Federal Register, October 31, 2013
Extension of the Comment Period on the Proposed Wolverine Listing Determination

Robert M. Inman, Dec. 2, 2013

I was recently informed by the USFWS that, when making a decision to list a species or not, they are not required to consider whether listing will result in the conservation of the species. If there are threats, they must list, even if the best conservation options that would work for the species are removed or hindered as a consequence of listing. Why is our system set up in a way that would allow this to happen? Has anyone gone through the list of things that need to be done to keep wolverines around in the western US for the next 100 years and thought about whether listing them will help or hinder these on-the-ground actions?

The USFWS believes it is compelled to list wolverines because there is science that proves climate change is an imminent threat.

Wolverines are linked to snow. This is not in doubt.

When you draw a line around the presence of snow on May 15 in as few as 1 out of 7 years (14% of years) it correlates fairly well with wolverine distribution. This also is not in doubt.

What is in doubt is why that relationship exists, whether there is any reason to believe that the presence of snow on May 15 in as few as 1 out of every 7 years is of any real biological importance for the survival of wolverines, and whether May 15 snow can be used to accurately predict where wolverines will or will not be in the future.

Some hypotheses have been put forth, but there are no reliable, validly derived scientific analyses that answer those questions.

If the USFWS is confident that the scientific works it has hinged its decision on can stand up to a rigorous review by a panel of truly independent scientists, then they should arrange such a review and remove any doubts. Certainly the magnitude of the precedent that this ruling establishes warrants careful scrutiny.

The following describes the logic used in the proposed rule and illustrates why it is critical to have a biologically meaningful link between wolverine distribution and May 15 snow in order to reach a conclusion validly.

Proposed Rule Logic
Given that:

A. Wolverine distribution is correlated with May 15 snow.
B. May 15 snow will shrink by 2100.

USFWS has concluded that:

C. Wolverine distribution will shrink by 2100.

The following 3 examples, which increase in their difficulty to discern reliability or not, show why it is imperative to have a clearly defined and plausible mechanism that links A to C in order to reach a valid conclusion.

First example.

A. Wolverine distribution is correlated with the density of license plates from MT, ID, WY.
B. The density of license plates from MT, ID, WY will increase by 2100.
   Therefore, we can conclude that
C. Wolverine distribution will increase by 2100.

This example is obviously nonsensical. Why? Because there is no reasonable mechanism that links wolverine distribution to density of license plates. So this conclusion is not valid and this form of logic (with no true mechanism linking A and C) is not sufficient.

Second example. This one based on peer-reviewed and published analysis. More intuitive. More difficult to assess validity or not.

A. Wolverine distribution is negatively correlated with Road Density (Rowland et al. 2003).
B. Road Density will increase by 2100.
   Therefore, we can conclude that
C. Wolverine distribution will decrease by 2100.

This example seems more plausible. It was based on real data. The mechanism that was <u>assumed</u> was wolverine avoidance of roads, which seems possible. However, in this case, the fact that humans place most of their roads at low elevations in flatter terrain, and that habitat suitable for wolverines occurs at higher elevations in more rugged terrain was not recognized and considered. Data from Copeland's studies in ID and ours in GYE show that wolverines stayed high even when there were places at low elevations with no roads or human activity that had lots of ungulates and carrion. So wolverines were not avoiding roads in the 2003 study, it just looked that way because they were not using lower elevations where roads exist. So yes, there is a (negative) correlation, but the assumed mechanism was incorrect upon close examination. This is a good example of assigning cause to an observed effect. It is also a good example of why it is important to have a clearly defined, plausible, and proven mechanism in order to reach a conclusion validly.

Third example. Also based on peer-reviewed publications. Most intuitive. Most difficult to assess validity or not.

A. Wolverine distribution is correlated with May 15 snow in as few as 14% of years (Copeland et al. 2010).
B. May 15 snow in as few as 14% of years will shrink by 2100 (McKelvey et al. 2011).
   Therefore, we can conclude that
C. Wolverine distribution will shrink by 2100 (McKelvey et al. 2011, USFWS Proposed Rule 2013).

OK, but if the logic is sound, then we can fill in the blank for the mechanism that links A to C.

A. Wolverine distribution is correlated with May 15 Snow because of mechanism _____?
B. May 15 Snow will shrink by year 2100 (McKelvey et al. 2011).
   Therefore, we can conclude that
C. Wolverine distribution will shrink by 2100 because of mechanism _____?

So what is the specific mechanism by which we should believe that May 15 snow in as few as 14% of years affects wolverine survival? The 2010 paper, the 2011 paper and the proposed rule have all clearly emphasized the "obligate need for snow for dens." But wolverines den on north slopes at high elevations. So the 2011 paper vastly overestimates (~75%) the consequences of climate change if dens are the mechanism. In addition, the analyses that the proposed rule relies upon are conducted at May 15. No other definition of "persistent late spring snow" is offered except any snow at all on May 15 in as few as 14% of years. Wolverines do not need snow for dens through May 15. Young are born primarily during February. This is the time of year when young are small and vulnerable enough that they might require the insulative properties of snow to survive. Because young are larger and well-furred by May 15 and ambient temperatures are not as low at that time, snow is not likely to be critical for dens at May 15. Snow is not the only place that wolverines can reduce their exposure. Snow depths of 1m on March 1 also likely correlate with wolverine distribution. So March 1 would be a more appropriate time to examine for potential climate impacts to dens. Is climate change predicted to reduce snow to depths that are significant for wolverine survival on March 1? What is the critical depth? The proposed rule appears to suggest on page 7866 last paragraph, that 1.5m snow may be a critical depth. Why? When? For how long?

If the mechanism is not dens, what is it? What scientifically defensible analysis has been proven and published as a mechanism that links May 15 snow to wolverine survival?

If there is no specific mechanism, then we do not know how or when climate change will impact wolverines.

We have modeled wolverine habitat in the western US with variables that include snow, but are not completely dependent on snow. We use snow depth on April 1, a time when young need thermal cover far more than they do by May 15. Our modeling suggest features other than snow are also important. I have attached a copy of that peer-reviewed publication. If the May 15 snow derived habitat is a proxy for something, our paper may describe what it is a proxy for. This analysis suggests looking at changes to snow depth on April 1 might be more appropriate.

Thank you for considering this information.