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Public Comments Processing

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Division of Policy and Directives Management

US Fish and Wildlife Service

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Dear US Fish and Wildlife Service:

The American Society of Mammalogists (ASM) is a non-profit, scientific Society consisting of more than 2,000 members from all 50 United States and 60 other countries worldwide. The ASM was founded in 1919 and is the world's oldest and largest organization devoted to the study of mammals. We strongly support the conservation and responsible use of wild mammals based on current, sound, and accurate scientific knowledge. The ASM has a long history of reviewing issues related to mammalian conservation, and where appropriate, adopting positions on issues concerning the conservation and responsible management of mammals and their habitats based upon our scientific expertise.

We are writing to you as part of the public comment period dealing with the proposed listing of the wolverine (*Gulo gulo luscus*) as threatened in the 48 contiguous US states. After review of the proposal, we strongly agree with your efforts to protect the wolverine under the ESA. We agree that a "threatened" designation is fully justified, but we also feel there should be an "escalator" provision in the listing whereby a "threatened" listing becomes an "endangered" listing if, after 5 additional years of data on wolverine populations and climate change, it becomes clear that wolverine populations and habitat are declining. Further, we believe that critical habitat must be designated for the species in the very near future. Herein, we provide scientific justification for our assertions.

First, the wolverine inhabits a relatively small portion of its former range in the 48 contiguous US states. The current distribution includes only the northern Rocky Mountains (MT, ID, WY) and northern Cascade Mountains (WA), although single, transient wolverines recently have been found in both CO and CA. The latest population estimate of numbers of wolverines in the lower 48 contiguous states lies between 250-300 individuals (USFWS 2013). However, the most recent and reliable estimate for N_e (effective population size) is only 35, suggesting that there are very few individual wolverines contributing to the gene pool in the 48 contiguous US states (Schwartz et al. 2009).

Second, according to the scientific literature, the fate of the wolverine in the 48 contiguous US states largely is dependent on snow cover. The geographic distribution, gene flow, reproductive activity, and population dynamics of this species have been shown to be constrained by snow depth (Copeland et al. 2010; Schwartz et al. 2009; Inman et al. 2012; Brodie and Post 2010). Using multiple radiotelemetry datasets, Copeland et al. (2010) found that 89% of all wolverine relocations (n=7,930) were in agreement with spring snow coverage maps. Further, female wolverines selected den sites (n=562) with persistent snow cover. In North America, female wolverines selected snow-covered den sites 69% (45 of 65) of the time. However, over the past 30 years, average snowpack depths have declined, and model predictions anticipate this trend to continue (Brodie and Post 2010; McKelvey et al. 2011; Mote et al. 2005). If winter snowpack continues to decline and average summer temperatures exceed those currently tolerated by wolverines, a significant portion of wolverine habitat will be lost (Copeland et al. 2010) and populations of wolverines in the 48 contiguous US states may not persist through this century (Peacock 2011).

Probably the most insidious threat faced by wolverines in the 48 contiguous states is climate change. Wolverines are a boreal species with many morphological and physiological adaptations for cold weather and deep snowpack. Using ensemble-averaging climate modeling techniques, promoted by the Intergovernmental Panel on Climate Change (IPCC) as a method that is more reliable than any single model, McKelvey et al. (2011) found that only 67% of predicted spring snow cover is predicted to persist within their study area (MT, ID, WY) through 2030-2059; that worsens to only 37% through 2070-2099. They predict that contiguous areas of spring snow cover will become smaller and more isolated over time with only three areas within the 48 contiguous US states predicted to retain substantial contiguous areas of wolverine habitat (north-central WA, northwestern MT, Greater Yellowstone NP area). The conclusion of McKelvey et al. (2011) that wolverine populations are likely to become smaller and more isolated than they are now is indicative of the urgency of this situation.

Third, available data indicate that wolverines in the 48 contiguous US states already are found in fragmented subpopulations with little connectivity. Wolverines typically occur at relatively low population densities, and in discrete, semi-isolated subpopulations within the 48 contiguous US states. Connectivity between these subpopulations is absolutely vital to ensure both genetic and demographic health of the entire population. Least-cost models indicate that dispersal routes through areas with persistent spring snow cover best explain genetic distance among subpopulations (Schwartz et al. 2009). Using this empirical approach, Schwartz et al. (2009) identified several corridors likely important for wolverine dispersal and population connectivity in the 48 contiguous US states. Because linkages between populations are important to the overall success of the population, we believe that these areas should also be designated "critical habitat" under the proposed ESA listing.

A high degree of population substructure and remarkably low levels of gene flow have been found in wolverines from Montana (Cegelski et al. 2003, Cegelski et al. 2006). These findings contrast sharply with results from less fragmented landscapes in Alaska and Canada. In the 48 contiguous US states, wolverine habitat is becoming increasingly fragmented due to human development and disturbance (Cegelski et al. 2003). Further, what limited gene flow is occurring in wolverines in the 48 contiguous US states is being carried out by males (Cegelski et al. 2006). Wolverine populations in Montana show significant matrilineal structuring and substantially restricted female gene flow, which indicates that demographic viability will depend upon the movement of female wolverines into new territories (Cegelski et al. 2006). However, movement of female wolverines into new territories may be constrained by their strong preference for areas with heavier spring snowpack for denning sites. Cegelski et al. (2006) found that at least 400 breeding pairs (or 1-2 effective migrants/ generation) would be necessary to ensure genetic viability in the long-term. At present, the estimated effective population size (number of breeding individuals) is only 35 for the entire metapopulation in the 48 contiguous US states. Identifying and protecting linkages among wolverine subpopulations will be critical for future conservation efforts.

Fourth, we strongly support discontinuing trapping of wolverines in Montana or any other of the 48 contiguous states. At present, the wolverine is harvested in only two states (MT and AK). Dalerum et al. (2008) found that harvested wolverine populations must be regarded as "sink" populations, and that "source" populations in combination with sufficient dispersal corridors must be secured for any wolverine harvest to be sustainable. Thus, any harvest of wolverines in the 48 contiguous US states would not be sustainable until the conditions outlined in Dalerum et al. (2008) are met (e.g., actually having "source" populations, sufficient dispersal corridors), which, in our estimation, is unlikely for the foreseeable future.

When the proposed listing of wolverines is implemented, cooperation between the USFWS and Canadian wildlife agencies is necessary to realize future wolverine recovery goals. We agree with the suggestion that adopting more conservative harvest strategies in southern British Columbia will protect fragmented wolverine populations in that region (Krebs et al. 2004). Unexploited wolverine populations in Canada can increase ~6.4% per year (Krebs et al. 2004) and provide immigrants into WA, ID and MT. Maintaining cross-border connectivity through international cooperation will be essential for persistence of wolverine populations in the contiguous 48 states.

Finally, when applying criteria for whether a taxon should be designated "endangered" or "threatened", in addition to considering all of the available scientific data, it is instructive to examine the ESA for its definitions and intent. It can reasonably be argued that the wolverine qualifies as "an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range." The wolverine's historic range within the 48 contiguous states once comprised a significant portion of its total US range, and occupancy of this area is at risk. We therefore argue for an automatic "escalator" from "threatened" to "endangered" status if 5 years of post-listing research and monitoring reveals continuing population declines and habitat loss in the 48 contiguous US states. This approach allows us to err on the side of the wolverine, setting basic protection in place now but facilitating enhanced protection if predicted declines and habitat loss or degradation ensue.

In summary, we believe there is an urgent need for legal protection of the wolverine under the ESA in the 48 contiguous US states. We agree that establishment of a designated NEP area in the Southern Rocky Mountains will benefit states interested in establishing experimental wolverine populations. In addition, we also highlight the need for designated critical habitat to maintain connectivity. Continued climate change in the form of observed losses of snowpack in the western US is predicted (McKelvey et al. 2011; Mote et al. 2005; Peacock 2011), further limiting the amount of wolverine habitat in the 48 contiguous US states. Given that wolverines are top predators in ecosystems with the accompanying life history characteristics of very low population densities and low reproductive output, their many adaptations to boreal forest existence and dependence on snow cover, and their present restricted geographic range in the lower 48 contiguous states, they already are at risk of local extirpation (Purvis et al. 2000). Climate-driven reductions in critical habitat and population connectivity likely will exacerbate extinction risks. The protection garnered through listing under the ESA, and subsequent designation of critical habitat, will provide an important, much-needed first step toward ensuring wolverine persistence in the 48 contiguous US states. We thank you for the opportunity to provide comments on this very important issue, and we offer to provide our expertise on this subject at any time.

Respectfully submitted,

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