MARINE MAMMAL COMMISSION

9 November 2009

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Marine Mammal Management
Alaska Regional Office
1011 East Tudor Road
Anchorage, AK 99503

Dear Dr. Meehan:

On 10 September 2009 the Fish and Wildlife Service published a *Federal Register* notice (74 Fed. Reg. 46548) requesting information regarding a petition to list the Pacific walrus subspecies (*Odobenus rosmarus divergens*) as threatened or endangered under the Endangered Species Act. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Service's request and the underlying petition and offers the following recommendations and comments.

RECOMMENDATIONS

The Marine Mammal Commission recommends that, in its review of the petition, the Fish and Wildlife Service—

- begin its status review of the Pacific walrus by defining the range occupied by some portion of the population (e.g., 90 percent), analyzing or predicting the current and expected changes in ice habitat in that area, and describing, to the extent possible, the anticipated changes in reproduction and survival that may occur as the ice haul-out habitat is lost and walruses are forced to haul out on land for various vital functions that otherwise took place in the ice habitat;
- describe, evaluate, and take into account the potential consequences of increased exposure and susceptibility of Pacific walruses to predation and disease under changing climatic conditions and the resulting implications for the status of the walrus population;
- (1) review the range of human-related threats that likely will arise or expand as the Arctic climate warms, (2) describe the current regulatory mechanisms for addressing them, and (3) evaluate the effectiveness of those mechanisms;
- work with the Eskimo Walrus Commission to include in the analysis of the listing petition (1) an estimate of the numbers of walruses being taken at present, including any potential biases in that estimate, (2) a review of the existing information on total population abundance, and (3) an assessment of whether current subsistence harvests are sustainable, keeping in mind the uncertainty in harvest levels (including hunting loss) and population numbers as well as the total walrus mortality from other human activities; and
- describe the possible consequences of having inadequate information on population status, the challenges that must be overcome to obtain the essential data and information, and the steps the Service plans to take to gather that data and information.

RATIONALE

The petitioned listing is based on the anticipated effect of climate change on the Pacific walrus population. Historically, female Pacific walruses have hauled out on drifting sea ice to give birth, nurse their young, rest, and gain access to important foraging areas. Over recent decades, climate warming has changed sea ice conditions in ways that are altering walrus behavior and habitat use and may have significant negative effects on the species' population status and viability. The Service's ability to evaluate these effects and respond to the petition in an informed manner will be compromised by the lack of definitive information on the population's status, including its abundance, trends, vital rates, and the health and condition of individual animals.

To respond to the petition, the Service must evaluate the status of the walrus population in the context of the five listing factors set forth in section 4(a)(1) of the Endangered Species Act. Those factors are (1) the present or threatened destruction, modification, or curtailment of the species' habitat or range, (2) overutilization for commercial, recreational, scientific or educational purposes, (3) disease or predation, (4) the inadequacy of existing regulatory mechanisms, and (5) other natural or manmade factors affecting its continued existence. The Marine Mammal Commission has supported several studies on Pacific walruses that are relevant to analyses of these factors (see enclosed list of reports and publications). Copies of the reports have previously been sent to the Service, but additional copies are available if needed.

<u>Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range</u>

In recent years, the extent and the timing of both freeze-up and break-up of sea ice in the Bering and Chukchi Seas have changed. Not only has the extent of summer ice coverage declined by 30 percent since the late 1970s, but the ice is breaking up earlier in the spring and freezing later in the winter, and multiyear ice is now scarce. In some areas, suitable ice habitat over offshore feeding grounds has disappeared completely. As a result, Pacific walruses are hauling out on land in greater numbers, for longer periods of time, in larger groups, and across a wider summer range than has been recorded in recent times. The Service will need to evaluate these changes and their expected effects on walrus reproduction, survival, abundance, trends, and status.

With regard to survival, the petition notes that large groups of walruses hauled out on land, particularly those in which calves and juveniles are mixed with adults, may experience high mortality from stampedes caused by disturbance, both natural and human-related. Stampede-related deaths are less likely for walruses that haul out on ice because in ice habitat walruses tend to congregate in smaller groups, are more widely dispersed, and in most areas are less subject to human disturbance. The petition also notes that some observers have reported seeing lone calves in open water beyond the outer edge of foraging grounds that were previously accessible from pack ice floes where walruses hauled out between foraging bouts. The observers concluded that such calves had been abandoned. Such incidents have not been reported historically, and they may signal reduced calf survival and recruitment into breeding age classes.

Greater dependence on land-based haul-out sites may mean that walruses have less access to offshore foraging habitat, increasing the probability that they will deplete their nearshore prey resources. If walrus foraging success is compromised, the condition of individual animals likely will decline, potentially affecting their ability to survive and reproduce successfully (including maintaining a pregnancy and nursing a calf after it is born). If animals are in poor condition at the end of summer, they will be less able to withstand cold winter conditions.

With these concerns in mind, the Marine Mammal Commission recommends that the Fish and Wildlife Service begin its status review of the Pacific walrus by defining the range occupied by some portion of the population (e.g., 90 percent), analyzing or predicting the current and expected changes in ice habitat in that area, and describing, to the extent possible, the anticipated changes in reproduction and survival that may occur as the ice haul-out habitat is lost and walruses are forced to haul out on land for various vital functions that otherwise took place in the ice habitat.

Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Pacific walruses are not taken for commercial, recreational, or educational purposes. They are taken for scientific purposes but, to date, such takes have been in relatively small numbers with negligible impact. However, with more walruses hauling out on land, they have become more vulnerable to the incidental effects of disturbance, as was recently observed along the northwest coast of Alaska where, it appears, a considerable number of walruses were trampled to death during a stampede to the water. The cause of this stampede is not known, but human activities are one possible cause of such events, and scientific research is one type of activity that can result in disturbance leading to a stampede. To reduce the incidence of stampedes, the Fish and Wildlife Service and the U.S. Geological Survey will need to consider the increasing vulnerability of the walrus population as walruses come to depend more heavily on land-based haul-out areas where they are more susceptible to disturbance by human activities, including scientific research.

Pacific walruses also are taken for subsistence purposes by Alaska and Russian Natives, and those takes will be addressed below in the section on adequacy of existing regulatory mechanisms.

Disease or Predation

Changes in walrus habitat and foraging conditions may have numerous harmful consequences. The loss of sea ice may mean that walruses spend more time in open water and that their haul-out locations become much more predictable. Although the rates of predation by killer whales and polar bears are not known and may be insignificant, such changes in walrus behavior and habitat use could make smaller walruses (i.e., juveniles) more vulnerable to predation. Most pinnipeds do not use haul-out areas that are accessible to large land-based predators so it remains to be seen whether and to what extent predation will increase as walruses spend more time on land.

The Pacific walrus population also may be more vulnerable to disease for several reasons. First, if foraging success is compromised, walruses may be in poorer condition and therefore more susceptible when exposed to the diseases that they normally encounter. Second, warming associated

with climate change already has led to northern range expansion for a number of diseases, disease vectors, and harmful algae, which means that walruses will be exposed to new pathogens and biotoxins. Third, if walruses spend more time on land, they may be more likely to encounter pathogens that occur more frequently in terrestrial animals. Fourth, walruses hauled out on land are likely to occur in greater concentrations than those using sea ice haul-out sites, which would facilitate walrus-to-walrus disease transmission.

For all these reasons, the Marine Mammal Commission recommends that, as the Fish and Wildlife Service evaluates the listing petition, it describe, evaluate, and take into account the potential consequences of increased exposure and susceptibility of Pacific walruses to predation and disease under changing climatic conditions and the resulting implications for the status of the walrus population.

Inadequacy of Existing Regulatory Mechanisms

In the foreseeable future, human activities will increasingly affect walruses as oil and gas development continues, commercial ships are rerouted through the Arctic, the military establishes a presence there for national security reasons, fisheries are initiated, and coastal development expands to support all those activities. Protection of walruses from the adverse effects of these activities likely will require greater regulation. For example, existing regulations may not provide sufficient protection for haul-out sites on land. Current regulations restrict the hunting of walruses within the Alaska State Game Sanctuary on Round Island in Bristol Bay and provide protection from disturbance caused by people, vessels, and low-flying aircraft. However, similar restrictions have not been adopted for other land-based haul-out sites in Alaska, such as Cape Seniavin on the Alaska Peninsula, and it is not clear that walrus haul-out sites in Russia are adequately protected.

To ensure that walruses have adequate protection under changing ecological conditions, the Marine Mammal Commission recommends that the Fish and Wildlife Service (1) review the range of human-related threats that likely will arise or expand as the Arctic climate warms, (2) describe the current regulatory mechanisms for addressing them, and (3) evaluate the effectiveness of those mechanisms.

Subsistence harvesting may well be the most difficult human activity to manage because it can appear to involve competing values. On one hand, the Marine Mammal Protection Act recognizes the value and importance of subsistence harvests to Alaska Natives, and the Act seeks to maintain the opportunity for such harvests. On the other hand, subsistence harvesting is the largest known source of human-related walrus mortality and it is not clear that the population can withstand current harvest levels. Furthermore, managing subsistence harvests has proven to be a difficult task, both in the United States and Russia.

The Service is responsible for assuring that subsistence harvests are adequately managed, and it attempts to carry out that responsibility through a cooperative agreement with the Eskimo Walrus Commission. As described in the Marine Mammal Commission's 2008 "Review of Co-management Efforts in Alaska," the Commission supports and encourages this co-management effort. To be

complete in its review of existing regulatory mechanisms, the Service will need to work with the Eskimo Walrus Commission to address two key questions: (1) how many walruses are being taken, including hunting loss (i.e., walruses killed or seriously wounded during the hunt that are not secured by the hunters), and (2) does that level of take exceed the population's regenerative potential (i.e., is it sustainable).

At present, neither the co-management agreement nor any applicable regulations cap the total number of walruses that hunters may take in Alaska and, in practice, the total number of walruses killed is uncertain. Currently, takes are monitored by two methods: (1) observers at the two main walrus-hunting villages record catch levels during portions of the spring hunt and (2) hunters report the walruses they take and present the walrus ivory for tagging. Results from these two methods indicate harvest levels in Alaska from 2003 to 2007 of between 1,630 and 1,918 walruses per year. Reported annual Russian harvests averaged 1,247 animals in that same period, for a combined harvest of between 2,877 and 3,165 walruses per year. Add to that the estimated number of animals struck and lost, and the estimated number of Pacific walruses killed each year from 2003 to 2007 averaged between 4,963 and 5,460.

To judge the accuracy of these estimates, the Service will have to assess the completeness of reporting and the appropriateness of the adjustment for animals struck and lost. Indeed, the current tracking methods are subject to potential biases. For example, observer coverage is incomplete over time (i.e., involving only a portion of the harvest season) and space (i.e., involving only a portion of the region where walruses are harvested). Also, hunters may be reluctant to report their takes of walruses, particularly if the walruses were killed primarily for their ivory, which is a valuable commodity. The adjustment for animals struck and lost is based on data from the 1950s and 1960s and may no longer reflect current hunting practices and experience or the conditions under which hunting is taking place. In recent years, Native hunters have reported deterioration in spring hunting conditions, leading to an increase in hunting at sea where walruses that are shot are more difficult to recover. With regard to both of these topics, the Service's analysis should take into account circumstances and practices in Russia as well as in the United States.

To address the question of whether harvest levels are sustainable, the Service may wish to use the formula for calculating potential biological removal level under the Marine Mammal Protection Act. Although this formula was developed primarily to assess impacts on marine mammal populations from commercial fishing, it provides a basis for estimating what the minimum population size would have to be to sustain this level of subsistence hunting. If (1) the potential biological removal level is equal to the larger estimated average annual take between 2003 and 2007 (i.e., 5,460 walruses), (2) the population is not considered endangered (i.e., a recovery factor of 1.0 is applied), and (3) the maximum productivity rate is 8 percent, then the minimum population size would need to be at least 136,500 walruses to provide sufficient assurance that subsistence takes would allow the population to increase toward or remain at its optimum sustainable population level. However, the assumptions behind this calculation may not be valid. For example, under current environmental conditions, it seems unlikely that the walrus population could approach a net productivity rate of 8 percent. In fact, recent observations suggest that it is experiencing reduced productivity and its actual growth rate may be negative.

To respond to the listing petition, the Fish and Wildlife Service will have to evaluate whether the existing regulations for co-managing the walrus harvest are adequate in light of the described uncertainties and concerns. To make informed judgments regarding those matters, the Marine Mammal Commission recommends that the Fish and Wildlife Service work with the Eskimo Walrus Commission to include in the analysis of the listing petition (1) an estimate of the numbers of walruses being taken at present, including any potential biases in that estimate, (2) a review of the existing information on total population abundance, and (3) an assessment of whether current subsistence harvests are sustainable, keeping in mind the uncertainty in harvest (including hunting loss) and population numbers as well as the total walrus mortality from other human activities.

Other Natural or Manmade Factors Affecting Its Continued Existence

At the heart of the petition to list the Pacific walrus population is the question of whether the Fish and Wildlife Service will be able to manage all the human-related impacts on the population. Doing so in an informed manner will require an adequate description of the population's status. To date, the Service has not been able to provide such a description, despite a well-intentioned survey effort in 2006. Virtually all major management measures to protect this population are compromised by the lack of information about the population's size and trends. So too is the future opportunity for Alaska Natives to harvest walruses for subsistence purposes. To address this situation, the Marine Mammal Commission recommends that, in its status review, the Fish and Wildlife Service describe the possible consequences of having inadequate information on population status, the challenges that must be overcome to obtain the essential data and information, and the steps the Service plans to take to gather that data and information. Management efforts cannot be judged adequate and future conservation cannot be considered assured until the Service can reliably describe the population's status.

Finally, the Marine Mammal Commission was involved in early reviews of the 2006 survey strategy and recognizes the difficulty of the task that the Service faces in trying to develop a more robust strategy for estimating abundance and assessing the status of the Pacific walrus population and its changes over time. Please let me know if the Commission can be of assistance in considering ways to review assessment procedures.

The Commission hopes that its recommendations and comments are helpful. Please contact me if you have any questions.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director

Enclosure

Papers and Reports on Pacific Walruses
Resulting from Marine Mammal Commission-sponsored Activities

Fay, F. H. 1982. Ecology and biology of the Pacific walrus, *Odobenus rosmarus divergens* Illiger. U.S. Fish and Wildlife Service. North American Fauna, No. 74. 279 pp. (MMC contract MM1533576-0)

Fay, F. H. 1984. Walrus. Pages 264–269 *In* D. Macdonald (ed.). Encyclopedia of Mammals. Equinox Ltd., Oxford, England. (MMC contract MM1533576-0)

Fay, F. H. 1984. Foods of the Pacific walrus, winter and spring in the Bering Sea. Pages 81–88 *In* F. H. Fay and G. A. Fedoseev (eds.). Soviet-American cooperative research on marine mammals. Vol. I-Pinnipeds. NOAA Technical Report NMFS-12. (MMC contracts MM4AC005, MM4AC006, MM5AC024, MM8AC013, and MM1533576-0)

Fay, F. H. 1985. *Odobenus rosmarus*. Mammalian Species 238:17. (MMC contract MM1533576-0)

Fay, F. H., H. M. Feder, and S. W. Stoker. 1977. An estimation of the impact of the Pacific walrus population on its food resources in the Bering Sea. Final report for MMC contracts MM4AC006 and MM5AC024. NTIS PB-273 505. 38 pp.

Fay, F. H., B. P. Kelly, and B. A. Fay (eds.). 1990. The ecology and management of walrus populations—report of an international workshop. Final report for MMC contract T68108850. 186 pp.

Fay, F. H., B. P. Kelly, and J. L. Sease. 1989. Managing the exploitation of Pacific walruses: a tragedy of delayed response and poor communication. Marine Mammal Science 5(1):1–16. (MMC contracts MM4AC005, MM4AC006, MM5AC024, MM8AC013, and MM1533576-0)

Lentfer, J. W. (ed.). 1988. Selected marine mammals of Alaska: species accounts with research and management recommendations. Final report for MMC contract MM2910798-4. 275 pp.

Stoker, S. W. 1977. Report on a subtidal commercial clam fishery proposed for the Bering Sea. Final report for MMC contract MM7AD076. 33 pp.