MARINE MAMMAL COMMISSION

2 July 2012

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Attn: Ellen Sebastian

Dear Mr. Kurland:

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 to delist the eastern stock (or distinct population segment) of Steller sea lions under the Endangered Species Act (77 Fed. Reg. 23209). The Commission provides the following recommendations and rationale.

RECOMMENDATION

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

- delist the eastern stock of Steller sea lions as a whole,
- recognize that Steller sea lions in the California Current ecosystem comprise a distinct population segment that has not yet met the delisting criteria throughout a significant portion of its range, and
- retain a threatened status for the California Current distinct population segment until such time that either it meets fully the criteria for delisting or the Service can insure that the slow growth and range retraction in California waters are not caused by the direct or indirect effects of human activities.

RATIONALE

To develop its recommendations the Commission relied primarily on the Service's proposed rule, the associated draft status review, the Revised Steller Sea Lion Recovery Plan (all available at http://alaskafisheries.noaa.gov/protectedresources/stellers/edps/status. htm), and the most recent (2011) stock assessment report (available at http://www.nmfs.noaa.gov/pr/sars/species.htm#otariids). The Commission believes that the Service should base its decision as to whether to delist the eastern stock of Steller sea lions on the status of the eastern stock as a whole and also on the status of potential units of conservation significance within the eastern stock. The key questions are—

(1) what is the status of the eastern stock as a whole,

(2) does the eastern stock contain any smaller units of conservation significance that might be recognized as distinct population segments, and

(3) if so, is any unit of conservation significance at risk of extinction throughout all or a significant portion of its range or likely to become so in the foreseeable future.

The eastern stock as a whole

Since 1997 the National Marine Fisheries Service has recognized as a separate eastern stock those Steller sea lions originating from and using rookeries and haulouts east of 144ºW longitude. The distinction is warranted on the basis of genetic, geographic, demographic, and morphologic information (Bickham et al. 1996, Loughlin 1997, Philips et al. 2009).

The recovery criteria for the eastern stock are set forth in the Revised Steller Sea Lion Recovery Plan. They include one biological criterion: the stock has increased at an average annual growth rate of 3 percent for 30 years. The Service's draft status review states—

> [T]he best available information indicates the eastern DPS [distinct population segment] has increased from an estimated 18,040 animals in 1979 (90% CI [confidence interval]: 14,076-24,761) to an estimated 63,488 animals in 2009 (90% CI: 53,082 - 80,497); thus an estimate of an overall rate of increase for the eastern DPS of 4.3% per year (90% confidence bounds of 1.99% – 7.33%, Figure 3.5.6). Moreover, given the observed data, the probability that the overall growth rate was >3.0% was 0.84 (NMML [National Marine Mammal Laboratory] 2012).

The Service acknowledged that the stock estimate for 1979 was based on counts in southeast Alaska only. In fact, count series of sea lions in different parts of their range vary in their length and year of origin, some extending more than 30 years and others falling short of that mark. The Service also noted that it based its trend analysis on the assumption that pups constitute a constant portion of the stock (i.e., non-pup numbers are estimated as a multiple of pup numbers.) Nonetheless, the growth in Steller sea lion numbers in the various parts of the eastern stock's range (illustrated graphically in Figures 3.5.1, 3.5.4, 3.5.5, and 3.5.6 of the status review) presents compelling support for recovery for the stock as a whole. Historical evidence indicates that the stock declined because of shooting or "predator control" and Steller sea lion numbers have increased steadily since they were protected in 1970 under Canada's Fisheries Act and in 1972 under the U.S. Marine Mammal Protection Act.

The Revised Steller Sea Lion Recovery Plan also cites the five listing/delisting factors set forth in the Endangered Species Act. They include—

(A) the present or threatened destruction, modification, or curtailment of the species' habitat or range;
(B) overutilization for commercial, recreational, scientific, or educational purposes;
(C) disease or predation;
(D) the inadequacy of existing regulatory mechanisms; or

(E) other natural or manmade factors affecting the species' continued existence.

With regard to the first delisting factor, climate-related habitat degradation is one of the leading hypotheses to explain the loss of Steller sea lion rookeries in California. That is, Steller sea lions may be shifting their distribution northward as climate disruption warms and otherwise alters the marine ecosystem off California. Anecdotal reports also indicate such a change is occurring at the northern edge of Steller sea lion distribution, with sea lions being observed in larger numbers in the northern reaches of the Bering Sea. If this hypothesis is true, then it may well be that, over time, Steller sea lions will continue to shift their distribution northward. The end result may or may not increase the risk of extinction to the sea lions depending on whether the essential elements of their habitat shift with them or already occur in the new areas they occupy. The other hypotheses put forward to explain the loss of habitat in California waters include interactions with human activities and competition with California sea lions. Although these are reasonable hypotheses, the available information is not sufficient to make a strong case for or against either of them.

With regard to the second delisting factor, the eastern stock of Steller sea lions is not used to any significant degree for commercial, recreational, scientific, or educational purposes and these types of activities are not known to pose a significant risk to the population. In Alaska they are killed for subsistence purposes and the best available information indicates a total annual harvest (including those shot but not recovered) from the eastern stock (U.S. waters only) of about a dozen sea lions. Regarding the third delisting factor, the eastern stock is exposed to a variety of diseases (as are all marine mammal populations) and the physical changes occurring in marine ecosystems (e.g., rising water temperatures) may increase the risk of disease if sea lions are newly exposed to pathogens or parasites that themselves may have expanded their range. The evidence to date does not reveal any such cases, but exposure to new pathogens is difficult to detect and often manifested in episodic disease events that are, by their very nature, difficult to predict beforehand and diagnose afterward. Steller sea lions in the eastern stock are preyed upon by transient killer whales and large sharks. The significance of killer whale predation on the western stock of Steller sea lions (i.e., its role as a factor that has contributed to its decline or is impeding its recovery) is controversial, but this is not the case for the eastern stock. Predation is likely to be an important factor influencing the dynamics of the eastern stock, but the existing information does not indicate that the influence of predation has increased or changed in any significant way.

With regard to the fourth delisting factor, existing regulations may or may not be adequate or, if adequate in concept or principle, may not be implemented effectively. Factors that may affect the abundance of the eastern stock include disturbance and shooting, bycatch in fisheries, entanglement in debris, introduction of contaminants into marine ecosystems, and subsistence harvests. The 2011 stock assessment report for the eastern stock estimates the potential biological removal level at 2,378 sea lions. It estimates the total annual human-related take as 48.7 sea lions (33.5 [fisheries] + 12 [subsistence] + 1.8 [research] + 0.6 [gunshot] + 0.4 [Bonneville Dam] + 0.4 [vessel strike]). Fisheries take may be underestimated because some fisheries that potentially injure or kill sea lions are not observed, an example of inadequate implementation. Estimates of sea lion takes for subsistence purposes have been debated because they depend on annual surveys of hunters rather than contemporaneous reports, but the numbers reported are sufficiently low that the error should not be substantial. The number of Steller sea lions found with bullet wounds is small (fewer

than a dozen), but the probability of detecting animals that have been shot is likely very small. Before Canadian authorities designated the Steller sea lion as a Species of Special Concern (2003), they issued special permits that allowed the shooting of about four dozen sea lions annually in British Columbian waters to remove them from the vicinity of mariculture operations. The number dying from entanglement in debris is unknown. The recovery plan notes that "the extent [of deaths from entanglement] is unknown and may range from a fraction of a percentage to several percent a year." Raum-Suryan et al. (2009) estimated an entanglement rate of 0.26 percent for sea lions in southeast Alaska and British Columbia. If that rate is accurate and applies to the entire population, and if the current abundance is on the order of 58,000 to 72,000 (as reported in the stock assessment report), then at any given time some 150 to 200 sea lions are entangled in debris. Of those, an unknown fraction will shed the debris, others will remain entangled for multiple years, and some will die from related wounds or an inability to forage or avoid predators. The probabilities of those specific outcomes are unknown.

The Commission is not aware of any other major threats to the eastern stock of Steller sea lions. The total extent of human-related serious injury and mortality is likely well below the potential biological removal level. Whether it is less than 10 percent of that level (and hence could be considered negligible) is less certain because the various estimates used to calculate the total take are biased low. Nonetheless, the population growth observed over the past three decades provides strong empirical evidence that the eastern stock as a whole has met the biological recovery goal set forth in the recovery plan and delisting appears to be consistent with the five delisting factors in the Endangered Species Act.

Smaller units of conservation within the eastern stock

In addition to considering the stock as a whole, the status review should consider whether any grouping of sea lions within the eastern stock also might warrant recognition as a distinct population segment for listing purposes.

The eastern stock occupies two major ecosystems formed as the North Pacific Current approaches western North America and splits into the Alaskan Current flowing northward and the California Current flowing southward. Undoubtedly, these ecosystems are related by virtue of their origin and they have a number of common characteristics and species. But they also have long been recognized as distinct (e.g., http://www.lme.noaa.gov/) and, in the Commission's view, rightly so. In accordance with the Service's policy on distinct population segments (61 Fed. Reg. 4722), the Service should consider whether the portions of the eastern stock of Steller sea lions that occupy the Alaska Current and California Current ecosystems are sufficiently discrete and significant and, if so, whether their status is such that one or both of them warrant listing.

Discreteness: The Service's policy establishes two conditions as criteria for discreteness. A population is considered discrete if—

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.

Steller sea lions found in waters of the Alaska Current certainly are separated from those in the California Current. The major currents and ecosystems differ and Steller sea lions have no rookeries from northern Vancouver Island to southern Oregon. Indeed, the only Steller sea lions in the waters off the lower 48 states are those occurring in the California Current ecosystem. Thus, they are separated from the remainder of the eastern stock by large ecosystem structure, geography, and ecology. The distinction is sharpened by the international boundary between the United States and Canada, and the fact that the management approaches of the two countries may differ significantly on measures related to such things as predator control.

Significance: The Service's policy determines the significance of a potential distinct population segment based on any one of the following four criteria—

1. Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon,
2. Evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon,
3. Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range, or
4. Evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

Here, the first two criteria apply. Both the Alaska Current and California Current populations occur in ecological settings unique for the Steller sea lion species and the loss of either of them would result in a significant gap in their range (Alaska Current population) or a significant curtailment of their range (California Current population). Congress instructed the Services to use distinct population segments "sparingly," but surely the entire range of the Steller sea lion species off the Pacific west coast (lower 48 states) warrants description as significant. To lose Steller sea lions along this coast would substantially diminish the California Current ecosystem through loss of a high-level predator. A similar argument could be made for the Alaska Current population, as loss of those sea lions would greatly diminish that ecosystem from the U.S.–Canadian border to the northern edge of the eastern stock's range near Prince William Sound, Alaska.

Status: The third element of a distinct population segment is conservation status—that is, does the unit of conservation significance under consideration warrant listing as threatened or endangered. Specifically, the Service's policy states—

If a population segment is discrete and significant (i.e., it is a distinct population

> segment) its evaluation for endangered or threatened status will be based on the [Endangered Species] Act's definitions of those terms and a review of the factors enumerated in section 4(a) [of the Act]. It may be appropriate to assign different classifications to different DPS's of the same vertebrate taxon.

If the Service recognizes the Alaska Current and California Current populations as discrete and significant, then it needs to determine if either is either endangered, or likely to become so in the foreseeable future, "throughout all or a significant portion of its range." This is where an analysis of the two populations diverges.

Alaska Current ecosystem: In the waters off both British Columbia and southeast Alaska, the Alaska Current population has grown substantially. For the southeast Alaska population the draft status review reports a growth rate of 3.6 percent per year from 1979 to 2009. For the British Columbia population the report states that—

> [P]up production increased from a count of 941 in 1971 to 4,118 in 2006, an increase that would be about 3.9% per year if the increase had been steady (Table 3.5.3). However, DFOC [Department of Fisheries and Oceans Canada] (2008:5) clarified that, like non-pup numbers, pup production was stable until the mid-1980s "but subsequently increased at 7.9% per annum."

The draft report used the increase in pup production as evidence that the Steller sea lion population has shown "strong growth and recovery in British Columbia for 30 years or longer (Table 3.5.3; Figure 3.5.1.b)." Altogether, the evidence provides substantial support for the conclusion that the eastern stock has recovered throughout the portion of its range within the Alaska Current ecosystem.

California Current ecosystem: The evidence for recovery of the portion of the eastern stock in the California Current ecosystem is not so compelling. Figure 3.5.4 in the draft status report illustrates strong growth in Washington waters (no active rookeries), but the data cover only the last two decades. Figures 3.5.1 (pups) and 3.5.5 (nonpups) illustrate strong growth in Oregon over at least three decades, but Figure 3.5.1 indicates slow growth in California waters and here, too, the data cover a period of about two decades only. When coupled with the loss of rookeries at San Miguel Island and Seal Rocks and nearly complete loss of the Farallon Islands rookery, the evidence for recovery in the California portion of the Steller sea lion's range falls short of meeting the biological criterion for the eastern stock—a demonstrated average annual growth rate of at least 3 percent over a 30-year period.

The explanation for this loss of rookeries and slower growth is not clear. As noted previously in this letter, the Service's draft status review suggests three hypotheses: competition with the recovering population of California sea lions, interactions with other human activities, and ecosystem changes caused by climate disruption. If the decline of Steller sea lions in California waters was indeed caused by competition with the California sea lion population, then one could make a reasonable argument that the Steller sea lion decline is a natural phenomenon not warranting the special protections provided by the Endangered Species Act. On the other hand, one could

make a strong argument for such protections if the cause is related to human impacts, whether directly through human activities or indirectly through the effects of human-driven climate disruption.

The question, then, is how to proceed in the face of such uncertainty. Here, the Commission believes that, as the agency with primary responsibility for Steller sea lion protection and conservation, the Service should take a precautionary approach until such time as it has the data sufficient to ensure that (1) Steller sea lions in California waters either have recovered or (2) their range retraction is the result of natural causes. This approach is essential if management of Steller sea lions is to be science-based. Given the present lack of information, any approach short of that could unwittingly contribute to further human-related retraction of the species along the U.S. west coast.

A way forward

Based on the preceding analysis, the Marine Mammal Commission recommends that the National Marine Fisheries Service—

- delist the eastern stock of Steller sea lions as a whole,
- recognize that Steller sea lions in the California Current ecosystem comprise a distinct population segment that has not yet met the delisting criteria throughout a significant portion of its range, and
- retain a threatened status for the California Current distinct population segment until such time that either it meets fully the criteria for delisting or the Service can ensure that the slow growth and range retraction in California waters are not caused by the direct or indirect effects of human activities.

Please contact me if you have questions about the Commission's recommendations.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director

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