

Appendix C for the Objection filed against the Selway Saginaw Vegetation Project by Native Ecosystems Council and the Alliance for the Wild Rockies on August 7, 2023.

Appendix C contains a review of the impacts of clearcut openings on wildlife. The scientific references and/or reports are provided in Appendix A.

The Selway Saginaw Vegetation Project includes an undefined number of openings over 40 acres; only individual units instead of combined units are defined. These undefined openings sizes also do not include natural meadows that may adjoin the proposed clearcut; the adjacent meadow openings are not included in the created opening size. Thus total opening sizes are unknown for this project, and are not disclosed to the public.

The project-level analysis of the effects of large openings on wildlife was very limited, and does not provide a basis for estimating the impact of the proposed clearcuts on various wildlife species. This analysis could not be tiered to the BDNF Revised Forest Plan (RFP) as there is no analysis in this RFP about how large openings will impact wildlife; the RFP indicates openings will be limited to 40 acres in size.

There are a host of impacts that will occur to various wildlife species that were not disclosed and thus not considered in the measurement of whether or not significant environmental impacts will result from the proposed large openings. Examples of these likely significant adverse environmental impacts to wildlife from the proposed large openings are provided below. Note that these

Impacts will be adverse for the pine marten. This species is known to avoid crossing larger openings, as well as thinned forests; marten were 1,200 times less likely to be located in openings compared to structurally complex forests stands in the study; avoidance of openings increased survival costs for marten, due to increased energetic demands; increased movements, including where cover was less, also increased their risk of predation (Kirkland 2016). It has been noted that in Montana, clearcutting results in an increase in pine marten territory size; the lack of tree cover in clearcuts also results in heavy snow accumulation that limit the marten's ability for hunting, resting, and escaping predators (Fager 1993). The detrimental effects of clearcutting on pine marten appears to limit pine marten persistence in a landscape when 25% or more of the home range has been clearcut (Hargis et al. 1999).

Clearcutting will be detrimental to the Canada lynx. The current best science has reported that for productive, high-quality lynx habitat, where female lynx are able to raise kittens, that no more than 5% of the home range of roughly 13,500 acres should be openings; this includes the entire landscape, including natural openings (Kosterman et al. 2018; Holbrook et al. 2019). Lynx have been documented to avoid clearcut openings in the winter, with the average crossing distance of lynx across clearcuts in winter being only 383 feet (Squires et al. 2010). The barrier impacts of clearcuts on lynx may last for up to 43 years (Holbrook et al. 2018). Clearcuts will contribute to natural openings and other forest vegetation treatments either planned or in place to reduce landscape connectivity, including roadside hazard clearcuts. Productive lynx habitat has been shown to have approximately 70% connectivity within the home range (Kosterman et al. 2018; Holbrook et al. 2019). Roads also require the construction and use of roads. Lynx do not avoid roads with low vehicle travel, which is 8 vehicle trips per day; high volume roads avoided by lynx have up to 55 vehicle trips per day (Squires et al. 2010), which would occur on logging roads. Clearcuts are also detrimental to lynx because habitat for their key prey species, the snowshoe hare is eliminated for 20 or more years (Squires et al. 2010; Holbrook et al. 2017b). The larger size of snowshoe hare territories is roughly 25 acres (Griffin 2004). Thus clearcuts of up to 400 acres or more will eliminate a block of 16 hare home ranges within one area; if relatively close adjacent large clearcuts are also created, a significant number of hare home ranges will be eliminated within a section or more of lynx habitat for several decades. Given that lynx also avoid clearcuts for up to 43 years (Holbrook et al. 2018), hares using older clearcuts may still not be available to lynx for several more decades.

Clearcuts will have adverse impacts on elk security. The current recommended level of security for elk is 30% of a landscape (Hillis et al. 1991). Security requires hiding cover, which can be provided by within-stand hiding cover, as is defined by Hillis et al. 1991, or by canopy cover from 23-60%, as defined by Lowrey et al. (2020); preferred elk security has a canopy cover level of over 53%. Within-stand security patches need to be at least 0.5 miles of an active motorized route, while canopy-cover security needs to be from 1.3 to 2 miles for an active motorized route, depending on canopy cover level. The Lowrey et al. (2020) study noted that

the 13% canopy cover level being defined as elk security by the Rangelack et al. (2017) study was invalid due to methodology; as well, the study area in that research included both private and public lands, instead of just public lands, as was the case for the Lowrey study. Still, a 13% canopy cover would not occur in clearcuts.

Clearcuts will be detrimental to grizzly bear recovery, in this landscape that is important to connect the Greater Yellowstone grizzly bear population, and associated genetics, to the Northern Continental Divide Ecosystem. Clearcuts require the construction of new roads for the Selway-Saginaw Vegetation Project, as well as reconstruction of old roads that have revegetated and thus are not suitable for ATV use, or likely hiking use by hunters. The significant expansion of ATV use in recent times (USDA/MFWP 2013 Collaborative Recommendations) means that all roads, regardless of closure, will have legal and illegal ATV use, as well as hiking use by hunters. Use of closed roads by hunters is a known mortality risk to grizzly bears (Schwartz et al. 2010). Roads pose a significant mortality risk to grizzly bears, which is why an active motorized route density of less than one mile per section is noted as important to maintenance of grizzly bear habitat use and presence (Proctor et al. 2020). This science also notes that to maintain and/or promote grizzly bear populations, occupied habitat should contain 60% core areas, or areas without any motorized activity; these core areas should be at least 2,500 acres in size, to allow grizzly bear habitat use without exposure to roads. When clearcuts are created in grizzly bear secure habitat, this secure habitat is lost for an undetermined amount of time, since new roads will be used for up to 10 years for logging and post-logging activities, and potentially, will be used for decades by ATV activity, even if roads are closed to motorized activity. There will also be a long-term increase in grizzly bear mortality from hunter use (Schwartz et al. 2010).

Clearcuts will be detrimental to the Northern Goshawk, a Montana Species of Concern. Openings over 4 acres in size are not identified as goshawk foraging habitat, since this bird is adapted to hunting in forests. On the other hand, clearcuts create habitat for the Red-tailed Hawk, an adaptable species that can

hunt in many different habitats, especially open areas. As the amount of landscape is opened up with clearcutting, the suitability of the habitat is changed from Northern Goshawk to Red-tailed Hawk habitat (La Sorte et al. 2004). This will be a relatively long-term change in species composition, as it will take decades for forests to reestablish as Northern Goshawk habitat. Clearcutting also eliminates 2 important prey species for the Northern Goshawk, the red squirrel and snowshoe hare, for at least several decades (Clough 2000). In addition, the research project on Northern Goshawks by Clough (2000) on the BDNF found that productivity of nests declined as the amount of clearcut area near the nest site increased.

Clearcutting will be detrimental to the Pileated Woodpecker, a Montana SOC. The management recommendations for this species include no clearcutting with a 1,000-acres territory (Bull and Holthausen 1993). A long term monitoring study on Pileated Woodpecker populations found that clearcutting resulted in a severe reduction of this woodpecker (Bull et al. 2007).

Clearcutting will be detrimental to an old growth-associated forest mammal, the Northern Flying Squirrel. This species depends upon the presence of trees for mobility, and it's maximum gliding distance between trees is only 100 feet; in addition, this small mammal is more likely to take long detours around openings than cross these canopy caps, even when direct distances were as high as 6.8 times shorter; population persistence of this small mammals depends upon "functional connectivity" of their forested habitat; canopy caps restrict population dispersal, restrict immigration, limit foraging areas, increase competition for isolated forest patches and increase predation rates; recent clearcuts over about 1,000 feet in width may be substantial barriers to this species (Smith et al. 2013). Clearcutting and resulting forest fragmentation has also been found to reduce population density of Northern Flying Squirrels as the proportion of the non-habitat matrix (early clearcuts and non-tree areas) increases; management for this species requires minimizing the creation of openings and maximizing the amount of old forest cover (Ritchie et al. 2009).

Clearcutting is also detrimental to an important prey species for the Northern Goshawk, the red squirrel, not only by eliminating habitat, as noted before, but by fragmenting the remaining habitat and creating forest gaps. This species avoids gaps created by clearcutting; indirect evidence indicated that perceived risk of predation, energetic costs, or both are higher in clearcuts (Bakker and Van Vuren 2003).

Clearcuts also adversely impact populations of the Red-backed Vole, a species that provides prey to forest carnivores such as the pine marten. Mills (1995) reported that this vole was essentially isolated in forest fragments surrounded by clearcuts, making little use of clearcut areas; the density of voles increased as distance from clearcut edges increased.

Clearcutting has severe adverse impacts on most forest songbirds, including neotropical migratory birds. Direct habitat loss occurs to all 64 species of western forest birds that likely occur in the Selway-Saginaw Project Area, due to the loss of relatively dense, mature and older forest stands that contain natural levels of snag habitat for woodpeckers, who create nesting cavities for many other forest birds, and the loss of both old growth and recruiting old growth habitat. In addition to this direct habitat loss, remaining habitats are degraded due to habitat fragmentation. In Ontario, forest patches less than 1,250 acres in size were identified as "sink habitat" for forest birds (Burke and Nol 2000). This study also reported that the reproductive success of some forest birds was lower in fragments than larger forest patches; small forest fragments may have lacked the necessary levels of food for birds; there may also have been higher rates of nest predation on nests in smaller fragments; as well as higher rates of brood parasitism by the Brown-headed Cowbird also reduced reproductive success in forest fragments; there were higher rates of brood parasitism within 100 feet of forest edges; they hypothesized that the impact of cowbird parasitism may be sufficient to prevent songbird populations from reaching replacement rates, in combination with high predation. Management of forest birds to reduce levels of brood parasitism by the Brown-headed Cowbird requires provision of large forest tracts of contiguous forest across a landscape and minimizing edge effects;

fragments increase the ratio of forest edge (300 m from an edge) to forest interior (300 m from an edge)(termed the cowbird edge effect); as a general rule, bigger tracts are better than smaller; in the eastern U.S., minimum tracts of 7,500 acres have been suggested to ensure persistence of forest songbirds (Robinson et al. 1992). Large forest tracts without clearcuts would also reduce the potential for nest predation by edge species as the Gray Jay (Ibarzabal and Desrochers 2004). Large forest tracts would also ensure that ample forest areas continuously provide large crops of conifer seeds at some point in time, so that landscape availability of this essential resource is always available for bird species dependent upon conifer seeds, as the Red Crossbill (Benkman 1993).

In addition to the direct habitat loss, loss of forage resources, and increased impacts on reproductive success, clearcuts fragment forest bird habitat and thus disrupt habitat use. In a study completed by Rail and Huot (1997), the probability of a forest bird crossing a forest gap decreases sharply as the distance across the gap increases to 131 feet; critical gap width in this study was 82-131 feet; smaller forest birds also cannot include 2 forest fragments 275 feet apart due to increased energy demands from traveling, along with increased predation risks from crossing open areas. In another study completed by Desrochers and Hannon (1997), forest birds were found to be twice as likely to travel through 164 feet of forest than through a similar distance of an opening; when given the chance to travel through a woodland or across a gap, the majority of birds preferred woodland routes, even when they were three times longer than shortcuts in the open; birds were 3 times less likely to cross gaps of about 230 feet, and 8 times less likely to cross gaps of 327 feet compared to similar distances within a forest; the authors noted that birds strongly preferred to move through forest versus open areas, possibly in part because songbirds are extremely vulnerable to raptors when they fly in the open.

Clearcuts affect the ability for management of songbird habitat due to fragmentation and the reduction in the size of remaining forest tracts. This will impact most forest birds, including Montana SOC as the Black-backed Woodpecker, where management recommends natural unmanaged forest tracts

at about 1,000 acres in size (Goggans et al. 1987). For the Pileated Woodpecker, also a Montana SOC, tracts without any clearcutting of roughly 1,000 acres in size are recommended, and to be provided in clumps of 3, which would be 3,000 acres of forest habitat without any clearcutting (Bull and Holthausen 1993). For the Brown Creeper, also a Montana SOC, patches of at least 250 acres in size are recommended (Wiggins 2005).

Clearcutting eliminates habitat for forest woodpeckers, who are keystone species for the remaining secondary cavity nesters. Lorenz et al (2015) noted that at least 7 woodpecker species (Hairy Woodpecker, Black-backed Woodpecker, Three-toed Woodpecker, Lewis's Woodpecker, Williamson's Sapsucker, Common Flicker)(although not noted would include the Pileated Woodpecker as well) create the nesting cavities for all remaining cavity nesting birds, which in the Selway Saginaw Project Area, would include 14 other forest birds. All woodpecker species depend on forest pests or other insects that occur in older forests, such as carpenter ants. As one example, in the Elkhorn Mountains of Montana, the Three-toed Woodpecker nested in an area that was infested with bark beetles, within stands that had over 70 larger snags per acre; this provided ample forage resources for this nesting bird (Saab et al. 2012). When forests are clearcut, there will be no woodpecker habitat for many decades; woodpeckers will thus be at lower densities in adjacent forest stands, due to lower levels of habitat; the impact on both woodpeckers, and the other forest birds that depend upon them to create nesting cavities, will be potentially severe and long-term. The greater the localized impact of clearcutting, the greater will be the adverse impact on forest birds.