



MARINE MAMMAL COMMISSION

23 March 2011

Ms. Kaja Brix, Assistant Regional Administrator
Protected Resources Division, Alaska Region
National Marine Fisheries Service
P. O. Box 21668
Juneau, AK 99802-1668

Attn: Ellen Sebastian, re RIN 0648-XZ59

Dear Ms. Brix:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service's proposed rule and 12-month finding regarding a petition from the Center for Biological Diversity to list the arctic (*Phoca hispida hispida*)¹, Okhotsk (*Phoca hispida ochotensis*), Baltic (*Phoca hispida botnica*), and Ladoga (*Phoca hispida ladogensis*) subspecies of ringed seal under the Endangered Species Act (75 Fed. Reg. 77476). The Commission offers the following recommendations and rationale.

RECOMMENDATIONS

The Marine Mammal Commission recommends that the National Marine Fisheries Service—

- list the arctic ringed seal subspecies as threatened under the Endangered Species Act, but first determine if ringed seals in the Canadian Archipelago might be recognized as discrete and excluded from that listing based on projections of limited change in physical and ecological conditions in the Archipelago;
- list the Okhotsk ringed seal subspecies as threatened under the Endangered Species Act;
- re-evaluate the status and threats—both individual and cumulative—to the Baltic ringed seal subspecies and consider listing it as endangered;
- re-evaluate the status and threats—both individual and cumulative—to the Ladoga ringed seal subspecies and consider listing it as endangered;
- devise and implement a research plan to address the major uncertainties and programmatic shortcomings revealed in the status review, including a research budget that accounts for the priority needs;
- strengthen collaborative efforts among range states to (1) assess the status and trend of ringed seal populations throughout the species' range and (2) identify the need for protective measures where necessary;
- collaborate with the Alaska Native community to monitor abundance and distribution of ringed seals, and use seals taken in the subsistence harvest to obtain data on demography, body condition, reproductive status, seasonal movements, patterns of dispersal of young,

¹ The Society for Marine Mammalogy Committee on Taxonomy periodically updates the list of marine mammal species and subspecies. The Committee currently assigns the species and the four subspecies to the genus *Pusa*, not *Phoca*.

- fidelity of adults to breeding areas, population structure, disease and parasites, contaminant loads, and other pertinent topics; and
- continue investigating ringed seal population structure, especially that of the arctic subspecies.

The Commission considers the last four recommendations essential if management and conservation decisions and efforts are to be science-based, comprehensive, and sufficient to sustain healthy ringed seal populations.

RATIONALE

The Service began by identifying five ringed seal subspecies—arctic, Baltic, Okhotsk, Ladoga, and the endangered Saimaa ringed seal (*Phoca hispida saimensis*)—based primarily on their distinct geographic ranges. The Ladoga and Saimaa subspecies occupy lakes in Russia and Finland, respectively. The other three subspecies are marine.

The Service then examined the subspecies based on the five threat factors set forth in the Endangered Species Act. It concluded that the arctic, Baltic, Okhotsk, and Ladoga ringed seal subspecies are at risk of becoming endangered in the foreseeable future and therefore warrant a designation of threatened. It also re-affirmed the previous endangered listing of the Saimaa ringed seal.

The Commission generally concurs with the Service's findings because (1) the greatest risk to the ringed seal species is the ongoing, and predicted continuation of, loss of sea-ice habitat from climate disruption, (2) existing regulatory mechanisms in the United States and elsewhere are not adequate to address the factors driving climate disruption (i.e., greenhouse gas emissions), and (3) the resulting changes in arctic and sub-arctic climate will be accompanied by added risks associated with increasing human activities in many parts of the ringed seal's range (e.g., oil and gas development, fishing, shipping, and activities that result in the discharge of contaminants).

However, the Commission is not in complete agreement with the Service's findings, as is described in the following sections. First, we reiterate some of the more important background information on ringed seal natural history and climate change.

Background

Ringed seal natural history—As was well described by the Service in its *Federal Register* notice, the ringed seal's annual cycle can be characterized as consisting of three ecological periods: (1) the open-water foraging period, (2) the winter subnivean period when ringed seals rest and pup in ice

and snow-covered lairs² and later mate, and (3) the spring “basking period” when seals haul out onto ice to molt.

The winter subnivean period is especially important for ringed seals. They exhibit a unique strategy to protect vulnerable young from extreme cold temperatures and predation; that is, they excavate lairs after freeze-up in the fall. Their ability to do so depends upon climate, ice, snow, and ocean conditions, which also determine whether lairs persist intact through the pupping phase and relatively long nursing phase of reproduction. The lairs protect the newborn pups from exposure to extremely cold air temperatures, immersion in cold water, and predators. Reduced snow cover, excessive rain, warmer temperatures, or early ice break-up in the spring can all cause the lairs to deteriorate or collapse. In such situations, the young lose their protective cover and are at risk of hypothermia and/or predation. Studies cited in the Service’s *Federal Register* notice describe situations where such exposure has led to nearly 100 percent pup mortality from hypothermia and predators. Even when lairs remain intact, pups can freeze when snow cover is too thin to provide sufficient insulation.

The predators that take advantage of failed lairs include bears, foxes, and birds of prey. Indeed, ringed seals and polar bears (*Ursus maritimus*) have co-evolved to the extent that their life cycles, abundances, and patterns of productivity are tightly entwined. Ringed seal young-of-the-year are the most important energy source for polar bears and as ringed seal numbers decline or increase with changing food availability or environmental conditions, the productivity of polar bears varies accordingly (Stirling and Øritslund 1995). Similarly, polar bear predation increases with the deterioration of the ice that supports ringed seal birth lairs. Such predation may increase to unsustainable levels, leading to a decline in the number of seals followed by a corresponding decline in bears. Therefore, the quality of ringed seal lairs and their integrity through some critical period appear to be crucial features for the survival of their pups but also have broader ecological significance. For that reason, the Commission concurs with the Service that adequate snow for the creation of subnivean lairs, especially in spring when pups are born and nursed is a specific habitat requirement for ringed seals.

The basking period also is important and should not be overlooked. Ringed seals molt during in late spring to early summer, with some variability in relation to latitude. Molting is a vital process as the seals depend on healthy coats to help protect them from extremely cold air and water temperatures. The process is energy-intensive and the seasonal persistence of ice is vital because the ice provides a resting platform during the molt. The failure of ice in a molting area may mean that seals are forced to spend more time in the water, where they must expend more energy to maintain their body temperature, i.e., energy which then does not go to the production of a new coat. Thus, the projected loss of ice also poses a threat to molting ringed seals during the basking period.

² As mentioned in the Federal Register summary, the Okhotsk seals generally do not build subnivean lairs but instead give birth on the ice surface “sheltering in the lee of ice hummocks” (Fedoseev 1971, 1975). Apparently they also haul out regularly on land (Ognev 1962).

Finally, the seals also may face important consequences of climate change during the open water period. As the Arctic warms, the duration of the annual open water period will increase. This increase may result in significant changes to the arctic marine food web. For example, both ringed seals and sea birds (thick-billed murre) along the western coast of Hudson Bay have been forced to change their primary diets from arctic cod to sand lance and capelin because the epontic (under-ice) habitat of the cod disappears at progressively earlier times (Gaston et al. 2003). The occurrence and significance of such changes over time and space are uncertain. Nevertheless, changes of this nature cannot be ruled out as potentially significant.

Climate disruption—Decisions to list ringed seal subspecies will be controversial because two of the subspecies are numerous now and the primary threat to the species—the loss of sea ice—is already underway but not expected to be fully manifested for decades or longer. Thus, the consequences of decisions made and actions taken today will not necessarily be realized for a generation or longer. The basis of this delay is that the main driving factor—high levels of greenhouse gases—will persist in the atmosphere for decades. Indeed, the projections in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change indicate that there may be little that can be done to prevent the consequences of climate disruption between now and 2050. It is after 2050 that projections begin to diverge. Importantly, their divergence depends not on actions to be taken in or near 2050, but on actions taken now. The question before us, then, is whether we are willing to take the necessary steps now to prevent the extirpation of these subspecies throughout significant portions of their range, or we will wait for better evidence of decline, by which time fewer and perhaps no meaningful options for mitigation or remediation will be available. Indeed, this is the great dilemma that we face repeatedly in considering the consequences of climate disruption.

The arctic ringed seal

The arctic subspecies currently numbers in the millions. Despite this abundance, the Service's biological review team judged the risks of climate disruption to the arctic ringed seal to be moderate to high. Projections of ringed seal habitat indicate deteriorating conditions over time, including changes in winter precipitation, snow depth and persistence, and winter and spring air temperatures. Declining sea ice, and reductions in the sea-ice season, will reduce the area available for building lairs. Decreased snow cover will compromise the quality of the lairs. Warmer temperatures will shorten the time that the lairs provide protection. All of these factors will increase the exposure of ringed seals, especially pups, to increased predation and hypothermia. Modeling of climate and sea-ice patterns suggests this subspecies may be able to respond initially by shifting its distribution northward. But by the end of the century, loss of sea ice and decreasing snow depths will mean that conditions for building adequate lairs will no longer be reliably present in most of the subspecies' range. The current information is not sufficient to determine whether or to what extent ringed seal numbers might have declined already, but future declines are expected to be severe. The Service's review team concluded that the overall spatial structure of the ringed seal population "likely will be disrupted with rapid loss of habitat patches" and, on that basis, predicted that the subspecies likely will disappear from a substantial portion of its range.

The Commission generally agrees with the Service's assessment. But it also questions whether ringed seals in the Canadian Archipelago³ will suffer the same fate, or at least within the same time frame. The Service found the available information insufficient to separate the arctic subspecies into smaller distinct population segments. The Commission recognizes that the existing genetic, morphological, and demographic information may not be sufficient to identify discrete population units within the arctic subspecies. However, the Commission believes the existing information may be sufficient to recognize ringed seals in the Canadian Archipelago as discrete based on geographical and ecological considerations. The 1996 joint policy statement by the National Marine Fisheries Service and the Fish and Wildlife Service on recognizing distinct vertebrate populations (61 Fed. Reg. 4722) states that—

A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions:

1. It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation.
2. It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

Projections of sea ice and air temperature in the Arctic over the remainder of the century indicate that conditions in the Canadian Archipelago will not follow the pattern evident in other arctic regions. According to those projections, which extend to the end of the century, the Archipelago will remain cooler than surrounding areas and annual ice will persist throughout much of the year. If that is the case— and if that ice remains suitable as ringed seal habitat⁴—then, while arctic ringed seals may decline or be extirpated throughout much of their range, at least in the Archipelago, they may have a refuge. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service list the arctic ringed seal subspecies as threatened under the Endangered Species Act, but first determine if ringed seals in the Canadian Archipelago might be recognized as discrete and excluded from that listing based on projections of limited change in physical and ecological conditions in the Archipelago.

³ The most important areas to be included would be best determined on the basis of ice and snow projections. At present, the areas that may be most important to the ringed seal are those found north of the Foxe Basin/Hudson Bay complex and also north of the Northwest Passage from western Baffin Island to eastern Banks Island.

⁴ Whether the ice will, in fact, remain suitable is uncertain. Studies have already shown a marked reduction in multi-year ice throughout the Arctic, including the region in question. Any reductions in the suitability of the ice for building lairs could affect ringed seal reproductive success.

The Okhotsk Sea ringed seal

Like the arctic subspecies, the current population of the Okhotsk Sea ringed seal subspecies is relatively large, numbering in the hundreds of thousands. The Service's review team anticipates that this population will suffer all of the same types of problems as those expected for the arctic subspecies. The major difference in the two subspecies is that any attempt by ringed seals in the Okhotsk Sea to retreat to the north will be blocked by the continental land mass. Thus, the Okhotsk Sea subspecies may decline even sooner than the arctic subspecies. Given the severity of the predicted ecological changes from climate disruption, and the fact that little if anything can be done to address those changes short of reducing greenhouse gas emissions, the Marine Mammal Commission recommends that the National Marine Fisheries Service list the Okhotsk Sea ringed seal subspecies as threatened under the Endangered Species Act.

The Baltic Sea ringed seal

The Baltic Sea ringed seal population was severely reduced by hunting and predator-control harvests in the 20th century. It declined from an estimated minimum of about 180,000 seals in 1900, to 25,000 in the 1940s, and as low as 5,000 in the 1970s. At present, it is thought to number about 10,000. This subspecies is subject to a range of threats, including impaired fertility associated with pollutants and mortality in fishing gear. Like the Okhotsk Sea subspecies, these seals will be unable to adapt to climate disruption by extending their range northward as sea ice recedes. Although they do rest on land, the island or offshore reef haul-out sites used do not provide the snow and ice conditions required for ringed seal pupping and nursing. The threats to this subspecies place it at greater risk than the more numerous and wider-ranging arctic and Okhotsk subspecies and indicate that it is in danger of extinction throughout its range. For this reason the Marine Mammal Commission recommends that the National Marine Fisheries Service re-evaluate the status and threats—both individual and cumulative—to the Baltic ringed seal subspecies and consider listing it as endangered.

The Ladoga ringed seal

Like the endangered Saimaa ringed seal, the Ladoga ringed seal is greatly reduced from historical numbers (20,000 in the 1930s, 5,000 to 10,000 in the 1960s, and 3,000 to 5,000 today). The changes in ice and snow cover predicted for the entire range of the ringed seal species already are underway in Ladoga Lake. Field studies have documented deterioration of denning conditions in the northern portion of the lake since 1996. Snow cover and snowdrifts have decreased, and the walls of birth lairs have collapsed, leaving pups more vulnerable to predators (Medvedev and Sipilä 2010). Although only about a quarter of the seals den in the northern portion of the lake, this area is bound to become more important for reproduction as the southern ice fields diminish or disappear. Like the Saimaa and Baltic subspecies, the Ladoga ringed seal is subject to mortality in fishing gear, industrial pollution, and disturbance of summer haul-out areas. As denning conditions deteriorate, predation by canids and birds of prey will increase as will the vulnerability of pups to hypothermia. Thus, the Ladoga ringed seal subspecies, historically reduced by hunting for predator control, now

faces serious ongoing and emerging threats to its survival. For this reason, the Marine Mammal Commission recommends that the National Marine Fisheries Service re-evaluate the status and threats—both individual and cumulative—to the Ladoga ringed seal subspecies and consider listing it as endangered.

The need for additional, more collaborative research

Finally, determination of the status of ringed seals has been hampered by lack of information on the distribution, abundance, and population structure of the species. The Commission has four recommendations to address this problem. First, the Marine Mammal Commission recommends that the National Marine Fisheries Service devise and implement a research plan to address the major uncertainties and programmatic shortcomings revealed in the status review, including a research budget that accounts for the priority needs. The Commission would be pleased to assist the Service with this effort by providing information from the Commission's Valencia workshop on monitoring arctic marine mammal species. Second, because the ringed seal species occurs within the waters of several countries, the Commission recommends that the Service strengthen collaborative efforts among range states to (1) assess the status and trend of ringed seal populations throughout the species' range and (2) identify the need for protective measures where necessary. It could do so under the existing Agreement between the Government of the United States of America and the Government of the Russian Federation on Cooperation in the Field of Protection of the Environment and Natural Resources. It also could confer with the Department of State on how to further build discussions and collaboration with researchers and managers from all parts of the ringed seal's range. Third, because monitoring the behavior and habitat selection of this species is difficult logistically, the Commission recommends that the Service collaborate with the Alaska Native community to monitor abundance and distribution of ringed seals, and use seals taken in the subsistence harvest to obtain data on demography, body condition, reproductive status, seasonal movements, patterns of dispersal of young, fidelity of adults to breeding areas, disease and parasites, contaminant loads, and other pertinent topics. Subsistence harvests provide opportunities to collect valuable data on the seal population in many parts of its range while minimizing the logistical (and cost) burden. And fourth, to ensure that decisions regarding the ringed seal are based on adequate science, the Marine Mammal Commission recommends that the National Marine Fisheries Service continue investigating ringed seal population structure, especially that of the arctic subspecies. The Commission sees no alternative to these four recommendations if management and conservation decisions and efforts are to be science-based, comprehensive, and sufficient to sustain healthy ringed seal populations.

Finally, although the Commission considers the above-described listings to be warranted, it does not believe that the subsistence harvest of ringed seals in U.S. waters constitutes a significant risk factor for the arctic ringed seal subspecies. This subspecies is an important food and cultural resource for Alaska Natives and subsistence hunting does not pose a significant risk to the subspecies. Based on the best available scientific information and knowledge of traditional subsistence patterns, the Commission sees no basis for imposing any new restrictions on the subsistence harvest.

Ms. Kaja Brix
23 March 2011
Page 8

I hope these recommendations and comments are helpful. Please contact me if you have questions or need additional information.

Sincerely,



Timothy J. Ragen, Ph.D.
Executive Director

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