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STUDY PLAN FOR THE ALASKA-CHUKOTKA POLAR BEAR POPULATION (2013-2015)

3rd Annual Meeting of the Scientific Working Group of the U.S.-Russia Polar Bear Commission

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14-16 March 2012

Authors: This plan was developed by members of the scientific working group (SWG) present at the 14-16 March 2012 meeting in Anchorage, Alaska. The following SWG members participated in development of this plan:

Stanislav Belikov (Russian cochair) - head of laboratory, All-Russian Research Institute of Nature Protection

Terry DeBruyn (U.S. cochair) - U.S. Fish and Wildlife Service

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The following SWG members were not present at the 14-16 March 2012 meeting and did not participate in the development of this plan:

Yuri Tototto – Executive Director, Marine Hunters Union

Vladilen Kavry, Russian Association of Indigenous Peoples of the North

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Background: In 2000, the *Agreement between the Government of the United States of America and the Government of the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population* (hereafter the “U.S.-Russia Agreement”) was signed establishing a four-member U.S.-Russia Polar Bear Commission (hereafter the “Commission”), consisting of a federal and Native representative from each country, to make management decisions for the Alaska-Chukotka (AC) polar bear population. It also established the SWG to advise the Commission. At the Commission’s inaugural

meeting in Moscow in September 2009, they defined the structure of the SWG which included a responsibility to consider scientific research and traditional ecological knowledge programs, including joint ones, for the study, conservation and monitoring of polar bears in the AC population. In 2011, the Commission tasked the SWG with developing a joint research plan. This study plan represents a prioritization of research needs that is, in part, a response to that request.

Current knowledge of the AC population: The Alaska-Chukotka (AC) polar bear population (also referred to as the “Chukchi Sea” subpopulation by Polar Bear Specialist Group [PBSG] of the International Union for the Conservation of Nature) ranges widely on the pack ice of the northern Bering, Chukchi, and eastern Siberian seas between the northwest coast of Alaska and the northeastern coast of Chukotka, including Wrangel and Herald islands in Russia (Figure 1). Movements and distribution of bears in this population are largely based on satellite tagging studies conducted from 1986-1994 and 2008-2011, and from direct observational studies. Long-term, ground-based observational studies and satellite tagging efforts support that polar bears in the AC population come on land on Wrangel and Herald islands and the Chukotkan coast every year for extended periods during the ice-free season, and that Wrangel Island is a particularly important resting place for bears. From 2004-2011, an average of 220 polar bears per year were observed using Wrangel Island as a seasonal refuge during the ice-free season. In some years, up to several hundred bears occur on Wrangel Island and the Chukotkan coast combined. Only pregnant female polar bears enter dens; other polar bears usually remain active throughout the winter. For the AC population the majority of maternity denning occurs on Wrangel and Herald islands, but also on the Chukotkan coast and occasionally on the sea ice. Land use for resting or denning by polar bears from this population is uncommon in Alaska.

Accurate estimates of survival and population size are not available for the AC population, unlike some other polar bear populations that have well-studied population dynamics. In 1992, although there was not enough information to directly assess the size of the AC population, experts estimated that there were 2,000 to 5,000 bears based on the number of maternity dens recorded from aerial surveys in the 1970s on Wrangel Island. In 2005, the PBSG used historical studies and expert opinion to estimate the size of the AC population to be approximately 2,000 bears. In 2009, the PBSG revised this estimate to “unknown” due to the lack of recent information. The wide distribution of polar bears on sea ice, the vast size of the region, and the lack of infrastructure to support research studies make estimating survival and population size difficult for the AC population.

Goals of this study plan: Collect information on the AC polar bear population and its habitat to be used in development of recommendations for its conservation and for its use by Native peoples of Chukotka and Alaska.

Objectives:

1. To prioritize research to strategically use available resources.
2. To promote research that effectively addresses the highest-priority research needs.
3. To promote coordination across borders necessary to effectively meet research objectives.

Summary of information needs: The SWG began development of the study plan by first identifying the broad information needs for the AC population. These were identified as the following:

1. Estimation of the level of human-caused lethal removals
2. Determination of population status:
 - a. via estimation of demographic parameters including population size, population growth rate, survival, and recruitment, or indices of these parameters.
 - b. via biological and ecological indices.
3. Current distribution of the population and implications for population size estimation and harvest allocation
4. Environmental and biological characteristics (e.g., bathymetry, ice concentration, benthic productivity) of important polar bear habitats, identification of key habitat areas (including denning areas), and projected future availability of habitats
5. Incorporation of local and traditional ecological knowledge and community based monitoring efforts to better understand bear seasonal distribution patterns and behavior; including denning behavior, movement patterns, and bear-human interactions
6. Improved methodologies for evaluating population status using multiple qualitative inputs (e.g., Bayesian models and Adaptive Resource Management tools)

Studies ranked as high priority: At a March 2012 meeting, SWG members discussed and agreed on the following list of high-priority research studies and projects to inform management decisions for the AC population. These studies were identified as having the highest priority for focusing financial and human resources over the next three years (studies in this section are listed in no particular order).

- Quantify the annual level and type of human-caused removals in Chukotka and Alaska. Evaluate methodologies for quantifying human-caused removals, including methodologies for quantifying illegal trade in polar bear parts.
- Use recapture and movement data from bears captured off the U.S. coast between 2008 and 2011, and from genetic sampling on Chukotka and Wrangel Island, to evaluate the feasibility of a capture-recapture approach for obtaining data on demographic parameters or related indices.
- Develop a polar bear capture program on the Chukotkan coast and a genetic sampling program on the Chukotkan coast and Wrangel Island. Begin biopsy darting on the Chukotkan coast and collect genetic samples via hair snaring on Wrangel Island.
- Monitor recruitment via reproductive status of polar bears encountered in Alaska and Chukotka-based captures as well as systematic observations of polar bears on Wrangel Island and the Chukotkan coast.
- Use ecological information (including traditional and local ecological knowledge) such as body condition, feeding ecology, recruitment, and the sex and age structure of harvested, captured, and observed polar bears to assess current population status and response to changes in sea ice conditions.
- Use updated demographic information in analyses to quantify the risk associated with different levels of human-caused removals.

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- Collect data on local and traditional ecological knowledge of polar bears including habitat use, seasonal distribution patterns, prey availability, bear behavior, denning, and bear-human interactions.
- Develop and use standardized community-based monitoring in Chukotka and Alaska to provide information on denning, prey availability, sea ice conditions, bear-human interactions, habitat use, diets and seasonal distribution patterns. Provide standardized training to participants to ensure data from all communities is comparable.
- Improve methodologies for evaluating population status and making management decisions, including the estimation of sustainable levels of harvest, via models that incorporate multiple qualitative inputs (e.g. Bayesian models)
- Use polar bear densities encountered during a 2000 aerial pilot survey of the sea ice in the Chukchi Sea to extrapolate an estimate of the number of bears inhabiting the sea ice in the autumn. Combine with estimates of the numbers of bears on land during the time of the survey to provide a population estimate with an associated error estimate.
- Investigate opportunities to gather information on polar bears via a planned aerial survey by the National Marine Fisheries Service in 2013 and 2014 to estimate the size and distribution of the ringed seal population in the Chukchi and northern Bering seas.
- Combine models of oil spill trajectories with habitat use models of polar bears in the AC population to evaluate risk and potential consequences for polar bears of an oil spill in the Chukchi Sea.

Studies ranked as medium and low priority: At the March 2012 meeting of the SWG, members individually assigned rankings to a list of research studies. Members did not have time to collectively discuss studies that were not identified as high priority. Therefore, rankings of medium and low priority are based on a summary of individual rankings by members attending the March 2012 meeting.

The following studies were identified as medium priority (the numbers in parentheses represent votes from SWG members on the level of priority):

- Incorporate updated habitat use information into simulation models to determine the feasibility of using an aerial survey to estimate population size. High (3), Med (4), Low (2)
- Monitor the status of prey species. High (2), Med (5), Low (2)
- Monitor seasonal distribution patterns of polar bears via observational methods and satellite tags for the purpose of identifying protected areas. This includes monitoring coastal distribution of polar bears in Chukotka via aerial surveys during the summer and autumn period; and annually monitoring bear occurrence, sex and age composition, and behavior at key locations, including community-based monitoring at walrus haulouts near the village of Ryrkaypiy, Vankarem and farther along the Chukotkan coast during the ice-free period. High (2), Med (7), Low (0)
- Identify key denning habitats via on the ground-based den surveys, particularly on Kolyuchin Island, and collect data on the ecology and behavior of females reproducing along the coast of Chukotka. High (3), Med (6), Low (0)

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The following studies showed some disparity in prioritization by members and were either of medium or low priority:

- Identify patterns of seasonal migrations. High (3), Med (1), Low (5)
- Examine genetic relatedness of individuals relative to habitat use and range patterns to determine if geographic patterns of habitat use differ among segments of the population. High (2), Med (2), Low (5)

The following studies were identified as being of lower priority than other studies for the three year period covered by this study plan:

- Assess the role of other potential factors that could influence polar bear abundance, including disease, parasites, contaminants, shipping, and industrial development. High (1), Med (3), Low (5)
- Consider the feasibility and utility of identifying habitat carrying capacity and an optimal polar bear population abundance or density for the AC population. High (0), Med (2), Low (5)
- Use existing radiotelemetry data to evaluate the potential distribution of polar bears within the population boundaries. High (0), Med (0), Low (6)
- Pursue new capture and satellite tagging of polar bears near the western boundary of the population to better identify the western boundary. High (0), Med (0), Low (6)

Next steps: Now that a list of high-priority research studies to address pressing information needs for the AC population has been agreed upon, members of the SWG will need to work together and with research partners to achieve the steps listed below. These steps are a priority action item of the SWG prior to the next annual meeting.

1. Determine what work is already being done that fulfills all or part of the identified high-priority research studies.
2. Identify high-priority studies that are not already being conducted as part of current, ongoing studies.
3. Identify resources, personnel and funding that are needed to complete the remaining high-priority research studies over the next three years.

Requested assistance: The SWG recognized the importance of collaboration between the U.S. and Russia, and requested that the Commission take steps to facilitate the following mechanisms, to improve collaboration on the studies listed in this study plan:

- Transferring of funds between countries. This difficulty currently represents a significant barrier to collaboration.
- Sharing of biological samples.
- Cross-collaboration of personnel on field and research studies.



Fig. 1: Approximate boundaries of the Alaska-Chukotka polar bear population in black outline. The U.S.-Russia Agreement defines the southern boundary as the southernmost extent of drift ice, the western boundary as a line north through the Kolyma River, and the eastern boundary as a line north through Barrow, Alaska.