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July 27, 2016

Shoshone National Forest
Attn: Rob Robertson
333 E. Main St.
Lander, WY 82520

Submitted electronically to: travel_management_comments@fs.fed.us

Re: Comments on the Shoshone National Forest's Proposed Action for the travel management plan

Dear Rob Robertson,

Please accept the following comments from Defenders of Wildlife (Defenders) and the Center for Large Landscape Conservation (CLLC) regarding the Shoshone National Forest's Proposed Action for the travel management plan. We appreciate the ability to engage in the planning processes of our fantastic public lands.

Defenders is a national non-profit conservation organization founded in 1947 focused on conserving and restoring native species and the habitat upon which they depend. We submit the following comments on behalf of our more than 1,200,000 members and supporters nationwide including many within Wyoming. These members greatly value the full array of wildlife found on the Shoshone National Forest ("SNF"), especially rare species like wolverines, Canada lynx, and grizzly bears.

Located in Bozeman, Montana, the CLLC seeks to strategically connect ideas, individuals, and institutions to create a network of connected natural areas resilient to large scale environmental challenges. During the development of the new Forest Planning Rule, CLLC and its partners provided comments focused solely on ecological connectivity, and we are pleased that new direction for connectivity is now to be a part of forest plan revisions across the country. As a result, CLLC is participating in selected Forest-level plan revisions to determine how the new national policy and its provisions for addressing connectivity will be translated into each new forest plan. We think the Forest Service's next generation of management plans can make a great leap forward to assure ecological connectivity is a key component for the management of our public lands.

We were aware of the public meetings for the travel management planning effort but were unfortunately unable to attend them. Defenders has been engaged in conservation issues on the SNF in the past, and we participated with extensive comments on the SNF's recently revised Forest Plan.

The Forest Service is legally obligated to minimize harassment of wildlife or significant disruption of wildlife habitats.[1] The SNF must apply a transparent and commonsense methodology for meaningful application of each minimization criterion to each area and trail. We have specific comments below on wolverines, Canada lynx, grizzly bears, and connectivity.

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[1] Executive Order 11989, issued in 1977 by President Jimmy Carter, amended Executive Order 11644 to require additionally that agencies close areas or trails whenever the agency determines that use of ORVs "will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails." Exec. Order No. 11989. See also, the Travel Management Rule, 36 C.F.R. § 212.55(b), (b)(1)–(3) ("minimization criteria")

Road System

The Forest Service faces many challenges with its vastly oversized, under-maintained, and unaffordable road system. The impacts from roads to water, fish, wildlife, and ecosystems are tremendous and well documented in scientific literature. Given that the SNF is proposing changes to its road system and given the geographic scale of this project across the entire forest landscape, this is precisely the type of project where the Forest Service must consider its travel analysis report and identify the minimum road system.[2] We urge the SNF to carefully evaluate its proposal and the alternatives through this lens.

To address its unsustainable and deteriorating road system, the Forest Service promulgated the Roads Rule (referred to as "subpart A") in 2001. 66 Fed. Reg. 3206 (Jan. 12, 2001); 36 C.F.R. part 212, subpart A. The Roads Rule created two important obligations for the agency. One obligation is to identify unneeded roads to prioritize for decommissioning or to be considered for other uses. 36 C.F.R. § 212.5(b)(2). Another obligation is to identify the minimum road system needed for safe and efficient travel and for the protection, management, and use of National Forest system lands. *Id.* § 212.5(b)(1).[3] The minimum road system is the road system, determined by the Forest Service, as needed to:

- Meet resource and other management objectives adopted in the relevant land and resource management plan,
- Meet applicable statutory and regulatory requirements,
- Reflect long-term funding expectations, and
- Ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.

Id. (minimum road system factors). *See also* Memorandum from Leslie Weldon to Regional Foresters *et al.* on Travel Management, Implementation of 36 CFR, Part 212, Subpart A (Mar. 29, 2012). The goal of subpart A is "to maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns."[4]

Recommendations: The SNF must ensure that the actions proposed under the travel management plan are consistent with subpart A. In the Proposed Action scoping document, it appears instead that the SNF is considering increasing the motorized routes by adding 36 miles (p.2), with 34.5 road or trail miles newly constructed (Table 2, p.9). There already 926 miles of National Forest System roads open to the public and many miles of motorized trails. Indeed, the SNF notes in the Proposed Action that "another need is to consider if there are current routes with resource concerns or enforcement issues which could be removed or changed in the system" (p.7). The SNF should seek to narrow the gap between available road maintenance funding and maintenance needs by removing more roads and should use its travel analysis report to help identify further roads and trails to remove.

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[2] 36 C.F.R. § 212.5(b)(1) ("For each national forest . . . the responsible official must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands.").

[3] In promulgating its rules, the Forest Service indicated that "[t]he requirement to identify roads for decommissioning is '[e]qually important' as the overall identification of the minimum road system." *Center for Sierra Nevada v. U.S. Forest Service*, 832 F. Supp. 2d 1138 (E.D. Cal. 2011) (quoting 66 Fed. Reg. at 3207).

[4] 2012 Weldon Memo at 1 ("The national forest road system of the future must continue to provide needed access for recreation and resource management, as well as support watershed restoration and resource protection to sustain healthy ecosystems."). *See also* 66 Fed. Reg. 3206, 3207 (Jan. 12, 2001) (noting the 2001 rules "signal the shift away from development and construction of new roads to maintaining needed roads and decommissioning unneeded roads."); Memorandum from Joel Holtrop, U.S. Forest Service Washington Office, to Regional Foresters *et al.* (Nov. 10, 2010) ("Though this process points to a smaller road system than our current one, the national forest road system of the future must provide needed access for recreation and resource management and support watershed restoration and resource protection to sustain healthy ecosystems and ecological connectivity.").

Winter Motorized Travel

As the Proposed Action document notes, "there is a need to designate roads, trails, and areas for winter motorized travel and produce an over snow vehicle (OSV) use map. This direction stems from a recent court decision and a subsequent revision of the 2005 Travel management Rule" (p 7). As this travel planning process moves forward, we expect to see reference and analysis related to the executive orders that underlay all travel management planning: Executive Orders 11644 and 11989. These orders were issued in response to the growing use of off-road vehicles (ORVs), including OSVs, and corresponding environmental damage and conflicts with non-motorized users. The executive orders require federal land management agencies to plan for ORV use to protect other resources and recreational uses. Specifically, the executive orders require that, when designating areas or trails available for ORV use (including OSV use), the agencies must locate them to:

(1) minimize damage to soil, watersheds, vegetation, and other resources of the public lands;

(2) minimize harassment of wildlife or significant disruption of wildlife habitats; and

(3) minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands.[5]

The 2005 Travel Management Rule (TMR) codified the executive order "minimization criteria" and it is extremely important that the SNF adhere to these criteria when making ORV and OSV designation decisions.

We recognize that the SNF's Forest Plan goes a long way in protecting wild lands and wildlife habitat on the SNF from the impacts of motorized recreation. However, forest plan allocations are not a substitute for the area designations made as part of winter travel planning. The Forest Plan has built a good foundation for over-snow vehicle travel planning but we expect to see additional analysis and more refined OSV area designations during the travel planning process. While the Proposed Action's closures on Togwotee Pass and forest-wide OSV season dates are excellent first steps for wildlife and non-motorized recreation users, these actions alone will not be enough to meet the legal requirements of travel planning.

Recommendations: To satisfy the legal requirements of the 2005 TMR and 2015 OSV Rule the SNF must look closely at the lands allocated for winter motorized use and designate discrete, delineated OSV use areas where OSV impacts on the environment, natural resources, and other uses are minimized. Open areas should have easily enforceable boundaries using topographic or geographic features such as a ridgetop, highway, or watershed boundaries. All other areas that are not determined to be appropriate for open designation must be closed (or limited to designated routes which have been located in compliance with the minimization criteria). Analysis must meet the minimization criteria under the TMR (36 CFR §212.55), which at the very least "…requires the Forest Service to apply the minimization criteria to each area it designated for snowmobile use." (Wild Earth Guardians v. Montana Snowmobile Ass'n, 45 ELR 20117 No. 12-35434, (9th Cir., 06/22/2015). Moreover, in order to comply with the minimization criteria, the Forest Service must include a "description of how the selected routes were designed 'with the objective of minimizing' impacts," Idaho Conservation League v. Guzman, 766 F. Supp. 2d 1056, 1073 (D. Idaho 2011), (quoting 36 C.F.R. § 212.55(b)). As a result, there was "no way to know how or if the Forest Service used [the information in the matrices] to select routes with the objective of minimizing impacts." Id. at 1072. The Forest Service is under an "affirmative obligation . . . to actually show that it aimed to minimize environmental damage when designating trails and areas." Cent. Sierra Envtl. Res. Ctr. v. U.S. Forest Serv., 916 F. Supp. 2d 1078, 1096 (E.D. Cal. 2013); see also Defenders of Wildlife v. Salazar, 877 F. Supp. 2d 1271, 1304 (M.D. Fla. 2012).

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[5] Exec. Order No. 11644, § 3(a), 37 Fed. Reg. 2877 (Feb. 8, 1972), *as amended by* Exec. Order No. 11989, 42 Fed. Reg. 26,959 (May 24, 1977).

Presidential Memorandum regarding Mitigating Impacts on Natural Resources

The mission of the U.S. Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. To the extent the SNF determines that the Proposed Action will reduce ecological connectivity, thereby impairing the SNF's long-term health and its ability to meet the needs of present and future generations, the SNF must decline to adopt the proposal or seek to affirmatively mitigate its harmful effects. Doing so is not only consistent with the agency's mission, but it also conforms to the recent direction of the Presidential Memorandum regarding *"Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment" (November 3, 2015).*[6] That memorandum directs the Secretary of Agriculture to ensure that the Forest Service's mitigation policies establish "a net benefit goal or, at a minimum, a no net loss goal for natural resources the agency manages that are important, scarce, or sensitive, or wherever doing so is consistent with agency mission and established natural resource objectives." For impacts that cannot be avoided entirely, the SNF should adhere to the three-part concept of mitigation – relying on avoidance, minimization, and compensation (with a preference for a ratio of greater than 1:1). In short, where harm results from agency action, compensatory mitigation is no longer at the agency's discretion; rather, it is now an affirmative national policy.

Recommendation: For impacts that cannot be avoided entirely, the SNF should adhere to the three-part concept of mitigation – relying on avoidance, minimization, and compensation. SNF should identify measures that can be undertaken to limit or offset any harm to connectivity as a result of the Proposed Action.

Wolverine

Manage for wolverine conservation, as new information exists showing current wolverine presence on the SNF

A study initiated in 2014 is underway examining wolverine presence in Wyoming (Inman et al. 2015). A 2015 progress report shows that wolverines were found on the SNF (Figure 1). They detected wolverine presence at five stations in Wyoming, including one station in the Southern Absaroka Range, one station in the Gros Ventre Range, and three stations in the Wind River Range.

[6] https://www.whitehouse.gov/the-press-office/2015/11/03/mitigating-impacts-natural-resources-development-and-encouraging-related

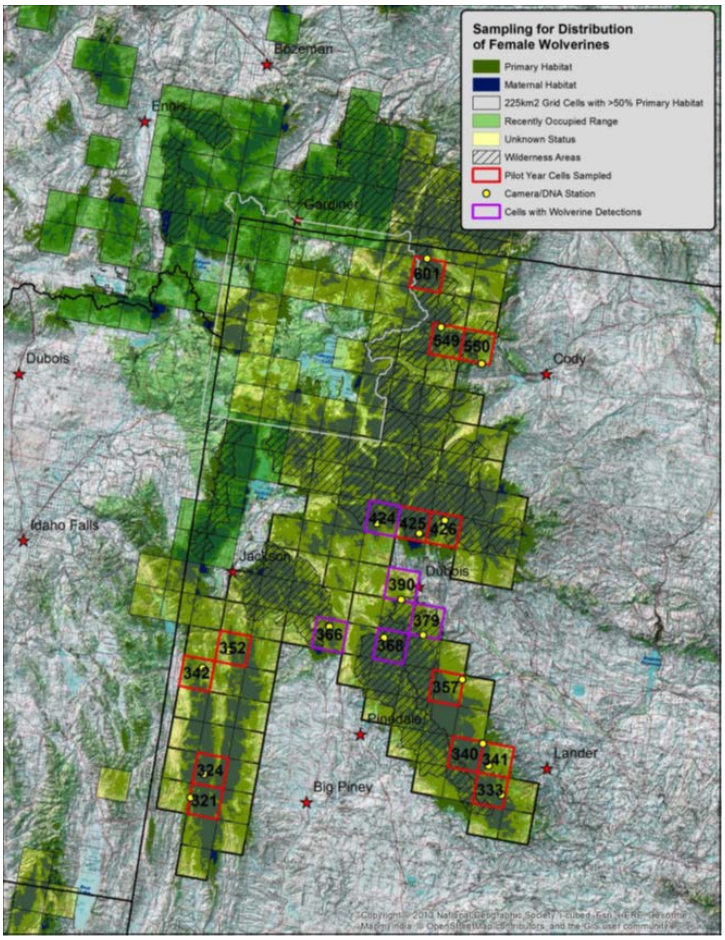

Figure 1. Wyoming wolverine research results from 2014-2015 season showing wolverine presence on the SNF. "Zoom-in to northwest Wyoming with layers representing primary and maternal habitat, known recent occupation vs. unknown status, and designated wilderness. We sampled red cells during the winter and spring of 2014-2015 but did not detect a wolverine (n=13 cells). We did detect a minimum of 3 individual wolverines in the purple cells (n=5 cells)" (Inman et al. 2015).

Maintain the SNF as a major wolverine connectivity zone

Schwartz and colleagues (2009) identified wolverine dispersal corridors in the U.S. Northern Rockies based on persistence of spring snow cover (Figure 2 and Figure 3). They tested whether a dispersal model in which wolverines prefer to disperse through areas characterized by persistent spring snow cover produced least-cost paths that correlated with genetic distance among individuals, and found that successful dispersal paths are indeed likely to be associated with snow cover, even after accounting for distance effects. Figures 2 and 3 demonstrates that portions of the SNF serves as a vital travel route that connects wolverines in the Greater Yellowstone with wolverine populations in other parts of Wyoming and Utah and Colorado. Maintaining wolverines and their habitat on the SNF is vital to connecting wolverines in the Northern Rockies to the large quantity of high-elevation high-quality wolverine habitat in the Southern Rockies of Colorado; the establishment of a wolverine population in Colorado is one of the key recovery needs for the species (U.S. Fish and Wildlife Service 2013). This wolverine corridor may prove critical to any climate adaptation strategy for the U.S. wolverine metapopulation.

Recommendation: Reduce or remove motorized travel on the SNF along wolverine corridor areas and in maternal denning habitat.

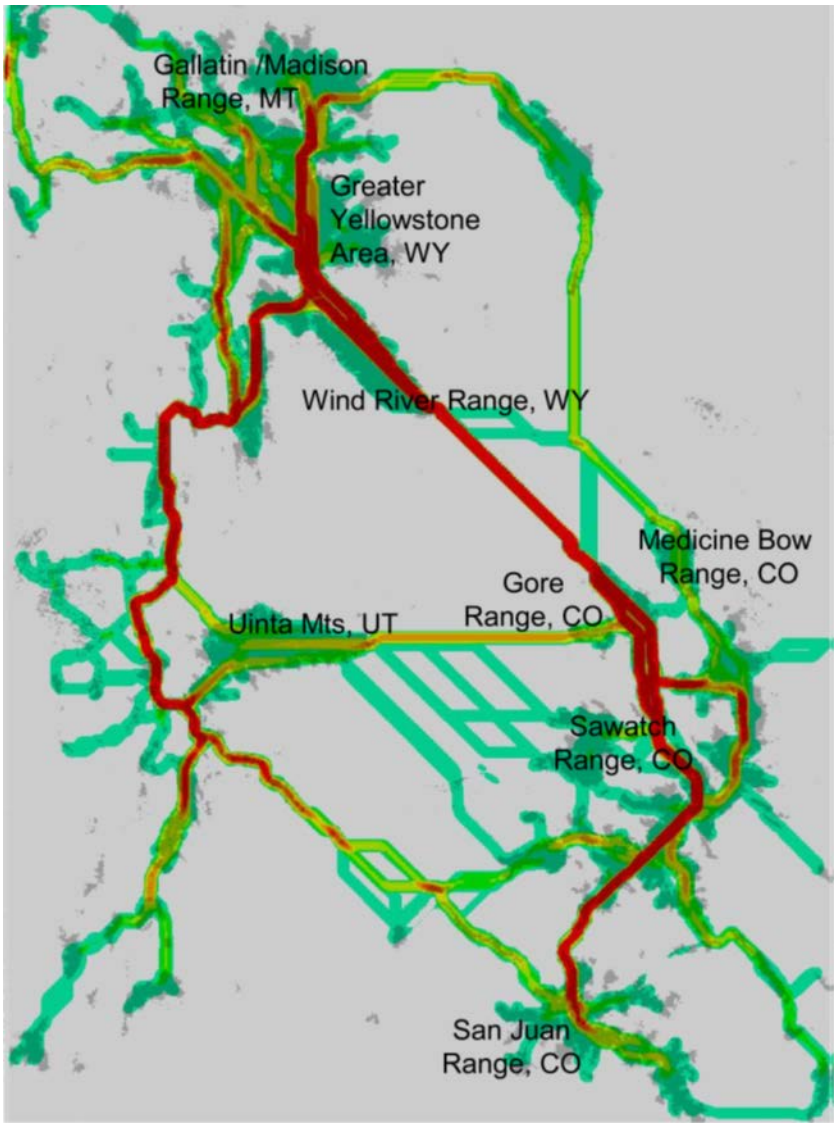

Figure 2. Map of "least-cost paths between Colorado (CO) to the Greater Yellowstone Area (in Wyoming [WY] and Montana [MT]). Areas in red were used more often than those in cooler colors" (Schwartz et al. 2009).

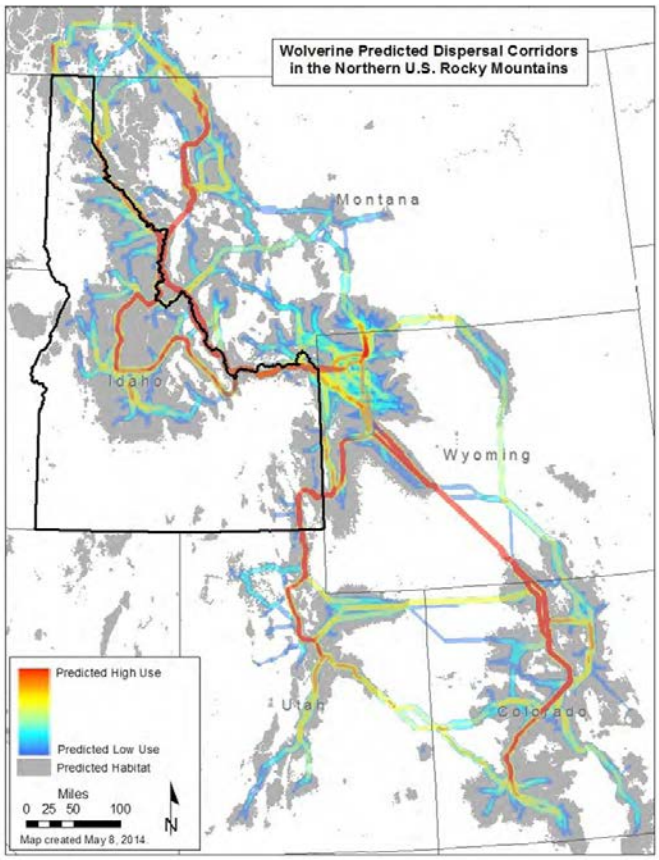

Figure 3 Wolverine predicted dispersal corridors (least-cost pathways) in the northern U.S. Rocky Mountains (Schwartz et al. 2009). Paths in red and orange are predicted to be used more often than those in blue. Corridor model data do not include southwest Idaho, Nevada, Oregon, and Washington.

Assess and avoid impacts to wolverines by OSV use

Impacts to wolverines from winter recreation must be assessed in depth and avoided, and analysis must meet the minimization criteria under the TMR (36 CFR §212.55). Dispersed recreational activities, especially winter motorized recreational activities, have the potential to negatively impact wolverine, disrupting and limiting use of natal denning areas (Hornocker and Hash 1981; Copeland 1996; Carroll et al. 2001; Rowland et al. 2003; May et al. 2006; Copeland et al. 2007; Krebs et al. 2007; Ruggiero et al. 2007; Lofroth and Krebs 2007; Inman et al. 2007a). Disturbance from foot and snowmobile traffic have been purported to cause maternal females to abandon or relocate dens (Myrberget 1968; Magoun and Copeland 1998; Inman et al. 2007b). Krebs et al. (2007) found that females tended to avoid areas with heli-skiing and backcountry skiing areas, and Copeland (1996) noted den abandonment after human disturbance. To the extent the SNF experiences heightened winter recreation activity in February, this usage would coincide with the time female wolverines are selecting and entering dens and giving birth (Heinemeyer et al. 2010).

Winter backcountry recreation is one of the fastest growing recreational activities in the U.S. and the northern Rockies (Cook and O'Laughlin 2008). Snowmobiles are now better able to reach areas previously inaccessible due to advanced technology with more powerful snowmobiles. Many of these places in the northern Rockies where winter recreation is experiencing growth spatially overlap suitable wolverine habitat and, more specifically, areas occupied by wolverines (Heinemeyer and Squires 2012; Heinemeyer and Squires 2013; Heinemeyer and Squires 2014; Heinemeyer and Squires 2015; IDFG 2014). High-cirque snowmobile use, especially cross-country use and "high marking", may present a substantial threat to wolverine habitat, including reproductive dens, thereby threatening wolverine reproductive success.

Researchers and natural resource managers have expressed concerns about effects of winter recreation on wolverine populations since the 1980s (Copeland 2009).

Current winter recreation research indicate that wolverines near human disturbance are likely changing their behavior and activity level in response to human activities (Heinemeyer and Squires 2013), raising substantial concern over the effect of winter recreation on the persistence of planning area populations. Wolverines in the study areas change their activity level at time periods and days of higher recreational use, shifting their activity to avoid the most heavily used areas within their home ranges. The data suggests that these increased movement rates are due to fewer resting periods in recreated areas. This may result in significant additive energetic effects on wolverines during the critical winter and denning periods; as evidenced in numerous studies on different species (Creel et al. 2002), these behavioral changes can negatively affect individuals' physiological stress levels and reproductive capacity. High disturbance areas may act as a population sink for wolverines.

As snowmobiling and backcountry skiing continue to grow in popularity, there is increasing concern that reproductive habitats may become limiting to populations due to human disturbance. This is a concern particular regarding reduced snowpack due to climate change. Recent warming has already led to substantial reductions in spring snow cover in the mountains of western North America (Mote et al. 2005; Pederson et al. 2010). Protection of reproductive denning habitat may be critical for the persistence of wolverine.

Such impacts to wolverines are well-described in the 2015 Travel Management Planning Project Final EIS by another Montana forest, the Bitterroot National Forest, attached as Appendix A in this document, and these impacts should be equally described by the SNF. As described by the Bitterroot National Forest, the Forest Services' own examination of impacts to wolverines indicates that wolverines are negatively impacted and harassed by OSV activity. This calls out for a much more precise analysis of, and more precise designation of, OSV use and travel constraints.

Recommendation: The SNF should undergo a significant examination of potential impacts to wolverines from winter recreation using the best available science, including the Heinemeyer and Squires (2010; 2012; 2013; 2014; 2015) study and an analysis of how dispersed OSV use meets the TMR criteria. We request that the SNF analyze the effects of each alternative on wolverine denning habitat and dispersal routes. Over-snow-vehicles should not be permitted within modeled maternal wolverine denning habitat.

Do not dismiss impacts to individual wolverines, as those are inevitably population-level impacts

There is no known population trend for wolverines in the SNF or across their range in the lower 48. It therefore cannot be assumed that wolverine populations are stable nor increasing. A lead wolverine researcher, Jeff Copeland, recently stated that there is no scientific evidence to back up the claim that wolverine populations are at their highest levels and still growing.[7] What is known is that wolverine numbers are extremely low. Wolverine habitat in the northern Rockies is restricted and disjunct (Aubry et al. 2007; Inman et al. 2013). This impacts wolverine genetic health, as wolverines in the lower 48 have low genetic diversity, high genetic drift, and low connectivity with Canadian populations (Kyle and Strobeck 2001; Cegelski et al. 2006; Schwartz et al. 2009). Wolverine populations are likely to be even further negatively affected by changes in the spatial distribution of habitat patches as remaining habitat islands become progressively more isolated from each other within this century due to climate changes (McKelvey et al. 2011). This impending habitat and subsequent connectivity loss warrants substantial concern for wolverine persistence in the long-term. Therefore, even one individual wolverine, especially a reproductive female, negatively impacted by human activities, will likely have negative repercussions over time on the genetic health of the overall population.

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[7] http://www.tetonvalleynews.net/page2/groups-sue-over-decision-not-to-list-wolverines-as-endangered/article_99ca2260-5bb9-11e4-a837-17e78c7599d1.html

Recommendation: Impacts analysis must consider a higher level of concern for very low wolverine populations in the SNF. The SNF should thus take a conservative approach when assessing and minimizing impacts to wolverines from winter recreation.

Improve SNF's wolverine modeling/mapping

The SNF's 2015 amendment to the 2013 biological evaluation for the Forest Plan does not appear to include high-quality modeling or mapping. We encourage the SNF to analyze the impacts to wolverine habitat using an updated and widely accepted model. There are two prevalent rangewide connectivity models for wolverine habitat in the continental U.S. The first model considers the presence of snow on May 15th as a factor that will influence wolverine locations between known habitats using least-cost path modeling (McKelvey et al. 2011). A second connectivity model predicts probable inter-habitat corridors based on resource selection function estimates from wolverine location data collected from wolverines fitted with VHF and GPS tracking devices and circuit theory (Inman et al. 2013). Additionally, the Inman et al. (2013) model outputs identified primary and maternal wolverine habitat in the western U.S that is easily accessed online.[8] Primary wolverine habitat is the area within the climactic limits of wolverines that resident adult wolverines are expected to occupy and maternal habitat includes areas that contain attributes consistent with those measured around the known wolverine dens used in this study. It is important to include analysis of both primary and maternal wolverine habitat. Figure 4 shows wolverine maternal denning habitat and primary habitat using the Inman model that should be used by the SNF.

Recommendation: Use an up-to-date wolverine habitat model. Include effects analysis to both primary and maternal wolverine habitat.

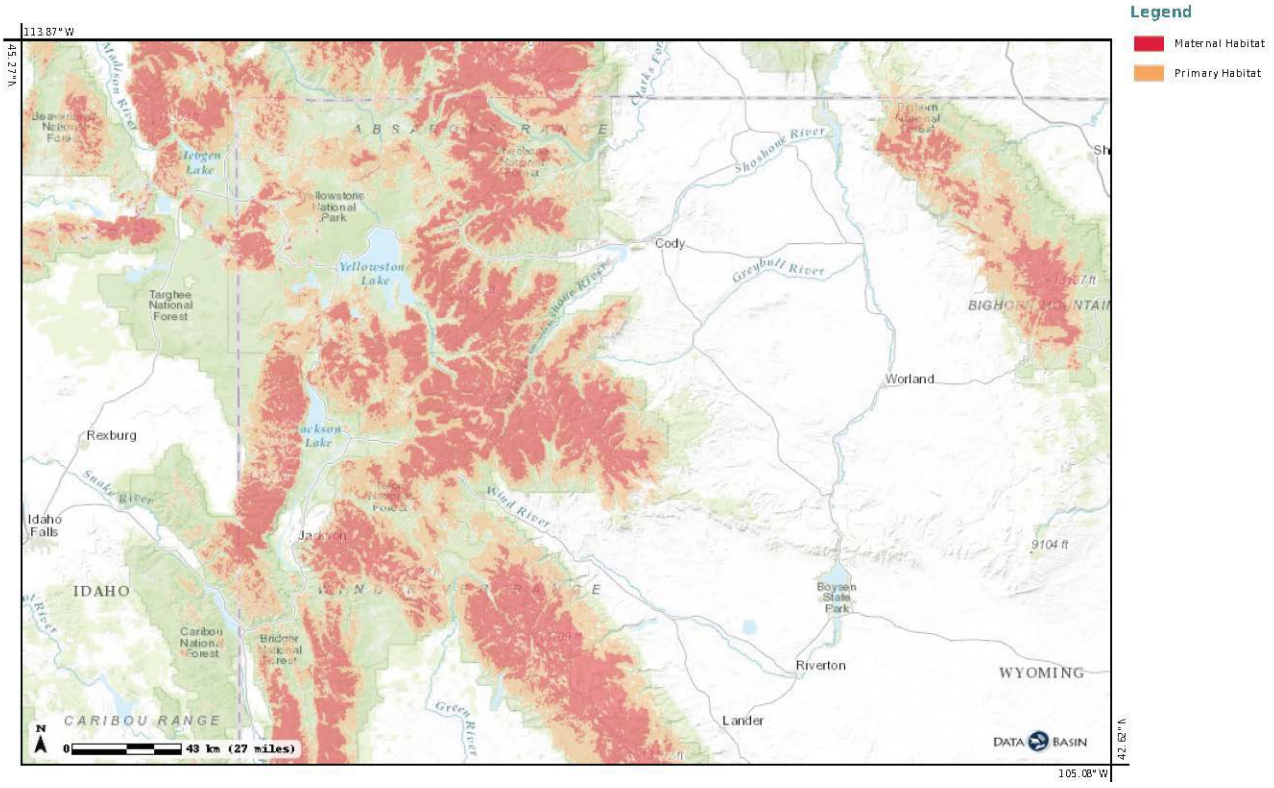

Figure 4. Maternal and primary wolverine habitat (Inman et al. 2013). From databasin.org.

[8] https://databasin.org/datasets/44d4a9ae1672459ebd8fb718f1cc7610

Canada Lynx

Assess and avoid impacts to lynx by winter and summer motorized use

Canada lynx are listed as threatened under the ESA. Critical habitat has been designated within the SNF, and the SNF is designated "occupied lynx habitat" by the Forest Service. The entire SNF is located in "core area" as described in the Recovery Outline (U.S. Fish and Wildlife Service 2005). The SNF has amended its forest plan with the Northern Rockies Lynx Management Direction (NRLMD) (U.S. Forest Service 2007) with its standards and guidelines to protect lynx.

As snow levels diminish with climate change, dispersed OSV use will become more concentrated in those snowy areas still remaining – exactly where lynx are trying to persist as well. Winter recreation will thus continually become a more serious threat to the persistence of the population over time. A Colorado winter recreation involving dispersed recreation (Interagency Lynx Biology Team 2013) has preliminarily found that lynx appear to change their activity levels temporally in relation to human activity – which may negatively impact the physiological health of lynx with implications on productivity of the population (J. Squires, pers.comm. 2016).

Additionally, open roads can increase lynx vulnerability to hunting, trapping, and/or poaching (Koehler and Brittell 1990; Aubry et al. 2000; Koehler and Aubry 1994; McKay 1991), as human access via Forest roads can increase the potential for mortality or injury of lynx captured incidentally in traps aimed at other species or through illegal shooting, although lynx harvest seasons were closed in Montana following listing in 2000.

Recommendation: There should be no expansion of snowmobile OSV routes or play areas in lynx habitat. The amount of OSV use within lynx analysis units (LAUs) should be analyzed to determine levels of stressors to individual lynx in LAUs with higher amounts of OSV use and should be minimized. We request that the number of miles of roads and trails open to summer motorized use within lynx habitat should be reduced to the lowest density possible.

Given direction to protect lynx habitat within the NLRMD, the SNF should analyze the effects of each alternative in the following areas:

- Expansion of snow compacting activities (Objective HU O1);
- Concentrating activities in existing developed areas, rather than developing new areas (Objective HU O3);
- Expansion of designated over-the-snow routes or designated play areas outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat (Guideline HU G11).

There are several lynx "Linkage Areas" mapped in the SNF that should be considered and for which have management guidance from the NRLMD (Figure 5). The SNF should analyze the effects to the following:

- Maintenance or restoration of lynx habitat connectivity in and between LAUs, and in linkage areas. (Objectives ALL O1, HU O2).

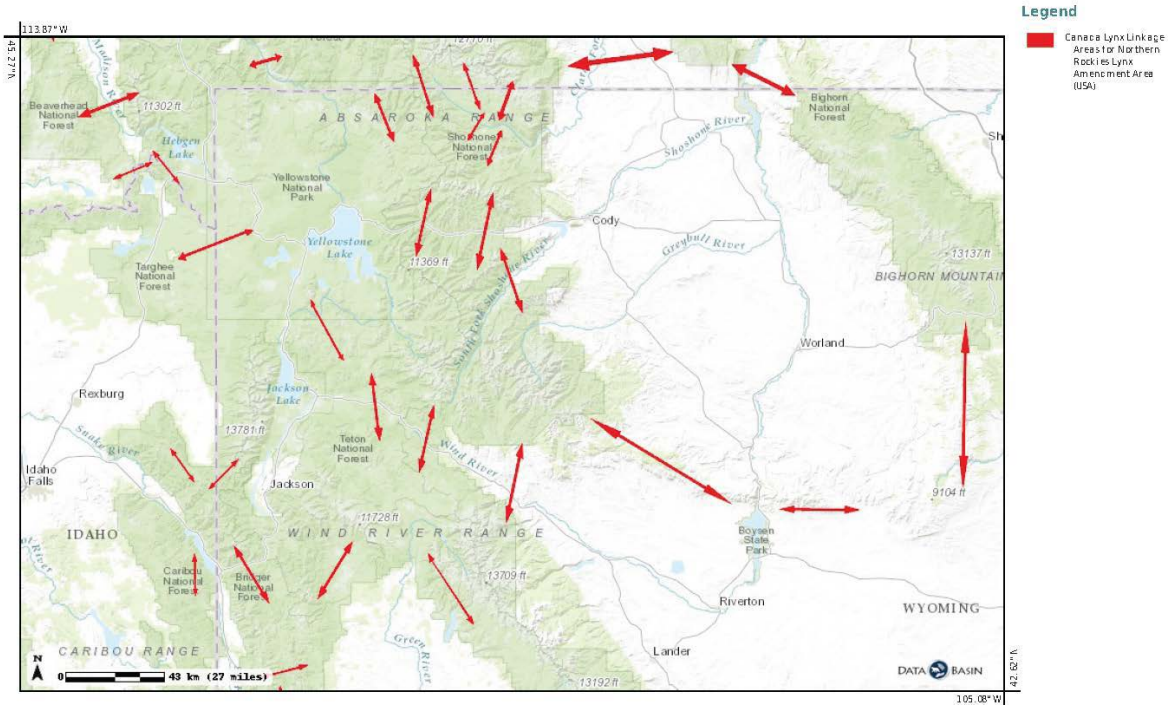

Figure 5 Canada Lynx Linkage Areas for Northern Rockies Lynx Amendment Area. USFS- Northern Region. From databasin.org

Grizzly Bear

Avoid grizzly bear mortality and habitat fragmentation from increased motorized access

Human development and access can negatively impact female grizzly bears and females with young, leading to avoidance of habitat and habitat fragmentation (Mace et al. 1996; Proctor et al. 2012, Proctor et al. 2015). Grizzly bears are sensitive to development and recreation with even low densities of residential development creating potential sink habitats (Schwartz et al. 2012). Grizzly bears are also less resilient to environmental disturbance due to low reproductive rates, the need for high quality foods in the spring and the natal philopatry of females (Weaver et. al. 1996). Given rapid development of private lands in the West, habitat protections and designations on public lands are fundamental to the long term vision for a viable meta-population of grizzly bears in the lower 48 states.

The SNF contains lands within the Yellowstone grizzly bear recovery zone as well as eight Bear Analysis Units outside the grizzly bear recovery zone. In March 2016, the U.S. Fish and Wildlife Service (FWS) proposed to remove Endangered Species Act protections for the Yellowstone grizzly bear population. That process is not final and grizzly bears remain listed. However if the delisting proposal is finalized, the SNF will be within the FWS's defined Demographic Monitoring Area (DMA). The DMA will be "the area within which the population will be annual surveyed and estimated and where total mortality limits will apply" (81 Fed. Reg. at 13186). The SNF should proactively analyze any proposed changes to the travel plan as they might affect grizzly bears both inside and outside the grizzly bear recovery zone and within the DMA.

We recognize that pressure from the motorized use community to increase access in the SNF is challenging to balance with the needs of a myriad of wildlife species. However the Forest Service is obligated to minimize harassment of wildlife and significant disruption of habitat for species such as grizzly bears (EO 11644 and 11989, TMR at 36 C.F.R. § 212.55 (b)). Travel planning changes such as an increase in motorized road density must not result in a loss of secure habitat for grizzly bears.

The SNFs' Proposed Action includes an increase in miles of motorized routes, loop opportunities and provides conditions for larger UTVs. In order to provide these opportunities the SNF is proposing changes to roadless areas. Inventoried Roadless Areas should be managed at their maximum acreage as roadless and motorized vehicle use should not occur in such locations.

Recommendation: Provide a detailed analysis of how the Proposed Action will impact grizzly bears both within the PCA as well as outside the PCA using the DMA boundaries identified by the FWS. Road density changes must not result in a loss of secure grizzly bear habitat within the PCA and there should be an emphasis on minimizing loss of grizzly bear habitat within the DMA.

Avoid increased conflicts with grizzly bears from dispersed camping

It is widely known that a primary source of conflicts between people and grizzly bears is correlated to the availability of anthropogenic attractants like coolers, garbage and game. Increasing the number of dispersed camping sites and improving access to such sites may result in conflicts with grizzly bears. We recognize that the SNF has Food Storage Order (No. 04-00-104). While food storage orders assist with minimizing conflicts on public lands enforcement is often difficult and compliance not assured. Some dispersed sites become basically, developed sites due to popularity and high use. Limiting access to dispersed sites and the number of developed sites offers another way to minimize bear-human conflict.

Recommendation: Do not allow for increased access to dispersed camping sites.

Avoid increased conflicts with grizzly bears from mountain bikes

Defenders urges the SNF to assess impacts that additional mountain biking opportunities will have on grizzly bears and those traveling in bear country. Bicyclists moving along a well maintained bike path can travel quickly and quietly. This can result in sudden encounters between bicyclists and grizzly bears. The sudden encounter is the most common situation associated with grizzly bear-inflicted injury (Herrero 1990). While attacks are rare, there have been two incidents in 2016 that have drawn media attention. This has raised concerns and conversations about the rapidly growing industries of mountain biking and trail running in bear habitat. On June 29, 2016 Brad Treat was killed after colliding with a grizzly bear in NW Montana[9] and on July 20, 2016 in southern Alberta, a woman came upon a bear on her bicycle and injuries were inflicted.[10] The woman's partner reacted quickly, using her bear spray and the bear moved away.

Recommendations: It is important that the SNF take into account the prospect that additional mountain biking opportunities may result in increased grizzly-human conflict and the potential for human safety concerns and grizzly bear mortality. Mountain bike trails should be located away from prime grizzly bear habitat and/or closed during periods when grizzly bears are using the area. Mountain biking trails should be well signed for bear activity and the SNF should conduct outreach and education on proper precautions to use while recreating in bear habitat while encouraging everyone to know how to use and carry bear spray.

Over snow vehicle use can disrupt grizzly bear den sites

In regards to OSV use, grizzly bears can be susceptible to disturbance at their den sites, can be easily awakened, and disturbance has been found particularly in the spring when females and cubs of the year are still present (Mace and Waller 1997). Allowing extensive OSV and winter access in areas where grizzly bears are denning is detrimental to grizzly bear security. The SNF should minimize OSV use in modeled grizzly bear denning habitat across the forest throughout the denning season (Oct/Nov entering dens, March/May emerging).

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[9] http://www.spokesman.com/blogs/outdoors/2016/jul/02/fatal-bear-attack-mountain-biker-triggered-collision-bear-search-called/

[10] http://globalnews.ca/news/2840129/alberta-bear-experts-warn-of-conflicts-with-cyclists-as-woman-recovers-from-attack/

Recommendations: Minimize OSV use in grizzly bear denning habitat across the forest throughout the season.

Connectivity

The SNF supplies essential breeding, denning, and feeding habitat for all of these species, but is especially important in supplying connectivity habitat. Connectivity provides for the adaptation of species to effects of climate change and is critical to the conservation of species diversity (Heller and Zaveleta 2009). It is also generally accepted that isolated populations are at greater risk of extinction over the long term, and the largest and rarest species tend to disappear first (Soule 1983). Some level of movement and gene flow between geographically separate populations however, decreases the probability of extinction (Soule 1987; Hanski 1999), promotes population persistence (Hanski and Gilpin 1997), mitigates genetic erosion, and allows for immigration and emigration in response to random genetic, demographic, and environmental changes, including disease epidemics, cyclical food shortages, climate change or large scale fire events (Breitenmoser et al. 2001; Hedrick 1996; Hedrick and Gilpin 1996).

We request that the SNF first seek to protect ecological connectivity in its travel management plan, or, as a last resort, to affirmatively mitigate the Proposed Action's harmful effects, consistent with the President's recent memorandum directing that the Forest Service's mitigation policies establish "a net benefit goal or, at a minimum, a no net loss goal for natural resources the agency manages that are important, scarce, or sensitive, or wherever doing so is consistent with agency mission and established natural resource objectives."

We respectfully urge the SNF to consider the following available connectivity studies during its assessment of the likely environmental effects of the Proposed Action (Table 1). Use of these scientific studies will allow the SNF to help ensure that it avoids activities that are detrimental to wildlife movement and ecological processes. In the event such harms cannot be avoided by adopting an alternative action, then the SNF should adopt measures to establish a net positive benefit, or at a minimum, no net loss, for this important natural resource area, as discussed below.

Spatial datasets produced by most of these studies highlighting areas of connectivity value are available online to view or download through the Great Northern Landscape Conservation Cooperative (GNLCC) Ecological Connectivity Data Atlas hosted on Data Basin. Table 1 below provides a list of available datasets and direct links. Contact information for data sources is also provided below in the descriptions of each dataset.

Other sources of connectivity mapping and modeling can be found elsewhere, which we have included in Appendix B.

Table 1. Connectivity datasets available to view or download through the GNLCC Ecological Connectivity Data Atlas.

Name	*Originator*	*Type*
Utah-Wyoming Rocky Mountain Ecoregion Core Areas and Linkages	R. Noss et al.	Landscape integrity
Western U.S. wolverine dispersal habitat	R. Inman	Single species
U.S. Northern Rockies Black Bear Movement Corridor Intensity	S. Cushman	Single species
Pacific Northwest Terrestrial Local Landscape Permeability	TNC	Landscape integrity
Western Governors' Association Connectivity Zones and Large Intact Blocks	WGA	Landscape integrity

Incorporate landscape integrity connectivity models

Several connectivity models have been developed that are not wildlife species-specific, but, rather, serve as a coarse-filter approach to identifying areas expected to support movement of a wide range of species as well as continuity of ecological processes. These models are intended to provide a first-pass, "20,000-foot" view of areas expected to be important for connectivity, and should not form the basis for fine-scale, site level management decisions. Instead, these models can help to inform the broader context of the planning area

and its contribution to regional-scale connectivity, and to guide selection of general areas within which to prioritize collection and/or use of finer-scale data.

While the models described below were designed with the same concept in mind, they employ different methodologies, encompass different geographic extents, and are presented in different forms. Therefore, while similarities exist, predictions of key corridors from each model will often disagree, particularly at finer scales. We suggest that each model offers a potentially valuable perspective on priorities in managing for connectivity, and that both should be considered, alongside other resources described below, but that care should be taken to understand and acknowledge the assumptions and objectives of each approach, which drive their predictions and interpretation.

West-wide Crucial Habitat Assessment Tool Landscape Connectivity Model

The Western Governors' Association has produced a west-wide Crucial Habitat Assessment Tool (CHAT) as part of its Wildlife Corridors and Crucial Habitat Initiative.[11] The CHAT is a cooperative effort of 16 Western states to provide the public and industry a high-level overview of "crucial habitat" across the West. "Crucial habitats" are places that are likely to provide the natural resources important to aquatic and terrestrial wildlife, including species of concern, as well as hunting and fishing species. The west-wide CHAT is intended to help users in the pre-planning of energy corridors and transmission routes, or in comparing fish and wildlife habitat, by establishing a common starting point across the West for the intersection of development and wildlife.

As part of the WGA's CHAT effort, connectivity among large intact blocks of habitat was modeled throughout the west. These models identify centrality flow lines, or corridor routes predicted to be crucial for maintaining broad-scale connectivity of several major biomes, including forested systems (WGA 2008). Each of these lines is buffered by 1 mile on each side to account for various sources of uncertainty in the model. Although this analysis was conducted throughout the west, individual states adopted it at their own discretion. Therefore, because some states selected alternative methods for modeling connectivity (e.g., Wyoming) and many states chose not to make connectivity layers public via the CHAT, this layer is not available for download from the CHAT website (though it is viewable on the GNLCC Connectivity Atlas through Data Basin's map interface; Table 1). For download access, please direct questions concerning access to and use of this dataset to John Pierce (360.902.2511, John.Pierce@dfw.wa.gov)

TNC Terrestrial Local Landscape Permeability

The Nature Conservancy recently released a study identifying resilient terrestrial landscapes across the Pacific Northwest, including Western Montana. As part of this study, local landscape permeability was modeled based on land cover and land use. Permeability quantifies the extent to which ecological flows outward from a given cell are impeded or facilitated by the surrounding landscape. Although this model is driven by human footprint on the landscape, similarly to the models described above, it differs in that it provides a continuous representation of the ease of moving through any given place on the landscape, rather than identifying major routes through an area from a broad-scale connectivity perspective. It is therefore expected to be complementary to the datasets described above. This dataset is downloadable through the GNLCC Connectivity Atlas (Table 1).

Specific Areas of Concern

Defenders supports Greater Yellowstone Coalition's comments on North Zone proposals and the Sierra Club Wyoming Chapter on the Washakie Ranger District proposals. In the North Zone and Washakie

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[3]In spring 2015, the Western Governors handed off oversight and management of CHAT to the Western Association of Fish and Wildlife Agencies (WAFWA) and Association of Fish and Wildlife Agencies (AFWA). The new name is the Western Association of Fish and Wildlife Agencies' Crucial Habitat Assessment Tool (WAFWA CHAT).

proposals, we discourage the SNF from constructing new trails that might bolster numbers but don't effectively meet the needs of the motorized community. We support the comments in the Wyoming Wilderness Associations comments on the Wind River Ranger District proposals. Currently over half of Wind River District crucial winter range is "exempted" to allow unregulated snowmobile use. The SNF should work closely with Wyoming Game and Fish to explain this rationale and demonstrate how these designated open areas meet the minimization criteria of Subpart C. The SNF should work closely with wildlife professionals and advocacy organizations to develop an alternative that emphasizes crucial winter range protection.

Conclusion

Thank you for the opportunity to provide comments on the SNF's Proposed Action for the travel management plan. We respectfully request that you consider the resources and recommendations above during your examination of the potential environmental effects of the Proposed Action. If you have any questions regarding our comments or the information we have provided, please do not hesitate to contact us.

Respectfully submitted,

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Appendix A Impacts Analysis to Wolverines in the 2015 Bitterroot National Forest Travel Management Plan DEIS

"Wolverines are rare carnivores that spend most of their time in upper elevation areas that retain snowpack late into the spring (Aubry et al. 2007). Wolverines appear to den in boulder talus fields or areas with down logs in high elevation basins. They may be sensitive to human disturbance from either motorized or non-motorized over-snow recreationists during the denning season, which is generally February through May. Disturbance may cause wolverines to abandon den sites and move kits a considerable distance, or may impact wolverine foraging success; either of which may reduce reproductive success….Over-snow vehicle use access leads to increased trapping pressure for some furbearers that prefer more mesic habitat conditions generally found at higher elevations or in riparian habitats, such as marten, fisher, lynx, and wolverine. Trapping season for these species is limited to the winter months, and most trappers prefer the relatively easy access to suitable habitat provided by over-snow vehicles. Lack of over-snow vehicle access dramatically reduces the amount of trapping pressure for these species, several of which are classified as Sensitive or are federally listed." (U.S. Forest Service 2015, Sec3.5, p9)

"The growing popularity of winter backcountry recreation has resulted in winter recreation expanding into previously undisturbed and unreachable public lands that often represent high quality wolverine habitat. The potential effects of winter recreation on wolverine reproduction, behavior, habitat use and populations are unknown but there is some concern regarding the effects of winter recreation on the species, particularly in denning habitat (Heinemeyer and Squires 2014). Squires et al. (2007) demonstrated that wolverine populations in small, isolated mountain ranges can be very susceptible to trapping pressure. Therefore, the analysis assesses the potential for motorized winter recreational use to disturb wolverines in potential denning habitat, and the potential for winter access to facilitate trapping pressure in remote areas." (Sec3.5, p38).

"Researchers have reported that female wolverines may be sensitive to human disturbance in the vicinity of natal and maternal dens, and may abandon dens and move their kits a considerable distance if they detect human presence in the area (Copeland 1996, Magoun and Copeland 1998). This could reduce kit survival rates by increasing the potential for predation or reducing the amount of time the female can spend procuring food. However, more recent reports indicate that wolverines may be able to tolerate at least some close approach by humans without abandoning their dens (Heinemeyer and Squires 2014, Heinemeyer and Squires 2013, Heinemeyer et al. 2010; Inman et al. 2007b; Persson et al. 2006). Human disturbance in wolverine habitat during the winter may also affect reproductive success by reducing the ability of female wolverines to hunt or to utilize food caches. These caches (typically carrion) appear to be critical in providing enough calories for female wolverines to accumulate sufficient energy reserves to successfully bear and raise a litter (Inman et al. 2012a)." (Sec3.5, p42)

"Preliminary results of an ongoing study in central Idaho designed to address whether winter recreational use is compatible with denning wolverines indicate that some wolverines do reside in landscapes that have relatively high levels of winter recreation, and at the home range scale are not excluded from these areas (Heinemeyer and Squires 2014, Heinemeyer and Squires 2013; Central Idaho Wolverine and Winter Recreation Research Study. 2012; Heinemeyer et al. 2010). However, wolverine movement rates increased notably when the animals were within portions of their home ranges with higher recreation use, and those movement rates were highest on days of the week when recreational activities were high. The data suggests that these increased movement rates are due to fewer resting periods in recreated areas. This may result in significant additive energetic effects on wolverines during the critical winter and denning periods

(Heinemeyer and Squires 2013). In addition, denning female wolverines in highly recreated areas were less active during the day and more active at night compared to females in areas with little recreation. Leaving the cubs unattended at night may increase their exposure to risk factors such as predation or low temperatures (*Ibid*). These preliminary results indicate that winter recreation may impact wolverines in as yet unknown ways." (Sec3.5, p42-43)

"Human presence in the vicinity of wolverine dens could result in reduced foraging success for adult females already stressed by the demands of bearing and raising a litter (Heinemeyer and Squires 2013; Inman et al. 2012a), or even in den abandonment (Copeland 1996, Magoun and Copeland 1998). Either could in turn reduce reproductive success for wolverines." (Sec3.5, p50)

Appendix B

Wildlife Linkage Mapping Software Available for Free on Internet [12]

Circuitscape: http://www.circuitscape.org/.

Borrows algorithms from electronic circuit theory to predict patterns of movement, gene flow, and genetic differentiation among plant and animal populations in heterogeneous landscapes. It complements least-cost path approaches because it considers effects of all possible pathways across the landscape simultaneously.

Connect: http://www.unc.edu/depts/geog/lbe/Connect/

A set of tools that helps researchers and conservation planners model landscape connectivity for multiple wildlife species in complex heterogeneous landscapes. This planning tool packages three connectivity modeling tools: Circuitscape, NetworkX, and Zonation into user-friendly geo-processing toolbox for ArcGIS 9.3

Connectivity Analysis Toolkit (CAT): http://www.klamathconservation.org/science_blog/software/

Combines several new connectivity analyses and linkage mapping methods in an accessible user interface. Through centrality metrics is evaluates paths between all possible pairwise combinations of sites on a landscape to rank the contribution of each site to facilitating flows across the network of sites, indicating continuous gradients of habitat quality. It helps one to avoid the focus on delineating paths between individual pairs of core areas characteristic of most corridor or linkage mapping.

Conservation Corridor http://www.conservationcorridor.org/.

North Carolina State University's site on the science of connectivity. This is not software, but tracks the latest news and peer-reviewed literature on wildlife corridors and connectivity, and aims to bring the information to practitioners.

Corridor Design: http://corridordesign.org/

Paul Beier's, a leader in connectivity analyses, hosts this website for his software. It gives the user a suite of ArcGIS tools to design and evaluate corridors that have been carried out by the State of Arizona.

Landscope America: http://www.landscope.org/focus/connectivity/

Helps to plan for connectivity for wildlife. Presents different methods and tools. It is meant to compliment. Compaction tool for North Carolina State University Conservation Corridor site.

Linkage Mapper: https://code.google.com/p/linkage-mapper/

A GIS tool designed to support regional wildlife habitat connectivity analyses. It was created for the Washington Wildlife Habitat Connectivity working group. Launched in 2013. It uses Circuitscape to ID pinch points within least-cost corridors and to analyze linkage network centrality. *Note: They have a Climate Linkage Mapper – that maps corridors following climatic gradients to facilitate species' range shifts under climate change. Appendix A. Wildlife Linkage Maps, Methods and Consideration*

MultyLink: http://pascal.iseg.utl.pt/~rbras/MulTyLink/.

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[12] List from: Cramer P., S. Gifford, B. Crabb, C. McGinty, D. Ramsey, F. Shilling, J. Kintsch, K. Gunson, and S. Jacobson. 2014. Methodology for Prioritizing Appropriate Mitigation Actions to Reduce Wildlife-Vehicle Collisions on Idaho Highways. Research Report 229, FHWA-ID-14-229. Prepared for Idaho Transportation Department. 280 pps.

Is an open source software application designed to select connectivity linkages for distinct types of habitats, under cost-efficient protocols. Looks at linkages free of barriers, [may not work for landscapes with roads]. Shows right on first page how it could be applied to climatic classes and protected areas. European created.

NetworkX: http://networkx.github.io/.

Software for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks. It is made for anything with nodes and networks.

Zonation: http://cbig.it.helsinki.fi/software/zonation/.

Is a conservation planning framework from Helsinki. It produces a hierarchical prioritization of the landscape based on the occurrence levels of biodiversity features in sites or cells, by iteratively removing the least valuable remaining cell while accounting for connectivity and generalized complementarity.