



United States
Department of
Agriculture

Forest
Service

Pacific Northwest
Research Station

Forestry Sciences Laboratory
3625 93rd Avenue SW
Olympia, Washington 98512-9195
(360) 753-7685 FAX: 753-7737

File Code: 4200

Date: May 11, 2013

Brent Esmoil, Acting Field Supervisor
U.S. Fish and Wildlife Service
Montana Ecological Services Field Office
585 Shepard Way, Suite 1
Helena, MT 59601

Dear Mr. Esmoil,

As requested, here are my peer-review comments on the Notice of the Proposed Listing of a Distinct Population Segment of the North American Wolverine Occurring in the Contiguous United States, and Establishment of a Nonessential Experimental Population of the North American Wolverine in Colorado, Wyoming, and New Mexico. I have also attached a copy of my most recent curriculum vitae, as requested.

In your cover letter, you noted that you were particularly interested in seeking comments and information from the peer review panel concerning: (1) Is our description and analysis of the biology, habitat, population trends, and historic and current distribution of the species accurate? (2) Do the Proposed Rules provide accurate and adequate review and analysis of the factors affecting the species? (3) Are there any significant oversights, omissions or inconsistencies in our proposed rules? (4) Are the conclusions we reach logical and supported by the evidence we provide? (5) Did we include all the necessary and pertinent literature to support our assumptions, arguments, and conclusions?

My overall responses to these questions are: (1) Yes, (2) Yes, (3) No, (4) Yes, and (5) Yes. As my responses indicate, I thought the individuals who prepared these documents did an outstanding job of researching, evaluating, and interpreting available information on wolverines in the contiguous U.S. I was extremely impressed with the level of scholarship contained in these documents, and the careful, thoughtful, and scientifically defensible way in which the vast majority of this information was considered and applied in these conservation documents. The only comments or criticisms I had on these documents were relatively minor in nature, and are presented separately below for each proposed rule:



Proposal for Threatened Status for the Distinct Population Segment of the North American Wolverine Occurring in the Contiguous United States

1. At the bottom of column 3 on p. 7866, you make statements about where wolverine dens “occur” or “are located” in both Idaho and Montana, which implies that we have strong knowledge about habitat selection at reproductive den sites by wolverines in both states; i.e., that we know where wolverine dens occur and where they do not. However, our current knowledge of wolverine denning habitat is largely descriptive in nature; i.e., the descriptions you present are of the locations where wolverine dens have been found so far; they aren’t necessarily the only locations where dens might be established. Thus, in my view, these statements are inappropriately definitive in nature, and I suggest that you replace “occur” and “are located” with “have been found” or some other language that clearly indicates that this reflects what we know at the present time from the few den descriptions that have been published, but that we have much to learn about wolverine denning habitat throughout their range in the contiguous U.S.

2. Additionally, because it is important to include available information on wolverine biology from all of the ecoregions or physiographic provinces where they occur in the contiguous United States, and because reproductive denning habitat is believed to be critically important for the persistence of wolverine populations, I think it would be useful to add descriptive information on the 2 wolverine natal dens we found in the northern Cascade Range in Washington in 2012 to the information presented at the bottom of column 3 on p. 7866. These are the only wolverine natal dens that have ever been described in the Cascade Range or Sierra Nevada (i.e., anywhere in the Pacific states). Since the data presented here on wolverine den sites in Idaho and Montana is descriptive in nature, it would seem appropriate to also include descriptive information on the dens we found in the North Cascades. I would be happy to provide this information to you if you wish to include it in the final rule (if it is adopted).

3. In the upper half of column 2 on page 7868, you state: “Elevation ranges used by historical wolverine populations in the Sierra Nevada and southern Rocky Mountains are unknown, but presumably wolverines used higher elevations on average, than more northerly populations to compensate for the higher temperatures found at lower latitudes.” In fact, however, we do have reliable information about the elevations that were used by historical wolverine populations in southern regions from the historical occurrence records we compiled; those data are presented in Figure 5 in Aubry et al. (2007). This graph clearly shows 2 things: (1) that wolverines use higher elevations than are generally available throughout the contiguous U.S., and (2) that wolverines occurred at increasingly higher elevations historically as one moves south from the northern regions of the contiguous U.S. into the Sierra Nevada and southern Rocky Mountains, presumably to compensate for the higher temperatures found in more southerly latitudes; i.e., because suitable snow conditions for wolverines occur at increasingly higher elevations as latitude decreases.

4. In the middle of column 1 on p. 7769, you state: “It is not known if these snow conditions existed historically in the Great Lakes of the contiguous United States; however, the small number of wolverine records from this area suggests they did not.” I acknowledge that this is a debatable point that could be argued either way, and that we will likely never know for certain whether or not resident wolverine populations occurred in the Great Lakes region historically. However, in my view, there is a rather substantial historical record of wolverine occurrence in the Great Lakes region, especially considering that those occurrence records date entirely to the 1800s when the compilation of specimen records for North American wildlife was in its rudimentary stages. There are 29 well-distributed historical occurrence records from the Great Lakes region that were all obtained during the 1800s (Aubry et al. 2007). Thus, there are substantially more historical records from the Great Lakes region than there are for any other regions of the contiguous U.S. that currently lack suitable snow conditions for wolverines. Note also that, although they are of questionable reliability and the reported locations were not precise enough to include in Figure 1 of Aubry et al. (2007), the 35 wolverine records from the 1800s in North Dakota (see Table 1 in Aubry et al. 2007) were reportedly trapped along the North Dakota-Minnesota border from 1801-1806). Thus, in my opinion, it is more likely that wolverines occupied the Great Lakes region during the 1800s (i.e., that suitable snow conditions were present), than it is that all of those records represent long-distance movements of wolverines into the Great Lakes region from Canada that were not associated with resident populations. Note also that Dawson (2000) reports that wolverines occurred historically throughout the province of Ontario, but that the southern limit of their range receded northward by 1900. I believe the same is true of the Great Lakes region in the contiguous U.S. In Aubry et al. (2007), we concluded that the Great Lakes region “probably represented the southern extent of wolverine distribution in eastern North America prior to European settlement”. This is a very important point to consider in the context of this proposed rule, because the 1800s was a period of very cold climatic conditions historically, and the apparent loss of wolverine range (and, presumably, wolverine habitat) in the Great Lakes region may indicate that the effects of a substantially warming climate throughout the 1900s has already resulted in the loss of potential wolverine range in the Great Lakes region, due to the relatively flat topography in that region. This is, we may have detected range losses from global warming in the Great Lakes region that did not occur in the western mountains because of the topographic differences between those regions—i.e., relatively small changes in climate will affect a much larger area that has flat topography (as in the Great Lakes region) than it will in rugged topography (as in the western mountains).

5. In Table 1 on p. 7870, the heading on column 1 should read: “Historical (<1961)” not “Historical (<1964).”

6. In the middle of column 2 on p. 7874, you state: “Within the four States that currently harbor wolverines (Montana, Idaho, Oregon (Wallowas) and Wyoming...”. Although it becomes clear

in the next sentence that this statement refers only to the Rocky Mountains, to avoid any confusion, I'd suggest changing this text to: Within the four Rocky Mountain States that currently harbor wolverines (Montana, Idaho, Oregon (Wallowas) and Wyoming...".

7. At the bottom of column 1 on p. 7883, you indicate that the wolverine is listed as state Endangered in Washington. This is incorrect; the wolverine is a state Candidate species in Washington.

8. In the middle of column 3 on p. 7883, you state: "...at this time, the available information does not suggest that dispersed winter recreation is a threat to the DPS". Although this statement is accurate, here and throughout the proposed rule, there is little acknowledgment that there are significant gaps in our knowledge regarding the potential effects of winter recreational activities on wolverines. I.e., although current information does not indicate that this is a serious problem for wolverines, this potential threat has only been studied very recently, and there is only study I know of that was designed specifically to address this issue (Kim Heinemeyer's wolverine and snowmobile study in Idaho). Thus, I think it would be appropriate to point out in various places that this potential threat has not been well-studied (especially compared to the other advances in our knowledge of wolverine ecology, distribution, genetic characteristics, and conservation status that have occurred in the last 10 years or so) and that we need a good deal more research before we can conclude with certainty that dispersed winter recreation is not a threat to the recovery of wolverine populations in the contiguous U.S., especially since such recreational activities take place during the wolverine denning period.

9. Near the middle of column 2 on p. 7888, you state: "Land management activities...can modify wolverine habitat, but this generalist species appears to be little affected by changes to the vegetative characteristics of its habitat". Although you appear to be referring to the wolverine as a "generalist species" in the sense that it is not associated with any particular vegetative conditions, I think it's potentially misleading to refer to the wolverine as a generalist species in any context. As we demonstrated in Aubry et al. (2007) and Copeland et al. (2010), the wolverine is actually a habitat specialist that is strongly associated with a very specific and narrow set of habitat conditions.

Proposal for Establishment of a Nonessential Experimental Population of the North American Wolverine in Colorado, Wyoming, and New Mexico

1. At the bottom of column 2 on p. 7894, you state: "Two recent instances of long-distance movements by male North American wolverines have been documented...". Although we know for certain from radiotelemetry data that a male wolverine travelled >900 km from northwestern Wyoming to north-central Colorado, we do not know for certain that the male wolverine detected

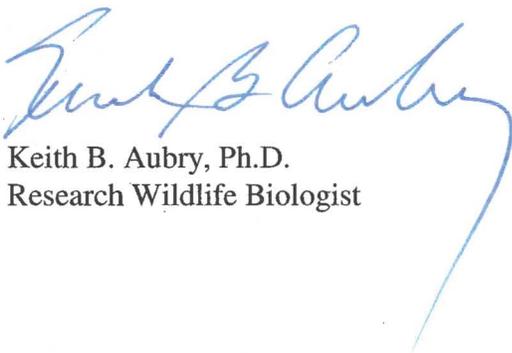
near Truckee, California travelled there from Idaho. The genetic data only tell us that this wolverine has the same genetic characteristics as the wolverines that currently occupy Idaho, and that it is not descended from wolverines that occupied the Sierra Nevada historically. However, we don't know whether he travelled there on his own or was transported there by humans and intentionally or accidentally released.

2. Near the middle of column 1 on p. 7898, you state: "Each animal would be fitted with a satellite collar and surgically implanted with a radio-transmitter prior to release". Collars and ear tags almost always come off and implanted collars eventually run out of battery power or fail. Consequently, I would recommend that you also implant a "pit tag" under the skin at the back of the animal's neck, so that each translocated individual can be immediately and easily identified with a pit-tag reader (i.e., without genetic analysis).

3. Near the top of column 2 on p. 7898, you state: "Noninvasive techniques such as telemetry, remote camera surveillance, snow tracking...would be used." You also refer to telemetry as being "noninvasive" near the bottom of column 3 on p. 7900. However, telemetry is not a noninvasive research or monitoring technique. Capturing, immobilizing, handling, ear-tagging, pit-tagging, collecting genetic samples, and radio-collaring are ALL invasive procedures. You may be referring to the collection of telemetry data remotely after all of that has happened as being "noninvasive", but since the wolverine must be carrying a transmitter for telemetry data to be collected, I think it's inaccurate and misleading to refer to telemetry as "noninvasive" in any context.

I sincerely hope that these comments and suggestions are helpful.

Sincerely,

A handwritten signature in blue ink, appearing to read "Keith B. Aubry". The signature is fluid and cursive, with a long, sweeping tail that extends downwards and to the right.

Keith B. Aubry, Ph.D.
Research Wildlife Biologist

CURRICULUM VITAE

1 May 2013

NAME: Keith B. Aubry
TITLE: Research Wildlife Biologist, GS-15
ADDRESS: USDA Forest Service
Pacific Northwest Research Station
3625 93rd Avenue S.W.
Olympia, Washington 98512

ACADEMIC AFFILIATIONS:

TITLE: Professor of Wildlife Science (Affiliate) and Member of the Graduate Faculty
ADDRESS: College of the Environment
School of Environmental and Forest Sciences
University of Washington
Seattle, Washington 98195

EDUCATION:

Ph.D. 1983 Wildlife Science
College of Forest Resources, University of Washington, Seattle
M.F.S. 1977 Wildlife Ecology
School of Forestry and Environmental Studies, Yale University, New Haven,
Connecticut
B.S. 1974 Forestry and Wildlife Management.
School of Natural Resources, University of California, Berkeley

RESEARCH EXPERIENCE:

1987-present. Research Wildlife Biologist, USDA Forest Service, PNW Research Station, Olympia, WA. Patterns of wildlife abundance and community composition in managed and unmanaged Douglas-fir forests in Washington and Oregon. Effects of varying levels and patterns of green-tree retention on ecological processes and public perceptions in Douglas-fir forests. Ecology and management of pileated woodpeckers in the Pacific Northwest. Ecology, genetics, and conservation biology of the Canada lynx, fisher, wolverine, and Cascade red fox in the Pacific Northwest. The bioclimatic envelope of the wolverine and its implications for predicting the effects of global climate change on their conservation status in southern boreal forests. Pleistocene and modern zoogeography of the red fox in North America.

1986-87. Research Associate, USDA Forest Service, PNW Research Station, Olympia, WA. Analysis of landscape-level environmental variation and its influences on vertebrate populations. Patterns of vertebrate abundances in forested landscapes.

1985-86 Research Associate, College of Forest Resources, University of Washington, Seattle and USDA Forest Service, PNW Research Station, Olympia, WA. Problem analyses of the potential habitat relationships of marten and fisher in Douglas-fir forests in the Pacific Northwest. Analysis of the effects of stand size and management regimes on surveys of vertebrate abundances.

1983-84. Post-doctoral Research Associate, College of Forest Resources, University of Washington, Seattle. Survey of carnivores with baited tracking stations, winter snow-tracking, and trapping. Survey of amphibians using time-constrained searches, stream surveys and pitfall trapping.

1978-83. Research Assistant, College of Forest Resources, University of Washington, Seattle. History of introductions and present distribution of indigenous and introduced red foxes in Washington. Distribution and morphology of the red fox in the Pacific Northwest. Quaternary zoogeography of the red fox in North America. Ecology of the Cascade red fox in Washington.

TEACHING EXPERIENCE:

1989-2000. Instructor. Forest Biology I: Forest Amphibians and Reptiles. One day field course covering natural history, distribution, and sampling techniques for amphibians and reptiles in Pacific Northwest forests. College of Forest Resources, University of Washington, Seattle.

1990. Instructor. Workshop on Natural History, Identification, and Sampling Techniques for Amphibians and Reptiles in Pacific Northwest Forests. USDA Forest Service, Packwood, WA.

1984. Instructor. Plant and Animal Succession in the Aftermath of the 1980 Eruption of Mount St. Helens: survey of small mammals in major vegetation types within the blast zone. School for Field Studies, Cambridge, MA.

1983. Instructor. The Biology and Conservation of Mammals, Laboratory: identification and natural history of Washington mammals. University of Washington, Seattle.

MEMBERSHIPS AND PROFESSIONAL ORGANIZATIONS:

The Wildlife Society
American Society of Mammalogists
Ecological Society of America
Martes Working Group
Northwest Scientific Association
Society for Northwestern Vertebrate Biology

PUBLICATIONS:

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