed seals (green diamonds) for 2000-2005. Ice data shown is an example of typical sea ice retreat in the fall and represents ice of 50% ice concentration or greater.

Because of the high density of polar bears around Barter and Cross Islands, a polar bear feeding ecology study was conducted in 2002-2007 to monitor the number, age, sex and activity patterns of polar bears using bowhead whale remains. Results confirm that large numbers of bears occur near Barter Island, with an average of 28 bears (range 0-65 bears) observed in 2002-2007, and fewer numbers of bears at Cross Island, with an average of 2 bears observed in 2002-2004 (range 0-13 bears).

At Barter Island, fewer bears (range 0-37, average of 20) were observed in 2005-2007 compared to the same dates in 2002-2004 (Fig. 4). This may be due to a decline in population size, decline in number of bears using the coast, a shift in the timing of coastal use, or other factors. In terms of activity patterns, polar bears were mostly inactive during day; bear density at the feeding site was highest at night. All age/sex classes (single adult bears, family groups, sub-adults) fed on whale remains (Table 1). Interestingly, brown bears frequently displaced polar bears from the feeding site. The FWS is working with the Village of Kaktovik to establish a long-term fall observer program so trends of bear use at Barter Island can be monitored in future years.

Table 1. Comparison in the percent of various sex/age classes observed at Barter and Cross Islands, 2002-2004.

	Barter Island (%)	Cross Island (%)
Adults w/o dependent young	18.8	65.6
Females with dependent young	24.6	13.5
Subadults	15.3	4.1
Cubs (dependent young)	14.4	16.8

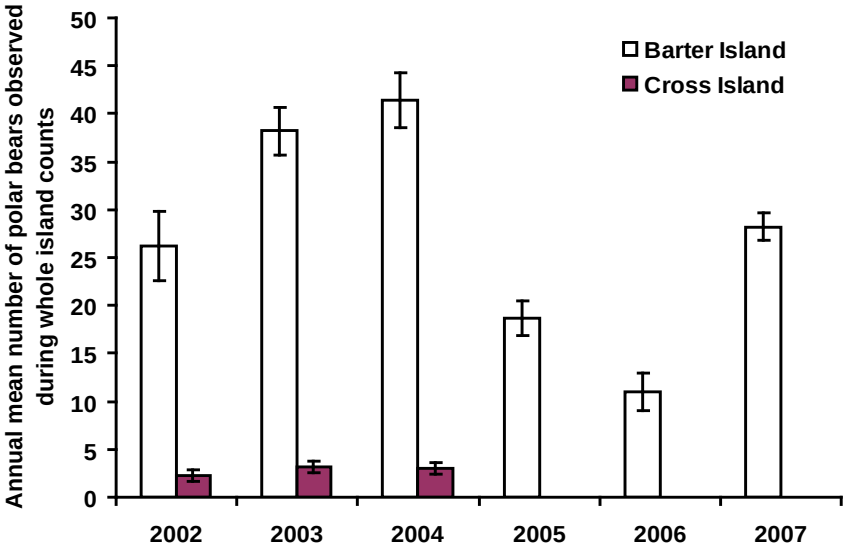


Fig. 4. Annual variation in the number of polar bears observed during daily counts on Barter and Cross Islands, Alaska between Sept 7-26th, 2002-2007.

Polar bears in Alaska spend most of their time out on the sea ice, but during the fall open water period approximately 5% of the SB population come to land (photo c/o Scott Schliebe).

The need for continued studies of Southern Beaufort Sea polar bears

Although research and traditional knowledge have taught us a lot about polar bears in the SB, this population is facing new challenges and there is still much to learn. For example, will climate change result in polar bears spending more time on land? How will polar bears be impacted by changes in the food chain, including effects on plankton, fish, and seals? Will changes in the sea ice cause polar bears to leave their traditional ranges and move into new areas? Will offshore oil development impact polar bears' ability to cope with climate change? Though long-term predictions for the SB indicate continued sea ice loss and negative effects, there will still be a mix of "good" and "bad" years for polar bears. However, bad years are expected to occur more often. To understand a long-lived and adaptable species like the polar bear, we need to look at the big picture over multiple years. The only way to do this is to continue ongoing research and to maintain the track record of good communication between government agencies and Native user groups.

For annual reports on polar bear research in the Southern Beaufort and Chukchi Seas, please contact the FWS at 1-800-362-5148 or the USGS at 907-786-7082.

Measurements taken on captured bears serve as important indicators of the health of polar bear populations (Photo c/ of Craig Perham)

Future consequences of reduced sea ice for Southern Beaufort Sea polar bears

What does sea ice loss mean for the future of the SB polar bear population? If the duration of the open-water season continues to increase, it is likely that the SB population will decline. Studies using climate models and data from radiocollared polar bears predict that the amount of optimal sea ice habitat in the SB region will decline by about 6% per decade in the next 45 years. If this happens, there is a greater than 60% chance that the size of the SB population will decline to a very small number. This would impact the number of polar bears that are available for subsistence harvest, and is the basis for FWS's recommendation of a voluntary reduction in harvest to slow population declines that are likely to result from climate change. Coastal residents should also be aware that hungry polar bears may become more frequent in villages as their opportunities to hunt seals decline.

A new study in the Southern Beaufort Sea: What are the potential consequences of a longer open water period for polar bears?

To learn more about how polar bears may be responding to climatic warming, a new research project funded in large part by the National Science Foundation was initiated by Dr. Merav Ben-David and Dr. Hank Harlow at the University of Wyoming in collaboration with the US Geological Survey and US Fish and Wildlife Service. The purposeof this study is to examine physiological differences in responses of polar bears that come on land from those that remain out on the SB pack ice. In 2008, polar bears were captured in the Prudhoe Bay area at the beginning and end of the open-water season to determine how their condition and physiology changed during this time, including whether they gained weight, accumulated body fat, or fasted. Similarly, in 2009, polar bears will be captured out on the Beaufort Sea pack ice at the beginning and end of the open-water season. This will help us understand how polar bears may cope with the longer open-water seasons that are predicted to occur in coming years, and help managers anticipate the potential consequences if more bears come on land.

Polar bears in the Chukchi Sea

Status of polar bears in the Chukchi/Bering Seas

Currently, very little is known about the status and health of polar bears in the Chukchi Sea, including reproductive rates, survival, or population size. Previous Chukchi Sea field research, conducted from 1987 – 1997, focused on movements, habitat use, and maternal den distribution of adult female polar bears. Since this earlier work, significant changes in sea ice dynamics have occurred, suggesting that polar bear movement patterns and habitat use are likely to have changed. In light of known climate changes in the Arctic marine environment and the lack of current data on the status and health of the Chukchi Sea polar bear population, it is imperative to obtain current information to ensure responsible management and conservation.

Information needs for the US-Russia Bilateral Agreement

The need for current biological information on the CS polar bear stock became a higher priority when, on December 9, 2006, Congress signed into law the 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 (Bilateral Agreement)*, originally signed by the U.S. and Russia in 2000. The primary purpose of the *Bilateral Agreement* is to ensure long-term conservation of this population. Now that implementing legislation is in place, a joint commission consisting of a government and native representative from each country will be established. The joint commission will be responsible for oversight of management and research activities set forth under the *Bilateral Agreement*, including polar bear harvest issues such as establishment of hunting quotas. High harvest levels, in combination with increasing environmental change in the region, make enactment of the *Bilateral Agreement* a high priority for polar bear conservation.

To facilitate collaborative projects that will address information needs of the joint commission, an *ad hoc* meeting of technical specialists from the U.S. and Russia occurred in Anchorage in 2007. Participants discussed future management, research, and conservation needs for the CS polar bear population and noted that the primary challenge to setting a sustainable harvest level, as called for by the *Bilateral Agreement*, is the lack of population information (status and trends). Participants identified a number of long-term and short-term research goals to provide information that will be needed by the joint commission to adequately manage harvest of the Chukchi Sea polar bear population.

New research in the Chukchi Sea

To ensure that the joint commission will have the best available science on which to base management decisions, the FWS and the USGS initiated a study in 2008 to begin gathering biological and demographic information on polar bears in the Chukchi Sea.

The short-term goals of this study are to identify the best methodology for estimating vital rates (i.e., breeding and survival rates) of polar bears in the Chukchi Sea, and to gain a better understanding of the health and age/sex structure of the population. The long-term goals are to estimate population status and trend, and to understand how polar bears are

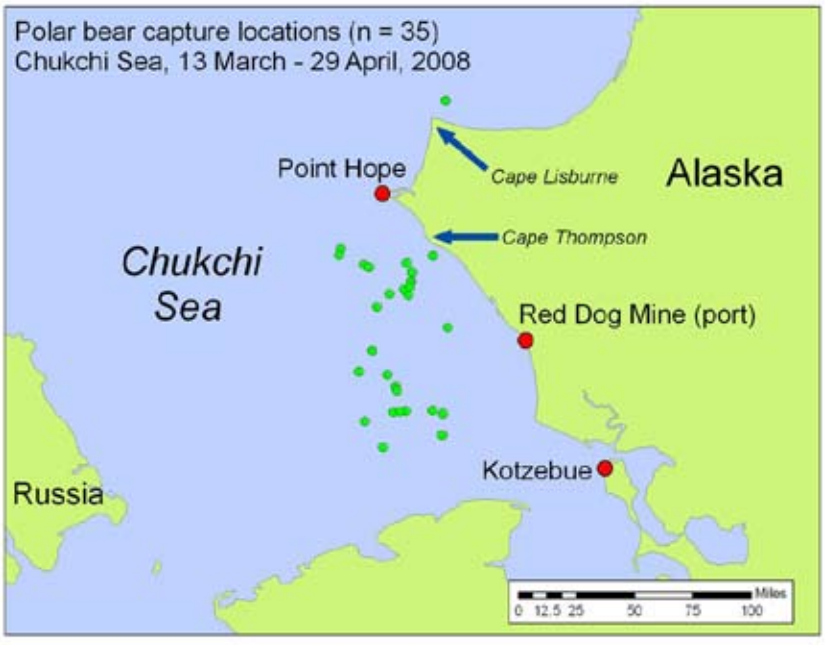


Fig. 5. Locations of polar bears captured on sea ice in the Chukchi Sea between March-April 2008.

distributed in the region and how they use the sea ice habitat. These goals will be evaluated in the context of rapidly changing sea ice conditions and other changes that may be occurring in the ecosystem.

In March/April of 2008, 35 polar bears were captured out on the sea ice between Point Hope and Kotzebue in the Alaskan Chukchi Sea. Age/sex information, body measurements, blood, hair, and fat biopsies were obtained (Fig. 5). Eleven adult females were fitted with satellite radiocollars and are currently providing location data every three days. These data will aid in determining the range, movements, and habitat use of polar bears in this population. Collars were fitted with new software that tracks the daily amount of time bears spend in the water. This information may be important in assessing additional impacts that changing sea ice conditions may have on swimming behavior. The study is planned to continue 2009-2011. In addition, efforts are being made to collaborate with Russian colleagues to begin additional work in Russia to gain a more comprehensive assessment of the CS population.

Blood samples from polar bears captured in the Southern Beaufort and Chukchi Seas provide information on bear health, contaminants, disease, and diet. (Photo c/o Karyn Rode)

Research on Contaminants and Disease in Polar Bears

Though contaminants and disease have not been definitively shown to negatively impact polar bear populations, high levels of contaminants in some polar bear populations, such as the population in the area surrounding Svalbard, Norway, have occurred in areas that also recorded reduced survival rates of cubs and possible reproductive impairment in adult females. In species other than polar bears, high concentrations of contaminants have been associated with neurological damage, immune suppression, and impaired fetal development. Possible effects of contaminants on immune suppression make disease an important factor to monitor in Alaska's polar bear populations.

A number of studies have been conducted to quantify contaminant levels in Alaskan polar bears. In general, levels of most contaminants are low in Alaskan polar bears compared to other polar bear populations throughout the Arctic. For example, though chlordanes (a pesticide banned by the EPA in 1983 due to effects on the nervous and digestive systems) are the most abundant contaminant found in SB polar bears, levels are 40% lower in Alaska than in other areas of the Arctic (Canada, Greenland, Norway). Overall, Chukchi Sea polar bears appear to be among the least contaminated polar bear populations in the circumpolar Arctic, with concentrations of most persistent organic pollutants increasing eastward through Canada, to Greenland, and Norway (Fig. 6).

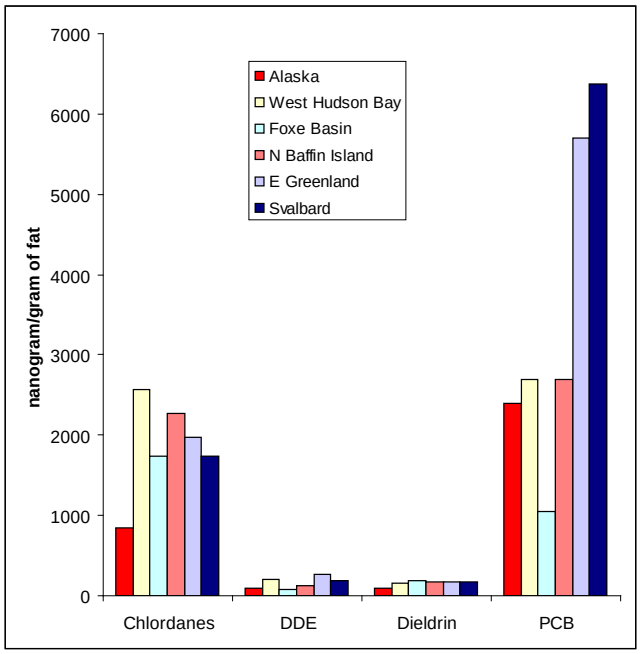


Fig. 6. Levels of 4 types of contaminants measured in polar bears throughout the circumpolar Arctic. (DDE = dichloro-deiphyenyldichloroethylen, Dieldrin was used previously as a substistute for DDT, PCB = polychlorinated biphenyls.). Alaskan populations (shown in red) have among the lowest contaminant levels found in polar bears throughout the Arctic.

Though a wide-variety of contaminants have been examined in polar bears and other marine mammals, very few studies have been conducted to determine what levels are actually detrimental to their health. Currently, work by Katrina Knott, Cassandra Kirk, and Torsten Bentzen, PhD students at the University of Alaska-Fairbanks, are making important strides in our understanding of interactions between feeding ecology and contaminant exposure (PCBs and mercury), and their impacts on body condition, health and productivity of polar bears in Alaska. A primary goal of this work is to examine

potential physiological effects of contaminant exposure and changes in prey choice among polar bears of various sex and age classes. If we can better understand how diet is related to contaminant levels, we'll be able to more accurately predict the future effects of dietary changes associated with climate change or other factors. For example, preliminary results indicate that the level of organochlorines (a chemical suspected of affecting reproduction and development in some species) in Alaskan polar bears, appears to be related to the ingestion of a higher proportion of lower trophic level prey, such as walrus, bearded seal, and bowhead whale. Baseline health data has been established for SB bears studied from 2005 to 2007 in order to monitor change over time . In terms of disease, measures of immune function (e.g., white blood cell counts) from polar bear blood samples suggest a healthy population in the SB. However, the work of Cassandra Kirk has indicated that polar bears that test positive for antibodies to some diseases, such as canine distemper, may exhibit compromised immune function. As these studies continue, supported by the World Wildlife Fund, BP Exploration, and Alaska INBRE (National Institute of Health), they'll provide important insights into the interactive effects of disease and contaminants on polar bear health. This will help interpret previous studies that have documented contaminant levels and the incidence of disease in polar bear populations throughout the Arctic.

Polar Bear Management Activities

Polar bear Protection Under the Endangered Species Act

In 2005, the Center for Biological Diversity petitioned the FWS to list polar bears as a "threatened" species under the Endangered Species Act (ESA), due to loss of sea ice habitat. To evaluate whether this action was necessary, FWS undertook an extensive review of all available information regarding the status of polar bears and potential threats. This information is summarized in a range-wide assessment that is available at: http://alaska.fws.gov/fisheries/mmm/polarbear/pdf/Polar_Bear_%20Status_Assessment.pdf. A proposed rule to list the polar bears as a "threatened" species and a 90-day comment period followed. Additionally, USGS prepared nine reports that addressed the current and projected future status of polar bears based on existing, previously un-analyzed data and new modeling efforts. Careful evaluation of the status assessment, USGS reports, and public comment led FWS to conclude that polar bears are likely to become endangered in the foreseeable future based on the loss of sea ice. On May 18, 2008, Secretary of the Interior Dirk Kempthorne announced his agreement with this recommendation and listed polar bears as a "threatened" species under the Endangered Species Act. For more information regarding the ESA listing please visit http://

Climate change is the most serious conservation concern for polar bears (Photo c/o Scott Schliebe)

alaska.fws.gov/fisheries/mmm/polarbear/issues.htm.

Now that polar bears have been listed, FWS' next step is to evaluate the extensive conservation efforts already underway and identify the most effective planning approach to take both nationally and internationally. A polar bear conservation/recovery plan will be developed with input from Alaska Natives and other interested parties. In addition, designation of Critical Habitat is currently being considered and guidelines are being developed for deterence of polar bears in areas of human settlement.

Harvest management

Alaskan Natives are permitted to harvest polar bears for subsistence purposes as outlined under the Marine Mammal Protection Act (MMPA). The FWS monitors harvest through local taggers in 15 communities hired through the Marking, Tagging, and Reporting program (MTRP). Taggers gather important information from hunters about polar bears harvested around their community, including the date, location of harvest, and the sex, age, and condition of the bear. While taggers assist in obtaining information from hunters, it is the hunter's responsibility to get the skull and hide of harvested bears tagged within 30 days of harvest. In addition, it is critical that a small premolar tooth be taken by the tagger and turned into the FWS to allow aging of all harvested bears.

1) Ensure that polar bears are available for harvest in the future.
2) Provide information to co-management partners (i.e. Alaska Nanuuq Commission, Inupiat-Inuvialuit Game Council, US-Russia joint commission) that allows them to evaluate harvest relative to their management agreements and objectives
3) Evaluate the status, trend, and health of polar bear populations

Monitoring polar bear harvest

The FWS serves as a conduit for harvest information. We analyze and summarize data provided by taggers and hunters on harvested polar bears and provide this information to co-management partners to assist them in making management decisions. In addition, we work with the USGS to obtain information on the population dynamics of polar bears obtained through research programs. Data collected from harvest and research are used to:

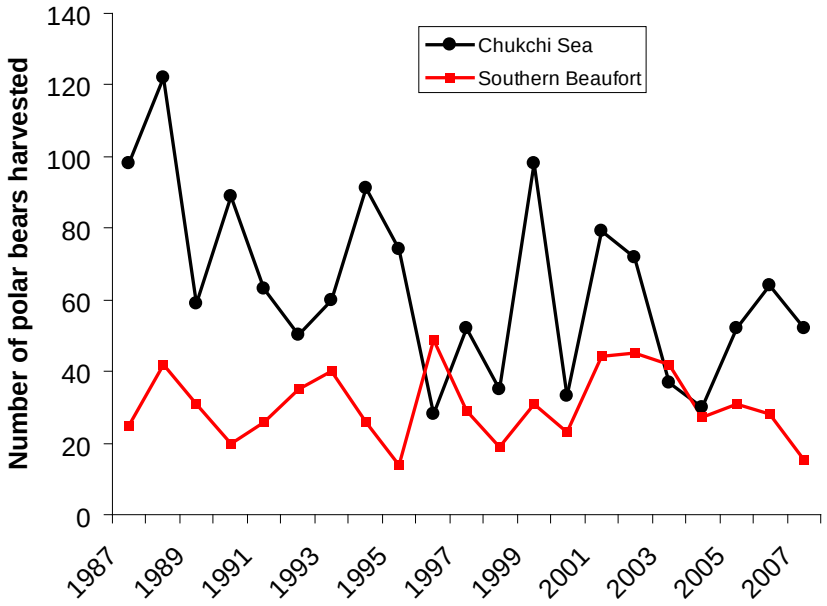


Fig. 7. Trends in the number of polar bears harvested in Alaska from the Southern Beaufort and Chukchi Sea populations between 1987-2007.

Information provided by hunters have shown that harvest levels have remained stable over the past 20 years in the SB but have declined in the CS (Fig. 7). Barrow, Point Hope, and Savoonga harvest the most polar bears per year of any villages in Alaska (Table 2).

Table 2. Mean and range of the estimated annual number of polar bears harvested per year per village for 1998-2007

Village	Bears harvested per year 1998-2007
Atqasuk	1.5 (1-2)
Barrow	21 (13-28)
Diomede	7 (2-12)
Gambell	11 (3-22)
Kaktovik	4 (1-9)
Kivalina	1 (1-3)
Nuiqsut	3 (2-7)
Point Hope	12 (10-18)
Point Lay	2 (1-4)
Savoonga	11 (4-33)
Shishmaref	5 (1-15)
Wainwright	5 (2-13)
Wales	2 (1-6)

Health and Biomonitoring

The FWS has a long-term bio-monitoring program designed to provide information regarding polar bear health. Hunters may donate samples from harvested polar bears for contaminant, disease, and other analyses. A full sample of the following tissues are needed: a large liver sample, large fat sample from the top of the rump, both kidneys, a long bone such as femur, and a large muscle samples.

Native co-management of polar bears

Alaska Native residents who live and hunt in polar bear habitat play an important role in conservation of the species. Co-management activities focus on subsistence harvest issues and on minimizing conflicts between humans and bears in human settlements.

Since 1988, SB polar bears have been managed under the Inupiat –Inuvialuit Agreement between Alaskan North Slope residents and the Inuvialuit Game Council in Canada. This voluntary agreement establishes a harvest quota and calls for management based on sustained yield. Additionally, the agreement prohibits hunting using aircraft or large motorized vehicles and calls for the protection of females with cubs and denning bears.

Recent studies suggest that the SB population may have recently declined and will continue to decline due to reduced sea ice availability. A new lower population estimate of 1500 bears, along with the projected future population decline indicates that the current harvest level of 80 bears (40 for Alaska and 40 for Canada) previously set under the Inupiat-Inuvialuit Agreement for a population of 1800 bears, is now unsustainable. Therefore, FWS is recommending a voluntary reduction in harvest for this population. Potential changes to harvest levels are currently being considered by members of the Inupiat-Inuvialuit Agreement and will be discussed in 2009.

In the Chukchi Sea, information on the current status of polar bears is lacking, resulting in an inability to reasonably determine a sustainable level of harvest for this population. The FWS is currently working on a modeling effort that will help predict the potential impacts of different harvest levels on the CS polar bear population. Results will be shared with the joint commission, the Alaska Nanuuq Commission, and village residents in 2009. In the meantime, focused efforts to conservatively manage this population, including protecting important habitat, ensuring that harvests are limited to subsistence needs, and avoiding the harvest of family groups, will be important to ensure their long-term sustainability.

Subsistence hunting

Although polar bears face serious threats from climate change in the future, FWS recognizes the social, cultural and economic importance of subsistence harvest to Native residents. Alaska coastal-dwelling Natives may still hunt polar bears under both the MMPA and the ESA for subsistence purposes. The hunt must be done in a non-wasteful manner and must be maintained within sustainable levels. If populations decrease as a result of changing ice conditions, it may mean that fewer bears may be available for hunting and that bears may be in poorer condition. To ensure that bear populations are managed to allow for long-term harvest, it is more important than ever to have adequate reporting of harvest, collection of harvest data, and collection of samples from harvested animals. For more information on tagging harvested polar bears, contact Brad Benter at 1-800-362-5148.

Hunters must report subsistence harvest by having the hide and skull tagged within 30 days. (Photo c/o Karyn Rode)

Bear-Human Interactions

A significant effort is currently underway to address polar bear-human interactions near Kaktovik. The Native Village of Kaktovik is in the process of developing a plan that will enhance safety for Kaktovik residents and visitors and minimize conflicts with bears. Once finalized, the bear-human interaction plan may be useful as a template for other villages in Alaska.

There have been few studies conducted in Alaska documenting how polar bears interact with other bears or humans. The FWS' goal was to obtain data that would help village residents minimize potentially dangerous bear-human interactions. In 2005-2007, we conducted a bear interaction study to characterize how polar bears respond to other polar bears, brown bears, and humans at the bowhead whale carcass feeding site at Kaktovik. Preliminary results indicate the following: 1) polar bears initiated more interactions with humans than did brown bears; 2) most interactions were initiated by sub-adult bears or dependent cubs, and were curious or investigative (vs. aggressive); and 3) brown bears initiated more aggressive interactions with polar bears than vice versa. Analysis is on-going to determine how variables such as distance and age/sex class of bears affect polar bear responses to humans and other bears.

Bear Safety

As fall freeze-up is delayed it's quite possible that polar bears using coastal areas will increasingly enter human settlements, particularly if they are nutritionally stressed. If a bear succeeds in finding food in a human settlement, it is more likely to become a problem. However, if it does not find food it is more likely to move on. **Please be sure to minimize any food attractants in your communities and camps and work with community members to develop strategies for minimizing conflicts with bears.**

Polar bears are very curious and it is normal for them to investigate anything that is unusual. If you see a bear, watch to see what it is doing, but also think about what to do if it gets too close. All bears are potentially dangerous and should be treated with respect. Bears that are surprised suddenly, starving, threatened, or defending their food or cubs are more likely to be aggressive. Extreme caution should be taken in these circumstances and the bear should be avoided. Make sure the bear has an open route to escape if it is behaving threatened.

Although subsistence hunting is legal under Federal law, we encourage everyone to seek non-lethal methods to deal with problem bears when possible and to ensure that any harvest is conducted for subsistence purposes only.

- If polar bears do not pose an immediate threat to human safety, stay away from bears and do not approach or harass them.
- Do not let bears associate food with humans; lock up or remove anything which could attract a bear, such as food, garbage, human waste, petroleum products, or animal carcasses.
- When in coastal areas, remain vigilant, and be aware of your surroundings; avoid surprising bears.
- If a polar bear poses an immediate threat to human safety, make loud noises and other distractions to encourage it to leave camp/village areas.
- Please report polar bear harassment or lethal take for public safety reasons to FWS at 1-800-362-5148.

Polar bears are naturally curious; minimizing food attractants help ensure that bears will not remain around human settlements. (Photo c/o Susi Miller)

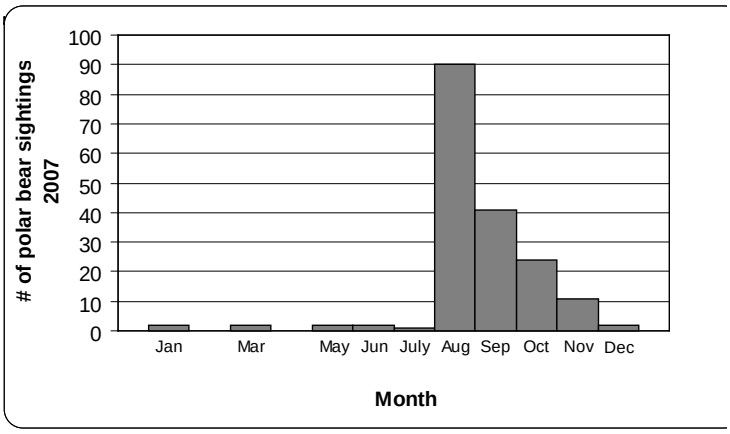
Managing polar bears in areas of oil and gas exploration and development

Activities of oil and gas operators are managed under the Incidental Take Program which allows FWS to mitigate potential impacts of a specified activity on polar bears through pre-planning. Sections 101(a)(5)(A) and (D) of the Marine Mammal Portection Act (MMPA) authorize the Secretary of the Interior to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals (including polar bears) by U.S. citizens who engage in a specified activity within a specified geographical region. Activities are allowed provided that the total of such taking will have no more than a negligible impact on these marine mammal species and do not have an unmitigable adverse impact on the availability of these species for subsistence uses. Two types of authorizations are available. Incidental Take Regulations (ITR) can be issued for up to five years; and if the taking is limited to harassment. An Incidental Harassment Authorization (IHA) can be issued for up to one year.

Oil and gas companies have to petition the FWS to issue Incidental Take Regulations. Once those regulations are in place, operators apply for a Letter of Authorization (LOA) which, if granted, allows them to incidentally "take" polar bears during the course of specifically outlined activities. For the most part, "takes" that result from polar bear interactions with industry are limited to changes in bear behavior.

Where appropriate, ITRs and IHAs can provide considerable conservation and management benefits to potentially impacted polar bears. Activities authorized under ITRs and IHAs must adopt measures to minimize any adverse impacts to polar bears; their habitat, and their availability for Alaska Native subsistence use. The FWS evaluates all industry projects with special attention to mitigating impacts to polar bears, such as limiting industrial activities around bear denning habitat. ITRs and IHAs also specify monitoring and reporting requirements which provide a basis for evaluating potential impacts of current and future activities on polar bears. Currently, all LOAs require that sightings of polar bears and signs of presence, such as tracks, be reported to the FWS during the course of any activity. Without incidental take authorizations, commercial activities could still continue; however, the Service would have no formal means of communicating with the oil and gas industry or have the ability to require monitoring and mitigation of specific activities and any form of resulting "take" would be a violation of the MMPA.

The FWS continues to work with oil and gas companies to improve polar bear monitoring and mitigation procedures within and around the North Slope oil and gas fields to limit disturbance and impacts to bears and subsistence uses. These include polar bear awareness programs, such as safety training and deterrence training; guidance provided to industry, plans of cooperation; and creating train-the-trainer curriculum for both polar bear deterrence and polar bear den detection surveys.



What is "Take" and how does it apply to polar bear management?

"Take" is a term defined under the MMPA as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal". The MMPA prohibits the "taking" of marine mammals unless exempted or authorized. Exemptions include: the 1) the harvest of marine mammals, including polar bears, by Alaska natives for subsistence purposes; and 2) the lethal take of a polar bear by anyone in defense of human life. Authorizations to take polar bears can be for: 1) scientific purposes, such as research to study bears by wildlife agencies, 2) educational purposes, such as museums and universities, 3) incidental take, and 4) intentional take. Incidental take occurs when an accidental or unavoidable interaction occurs between humans and bears in the course of human activities. Intentional take is the deterrence, or non-lethal hazing, of bears from human activities for the safety of the people and the bear.

August, where 90 sightings totaling 148 bears were observed. The number of bears seen include repeat sightings of some bears. The increase in sightings may be due to a combination of variables – an increased number of bears using the terrestrial habitat, an increased number of projects with bear monitors, as well as increased compliance and monitoring of industry projects, especially during August and September.

In the Beaufort Sea region, incidental take regulations have been in place since 1993. Current regulations expire in 2011. In the Chukchi Sea, regulations were in place from 1991-1996. One-year IHAs were issued for oil and gas activities in 2006 and 2007. Regulations were established in 2008 for the Chukchi Sea and will expire in 2012.

Local Involvement in polar bear research and management

We encourage local involvement in research and management activities. In 2008 we worked to involve participants from Point Hope and Kotzebue in polar bear captures in the Chukchi Sea. In Kaktovik, we trained a local resident to conduct polar bear counts during the fall and hope to continue this effort in future years. For further information on ways to become more involved in polar bear research and management, or any of the issues discussed in this pamphlet, please contact the FWS' Marine Mammals Management Office at 1-800-362-5148. You can also visit the FWS polar bear management website at: http://alaska.fws.gov/fisheries/mmm/polarbear/issues.htm or the USGS Alaska Science Center's website at: http://alaska.usgs.gov/science/biology/polar_bears/.

Photo c/o Scott Schliebe

Meet the staff of the USFWS polar bear program

There has been a lot of change recently in the staff of FWS's polar bear program. In June 2008, Scott Schliebe retired as the program's supervisor and in December 2008, Terry Debruyn began as the new program supervisor. Eric Regehr, formerly with the US Geological Survey's polar bear program, and Karyn Rode, were recently hired as permanent biologists in the program. Rosa Meehan remains the acting supervisor of the Marine Mammals Management unit which includes programs managing polar bears, sea otters, and walrus.

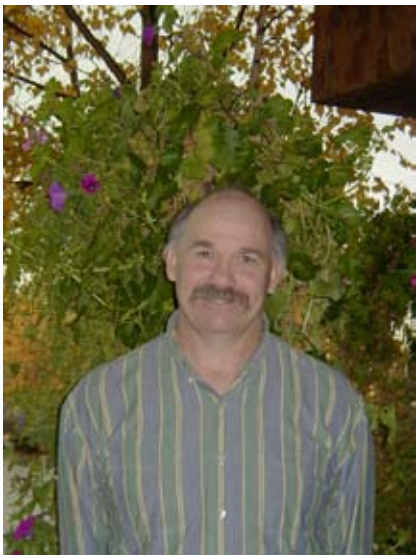
Terry D. DeBruyn is the new polar bear program supervisor. He comes to FWS from the National Park Service where he spetn 8 years working as the a regional wildlife biologist. Terry got his MS and PhD studying black bears on Michigan's upper peninsula. He has been studying bears for over 19 years.

Craig Perham handles all polar bear issues related to oil and gas exploration and development. He also provides training to industry and Native villages in techniques to deter bears and minimize bear-human interactions.

Susi Miller specializes in studying and managing polar bear-human interactions and conducts outreach. She is a certified firearms and bear safety instructor.

Karyn Rode conducts outreach on polar bear biology and research activities. She studies the foraging ecology, diets, and health of Alaska's polar bear populations with particular emphasis on the Chukchi Sea population.

Tom Evans specializes in monitoring polar bear harvest and contaminants levels. He is currently working to develop a new technique for estimating populations using aerial surveys.



Eric Regehr is a research biologist speciailizing in the study of polar bear population dynamics, including harvest management and the effects of sea ice changes on polar bear populations. He also conducts outreach and develops materials to communicate about research activities and results.