

MARINE MAMMAL COMMISSION
4340 EAST-WEST HIGHWAY, ROOM 905
BETHESDA, MD 20814

2 March 2007

Mr. Garth Griffin, Chief
Protected Resources Division
National Marine Fisheries Service
1201 NE Lloyd Boulevard., Suite 1100
Portland, OR 97232

Dear Mr. Griffin:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service's proposed recovery plan for the southern resident stock of killer whales (*Orcinus orca*). The Service has done a commendable job of assessing the status of the stock, evaluating factors that are likely to impede recovery, proposing recovery measures to address those factors, and identifying research activities necessary to inform and support recovery measures. The recommendations and comments that follow are intended to support the proposed recovery plan.

RECOMMENDATIONS

Based on its review of the proposed recovery plan for the southern resident stock of killer whales, the Marine Mammal Commission recommends that the National Marine Fisheries Service—

- revise the delisting and downlisting criteria to be more explicit and measurable;
- revise biological criterion 2 to be more precautionary with respect to numbers of reproductive males and females that would be required before consideration of downlisting or delisting;
- assign high priority to monitoring of population status in view of its importance for detecting changes in status, evaluating threats, and assessing the effectiveness of recovery actions;
- also assign high priority to monitoring and evaluation of the effectiveness of recovery actions; and
- clarify the relationships among specific delisting or downlisting criteria, recovery measures, and research and monitoring activities to ensure internal consistency in the recovery program.

RATIONALE

Delisting and downlisting criteria

The logic behind the proposed delisting and downlisting criteria is generally well developed. However, in a number of cases, the criteria would be improved by making them as explicit, measurable, and reliable as possible.

Certain criteria could be improved by specifying the period of time involved in their measurement. For example, the fourth bullet under biological delisting criterion 2 requiring “no significant increase in mortality rate for any sex or age class” and threats delisting criteria A.1, A.3, and D.3 should be clarified to indicate the relevant time frame for the observations, including collection of baseline information. For example, it would be useful to indicate if mortality would have to be monitored for 1 year, 5 years, 10 years, or some other time period before a finding of no significant impact could be reached. In this case, it might also be useful to indicate what constitutes a “significant” increase in mortality. In the same manner, it would be helpful to indicate the period of consideration for whale-watching impacts (e.g., a year, a decade) and how those impacts would be measured (e.g., number of vessels, noise levels, changes in behavior or distribution).

Similarly, delisting criterion B.2 should be clarified to indicate the amount of time that would have to elapse since the last removal or human-caused death before the southern resident stock could be considered for delisting. For example, would a year without a death be sufficient, or 10 years, and so on? In this regard, it is worth noting that ship strikes were implicated in the deaths of two southern resident killer whales in 2006. Presumably those deaths would fall under “other activities” and thus be considered under criterion B.2.

Other proposed criteria are not sufficiently measurable to be useful for indicating when delisting or downlisting should occur. For example, threats delisting criteria A.2, C.1, and E.5 all refer to “knowledge” as a requirement for recovery, but it is not clear how knowledge would be assessed or measured to determine that it was sufficient to consider the population for delisting or downlisting. An example of specific knowledge related to foraging might be determination of foraging patterns when the whales are outside of Puget Sound. Examples of possible measures for assessing disease might be gained from stranded animals or from photo-based assessment of animal condition. Similarly, criteria A.3 and D.3 both indicate a need for reduction in impacts, but it is not clear how much reduction is necessary. For example, would any reduction suffice or would a reduction need to be of sufficient magnitude to allow recovery?

Both threats-based downlisting criteria 1 and 2 are vague and leave too much room for interpretation. Here, too, it is not clear how “understanding” or “progress” will be measured or what level of “improvement” or “progress” will be necessary to merit downlisting. Without clarification of these criteria, it seems quite likely that downlisting decisions will be made solely on the biological criteria without consideration of potential threats to the population.

A number of delisting criteria require that management and research actions are effective, but it is not clear how effectiveness will be measured. Examples include criterion A.2, which seems to focus on the need for effective ecosystem-based fisheries management, A.4, B.1, E.1, E.2, and E.4. These criteria all could be revised or clarified to provide explicit measures of effectiveness. For oil spills, for example, effectiveness might be judged based on written plans, coordination meetings among respondents, stockpiling of response supplies and equipment, conducting drill exercises, identification of key habitat areas and development of measures to protect them, and so on. Efforts to assess the effectiveness of management actions also should take into account likely future conditions to ensure that they are up to the task.

Finally, delisting criterion E.1 was not clear to us. The plan should be modified to clarify what is meant by “oil spill response plan wildlife brand section of NWACP.”

Although we believe that the delisting and downlisting criteria are comprehensive with regard to topics covered, we also believe they could be made more explicit and measurable. For that reason, the Marine Mammal Commission recommends that the delisting and downlisting criteria be revised accordingly.

Demographic considerations

Delisting and downlisting criteria also need to be reliable indicators of recovery. We question whether demographic criterion 2 reflects sufficient recovery for downlisting or delisting. Our concern is focused particularly on the number of males per pod. Mate selection by southern resident killer whales appears to follow the pattern exhibited by northern resident whales: mating only occurs between and not within matrilineal pods (e.g., a male from J pod would not mate with females from J pod but would mate with females from K or L pods). This behavior is thought to reduce the potential deleterious effects of inbreeding. However such effects could still accrue if very few reproductive males or females were present in one or more pods. For example, in recent years J and K pods each have had only one reproductive male; as a result, all the reproductive females from L pod were able to mate only with one of those two males. Clearly, those two males from J and K pods could contribute substantially to the genetic composition of the next generation of L pod animals, increasing the risks of inbreeding if one or both males carry detrimental alleles. In this regard, it is interesting to note that L pod has declined in recent years, while J and K pods (which had access to seven reproductive males from L pod) have increased. Although a variety of factors could have led to those disparate trends, it is clear that the demographic and social structure of the population is critical for sustained recovery. The Service recognizes the importance of demographic and social structure and explicitly addresses relevant concerns in biological delisting criterion 2 (“Available information on social structure, calf recruitment, survival, population age structure, and gender ratios of the Southern Resident DPS ... are indicative of an increasing or stable population”). This criterion focuses primarily on the demographic structure of the population and specifically requires “representation from at least three pods; at least two reproductive age males in each pod or information that fewer males are sufficient; and a ratio of juveniles, adults, post-reproductive, male and female individuals similar to the Northern Resident population model.”

Although it is clear that demographic structure is an important determinant of recovery potential, it is not clear that the standards set by biological criterion 2 for both delisting and downlisting are sufficient to promote and sustain recovery. In particular, it is not clear that the presence of two reproductive males in each pod is sufficient to support the reproductive rate necessary for recovery and avoid the deleterious impacts of inbreeding. Given the long calving interval and low number of reproductive females in the population, it is conceivable that very few mature males could impregnate a sufficient number of females to maintain the current reproductive rate. It is not clear, however, that opportunities for mating (i.e., contact between pods with available reproductive males and females) always result in successful mating (e.g., females may refuse mating attempts and some males may have low sperm quality or other such limitations). To address this

uncertainty, as well as inbreeding risks, the quantitative measures under criterion 2 should be revised to require sufficient numbers of reproductive males and females in each pod to support the reproductive rate necessary for recovery and avoid the deleterious effects of inbreeding. Further research will be necessary to determine “sufficient numbers,” such as genetic research to determine the pedigree of extant killer whales and estimate the frequency with which individual males successfully mate with multiple females from other pods. Until such research has been conducted, the Marine Mammal Commission recommends that the recovery plan be revised to be more precautionary with respect to numbers of reproductive males and females that would be required to merit downlisting or delisting. To the extent possible, such default values should be derived from population viability analyses based on known demography, genetics, and population trends.

Priorities for Research and Monitoring

With regard to the setting of research priorities, we believe two areas warrant greater emphasis than indicated in the draft plan. The first pertains to monitoring of population status, which is given priority 2 or 3. Such monitoring is essential to detect changes in status in a timely fashion, evaluate the effects of risk factors, and guide recovery actions. One could reasonably argue that monitoring itself does not lead directly to recovery and therefore should not be given greater priority than actual recovery actions. At the same time, however, the recovery process will occur over a period of time and will almost certainly be dependent upon information about the status and trends of the population to guide recovery efforts. Whether the plan assigns a priority of 1, 2, or 3 to monitoring, we cannot realistically expect an effectively managed recovery program without such monitoring. For that reason, the Marine Mammal Commission recommends that during the implementation of the recovery plan, the National Marine Fisheries Service give high priority to the level of monitoring deemed necessary to guide recovery efforts.

The same arguments apply to evaluating the effectiveness of recovery actions, and the Marine Mammal Commission also recommends that the National Marine Fisheries Service give high priority to these activities. We do not advocate excessive focus on research alone, and the Service will have to weigh recovery and research activities carefully, but we believe evaluation of the effectiveness of recovery actions is important. In particular, the Service should monitor the effectiveness of (1) fisheries management actions to promote the recovery of salmon populations and thus ensure that adequate prey is available for the southern resident stock, (2) management actions to eliminate incidental or direct mortality of southern resident whales, (3) measures to reduce the level of disturbance to the population by whale-watching vessels, and (4) measures to reduce the levels of contaminants in Puget Sound and, through bioaccumulation, in the whales.

Linking delisting and downlisting criteria, recovery measures, and research

Although all recovery plan measures and research activities appear to be relevant, how and to what extent they will promote or help document recovery is not always evident. For example, it is not obvious how the management of atypical southern residents (recovery measure 4.1) will contribute to the recovery of the population. Also, the priority levels assigned to recovery and research activities do not always appear to be internally consistent. For example, research activities


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focused on southern resident diet (B.2), prey availability (B.6.1), and oceanography (B.8) were assigned priority 1. However, the relevant recovery action (1.1) to “rebuild depleted populations of salmon and other prey to ensure an adequate food base for recovery of the Southern Residents” was assigned lower priority, which seems inconsistent. As another example, preventing and responding to oil spills (2.1.1 and 2.1.2) were assigned priority 1, but the relevant research activity (B.6.4, “Determine risks from other human-related activities”) was assigned priority 2. These apparent mismatches in priority assignments may be justified, but a review of the relationships among delisting or downlisting criteria might reveal some inconsistencies that warrant reconsideration or highlight recovery measures or research activities that might otherwise be overlooked. For example, delisting criterion B.2 requires that there be no incidental or deliberate deaths associated with fisheries or other activities, but no recovery measures or research activities are included in the recovery plan to ensure that this criterion is met— although the Service clearly has programs in place to monitor and manage incidental mortality associated with commercial fisheries.

To ensure internal consistency in the recovery program, the Marine Mammal Commission recommends that the National Marine Fisheries Service review and clarify the relationships among specific delisting or downlisting criteria, recovery measures, and research and monitoring activities. Such clarification should help the Service make and justify decisions regarding research and recovery priorities.

Again, we believe that the Service has done a commendable job preparing this draft recovery plan, and we hope you will find our recommendations and comments helpful as you finalize the plan. Please contact me if you have any questions.

Sincerely,



Timothy J. Ragen, Ph.D.
Executive Director