3 January 2011

Rowan W. Gould, Ph.D.
Acting Director
U.S. Fish and Wildlife Service
1849 C Street, NW
Washington, DC 20240

Dear Dr. Gould:

Determining whether the Pacific walrus warrants listing as threatened or endangered under the Endangered Species Act is a difficult task, and the Marine Mammal Commission appreciates the Fish and Wildlife Service's important work on this matter. After consideration of the Service's May 2010 status review of the Pacific walrus and related literature, and after consultation with its Committee of Scientific Advisors on Marine Mammals, the Commission finds this to be a situation clouded by considerable uncertainty regarding both the effects of climate disruption on the walrus population and the effectiveness of human societies in addressing the factors disrupting the climate. Keeping in mind those sources of uncertainty, as well as changes recently observed in the population's distribution, behavior, condition, and survival, the Commission believes that the Pacific walrus population faces serious threats and that its management warrants a precautionary approach.

RECOMMENDATION

The Marine Mammal Commission recommends that the U.S. Fish and Wildlife Service propose to list the Pacific walrus as threatened under the Endangered Species Act.

RATIONALE

The Commission's recommendation is based on consideration of the five listing factors set forth by the Endangered Species Act.

Present or threatened destruction, modification, or curtailment of the species' habitat or range

Without question, the warming of the Arctic is destroying, modifying, and curtailing walrus habitat and will continue to do so in the foreseeable future. The loss of sea ice habitat is perhaps the most significant threat to the walrus population. As sea ice forms and recedes seasonally, it provides a moving platform that walruses use to gain access to foraging grounds and to rest between foraging bouts. It also provides a platform for females to give birth and nurse and care for their young, and it provides at least a partial refuge from predators.

Three aspects of the sea ice decline warrant special consideration. The first is the period over which the decline is expected to continue. Modeling studies conducted for the fourth assessment of the Intergovernmental Panel on Climate Change provide a compelling case that sea ice will continue to decline for the foreseeable future unless human societies are willing to take meaningful action to address the factors disrupting the climate. Those studies also indicate that, even if meaningful actions were taken soon, their effects would not be clearly evident until the latter half of this century

because of the lagged effects of greenhouse gases that already have been emitted and that will persist in the atmosphere for decades. Unfortunately, our political, social, and economic systems have not yet responded to the already strong evidence of climate disruption. Given that inertia, plus the fact that the underlying causes may worsen over time, the Marine Mammal Commission sees no basis for confidence that climate disruption and its effects on walrus habitat are being or soon will be brought under control.

Second, although sea ice will continue to form seasonally, it is already forming later in the fall/winter, receding earlier in the spring/summer, and providing diminishing access to important summer/fall foraging habitat as it recedes north of the shallow continental shelf. Its availability as a resting platform for foraging and reproduction and as a refuge from predation is diminishing and will continue to diminish over time. As the sea ice recedes, the open-water season is increasing and will continue to increase, forcing walruses to depend on foraging habitat that is accessible only from terrestrial haul-out sites. Because walruses do not have the stamina to remain at sea for long periods, they will be able to travel only limited distances from land, with those distances determining the boundaries of their reduced foraging base. In essence, large portions of their previous summer/fall foraging habitat will be inaccessible to them during the open-water season. Their concentration in smaller foraging areas likely will limit the prey available to them, reduce their foraging success, compromise their survival and reproduction, and thereby cause further reduction in their abundance.

Third, the loss of sea ice will likely change the physical characteristics of the marine ecosystem in ways that may be particularly detrimental to walruses. The shift to an open-water system in late summer and autumn could alter seasonal pulses of ocean productivity throughout their range and decrease nutrient input into the benthic communities that they depend upon for food. If, in fact, walruses become increasingly dependent upon land-based haul-out sites and their foraging range is correspondingly restricted, then a detrimental shift in the ecology of waters within range of those haul-outs could cause a further reduction in their foraging success. Walruses are known to consume some pelagic prey, and they exhibit a degree of plasticity in their prey selection; nonetheless, they depend heavily upon thriving benthic invertebrate communities, and changes to those communities could have a serious impact on them. The amount of sea ice formed in winter months will not matter if juveniles and adult females cannot sustain themselves and their young through the open-water season when they are dependent upon land-based haul-out sites. Observations of walruses hauled out on Russian shores in poor condition lend credence to the concern that habitat loss is an important threat to the persistence of this population.

Overutilization for commercial, subsistence, recreational, scientific or educational purposes

The only significant direct take of walruses by humans is for subsistence purposes, and that take occurs both in U.S. and Russian territories. If the population declines in response to climate disruption, current harvest levels may not be sustainable and, therefore, would pose an additional threat to the population. A reduction in harvest levels would be required, but in the United States this could lead to co-management conflict and would almost certainly lead to hardship for Alaska Native communities dependent on subsistence hunts. The Service's co-management agreements with the Eskimo Walrus Commission and the Qayassiq (Round Island) Walrus Commission (the

latter also involving the state of Alaska) would provide an important basis for negotiation of such matters. Nonetheless, the expected decline in walrus numbers and the need to increase their protection will likely result in conflicting views regarding the harvest, with the burden of management changes falling on Alaska Native communities. At present, the amount of influence that the United States has over the Russian harvest is not clear.

Uncertainty regarding the significance of the subsistence harvest as a threat to Pacific walruses is exacerbated by the fact that the Service is not able to provide a reliable estimate of walrus abundance (described later in this letter). At a minimum, an estimate of abundance is crucial for judging whether the take levels are sustainable. Furthermore, the Service must consider whether a population declining due to factors related to climate disruption has any tolerance for harvest. The two communities that account for most of the walrus harvest have taken initiative on this matter by imposing trip limits on hunters. However, trip limits affect the rate of take but do not necessarily restrict the total numbers taken. As population abundance declines, the Service—presumably working with the Eskimo Walrus Commission—will need to adopt stronger conservation measures, such as limiting the total take per season, limiting the take to males only, or even prohibiting take, either in certain areas or altogether. It also will be important for the Service to work with the subsistence communities to collect information on the population, such as the age, sex, reproductive state, contaminant loads, and health and physical condition of the walruses harvested. Such cooperation may be one of the most important and efficient ways of evaluating changes in the walrus population as climate disruption continues.

Diseases, parasites, and predation

Climate disruption is the primary threat to walruses, and our ability to protect the population will depend heavily on our willingness and ability to address the causative factors. However, the population also will be subject to possible secondary threats, including diseases, parasites and predation. Disease and parasitism are common to marine mammals, but they—like other organisms—may be particularly vulnerable to diseases to which they have not been exposed and to which they have not developed an appropriate immune response. In addition, the risks from novel diseases and parasites may be exacerbated if the walruses are in generally poor physical condition because of declines in their foraging range or success. Here again, efforts to assess changes in walrus health and condition will be enhanced significantly through cooperation between scientists and Alaska Native communities. However, it is not practical to treat walruses that are seriously inflicted with disease or parasites or in poor condition.

Predation also poses an increasing threat to the population as walruses are forced to haul out on land. For years, marine mammal ecologists have sought to explain the habitat-use patterns of those pinnipeds that haul out on land. The single most common observation is that they do not haul out in large numbers in areas where they or their offspring will be exposed to terrestrial predators. As walruses are forced to haul out on the shores of Alaska and Russia, they likely will become a target of large terrestrial predators, including polar bears, grizzly bears, and wolves. It may take some time for predators to adapt their foraging patterns to take advantage of the increased availability of walruses, but Russian scientists have already documented predation by polar bears on walruses that

have come ashore in poor condition. Such predation also has been documented for other walrus populations: polar bears prey on Atlantic walrus calves in mixed-herd haul-outs at Coates Island in northern Hudson Bay. In addition, predators may affect the population not only by killing individuals, but also by causing stampedes in which walruses, particularly calves and juveniles, are trampled to death. Finally, although scientists have focused much of their discussion on interactions with land-based predators, the loss of sea ice and the increasing confinement of walruses to open water also mean that they will be more exposed to killer whale predation. It remains to be seen whether such predation will become a significant threat to the population, but at this time that possibility cannot be ruled out.

Inadequacy of existing regulatory mechanisms

One of the more compelling reasons to list the Pacific walrus as threatened pertains to our limited ability to protect them from the physical, biological, and ecological changes that will result from disruption of the earth's climate. First and foremost, neither the United States nor any other nation has in place the kind of regulatory mechanisms needed to control the factors disrupting the climate. The measures that have been discussed and proposed have been limited in scope, would only begin to address the underlying factors, and have not been taken up on an appropriate scale by governments or societies. All past patterns indicate that the time frame for responding to climate disruption will be best measured in decades rather than years.

Adequate population assessments will be essential for guiding regulatory measures and, for the Pacific walrus, the time frame for assessment and protection also will be prolonged. The first major effort to census the population was in 1975. Thirty-five years later we still lack a reliable estimate of abundance and trends, despite an extensive effort to assess the population in 2006. The 2006 best estimate of 129,000 comes with 95 percent confidence limits that range broadly from 55,000 to 507,000. The estimate is known to be biased because the survey did not cover some areas. However, the Commission does not agree that 129,000 is necessarily a minimum estimate. Rather, the true abundance (N_T) is a function of the estimated abundance (N_E) plus or minus some error (E), plus the number of walruses in areas not surveyed (S); that is—

$$N_T = N_E \pm E + S$$

N_E is a minimum estimate of N_T only if E is positive or, if negative, smaller in magnitude than S. The clarification is important because, until the scientists responsible for assessment can characterize S and E, it is not possible to confirm with certainty that the population is at least 129,000.

This persistent uncertainty in status is now confounding and will continue to confound many aspects of management. For example, the uncertainty affects the estimation of the population's potential biological removal level or its tolerance for human-related serious injury and mortality. It will be an impediment when the Service is attempting to protect the walrus from any adverse effects of oil and gas development and, in the foreseeable future, it may affect measures to protect walruses from disturbance or other effects of increased commercial shipping and fishing. It

will also be an impediment whenever the Service attempts to ascertain the effectiveness of its protective measures.

In addition to the lack of basic knowledge of the population parameters essential for management, the Commission knows of no existing regulatory measures in place or proposed that will protect the walrus from the loss of sea ice habitat, the ensuing changes in the Arctic marine ecosystem, or the potential increase in disease, parasitism, and predation. For that reason, the Commission can only conclude that the current regulatory regime is not sufficient to deal with the range of significant threats facing this population now and in the foreseeable future.

Other natural or human factors affecting the species' continued existence

The changes occurring in the Arctic are opening the region to an increase in human activity that may lead to an additional and significant impact on walruses. Oil and gas development is already underway; commercial shipping has already increased in the open-water season; commercial fishing has been postponed but may be initiated if economically viable target stocks are identified; military activities will increase to provide security in both the U.S. and Russian Arctic; tourism already is increasing as cruise ships are able to ply Arctic waters; and coastal regions will be developed to support these and other activities. How walruses respond to all this new activity is difficult to judge, but increased activity is likely to lead to increased threat from disturbance, particularly in the open-water period and near terrestrial haul-out sites.

The conservation tools made available by a listing under the Endangered Species Act will be most useful during this period of increased industrial development and uncertainty regarding the impact of climate disruption on the Pacific walrus. The listing will enhance the Service's ability to shape the course of human activities and to limit potentially adverse effects by addressing threats in the early stages of Arctic development rather than once major activities are under way.

Finally, the Commission recognizes that walruses dependent on land-based haul-out sites have persisted in the past and are persisting at present. Nevertheless, this period of Arctic warming is likely different from any other that the Pacific walrus has experienced because the environmental changes are coupled with the rapid increase of human activities. Assumptions about the ability of walruses to adapt are just that—assumptions. They are useful for generating hypotheses about how these animals might respond, but they are not a basis for an informed, affirmative approach to management. Given that, one, the Service—and indeed all of us—will have little control over the response of walruses to climate disruption; two, the status of the population will remain uncertain for some time to come because scientists have not been able to provide a reliable estimate of population abundance or trends; three, the effects of climate disruption will be exacerbated by the effects of additional human activities; and four, our options for compensating for adverse effects are—and likely will continue to be—sorely limited, the Commission can only conclude that the best management options will be to address threats as soon as possible with the hope of preventing irreversible consequences.

After considering the threats to the Pacific walrus and the listing factors as set out by the Endangered Species Act, the Marine Mammal Commission recommends that the U.S. Fish and Wildlife Service propose to list the Pacific walrus as threatened under the Endangered Species Act.

Please contact me if you have questions regarding the Commission's recommendation or rationale or if the Commission can be of additional assistance as you deliberate the future of this population.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director