

Jeff Copeland Comments on Proposed Rule to List Wolverine and Proposed Rule to allow NEP

1. **Line 310** states, “*It has a broad, rounded head; short, rounded ears; and small eyes. Each foot has five toes with curved, semi-retractile claws used for digging and climbing (Banci 1994, p. 99).*” The “semi-retractile claws” component of this statement, found in Banci 1994, while certainly embedded in the literature, has never been comprehensively addressed. This alleged characteristic appeared as well on The Wolverine Foundation’s website for some time until it was brought to the attention of the directorship through a public inquiry. I provide below a response to the question regarding claw anatomy provided by Clint Long, former TWF founding director, which I think should help clarify this issue.

“I assume the semi-retractile designation resulted from a bio-mechanical observation – i.e., an observed ability of the wolverine to contract its digits, particularly on its front feet, which produces a more direct contact of the toenails for climbing, grooming pelage, defense, etc. Not to the extent, but much the same as when you or I partially close our hands through flexor tendons/muscles of the phalanges, our fingernails become the point of contact for scratching, etc. However, I certainly would not consider our fingernails to be even trace retractile. From an anatomical assessment, the toenails (claws) of the wolverine are definitely fixed and I’m not aware of any science based protocol or criteria that would define them as semi-retractile.”

2. **Lines 313-329** In regards to wolverine reproduction, the document states that “...energetic constraints due to low food availability result in loss of pregnancy in about half of them [female wolverines] each year.” The belief that only half of reproductively mature wolverines give birth each year has developed from summary statistics that indicate a 50% reproductive rate measured across all reproductively active wolverines, and stems largely from a single study conducted in Sweden (Persson 2005), but this has never been presented as a biological fact (that females only produce kits every other year). In my central Idaho study (Copeland 1996) I had two females that produced kits in 5 of 6 years they were reproductively active, while I had 2 females that never produced kits across 3 years they were monitored. While this may equate to reproductive rate of about 50%, it hides the fact that some females are very prolific while others are not. We noticed this same phenomenon in Glacier Park. One female produced kits in 5 of 6 years, while another only produced kits in 2 of those same years. While the Glacier data is not currently published, the Sawtooth data are so I might suggest that the discussion regarding reproductive rate at least include the fact that 1) the 50% reproductive rate for females is based on population averages and not individual females, and 2) note that in the Sawtooth study Copeland (1996) reported that 2 females produced kits in 4 of 5 reproductive years. The point being that the reproductive rate may be skewed toward (or against) reproductively “capable” females, such that some females simply appear to be better reproducers than others.
3. **Line 450** I have always been uncomfortable with this idea that wolverines live in a “relatively unproductive niche.” Relatively unproductive compared to what? The wolverine adapted to a niche that affords relatively low competition, and the wolverine commonly displays the capacity to utilize broad home ranges in a fairly efficient

manner. I think one could make the argument that for an animal that makes its living as a scavenger, at least during the winter, this is a highly productive niche, particularly in places like Glacier National Park. Not sure what I am suggesting here other than I think this ignores the animal's obvious adaptations toward thriving in this "unproductive" niche and suggests this animal is living on the very edge of survival, which I don't believe is accurate.

4. **Lines 527-535** Aubry et al. (2007) made the point that the wolverine's historical distribution likely did not differ greatly from that of today (excepting Calif, Colo, Utah), but they did not suggest anything regarding population densities. It is apparent from current data that there can be significant differences in population densities – e.g., densities in Glacier Park appear to be much higher than those of central Idaho. These differences are most likely related to food availability. Glacier Park provides year-around availability of carrion in the form of mountain goat and mountain sheep mortalities whereas in central Idaho, wolverine winter food came in the form of deer, elk, and moose carcasses, most of which probably related to hunter wounding mortality. With the knowledge that wolverine densities appear highly variable and tied to food availability I think it is a stretch to suggest that historical densities "*would likely have been larger than...today due to the larger area occupied.*" I think this raises a very interesting hypothesis that could be addressed given what is known about historical ungulate populations, but in the context presented here, I don't believe this premise is necessarily valid.
5. The entire section under the heading, "**The Complexity of Geographic Range Delineation**" seems to add "complexity" to a component of wolverine knowledge that is actually fairly well understood. That is, the wolverine's historical and current distribution and what our understanding of distribution has elucidated in regards to habitat relationships. **Lines 599-600** suggest that information on distribution is lacking while the author follows with an in-depth summary of the comprehensive analysis of distribution provided by Aubry et al. (2007). It is difficult to imagine a more complete and comprehensive analysis of the wolverine's historical and contemporary distribution than what is provided by Aubry et al. I just find it somewhat confusing to suggest that our knowledge in this regard is lacking and then follow why it is lacking with the statement offered in **Lines 658-660** that "*...we have strong information on the areas that are currently suitable...*" Which is it?

The discussion on source/sink populations beginning with **Line 662** needs some attention. The author suggests that the wolverine's range should be defined only by areas that will support "viable" populations and should not include areas identified by extralimital occurrences, and considers this position as supported by the findings of Aubry et al. (2007) (**Lines 666-670**). Aubry et al. (2007) identifies extralimital observations in the context of their inclusion in defining the broadscale, historical distribution of the wolverine insomuch as how their inclusion tended to over-extend the distribution to include areas of non-habitat. I don't think it is a fair assessment to characterize Aubry et al. (2007) as suggesting that the habitat directly associated with these extralimital observations should be excluded or disregarded as potentially important to the wolverine's life history requirements. Dispersal is as important a

component of the wolverine's "life history needs" as is reproduction, and is particularly so given that a primary thesis of this proposed rule is the concern that global warming may exaggerate the difficulty of wolverine population gene flow. We certainly need to be able to identify and protect islands of habitat, which may be too small to support resident populations but contribute to gene flow by providing resting, foraging, and security habitat (stepping stones), in route to occupied habitat. As such, **Lines 684-688** contain somewhat conflicting statements: considering wolverine habitat as only habitat "*suitable for long-term occupancy and reproduction*" completely excludes dispersal as a critically important component of the wolverine's life history requirements. The "*conservation value*" of identifying and protecting these "stepping stones" in my view cannot be over-emphasized.

6. **Lines 873-876** As with Line 450 above, I am a bit uncomfortable with the way this is worded as it presents an image of an animal that is living on the edge, struggling to survive. Characterizing wolverine habitat as "unproductive" or "food-scarce" is, I think, fitting in the context of how other species might relate to wolverine habitat, but from the perspective of the wolverine I am not sure this is an accurate characterization. This also suggests that wolverines persist in this habitat because they have developed techniques (food caching to avoid decomposition) to do so, rather than considering that they are simply adapted well to this environment. In other words, living in a cold environment allows for food preservation naturally – it doesn't necessarily require that the organism perform some task (caching) to preserve its food. I would be more comfortable with this if it was worded such that the "unproductive" nature of the habitat was considered unproductive for other carnivores and not necessarily for the wolverine.
7. **Line 1372 Habitat Impacts Due to Human Use and Disturbance** - I had a lot of difficulty with this entire section (see additional comments on manuscript). It is my understanding that to qualify as a threat it must be arguable that the issue at hand will adversely impact the species across the entire DPS. "Threats" that are localized or potentially intermittent cannot be considered in this context. Here, all of the Factor A impacts are discounted as threats not because they fail to meet the DPS-wide requirement but because they have not been adequately, or empirically, identified as such. Under the **Factor A** heading, beginning with **Line 1069** it states that impacts due to human use and disturbance are "*impacts to wolverine habitat.*" Listed along with climate change are the 5 other factors considered *impacts* to wolverine habitat. At this point in the document (**lines 1069-1072**) we would appear to have *prima facie* evidence that these factors may adversely impact the wolverine. In other words, we are not listing potential impacts such as meteor strikes or volcanic eruptions, which certainly could have an impact, only because we don't view such as a reasonably likely impact, such as we apparently do with the other 5 factors. The concern that winter recreational activity may adversely impact the wolverine is a valid, common sense concern. And, it is the primary management concern for wolverine currently faced by our land management agencies. If the author believes, as is suggested in this document, that dispersed recreational activities are not currently impacting or a potential impact to the wolverine, then shouldn't this issue should be removed from Factor A (which would really open a can of worms) and left to reside in the category of meteor strikes and

volcanic eruptions. If it is to be left as a component of Factor A then it should not be totally discounted, but considered as a factor, but one that is not DPS-wide. What this leaves is a need for understanding the impact to the DPS should areas that include dispersed recreation result in the displacement of resident wolverines. That is the issue currently under question by the Heinemeyer/RMRS study.

Throughout this section the author provides no equivocation as to the impact of the activities listed, e.g.,

Line 1518 “...we conclude that wolverines do not avoid human development...,” **Line 1521** “There is no evidence that wolverine dispersal is affected by infrastructure development,” **Line 1558** “...there is no evidence that human development and associated activities are preventing wolverine movement...,” **Line 1615** “...evidence indicates that ...wolverines can...cross transportation corridors.”

All of the above, and others, provide unequivocal statements regarding the impacts of the activities when there is, in fact, very little data to support such. I understand, as stated above, that the reason for this is the necessity to exclude these activities as threats. And while I would agree that the impact of these activities is not well understood, discounting these activities appears somewhat arbitrary as an objective reviewer could easily judge the impact of the activities either way. I would suggest the author either insert an appropriate level of equivocation or consider removing the impacts from Factor A.

8. Under the section entitled **Infrastructure Development**, from **Lines 1526-1562** the author inserts a section on dispersal as it relates to the impact of infrastructure development. I found that this section makes a pretty good argument for the consideration of gene flow as a primary threat to wolverine metapopulation persistence. The author states that **Line 1527** “...the probability of making [dispersal] movements decreases with increased distance between suitable habitat...,” **Line 1537** “gene flow between wolverine subpopulations ...may not be high enough to prevent genetic drift.” The author states that movement *appears* to be occurring as adequate evidence that infrastructure is not adversely impacting movement but concedes that wolverine movement rates are limited by suitable habitat **Lines 1559-1562**. It feels like the author is identifying an impact within an impact – wolverines are dispersing in spite of infrastructure, but not well enough to avoid genetic drift.

The Cegelski et al. (2006) and Schwartz et al. (2007) papers make it clear that wolverine populations in the western U.S. are already experiencing gene flow issues within an environment where gene flow is certainly not going to improve. I think it would be fairly easy to make the case that inadequate gene flow poses a serious threat.

9. I am not very comfortable with this paragraph. It is stated earlier in the document that wolverine home ranges are large enough that an entire mountain range could provide suitable habitat for as few as 2-3 females. In this paragraph the author first suggests that we know of no examples where a single home range-scale effect is indicated. Does this suggest that impacting a single home range would be considered a population-level effect, as indicated by the second sentence? I think we could easily come up with

examples in which snowmachines, developed ski areas...could be argued as impacting a wolverine home range-size area. I am not suggesting such would have a population-level effect whereas the author of this paragraph is suggesting that it would not.

10. I understand the arguments made here for a minimal DPS-wide effect but I think that argument is weakened, and left appearing a bit arbitrary, when one considers the arguments used to support the climate-related threat. **Lines 1670-1676** provide support for the climate threat argument by providing a summary of cumulative impacts relating to a warming climate – *habitat isolation, reduced frequency of dispersal, loss of genetic diversity, demographic stochasticity*... I think there will be a strong argument made that reduced habitat availability resulting from climate warming will concentrate human activities within remaining habitat thereby contributing to all these factors as well.

I mentioned earlier my concern about the select listing of issues in order to discount their importance (volcanoes and meteors). One might consider the argument that the primary difference between climate-related concerns and the others is that climate change impacts, while not yet measurable, are arguably impending, while the others (recreation et al.) are still manageable. It is going to be very difficult to ignore the potential range-wide impact of winter recreation concentrated by a reduced snowpack.

Furthermore, the argument (or justification) that a threat can only be recognized for this process if it meets the DPS-wide criterion seems to be set aside when considering the impact of trapping in the *Summary of Factor B*, and the *Synergistic Interactions Between Threat Factors* sections. The author states that while the current level of trapping mortality would not be considered a threat to the DPS (**Line 1864**) it “*is likely to become a threat to the DPS*” (**Lines 1867-1868**). The author also qualifies the potential trapping threat as “*...not as...geographically comprehensive...*,” which would also seem to suggest that the trapping threat may not be DPS-wide. It is difficult for me to accept the belief that trapping (particularly incidental trapping) would ever pose a significant threat to the wolverine DPS-wide, particularly when compared to the potential threat posed by other human-related factors, such as winter recreation. Maybe I don't fully understand the implications of threats versus potential threats in this context but it would seem that the *Synergistic Interactions* section would provide a reasonable opportunity to express concerns about the potential impact of winter recreation activities as a cumulative impact without actually classifying it as a threat.

Comments on the Proposed Rule for NEP (10j)

1. My only extended comment pertains to the argument that the establishment of a NEP is a necessary action. **Lines 454-458** argue that the likelihood of female wolverines naturally reestablishing in the southern Rockies is extremely low. While that certainly may be the case it is still only speculative. We are currently in a very exciting time relative to wolverine ecology in the western U.S. in that we are witness to the natural recolonization of a species that was largely extirpated by the mid-20th century.

Wolverines are almost certainly still moving south as evidenced by recent observations in central Washington, eastern Oregon, and southeastern Idaho, not to mention the two individuals that traveled to Colorado and northern California. I think it is a bit unfair to not at least offer for public comment the possible eventuality that the wolverine may naturally recolonize Colorado, Utah, and California if given enough time. The idea that the probability of such is extremely low is only speculative so why completely discount the possibility.