

# Wolverine & Over Snow Vehicle Use Summary

## General Overview of Over Snow Vehicle Use Impacts to Wolverine

The following excerpt is from the Final Environmental Impact Statement for the Revised Forest Plan for the Idaho Panhandle National Forests (USDA Forest Service 2013):

“There are no Forest Service management activities that threaten wolverines (direct effects) or high-elevation habitats (indirect effects). Activities on NFS lands do not pose a threat to the viability of the species. Activities that are not likely to disturb wolverines, or habitat, and therefore threaten the viability of the species include (USDI Fish and Wildlife Service 2013a pages 7890 and 7877-7880):

- Dispersed recreation such as snowmobiling, skiing, backpacking, and hunting for other species;
- Management activities such as timber harvest, wildland firefighting, prescribed fire, and silviculture; and
- Mining.

Wolverines have been documented to persist and reproduce in areas with high levels of human use and disturbance (USDI Fish and Wildlife Service 2013a page 7877). There appears to be no evidence that the activities listed above (e.g., snowmobiling, skiing, timber harvest, and mining) translate to threats to subpopulations, populations, vital rates, gene flow, and population persistence (USDI Fish and Wildlife Service 2013a page 7877). USDI Fish and Wildlife Service (2013a) cited ongoing research into the impacts of high levels of recreational use on wolverines in central Idaho. The ongoing research has documented wolverines living in areas of high recreational use (i.e., disturbance) (USDI 2013 page 7878, Heinemeyer 2012, Heinemeyer and Squires 2012).”

However a recent document called Wolverine – Winter Recreation Research Project: Investigating the Interactions between Wolverines and Winter Recreation Final Report (Heinemeyer et al 2017) concludes that both male and female wolverines responded negatively to increasing intensity of winter recreation within home ranges. Below are some excerpts from the Heinemeyer et al 2017 report:

“Wolverines may be vulnerable to direct and indirect impacts of recreation during winter, as they naturally occur at low densities, have low reproductive rates, and remain active through the winter (Hash 1987). There has been no effort focused on understanding wolverine responses to winter recreation, though research suggests they are sensitive to human activities and infrastructure (May et al. 2006, Krebs et al. 2007, Stewart et al. 2016, Heim et al. 2017). Females enter reproductive dens within deep snowpack during the winter recreation season with kits born in mid-Feb to early March and they occupy these dens through late April or mid-May (Hash 1987, Magoun and Copeland 1998). The potential impact of backcountry winter recreation to denning females is of primary concern (Carroll et al. 2001, May et al. 2006, Copeland et al. 2007, Krebs et al. 2007).”

“Habitat models that included winter recreation showed that both males and females responded negatively to increasing intensity of winter recreation within home ranges. Dispersed recreation activities elicited a stronger response than recreation along roads and groomed routes, with females showing more sensitivity to disturbance than males. The functional responses to dispersed recreation,

particularly to motorized dispersed recreation, suggests that avoidance results in potentially important indirect habitat loss when a significant portion of an animal's home range receives recreation use, as it is exactly those animals exposed to higher levels of recreation that are most strongly displaced from these areas. Other wolverines were exposed to winter recreation within only a relatively small portion of their large home ranges, and the functional responses also suggest that this limited exposure may mute the indirect habitat loss. The weak avoidance of areas near linear access used by winter recreationists suggests wolverines may be less sensitive to these linear disturbances."

"Female wolverines appeared to discriminate between different types of winter recreation with the best supported female model containing separate predictors for linear recreation travel, dispersed motorized recreation and dispersed non-motorized recreation. Females avoid all three forms of winter recreation but the relative importance of each is different. Females show a strong avoidance of areas with dispersed non-motorized recreation, though these areas are limited within home ranges. Motorized dispersed winter recreation is the second most important predictor of female habitat selection, indicating that this disturbance has a strong influence on female wolverine habitat selection in areas where motorized recreation occurs. This strong avoidance combined with the potential for motorized recreation to cover larger areas may lead to important indirect habitat loss for female wolverines."

#### **Relevant Forest Wide Goals**

- GOAL-WL-01. The IPNF manages wildlife habitat through a variety of methods (e.g., vegetation alteration, prescribed burning, invasive species treatments, etc.) to promote the diversity of species and communities and to contribute toward the recovery of threatened and endangered terrestrial wildlife species.

#### **Relevant Forest Wide Desired Conditions**

- FW-DC-WL-01. Nests and den sites and other birthing and rearing areas for terrestrial threatened, endangered, proposed, or sensitive species are relatively free of human disturbance during the period they are active at these sites. Individual animals that establish nests and den sites near areas of pre-existing human use are assumed to be accepting of that existing level of human use at the time the animals establish occupancy.
- FW-DC-WL-02. A forestwide system of large remote areas is available to accommodate species requiring large home ranges and low disturbances, such as some wide-ranging carnivores (e.g., grizzly bear).
- FW-DC-WL-03. Recovery of the terrestrial threatened and endangered species is the long-term desired condition. Foraging, denning, rearing, and security habitat is available for occupation. Populations trend toward recovery through cooperation and coordination with USFWS, state agencies, other federal agencies, tribes, and interested groups.

#### **Available GIS DATA**

**Region 1 Persistent Snow Cover** - The presence of persistent spring snow cover (i.e., snow cover from April 24 through May 15) has been determined to define wolverine habitat year-round (Aubry et al. 2007). A review of wolverine research in nine radio telemetry study areas revealed that approximately

95 percent of summer locations and 86 percent of winter locations fell within areas that had persistent spring snow cover at least one of seven years (Copeland et al. 2010).

Female wolverines give birth and rear young from mid-February to approximately the end of March in dens excavated in (often deep) snow. While dens in Idaho have been reported as occurring on “rocky sites, such as north-facing boulder talus or subalpine cirques” (USDI Fish and Wildlife Service 2013a), Copeland et al. (2010) found that female wolverines also showed a preference for denning in habitats that had persistent spring snow cover at least five of seven years.

For the IPNF:

- Potential Wolverine Habitat = One to Seven years persistent snow
- Potential Wolverine Denning Habitat= Five to Seven years persistent snow

**Description of methods used to develop the spring snow layer documented by Jeff Copeland RMRS, Forest Sciences Lab, Missoula MT:** We developed a spatial data layer of Northern Hemisphere spring snow cover for the 7-year period from 2000 to 2006 using Moderate Resolution Imaging Spectroradiometer (MODIS) 500-m spatial resolution daily snow data from the Terra satellite (Hall et al. 2006). We re-classified each image into 4 cover classes (snow, bare ground, cloud, night) for each of the 7 years. A portion of each daily MODIS image was typically obscured by clouds or, occasionally, by night. Generating cloud- and night-free images required compositing 21 consecutive days from 24 April to 15 May, which generally corresponds to the period of wolverine den abandonment (Magoun and Copeland 1998) and is consistent with the time period used by Aubry et al. (2007) to correlate historical occurrence records with spring snow cover. This reduced the number of cloud or night pixels during this period to <3%. We then produced binary layers each for snow and bare ground for each year. The bare ground layer was then overlaid onto the snow layer to mask any ephemeral snow that fell during the period, leaving only the residual winter snowpack. In other words, grid cells were denoted as bare ground if, for any day within the period, they were classified as bare ground. This resulted in a final spring snow cover layer that included only areas in which snow cover persisted to May 15. We then summed areas of spring snow cover in each year across the 7-year period of available MODIS imagery to create a GIS layer depicting the number of years out of 7 that each pixel was covered with snow.