

MARINE MAMMAL COMMISSION
4340 EAST-WEST HIGHWAY, ROOM 905
BETHESDA, MD 20814

16 November 2005

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Dear Rosa,

The Marine Mammal Commission has reviewed the draft study plan for the collaborative Pacific walrus survey to evaluate the “overall approach and survey logic,” as you requested. Although the Commission generally avoids reviewing study plans for specific research projects, we realize that this survey is the result of many years of development, and we appreciate your desire to ensure that the survey is scientifically sound and will result in an estimate with sufficient precision to track trends.

The Commission and its Committee of Scientific Advisors have been concerned about Pacific walrus and, in particular, the lack of reasonable population estimates for quite some time (e.g., letter to the Service dated 28 December 2001). The draft study plan represents the culmination of several years of research and development of new survey and tagging techniques, as well as careful consideration of the statistical requirements for successful survey design. The Commission commends you and the involved U.S. Fish and Wildlife Service and U.S. Geological Survey (USGS) staff for the substantial progress. We particularly note the groundbreaking efforts by Doug Burn and Chad Jay to develop effective high-altitude thermal survey methods and tag deployment and attachment techniques. The Commission also appreciates the collaboration of Russian scientists, which will be essential for the successful completion of a range-wide survey of Pacific walrus.

The overall design of the combined aerial survey and tagging projects is generally sound. If field efforts can be conducted according to the plan, it should provide a high likelihood of success in estimating the total population size of Pacific walrus with reasonable accuracy and precision. We were unable to review the plans for the research occurring in Russian waters because detailed information on methods was not available for inclusion in the draft study plan. We understand that a research coordination meeting was held after the draft study plan was written and that plans for the Russian portion of the study have been developed.

Based on our review of the study plan, we do have three principal concerns as well as some general comments and suggestions that you should consider prior to implementing the study plan. First, the study design is premised on several fundamental assumptions, at least two of which are not stated explicitly in the draft study plan. The study plan implicitly assumes that the behavior of younger animals, which will not be tagged (because they do not have sufficiently thick skin and blubber to allow safe use of the imbedded tag), is accurately represented by the older animals that will be tagged. The plan also implicitly assumes that only a negligible portion of the walrus population will be north of Bering Strait during the survey and therefore pack ice north of the Strait

will not be surveyed. This second assumption may be valid now but may not be valid in future studies if the extent of seasonal sea ice in the Bering Sea continues to decrease.

Second, the description of aerial survey methods indicates a potential difficulty with matching thermal data and photographic images of walrus groups. Apparently the thermal scanner does not record geographic locations, so the locations of walrus groups (hot spots) along a transect are extrapolated from the known starting and end points of the transect. This could be a potentially significant problem, although it could be readily solved by keeping a detailed electronic file of time and position in a GPS onboard the thermal imagery plane. In addition, the plan notes potential problems with scan results that could be caused by changes in the position of the aircraft (i.e., pitch, yaw, and roll). Apparently equipment is available to rectify that problem as well as to geo-reference the thermal data. Although the study plan does not indicate the cost of that equipment, it seems that, unless the equipment is prohibitively costly, it should be used to ensure that the quality of collected data is as good as possible.

Third, the draft study plan mentions the problem that some walruses will be missed by the high-altitude thermal survey because they are in groups too small to detect. It is difficult to evaluate how large a bias this might introduce into the survey results without some information on the distribution of group sizes likely to be encountered. Presumably some data on group size distributions are available from the 2002–2005 pilot studies. It would be useful to present that information in the study plan. The study plan suggests that this issue will be addressed by using the low-altitude survey plane to conduct line-transect surveys to evaluate the distribution of walrus group sizes, presumably within the thermal survey strips. The plan, however, fails to describe how the line-transect surveys will be designed to observe a representative sample of group sizes, while ensuring that the low-altitude plane will be able to complete its primary mission (collecting digital photographs of walrus groups that match those recorded by the thermal survey). Also, the plan does not state how those results will be used to correct for missed small groups in the final population estimate.

In conjunction with the tagging and survey projects, the Service and USGS should consider gathering other relevant types of data that may support the study or be useful for development of future approaches to monitoring status or trends. For example, biopsy samples might be collected in conjunction with the tagging project; such samples could be used to assess the genetic structure of the population, evaluate contaminant loads in walruses, and make comparative studies of diet or body condition (e.g., based on fatty acid analysis of blubber samples). In addition, data might be collected that could lead to future alternative survey methods, such as data from reconnaissance satellites or other “National Technical Means.” Although such data may be difficult to access in the face of ongoing strategic and tactical needs for those data from other regions, it may be useful to evaluate even a small sample of such data in conjunction with the extensive survey data that will be collected by the visual and thermal survey planes. It would be unfortunate to miss this opportunity to evaluate technologies that may be more available and less expensive when future surveys are conducted.

The Service and USGS also should consider expanding their collaborative effort to include other researchers who may be able to collect and contribute relevant data on other components of

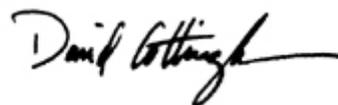
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the ecosystem. At a minimum, the you should coordinate with the National Oceanographic and Atmospheric Administration (NOAA) and National Aeronautics and Space Administration to ensure that appropriate satellite-derived environmental data are integrated into the sampling design. Additional environmental data should be sought from ships or planes conducting oceanographic research in the study area. In addition, the ship used for the tagging project could provide a good platform for collaboration. Several major research initiatives are ongoing or planned for the Bering Sea, and the walrus tagging cruise may provide an ideal opportunity to support those programs while collecting data that may be useful for understanding the distribution and ecology of walruses. These initiatives include the National Science Foundation's Bering Ecosystem Studies (BEST) program and the NOAA's Fisheries Oceanography Coordinated Investigations (FOCI), North Pacific Climate Regime and Ecosystem Productivity (NPCREP), and Loss of Sea Ice (LOSI) programs. In addition, several research organizations, including the University of Tennessee and the University of Alaska Fairbanks, have collected some relevant oceanographic and ecological data in the past, and simultaneous collection of such data could be important for understanding the distribution and ecology of walruses during the survey. If skiffs could be deployed for work on other marine mammals without disrupting the walrus tagging work, biopsy and/or tagging projects could be conducted on bowhead or beluga whales or on bearded, ribbon, ringed, or spotted seals. Collecting information to clarify the stock structure of bowhead whales is particularly important prior to the determination of a new International Whaling Commission quota for subsistence harvest of the whales. In addition, very little is known about stock structure, movements, or foraging behavior of any of the four ice seal species.

As noted earlier, this study has a high likelihood of success if it can be conducted as planned. The Service, USGS, and the Commission realize that numerous factors, especially weather and ice conditions, may require that investigators make adaptive changes to the study design. Although the specific conditions that will occur during the tagging and survey efforts cannot be predicted, we recommend that the Service do what it can to plan for the likely need to react adaptively to circumstances that may arise.

If you have any further questions or concerns regarding the Commission's review of the draft study plan or would like contact information for specific potential collaborators, please feel free to contact the Commission. We hope that the range-wide survey of Pacific walruses will be successful and eagerly look forward to an updated, valid estimate of the abundance of Pacific walruses.

Sincerely,



David Cottingham
Executive Director

cc: Doug Burn
Chad Jay