



MARINE MAMMAL COMMISSION

4 February 2013

Samuel D. Rauch, III
Acting Administrator for Fisheries
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910

Dear Mr. Rauch:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service's 27 November 2012 notice (77 Fed. Reg. 70733) announcing a 90-day finding on a petition to delist the southern resident killer whale (*Orcinus orca*) as an endangered species under the Endangered Species Act. The Commission also has reviewed the 1 August 2012 petition submitted by the Pacific Legal Foundation to request the review. The Service found that the petitioned action "may be warranted" and is requesting information to assist it in conducting a status review of the species. As discussed below, the Commission disagrees with many of the petitioner's claims and with the Service's conclusion that the petition presents substantial scientific or commercial information indicating that a delisting action may be warranted.

RECOMMENDATION

The Marine Mammal Commission recommends that, consistent with agency precedent and applicable case law, the National Marine Fisheries Service interpret the Endangered Species Act's definition of "species" to include distinct population segments of both species and subspecies. The Commission further recommends that, in this period of sorely limited resources, the Service (1) reverse its initial determination that the petition presents sufficient new information to warrant a review of the listing status of the southern resident killer whale population and (2) redirect the resources that would be required for such a review toward needed research and recovery activities.

RATIONALE

Listing a distinct population segment of a subspecies

The heart of the petitioner's request is its claim that the southern resident killer whale does not qualify as a distinct population segment of a species and therefore is not eligible for listing under the Endangered Species Act. Specifically, the petitioner contends that the Act allows the listing of species, subspecies, and distinct population segments of species, but not the listing of distinct population segments of subspecies. The petitioner identifies two possible interpretations of the statutory definition of a "species" under which a distinct population segment of a subspecies would fit within that definition and be eligible for listing. First, because a subspecies is considered a species for purposes of the definition, it also should be considered a species when applying the "distinct population segment" portion of the definition. That is, because a subspecies qualifies as a species, a distinct population segment of a subspecies also fits within the statutory definition. Second, because

a subspecies, by definition, is a sub-unit of a species, any distinct population of a subspecies also may be considered as a distinct population segment of a species if it meets the criteria.

The petitioner then attempts to discount these interpretations as inconsistent with the Act's "plain meaning" of "species" as defined in the Act. However, the fact that the petitioner must devote seven pages of analysis to that argument belies the assertion that the statute is clear on its face. In fact, the statute is ambiguous regarding the question of whether a distinct population segment of a subspecies qualifies as a species and is eligible for listing. Because the definition is ambiguous, the petitioner is incorrect in applying the first part of the standard of review set forth in *Chevron U.S.A. v. Natural Resources Defense Council*, which states that "[i]f the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency must give effect to the unambiguously expressed intent of Congress." Rather, in this instance, the Service should be employing the second prong of the *Chevron* analysis—"if the statute is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency's answer is based on a permissible construction of the statute." Although the petitioners may disagree, the Service's determination—that southern resident killer whales constitute a distinct population segment that qualifies for listing—is a permissible interpretation of the Endangered Species Act and should be afforded deference by a reviewing court.

Importantly, the Service's interpretation comports with that of the Fish and Wildlife Service, which shares responsibility for implementing the Endangered Species Act. In addition, this particular issue arose in *Sierra Forest Products v. Kempthorne*, a 2008 case in which the plaintiffs challenged the Fish and Wildlife Service's decision to place a distinct population segment of the Pacific fisher on the candidate species list as warranted, but precluded by higher priority listing actions. The plaintiffs argued that the Service's action was illegal because the Act did not authorize the listing of a distinct population of a subspecies. The court ultimately ruled that the administrative record was sufficient to show that the Service had treated the population segment as being part of the species. However, the court also addressed the question of listing distinct population segments of subspecies. In this regard, the court stated that—

even assuming for the sake of argument that the Service had found the West Coast DPS of the [Pacific] fisher to be a DPS of a subspecies, this would have been a permissible agency action insofar as the Service is authorized to list a DPS of a subspecies on the Candidate Species List. See Center for Biological Diversity v. United States Fish & Wildlife Service, 2008 WL 1776455, *2 n. 5 (9th Cir. 2008) (concluding that the Service's interpretation of the ESA to allow listing of a DPS of a subspecies is entitled to deference because it is a permissible construction of the ESA).

Clearly, the Endangered Species Act provides sufficient latitude for the Service to list a distinct population of killer whales as endangered or threatened regardless of whether that segment is viewed as being part of the overall species or part of a subspecies. The Marine Mammal Commission therefore recommends that, consistent with agency precedent and applicable case law, the National Marine Fisheries Service interpret the Endangered Species Act's definition of "species" to include distinct population segments of both species and subspecies.

The southern resident killer whale population as a distinct population segment

The petitioner then argues that the southern resident killer whale population does not constitute a distinct population segment. In fact, the Service has previously determined the opposite after substantial review, analysis, and debate of the best scientific and commercial information available (Krahn et al. 2002, Krahn et al. 2004, 70 Fed. Reg. 69903).

Research around the world has identified the existence of multiple, geographically distinct populations of killer whales that have unique combinations of behavioral and ecological traits (de Bryun et al. 2013). Two of the best known of those “ecotypes” are the “resident” and “transient” killer whales of the North Pacific; a third “offshore” ecotype also occurs in the North Pacific. After reviewing the analyses and conclusions of the 2002 status review, together with new information available after 2002, the 2004 biological review team concluded that North Pacific resident killer whales constitute a putative subspecies based on distinctive differences in external morphology, skull shape, distribution, feeding specialization, acoustic dialects, and genetics. This conclusion was based in part on the results of a workshop focused on the taxonomy of cetaceans, at which “a majority of participants felt that Resident- and Transient-type killer whales in the ENP [eastern North Pacific] probably merit at least subspecies status...” (Reeves et al. 2004).

The petitioner argues that the available genetic data do not support subspecies status for North Pacific resident killer whales and, by extension, that they do not support status as a distinct population segment for southern resident killer whales. The petitioner cites an analysis of genetic data from several populations of killer whales in the North Pacific by Pilot et al. (2010). Unlike previous studies (e.g., Hoelzel et al. 2007), which had found little or no evidence of genetic interchange between resident and transient killer whales in the North Pacific, Pilot et al. (2010) documented the apparent movement of one individual from a transient pod to an offshore pod, the presence of three putative offspring of inter-ecotype matings, and apparently recent inter-population gene flow within ecotypes, albeit at low rates. The petitioner interprets these findings, which were not available at the time that southern resident killer whales were listed, as evidence of genetic interchange among ecotypes and populations. According to the petitioner, such interchange is not consistent with the genetic isolation of the ecotypes and, therefore, is not consistent with the treatment of North Pacific resident killer whales as a putative subspecies.

The Commission believes that the petitioner’s arguments are incorrect and inconsistent. First, the migration of an individual from one ecotype to another creates the potential for gene flow, but is not proof of it. Proof would require demonstration of mating and production of an offspring capable of successfully producing its own offspring. Second, although Pilot et al. (2010) found evidence of inter-ecotype mating, none of the three cases involved North Pacific resident killer whales. Third, the occurrence of what appears to be some mating between individuals from different populations within the putative subspecies is not germane to the questions as to whether and to what degree the subspecies itself is genetically isolated. Fourth, gene flow between subspecies is not inconsistent with their designation as such. Indeed, low levels of gene flow between subspecies that are not geographically isolated, as is the case for the North Pacific killer whale ecotypes, may be expected. Reeves et al. (2004) wrote “the subspecies concept should be understood to embrace

groups of organisms that appear to have been on independent evolutionary trajectories (with minor continuing gene flow), as demonstrated by morphological evidence or at least one line of genetic evidence.” That is, Reeves et al. (2004) assert that minor continuing gene flow does not preclude two groups from being on independent evolutionary trajectories and therefore recognized as separate subspecies. Complete genetic isolation is only expected between species, although even then occasional genetic interchange can occur without calling into question their status as species (e.g., mating between polar bears and grizzly bears). Fifth—and related to the preceding point—the petitioner implies that complete genetic isolation also is required to satisfy the “discreteness” criterion for designation of a distinct population segment, but that assertion is not consistent with the accepted guidelines. The guidelines established by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (61 Fed. Reg. 4722) state that “[q]uantitative measures of genetic ... discontinuity may provide evidence of ... separation,” but that a population may satisfy the discreteness criterion if it “is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors.” Finally, the petitioner argues that there is no evidence that the behavioral and ecological differences between ecotypes and populations within ecotypes have a genetic basis and that those differences are more likely the result of learning and cultural transmission. Here, the petitioner implies that the lack of a genetic basis for the differences is not consistent with genetic isolation or designation as a subspecies or distinct population segment. To the Commission’s knowledge, no studies have been done to determine the basis for the behavioral and ecological differences, so it is not possible to determine what influence genetics may have in determining those differences. However, the petitioner’s argument fails to recognize that behavioral and ecological differences can themselves result in reproductive isolation, which may increase over time as genetic differences accumulate from other processes (e.g., genetic drift), possibly leading to speciation (Riesch et al. 2012).

The petitioner’s argument also does not address other important contributions in the scientific literature. Several studies of the genetics of killer whale populations, in addition to Pilot et al. (2010), have been published since the 2005 listing of southern resident killer whales. More than one study has shown that North Pacific resident killer whales are genetically distinct from North Pacific transient killer whales, based on an analysis of mitochondrial DNA, and that they belong to separate global genetic clades. The portion of the mitochondrial genome that typically has been analyzed (the control region) shows low diversity in killer whales, resulting in relatively low power to resolve phylogenetic relationships. However, a recent analysis of the entire mitochondrial genome of killer whales has reinforced the view that several of the ecotypes identified around the world have been isolated for hundreds of thousands of years and that North Pacific resident and transient killer whales diverged between 150 and 700 thousand years ago (Morin et al. 2010). The authors of this study concluded that the behavioral, morphological, and genetic differences between or among ecotypes support “the recognition of [the ecotypes] as separately evolving metapopulation lineages, and the elevation of three [ecotypes] to species, and several others to subspecies status.” They recommend the designation of transient killer whales as a separate species and North Pacific resident killer whales as a subspecies pending the collection of additional genetic data. Although the Pilot et al. (2010) data suggest that further research is needed before a consensus is reached regarding the specific taxonomic status of North Pacific resident killer whales, their findings are not sufficient to refute the treatment of North Pacific resident killer whales as a putative subspecies or the designation of the southern resident killer whales as a distinct population segment.

The analysis of nuclear DNA by Pilot et al. (2010) did detect apparent mating between individuals of different ecotypes, as well as one potential mating between populations within the North Pacific resident killer whale ecotype, namely between a whale from the Russia population and a whale from the Alaska and Bering Sea population. However, the data presented in Pilot et al. (2010) do not provide conclusive evidence of recent mating between southern resident killer whales and those other resident populations, or between resident killer whales and any of the other regional ecotypes. Another study of nuclear DNA found no evidence of mating between male northern resident killer whales (or males from any other population) and female southern resident killer whales (Ford et al. 2011). Further, Ford et al. (2011) pointed out that the frequency of apparent inter-population mating reported by Pilot et al. (2010) is too high to be compatible with other estimates of genetic differentiation and gene flow between these populations (e.g., Hoelzel et al. 2007). Moreover, Pilot et al. (2010) appear to have used unusually liberal criteria to assign parentage based on genetic data (P.A. Morin, pers. comm.). In a recent nuclear-DNA analysis of many more individuals and loci than were used in Pilot et al. (2010), Parsons et al. (in review) found that any tendency for individuals from North Pacific resident and transient ecotypes to cluster together, as was the case in the Pilot et al. (2010) study, completely disappeared when more nuclear loci were used and incomplete composite genotypes were removed from the analysis. The Parsons et al. study found that “[e]stimates of genetic distance between the two predominant North Pacific ecotypes [residents and transients] indicate negligible levels of gene flow.”

Given the strong evidence for evolutionary divergence between the North Pacific resident killer whale ecotype and other killer whale ecotypes (Morin et al. 2010) and the lack of evidence for recent genetic exchange between North Pacific resident killer whales and other ecotypes in the North Pacific (Pilot et al. 2010), the Commission finds no basis for the petitioner’s assertion that North Pacific resident killer whales are not a genetically distinct group. Indeed, Morin et al. (2010) suggested elevating them to subspecies status. Furthermore, the Commission does not believe that the results of Pilot et al. (2010) are necessarily inconsistent with recognition of southern resident killer whales as a distinct population segment.

For all these reasons, the Commission does not agree with the Service’s conclusion that the petition presents substantial scientific or commercial information indicating that a delisting action may be warranted. Furthermore, the Commission questions the use of the Service’s very limited resources for the purpose of further considering this issue. Those resources could be used much more productively to investigate and manage the factors that may be preventing recovery of the population. For that reason, the Marine Mammal Commission recommends that the National Marine Fisheries Service (1) reverse its initial determination that the petition presents sufficient new information to warrant a review of the listing status of the southern resident killer whale population and (2) redirect the resources that would be required for such a review toward needed research and recovery activities.

The Commission hopes these comments are useful. Please contact me if you have any questions about them.

Sincerely,



Timothy J. Ragen, Ph.D.
Executive Director

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