Decision Memo
Moose Creek Vegetation Project
U.S. Forest Service
Belt Creek-White Sulphur Springs Ranger District
Helena – Lewis and Clark National Forest
Meagher County, Montana

USDA

2/27/17

William Avey — Date

Forest Supervisor, Helena – Lewis and Clark National Forest

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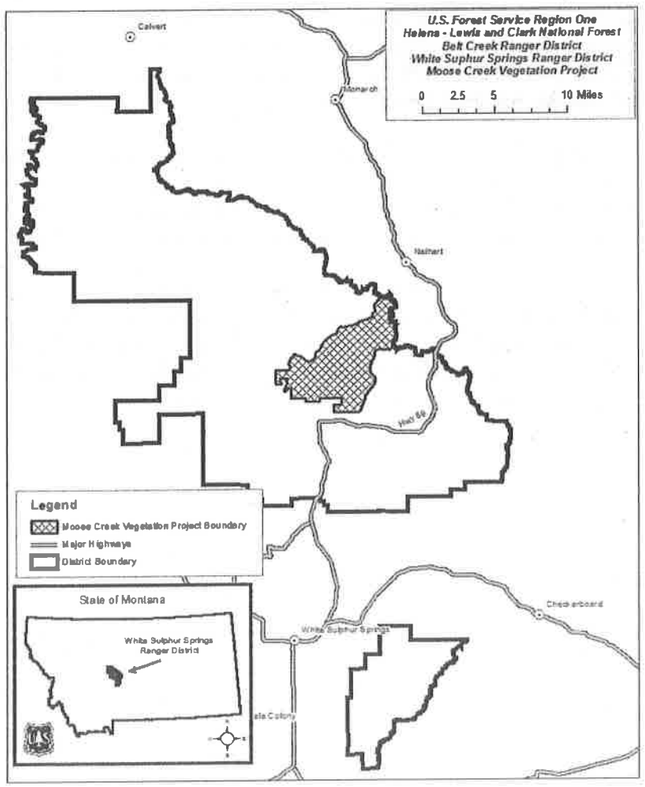
Background and Purpose & Need

The Secretary of the U.S. Department of Agriculture delegated authority to implement the provisions of Section 8204 of the Agriculture Act of 2014 (Public Law 113-79) (also referred to as the Farm Bill to the Chief of the Forest Service on March 6, 2014. This delegation provided the Forest Service with authority to carry out projects under amended Title VI of the Healthy Forests Restoration Act of 2003 (16 U.S.C. 6591 et seq.) that add Sections 602 and 603 to address qualifying insect and disease infestations on National Forest System lands.

Figure 1: Project Vicinity Map



The Helena – Lewis and Clark National Forest began consideration of a project under this authority in April, 2016 that would reduce the risk or extent of, or increase resilience to, insect and disease infestations in the Moose Creek area of the Little Belt Mountains.

The purpose of this proposed project is to maintain or restore the structure, function, composition and connectivity of a forest system that has been adversely affected by insect and disease. Treatments can take a variety of forms to promote resiliency to insect and disease while providing for the retention of larger trees. This includes but not limited to thinning, prescribed fire, and timber harvesting. The need for treatment has been identified from the observed existing condition, from the findings in the Little Belts Landscape Assessment (2014), supporting information from resource specialists (i.e. insect and disease aerial detection surveys) and input from the collaborative process participants. These actions will also help improve the health and vigor of the remaining live trees, recover the value of dead and dying trees before they decay and no longer have commercial value, and contribute to the supply of timber. This project will not eliminate the mountain pine beetle outbreak or other insect and diseases but it will create conditions that provide for healthier forest conditions.

Many of the home and property owners in proximity to the project area have expressed concern over the current condition of the forest and the risks to their property. This decision will in part, help reduce the possibility of catastrophic fire presented by the current forest conditions, to the adjacent private lands, without incurring significant effects to the environment.

Mountain pine beetle which attacks lodgepole pine trees has been active in the project area. The landscape is at a moderate to high mountain pine beetle hazard based on stocking density, advanced age, and average stand diameter (USDA FHP 2016). Mountain pine beetle can shift from endemic populations to epidemic populations when dense lodgepole stands average more than 80 years old with a mean diameter greater than eight inches.

Figure 2: Mountain Pine Beetle-Caused Mortality in Project Area

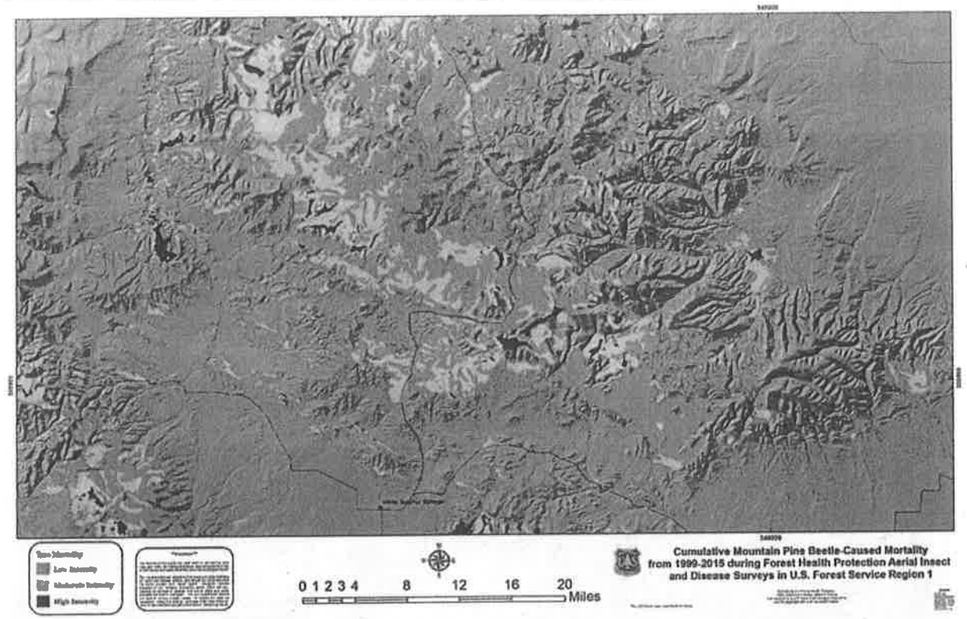


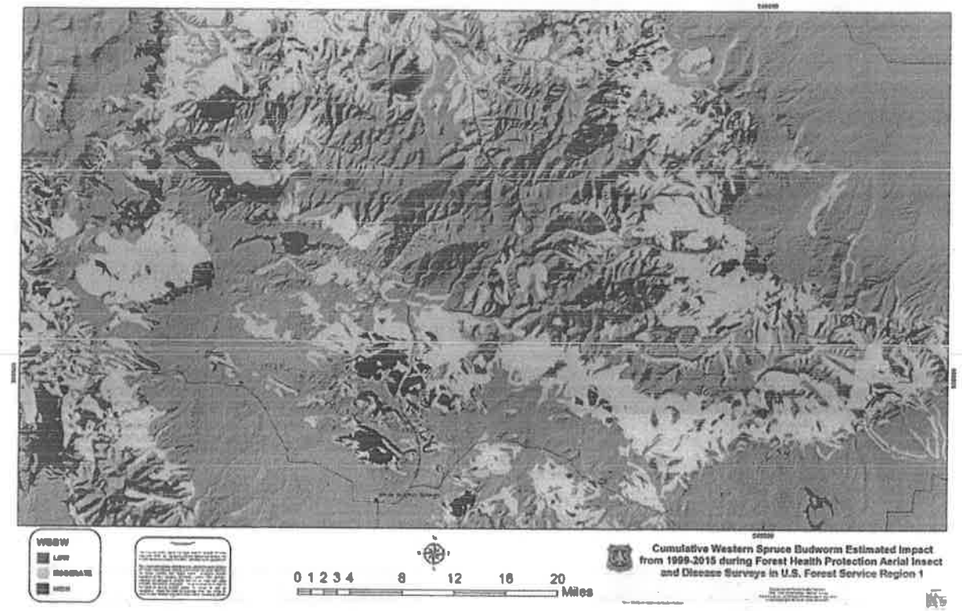
Figure 3:Example of Mountain Pine Beetle Attack

Figure 4: Dead and Dying Lodgepole Pine Stand

Forest stand conditions in the project area meet this criteria which led to the spread of the mountain pine beetle outbreak in the project area. In addition to various levels of mountain pine

beetle, western gall rust, comandra rust, Douglas-fir beetle and western spruce budworm are prevalent throughout the area.

Figure 5: Spruce Budworm Impact In Project Area



Currently, stands in the project area are experiencing ongoing tree decline and mortality from insect activity - see photographs below. This project will remove lodgepole pine susceptible to mountain pine beetle, create stand conditions with a low mountain pine beetle hazard, and remove the source of continual dwarf mistletoe infection to the lodgepole understory.

Figure 6: Example of Western Spruce Budworm

Figure 7: Example of Rust Canker

Figure 8: Stand Defoliated by Western Spruce Budworm

With no direct management action, dwarf mistletoe-infected mature trees will continue to infect trees in the lower canopy levels leading to tree decline and mortality. Fuel accumulations will also continue to increase. Previous actions that have been conducted in the area have been considered as part of this project design and are described in the Forest Vegetation Report and

other specialist reports contained in the project case file.

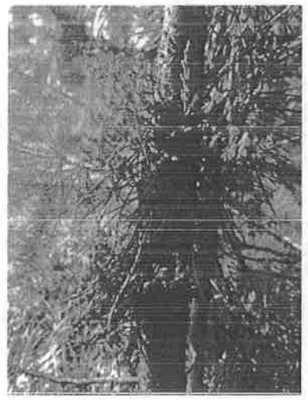


Figure 9: Dwarf Mistletoe

Figure 10: Mistletoe Witches Broom Formation

DECISION

Project Activities

I have decided to implement vegetation and prescribed fire treatments on about 2,200 acres and associated road management activities described in Table 1 and Table 2 shown on the decision map in Appendix B for this project area, located in the Little Belt Mountains in Townships 12 and 13 North, Ranges 6, 7 and 8 East, Montana Principal Meridian, about 16 miles north of White Sulphur Springs, Montana and north of U.S. Highway 89. My decision includes required design features, mitigations and monitoring. Portions of this project area include Wildland Urban Interface. A complete list of treatments by unit can be found in Table 6 in Appendix C.

My decision incorporates opportunities for activities that can be funded by the dollars from the sale of National Forest timber under authorization of the Knutson-Vandenberg Act of 1930 (16 United States Code 576-576b; 46 Stat. 527), as amended by the National Forest Management Act of October 22, 1976 (16 United States Code 1600 et seq.). Only projects that are within the timber sale area and meet specifications in Forest Service Handbook 2409.19 can qualify for Knutson-Vandenberg funding (USDA Forest Service 2004a). I am able to select and prioritize Knutson-Vandenberg appropriate activities that the interdisciplinary team has identified and analyzed. If sufficient Knutson-Vandenberg funds are not generated from a timber sale, projects would be completed using alternative funding sources.

Table 1:Treatment By Acres

Treatment	Acres
Commercial Harvest With Prescribed Fire	2024
Pre-Commercial Thinning	74
Aspen Restoration With Prescribed Fire	52
Whitebark Pine Enhancement With Prescribed Fire	45
Total	**2195**

Figure 11: Representative Stand Before Treatment

Figure 12: After Treatment – Commercial Thin

My decision does not change existing travel management and is consistent with the Little Belt-Castle-North Half Crazy Mountains Travel Plan (USDA 2007) and current Motor Vehicle Use Map (2013 MVUM). My decision will include road maintenance and road reconstruction on permanent system roads that will be needed for project activities. Some of these roads are currently closed to motorized use in the 2007 Travel Plan and will remain closed for non-project activities. At the end of the project these roads will be stored with some type of a closure structure such as a gate. Refer to the Transportation Map in Appendix B of this document. A portion of the Bottle Creek motorized trail 714 near Moose Mountain will be utilized for project activities and then returned to an all-terrain vehicle trail width upon completion of the project. My decision also includes construction and reconstruction of temporary roads (approximately 12.8 miles) that will be fully decommissioned (rehabilitated) no later than 3 years after the date on which the project is completed. Road maintenance will occur on all roads utilized for timber hauling and associated harvest operation. No permanent road construction will occur or is authorized with this decision. Miles of Road Management Activities in my decision are outlined below in Table 2.

There is a need for private road access to treat units 34 and 35 in Little Moose Creek. Any use of these private roads for access to the units will require authorization under a separate Temporary Road Use Permit from the affected landowners. If granted, this access would require up to an additional 0.7 miles of road reconstruction and 0.3 miles of new road construction on private

land. My decision has assessed the effects of this additional road work, were it to occur.

Table 2: Road Management Activities

Road Management Activities for Project Implementation	Miles (rounded to nearest tenth)
Maintenance of Permanent System Road	17.7
Reconstruction of Permanent System Road	16.6
Construction Temporary Road (Decommission after project completion)	8.2
Reconstruction (Use as Temporary Road; Decommission after project completion)	4.6
Reconstruction (Stored after project completion)	24.8
Reconstruction (Decommission back to trail after project completion)	0.1
Construction of Permanent System Road	0.0

DECISION RATIONALE

Considerations Based on Collaborative Input, Interdisciplinary Project Development and/or Scoping

The Moose Creek Vegetation Project is an area identified in the Little Belt Mountains Landscape Assessment (USDA 2014) as having an opportunity and need for some level of management to meet desired vegetation conditions. With the opportunity provided in the Farm Bill Authority to utilize a recently established category of actions, I proceeded to notify the public and other potential interested stakeholders in the spring of 2016 to begin a collaborative process for project development. Local landowners, a livestock permittee, a fire official from Meagher County, a conservation organization, Montana Fish, Wildlife and Parks biologists, and a timber company representative participated during the process that resulted in refinement of treatment areas. The collaboration and public process is described in sections that follow. This process also provided an opportunity to dialogue with participants on past management effects, desired conditions, forest restoration needs, local economic issues and current forest health and fire threats. This project begins to address concerns from insect and disease mortality such as fuel loading as well as reducing susceptibility to additional infestation and providing for overall forest resiliency.

As the Deciding Official, I instructed my staff and the interdisciplinary (project analysis) team and relayed to the collaborative participants that I would ensure the project was designed to comply with the current standards for Canada lynx, northern goshawk, migratory birds, other sensitive species, forest management indicator species, and old growth, while meeting all additional applicable Lewis and Clark National Forest Plan standards (USDA 1986).

My decision is responsive to the concerns and issues raised during the required scoping period, from engagement of collaborative participants during working meetings and field trips to the project area, and the findings of the interdisciplinary team. Issues raised through the public involvement process were reviewed and I determined there was no level of extraordinary

circumstances or uncertainty of past management effects that would warrant further documentation in an Environmental Assessment or Environmental Impact Statement.

In my decision I focused on forest stand improvements to restore resiliency to insect and disease, address dead and down fuel loads and reduce the associated potential for higher intensity wildfire, specifically near residences and adjacent infrastructure. The project also promotes whitebark pine regeneration, provides enhancement of aspen clones, protects older large trees, and thins several previously harvested units to improve growth and resiliency of these younger forest stands. The project has considered economic feasibility and impact to local communities. Notable feedback from the working group participants resulted in the project including treatment units near private lands near Little Moose Creek (Units 34 and 35), a unit that includes an area of blowdown that has high fuel loadings (Unit 36), and the addition of several aspen treatment units, emphasis on treatment in the wildland – urban interface, that will improve elk habitat. One participant added additional ecological information related to aspen. Another discussed resiliency and climate. Some working group participants also expressed specific concerns for the potential impacts that winter logging would have on winter recreation activities. My decision provides direction for treatment activities to consider and minimize potential impacts to winter recreation users.

This project follows agency guidance outlined in "Climate Change Considerations in Project Level NEPA Analysis" for carbon cycling and storage (see project case file). This project maintains habitat for migratory birds. Sediment delivery points that were identified will be substantially reduced and eliminated where possible by implementation of best management practices as well as placing in long-term storage some roads not currently open to motorized use on the 2013 Motor Vehicle Use Map. Project consultation with the Montana State Historic Preservation Office is complete. They concurred with our project area inventories, site avoidance plans, and documentation (letter dated October 18, 2016). The U.S. Fish and Wildlife Service concurs with the determination that the project is not likely to adversely affect the threatened Canada lynx (letter dated January 20, 2017).

My decision includes design features and monitoring that will meet forest plan standards, maintain scenic integrity along the Highway 89 corridor, protect goshawk, retain snags, provide for public safety, maintain soil productivity while minimizing erosion and sedimentation potential to Moose Creek, and protect heritage resources in the project area balance commercial timber harvest and recreation uses, and others. Please see Appendix A for specific project design features and monitoring.

Extraordinary Circumstances

After review of agency procedures, the interdisciplinary resources conditions, worksheets, reports and scoping information contained in the project case file, I have found that no extraordinary circumstances to resource conditions exist that would warrant further analysis and documentation in an Environmental Assessment or an Environmental Impact Statement. Under 36 Code of Federal Regulations 220.6 (b) and Forest Service Handbook 1909.15 (31.2), extraordinary circumstances are defined as those resources conditions that should be considered in determining whether extraordinary circumstances related to a proposed action warrant further

analysis and documentation in an Environmental Analysis or Environmental Impact Statement and the mere presence of one or more of these resources conditions does not preclude use of a categorical exclusion. It is the existence of a cause-effect relationship between a proposed action and the potential effect on those resources conditions coupled with the degree of the potential effect that determines whether extraordinary circumstances exist. I took into account resources conditions as listed under 36 Code of Federal Regulations 220.6(b)(1) and Forest Service Handbook 1909.15(31.2), the anticipated effects of the proposed activities as presented in resources specialists reports including design features and monitoring, and the input received from scoping in determining whether extraordinary circumstances might exist.

Federally listed threatened or endangered species or designated critical habitat, species proposed for Federal listing or proposed critical habitat, or Forest Service sensitive species

- Fish - There are no threatened or endangered aquatic wildlife species known to occur in these areas. One conservation population of westslope cutthroat trout (*Oncorhynchus clarki lewisi*, a sensitive species) occurs in the project area in a portion of Daniels Creek. Additional conservation or core populations are known to occur within a small portion of the analysis area, in O'Brien, a tributary to Belt Creek, and in Belt Creek. A sportfish population of westslope cutthroat trout is present in Adams Creek, which is crossed by a haul route. The second Forest Service sensitive aquatic species present in the project area is the western toad (*Anaxyrus boreas*). Numerous observations of western toads have been recorded in the project and analysis area in the Daniels, Belt, Adams, and Sheep creek drainages. Western pearlshell mussel- is not known to exist within the project area (Stagliano, 2010, 2015). There are also no recorded observations for the sensitive northern leopard frog in the project or analysis area. Project design features identified in Appendix A include specific actions designed to mitigate effects to these species. There are no identified extraordinary circumstances for Sensitive Aquatic Species.

- Plants –The Helena – Lewis and Clark National Forest does not support suitable habitat or populations of threatened or endangered plant species. A sensitive plants species biological evaluation was completed for this project (project case file). There are two sensitive plant species present in treatment units, whitebark pine and Missoula phlox. Whitebark pine occurs in several units in the project area, but whitebark pine treatment is not the primary target in those units. Whitebark pine will be beneficially impacted through implementation of the project. Individual Missoula phlox and its habitat may be impacted through implementation of activities in unit 8. However, the impacts would not likely result in a trend toward federal listing or reduced viability for the population or species. Any additional Region 1 sensitive species or populations discovered in the project area will be protected from project activities by appropriate design features and mitigations. No impacts to additional species are expected and no identified extraordinary circumstances exist.

- Wildlife - A Biological Evaluation and Wildlife Report was prepared for this project and is found in the project case file. This Biological Evaluation considered the Threatened,

Endangered, candidate and sensitive wildlife species that occur, are expected to occur, or may occur in this portion of the Helena-Lewis and Clark National Forest. A Biological Assessment was prepared for the Canada lynx. The US Fish and Wildlife Service concurred with the finding of **may affect, but is not likely to adversely affect** in a letter dated January 17, 2017 (Refer to the project case file). The project area includes unoccupied, secondary lynx habitat. Secondary areas only support lynx intermittently and lynx use of the area would be considered transient. Recent verified observations of lynx within the action area have not occurred and lynx are not likely to be found in the action area during proposed activities. Therefore, the likelihood of disturbance to transient lynx is discountable. There are no determinations for wildlife species that created extraordinary circumstances.

Federally Listed Threatened or Endangered Species

This table provides a list of species that are Threatened, Endangered, Proposed, and Sensitive Species on the Jefferson Division of the Helena-Lewis and Clark National Forest. It also provides a synopsis of how the Moose Creek Vegetation project is expected to affect these species.

Table 3 Threatened, Endangered, Proposed, and Sensitive Species

Species Name	Occurrence in Project Area	Rationale and Determination
Threatened, Endangered and Proposed Species from US Fish and Wildlife Service website (11/25/2016)		
Grizzly Bear ***Threatened***	Is not known to occur on the Jefferson Division of the Helena – Lewis and Clark National Forest. This area is not proposed as a recovery area for the species.	**No effect**
Canada Lynx ***Threatened***	Lynx habitat occurs in the project area.	This project **may affect, but is not likely to adversely affect** Canada lynx. See biological assessment and US Fish and Wildlife concurrence letter dated January 17, 2017 for details.
Canada Lynx Critical Habitat	There is no Canada Lynx Critical Habitat on the Jefferson Division.	**No effect**
Wolverine ***Proposed***	Wolverine are known to inhabit the Little Belt Mountains.	See Programmatic Biological Assessment for Wolverine for rationale to support determination of **Not Likely to Jeopardize the Continued Existence of the North American wolverine.**
Whitebark pine ***Candidate***	Occurs in the project area	**Beneficial impact** (See Biological Evaluation for botany)
Forest Sensitive Species		
Birds and Reptiles		
Bald Eagle	No known bald eagle nests occur in the	There are no known nests near or

Species Name	Occurrence in Project Area	Rationale and Determination
	vicinity of the project. Transient bald eagles are occasionally seen across the forest in many locations. Bald Eagle is also a Management indicator species, refer to the project case file for additional information.	within project area, and none are expected to be found given the lack of typical bald eagle nesting habitat in the project area. The Montana Bald Eagle Management Guidelines provide a general recommendation for a distance buffer of ½ mile from active and alternate nests, concentrated foraging areas, and communal roost sites during the appropriate season of eagle use. Project complies with the Bald and Golden Eagle Protection Act of 1940. **No Impact**
Peregrine Falcon	No known nesting occurs near the project area. The closest known nesting occurs on the Smith River which is not in the area of influence of project effects. Peregrine Falcon is also a Management indicator species, refer to the project case file for additional information.	No nesting habitat and no known nests near or within project area, and none are expected to be found given the lack of typical peregrine nesting habitat in the project area. **No Impact**
Flammulated Owl	There are no recorded observations of flammulated owls in the Little Belt Mountains.	This project does not contain flammulated owl habitat. It is not expected to affect flammulated owls, or their habitat. **No Impact**.
Burrowing Owl	There are no recorded observations of burrowing owls in the Little Belt Mountains.	No known nests are near or within project area. The habitat type of the project area is forest. The project is not expected to affect burrowing owls, or their habitat. **No Impact**
Blackbacked Woodpecker	Black-backed woodpeckers excavate nests in the sapwood of standing dead trees, or live trees with heart rot like aspen. Recently burned areas provide high quality foraging habitat and mature and old-growth forest with many snags can also provide foraging habitat. Standing dead lodgepole killed by mountain pine beetle is also used as foraging habitat.	Project will affect black-backed woodpecker habitat. See Wildlife Report in project case file. **May Impact Individuals or Habitat but Would Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Population Viability**
Greater Short-horned Lizard (S)	There are no records of these reptiles on the Jefferson Division of the Helena – Lewis and Clark National Forest.	**No Impact.**
Greater Sagegrouse	Sagebrush is the preferred habitat of the sagegrouse. There are no known sagegrouse leks near the area of influence of the project.	Project will not affect sagebrush habitat. **No Impact.**
Harlequin Duck	Potential habitat does not exist near the	Species is not known to breed in

Species Name	Occurrence in Project Area	Rationale and Determination
	project area.	the Little Belt Mountains. **No Impact**
Mammals		
Bighorn Sheep	There is no resident band of sheep known to inhabit the Little Belt Mountains. Bighorn Sheep are also a Management indicator species, refer to the project case file for additional information.	Occasionally transient sheep are observed moving through the Little Belt Mountains and this project will not affect their ability to continue to do so. **No Impact**
Fisher	Habitat does not occur in the project area. Species is not known to occupy the project area. There are no records of fisher occurrence in the Little Belt Mountains.	Fisher habitat will not be affected by this project. **No Impact**
Gray Wolf	Gray wolves range widely from prairie breaks to alpine habitats. No known den or rendezvous sites in the area. Gray Wolf is also a Management indicator species, refer to the project case file for additional information.	Project is not expected to affect populations of ungulates, the main prey of wolves. **No Impact**
Townsend's Big-eared Bat	Townsend's big-eared bats are known to use Lick Creek Cave in the Little Belt Mountains. There is a limited amount of large, thick-barked mature trees in the project area because lodgepole is the dominant forest species.	The project will not affect caves, abandoned mines, or buildings where bats may be roosting or hibernating. It is extremely unlikely that this project will remove a roost tree. This leads to a determination of **No Impact.**
Northern Bog Lemming	Habitat does not exist in project area.	There is no documented occurrence of northern bog lemmings in the Little Belt Mountains. **No Impact**
Aquatics		
West slope cutthroat trout	Present	**May impact** individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species
Western toad	Present	**May impact** individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species
Western pearlshell mussel	Not known to occur in the project area	**No Impact**
Northern leopard frog	Not present in the project area	**No Impact**
Plants		
Missoula phlox	Present in Unit 8	**May impact** undiscovered individuals and habitat, but will

Species Name	Occurrence in Project Area	Rationale and Determination
		not likely contribute to a trend towards federal listing or loss of viability to the population or species.
Short-styled Columbine, Upward-lobed Moonwort, Wavy Moonwart, Peculiar Moonwart, Small Yellow Lady's Slipper, Sparrow's Egg Lady's Slipper, Northern wildrye, Rattlesnake plantain, Austin's Knotweed and Hall's Rush	Not discovered in the project area	**May impact** undiscovered individuals and habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species.
Round-leaved, Lackschewitz' milkvetch, giant helleborine Lackschewitz' fleabane, Macoun's gentian, Howell's grindelia , storm saxifrage, stalked-pod locoweed, blunt-leaved pondweed, five-leaved cinquefoil, tufted club-rush English sundew, linear-leaved sundew, Barratt's willow, water bulrush, alpine meadowrue and California false-hellebore	Not found and not likely to have populations or suitable habitat in the treatment units	**No Impact**

Flood plains, wetlands, or municipal watersheds

There will be no extraordinary circumstances associated with floodplains, wetlands or municipal watersheds with this project. This project will incorporate Montana Forestry Best Management Practices and additional design features found in Appendix A. These requirements restrict project activities within floodplains, riparian areas, and wetlands. No treatments occur in a municipal watershed. There are 3.2 miles of existing roads that may be used as haul routes leading into the project area through the O'Brien Creek municipal watershed, within the 6th code Hydrologic Unit Code of Belt Creek-Carpenter Creek. The routes are located at high elevation in the drainage headwaters and utilize existing roads. The required road maintenance practices are predicted to reduce erosion and sedimentation on haul routes to below existing conditions. Therefore, no significant effects in this watershed are anticipated. There are no irreversible commitments because any potential impacts to water resources or aquatic wildlife resources

stemming from project activities will be temporary in nature.

Congressionally designated areas such as wilderness, wilderness study areas, or national recreation areas

There are no extraordinary circumstances related to these resources because they are not present in, or adjacent to, the project area.

Please refer to the Decision Map and the Helena – Lewis and Clark National Forest website, at *http://www.fs.usda.gov/main/lcnf/home*.

Inventoried roadless areas or potential wilderness areas

None are present within the project area. Refer to the Figure 1: Project Vicinity Map and Figure 15: Decision Map. The project will not impact inventoried roadless or potential wilderness areas.

Research Natural Areas

The project area is not within a designated Research Natural Area for the Helena – Lewis and Clark National Forest. None are present or adjacent to the project area, refer to Figure 1: Project Vicinity Map and Figure 15: Decision Map

American Indians and Alaska Native Religious or Cultural Sites

The Forest's Ethnographic Overview was consulted. No site types identified as 'sensitive' to tribes are known to exist in the general project area. Proposed impact areas were inventoried on the ground and no sites of this type were found. Tribal consultation was conducted. Therefore, there will be no impact from this decision to American Indians or Alaska Native religious or cultural sites. Tribal consultation and coordination occurred with the Northern Arapaho Tribe on May 19, 2016 and with the Confederated Salish and Kootenai Tribes on May 26, 2016.

Archaeological Sites, or Historic Properties or Areas

Surveys and inventories have been completed and documented (project case file). Identified sites will be avoided through design features or mitigation measures. Associated inventory and site avoidance consultation with the State Historic Preservation Office resulted in a concurrence evaluation (letter dated October 18, 2016) that the project poses no adverse effects to historic properties. Inventories, avoidance measures, and consultation comply with Section 106 of the National Historic Preservation Act and the current Programmatic Agreement between Region One of the Forest Service and the State Historic Preservation Office. Adverse effects to historic properties will be avoided. There have been no new sites found and the project will not have extraordinary circumstances.

COLLABORATION, SCOPING AND PUBLIC INVOLVEMENT

Collaboration

Planning and development of the proposal was done through a required non-exclusive collaborative process that included multiple persons representing diverse interests. The Forest Service initially conducted a public open house in White Sulphur Springs, Montana on March 14, 2016, to inform attendees of the agency's interest in doing vegetation treatments in the Moose Creek area. This initial meeting provided for public participation by querying them about their specific concerns in this area, and asking them to continue to participate in the development of the project as treatments and areas to apply them were refined. Notice of this initial open house was conducted through widely distributed direct mailings to known interested individuals, community groups, local fire districts, County Commissions, Tribal Governments, and other agencies, as well as sportsmen, conservation and environmental groups, local landowners, special-use permit holders and various businesses. Additionally a notice was published in the *Meagher County News* along with posting on the Lewis and Clark National Forest website, Twitter and Facebook pages. Attendance and participation at the initial open house included local land and homeowners, private business owners, recreation interest groups, timber industry professionals, local government interests, and State wildlife agency biologists. This open house was hosted by the Forest Service. An employee with training and experience in meeting facilitation served as a dedicated point-of-contact for all non-Forest Service collaborative participants. This meeting facilitation ensured that the collaborative process was efficient and productive for all participants.

Many of the individuals attending the initial open house attended follow up meetings and continued to stay engaged in the collaborative process as a participant "working" group. My staff ensured this was an open and continuous collaborative process. Participants were free to attend and be engaged according to their interest.

Figure 13: Working Group Collaborative Participants and Forest Service Staff

Participants were informed from the beginning that as the Line Officer, I was not looking for consensus, but their role was to provide input, and considerations from all perspectives through open dialog. Our objective was to provide a set of meetings to foster an understanding of purpose and need and to educate individuals on the NEPA process and resource constraints. With this sharing of ideas, options for project development were identified that complied with the authority under Section 603 of Healthy Forest Restoration Act (16U.S.C.6591b). Project decisions however remain at the sole purview of the responsible official. Participants were informed of potential resource constraints or sideboards that may be warranted to meet other required laws, policy and the Lewis and Clark National Forest Plan as well as opportunities to assist during implementation and monitoring. This group of participants attended field trips, utilized information on the existing conditions and reviewed the ability to achieve Forest Plan goals. Identified opportunity areas within the designated area were provided by the Forest Service Interdisciplinary Team to the participants. Through this collaborative process participants assisted resource specialists in the identification of issues, refinement of management options and areas, as well as input on the development of treatment types to meet objectives. Continued interaction with participants was open and ongoing via email correspondence, face to face meetings, field visits to the project area and by phone with Forest Service Staff.

Additional information on this collaborative process is contained in the project case file.

Figure 14: Collaborative Participant Field Trip to Project Area

Scoping

The Moose Creek Vegetation Project was originally listed as a proposal on the Lewis and Clark National Forest Schedule of Proposed Actions in March 2016. A required scoping period (Forest Service Handbook 1909.15, Chap 30, and Section 31.3) was initiated on September 2016. The Lewis and Clark National Forest website was utilized to provide supporting project information and updates including, draft maps, meeting notes, data tables and other project development information. Information on the project scoping period was provided to all contacts originally notified (including Tribal Governments) at the start of the collaborative process as outlined in the section above. Notification took several forms including direct mailings, electronic mail, website posting, Twitter and Facebook. This scoping included a list of proposed unit acreages and a notification that some treatments in the project proposal could create openings greater than 40 acres in size. The project case file contains all correspondence related to scoping including comments received.

Applicable Categorical Exclusion

Background

Section 8204 of the Agriculture Act of 2014 (Public Law 113-79) (also referred to as Farm Bill) amended Title VI of the Healthy Forests Restoration Act of 2003 (16 U.S.C. 6591 et seq.) to add Sections 602 and 603 to address qualifying insect and disease infestations on National Forest System lands. The Secretary of the U.S. Department of Agriculture delegated authority to implement the provisions of the Farm Bill to the Chief of the Forest Service on March 6, 2014.

Section 602 provides, in part, the opportunity for Governors to request designation to areas in their State that are experiencing, or at risk of, an insect or disease epidemic. The Forest Service received letters from 35 states requesting designations. These requests were reviewed to ensure they met at least one of the following eligibility criteria outlined in the Farm Bill: experiencing forest health decline based on annual forest health surveys; at risk of experiencing substantially increased tree mortality based on the most recent Forest Health Protection Insect and Disease Risk Map; or contains hazard trees that pose an imminent risk to public infrastructure, health, or safety.

Upon reviewing the States' requests, the Chief designated approximately 45.6 million acres of National Forest System lands across 94 national forests in 35 States. Over 6.6 million acres were designated in the Northern Region (1,708,628 million acres in Idaho; 4,955,159 million acres in Montana). These areas will be further evaluated to identify potential projects that reduce the risk or extent of, or increase resilience to, insect and disease infestations. Information on the request and designation process, by state, can be found at *http://www.fs.fed.us/farmbill/areadesignations.shtml*. The Moose Creek Vegetation Project falls within one of the Chief's designated areas for Montana.

Section 603 establishes a categorical exclusion for qualifying insect and disease projects in designated areas on National Forest System lands. An insect and disease project that may be categorically excluded under this authority is a project that is designed to reduce the risk or extent of, or increase the resilience to, insect or disease infestation in the areas (Healthy Forest Restoration Act, Sections 602(d) and 603(a)). The decision includes a portion of unit 36 that has an area of dead and down trees from a previous wind event. This blowdown (windthrown trees) fits a category of action for Salvage of Dead and/or Dying Trees at 36 Code of Federal Regulations 220.6(e)(13) that may be used to harvest a portion of this stand and address this heavy concentration of material.

Insect & Disease Infestation Categorical Exclusion

This categorical exclusion may be used to carry out a collaborative restoration project in an insect and disease treatment area designated by the Chief under section 602. The applicable category of actions is identified in agency procedures Forest Service Handbook 1909.15, Chapter 30, Section 32.3 (Categories Established by Statute), #3.

The Insect and Disease Infestation category is applicable for this project because:

1. The project is in an area designated in accordance with section 602(b) and (c) of the Healthy Forest Restoration Act. Areas of designation and information is contained in the project case file.
2. Portions of the project are in the wildland urban interface and those portions outside the wildland urban interface are in Condition Classes 2 or 3, Fire Regime Groups I, II, or III. Maps and background information is contained in the project case file.
3. The project is **not** located: in congressionally designated Wilderness and Wilderness Study Areas; in areas where the removal of vegetation is restricted or prohibited by statute or by Presidential proclamation; or in areas where the activities described above

would be inconsistent with the applicable Land and Resource Management Plan.

4. The project's number of acres treated does not exceed 3,000 acres.
5. The project does not include the establishment of permanent roads. Additionally:
    a. Temporary roads will be constructed but will be removed no later than three years after the project is completed.
    b. Maintenance or repairs will be conducted on permanent roads that are already established in the project area.
6. Public notice and scoping was conducted. (See discussions on the public involvement process under the *Collaboration and Public Involvement* section.)
7. The project was developed through a collaborative process that includes multiple interested persons representing diverse interests and is transparent and non-exclusive:
    a. The best available scientific information is considered to maintain or restore ecological integrity, including maintaining or restoring the structure, function, composition and connectivity. *(Refer to the project case file)*
    b. The project maximizes the retention of old growth and large trees, as appropriate for the forest type, to the extent that the trees promote stands that are resilient to insect and disease. *(Refer to project case file).*

See additional discussions on the collaborative process under the *Collaboration and Public Involvement* section.

Salvage of Dead and/or Dying Trees Categorical Exclusion

The Insect and Disease Infestation category and the Salvage of Dead and/or Dying Trees is applicable for this project.

> *Salvage of dead and or dying trees not to exceed 250 acres, requiring no more than a half mile of temporary road construction. The proposed action may include incidental removal of live or dead trees for landings, skid trails, and road clearing.* (36 CFR 220.6(e)(13)

This categorical exclusion may be used to carry out harvest of a portion of a stand damaged by a wind or ice event, and to construct short temporary road to access the damaged trees in the blowdown-affected area in a portion of Unit 36's 132 acres.

I have determined that the Moose Creek Vegetation Project's actions are categorically excluded from documentation in an Environmental Assessment or Environmental Impact Statement.

FINDINGS RELATED TO OTHER LAWS AND REGULATIONS

National Forest Management Act

The project complies with the 1974 Forest and Rangeland Renewable Resources Planning Act, as amended by the 1976 National Forest Management Act and Forest Service policy (Forest Service Manual 2400 – Chapter 2470) for Suitability for Timber Production [16 USC 1604 Sec.6 (g)(3)(E) and (k)], by meeting the following requirements:

I. Soil, slope, or other watershed conditions will not be irreversibly damaged.

II. There is assurance that such lands can be adequately restocked within five years after harvest.

III. Protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperature, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat.

IV. The harvesting system to be used is not selected primarily because it will give the greatest dollar return.

Site-specific silvicultural prescriptions would specify the desired species composition, stand structure, tree distribution, and stocking level necessary to meet management goals consistent with the project's purpose and need. Ground-based and skyline harvest systems, as well as manual tree felling, have been planned to accommodate topography, vegetation, fuel, soil, wildlife, and recreation constraints and management objectives. Prescribed clearcuts are within mature to over-mature lodgepole pine-dominated areas impacted by mountain pine beetle, dwarf mistletoe, western gall rust, and other diseases. Regeneration harvest units would be adequately stocked within five years of harvest (Refer to Forest Vegetation Case File and Forest Plan Compliance Table). The other units would receive an intermediate treatment (pre-commercial thin, commercial thin, improvement cut, daylight thin) with an emphasis on developing a healthy stand with reduced insect infestation hazard and disease infection. All roads will be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources (16 USC 1608(c)).

Openings greater than 40 acres will be created in several areas as the result of regeneration harvest. A 60 day public notification was initiated at the time of scoping which began September 16, 2016 to inform the public of these larger openings. The Regional Forester was briefed on the units over 40 acres in size prescribed for even-aged regeneration harvest. Approval to exceed 40 acre opening sizes was granted in a Letter dated February 1, 2017. This project complies with Forest Service Manual 2471.1 direction (See project case file).
On April 9, 2012 the Department of Agriculture issued a final planning rule for National Forest System land management planning (2012 Rule) 77 FR 68121162-212761). None of the Requirements of the 2012 Rule apply to projects and activities, as the Lewis and Clark National Forest Plan was developed under a prior planning rule (36 Code of Federal Regulations 219.17(c)).

Furthermore, the 2012 Rule explains, "[The 2012 Rule] supersedes any prior planning regulation. No obligations remain from any prior planning regulation, except those that are specifically included in a unit's existing plan. Existing plans will remain in effect until revised" (36 Code of Federal Regulations
219.17).

Lewis and Clark National Forest Plan

The project complies with forestwide and management area standards. The Forest Plan Compliance Table for the project is contained in the project case file.

Endangered Species Act

The Moose Creek Vegetation Project complies with the Endangered Species Act. A biological assessment was prepared for the Canada lynx and is contained in the project case file. The U.S. Fish and Wildlife Service concurs with the determination that the project is not likely to adversely affect the threatened Canada lynx (letter dated January 20, 2017). Refer to Table 3 above and supporting documentation in the project case file.

Migratory Bird Treaty Act

This project will be in compliance with the Executive Order titled "Responsibilities of Federal Agencies to Protect Migratory Birds," (Executive Order 13186) as a wider range of successional habitats will be available in the project area after project completion. This wide range of successional habitats would contribute to the maintenance of habitat and populations for a variety of Neotropical migratory bird species and is not likely to result in a trend toward Federal listing or loss of viability for any Neotropical migratory bird species. Several design features are also responsive to the needs of migratory birds during nesting. This project is compliant with this Migratory Bird Treaty Act.

Montana State Water Quality Standards and Clean Water Act

Executive Order 12088 requires the Forest Service to meet the requirements of the Clean Water Act. The project has been reviewed and is determined to be in compliance with the management framework applicable to this resource by federal Clean Water Act and Montana's water quality standards, Montana Stream Protection Act and Streamside Management Zone Law as contained in the Administrative Rules of Montana.

National Historic Preservation Act

Historic properties may be the result of aboriginal use (prior to Euro-American influence) or historic period use. The may represent a single event or a complex system. The may be an object, feature, site, or district. And they must meet the criteria outlined in 36 Code of Federal Regulations Code of Federal Regulations 60.4 to qualify for the National Register. The consideration of effects previewed in NEPA is formalized through the National Historic

Preservation Act Section 106 review process. Section 106 review is a 'cultural resource-specific' process that is often completed concurrent with NEPA and must be concluded prior to the NEPA decision. Section 106 review is the subject of a Regional Programmatic Agreement and is included in federal policy, direction, and guidance. If undocumented archeological resources are found during project implementation, ground disturbances in the area must stop and the Forest Archeologist will be notified. The State Historic Preservation Office has reviewed our inventory report and associated site reports. In a letter dated October 17, 2016, they have agreed that our analysis design features and mitigation plans comply with the National Historic Preservation Act.

Environmental Justice Executive Order

Executive Order 12898 (59 Fed. Register 7629, 1994) directs federal agencies to identify and address any disproportionately high and adverse human health or environmental effects on minority and low-income populations. No environmental justice issues were identified for this project and it is not expected to lead to disproportionately high and adverse impacts on minority or low-income populations. In review of the resource analysis and project case file, implementation of my decision will comply with Executive Order 12898.

Administrative Review Opportunities

Decisions that are categorically excluded from documentation in an Environmental Assessment or Environmental Impact Statement are not subject to an administrative review process (pre-decisional objection process) (Agriculture Act of 2014, Subtitle A, Sec. 8006).

Implementation Date

The project is expected to be initiated in 2017. Activities are expected to occur over several years following the decision.

Contact

For additional information concerning this decision, contact:

Bethany Ihle, Deputy District Ranger

Belt Creek – White Sulphur Springs Ranger District
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Neihart, MT 59465
(406)236-5511

APPENDIX A: PROJECT DESIGN FEATURES & MONITORING PLAN

The following design features and monitoring are included in my decision. They provide for consistency with the Forest Plan and other laws, regulations, policies or guidance, and/or minimize potential impacts to the applicable resources.

Table 4: Project Design Features

Resource Area	Design Feature	Application
Silviculture and Sensitive Plants	To the extent possible whitebark pine trees (be consistent on name convention through the table) of all size classes will be protected from damage. This may include ensuring that designated equipment trails avoid whitebark and trees are directionally felled away when possible.	All Treatment Units with whitebark pine
Silviculture and Sensitive Plants	Generally, conifers within 10-20 feet of living whitebark pine will be cut.	All Treatment Units with whitebark pine
Silviculture and Sensitive Plants	Whitebark pine will be protected from potential fire mortality in prescribed burning areas through techniques such as directional felling of trees away from whitebark, reducing fuel loads adjacent to whitebark by pulling slash away 10 to 20 feet depending on tree size, and designing ignition patterns to limit fire intensity to whitebark individuals. Jackpot fuel piles will be arranged to avoid scorching whitebark trees in the vicinity and target seedlings and saplings of competing tree species, such as subalpine fir, where practical.	All Treatment Units with whitebark pine
Silviculture and Sensitive Plants	Known populations of Missoula phlox occur in Unit 8. These populations will be identified and buffered during implementation to the extent possible. Ground disturbing activities (e.g. temporary road construction, fire line, equipment, etc.) will be avoided within known populations.	Unit 8
Silviculture and Sensitive Plants	The remaining suitable habitat in the project area that was not surveyed in 2016 will be surveyed by Forest Service botany staff prior to implementation (USDA 2016a). If additional sensitive species are discovered in the project area the appropriate buffers will be applied.	Project area
Silviculture and Sensitive Plants	No noxious weed herbicide treatment will be applied within a 100 foot buffer any sensitive plant population, in accordance with the Noxious Weed Forest Wide Environmental Impact Statement (USDA 1994).	Unit 8 and Project Area
Fuels	Control Line will be constructed when necessary to contain prescribed burns and/or address resource concerns.	All prescribed burn units with control line
Fuels	Control lines intersecting or within sight of approved travel routes will be disguised/blocked by scattering cut vegetation to help prevent illegal (travel) use.	All prescribed burn units with control line

Resource Area	Design Feature	Application
Fuels	Broadcast burning will be conducted based on weather and site specific conditions. Burning will take place under the guidelines set forth in a prescribed fire burn plan developed specifically for this project area.	All Units with prescribed burning
Fuels	Jackpot burning will generally be conducted in late summer and fall or when fuel and climatic conditions favor prescription parameters.	All prescribed burn units with jackpot burning
Fuels	A minimum of 10 to 15 tons per acre of coarse woody debris will be maintained where feasible.	All Treatment Units
Fuels	Piles, from hand piled material, will generally not exceed 8 feet wide and six feet high. Piles should be dirt free and tight. Protruding objects, such as trees, logs, and limbs should not extend beyond the pile. Piles should normally not occupy more than twenty percent of a particular unit and should not be within 50 feet of any values at risk.	All Hand Piles
Fuels	Within prescribed fire units a minimum 10 tons of woody material greater than 4.0 inches diameter on the small end and at least 4 feet in length will be left, evenly distributed and within 18 inches of the ground. Areas exceeding 10 tons per acre will be hand piled.	All Units with Prescribed Burning
Fuels	Broadcast and jackpot burning will occur when soils are at or above 20 percent moisture.	All Prescribed burn Units
Fuels	Pile burning will occur when one of the following conditions is met: Piles are located on previously disturbed soil, or on prisms associated with closed roads, trails, or landings, OR Soils are at or above 20 percent volumetric moisture (Busse et al. 2010) and weather is cool, OR Soils are frozen to a depth of 6 inches or more OR covered by at least 6 inches of compacted snow or ice.	All Treatment Units with Piles
Hydrology	Operate in accordance with State of Montana Streamside Management Zone law and rules as defined in the Montana Code Annotated 77-5-301 (DNRC 2006).	All Treatment Units with streams or wetlands
Hydrology	In addition to Stream Management Zone rules, the following measures will be taken to protect isolated wet areas that are not adjacent to streams: A 50-foot no-equipment buffer will be marked around all isolated wetlands, seeps, and springs to limit the risk of erosion, sedimentation, or compaction of wetland soils. All such areas will be identified and marked as equipment exclusion zones prior to project implementation.	All Mechanical Units

Resource Area	Design Feature	Application
	Exclude equipment and trucks from operating within isolated wetland buffers unless winter conditions exist, as specifically defined in the Soils Specialist Report.	
Hydrology	For units adjacent to Daniels Creek locate burn piles a minimum of 100 feet from the stream.	Units 39, 38a and 38c
Hydrology	For all other jackpot burn units, locate burn piles outside the Stream Management Zones. For all broadcast burn units, apply no-ignition buffers and design burn plans to avoid broadcast burning within the Stream Management Zones.	All Treatment Units
Hydrology	Upon completion of pile burning, rake or otherwise disturb the burned surface and seed where deemed appropriate by Soils or Hydrology staff in order to reduce potential for runoff from burn sites.	All Treatment Units
Hydrology	Road reconstruction and maintenance on both existing as well as any new temporary roads will be done in accordance with standard best management practices (USDA 1988; USDA 1994; USDA 1998; USDA 2012) to disconnect or minimize existing and avoid developing new sediment delivery points. Temporary road construction will be done in a manner that aids and improves the effectiveness of decommissioning and obliteration following project completion. All temporary roads will be obliterated following the completion of harvest activities in the units accessed by each road.	All roads
Hydrology	Project-area road segments with sediment delivery points (as identified in pre-implementation surveys) will be repaired using appropriate measures (e.g. blading, grade dips, new cross-drain culverts, gravel surfacing, slash-filter windrows, straw bales). Install road drainage features as needed to divert runoff to undisturbed forest floor, to allow sediment deposition and prevent delivery to streams and other waterbodies.	All Haul Routes with sediment delivery points
Hydrology	Haul routes will be maintained at minimum haul standards to reduce rutting and allow for effective drainage for the duration of the project, and at the end of project activities. Temporary road will be maintained to these standards to prevent development of sediment delivery vectors until they are decommissioned and obliterated.	All Haul Routes
Hydrology	The following snowplowing design measures will be implemented on any haul routes used for winter operations: Do not sidecast snow into any stream channel. Leave drainage points (breaches) in the snow berm to avoid concentration of snowmelt runoff on the road surface. Plow snow cover off roadways to facilitate deep-freezing of	All Winter Haul Routes

Resource Area	Design Feature	Application
	the road grade before hauling. Use shoes on the plow blade to protect the road surface from damage that could sidecast or mobilize sediment.	
Hydrology	Avoid hauling and other heavy-equipment traffic during conditions where the road surface is at or near saturation.	All Project Roads
Hydrology	Minimize cleaning of vegetated ditches that are still functional.	All Haul Routes
Hydrology	Temporary roads will be constructed outside of wet areas and with no or minimal stream crossings. Roads will be located to avoid adverse effects to soil, water quality, and riparian resources.	All Temporary Roads
Hydrology	If a crossing is required over a stream channel, including intermittent drainages, any applicable permits would be obtained prior to implementation, such as a Streamside Protection Act 124 permit, Clean Water Act section 404 permit, and potentially a state 318 permit for Short-Term Water Quality Standards or Clean Water Act 401 Water Quality Certification.	See Hydrology/Soil Map in the project case file
Hydrology	The crossing over Daniels Creek on Road 6404 will be done with a temporary bridge at the site of the existing ford. Following project implementation, the bridge will be removed and the crossing site stabilized and rehabilitated.	Road 6404 (Daniels Creek)
Hydrology	If temporary roads are to be left in place over the winter, they will be winterized using appropriate soil stabilization methods, including additional erosion control measures that may include seeding and/or mulching. This would include reconstructed roads planned for storage following project implementation.	All Roads to be decommissioned or put into storage.
Hydrology	During road decommissioning and culvert replacements or removals, erosion control measures will be designed and implemented with input from project hydrologist to prevent sediment mobilization and delivery to streams or other waterbodies.	See Hydrology/Soil Map in the project case file
Hydrology	Landings, skid trails, and slash piles will be located in suitable sites to minimize, potential for erosion and sediment delivery to nearby waterbodies.	All Harvest Units
Hydrology	Contractors will have spill prevention and containment materials on site to minimize the risk of an accidental spill of petroleum products, as well as to protect water courses and aquatic biota from adverse effects in the event of a spill.	All Mechanical Units
Hydrology	To ensure adequate stream culvert capacity (USDA 1991; USDA 2014), the following crossings will be upgraded or restored (Refer to table/map in project case file):	See Hydrology/Soil in the project case file and the

Resource Area	Design Feature	Application
	Road 204 requires 6 culvert replacements. Road 6412 will have major repair completed on existing concrete culverts. There will be 10 stream crossing structures removed and the crossing site restored to natural channel contours on existing roads proposed for long-term storage.	Transportation Map in Appendix B
Soils	Additional erosion control shall be utilized along temporary roads in units 43 and 46 due to erodible soils. To reduce the likelihood of erosion initiation points along the road and at the top of cable corridors, retain at least 4 inches of slash material to provide additional ground cover. Slash should be less than 18 inches deep to comply with fuels and wildlife recommendations. All temporary roads, landings, skid trails, and other highly disturbed areas will be decommissioned following the completion of harvest activities, according to the decommissioning measures described in the Road Closure Lever (see Transportation Map in Appendix B). Disturbance within harvest units will be reclaimed immediately upon completion of harvest activities. Disturbance outside harvest units will occur within three years of harvest completion.	Units 43 and 46
Soils	Disturbed areas cleared of vegetation through project activities, including but not limited to areas within harvest units, reclaimed roads, and landings, will have at least 60 percent ground cover reestablished through redistribution of fine wood, litter or duff, slash material, and seeding.	All Treatment Units
Soils	Ground-based equipment shall not operate on slopes over 35 percent (USDA 1988; BMP 13.02 and 14.07).	All Mechanical Units
Soils	Ground Based equipment shall not operate on soils susceptible to mass failure.	See Hydrology/Soil Map in the project case file
Soils	Ground-based equipment operations will be restricted to frozen (6 inches or deeper) or snow-covered (6 inches of packed snow or ice) soil, or a combination of both frozen and snow-covered ground if determined to be adequate in the field by the soil scientist.	Units 35
Soils	Units with existing disturbance require a combination of dry soils (As described in "Field Guide to Soil Moisture Conditions Relative to Operability of Logging Equipment" contained in Soil Appendix 1) during ground operations AND deferred burn treatments (based on post-harvest monitoring.	Units 2,6,14, 19 and 22
Soils	Retain at least 10 tons of coarse woody debris per acre,	All Treatment

Resource Area	Design Feature	Application
	depending on habitat type and natural availability (Graham et al., 1994, Brown et al. 2003). Upper limit of coarse woody debris distribution will be determined by fuel recommendations.	Units
Soils	Pile burning will occur when one of the following conditions is met: Piles are located on previously disturbed soil, or on prisms associated with closed roads, trails, or landings, OR Soils are at or above 20 percent volumetric moisture (Busse et al. 2010) and weather is cool, OR Soils are frozen to a depth of 6 inches or more OR covered by at least 6 inches of compacted snow or ice.	All Treatment Units
Soils	To minimize additional disturbance footprint, reuse all old skid trails, landing areas, and user-created roads where feasible.	All Mechanical Units
Soils	Designate all skid trails with an average of 100 foot spacing.	All Harvest Units
Soils	Non-winter ground based operations should occur when soil surfaces and profiles are dry (See description above). Grazing will be deferred as practicable within treatment areas through the current allotment management plan to reduce soil resource impacts.	All Mechanical Units
Heritage	The project will comply with the 2015 Heritage Resources Programmatic Agreement between Montana State Historic Preservation Office, Region One of the Forest Service, and the Advisory Council on Historic Preservation.	All Project Components
Heritage	If a heritage site is discovered during project activity, the project work would cease in that location of the forest and the Heritage Specialist will determine if project implementation must be modified to avoid impacts to those resources. The Heritage Specialist will also determine if these resources are subject to State and/or Tribal Historic Preservation Officer review and comment, according to the 36 Code of Federal Regulations 800 compliance process.	All Project Components
Heritage	All road work in the area of the heritage site shall remain within the existing road prism.	Road 6411
Aquatics	The crossing over Daniels Creek shall be done with a temporary bridge as designed by the project engineer. Stabilize and rehabilitate the current ford crossing.	Road 6404
Aquatics	Prescriptions within Streamside Management Zones and in Riparian Areas will comply with Best Management Practices under the following regulatory guidance:	All Treatments in Stream Management Zones

Resource Area	Design Feature	Application
	Administrative Rules of Montana 16.20.603, Administrative Rules of Montana 17.30.623, Forest Service Manual 7722, Forest Service Handbook 7709.56b, and The Regional Forester's Memorandum of Understanding on Non-point Source Pollution.	
Scenery	Landscape Architect will coordinate work as needed with the layout and marking of units that are visible from Highway 89.	Units 14, 16, 17, 18, 25, 26, 38, & 40
Scenery	Feather edges and vary the width of the transition zone of units 16a and 16b.	Units 16a and 16b
Scenery	Minimize visibility of all stumps within 100 feet from all open roads and trails, to the extent possible on ground based units. Stump height of 8 inches or less is recommended.	Treatment units Adjacent to open roads
Scenery	Locate landings so they are not visible from Highway 89.	Units 14, 16, 17, 18, 25, 26, 38, & 40
Scenery	Slash, root wads, and other debris will be removed, buried, burned, chipped or lopped to a height of 18" or less when visible from open roads and trails.	All Units adjacent to open roads
Scenery	For units along open roads and trails visible from roads, trails, and residential tracts: explore alternative methods of marking (cut tree mark, designation by description) to be worked out with the Landscape Architect.	Units along open roads and trails visible from roads, trails, and residential tracts
Transportation	Decommission all temporary roads used, no later than 3 years after the date of project completion (to include all temporary constructed roads for harvest activities).	All existing and new temporary roads used for haul.
Transportation	Decommission all trails used for haul back to condition of intended use. This will include partially scarifying and partially obliterating the temporary haul road to narrow the template, and replacement of seasonal closure gate.	Trail 714
Recreation	During implementation all roads (including newly constructed and or reconstructed under this proposal not currently authorized for use per the motorized 2007 Little Belt, Castle, and North Half Crazy Mountains Travel Plan) shall be closed to public motorized use. This may necessitate installation of temporary gates, relocation of existing gates or other devices.	All haul routes. See Little Belts Travel Plan Map
Recreation	Any designated all-terrain vehicle or snow trail used for hauling, skidding or other logging operations having	All Haul Routes

Resource Area	Design Feature	Application
	disturbance from existing condition shall be re-established as close to its original condition as possible. Opportunity to enhance or improve designated trails after project implementation should be pursued.	
Recreation	Logging operations and hauling will not be permitted on weekends between December 1 – May 15, to provide for weekend winter recreation uses, such as snowmobiling, dogsledding, etc. The weekend time period starts at 5:00 p.m. on Friday evenings and ends at 12:01 a.m. Monday. Log hauling will not be permitted on the following holidays to provide for public recreation: New Years' Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving, and Christmas. Specific to groomed snowmobile routes (trails and roads): Leave two inches of compacted snow on route surface for winter logging operations.	Divide Road 839, Moose Mountain Road 6412, Adams Creek Road 6414, Moose Creek Road 204, Sheep Creek Road 119, and Moose Park Road 6408. See Transportation Map in Appendix B
Recreation	During sale/unit layout protect all established dispersed camp sites. Sites should remain untreated and where practical preserve vegetative tree cover and allow for screening of up to 100 feet.	All Treatment Units
Recreation	Logging and hauling operations will be coordinated with recreation staff and line officer.	All harvest units, winter and summer.
Recreation	Assure when logging and hauling operations are occurring (summer or winter) that adequate safety warning signs are placed along open Forest Service roads and junctions in the affected area to provide for public safety.	All Haul Routes, All Harvest Units
Range	Design operations to minimize disruption of allotment management through early coordination of planned treatment activities with the District Rangeland Management Specialist.	All Treatment Units
Range	Grazing will be deferred as practicable within treatment areas through the current allotment management plan to reduce soil resource impacts.	All Treatment Units
Weeds	Remove all mud, dirt, and plant parts from all off road equipment before moving into project area. Cleaning must occur off National Forest lands. This does not apply to service vehicles that will stay on the roadway, traveling frequently in and out of the project area.	All Mechanical Treatments
Weeds	Clean all equipment prior to leaving the project site, if operating in areas infested with new invaders as determined by the Forest Weed Specialist.	All Mechanical Units

Resource Area	Design Feature	Application
Weeds	Revegetate all disturbed soil, except the travel way on surfaced roads, in a manner that optimizes plant establishment for that specific site, unless ongoing disturbance at the site will prevent weed establishment. Use native material where appropriate and available. Use a seed mix that includes fast, early season species to provide quick, dense revegetation. To avoid weed contaminated seed, each lot must be tested by a certified seed laboratory against the all State noxious weed lists and documentation of the seed inspection test provided.	All Temporary Roads and Mechanical Units
Weeds	Prior to timber sale activities, conduct herbicide treatment (per USDA-FS 1994 Noxious Weed ROD) of noxious weeds on Forest roads that will be used by timber sale purchasers within the project area.	All Haul Routes
Weeds	After timber sale activities, monitor treatment units, landings, and skid trails for noxious weed establishment for three years. Conduct herbicide treatment of noxious weeds that are found during monitoring (per USDA-FS 1994 Noxious Weed ROD).	All Mechanical Treatments
Wildlife	If a new species is listed and the species or their habitat occurs in the project area, activities will be examined to determine if project modification is necessary.	Project Area
Wildlife	For recently occupied goshawk nests, a no treatment buffer of a minimum of 40 acres will be maintained around nest trees.	Units with occupied goshawks. See Wildlife Map in project case file.
Wildlife	At least 180 acres of goshawk nesting habitat per home range will be retained in the Project area with an emphasis on stands that have been used by goshawks for nesting. To reduce disturbance to nesting goshawk, do not allow project activities from April 15 to August 15 within ¼ mile of known active nests. An active goshawk family can be monitored to see if project activities could occur before August 15 without affecting fledging.	Units with occupied goshawks. See Wildlife Map in project case file.
Wildlife	All temporary roads would be closed to the public motorized use at all times.	All Temporary Roads.
Wildlife	Logging, hauling and road building activity (winter and non-winter) will be confined to a single drainage at a time with all work completed in the shortest time frame possible. Prior to logging, the project wildlife biologist will work with the pre-sale forester to compartmentalize drainages in order to meet this mitigation measure.	All Harvest Units and Haul Routes. See Implementation Subdivisions map in the project case file.

Resource Area	Design Feature	Application
Wildlife	Impacts to elk calving habitat would be minimized by limiting project activities to a single drainage at a time as mentioned above with a focus on limiting treatment in the area below the 6412 road between Wolsey Creek and Little Moose Creek from May 15 to July 1.	Area below the 6412 road between Wolsey Creek and Little Moose Creek. See Implementation Subdivisions map in the project case file.
Wildlife	Openings created by clearcuts should be small although openings up to 100 acres may be acceptable where the adjacent forest edge supplies security. Design clearcuts so that the best available cover occurs at the uncut edge.	Clearcut, Shelterwood and Seedtree Harvest Units
Wildlife	Keep all soft snags which are not a safety or fire hazard.	All Treatment units
Wildlife	Retain snags adjacent to natural openings, near water, in valley bottoms, or in aspen groves if possible.	All Treatment Units
Wildlife	When designing snag retention in harvest units, it also is preferable to retain clusters of snags rather than spacing them uniformly in an area. It is preferable to retain snags that are away from open roads to limit firewood cutting.	All Harvest Units
Wildlife	Retain larger diameter wildlife trees wherever possible	All Treatment Units
Wildlife	Leave deformed, cull, and spike-topped trees during timber harvest to provide for future snags.	All Harvest Units
Wildlife	Where feasible, protect snags from prescribed fire by clearing brush from base of snag.	All Treatment Units
Wildlife	Keep down trees for wildlife feeding sites. It is preferable to have two logs with bark per acre and some deteriorated logs. Cutting brush along low-speed, low-traffic-volume roads should be done to the minimum level necessary to provide for public safety.	All Treatment Units
Wildlife	All broadcast burns will be implemented prior to May 20 (or later depending on elevation and aspect) or after July 15 in order to protect nesting birds in forested habitat, unless surveys indicate birds are not present.	All Broadcast Burn Units
Wildlife	For units that are proposed for Douglas-fir improvement, retain a minimum number of large live trees (15-19.9 inches diameter at breast height) to provide summer roosting habitat for Townsend's big-eared bat; five trees per acre in warm dry potential vegetation types, and 10 trees per acre in cool moist	15, 15a, 32, 33, 36, 38a, 38c, 38e, 38h, 38i, 38j, 38k, 38l, 38o, 38q, and

Resource Area	Design Feature	Application
	potential vegetation types. This guideline applies as an average trees per acre across treatment units. Large live trees need not be present on every acre; they may be clumped as appropriate for the site and species. Additionally, retain a minimum number of large (15 to 19.9 inches diameter at breast height) Douglas-fir snags per acre according to potential vegetation type; retain three large Douglas-fir snags in warm dry potential vegetation types and retain five large Douglas-fir snags in cool moist potential vegetation types. Guideline applies as an average snags per acre across a project area. Snags need not necessarily be present on every acre or in every treatment unit; they may be clumped as appropriate for the site, species, and existing snag distribution.	46.
Facilities and Infrastructure	Design treatments to avoid damage to existing structural range improvements, such as range allotment fences and water developments.	All Treatment Units with Range Improvements
Facilities and Infrastructure	Protect and save all trail and road route markers, trail head, and informational signage that may be disturbed by project activities.	All Treatment Units and Project Roads

Table 5: Monitoring Plan

Resource Area	Monitoring Element	Application
Hydrology	Best Management Practices effectiveness monitoring will be completed for treatment-unit and road Best Management Practices. The road improvement contracting officer's representative and timber sale administrator would monitor Best Management Practices for proper implementation and watershed staff would evaluate their effectiveness.	All harvest units and haul routes utilized.
Hydrology	Include review of harvest and burn units adjacent to waterbodies to ensure Stream Management Zone law and project-specific design criteria and mitigations were followed, and to identify any erosion and sediment delivery to streams.	All harvest units and haul routes utilized.
Hydrology	Include assessment of road conditions to determine effectiveness of road Best Management Practices in reducing sediment delivery to streams, effectiveness of road decommissioning and effectiveness of road storage efforts.	All harvest units and haul routes utilized.
Hydrology	Where Best Management Practices are shown to be inadequate in protecting water quality, they would be modified or project activities would be discontinued.	All harvest units and haul routes utilized.
Botany	Monitoring of the marking and harvest would indicate how well the objective was met for enhancing whitebark pine stands.	All whitebark pine treatment areas.
Fire/Fuels	Piles shall be monitored for post-fire vegetation response and re-seeding/revegetation may be needed to enhance re-sprouting of native grasses and forbs.	All units with planned pile burns.
Silviculture	Stocking surveys of harvest units will be completed to ensure required reforestation occurs.	All applicable harvest units.

APPENDIX B: MAPS OF PROPOSED ACTIVITIES

Figure 15: Decision Map

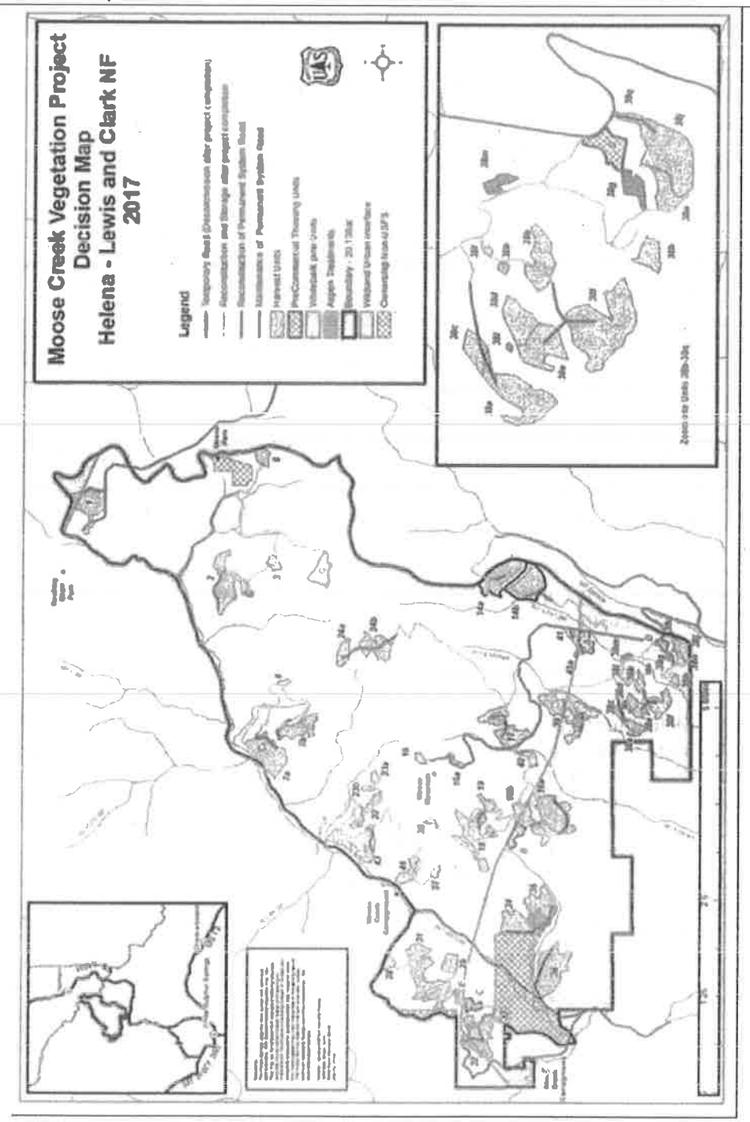
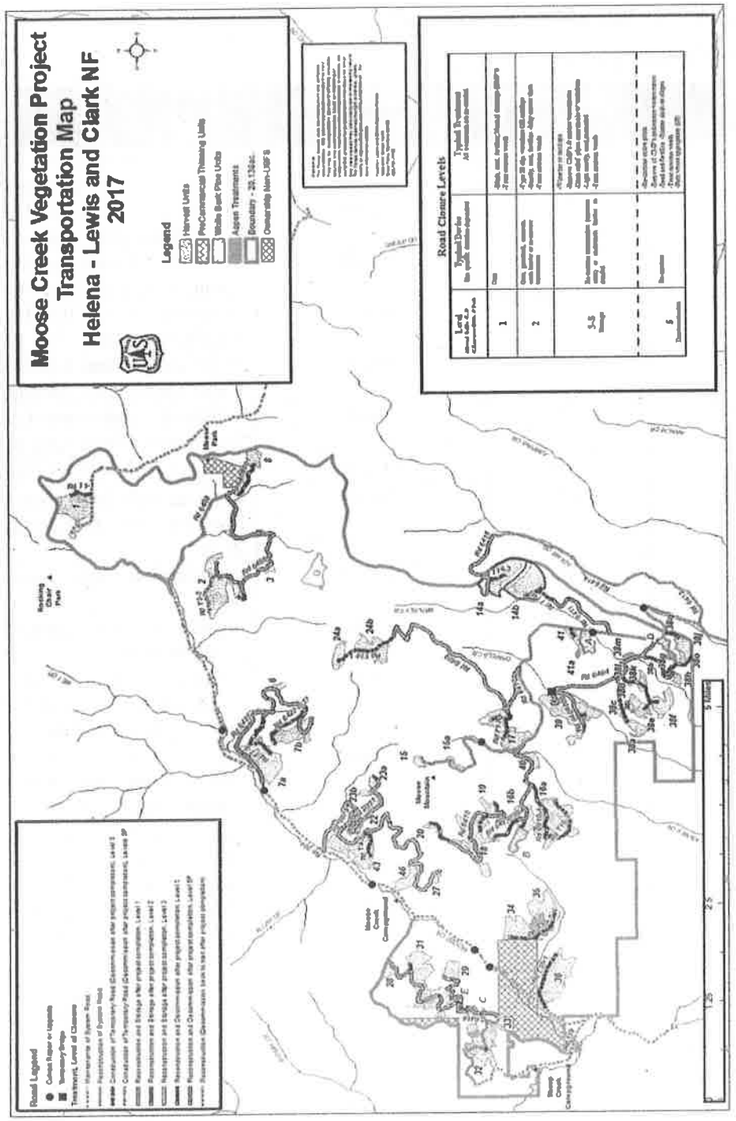


Figure 16: Transportation Map



APPENDIX C: PROJECT TREATMENTS

Table 6: Project Treatments

Unit	Approximate Acres	Harvest System	Treatment
G	45	Hand	Pre-Commercial Thin. Whitebark Pine Enhancement. Handpile Burn.
A	25	Hand	Wildland – Urban Interface. Pre-commercial Thin. Lop and Scatter.
B	21	Hand	Wildland – Urban Interface. Pre-commercial Thin. Lop and Scatter.
C	15	Hand	Wildland – Urban Interface. Pre-Commercial Thin. Lop and Scatter.
D	10	Hand	Wildland – Urban Interface. Pre-Commercial Thin. Handpile burn.
E	3	Hand	Wildland – Urban Interface. Pre-Commercial Thin. Lop and Scatter.
1	90	Tractor	Clearcut with Jackpot Burn
2	100	Tractor	Clearcut with Slash Understory; Daylight Thin. Broadcast or Jackpot Burn.
3	14	Tractor	Clearcut with Leave Trees. Jackpot burn.
6	7	Tractor	Improvement Cut. Jackpot or Handpile Burn.
7a	98	Cable	Clearcut with Leave Trees. Thin Pole Stands. Thin Understory where present. Jackpot Burn.
7b	59	Cable	Clearcut with Leave Trees. Thin Pole Stands. Thin Understory where present. Jackpot burn.
8	21	Tractor	Clearcut with Leave Trees. Daylight Thin and Sanitize Understory. Jackpot Burn.
14a	85	Tractor	Clearcut Mature Stands. Commercial Thin Pole Stands. Jackpot or Handpile Burn.
14b	83	Tractor	Clearcut Mature Stands. Commercial Thin Pole Stands. Jackpot or Handpile Burn.
15	8	Tractor	Commercial Thin. Jackpot Burn Mature; Jackpot or Hand Pile Burn Pole Stands.
15a	9	Hand	Commercial Thin with Handpile Burn.

Unit	Approximate Acres	Harvest System	Treatment
16a	59	Tractor	Clearcut with Leave Trees. Jackpot Burn Mature. Jackpot or Handpile Burn Pole Stands.
16b	98	Tractor	Clearcut with Leave Trees. Jackpot Burn Mature. Jackpot or Handpile Burn Pole Stands.
17	86	Tractor	Clearcut with Slash Understory. Jackpot Burn.
18	100	Tractor and Cable	Clearcut with Jackpot Burn.
19	16	Tractor	Clearcut and Slash. Broadcast or Jackpot Burn.
20	7	Cable	Clearcut and Slash. Jackpot Burn.
22	29	Tractor	Commercial Thin pole Stand. Jackpot Burn.
23a	10	Tractor	Clearcut with Leave Trees, Slash Understory. Jackpot Burn.
23b	7	Tractor	Clearcut with Leave Trees. Slash Understory. Jackpot Burn.
24a	28	Tractor	Clearcut with Leave Trees. Slash Understory. Jackpot Burn.
24b	61	Tractor	Clearcut with Leave Trees. Slash Understory. Jackpot Burn.
27	8	Cable	Clearcut with Leave Trees. Thin Understory. Jackpot Burn.
28	15	Tractor	Clearcut. Jackpot Burn.
29	26	Cable	Clearcut. Thin Understory. Jackpot Burn.
31	141	Cable	Clearcut with Leave Trees. Jackpot and Handpile Burn.
32	86	Tractor and Cable	Commercial Thin; Clearcut with Leave Trees; Thin Saplings and Pole Stands. Jackpot or Handpile Burn.
33	4	Tractor and Cable	Commercial Thin. Thin Understory. Jackpot or Handpile Burn.
34	68	Tractor	Clearcut with Leave Trees. Jackpot or Handpile Burn.
35	88	Tractor	Clearcut with Leave Trees. Aspen Restoration. Jackpot or Handpile Burn.
36	132	Tractor	Commercial Thin. Salvage Blowdown, Regenerate. Jackpot or Handpile Burn.
38a	24	Tractor	Commercial Thin. Jackpot Burn.
38b	14	Tractor	Clearcut with Leave Trees. Thin Understory. Jackpot Burn.
38c	7	Tractor	Commercial Thin. Jackpot Burn.

Unit	Approximate Acres	Harvest System	Treatment
38d	12	Tractor	Clearcut with Leave Trees. Thin Understory. Jackpot Burn.
38e	16	Tractor	Commercial Thin. Jackpot Burn.
38f	40	Tractor	Clearcut with Leave Trees. Thin Understory. Jackpot Burn.
38g	5	Hand	Aspen Restoration. Jackpot Burn.
38h	7	Tractor	Commercial Thin. Jackpot Burn.
38i	1	Tractor	Commercial Thin. Jackpot Burn.
38j	30	Tractor	Commercial Thin. Jackpot Burn.
38k	1	Tractor	Commercial Thin. Jackpot Burn.
38l	1	Tractor	Commercial Thin. Jackpot Burn.
38m	4	Tractor	Clearcut with Leave Trees. Aspen Restoration.
38o	9	Tractor	Commercial Thin. Jackpot Burn.
38q	2	Tractor	Commercial Thin. Jackpot Burn.
39	100	Tractor	Clearcut with Leave Trees. Thin Understory. Jackpot burn.
40	16	Tractor	Clearcut with Leave Trees. Slash Understory. Jackpot Burn.
41	16	Tractor	Clearcut with Leave Trees. Thin Understory. Jackpot Burn.
41a	2	Hand	Aspen Restoration. Slash Understory. Jackpot Burn.
43	95	Cable	Clearcut with Leave Trees. Slash Understory where needed. Commercial Thin Pole Stands. Jackpot Burn.
46	31	Cable	Commercial thin. Jackpot Burn.

Total Acres: 2195

APPENDIX D: LITERATURE CITED

USDA Forest Health Protection. 2016. Insect and disease activity in the Moose creek project area (Helena-Lewis and Clark National Forest). Report Number MFO_TR-16-21. September 28, 2016. USDA Forest Health Protection, Missoula Field Office.

USDA Forest Service. 2014. Summary Report: Little Belt mountains landscape assessment. USDA Forest Service, Lewis and Clark National Forest.

USDA Forest Service. 2007. Little Belt-Castle-North half Crazy Mountains Travel Plan, Record of Decision. Lewis and Clark National Forest.

USDA Forest Service 1994. Noxious Weed Control, Record of Decision. Lewis and Clark National Forest.

USDA Forest Service. 1986. Lewis and Clark national forest plan, as amended. USDA Forest Service, Lewis and Clark National Forest.

Resource specific references and literature citation are contained in the project case file.

United States Department of the Interior
Fish and Wildlife Service
Ecological Services
Montana Field Office
585 Shepard Way, Suite 1
Helena, Montana 59601-6287
Phone: (406) 449-5225, Fax: (406) 449-5339

In reply refer to:
File: M19 Helena-Lewis and Clark National Forest (I)
06E11000-2017-I-0082 Moose Creek Vegetation Project

January 20, 2017

William Avey, Forest Supervisor
Helena-Lewis and Clark National Forest
2880 Skyway Drive
Helena, Montana 59602

Dear Mr. Avey:

We are responding to your December 2, 2016 request for U.S. Fish and Wildlife Service (Service) consultation on the proposed Moose Creek Vegetation Project, pursuant to Section 7 of the Endangered Species Act of 1973. The project occurs on the Belt-White Sulphur Springs Ranger District of the Helena-Lewis and Clark National Forest (Forest). Effects of the proposed actions were reviewed in regards to federally listed threatened and endangered species. The Forest determined the proposed action "*may affect, but is not likely to adversely affect*" the threatened Canada lynx (*Lynx Canadensis*).

The Moose Creek Vegetation Project is planned under Section 8204 of the Agricultural Act of 2014 (Public Law 112-79), commonly referred to as the 'Farm Bill'. The goal of the project is to improve forest resiliency in an area that has been adversely affected by insects and disease. The 20,138 acre project area is located in the Little Belt Mountains on the Jefferson Division of the Forest, approximately 20 miles north of White Sulphur Springs, Montana. The proposed action includes vegetation treatment and road management activities. Regeneration harvest of dead and dying lodgepole pine that has been infected by mountain pine beetle would occur on approximately 2,000 acres of the 2,353 acres proposed for treatment. Treatments to enhance aspen or whitebark pine would occur on 130 acres. Prescribed fire would be used in any project unit to promote forest regeneration or enhance aspen. Approximately 8.5 miles of new temporary road would be constructed and then decommissioned within three years of completing the project. Approximately 31 miles of road currently closed to the public would be temporarily utilized and then closed after completing project activities. An additional 34 miles of existing road open to public use may also be utilized during project activities. Approximately 5.1 miles of existing road would be decommissioned within three years of completing the project.No new permanent roads would be added to the Forest transportation network. Additional information and further details on the proposed activities can be found in the biological assessment for the project (U.S. Forest Service 2016).

The proposed action is located within unoccupied, secondary Canada lynx habitat or a 'secondary area' as defined in the Canada Lynx Recovery Outline (U.S. Fish and Wildlife Service 2005) and Revised Canada Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team 2013). Secondary areas only support lynx intermittently and lynx use of the action area would be considered transient. Recent verified observations of lynx within the action area have not occurred and lynx are not likely to be found in the action area during proposed activities. Therefore, the likelihood of disturbance to transient lynx is discountable. If transient lynx were to be in a project area during implementation, the potential for disturbance is not expected to result in significant effects or reduce an individual's ability to move through the area.

Although the Northern Rockies Lynx Management Direction (NRLMD, U.S. Forest Service. 2007) only applies to areas occupied by lynx, this direction was considered for the proposed action. All standards and guidelines in the NRLMD would be met. Exemptions and exceptions to VEG S5 would be used for precommercial thinning of 109 acres of the stand initiation structural stage of snowshoe hare habitat; the exemption to VEG S5 would allow precommercial thinning of 61 acres within the wildland urban interface and exceptions would allow treatment of 61 acres to restore whitebark pine and 2 acres to restore aspen. Effects to lynx habitat would be minimal and would not significantly affect transient use of habitat by lynx. The project would maintain connectivity, allowing transient lynx to move through the area, and would not preclude any future use of the area by transient lynx. Consequently, effects to lynx habitat would be discountable and/or insignificant.

The Service has reviewed the biological assessment and concurs with the determination that the proposed action is not likely to adversely affect the threatened Canada lynx. The Service bases its concurrence on the information and analysis in the biological assessment prepared by Allison Kolbe, District Wildlife Biologist, and information in our files.

This concludes informal consultation pursuant to the regulations implementing section 7(a) (2) of the Endangered Species Act, 50 C.F.R. 402.13. This project should be re-analyzed if new information reveals effects of the action that may affect listed or proposed species or designated or proposed critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to a listed or proposed species or designated or proposed critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this Project.

We appreciate your efforts to ensure the conservation of threatened and endangered species as part of your responsibilities under the Endangered Species Act, as amended. If you have questions or comments related to this consultation, please contact Tom Olenicki at thomas_olenicki@fws.gov or (406) 449-5225, extension 213.

Sincerely,

Jodi L. Bush
Office Supervisor

References Cited:

Interagency Lynx Biology Team. 2013. Canada lynx conservation assessment and strategy. DRAFT 3rd edition, June 13, 2013. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication #R1-13-XX, Missoula, Montana. 116 pages.

U.S. Fish and Wildlife Service. 2005. Recovery Outline: Contiguous United States Distinct Population Segment of Canada Lynx. U.S. Fish and Wildlife Service, Region 6, Montana. 21 pages.

U.S. Forest Service. 2007. Northern Rockies lynx management direction record of decision. USDA Forest Service, Northern Region 1, Missoula, Montana. 71pp.

U.S. Forest Service. 2016. Biological Assessment for Canada lynx, Moose Creek Vegetation Project. Belt-White Sulphur Springs Ranger District, Helena-Lewis and Clark National Forest, White Sulphur Springs, Montana. 33pp.

Biological Assessment for Canada Lynx

Moose Creek Vegetation Project

Helena-Lewis and Clark National Forest, Jefferson Division, Belt-Creek White Sulphur Springs Ranger District
December 2, 2016

Prepared by:

/s/ Allison Kolbe
Allison Kolbe, District Wildlife Biologist

Contents

Introduction

Purpose and Authority

This Biological Assessment reviews possible effects of the Moose Creek Vegetation Project, a proposed federal action, on Canada lynx, a threatened species and its habitat. Threatened, endangered, and proposed species are managed under the authority of the Federal Endangered Species Act (PL 93-205, as amended) and the National Forest Management Act (PL 94-588). Under provisions of the Endangered Species Act, Federal agencies shall use their authorities to carry out programs for the conservation of listed species, and shall insure any action authorized, funded, or implemented by the agency is not likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of proposed species; or (3) adversely modify proposed critical habitat (16 USC 1536(a)(2)).

Summary Determination of Effects

Implementation of the proposed Federal action ***may affect, but is not likely to adversely affect*** Canada lynx.

Implementation of the proposed Federal action would have ***no effect*** on Canada lynx designated critical habitat.

Consultation Requirements

In accordance with the Endangered Species Act, its implementation regulations, and Forest Service Manual 2671.4, the Helena-Lewis and Clark National Forest[1] is required to request consultation from the United States Fish and Wildlife Service with respect to the determination (by Forest biologists) of potential effects on species listed as *threatened* or *endangered,* on species *proposed* for listing, and on designated *critical habitat* for those species: in this case, the Canada lynx, and the North American wolverine.

Need for Re-Assessment Based on Changed Conditions

The Biological Assessment findings are based on the best current data and scientific information available. A revised Biological Assessment will be prepared if: (1) new information reveals effects which may impact threatened, endangered, and proposed species or their habitats in a manner or to an extent not considered in this assessment; (2) the proposed action is subsequently modified in a manner that causes an effect which was not considered in this assessment; or (3) a new species is listed or habitat identified which may be affected by the action.

Species Included in this Assessment

A species list for the Lewis and Clark National Forest, dated November 25, 2016, was obtained from the FWS Montana Ecological Services Field Office web site http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/Forests/L&C_sp_list.pdf on 12/01/16. The list states that the Service has determined that Canada lynx are transient and there is secondary/peripheral lynx habitat on the Jefferson Division of the Lewis and Clark National Forest where

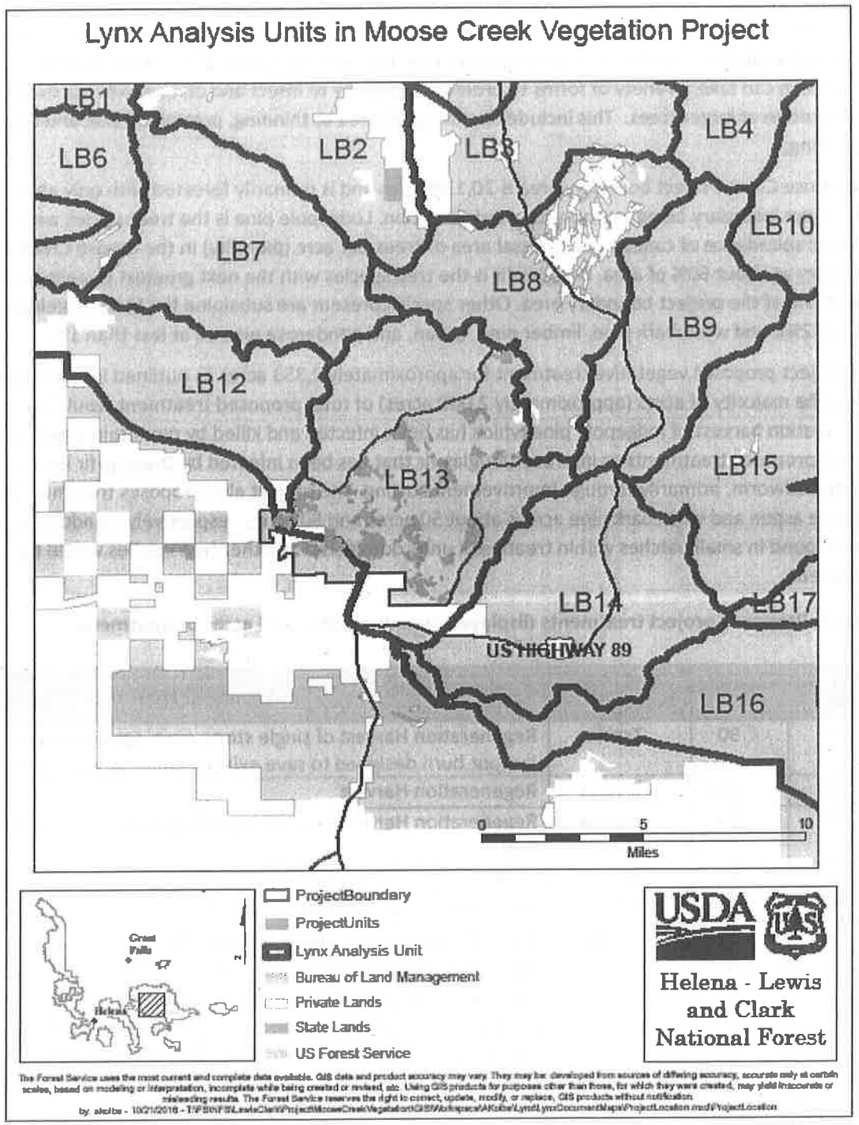
[1] Note that even though the Helena and Lewis and Clark National Forests are now the Helena – Lewis and Clark National Forest, the separate *Forest Plans* remain in place until Forest Plan revision has been completed (anticipated 2018). Also note that there are occasional references to the Lewis and Clark National Forest only; this occurs when information is specific to the Lewis and Clark portion of the Helena-Lewis and Clark National Forest.

the Moose Creek Vegetation Project would occur. There is no designated Critical Habitat for Canada lynx on the Jefferson Division; therefore Critical Habitat will not be discussed further. The wolverine is a proposed species that is known to be present in the project area; project effects to wolverine were documented with the Programmatic Biological Assessment regarding the effects of routine National Forest Service projects on the proposed North American wolverine and will not be discussed further in this assessment.

Moose Creek Vegetation Project Description

Project Location

The Moose Creek Vegetation Project would occur in the Little Belt Mountains on the Jefferson Division of the Helena-Lewis and Clark National Forest. The project area is in Meagher County, Montana, approximately 20 miles north of White Sulphur Springs. The legal description of the approximate center of the project area is Section 3 of Township 12N, Range 7E. See map for overview of project area.


Lynx Analysis Units in Moose Creek Vegetation Project
LB1
LB2
LB3
LB4
LB6
LB7
LB8
LB9
LB10
LB12
LB13
LB14
LB15
LB16
LB17
US HIGHWAY 89
0
5
10
Miles
Great Falls
Helena
ProjectBoundary
ProjectUnits
Lynx Analysis Unit
Bureau of Land Management
Private Lands
State Lands
US Forest Service
USDA
Helena - Lewis and Clark National Forest
The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those, for which they were created, may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace, GIS products without notification.
by: akolbe - 10/21/2016 - T:\FSI\NFS\LewisClark\ProjectMooseCreek\Vegetation\GIS\Workspace\AKolbe\LynxLynxDocumentMaps\ProjectLocation.mxd\ProjectLocation

Project Description

The Moose Creek Vegetation Project is being planned under the authority of the "Farm Bill Categorical Exclusion." The purpose of this proposed project is to maintain or restore the structure, function, composition and connectivity of a forest system that has been adversely affected by insect and disease. Treatments can take a variety of forms to promote resiliency to insect and disease while providing for the retention of larger trees. This includes but is not limited to thinning, prescribed fire, and timber harvesting.

The Moose Creek Project boundary area is 20,138 acres and is primarily forested with only about 10% of the project boundary being in a non-forested condition. Lodgepole pine is the tree species with the greatest abundance of canopy cover, basal area or trees per acre (plurality) in the Moose Creek Project boundary at about 60% of area. Douglas-fir is the tree species with the next greatest plurality covering about 17% of the project boundary area. Other species present are subalpine fir (11%), Engelmann spruce (2%), and whitebark pine, limber pine, aspen, and ponderosa pine all at less than 1%.

The project proposes vegetative treatment for approximately 2,353 acres as outlined in the following table. The majority of acres (approximately 2,000 acres) of total proposed treatment would be regeneration harvest of lodgepole pine which has been infected and killed by mountain pine beetle. The project proposes treatments to improve Douglas-fir that has been infected by Douglas-fir beetle and spruce budworm, primarily through improvement cutting. The project also proposes treatments to enhance aspen and whitebark pine across about 50 acres and 80 acres, respectively; in addition, aspen where found in small patches within treatment units dominated by other tree species would be enhanced.

Table 1: Proposed project treatments displayed by unit number and acres of treatment.

Unit	Approx. Acres	Harvest System	Proposed Treatment
1	90	Tractor	Regeneration Harvest of single story, even-aged lodgepole pine and follow up jackpot burn designed to save existing whitebark pine seedlings/saplings
2	106	Tractor	Regeneration Harvest
3	14	Tractor	Regeneration Harvest of single story lodgepole pine and follow up jackpot burn
6	7	Tractor	Regeneration Harvest and Prescribed fire
7(a-b)	157	Cable	Regeneration Harvest and Prescribed fire
8	21	Tractor	Regeneration Harvest and Prescribed fire
14	204	Tractor	Regeneration Harvest of mature lodgepole pine and thinning of pole sized lodgepole pine, follow up with jackpot burning
15	8	Tractor	Regeneration Harvest of lodgepole pine leaving whitebark pine trees, slash dense pockets of regeneration and follow up broadcast burn or jackpot burn
15a	9	Tractor	Commercial Thin to reduce density of lodgepole pine while retaining whitebark pine, slash seedlings and saplings
16	195	Tractor	Regeneration Harvest of lodgepole pine while leaving Douglas-fir and Prescribed fire
17	124	Tractor	Regeneration Harvest of mature lodgepole, slash subalpine fir understory in northern portion and pile or jackpot burn

18	115	Tractor	Regeneration Harvest and broadcast burn
19	16	Tractor	Regeneration Harvest and Prescribed fire
20	7	Cable	Regeneration Harvest and Prescribed fire
22	29	Ground	Regeneration Harvest and Prescribed fire
23 (a-b)	17	Tractor	Regeneration Harvest and Prescribed fire
24 (a-b)	89	Tractor	Regeneration Harvest and Prescribed fire
27	8	Cable	Regeneration Harvest and Prescribed fire
28	15	Tractor	Regeneration Harvest with leave trees and Prescribed fire
29	26	Cable	Regeneration Harvest with leave trees and Prescribed fire
31	141	Cable	Regeneration Harvest with leave trees and Prescribed fire
32	86	Tractor	Regeneration Harvest with leave trees and Prescribed fire, promote aspen
33	4	Tractor	Regeneration Harvest with leave trees and Prescribed fire, promote aspen
34	68	Tractor	Regeneration Harvest of lodgepole and pile burn
35	88	Tractor	Regeneration Harvest of lodgepole to enhance aspen and jackpot burning
36	132	Tractor	Regeneration Harvest, Salvage of blowdown, Mechanical rearrangement of fuels to assist burning and jackpot burning
38 (a-q)	172	Tractor	Regeneration Harvest of lodgepole to enhance aspen and jackpot burning
39	126	Tractor	Regeneration Harvest and Prescribed fire
40	16	Tractor	Regeneration Harvest with leave trees, slash understory promoting Douglas-fir and healthy whitebark pine, thin pole sized trees and jackpot burn
41	16	Tractor	Regeneration Harvest of lodgepole, sanitize seedlings/saplings to remove dwarf mistletoe and gall rust, improve aspen in wet area, and Prescribed fire
41a	2		Aspen enhancement
43	95	Cable	Regeneration Harvest of lodgepole leaving Douglas-fir Seed Tree and Prescribed fire.
46	31	Cable	Regeneration Harvest-(Seed Tree) and Prescribed fire
A	25	Manual	Pre-commercial thinning
B	21	Manual	Pre-commercial thinning
C	15	Manual	Improvement Cut -pre-commercial thinning and Prescribed fire
D	10	Manual	Pre-commercial thinning
E	3	Manual	Pre-commercial thinning
G	46	Manual	Daylight Thin and Pre-commercial Thinning and Prescribed fire

The project would create approximately 8.5 miles of new temporary road and temporary use would occur over an existing road or trail template on another 31 miles that are currently closed to public use. All temporary roads constructed would be decommissioned no later than three years after the date on which the project is completed, and 5.1 miles of existing road template would also be decommissioned after use. Any trails used would be restored to their previous condition. Approximately 34 miles of existing road that is open to the public may be utilized as haul routes. These routes would receive maintenance to meet Best Management Practices as applicable. No new permanent roads would be added to the forest transportation system. This proposal does not include travel management planning.

Mechanized equipment would be used to harvest timber and trucks would be used to remove timber from the forest. Harvesting may occur during any month of the year; some units would likely be harvested only when soils are frozen or snow is on the ground to prevent soil disturbance in sensitive areas. Other units would be harvested during spring, summer or fall seasons.

Prescribed fire in the form of pile burning, jackpot burning or broadcast burning may be applied in any unit to promote regeneration or enhance aspen. The sum of project activities would result in units being entered on several occasions over the course of the length of the project to harvest timber, prepare for prescribed fire, to apply prescribed fire, to perform restocking survey and/or to apply weed treatment. Additionally, if temporary road was built to access a unit, up to three years' time after project completion is allowed for the road to be decommissioned.

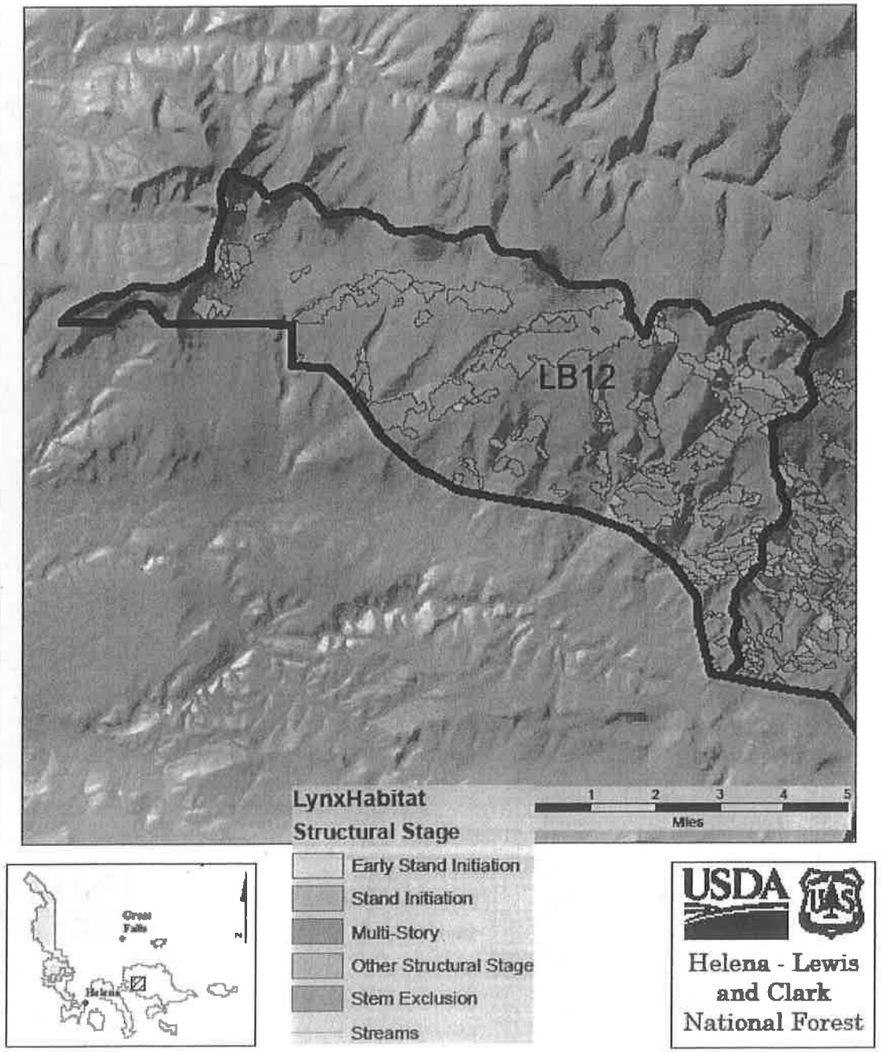
The estimated period of operation of activities may be over 5 years or more once the project decision is signed.

Description of Canada lynx habitat in the project vicinity

The action area for the Moose Creek Vegetation Project is situated in that part of the Forest that has been classified as *unoccupied* lynx habitat by the Northern Rockies Lynx Management Direction (USDA 2007b). Habitat types with the potential to support lynx habitat occupy 14,523 acres of the action area (LB12 and LB13 Lynx Analysis Units). Other than records of lynx relocated to Colorado, who subsequently left and were transients in the Little Belt Mountains on the Jefferson Division, this assessment recognizes that the most recent verified records of lynx presence were in 1981. It is very unlikely that there are resident lynx in the area and instead, more likely, lynx occasionally use this area as a linkage zone or travel corridor while dispersing to areas that have higher quality habitat.

Habitat capable of supporting snowshoe hares (the primary lynx prey) year-round is not abundant and is fragmented. In addition, the widespread demise of forest overstories and consequent accumulation of dead-tree habitat as a result of mountain pine beetle infestation has altered habitat suitability patterns throughout the action area. See maps for display of the extent of current structural stages of snowshoe hare habitat (early stand initiation, stand initiation and multi-story) and potential lynx habitat areas that are not currently providing snowshoe hare habitat (other structural stage and stem exclusion) in the action area.

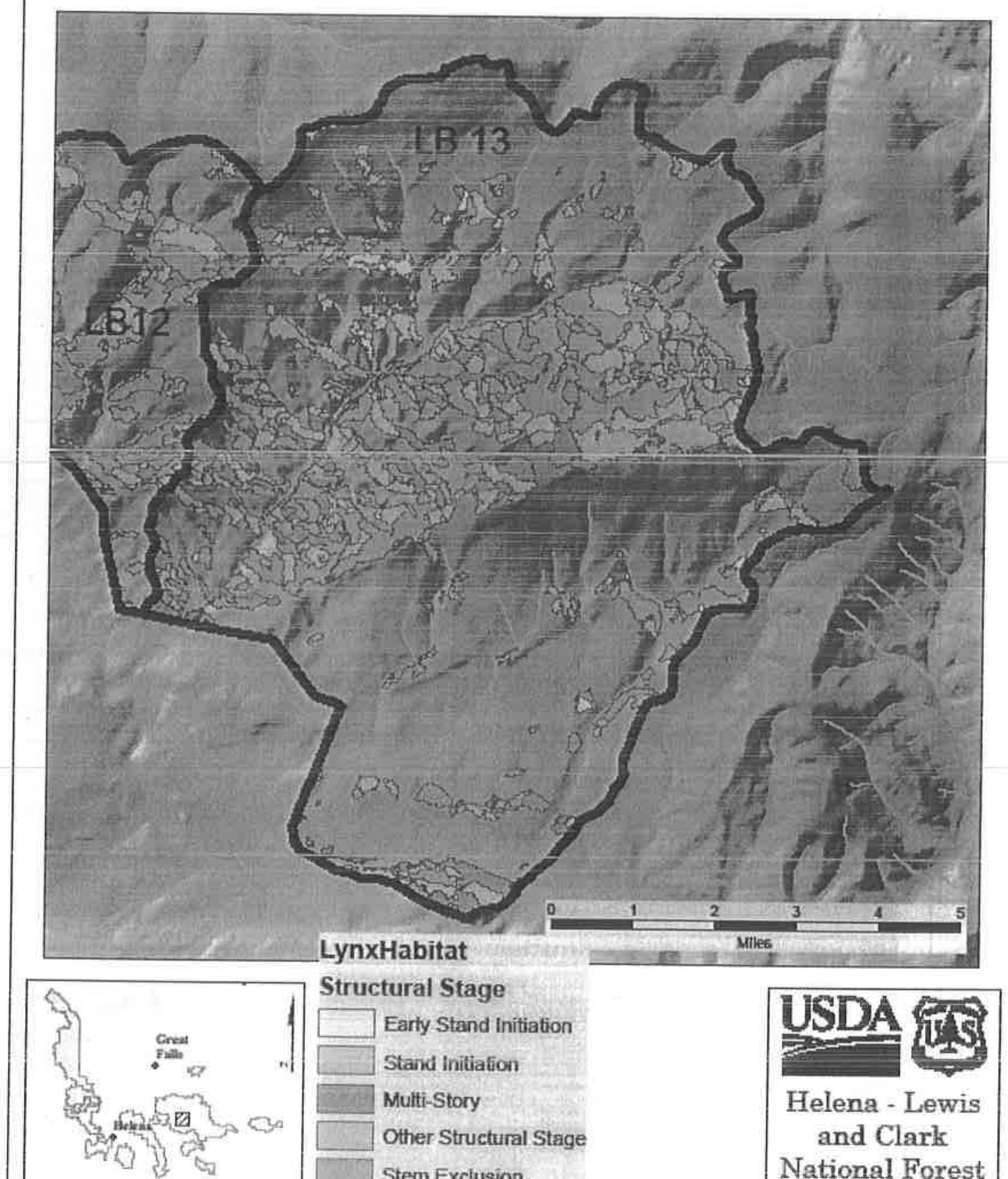
Lynx Habitat and Potential Lynx Habitat in LB12 LAU



The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those, for which they were created, may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace, GIS products without notification.

by: slelbo - 1/8/2018 - T:\FSNFS\LewisClark\ProjectMooseCreek\VegetationGIS\Workspace\AK\elbe\Lynx\LynxDocumentMaps\LynxHabitatInProjectArea.mxd\LynxHabitatInProjectArea

Lynx Habitat and Potential Lynx Habitat in LB13 LAU



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This assessment notes that implementation of the proposed action would result in a reduction of stand initiation hare habitat. However, these effects would be short term and are within the allowable exemptions outlined in the Northern Rockies Lynx Management Direction. All proposed treatments comply with Northern Rocky Mountain Lynx Management Direction (USDA 2007b).

Little Belt Mountains Canada Lynx Survey

Lynx surveys were conducted in the Little Belt Mountains in February and March of 2010 using the established USFS protocol for use during winter. Lynx were not detected during the surveys. A report of the survey results was completed (USDA FS 2012). Because the surveys did not meet protocol, as described in the survey report, the forest again conducted surveys in the Little Belt Mountains from February to April, 2013 using methodology outlined in Squires et al. 2004 and further analyzed in Squires et al. 2012. A report of those surveys concluded that based "on the conditions at the time of survey, the quality of the habitat surveyed, and the species detected during the survey other than lynx, the surveys conducted in the western portion of the Little Belt Mountains are adequate in determining that lynx were not present at the time the surveys were conducted in 2013 (USDA FS 2013).

Little Belt Mountains Canada Lynx Records

The Montana Natural Heritage Program maintains a database of species observations (Montana Natural Heritage Tracker). A query of the database (October 2016, in project record) shows that records of lynx observations in the Little Belt Mountains are recorded from 1979 through 2002 and come primarily from furbearer trapping. These observations are categorized as verified or anecdotal. Verified observations or records are those that scientifically document a lynx by identifying physical remains, live-captured animals, or DNA samples (USFS 2007b (ROD)). Anecdotal observations are generally tracks and reported sightings where physical evidence is lacking. Table 2 summarizes the observations from the Montana Natural Heritage Tracker by year for the Little Belt Mountains. There are 6 verified records dating from 1979 to 1981 in the Little Belts.

Information has been obtained regarding the Colorado collared and released lynx that traveled through Montana. Eight of Colorado's 218 reintroduced lynx made 10 forays into Montana, lasting from 1 to 217 days (J. Ivan e-mail to A. Rohrbacher dated July 26, 2011). Three of the individuals traveled through the Lewis and Clark National Forest. In 2005 one individual spent 70 days in Montana, including, traveling in the Crazy Mountains, then went back into Yellowstone National Park via the Absaroka Mountains. In 2006, two individuals traveled around Montana before heading back in to Yellowstone National Park at the west entrance. One spent 98 days in Montana, including travelling from the Absaroka Mountains across the steppe to the Snowy Mountains, west into the Little Belt Mountains, and further west into the Big Belt Mountains. The other individual spent 217 days in the state, including travelling through the Little Belt Mountains and spending two weeks in the Madison Range before heading back into Yellowstone.

Table 2: Natural Heritage Tracker database summary of lynx observations.

Mountain Range	Verified observations	Anecdotal observations
Little Belt Mountains	1979, 1980 (3), 1981	2001, 2002
TOTAL	N=6	N=2

Moose Creek Vegetation Project Canada Lynx Habitat Survey

Lynx habitat is defined in the Northern Rockies Lynx Management Direction Record of Decision Glossary: "Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters and provide a prey base of snowshoe hare. In the northern Rockies, lynx habitat generally occurs between 3,500 and 8,000 feet of elevation, and primarily consists of lodgepole pine, subalpine fir, and Engelmann spruce. It may consist of cedar-hemlock in extreme northern Idaho, northeastern Washington and northwestern Montana, or of Douglas-fir on moist sites at higher elevations in central Idaho. It may also consist of cool, moist Douglas-fir, grand fir, western larch and aspen when interspersed in subalpine forests. Dry forests do not provide lynx habitat. (LCAS)"

The Moose Creek Vegetation Project was designed to minimize effects to Canada lynx habitat. Project planning began using a coarse filter process; the Eastside Assessment Canada lynx habitat query (USDA FS 2015) was applied to the project area and used to identify areas on the ground that likely were or were not Canada lynx foraging habitat. Areas that the query identified as early stand initiation, stand initiation, or multi-story structural stages (i.e. areas that were identified as currently being lynx habitat) were dropped from consideration as potential project units (except for some precommercial thinning in instances where excepted by NRLMD). 'Stem exclusion' and 'other structural stage' were structural stages that were brought forward in the planning process as areas that may become project units because vegetative management actions in these potential lynx habitat types may result in the development of foraging habitat.

Field survey for Canada lynx habitat occurred during the months of May through October in 2015 and 2016 in all timber stands that were identified as potential project units. This field survey is considered highly reliable because wildlife technicians are trained: to identify habitat types, to identify lynx habitat in all structural stages, and to use cover-board for ocular estimates on the amount of horizontal cover. Photos and notes are taken to document forest conditions and have been reviewed by the project biologist. An assumption made is that there would be no effects to lynx habitat if vegetation management occurs in non-lynx habitat. As noted above, dry forests do not provide lynx habitat. All proposed project units were habitat typed (Lee and Pfister 1978) during field survey; any timber stands in the warm and very dry, warm and dry, or cold and dry habitat types were determined to not be Canada lynx habitat. Forested stands of all other habitat type groups were assessed for whether they are currently providing snowshoe hare habitat using guidance by Bertram and Claar (2009). Another assumption made is that timber stands that are in potential lynx habitat types, but are not currently in a structural stage that is providing snowshoe hare habitat (i.e. foraging habitat for lynx), could be altered through vegetative management without negative consequences to lynx.

Stand initiation snowshoe hare habitat has been validated in Unit G proposed for whitebark pine treatment outside of the wildland urban interface (WUI). This unit has not been dropped from the proposed action since the NRLMD provides for precommercial thinning in early stand initiation and stand initiation snowshoe hare habitat outside of the WUI for the purpose of restoring whitebark pine.

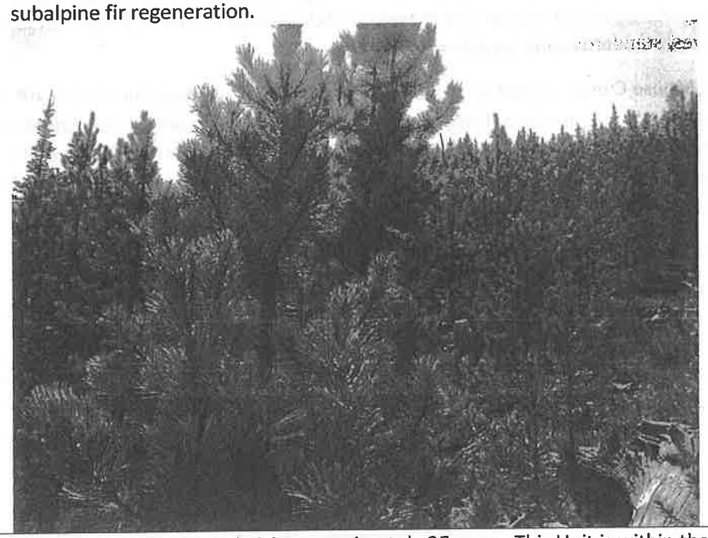
Early stand initiation and stand initiation snowshoe hare habitat has been validated in three units proposed for fuel treatment inside the wildland urban interface (WUI). These areas have not been dropped from the proposed action since the NRLMD provides exception for fuel treatment in the WUI in early stand initiation and stand initiation snowshoe hare habitat.

The wildland-urban interface, or WUI, is defined as areas where wildland vegetation meets urban developments or where forest fuels meet urban fuels such as houses. The WUI boundaries in a majority of the project area are derived from the *Community Wildfire Protection Plan (CWPP)* for Meagher County within which the project occurs (Meagher County 2014). The process for defining WUI within Meagher County is based on the Healthy Forests Restoration Act, introduced in 2003, which allows the development and implementation of hazardous fuel reduction projects when certain conditions are met. Specifically the Moose Creek project occurs in the WUI named "Hwy 89 Corridor".

Stand initiation snowshoe hare habitat has also been validated in a Unit 41a proposed for aspen enhancement where aspen is in decline. This area has not been dropped from the proposed action since the NRLMD provides exception for aspen enhancement in early stand initiation and stand initiation snowshoe hare habitat.

See Table 3 for project affects to lynx foraging habitat.

Table 3: Description of Canada lynx habitat proposed for vegetative treatment.

Unit	Lynx Habitat found
41a	Unit 41a is an aspen improvement unit about 2 acres in size. Field survey found that this area is currently providing lynx foraging habitat.
Unit G	Unit G is about 46 acres designed for whitebark pine enhancement. The unit was surveyed, and it is currently providing lynx foraging habitat in the stand initiation stage. See photo of regenerating whitebark pine in a mix of lodgepole pine and subalpine fir regeneration. 
PCT A	Pre-commercial thinning Unit A is approximately 25 acres. This Unit is within the Meagher County Community Wildlife Protection Boundary. Survey found foraging habitat to be in a patchy condition of hare habitat patches about ½ acre in size within openings.

PCT B	Pre-commercial thinning Unit B is approximately 21 acres. This Unit is within the Meagher County Community Wildlife Protection Boundary. Survey found that the Unit is currently providing stand initiation lynx foraging habitat.
PCT C	Pre-commercial thinning Unit C is approximately 15 acres. This Unit is within the Meagher County Community Wildlife Protection Boundary. Survey found that the Unit is currently providing stand initiation lynx foraging habitat.

Analysis Area/Action Area

Based on the Northern Rockies Lynx Management Direction (NRLMD) (2007), the analysis area for analyzing and monitoring project effects (direct, indirect, and cumulative) to lynx habitat are the affected Lynx Analysis Units (LAUs). The scale for direct effects analysis is the impacted LAUs since effects from the proposed activities would occur within them. Indirect effects are considered for the impacted LAUs as well as adjacent LAUs for connectivity and movement effects. Lynx have large home ranges and are highly mobile; therefore, activities in one LAU may indirectly affect lynx movement within or between adjacent LAUs. LAUs are an appropriate scale for analysis because: 1) the LAU size was determined by life history needs of the species and represents the size of a home range of a female lynx, 2) maintaining habitat conditions at the LAU scale which approximates the home range of a lynx, will allow for a mosaic arrangement of lynx habitat components distributed across the LAU, 3) evaluating the affected LAU while considering adjacent LAUs ensures maintenance of connectivity habitat, and 4) expanding the analysis area could dilute the effects of the proposed project. In addition, LAU boundaries do not change and therefore LAUs provide for monitoring of and compliance with the objectives, standards, and guidelines of the NRLMD.

For the Moose Creek Vegetation Project the affected Lynx Analysis Units (LAU) are LB13 and LB12. The project boundary is almost entirely contained within LAU LB13, where the majority of units and majority of acres of vegetation would be affected. Unit 36 and portions of Units 32, 34 and 35 are entirely outside of any LAU boundary. The LAU LB12 would have a portion of Unit 32 and of Unit 33 occur for a total of approximately 70 acres of project treatment.

The project area is also in a linkage area defined in the NRLMD (USDA 2007a).

Canada Lynx Environmental Baseline: Existing Condition

There are a number of land parcels owned by private individuals in the affected (LB12 and LB13) LAUs. Of the 2,454 acres of non-federal ownership in the LB12 LAU boundary and the 2,739 acres of private ownership in LB13 LAU, according to the Eastside Assessment Canada Lynx Habitat query, 385 acres are potential lynx habitat of which 122 acres are currently suitable lynx foraging habitat. Private lands in the affected LAUs primarily provide lynx with habitat that could be used for travel cover and connectivity within and between LAUs.

The existing condition of the Canada lynx habitat in the action area is a result of the effects of past and ongoing human actions and natural factors. The major factors that have influenced the current vegetative condition of the affected Lynx Analysis Units are timber harvest, wildfire, fire suppression, livestock grazing, and insect and disease infestation. A large part of the action area is comprised of lodgepole pine with a high density of over-story trees and closed canopy conditions that support little understory regeneration and are unsuitable for snowshoe hare habitat. Several past harvest areas now

provide winter foraging opportunities for lynx. Approximately half of the current forest is in the 5.0" to 9.9" diameter at breast height size class. About one-quarter of the forest is in the 10.0" to 14.9" diameter at breast height size class category with only about eight percent of the current forest in a size class less than 5.0" diameter at breast height.

Photo 1 A typical lodgepole pine stand in the Moose Creek project boundary; this stand condition is considered 'stem exclusion' because a closed canopy prevents regeneration.

Records of timber harvest begin in about 1950 for the action area which show that 10,836 acres have had some type of harvest; there are a total of 56,759 acres in the action area. The majority of acres of timber harvested in LB12 and LB13 were clear-cuts likely due to the preponderance of lodgepole pine forest types; clear-cut is a typical harvest system for lodgepole. Approximately 2,000 acres were harvested in each of the decades of the 1950s through the 1980s which have contributed to a variety of age classes from 70 years old to 40 years old. A smaller amount of regeneration timber harvest from 1990 through 2006 which has created early seral to seral forest conditions. See Table 4 for types of harvest that have occurred in the action area.

Table 4. Types and amount of timber harvest that have occurred in the action area since 1950.

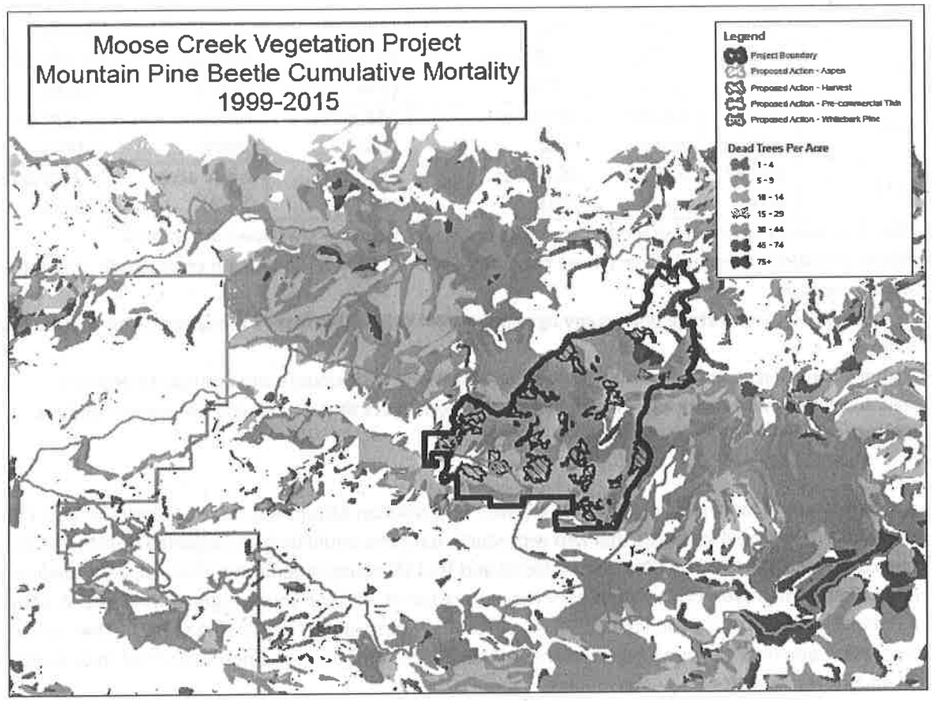
	Commercial Thin acres	Salvage Cut acres	Seed-tree Seed Cut acres	Shelterwood Establishment Cut acres	Stand Clearcut acres	Stand Clearcut with Leave Trees acres	Two-aged Seed-tree or Shelterwood acres
LB12	5	0	0	20	1,017	38	0
LB13	107	503	39	73	8,242	748	44

From fire history records, the majority of LB12 Lynx Analysis Unit (LAU) has not experienced wildfire since 1800. In LB12 then, mature conifer forest is present except for what has been harvested. In 1996 the Coyote Creek wildfire occurred in LB13 LAU, burning approximately 3,400 acres of forest. Wildfire often changes suitable lynx foraging habitat into unsuitable habitat for a number of years until the forest regenerates to a point where young trees again provide snowshoe hare habitat.

Prescribed fire has occurred on a limited number of acres in the action area. In total, only 1,172 acres have been burned by broadcast burning, jackpot burning, or under-burning. Prescribed burning typically results in low to moderate fire intensity and is normally used to help regenerate forests after harvest. In general, prescribed burning is expected to reduce lynx foraging habitat in the short term, but helps to produce foraging habitat in the future.

Livestock grazing has occurred on Forest since early 1900s. Grazing has influenced wildfire behavior; a reduction of grass to carry fire during summer when lightning occurs has certainly led to decreased amount of wildfire. Overall this has likely helped contribute to mature, homogeneous forest with much less stand initiation foraging habitat. Additionally, grazing has likely reduced the amount of aspen, which provides snowshoe hare habitat. However, it is impossible to know exactly how livestock grazing has influenced the current condition of forests and lynx habitat.

A mountain pine beetle outbreak started in the Little Belt Mountains around 2006 and affected the action area primarily from about 2006 through 2011. Due to the relative lack of wildfire in the action area in the past 200 years, and the high percentage of mature lodgepole pine forest, the action area was particularly susceptible to infection by mountain pine beetle. This has resulted in a high amount of mature lodgepole stands that have approximately 50% standing dead trees. The silviculturist produced the following map which shows the extent of mortality due to mountain pine beetle in the action area.



Refer to Table 5 below for existing condition of lynx habitat components in the affected LAUs. This information is derived from the Eastside Assessment Canada lynx habitat query. This table also displays the existing condition of lynx habitat components for the LAUs adjacent to those affected by the project (LB7, LB8, LB9, LB14, and LB16).

Table 5: Existing Condition of LAUs Affected by Project and LAUs Adjacent to Project LAUs.

LAU Name	Total Acres	Total Lynx Habitat Acres	Stand Initiation (winter forage) Acres[1] (% of lynx habitat)	Early Stand Initiation (summer forage only) Acres[2] (% of lynx habitat)	Multistory (forage)[3] Acres (% of lynx habitat)	Other[4] (Stem exclusion; multistory non-feeding) Acres (% of lynx habitat)
LB12	21,048 acres	4,773 acres	311 acres (7%)	30 acres (1%)	383 acres (8%)	4,051 acres (85%)
LB13	35,711 acres	9,750 acres	1,539 acres (16%)	264 acres (3%)	1,814 acres (19%)	6,133 acres (63%)
LB7	26,151 acres	12,880 acres	630 acres (5%)	162 acres (1%)	2,292 acres (18%)	9,796 acres (76%)

LB8	26,116 acres	13,144 acres	774 acres (6%)	234 acres (2%)	3,145 acres (24%)	8,991 acres (68%)
LB9	20,801 acres	10,021 acres	1,202 acres (12%)	51 acres (1%)	3771 acres (38%)	4,997 acres (50%)
LB14	27,732 acres	10,742 acres	585 acres (5%)	113 acres (1%)	6,415 acres (60%)	3,628 acres (34%)
LB16	24,047 acres	5,379 acres	264 acres (5%)	205 acres (4%)	2,842 acres (53%)	2,068 acres (38%)

[1]Stand initiation structural stage that currently provides winter snowshoe hare habitat
[2]Stand initiation structural stage where the trees have not grown tall enough to protrude above the snow in winter.
[3]Multistory structural stage with many age classes and vegetation layers that provide snowshoe hare habitat.
[4]Other – Stem Exclusion Structural Stage – Closed canopy with understory limited; Multistory structural stage with many age classes and vegetation layers that do not provide snowshoe hare habitat.

A recent study in northwestern Montana (Swan and Mission Mountains near Seeley Lake and Purcell Mountains near Libby) indicated that lynx reproductive success could be best explained by forest structure that comprised greater than 50% mature forest and 10-15% young regenerating forests, per female home range. And, that greater connectedness of the mature forest with the young regenerating forests with low perimeter-area ratios provided the optimal configuration (Kosterman 2014). That study further concluded that lesser amounts of young regenerating forests (<10%) and greater amounts (>15%) may negatively affect lynx reproduction.

Currently, neither LAU in the action area meets Kosterman's recommendations for young forests (early stand initiation and stand initiation habitat). Assuming that the mature habitat reported in Kosterman is equivalent to multistory hare habitat, then the condition of neither of the two LAUs in the action area are compatible with Kosterman's recommendations. However, the project area is considered secondary, unoccupied habitat and until such time as occupation has been documented, the project area may be more important for transients to travel through rather than for reproduction. Also, the Little Belt Mountains are drier and patchier than Kosterman's study areas making a direct comparison between the results of that study and important lynx habitat components in the action area difficult.

Habitat in the Project Area

The Moose Creek Project boundary is almost entirely within Lynx Analysis Unit LB13. Within the Moose Creek Project Boundary which is 20,138 acres, there is 6,467 acres of potential lynx habitat. See Table 6 for distribution of lynx habitat structural stages; the project area distribution of habitat is rather similar to the action area distribution of habitat.

Table 6: Existing Condition of Canada lynx habitat in project boundary

Moose Creek Project Boundary Total Acres	Total Lynx Habitat Acres	Stand Initiation (winter forage) Acres[1] (% of lynx habitat)	Early Stand Initiation (summer forage only) Acres[2] (% of lynx habitat)	Multistory (forage)[3] Acres (% of lynx habitat)	Other[4] (Stem exclusion; multistory non-feeding) Acres (% of lynx habitat)
20,138 acres	**6,467 acres**	**1,008 acres (16%)**	**55 acres (1%)**	**1,110 acres (17%)**	**4,293 acres (66%)**

Many project area forests—especially stands dominated by lodgepole pine—while exhibiting relatively high density of overstory trees and closed canopy conditions, support little understory regeneration and are unsuitable for snowshoe hare habitat (see Photo 1 and Photo 2). Several past harvest areas now provide winter foraging opportunities for lynx (see Photo 3). Multi-storied forested stands provide snowshoe hare habitat year-round (see Photo 4 and Photo 5).

Photo 2 A mature lodgepole pine stand on Moose Mountain. This is typical of a majority of mature forests in the project area-a relatively dense overstory with evidence of beetle-kill where little regeneration is present in the understory. This is "potential lynx habitat", but in its current configuration ('stem exclusion') it does not provide habitat for snowshoe hares and thus is not considered viable lynx foraging habitat.

Photo 3 Stand initiation hare habitat near the Moose Creek Campground

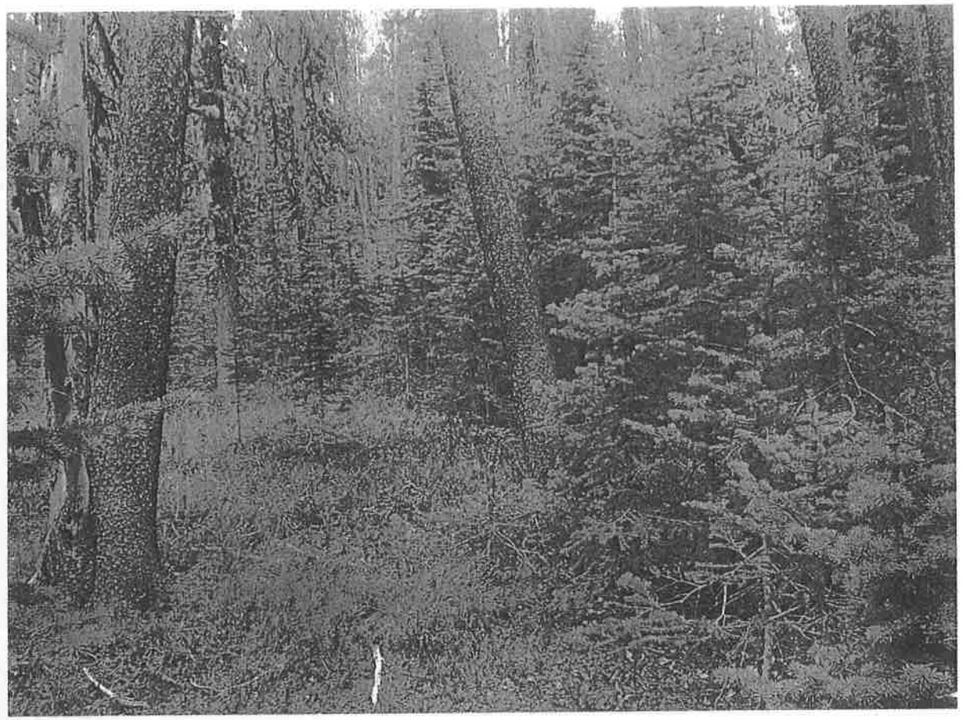


Photo 4 Multi-storied mature forest in the Moose Creek project boundary. These forests provide year-round habitat for snowshoe hares.

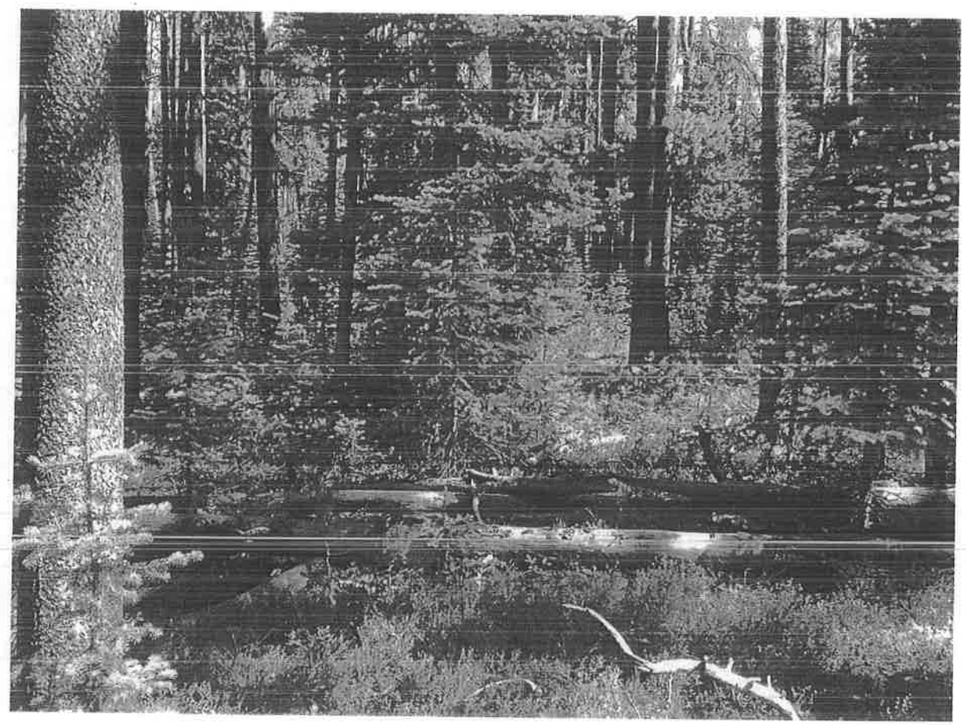


Photo 5 Multi-storied mature forest in the headwaters of Moose Creek drainage. These forests provide year-round habitat for snowshoe hares.

Canada Lynx Direct and Indirect Effects

The standards and guidelines in the *Record of Decision* for the *Northern Rockies Lynx Management Direction (NRLMD ROD)* (USDA 2007b, Attachment 1)—form the basis of the effects analysis of project activities on lynx and lynx habitat. Of the seven standards and twenty-four guidelines presented in the *ROD,* the following standards and guidelines directly pertain to the proposed action: standards ALL S1, VEG S1, VEG S2, VEG S5, and VEG S6 and guidelines VEG G1, VEG G4, VEG G5, VEG G10, VEG G11, HU G8, and HU G9. These deal with vegetation management in lynx habitat, road management, and linkage habitat. All fall within the groupings categorized as "all management practices and activities" (ALL), "vegetation management practices and activities" (VEG), or "human use projects" (HU).

Vegetation Management

Timber harvest and prescribed fire in the proposed action would reduce snowshoe hare habitat in the short term rendering some areas unsuitable for snowshoe hares until the understory regenerates. Timber harvest and prescribed fire in the short term would remove conifers that may provide screening cover that facilitates travel. In the long term, harvest and burning treatments would result in patterns of habitat

that are desirable to lynx – i.e. early successional habitats that provide year-round snowshoe hare habitat interspersed with older multistory stands.

Timber harvest treatments include regeneration harvest, salvage harvest, commercial thinning, and precommercial thinning. Prescribed fire treatments would occur as a follow-up treatment to harvest on the same acres. Treatment effects on lynx habitat depend on the type of treatments. Regeneration harvest would result in conversion from any type of structural stage to early stand initiation. Regeneration harvest can also reduce potential denning habitat and red squirrel habitat by removing large trees and down logs on the site. Salvage harvest would remove potential denning habitat and travel screening cover. Commercial thinning would reduce screening available for lynx to hide while travelling. Precommercial thinning would remove year-round snowshoe hare habitat (lynx foraging habitat); it involves thinning young trees, which reduces the density of sapling sized conifers and understory shrubs and returns the stand to 'early stand initiation' structural stage.

An assumption regarding effects to lynx habitat is that management actions in 'stem exclusion' or 'other' lynx habitat would not be detrimental to lynx over the long term. Stands in these structural stages are currently not providing year-round snowshoe hare (lynx foraging) habitat. When mature trees are harvested, sunlight that was previously shaded stimulates trees to regenerate creating stand initiation lynx foraging habitat in the future (within 15 to 20 years depending on site conditions).

Planned treatments within lynx habitat in the action area include precommercial thinning for aspen improvement, precommercial thinning to restore whitebark pine and precommercial thinning for fuel treatment projects within the wildland urban interface. This would total approximately 108 acres of precommercial thinning in lynx habitat in LB13 LAU. These precommercial thinning treatments are allowable exceptions under the Northern Rockies Lynx Management Direction 2007. Precommercial thinning directly reduces snowshoe hare habitat because hare hiding cover and forage are reduced.

Other vegetation treatments planned in lynx habitat in the LB13 LAU are regeneration treatments for 388 acres in 'stem exclusion' and 84 acres in 'other' structural stages of lynx habitat. In the LB12 lynx analysis unit (LAU) there are approximately 6 acres of regeneration harvest planned in stem exclusion lynx habitat; no other vegetation treatments are planned in lynx habitat in this LAU.

Prescribed fire would be used as a follow-up treatment to the timber harvest treatments. It is used to reduce residual fuels left after logging operations and to prepare the soil for regeneration of trees. Primarily pile burning or jackpot burning (fire applied to concentrations of fuels that have not been piled) would be applied, occasionally broadcast burning might be used. Overall, prescribed fire is not expected to be an additional detriment to the condition of lynx habitat than would already occur from the timber harvest.

Denning habitat is usually not a limiting factor for lynx in the northern Rockies (USDA 2007c, p. 173), and the Lynx Management Direction does not present a standard that specifies how much denning habitat needs to be retained in a given LAU (USDA 2007b, p. 14-17). However, Guideline VEG G11 states that substantial pockets of large woody debris should be distributed throughout each LAU and that if denning habitat appears to be deficient, projects should be designed to retain coarse woody debris (USDA 2007b, Attachment 1, p. 5). Following the mountain pine beetle outbreak, such debris is becoming abundant over wide areas and should not appreciably be affected by project treatments.

Table 7 displays the expected condition of lynx habitat within 15 to 20 years after project completion.

Table 7: Predicted post-project (within 15-20 years of project activities) condition of lynx habitat within affected LAUs

LAU Name	Total Acres	Total Lynx Habitat Acres	Stand Initiation (winter forage) Acres[1] (% of lynx habitat)	Early Stand Initiation (summer forage only) Acres[2] (% of lynx habitat)	Multistory (forage)[3] Acres (% of lynx habitat)	Other[4] (Stem exclusion; multistory non-feeding) Acres (% of lynx habitat)
LB12	**21,048 acres**	**4,773 acres**	**311 acres (7%)**	**36 acres (1%)**	**383 acres (8%)**	**4,045 acres (85%)**
LB13	**35,711 acres**	**9,750 acres**	**1,480 acres (15%)**	**831 acres (9%)**	**1,814 acres (19%)**	**5,625 acres (58%)**

Road Management

Approximately 8.5 miles of temporary road would be constructed then obliterated within 3 years of project completion for the proposed action. Thirty-one miles of existing roads closed to the public would be used for hauling, and of these, 5.1 miles would be decommissioned after project completion. An additional 34.3 miles of existing road open to the public would be used for hauling.

Lynx generally do not appear to be impacted by forest roads with low vehicular traffic (Squires *et al.* 2010) and may actually use the road for travel (Koehler and Brittell 1990). However, because lynx appear to den father away from roads than would be randomly expected (Squires *et al.* 2008), the temporary roads and use of closed roads may displace lynx from otherwise available denning habitat. Some researchers have noted that adult female lynx may move kittens to new den sites in order to avoid nearby vehicle traffic that escalates as summer comes on (Ruggiero *et al.* 1999). In some cases, lynx may alter normal travel and hunting patterns to avoid open roads, but they are also likely to travel along roadways less than 50 feet wide with good cover along both edges (Koehler and Brittell 1990). Field research and observation have shown that in normal circumstances lynx do not avoid habitat near roads except for those with high traffic volume (Aubry *et al.* 2000; Ruggiero *et al.* 1999).

Forest roads do provide greater human access, including to fur trappers who may incidentally trap a lynx when targeting other species. The likelihood of this occurring, however, is extremely low considering lynx presence is transient at best in the project area. Restricting temporary roads to project activities only would help offset the potential for incidental trapping and other activities that may disrupt lynx habitat use.

None of the temporary roads constructed for the project or the use of closed roads would yield high traffic volume since these roads would be closed to the public. Road speeds are already low since all Forest roads in the action area require speed limits of 35 mph.

Linkage Habitat

Landscape connectivity is an important component of lynx conservation, particularly at the southern edge of their distribution (Squires *et al.* 2013). The NRLMD defines connectivity as consisting of *"an adequate amount of vegetation cover arranged in a way that allows lynx to move around. Narrow forested mountain*

ridges or shrub-steppe plateaus may serve as a link between more extensive areas of lynx habitat..." (NLRMD USDA 2007b, Attachment 1, p. 11).

Timber harvest and prescribed fire in the short term would remove conifers that may provide screening cover that facilitates travel. Regeneration harvest constitutes the bulk of the treatments in the proposed action for both LAUs. Regeneration harvest can alter lynx movement through a stand, although this varies seasonally and temporally (Squires et al 2010, Squires *et al.* 2013, p. 193). Research has documented many instances of lynx crossing unforested openings (Roe *et al.* 2000, cited in USDA 2007b, p. 10). Lynx will move across extensive non-forested areas as needed during dispersal or other long-range excursions (Koehler and Aubry 1994, p. 88; Ruediger *et al.* 2000, p. 1-12; Aubry *et al.* 2000, p. 379), although they prefer to travel through forested habitats or along forest edges (Squires *et al.* 2013; Ruediger *et al.* 2000, ch.1 p.4; Mowat *et al.* 1999).

Thinning could also affect lynx movement across the landscape and can alter lynx distribution within their home range (Squires *et al.* 2006, Squires *et al.* 2010).

Areas of high human use can also interrupt habitat connectivity and further fragment lynx habitat (Ruediger *et al.* 2000, p. 2-18). The construction of 8.5 miles of temporary roads and the use of 31 miles of closed roads for hauling can have some influence on the ability of lynx to disperse through the area or move about freely within their home range. While there is no evidence that suggests that forest roads pose a threat to lynx (USDA 2007b, p. 3), road construction may reduce lynx habitat by removing forest cover and winter road use may provide access for lynx competitors. Conversely lynx have been documented using less traveled roads where the adjacent vegetation provides good hare habitat and Squires *et al.* (2010) concluded that forest roads with low vehicular or over-snow vehicle traffic had little effect on lynx seasonal resource-selection patterns in Montana. While preliminary information suggests lynx do not avoid roads (USDA 2007b, p. 26), potential impacts are reduced when access, traffic volume, and road speed are reduced. Access would be kept to the minimum required to accomplish project activities by closing all temporary roads to the public. Traffic volume would be high in active logging and burning units although this use would be locally concentrated (e.g. logging activities would be confined to a single drainage at a time). And, cover would be limited along roads that access regeneration harvest units since these roads are surrounded by primarily dead lodgepole pine which, if they pose a hazard to project operations, would be removed.

Connectivity across larger landscapes would not be compromised by this project since most (96%) of the action area would not be affected by the project and the units are spread out; although, lynx may have to temporarily adjust movement patterns during project implementation. Harvest and burning treatments juxtaposed with untreated area would result in patterns of habitat that are desirable to lynx – i.e. early successional habitats that provide year-round snowshoe hare habitat interspersed with older multistory stands (Squires *et al.* 2010).

Schwartz *et al.* (2002) conclude that lynx throughout western North America are closely related indicating populations have been well enough connected to maintain close kinship (USDA 2007b, p. 181). The proposed action would not compromise the ability of lynx to remain connected.

Squires *et al.* (2010, p. 194) conclude that *"results from our population-level model indicate that changes to vegetation structure can increase landscape resistance to lynx movements (Fig. 3), however, there is no evidence that this currently is causing genetic isolation (Schwartz et al., 2002)".*

Compliance with Northern Rockies Lynx Management Direction (Forest Plan) Guidance

Attachment 1 in the *Northern Rockies Lynx Management Direction ROD* (USDA 2007b) displays the objectives, standards, and guidelines designed to promote lynx conservation. *Objectives* are descriptions of desired resource conditions for lynx. *Standards* are management *requirements* designed to meet objectives. *Guidelines* are management actions that, while not required, are *normally taken* to meet objectives (USDA 2007b, p. 7). Standards and guidelines that deal with the potential effects of vegetation management on lynx can be found in *NRLMD* sections addressing "all management practices and activities" (ALL), "vegetation management practices and activities" (VEG), or "human use projects."

Table 8. NRLMD standards and guidelines applicable to the Moose Creek Project in LAUs LB12 and LB13

Description	How the Standard is Met
Standard ALL S1	
New or expanded permanent development and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.	The project area is in the Little Belt Mountains which has been identified as a linkage area in secondary habitat in the NRLMD. The project maintains the general forested nature of the action area as well as landscape connectivity permitting broader lynx movements. Planned treatments in the proposed action affect 623 acres of lynx habitat (4% of habitat in the action area). Connectivity across larger landscapes would not be compromised by this project since 96% of the lynx habitat would remain untreated in the action area although the lynx may have to temporarily adjust movement patterns during project implementation. Research has documented many instances of lynx crossing unforested openings (Roe *et al.* 2000, cited in USDA 2007b, p. 10). Lynx will move across extensive non-forested areas as needed during dispersal or other long-range excursions (Koehler and Aubry 1994, p. 88; Ruediger *et al.* 2000, p. 1-12; Aubry *et al.* 2000, p. 379), although they prefer to travel through forested habitats or along forest edges (Squires *et al.* 2013; Ruediger *et al.* 2000, ch.1 p.4; Mowat *et al.* 1999).
Standard VEG S1	
The standard: Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages limit disturbance in each LAU as follows: If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects. Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit. In addition,	Approximately 1% (30 acres) of LAU LB12 and 3% (264 acres) of LAU LB13 are 'early stand initiation.' Under the proposed action, an additional 6 acres of lynx habitat would be regenerated in LAU LB12 which would still result in early stand initiation being 1% of the lynx habitat in that LAU. An additional 567 acres of lynx habitat would be regenerated to increase the early stand initiation lynx habitat from 3% (264 acres) to 9% (831 acres) in the LB13 LAU. The percent of early stand initiation habitat in any of the LAUs that touch the action area LAUs do not exceed 30% (see Table 4).

Description	How the Standard is Met
fuel treatment projects may not result in more than three adjacent LAUs exceeding the Standard.	
Standard VEG S2	
Standard VEG S2 applies to all timber management projects that regenerate forests, except for fuel treatment projects within the wildland urban interface (WUI), subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit. **The standard:** Timber management projects shall not regenerate more than 15 percent of lynx habitat on NFS lands within an LAU in a ten-year period.	There has been only one acre of regeneration harvest in the action area on NFS lands within the past ten years. The Moose Creek Vegetation project would result in the regeneration of 6 acres of lynx habitat in LB12 LAU and would result in the regeneration of 567 acres of lynx habitat in the LB13 LAU. This would result in the percent of lynx habitat regenerated in the LB12 and the LB13 LAUs in a ten year period to <1% and 6% respectively.
Standard VEG S5	
Standard VEG S5 applies to all precommercial thinning projects, except for fuel treatment projects that use precommercial thinning as a tool within the wildland urban interface subject to the following limitation: Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit. **The standard**: Precommercial thinning projects that reduce snowshoe hare habitat may occur from the stand initiation structural stage until the stands no longer provide winter snowshoe hare habitat only: 1. Within 200 feet of administrative sites, dwellings, or outbuildings; or 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock; or 3. Based on new information that is peer reviewed and accepted by the regional level of the Forest Service, and state level of FWS...; or 4. For conifer removal in aspen, or daylight thinning around individual aspen trees, where aspen is in decline; or 5. For daylight thinning of planted rust-resistant white pine where 80% of the winter snowshoe hare habitat is retained; or 6. To restore whitebark pine. Exceptions 2 through 6 shall only be utilized in LAUs where Standard VEG S1 is met.	The standard is met because all precommercial thinning proposed for the Moose Creek Vegetation project meets the exemptions and exceptions and standard VEG S1 is met. There is no precommercial thinning in lynx habitat in the LB12 LAU. In the LB13 LAU, there are 59 acres of precommercial thinning proposed in lynx habitat (as identified by the Eastside Assessment lynx habitat query) and 109 acres of precommercial thinning proposed in actual lynx habitat as verified by field survey. The precommercial thinning is planned for various management objectives including: for fuel treatment projects in the wildland urban interface (61 acres); to restore whitebark pine (46 acres); and to restore aspen (2 acres).
Standard VEG S6	
Standard VEG S6 applies to all vegetation management except for fuel treatment projects within the wildland urban interface, subject to the following limitation: Fuel treatment projects within the WUI that do not meet	The standard is met because there are no vegetation treatments in multistory habitat in the action area.

Description	How the Standard is Met
Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit. **The standard**: Vegetation management projects that reduce snowshoe hare habitat in multistory mature or late seral forests may occur only: • Within 200 feet of administrative sites, dwellings, or outbuildings, etc.; or • For research studies or genetic tree tests evaluating genetically improved reforestation stock; or • For incidental removal during salvage harvest (e.g. removal due to location of skid trails)	
Guideline VEG G1	
Vegetation management projects should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed canopy structural stage stands to enhance habitat conditions for lynx or their prey (e.g. mesic, monotypic lodgepole stands.) Winter snowshoe hare habitat should be near denning habitat.	The Moose Creek Vegetation project would meet this guideline because the majority of treatment in lynx habitat would be regeneration of stem-exclusion lodgepole pine habitat. As discussed above, denning habitat is not limited and is well dispersed due to the mountain pine beetle infestation across the action area, therefore winter snowshoe hare habitat would be near denning habitat.
Guideline VEG G4	
Prescribed fire activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.	This guideline would be met because prescribed fire would only be applied in timber harvest units and would not create permanent travel routes because these harvest units are expected to regenerate into forested condition. No permanent firebreaks on ridges or saddles would be built as a part of this project.
Guideline VEG G5	
Habitat for alternate prey species, primarily red squirrel, should be provided in each LAU.	Red squirrels are common small mammals who use a variety of habitats. Although conifer seeds are their primary food source, red squirrels are true omnivores who eat eggs, nestlings, and other small mammals in addition to seeds, mushrooms and berries. Red squirrel habitat is found throughout the action area.
Guideline VEG G10	
Fuel treatment projects within the WUI should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation.	Overall, the project is designed to be responsive to the mountain pine beetle outbreak in the area, promote desirable regeneration, and improve forest resiliency. These goals are compatible with conservation of lynx habitat. The proposed action has been designed with VEG S1, S2, S5, and S6 in mind. Several units originally proposed for treatments at the start of project planning have been dropped from consideration in this proposed action when field validation found lynx foraging habitat.
Guideline VEG G11	

Description	How the Standard is Met
Denning habitat should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads or large piles of wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects should be designed to retain some coarse woody debris, piles or residual trees to provide denning habitat in the future.	Denning habitat is not lacking in the project area. Due to the mountain pine beetle outbreak there is an abundance of down logs with many more standing snags that will become down logs in the near future. About 4% of the lynx habitat in the action area would be treated leaving 96% untreated.
Guideline HU G8	
Cutting brush along low-speed, low-traffic-volume roads should be done to the minimum level necessary to provide for public safety.	Road maintenance associated with this project would occur only on haul routes, including brushing in some instances, for safety purposes. Routes not used for hauling would not be brushed.
Guideline HU G9	
On new roads built for projects, public motorized use should be restricted. Effective closures should be provided in road designs. When the project is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives.	Temporary roads that would be built in the proposed action would be closed to public use. Post-project implementation, these roads will be decommissioned within 3 years of close of timber sale.

Canada Lynx Cumulative Effects

Cumulative effects for lynx are those generated by future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area. Effects of other activities on Federal lands are displayed as part of the environmental baseline section above.

Within this restricted scope of State and private activity, future effects could occur in numerous blocks of private inholdings within Forest boundaries, in the action area—most of them likely to be relatively small individually (salvage logging, local mining, access roads, house construction, grazing, etc.)

No large-scale activities—mining operations, subdivisions, recreational developments—are currently proposed for private or state lands in the action area. But it is certain that the gradual, ongoing development of these lands will continue, including the addition of dwellings, access roads, and all manner of human activity associated with them. While locally disruptive, these developments will remain too fragmented in their distribution within the continuum of forested lands to serve as a barrier to lynx dispersing through or establishing home ranges in this part of the landscape.

In recent decades, many of the private lands within and adjacent to the National Forest have been heavily logged and roaded. Forest regeneration has been erratic and often poor, and these habitat changes have thus reduced potential habitat opportunities for lynx in terms of diminished denning habitat, foraging habitat (winter snowshoe hare habitat), and forested travel lanes. Because so much of the available holdings have already been harvested, prospects for future activity are relatively minor, although on some inholdings, removal of beetle-killed trees remains a possibility.

Implementation of the proposed action, when added to the total of other past, current, and imminent human actions in the action area is not likely to result in a cumulative effect that would produce

measurable effects to Canada lynx. Of the potential lynx habitat in the action area, 385 acres occur on private land, this is only about 3% of the total lynx habitat in the action area.

Canada Lynx Summary and Determination of Effects

Lynx in the northern Rockies are sensitive to changes in forest structure (Squires *et al.* 2013, Koehler 1990, Squires 2010). Because proposed treatments would reduce overstory and understory vegetation and remove down wood, snowshoe hare habitat and the quality of lynx denning and foraging habitat would be reduced over the short and long term (greater than 10 years) (Squires *et al.* 2013, Squires 2010). Thinning could also affect lynx movement across the landscape and can alter lynx distribution within their home range (Squires *et al.* 2006, Squires *et al.* 2010).

While there is no evidence that suggests that forest roads pose a threat to lynx (USDA 2007b, p. 3), road construction may reduce lynx habitat by removing forest cover and winter road use may provide access for lynx competitors. Conversely lynx have been documented using less traveled roads where the adjacent vegetation provides good hare habitat and Squires *et al.* (2010) concluded that forest roads with low vehicular or over-snow vehicle traffic had little effect on lynx seasonal resource-selection patterns in Montana. While preliminary information suggests lynx do not avoid roads (USDA 2007b, p. 26), potential impacts are reduced when access, traffic volume and road speed are reduced. Forest Service roads in lynx habitat (as well as outside of lynx habitat) are 35 mph or less.

Implementation of the proposed action would result in a reduction of stand initiation hare habitat and stem exclusion or other lynx habitat. However, these effects are within the allowable exemptions outlined in the NRLMD. All proposed treatments comply with Northern Rocky Mountain Lynx Management Direction (USDA 2007b). Due to the small magnitude of habitat changes, the determination for implementation of the proposed action is ***"may affect, not likely to adversely affect"*** for Canada lynx. There is no critical habitat in the project area and therefore no effect to critical habitat. This determination is based on the following:

The Moose Creek Vegetation project would occur in the Little Belt Mountains on the Jefferson Division of the Helena-Lewis and Clark National Forest. The US Fish and Wildlife Service considers the Jefferson Division to be secondary habitat where lynx are transients. Forest winter tracking survey completed in recent years did not detect lynx presence, and there are no verified records of lynx presence since 1981 in the project area or in the Little Belt Mountains. It is highly unlikely that there are resident lynx in the Little Belt Mountains and even less likely that there are breeding lynx in the Little Belt Mountains. Therefore, vegetation management actions that reduce lynx habitat are expected to be less important here than in places where lynx are residents.

The Moose Creek Vegetation project proposes a total of 2,353 acres of vegetative treatment. Of these acres, only about 588 acres would occur in potential lynx habitat. The majority of the proposed action that would occur in lynx habitat is in 'other' or in 'stem exclusion' structural stage (480 acres). These are habitat types that are potential foraging habitat for lynx but are not currently in a structural condition that is providing habitat for the main prey of lynx, the snowshoe hare. Vegetation management actions in these structural stages may result in short term degradation of lynx habitat by removing travel cover, but should result in foraging habitat within about 15 to 20 years of project actions.

The remainder of the proposed action that would occur in lynx habitat (108 acres) is precommercial thinning. This would directly reduce snowshoe hare habitat, and therefore lynx foraging habitat on these acres. However, this activity is allowed for under the Northern Rockies Lynx Management Direction.

Ninety-six percent of the lynx habitat that exists in the project area would remain intact and unaffected by the proposed project.

Habitat connectivity and travel cover across the project area and across larger landscapes would not be compromised by this project because only 4% of the action area would be affected by the project and the units are spread out leaving forested cover between units. Although, lynx may have to temporarily adjust movement patterns during project implementation.

Roads built and used for the project are not expected to have measurable effects to lynx. Field research and observation have shown that in normal circumstances lynx do not avoid habitat near roads except for those with high traffic volume (Aubry et al. 2000; Ruggiero et al. 1999); nor do they avoid gravel forest roads (Squires et al. 2010).

Denning habitat would remain plentiful in the project area after implementation due to the widespread extent of the mountain pine beetle infestation and resulting dead trees.

Lynx habitat is analyzed according to the Northern Rockies Lynx Management Direction which establishes thresholds for project impacts to lynx. The NRLMD direction is intended to conserve and promote the recovery of Canada lynx in the context of land management. The NRLMD decision will "provide habitat to maintain a viable population of lynx in the Northern Rockies ...and will provide habitat to support persistence of lynx in the Northern Rockies in the long-term" (see NRLMD, USDA 2007b, particularly p. 40). The Moose Creek project adheres to the NRLMD standards and guidelines.

If lynx are detected in the project area during implementation, activities would be examined to determine if activity modification is necessary.

Recommendations for Removing, Avoiding, or Compensating for Adverse Effects

USFWS Terms and Conditions

In its *Biological Opinion on the Effects of the Northern Rocky Mountains Lynx Amendment* (USDI 2007, p. 75), the USFWS concluded that the NRLMD "is not likely to jeopardize the continued existence of lynx". Included in the statement are a number of non-discretionary "terms and conditions" with which the Forest must comply as summarized in Table 9 (USDI 2007, pp. 81-82).

Table 9 Terms and conditions from the biological opinion on the effects of the Northern Rocky Mountains Lynx Amendment on Canada Lynx

Term and Condition	Compliance
Fuels management projects conducted under the exemptions from standards VEG S1, S2, S5, and S6 in occupied habitat shall not occur in greater than 6% of lynx habitat on any Forest	The Moose Creek Vegetation Project would not occur in occupied habitat. Total exemption acres for the Lewis and Clark NF are 58,200. Even if the Moose Creek Vegetation project were in occupied habitat, the 60 acres of precommercial thinning that would occur under the fuel management exemption would not contribute toward approaching the 6% of lynx habitat threshold.
Fuels management projects conducted under the exemptions from standards VEG S1, S2, S5, and S6 in occupied habitat shall not result in more than 3 adjacent LAUs not meeting the VEG S1 standard of no more than 30 percent of an LAU be in stand initiation structural stage.	The Moose Creek Vegetation project would not occur in occupied habitat. Even if the project was subject to this term and condition, it would be met because there would be no adjacent LAU that has more than 30 percent of lynx habitat in a stand initiation structural stage. See Table 5 for existing condition of adjacent LAUs and see Table 7 for post-project implementation breakdown of lynx habitat by structural stage.
In occupied lynx habitat, precommercial thinning and vegetation management projects allowed per the exception listed under VEG S5 and S6, shall not occur in any LAU exceeding VEG S1, except for protection of structures.	To date, the Forest has not utilized any exception acres for VEG S5 or S6. The proposed action would treat 46 acres of snowshoe hare habitat (early stand initiation and stand initiation) through precommercial thinning to promote whitebark pine and 2 acres of snowshoe hare habitat to promote aspen. Most of these acres are outside of the WUI. The Forest has no allocation for whitebark pine or aspen. However, these actions would occur in unoccupied habitat, and therefore are not subject to this term and condition. None of the LAUs in the action area exceed 30% of unsuitable lynx habitat (i.e. early stand initiation habitat).
The Forest Service shall work with the Service to develop and complete an acceptable protocol to survey currently unoccupied lynx habitat in secondary area with 18 months of the date of Forest Service's Record of Decision for the amendments. An acceptable protocol may include any or none of the following, and is not limited to the following: surveying each Forest with unoccupied lynx habitat at some regular interval; ground-truthing and refining lynx habitat maps to more accurately identify lynx habitat in secondary area; relying on survey data generated by other	Lynx surveys were conducted in the Little Belt Mountains in February and March of 2010 using the established USFS protocol for use during winter. Lynx were not detected during the surveys. A report of the survey results was completed (USDA FS 2012). Because the surveys did not meet protocol, as described in the survey report, the forest again conducted surveys in the Little Belt Mountains from February to April, 2013 using methodology outlined in Squires et al. 2004 and further analyzed in Squires et al. 2012. A report of those surveys concluded that based "on

cooperating agencies; removing some portions of secondary area from survey requirements (based on for instance, the best mapping information, most recent information, habitat quality and quantity, advice and recommendations from lynx experts, and juxtaposition between core areas). The Forest Service shall provide a written rationale for the protocol.	the conditions at the time of survey, the quality of the habitat surveyed, and the species detected during the survey other than lynx, the surveys conducted in the western portion of the Little Belt Mountains are adequate in determining that lynx were not present at the time the surveys were conducted in 2013 (USDA FS 2013).

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CATEGORICAL EXCLUSION WORKSHEET:
RESOURCE CONSIDERATIONS

Wildlife

Moose Creek Vegetation

Belt Creek- White Sulphur Springs Ranger District

Helena-Lewis and Clark National Forest

Description of the Proposed Action

Refer to project proposal (project case file).

Required Design Features

The following design features are required to ensure compliance with the regulatory framework for this resource and/or to reduce the risk of adverse impacts to this resource. A description is provided as to when, where and how the design feature should be applied and/or what conditions would trigger the need to apply the design feature.

If listed species or their habitat is in the project area, activities will be examined to determine if project modification is necessary.
Anticipated Effectiveness: This design feature may be necessary if a new species was listed by the USFWS subsequent to the decision for this project being signed.

The following modification is based on Northern Rockies Lynx Management Direction (Forest Plan): Cutting brush along low-speed, low-traffic-volume roads should be done to the minimum level necessary to provide for public safety.
Anticipated Effectiveness: Brush along low speed roads may be providing snowshoe hare habitat. This design feature would help preserve hare habitat.

All broadcast burns will be implemented prior to May 20 (or later depending on elevation and aspect) or after July 15 in order to protect nesting birds in forested habitat, unless surveys indicate birds are not present.
Anticipated Effectiveness: This design feature should protect most nesting birds while incubating and raising their young to the point of fledging.

- For recently occupied goshawk nests, a no treatment buffer of a minimum of 40 acres will be maintained around nest trees.
- At least 180 acres of goshawk nesting habitat per home range will be retained in the Project area with an emphasis on stands that have been used by goshawks for nesting.
- To reduce disturbance to nesting goshawk, do not allow project activities from April 15 to August 15 within ¼ mile of known active nests. An active goshawk family can be monitored to see if project activities could occur before August 15 without affecting fledging.

Anticipated Effectiveness: These design features are best practices from the Northern Region Northern Goshawk Overview and are designed to reduce project effects to nesting goshawk.

- All temporary roads would be decommissioned within 3 years after project activities are completed. Decommissioning of roads would ensure no future loss of elk security.
- All temporary roads would be closed to the public at all times.
- Logging and road building activity will be confined to a single drainage at a time with all work completed in the shortest time frame possible. Prior to logging, the project wildlife biologist will work with the pre-sale forester to compartmentalize drainages in order to meet this mitigation measure.
- Impacts to elk calving habitat would be minimized by limiting project activities to a single drainage at a time as mentioned above with a focus on limiting treatment in the area below the 6412 road between Wolsey Creek and Little Moose Creek from May 15 to July 1.
- Cleanup slash inside of clearcuts to a depth below 1.5 feet.
- Openings created by clearcuts should be small although openings up to 100 acres may be acceptable where the adjacent forest edge supplies security. Design clearcuts so that the best available cover occurs at the uncut edge.

Anticipated Effectiveness: These design features are Forest Plan standards and are designed to help provide habitat security to elk.

- Keep all soft snags which are not a safety or fire hazard.
- Retain snags adjacent to natural openings, near water, in valley bottoms, or in aspen groves if possible.
- When designing snag retention in harvest units, it is preferable to retain clusters of snags rather than spacing them uniformly in an area. It is also preferable to retain snags that are away from open roads to limit firewood cutting.
- Retain larger diameter wildlife trees wherever possible.
- Leave deformed, cull, and spike-topped trees during timber harvest to provide for future snags.
- Where feasible, protect snags from prescribed fire by clearing brush from base of snag.
- Keep down trees for wildlife feeding sites. It is preferable to have two logs with bark per acre and some deteriorated logs.

Anticipated Effectiveness: These design features are Forest Plan standards and are designed to retain snag habitat.

To the extent possible, retain all large (>12" DBH) live and large dead Douglas-fir trees for potential roosting habitat for Townsend's big-eared bats.

Anticipated Effectiveness: This design feature is based on literature where Townsend's big-eared bats used this size or larger of thick-barked tree for roosting; it is expected to help avoid impacts to this species.

Cause-Effect Relationship

The Moose Creek Vegetation project will remove post-fledging area habitat for the northern goshawk. Project adheres to Northern Goshawk Northern Region Overview Project Considerations, see project record for details.

The Moose Creek Vegetation project will remove snag habitat from the project area and reduce snag recruitment. This will reduce habitat available to the black-backed woodpecker.

The Moose Creek project may affect, but is not likely to adversely affect Canada lynx. See Biological Assessment for details.

The Moose Creek Vegetation Project will would affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for any species in the migratory birds group. See Migratory Bird Report for details.

Species that were considered, but for which a project cause-effect relationship was not anticipated, are described in Threatened, Endangered, Sensitive, and Management Indicator Species document.

Regulatory Framework

The proposed action has been reviewed and is determined to be in compliance with the management framework applicable to this resource. The laws, regulations, policies and Forest Plan direction applicable to this project and this resource are as follows:

Lewis and Clark National Forest Plan

Forest Plan direction for wildlife resources is found in the Forest Plan Standards table. The Moose Creek Project complies with Forest Plan standards. See Table for details.

National Forest Management Act

The Forest Service is required by the National Forest Management Act (NFMA) and its implementation regulations to provide for a diversity of native plant and animal communities based on the suitability and capability of the land in order to meet multiple use objectives. The Moose Creek project is compliant with this law because all affected animal species were considered and provided for based on the suitability and capability of the land.

Forest Service Manual

The Forest Service Manual (FSM) (2670.32) directs that for species identified as sensitive, the Forest Service shall "avoid or minimize" impacts to species whose viability has been identified as a concern. FSM (2672.41) directs the Forest Service to ensure that Forest Service actions do not contribute to loss of viability. The Moose Creek Vegetation project is in compliance with this direction, see Threatened, Endangered, Sensitive, and Management Indicator Species document for details.

Endangered Species Act

The Endangered Species Act of 1973 requires all Federal agencies to review any project authorized, funded, or carried out to determine that the action is not likely to jeopardize the continued existence of any proposed, threatened, or endangered species. This is accomplished via preparation of a biological assessment for those listed or proposed species present in the project area. The Moose Creek Project is in compliance with this law because a biological assessment has been prepared for the Canada lynx and the programmatic biological assessment was used to document potential project effects to the proposed North American wolverine and the project actions are not likely to jeopardize the continued existence of any proposed, threatened, or endangered species.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 is in effect. Both species of eagles are known to occur on the Forest. The project is compliant with this law because the project would not affect bald or golden eagle habitat. Project effects to these species are found in the Threatened, Endangered, Sensitive, and Management Indicator Species document.

Migratory Bird Treaty Act

In accordance with Executive Order 13186, Federal agencies are required to minimize negative effects to migratory birds. Additionally, the Migratory Bird Treaty Act of 1918 protects species from hunting and overexploitation. The Moose Creek project is compliant with this law because design criteria incorporated into proposed action will help minimize negative effects to migratory birds. Implementation of the proposed action would affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for any species in this group. A wider range of successional habitats would be available in the project area after project completion; this would contribute to the maintenance of habitat and populations for a variety of neotropical migratory bird species. See Migratory Bird document and design criteria for details.

Extraordinary Circumstances

The following conditions were necessary to consider for this resource and the following determinations are made based on a review of the proposed action, required design features, the regulatory framework, and necessary analysis **for this resource**:

Canada lynx (threatened)

Extraordinary Circumstances Determination:
Will not have extraordinary circumstances associated with the proposed actions.

Wildlife

See Canada lynx Biological Assessment for details.

North American Wolverine (proposed)

Extraordinary Circumstances Determination:
Will not have extraordinary circumstances associated with the proposed actions.

Wildlife

See Programmatic Biological Assessment for North American Wolverine for details.

Sensitive Species

Extraordinary Circumstances Determination:
Will not have extraordinary circumstances associated with the proposed actions.

Wildlife

All sensitive species in the Northern Region were considered in relation to the proposed Moose Creek Vegetation project. See Threatened, Endangered, Sensitive, and Management Indicator Species document.

The Moose Creek Vegetation Project May Impact Individuals or Habitat, but would Not Likely Contribute to a Trend toward Federal Listing or Loss of Viability to the Population or Species for the black-backed woodpecker. See black-backed woodpecker report in project record for details.

Allison Kolbe, District Wildlife Biologist

December 21, 2016

Attachments:

This table provides a list of species that are Threatened, Endangered, Proposed, Sensitive and/or Management Indicator Species on the Jefferson Division of the Helena-Lewis and Clark National Forest. It also provides a synopsis of how the Moose Creek Vegetation project is expected to affect these species.

Region One Jefferson Division, Little Belt Mountains, Helena-Lewis and Clark National Forest, Montana Moose Creek Vegetation Project		
Species Name	**Habitat Preference and Occurrence in Project Area**	**Rationale and Determination**
Threatened, Endangered and Proposed Species from USFWS website (as of 11/25/2016)		
Grizzly Bear ***Threatened***	Is not known to occur on the Jefferson Division of the Lewis and Clark National Forest. This area is not proposed as a recovery area for the species.	**No effect**
Canada Lynx ***Threatened***	Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters and provide a prey base of snowshoe hare. Multi-story and early seral conifer stands are important for foraging; prefers woody debris for denning. Lynx habitat occurs in the project area.	This project **may affect, but is not likely to adversely affect** Canada lynx. See biological assessment for details.
Canada Lynx Critical Habitat	There is no Canada Lynx Critical Habitat on the Jefferson Division of the Lewis and Clark National Forest.	**No effect**
Wolverine ***Proposed***	High elevation alpine and boreal forests that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season. Wolverine are known to inhabit the Little Belt Mountains.	See Programmatic Biological Assessment for Wolverine for rationale to support determination of **Not Likely to Jeopardize the Continued Existence of the North American wolverine.**
Forest Sensitive Species		
BIRDS and REPTILE		

Region One Jefferson Division, Little Belt Mountains, Helena-Lewis and Clark National Forest, Montana Moose Creek Vegetation Project		
Species Name	Habitat Preference and Occurrence in Project Area	Rationale and Determination
Bald Eagle (S & MIS)	Preferred nesting areas are adjacent to water bodies (large rivers or lakes) containing sufficient fisheries for foraging with large diameter snags or trees or cliffs for nesting and perching. No known bald eagle nests occur in the vicinity of the project. Transient bald eagles are occasionally seen across the forest in many locations.	There are no known nests near or within project area, and none are expected to be found given the lack of typical bald eagle nesting habitat in the project area. The Montana Bald Eagle Management Guidelines provide a general recommendation for a distance buffer of ½ mile from active and alternate nests, concentrated foraging areas, and communal roost sites during the appropriate season of eagle use. **No Impact**
Peregrine Falcon (S & MIS)	Nests on cliffs adjacent to grassland, riparian openings or bodies of water. No known nesting occurs near the project area. The closest known nesting occurs on the Smith River which is not in the area of influence of project effects.	No nesting habitat and no known nests near or within project area, and none are expected to be found given the lack of typical peregrine nesting habitat in the project area. **No Impact**
Flammulated Owl (S)	Flammulated owls are inhabitants of semi-arid cool sites of mid-elevation large diameter ponderosa pine and Douglas-fir communities. Flammulateds nest in existing cavities. The Jefferson Division of the Lewis and Clark NF has relatively little of this type of habitat. Proposed project will not affect such habitat.	There are no recorded observations of flammulated owls in the Little Belt Mountains. This project does not contain flammulated owl habitat. It is not expected to affect flammulated owls, or their habitat. **No Impact.**
Burrowing Owl (S)	Burrowing owls inhabit open grassland types with low ground cover and use abandoned small mammal burrows for roosting and nesting. Burrowing owls have a varied diet depending on availability of invertebrates, small mammals, amphibians, reptiles and birds.	There are no recorded observations of burrowing owls in the Little Belt Mountains. No known nests are near or within project area. The habitat type of the project area is forest. The project is not expected to affect burrowing owls, or their habitat. **No Impact**

Region One Jefferson Division, Little Belt Mountains, Helena-Lewis and Clark National Forest, Montana Moose Creek Vegetation Project		
Species Name	Habitat Preference and Occurrence in Project Area	Rationale and Determination
Blackbacked Woodpecker (S)	Black-backed woodpeckers excavate nests in the sapwood of standing dead trees, or live trees with heartrot like aspen. Recently burned areas provide high quality foraging habitat and mature and old-growth forest with many snags can also provide foraging habitat. Standing dead lodgepole killed by mountain pine beetle is also used as foraging habitat.	Project would affect black-backed woodpecker habitat. See details of analysis in CE_ResourceWorksheetWildlife document. **May Impact Individuals or Habitat but Would Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Population Viability**
Greater Short-horned Lizard (S)	Greater Short-horned lizards live in sandy soil, short grass, and sagebrush habitats. They eat invertebrates. There are no records of these reptiles on the Lewis and Clark National Forest. Threats to this species in Montana are speculative due to lack of study and poor survey coverage. Removal of sagebrush and conversion of prairie to cropland as well as off-road vehicle traffic and use of insecticides have likely contributed to the decline of these once-abundant lizards (MTNHP website).	Project would not affect Greater Short-horned lizards because there are none known to inhabit the Lewis and Clark National Forest and the habitat type of the project area is forest, not sagebrush-grass. **No Impact**
Greater Sagegrouse (S)	Sagebrush is the preferred habitat of the sagegrouse.	Project would not affect sagebrush habitat. There are no known sagegrouse leks near the area of influence of the project. **No Impact**
Harlequin Duck (S)	Harlequin duck habitat is low-gradient, fast-flowing streams with cobble to boulder substrate. Potential habitat does not exist near the project area.	Species is not known to breed in the Little Belt Mountains and may occasionally be observed on the Smith River. Project would not affect Harlequin ducks or their habitat because no habitat exists in the project area. **No Impact**
MAMMALS		

Region One Jefferson Division, Little Belt Mountains, Helena-Lewis and Clark National Forest, Montana Moose Creek Vegetation Project		
Species Name	**Habitat Preference and Occurrence in Project Area**	**Rationale and Determination**
Bighorn Sheep (S & MIS)	Bighorn sheep use open to semi-open mountain slopes, foothills, breaks, or badland habitats near cliffs and rocky areas used as escape habitat. Minimal snow depths and south aspects near cliffs are important during winter.	There is no resident band of sheep known to inhabit the Little Belt Mountains. Occasionally transient sheep are observed moving through the Little Belt Mountains and this project would not affect their ability to continue to do so. **No Impact**
Fisher (S)	Fisher habitat use is related to mature forests with abundant structure in the form of large, down logs and more then one canopy layer. Habitat does not occur in the project area.	Species is not known to occupy the project area. There are no records of fisher occurrence in the Little Belt Mountains. Fisher habitat would not be affected by this project. **No Impact**
Gray Wolf (S & MIS)	Gray wolves range widely from prairie breaks to alpine habitats, depending on prey availability, which is a major determinant of denning and rendezvous sites. No known den or rendezvous sites in the area.	There are no den or rendezvous sites known on the Jefferson Division. Because wolves are so wide-ranging and could travel through any area at any time, they could possibly be disturbed by project activities, but there is ample displacement habitat in all directions surrounding the project area, so this possible disturbance is deemed negligible. Project is not expected to affect populations of ungulates (main prey of wolves). **No Impact**
Townsend's Big-eared Bat (S)	Townsend's big-eared bats preferred habitat is caves and abandoned mines and they occasionally use buildings for roosting. Bats can also roost under bark of large, thick-barked mature trees, in caves, or in rock crevices. Generally these bats feed nocturnally near their roost, foraging on flying insects, especially moths. Townsend's big-eared bats are known to use Lick Creek Cave in the Little Belt Mountains. There is a limited amount of large, thick-barked mature trees in the project area because lodgepole is the dominant forest species.	The project would not affect caves, abandoned mines, or buildings where bats may be roosting or hibernating. Many lodgepole snags would be felled by project activities, but lodgepole is a thin-barked species that bats are not known to use for roosting. The majority of project activities would affect lodgepole pine habitat. Some units are designed to improve Douglas-fir and the project would include a design criteria to retain large Douglas-fir which may provide roosting habitat for this bat. Overall, it would be extremely unlikely that this project would remove a roost tree. This leads to a determination of **No Impact.**

Region One Jefferson Division, Little Belt Mountains, Helena-Lewis and Clark National Forest, Montana Moose Creek Vegetation Project		
Species Name	**Habitat Preference and Occurrence in Project Area**	**Rationale and Determination**
Northern Bog Lemming (S)	Northern Bog Lemmings need thick mats of sphagnum moss in bogs, fens, or other wet areas. Habitat does not exist in project area.	There is no documented occurrence of northern bog lemmings in the Little Belt Mountains, and this type of habitat does not exist in the project area. **No Impact**
Management Indicator Species for Commonly Hunted		
Elk (MIS)	Elk are a wide-ranging species through variety of habitats. Summer/fall habitat and population exists in the project area, but no winter habitat occurs within area of influence of the project. There may be some elk calving areas in the southernmost portion of the overall project boundary.	This project involves timber harvest and therefore, the Forest Plan requires an elk hiding cover analysis. See FP Standards table for the Moose Creek Vegetation project. Some hiding cover would be lost through this project but the project would not reduce the hiding cover below FP standards. There is adjacent displacement habitat with adequate hiding cover in all directions from the project area. Design features are included to minimize impacts to hunting and parturition habitat. This project is **not expected to lead to reduction in elk hunting opportunity.**
Mule Deer (MIS)	Mule deer are a wide-ranging species through variety of habitats. Summer/fall habitat and population exists in the project area, but no winter habitat occurs within area of influence of the project.	Some hiding cover would be lost through this project, but there is adjacent displacement habitat with adequate hiding cover in all directions from the project area. This project is **not expected to lead to reduction in mule deer hunting opportunity.**
White-tailed Deer (MIS)	White-tailed deer tend to use deciduous riparian and low-elevation grass and cropland. However, white-tailed deer are using a greater variety of habitats and are more widespread than ever. Primary habitat tends to be found at lower elevation and on private lands. Summer/fall habitat and population exists in the project area, but there is not winter habitat in the project area.	Some hiding cover would be lost through this project, but there is adjacent displacement habitat with adequate hiding cover in all directions from the project area. This project is **not expected to lead to reduction in white-tailed deer hunting opportunity.**

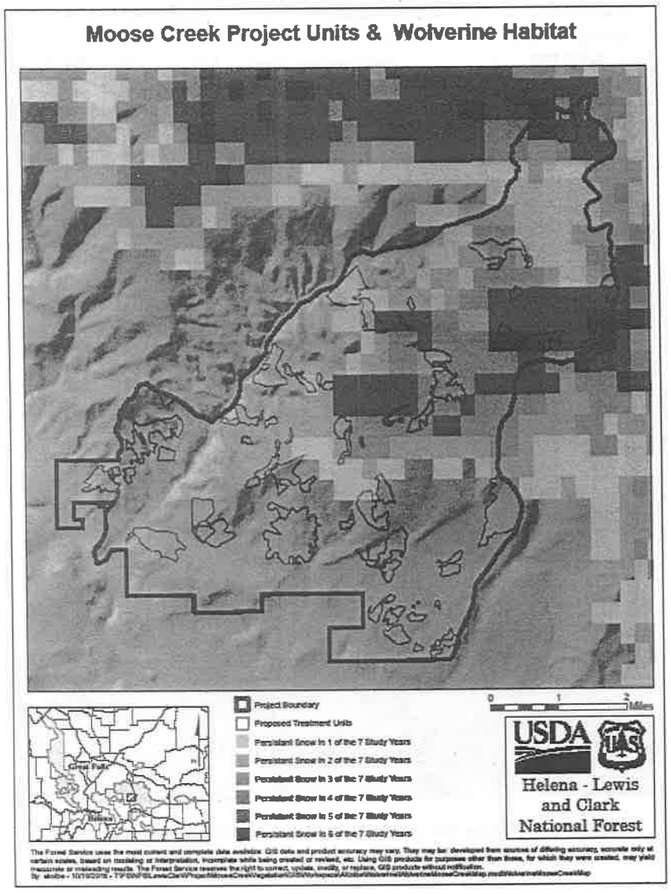
Region One Jefferson Division, Little Belt Mountains, Helena-Lewis and Clark National Forest, Montana Moose Creek Vegetation Project		
Species Name	**Habitat Preference and Occurrence in Project Area**	**Rationale and Determination**
Black Bear (MIS)	Black bear are a wide-ranging species that use a variety of habitats. Habitat exists in the project area.	This project would not affect black bear habitat in a way that would make it unsuitable. Project is **not expected to lead to reduction in black bear hunting opportunity.**
Mountain Goat (MIS)	Mountain goat habitat consists of high elevation meadows that are in proximity to cliff habitats.	Mountain goats do not inhabit the Little Belt Mountains. Project is **not expected to lead to reduction in mountain goat hunting opportunity.**
Mountain Lion (MIS)	Mountain lions are wide-ranging and use a variety of habitats. Habitat and population exist in project area. The most important components of mountain lion habitat are availability of prey (primarily deer and elk), presence of cover, and space to avoid humans.	This project is not expected to lead to a reduction of prey of mountain lions nor would it completely remove availability of cover. Project is **not expected to lead to reduction in mountain lion hunting opportunity.**
Dusky Grouse (MIS)	Dusky grouse winter at high elevations in conifer stands. In spring and summer, they use forest edges and openings, grass-forb areas, and deciduous thickets. Dusky grouse eat conifer needles, berries, insects and green plants.	This project would not affect dusky grouse or their habitat in a way that would make it unsuitable. Project is **not expected to lead to reduction in dusky grouse hunting opportunity.**
Management Indicator Species for Commonly Trapped		
Beaver Habitat (MIS)	Beaver use stream, pond and lake habitats.	Proposed project would not affect beaver habitat. **Project activities not expected to lead to reduction in fur trapping opportunity.**
Bobcat (MIS)	Bobcats use a variety of habitats; they prefer rough broken terrain, in areas of high prey density (snowshoe hares, jackrabbits and rodents). Natural rocky areas are used for denning. Habitat and population exists in project area.	Project is not expected to impact individual bobcats or habitat. **Project activities are not expected to lead to reduction in fur trapping opportunity.**
Management Indicator Species for Special Interest		

Region One Jefferson Division, Little Belt Mountains, Helena-Lewis and Clark National Forest, Montana Moose Creek Vegetation Project		
Species Name	**Habitat Preference and Occurrence in Project Area**	**Rationale and Determination**
Golden Eagle (MIS)	Golden eagles nest on cliffs or in large trees. They hunt over prairie and open woodlands. Native grasslands and shrub-steppe landscapes are important habitats. Golden eagles eat carrion, rabbits, squirrels, grouse, waterfowl, etc.	No known nests within project area. Project would not affect nesting activity or prey base of golden eagles because the project area is not near important habitats. **No Impact.**
Prairie Falcon (MIS)	Prairie falcons nest on cliffs and hunt grasslands and prairie habitats. Potential habitat does not occur near the project area. Prairie falcons eat passerines such as horned larks and meadowlarks, and mammals like ground squirrels.	No nesting habitat and no known nests within project area. Project would not affect nesting activity or prey base of prairie falcons. **No Impact.**
Management Indicator Species for Special Habitat Needs: Old-Growth Forest, Tree Cavity-Conifer		
Northern Goshawk (MIS)	Goshawks nest in mature forests in all habitat types and forage in open stands with little understory. There are several known goshawk territories within a few miles of the project area.	Goshawks are identified by the Forest Plan as MIS for old growth forest.There are several active goshawk territories within the Moose Creek Vegetation project boundary. Design criteria are included to protect recently active goshawk nests. Project activities are designed to make old growth forest more resilient to future wildfire and insect or disease, but project will not reduce amount of old growth. See old growth report. Project would affect goshawk habitat. See details of analysis in CE_ResourceWorksheetWildlife document. **Project would not reduce the amount or availability of old growth forest.**

Region One Jefferson Division, Little Belt Mountains, Helena-Lewis and Clark National Forest, Montana Moose Creek Vegetation Project		
Species Name	Habitat Preference and Occurrence in Project Area	Rationale and Determination
American Three-Toed Woodpecker (MIS) (formerly Northern Three-toed Woodpecker)	Three-toed woodpeckers excavate nests in stumps or dead or dying trees in mature, old-growth or logged forest. Habitat for this species is present in the project area.	Project would impact presence or availability of snags, forest types providing snags, or environmental processes that create snags, **however, project would meet Forest Plan standards for snag retention.** According to the Forest Plan monitoring requirements Table 5.1 page 5-11, maintaining snag numbers for the Northern 3-Toed woodpecker will maintain a minimum viable population. See Forest Plan consistency table and snag report for snag analysis.

Programmatic Biological Assessment Consultation Summary Sheet for North American Wolverine			
Page _1__ of __4_ Administrative Unit: Helena-Lewis and Clark National Forest, Jefferson Division, Belt Creek-White Sulphur Springs Ranger District Contact: ***Allison Kolbe***, Belt-White Sulphur Springs District Biologist Reviewed by: D.Pengeroth Date: December 20, 2016			
Project Name and Description	Project Activity Number (from Appendix A)	Units	Comments
The Moose Creek Vegetation Project is located in the Little Belt Mountains of the Helena-Lewis and Clark National Forest, about 20 miles north of White Sulphur Springs. The project boundary includes portions of Upper Sheep and Moose Creek 6th code HUCs and is about 20,000 acres. The purpose of the project is to maintain or restore the structure, function, composition and connectivity of a forest system that has been adversely affected by insect and disease. Overall approximately 2,353 acres is proposed for various treatment. The majority (approximately 2,000 acres) of the proposed treatment is lodgepole regeneration, 80 acres is whitebark pine restoration, 50 acres is quaking aspen improvement and the remainder is pre-commercial thinning, improvement cutting and intermediate harvest. The Farm Bill Categorical Exclusion authority is being used for this project. Therefore, the treatments must be focused in areas that are out of sync with reference condition vegetation, fuels and disturbance regimes if the treatments are not in the wildland-urban interface. The entire project boundary area is considered wolverine female and male dispersal habitat, and project activities are not expected to affect wolverine's ability to move through the project area. The project boundary includes wolverine primary habitat, but not maternal habitat. Approximately one quarter of the lands in the	***#1 Timber Harvest***	***Entire project area, approximately 2,353 acres***	The primary activity of the Moose Creek Project is timber harvest. As the USFWS has noted in its proposed rule to list the wolverine, "Wolverines are not thought to be dependent on specific vegetation or habitat features that might be manipulated by land management activities, nor is there evidence to suggest that land management activities are a threat to the conservation of the species" [http://federalregister.gov/a/2013-01478]. Therefore, although the project would create about 2,000 acres of clear-cuts, and reduce vegetation across another 300 acres, the vegetative structure and composition of a forest are not thought to influence wolverine's use of an area and the project units would remain available as habitat to wolverine.
	#2 Mechanical Equipment Use	***Entire project area, approximately 2,353 acres***	Wolverines have been documented to reproduce and survive in areas with high human use and activities (Federal Register 2013, page 7877) suggesting that wolverines can survive in areas with human use and disturbance. Therefore, use of chainsaws, logging trucks, feller-bunchers, and other equipment associated with this project is not expected to negatively impact wolverine. These activities would occur during a discrete time period and would not be occurring across the entire project area all at once. Although equipment use in an area of a project may displace wolverine from that location during the time equipment is in use, the entire remainder of the project area and adjacent forest would be available to wolverine as displacement habitat.
	#4 Roads and Road Maintenance	***All existing roads in project area***	The existing transportation system: 34.3 miles of existing open road, 31 miles of existing closed road, and 8.4 miles of temporary road would be constructed and decommissioned no later than 3 years after the date on which the project is completed; no permanent roads would be constructed. Because wolverines are not dependent on specific vegetation or habitat features, infrastructure development and maintenance (secondary roads, communication sites, campgrounds, etc.) and land management activities (such as recreation, grazing, timber harvest, and prescribed fire) conducted on National Forest System lands were determined not to be a threat to the DPS (Federal Register 2013, page 7879).

project boundary are considered wolverine primary habitat (5,613 acres), and of this, 454 acres would have project treatment. There is a very small amount of wolverine potential denning habitat mapped in the project area, and a small portion of the project area that holds persistent spring snow in as many as 5 out of 7 years. See map for treatment units in relation to wolverine persistent snow habitat. The Forest Service recognizes that some of the activities have the potential to affect individual wolverines, and/or their habitat, but not to the level of jeopardizing the continued existence of the wolverine. For example, Fisher et al. 2013 found that there was a large scale spatial correlation between wolverine occurrence and habitat fragmentation where fewer wolverines occurred where there were seismic lines 3 meters wide cut across the landscape in a grid like fashion. However, no evidence was found that wolverine occupancy varied with the amount of regenerating area after timber harvest or fire (Ibid.) Another example comes from Stewart et al. 2016 who found that there is spatial variability in wolverine behavior that corresponds to increases in human footprint. The Moose Creek project area has a history of timber harvest and human activity; in spite of this, wolverines continue to be observed in the project area. The Moose Creek Vegetation Project is not expected to jeopardize the continued existence of the North American wolverine because the project activities fall within the scope of routine activities that are conducted on National Forest System lands that were reviewed by the USFWS and are not considered to be a threat to the Distinct Population Segment of the North American wolverine.	***#5 Silvicultural Activities***	***Entire project area, approximately 2,353 acres***	The entire project is essentially a silvicultural activity to improve forested conditions where timber harvest is the tool that will be used to accomplish most of the silvicultural prescriptions. Because wolverines are not dependent on specific vegetation or habitat features, infrastructure development and maintenance (secondary roads, communication sites, campgrounds, etc.) and land management activities (such as recreation, grazing, timber harvest, and prescribed fire) conducted on National Forest System lands were determined not to be a threat to the DPS (Federal Register 2013, page 7879).
	#10 Prescribed fire	***Entire projeet area, approximately 2,353 acres***	Pile burning, jackpot burning and broadcast burning would be used as a follow-up treatment to harvesting to prepare the sites for regeneration. The USFWS reports that few effects to wolverine have been documented from land management actions such as grazing, timber harvest, and prescribed fire, and cites examples where wolverine have used recently logged areas and recently burned areas despite the loss of canopy cover (Federal Register 2013, page 7879). Prescribed fire activity, like any other forest management activity, might displace wolverine from the area where work is occurring, but the area would again be available to wolverine as habitat once the management activities cease.
	#12 Weed Management	***Entire project area, approximately 20 acres***	Weeds would be treated as needed. Wolverine response to weed management is expected to be similar as to other typical Forest Service land management activities as described above, therefore no negative impacts to wolverine is expected as a result of weed treatment.


Moose Creek Project Units & Wolverine Habitat
Project Boundary
Proposed Treatment Units
Persistent Snow in 1 of the 7 Study Years
Persistent Snow in 2 of the 7 Study Years
Persistent Snow in 3 of the 7 Study Years
Persistent Snow in 4 of the 7 Study Years
Persistent Snow in 5 of the 7 Study Years
Persistent Snow in 6 of the 7 Study Years
0
1
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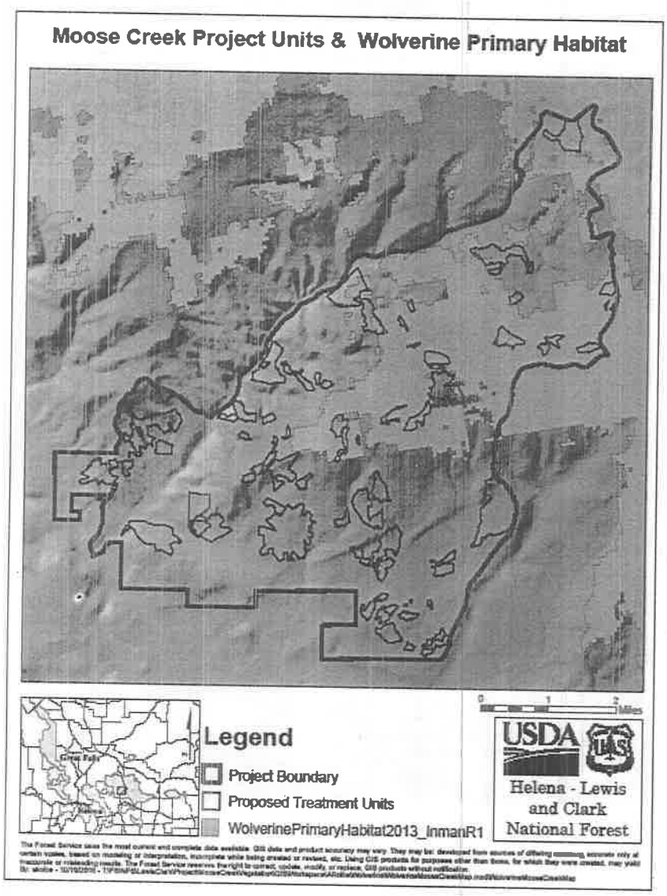
Miles
USDA
Helena - Lewis and Clark National Forest


Moose Creek Project Units & Wolverine Primary Habitat
Legend
Project Boundary
Proposed Treatment Units
WolverinePrimaryHabitat2013_InmanR1
Miles
USDA
Helena - Lewis and Clark National Forest

American Three-toed Woodpecker Report for Moose Creek Vegetation Project

The American three-toed woodpecker was formerly known as the Northern three-toed woodpecker. The American three-toed woodpecker is very similar to the black-backed woodpecker morphologically. Like the black-backed woodpeckers, the American three-toed woodpeckers eat larvae of bark beetles and respond to mountain pine beetle epidemics. They are sympatric species that occur together.

The Lewis and Clark Forest Plan snag standard includes direction for the Northern three-toed woodpecker in lodgepole pine forest type as 72 snags per 100 acres and in subalpine fir forest types as 108 snags per 100 acres. The estimate of post-project condition of snags in the Moose Creek Vegetation project area is displayed below.

Post-Project condition of snags in Moose Creek Project Area	Snags Per Acre 10-15" DBH	Snags Per Acre >15" DBH	Total Snags Per Acre >10" DBH	Total Snags Per 100 Acres >10" DBH
All Forest Types	2.03	0.5	2.53	253
Douglas-fir	2.68	1.02	3.7	370
Riparian Aspen	1	0.5	1.5	150 *based on small sample size
Lodgepole	1.78	0.42	2.2	220
Subalpine fir	1.12	.15	1.27	127
Mixed Conifer	2.42	0.59	3.01	301

The Moose Creek Vegetation Project would meet the Forest Plan standard for snag habitat for the American three-toed woodpecker.

Project effects to the American three-toed woodpecker are expected to be similar as effects to the black-backed woodpecker because these sympatric species are morphologically similar. To date, there has been no known extirpation of cavity nesting species in Montana. See black-backed woodpecker report for details.

Northern Goshawk Analysis for Moose Creek Vegetation Project

General Description

The Northern goshawk is the largest and heaviest bodied of the three North American accipiters. Goshawks are forest dwelling generalist predators known to forage in both closed canopy and more open habitats. Goshawks are permanent residents in North America where they make seasonal movements but migration in this species is poorly understood. They are territorial birds who defend their nesting territories and one or both pair members often return to previously used territories and frequently use the same nest structure in consecutive years.

Species Status

The Northern Region of the Forest Service does not consider the northern goshawk a sensitive species; sensitive species are defined as those plant or animal species for which population viability is a concern as evidenced by significant current or predicted downward trends in population numbers or density and/or habitat capability that would reduce a species existing distribution. The Lewis and Clark Forest Plan (1986) designated the goshawk as a Management Indicator Species for old growth forest habitat (see analysis for old growth forest for the Moose Creek Vegetation Project). The northern goshawk is considered a species of concern by the Montana Natural Heritage Program; this is based on the Montana State Rank of S3, "potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas." The northern goshawk has a global rank of G5, "common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range."

According to the Partners in Flight population estimates database, which is based on Breeding Bird Survey 1998-2007, the northern goshawk population estimate is 200,000 in North America with 110,000 in Canada and 90,000 in the United States (Partners In Flight 2016).

In 1998, in response to a 1997 petition to list the northern goshawk as threatened or endangered in the western United States, the U.S. Fish and Wildlife Service concluded based on the best available science that (*in* Northern Goshawk Northern Region Overview Key Findings and Project Considerations 2007):

- There was no evidence of a declining population trend for goshawks in the western United States (west of the 100th meridian).
- There is no evidence that goshawk habitat is limiting the population, or that significant curtailment of the species' habitat or range is occurring.
- The goshawk continues to be well-distributed throughout its historical range.
- There are not significant areas of extirpation.
- While the goshawk uses stands of mature and older forests it is not dependent on old growth, and uses a variety of forest habitats in meeting its life history requirements.
- Listing as endangered or threatened is not warranted.

Habitat Needs

The size of goshawk home ranges during the nesting period has been reported as varying from 1,400 to 8,650 acres, depending on sex of bird and habitat conditions (Hargis et al. 1994 and Kennedy et al. 1994). During the breeding season, goshawk home ranges are described as being composed of three

areas: the nest stand, the post-fledging area and the foraging area. The portions of the home range that are actively defended are the nest stand and the post-fledging area; the larger foraging area is not known to be actively defended and adjacent pairs of goshawks may overlap in their use in the foraging areas (Squires and Kennedy 2006).

In general, goshawk nest habitat is described as forested stands composed of a variety of tree species (Douglas-fir, ponderosa pine, lodgepole pine, aspen, mixed stands, etc.) with mature, larger trees, closed canopy and open understory. Clough (2000) found that in west central Montana, goshawks selected for nest stands of mature and older forest that were approximately 40 acres in size, surrounded by a mix of younger forest and non-forested openings.

It was once thought that goshawks are dependent on old growth forest conditions; consequently in the late 1980s when many forest plans in the Northern Region were written the goshawk was included as a Management Indicator Species for old growth forest in the Lewis and Clark Forest Plan, among others. Much research on goshawks has been conducted in subsequent years and it has been found that although old growth is used by goshawks as habitat, it is not a necessary component. In "The Northern Goshawk Status Review" the Service found no evidence that the goshawk is dependent on large, unbroken tracts of "old growth" or mature forest (63 FR 35183 June 29, 1998).

The post-fledging area (PFA) is the area where goshawk young learn to fly and hunt; it provides protection from predators such as great horned owls and red tail hawks. The goshawk family uses the post-fledging area until the young disperse and no longer depend on the adults for food. Clough (2000) found that goshawk PFAs contain north aspects, high canopy closure (68.9% of the PFA contained forest with more than 50% canopy closure), and fewer clearcut harvest areas than that available in the general forest. The size (198 to 494 acres), shape, habitat composition, and functional importance of the PFA may vary with local conditions, such as habitat composition, disturbance history, prey availability, and risk of predation (Squires and Kennedy 2006 *in* Northern Goshawk Northern Region Overview Key Findings and Project Considerations 2007).

From the nest stand to the post fledging area (PFA) to the general foraging area, the diversity of canopy closure, tree size, structure and age increasingly varies. At larger spatial scales beyond the nest stand and PFA, the goshawk is considered a habitat generalist (63 FR 35183 June 29, 1998). Reynolds et al. (1992) recommend to maintain a mix of seral stages and vegetation types that reflect historical landscape patterns in goshawk home ranges. Habitats other than closed-canopy, open understory forest types provide habitat for important prey items of the northern goshawk including the snowshoe hare.

Risks and Threats to Goshawk

Weather, more than any other factor, is thought to affect egg and nestling survival (Squires and Kennedy 2007). Great horned owls are considered the primary predator of goshawks and may be more successful in areas where there is a low-density of goshawk prey causing the female goshawk to spend more time away from the nest.

> Goshawk breeding populations are thought most limited by food (shown to limit reproduction), predation, and density dependent territoriality. Therefore, management activities that are important to consider include those that have a negative effect on prey populations, increase goshawk's risk of predation or other mortality factors, or degrade or destroy nesting habitat

within a home range. The primary influences on the amount, distribution and suitability of goshawk habitat are management treatments in forest vegetation (e.g., thinning, timber harvest) and stand replacing fires (Squires and Ruggiero 2006 *in* Northern Goshawk Northern Region Overview Key Findings and Project Considerations 2007).

Regional Context

Samson (2006b) estimated a critical habitat threshold to maintain minimum viable populations for six species, including the northern goshawk, in the Northern Region and also estimated habitat available by National Forest for each species. For the northern goshawk, Samson (2006b) used the post-fledgling area as the critical amount of habitat to estimate that 30,147 acres of habitat were required to maintain a minimum viable population of goshawks in Region 1. Samson (2006b), updated by Bush and Lundberg (2008), also estimated habitat available on each of the 12 National Forests in the Northern Region; all 12 forests contain estimated habitat amounts that exceed the threshold of habitat for a minimum viable population for northern goshawks in Region One.

Findings by Samson (2006a) include that goshawk habitat is abundant and well distributed in the Northern Region and that the level of timber harvest is insignificant when compared to the amount of forested nesting habitat available to goshawks in the Northern Region.

Forest Context

In 2006, the Lewis and Clark National Forest increased efforts to monitor all known goshawk nest sites (Forest Plan monitoring item C-8). The number of known territories has increased every year due to survey and monitoring efforts; in 2006 the number of known territories was 85 (see Goshawk Monitoring Summary in project record).

According to the Bush and Lundberg (2008) update to Samson (2006a) across the Lewis and Clark National Forest, there is estimated to be 23,953 acres of nesting habitat, 163,891 acres of post-fledging area habitat and 465,198 acres of foraging habitat available to goshawks. This habitat estimate means that the Lewis and Clark National Forest has more than five times the habitat estimated as needed for maintaining a minimum viable population for the entire Northern Region.

Subsequent to Samson's work, an investigation into whether goshawks east of the continental divide exhibit nesting preferences as reported in the literature for the more studied western goshawks was conducted (Bush et al. 2012). Stand exam plots of known nesting stands on the Custer-Gallatin and Lewis and Clark National Forests were measured from 2007 to 2011 and analyzed to answer various questions. Bush et al. (2012) found that among other things:

- goshawks are not exclusively using old growth forests for their breeding sites
- eastside goshawks used timber stands with more and less canopy cover than the Samson (2006a) model range inputs, and tree size and basal area were similarly variable
- and, eastside goshawks use habitat in proportion to its availability.

Due to the Samson model using narrower parameter value ranges than were evident in the observed eastside goshawk stand data, the Samson estimate of nesting habitat likely underestimates the amount of nesting habitat available to goshawk on the Lewis and Clark National Forest.

Based on the eastside goshawk nest analysis of Bush et al. (2012) as described above, an Eastside Assessment Goshawk Nest Habitat Model was developed (Northern Region Geospatial Group Technical Guide TG-14-3 v.1). This effort to quantify goshawk habitat for the Northern Region east side forests (Custer-Gallatin, Helena-Lewis and Clark) uses the 2014 version of VMap and disturbance history to identify existing goshawk nesting habitat, areas where there is no site potential to become goshawk nesting habitat, areas that were likely goshawk nesting habitat but currently are not due to disturbance, and areas that have possibly recovered from past disturbance to once again be functioning as goshawk habitat. According to this model, there is 833,994 acres of goshawk nesting habitat on the Lewis and Clark National Forest.

Project Context

The Moose Creek Project Boundary is approximately 20,138 acres, of which, only 600 are privately owned, with the remaining 19,537 acres being National Forest. There are four known goshawk territories in the project boundary: Upper Moose Creek, Little Moose Creek West, Little Moose Creek East, and Daniels Creek. The Daniels Creek territory has been known since 1992 and the other 3 territories were found as a result of survey for the Moose Creek Project in 2015 and 2016. The Moose Creek Project Boundary also contains all proposed vegetative treatment units which total approximately 2,353 acres. The geographic extent where the direct and indirect effects of the proposed action to goshawk are expected to be evident would be contained within the project boundary. The effects of the proposed project may be diluted if a larger geographic boundary was considered for cumulative effects because there is treatment proposed for only about 12% of the total project boundary. For these reasons, the project boundary is selected as the analysis area for direct, indirect and cumulative effects to goshawk.

The current forest condition of much of the Moose Creek Project area, including goshawk territories, is out of the natural condition of what would have existed in the absence of modern human intervention. Fire suppression and grazing, among other human activities, has altered the natural succession and regeneration of forests. Fire Regime Condition Class (FRCC) is a standardized tool for determining the degree of departure from reference condition vegetation, fuels and disturbance regimes. There are three condition classes described by FRCC describing the amount of departure in vegetation composition, structure and fuels from reference condition; low departure (<33% from reference condition) is Condition Class 1, moderate departure (33-66% from reference condition) is Condition Class 2, and high departure (>66% from reference condition) is Condition Class 3. The current FRCC for the Moose Creek Project area is displayed in the following table which came from the Little Belts Landscape Assessment, Vegetation Departure and Wildfire Threat Report, Helmbrecht et al. (2012).

Fire Regime Condition Class	Acres	% of Project Area
1	3962.5	20.0
2	10654.5	53.0
3	3646.5	18.0
Other (rock/road/water/etc.)	1874.5	9.0

Total	20,138	100%

The Moose Creek Vegetation Project is being planned under the authority of the "Farm Bill Categorical Exclusion." Limitations of this authority include projects that are located in condition classes 2 or 3 if outside of wildland urban interface, and projects must maximize old growth and large trees to the extent the trees promote stands that are resilient to insect and disease threats.

A Goshawk Nesting Foraging model was developed by Lewis and Clark National Forest (LCNF) biologists, the Timber Stand Management and Record System (TSMRS) database manager and the Forest GIS specialist in 2006. Mountain pine beetle heavily affected the Moose Creek project area from about 2007 to 2010 resulting in many acres of dead lodgepole pine trees and loss of canopy cover subsequent to the model run. Therefore the results of the 2006 Goshawk Nesting Foraging model will not be used for this analysis.

Eastside Assessment Goshawk Nest Habitat Model was used (Northern Region Geospatial Group Technical Guide TG-14-3 v.1) to query the condition of northern goshawk nesting habitat in the Moose Creek Vegetation project boundary, and results are displayed in the table below.

Eastside Assessment Model results

Goshawk Nesting Habitat	Moose Creek Project Boundary Existing Condition
Affected	100 acres
Existing	13,456 acres
Not Habitat	5,654 acres
Possibly Recovered	928 acres
Total	20,138 acres

Project Effects to Foraging Habitat

In general, the entire project area is considered foraging habitat because over 90% of the area is forested and many studies have reported that goshawks use a wide variety of habitat conditions, especially forested conditions, to forage. The goshawk is a generalist predator and its various prey species (grouse, snowshoe hare, woodpeckers, ground squirrels, red squirrels, and others) require many different seral stages and forest structures to carry out their live processes. Goshawk have been observed hunting in a wide variety of forested habitats as well as along forest edges with riparian areas or clearcuts and in open areas.

The Moose Creek Vegetation Project proposes management actions to over 2,300 acres of forested habitat. The main treatment proposed is regeneration clearcut of lodgepole pine due to the high infestation of and resulting mortality from mountain pine beetle. This action will certainly change the foraging habitat for goshawk, but it is hard to predict what the affects to goshawk prey species will be due to the lack of research on this topic. On average across the project area, 30% of the lodgepole have been killed by the mountain pine beetle and the live trees remaining are likely providing some habitat for the red squirrel, a prey item for the northern goshawk. Regeneration harvest of 2,000 acres of

lodgepole will remove squirrel habitat, but this is not likely to be significant to goshawk for several reasons:

- red squirrels are known to move in response to cone production and squirrels eat a variety of items,
- the quality of the cone crop in these mature, partially dead lodgepole stands is not high because the health of the stands is degraded due to dwarf mistletoe among other reasons,
- and there would be 10,000 acres of similar habitat available to goshawk and their prey in the project area after project implementation.

Likely the overall affect may be short term degradation of prey habitat with long term benefit. Goshawk will be able to use clear-cut areas to forage in, but until regeneration becomes tall enough for species such as snowshoe hare and grouse to forage and hide in, the amount of prey may be reduced in the short term (10 to 20 years).

The proposed action would increase structural diversity of the Moose Creek Project area, which is assumed to increase habitat for a variety of goshawk prey species; Hargis et al. (1994) concluded that "emphasis should be placed on creating or maintaining vegetation diversity," and "that timber harvests be designed to create a juxtaposition of seral stages." The Moose Creek Project is being designed to maintain or restore the structure, function, composition and connectivity of a forest system that has been adversely affected by insect and disease and is not in a current condition congruous with historic fire regime condition class (FRCC). As discussed above, all project activities are planned in areas that are in condition class 2 or 3 if not in the wildland urban interface (WUI). In the WUI, there is 45 acres of pre-commercial thinning proposed, and all other treatments would occur in FRCC 2 or 3.

The Moose Creek Vegetation Project is not expected to have a significant effect to goshawk's ability to forage in the project area for the following reasons:

- Goshawk are known to forage in a variety of habitats, including forests, forest edges, clearcuts and open meadows
- Goshawk are generalist predators who are known to forage on a variety of prey species
- Various prey species need different habitat conditions to carry out their live processes and it is thought that the increased structural diversity as a result of this project would promote goshawk prey
- The project would change less than 12% of the structure of foraging habitat in the analysis area, but the entire area is still expected to remain as foraging habitat in the future.

Project Effects to Post Fledgling Area Habitat

As previously noted, there are four known goshawk territories in the project boundary: Upper Moose Creek, Little Moose Creek West, Little Moose Creek East, and Daniels Creek. The Daniels Creek territory has been known since 1992 and the other 3 territories were found as a result of survey for the Moose Creek Project in 2015 and 2016. Based on a review of research and project survey, these may be the only territories in the Moose Creek Project Boundary area. Wisdom et al. (1999) suggests that home ranges in the Interior Columbia River Basin may be approximately 7,000 acres and Reynolds et al. (1992) suggests that goshawk home ranges are approximately 5,000 acres in size. The Moose Creek Project

Boundary area is 20,138 acres and given that the foraging portion of goshawk home ranges are thought to overlap and not all land in the project boundary is expected to provide goshawk habitat, using a home range size of approximately 5,000 to 7,000 acres, four goshawk territories is within expectation.

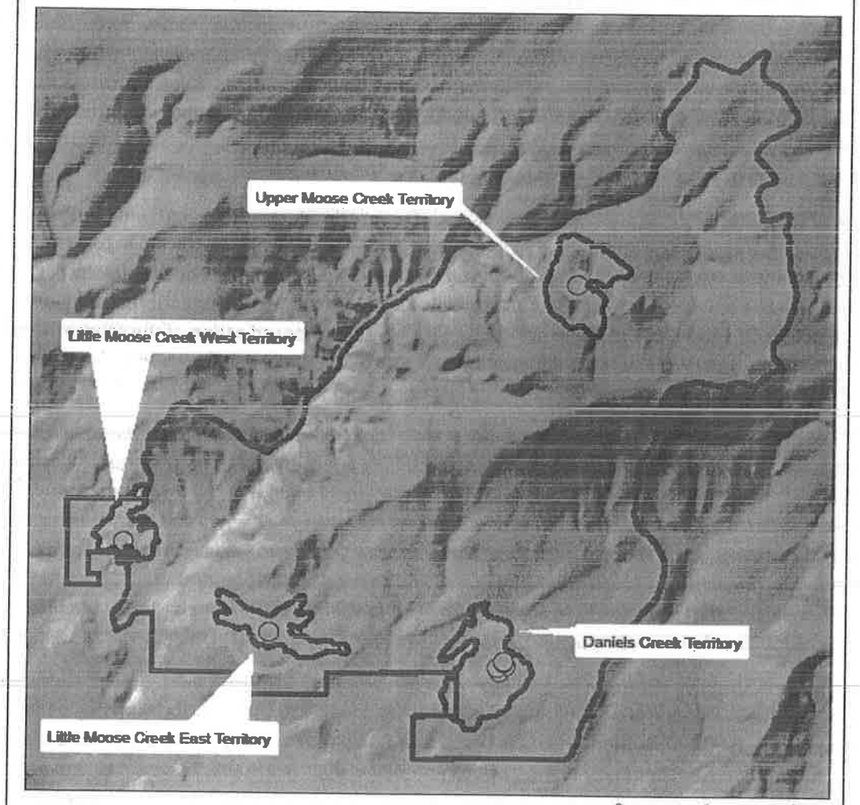
Conversely, based on the spatial arrangement of these territories across the Moose Creek Project Area (see map below) it would not be surprising if an additional territory located somewhere south of the Upper Moose Creek territory was located in the future. Three of the four goshawk territories were discovered as a result of project survey; although we may have missed detecting a territory due to inactivity during 2015 or 2016 when project survey occurred, all treatment units were thoroughly surveyed by wildlife and other resource crews. However, the total project boundary was not surveyed by wildlife technicians as about 8,000 acres of 20,138 were surveyed.

The vegetative condition of the Little Moose Creek West, Little Moose Creek East and Daniels Creek post-fledging areas (PFA) is dominated by lodgepole pine forest which is mostly dead as a result of the mountain pine beetle infestation. The Upper Moose Creek PFA is primarily Douglas-fir which is alive and is functioning as very productive habitat for wildlife species dependent on older forest conditions. There are no proposed actions in the Upper Moose Creek PFA. The proposed action of the Moose Creek project where it intersects the post-fledging areas, targets lodgepole pine forest where most (more than 50%) of the lodgepole is dead.

Victor Murphy, a wildlife technician who has been working for the Lewis and Clark National Forest surveying goshawks since 2006, has mapped post-fledging areas for these four territories based on his local knowledge of goshawks on the Lewis and Clark National Forest and the project area. The result of this work is post-fledging area (PFA) sizes of 221 acres, 291 acres, 422 acres and 547 acres for the Little Moose Creek West, Little Moose Creek East, Upper Moose Creek and Daniels Creek territories, respectively. These results are in line with Squires and Kennedy (2006) reporting that literature they reviewed suggest that goshawk PFAs may be 198 acres to 494 acres and vary in size depending on local conditions, such as habitat composition, disturbance history, prey availability, and risk of predation.

The Northern Goshawk Northern Region Overview (Brewer et al. 2007) provides project considerations for goshawk post-fledging area habitat analysis which is commonly used by Northern Region forests for goshawk analysis. This document instructs that a post fledging area analysis will use a 420-acre area circle centered on a nest or another type of polygon that is digitized in GIS. To be thorough in this analysis, effects to goshawk PFAs for the project will be analyzed with both the local knowledge and the Northern Region project consideration approach.

Moose Creek Project Area Known Goshawk Nests and PFAs



Territory	Local Knowledge PFA Acres	Regional Project Consideration	# Acres Local Knowledge PFA Affected by Project	# Acres Regional Project Consideration PFA Affected by Project
Little Moose Creek West	221	420	67 (30%)	77 (18%)
Little Moose Creek East	291	420	0	40 (10%)
Daniels Creek	547	420	121 (22%)	80 (19%)
Upper Moose Creek	422	420	0	0

The Little Moose Creek West PFA was identified by V. Murphy to be 221 acres. This PFA is surrounded by open grassland to the south and west and by cut over forested vegetation to the northwest which limit this PFA to a smaller area. This PFA has significant lodgepole pine mortality, where the condition of the habitat in the near future is not expected to provide quality goshawk PFA habitat due to the dead trees that will continue to fall and will reduce the canopy cover over time. In west-central Montana, in habitat conditions similar to the Lewis and Clark National Forest, Clough (2000) found that 68.9% of PFA contained canopy cover of over 50%. With a 420 acre circle centered on the nest structure, about 112 acres (or 27%) of the PFA would be in open grassland condition. This exceeds the amount of habitat (22%) that Clough (2000) found in open condition (less than 25% canopy closure) in PFAs in her study area. However, even if a 420 acre polygon including more timber was drawn rather than using the 420 acre circle centered on the nest, it would not affect the analysis because redrawing the 420 acre PFA would not include more acres treated by the Moose Creek Project.

Thirty percent of the Little Moose Creek West PFA based on local knowledge, and 18% of a 420 acre PFA would have a mix of vegetative treatments including commercial thinning of Douglas-fir, clear-cut lodgepole where ponderosa pine, Douglas-fir and aspen would remain where found, and thinning of lodgepole saplings and poles. A follow up jackpot burn or pile burning would occur.

The Little Moose Creek East PFA was identified by V. Murphy to be 291 acres. This PFA is limited by a large blowdown area to the west. As identified by local knowledge, the PFA would not be affected by proposed treatments in the Moose Creek Project. With a 420 acre circle drawn around the nest location, there would be vegetative treatments on 40 acres by the Moose Creek Project in Unit 35.

The Daniels Creek PFA has been estimated to be 547 acres by V. Murphy. This territory was originally discovered in 1992 and there are several known recently occupied nest trees. The Moose Creek Project would treat 121 acres (22%) of the local knowledge PFA. All recent nest trees were buffered by a 420 acre circle, and within this area, the Moose Creek Vegetation Project would treat 80 acres (19%). These treatments would include thinning pole sized stands, clear-cutting lodgepole and leaving Douglas-fir and aspen where found, enhancing aspen, and thinning the understory all for the purposes of reducing insect and disease and improving aspen.

The Upper Moose Creek PFA has been digitized and estimated to be 422 acres by V. Murphy. There are no treatments proposed as part of the Moose Creek Project that would affect the local knowledge based

PFA or a 420 acre circle PFA centered on the nest tree. No direct, or indirect project effects, and therefore, no cumulative effects to the Upper Moose Creek goshawk territory are expected.

The Moose Creek Project proposes to harvest trees in identified post-fledging areas of known goshawk territories; this would result in a direct reduction of canopy cover in approximately 30% of the Little Moose West and 20% of the Daniels Creek PFAs. The Upper Moose Creek PFA would not be affected by the project. Based on local knowledge, the Little Moose Creek East PFA would not be affected by project activities and based on Northern Region Project Considerations, using a 420 acre circle centered on the nest stand as a PFA boundary, about 10% of this PFA boundary would have canopy cover reduced by the Moose Creek Project. These direct effects to goshawk post-fledging areas are not expected to negatively affect goshawks for the following reasons:

- The Moose Creek Project objectives are to reduce the potential for insect and disease, or remove forest already infected and to promote forest resiliency while moving the condition of the forest closer to reference condition. As discussed, the current forest condition of much of the Moose Creek Project area, including goshawk territories, is out of the natural condition of what would have existed in the absence of European settlement, and out of the natural condition under which goshawks evolved. Reynolds et al. (1992) recommended to maintain a mix of seral stages and vegetation types that reflect historical landscape patterns in goshawk habitat. Although some canopy cover would be removed in goshawk PFAs, this canopy cover will be naturally reduced in the near future when the dead trees fall. This project would promote future forested habitat faster than would happen naturally for goshawks.
- Across the project area, the Eastside Assessment goshawk nesting habitat model estimates that there is currently 13,456 acres of nesting habitat. Nesting habitat can also function as goshawk PFA habitat; the Moose Creek project would affect 2,214 acres (16%) of this nesting/PFA habitat, leaving 84% of it intact for goshawks to rear their young.
- Forested canopy in PFAs will still be available for each of the three known territories that would have direct effects due to vegetative treatments in their PFAs, because less than 30% of each PFA would be affected.
- No ground disturbing activities would be allowed inside known occupied PFAs from 15 April through 15 August to protect goshawk pair and young from disturbance during the breeding season or until fledglings are capable of sustained flight. When flight feathers fully develop and harden, then goshawk young are capable of sustained flight, which takes approximately 30 days after fledging from the nest. Site-specific data would continue to be used and if needed, timing restrictions would be designed to reflect variations in fledging dates.

Project Effects to Nesting Habitat

The Moose Creek Project would not directly affect known nesting habitat in the project area. Each known recently occupied[1] nest would be buffered by 40 acres of a no activity area. No activity means

[1] Recently occupied refers to the use of a nest area, PFA, or home range by a breeding pair of goshawks and its young during the breeding season. Note that determining non-use of an area where a breeding pair has been previously documented may require monitoring the area for occupancy during the breeding season over a 5 (Woodbridge and Hargis 2006) to 8 year period (Reynolds et al. 2005).

that no ground disturbing activities may occur in known occupied nest stands at any time during the year until the nest stand is no longer occupied.

Project effects to available goshawk nesting habitat as estimated by the Eastside Assessment are displayed below. The Moose Creek project would affect 2,214 acres of existing goshawk nesting habitat and it would affect 71 acres of goshawk nesting habitat which is possibly recovered to a condition that it is again serving as nesting habitat. Approximately 13% of the goshawk nesting habitat across the entire project boundary would be removed (note that these numbers are now overestimated because the project activities were reduced from what they were at the time of this report being prepared to now a total of 2,353 acres as of December 30, 2016).

Goshawk Nesting Habitat	Moose Creek Project Boundary Existing Condition	Treatment Units Harvest	Treatment Units Whitebark Pine	Treatment Units Precommercial Thinning
Affected	100 acres	0 acres	0 acres	0 acres
Existing	13,456 acres	2,213 acres	1 acre	4 acres
Not Habitat	5,654 acres	346 acres	59 acres	18 acres
Possibly Recovered	928 acres	1 acre	18 acres	52 acres
Total	20,138 acres	2,560 acres	78 acres	74 acres

The direct effects to goshawk nesting habitat are not expected to negatively affect goshawks for the following reasons:

- Although 13% of the possible goshawk habitat across the project area would be removed, known nesting sites in each of the four known territories would be preserved with a 40 acre buffer around each.
- As suggested by the Northern Region project considerations for goshawk (Brewer et al. 2007), at least 240 acres of nesting habitat per 5000 acre foraging area in stands of at least 40 acres should be maintained, for a total of 960 acres across the project area. In fact, much more than this would be available to goshawks in the Moose Creek project area after the proposed action is implemented.

Cumulative Effects

A summary of past management and natural activities that have changed forest structure since 1950 for the Moose Creek Vegetation Project boundary is included in the project record. Since 1950, 5,088 acres were clearcut harvested and only 257 acres were harvested using other methods. This is indicative of the composition of the Moose Creek Project boundary being primarily lodgepole pine, which is typically clearcut because it is wind-infirm and would fall over if partially cut or thinned. In approximately 50 years, lodgepole can grow to 80 feet tall providing canopy cover. Therefore, the 2,388 acres of clearcuts that occurred from 1950 to 1969 have likely grown back to providing canopy cover for the goshawk. Broadcast, jackpot and other under burns that have occurred since 1950 have likely improved foraging habitat for goshawk due to their effects of opening understories which enhances the goshawk's ability to hunt. Only 457 acres have been affected by wildfire since 1950, with most of those acres burned

occurring since 1990 and it is assumed that these areas are not currently goshawk habitat but have the potential to be so in the future.

Other past activities that have helped shape the existing condition of goshawk habitat in this project area is the infestation of the mountain pine beetle especially during about 2007 to 2010. This infestation caused an average of 30% of mature lodgepole pine trees to die across the project area. Although recent project area survey has shown that some goshawks have successfully raised fledglings in these stands, the habitat isn't expected to continue to remain productive into the near future as standing dead trees die and subsequently live trees in the same stand fall due to wind effects.

There are no reasonably foreseeable activities in the project area boundary that would affect goshawk habitat on National Forest lands other than the Moose Creek Project and the standing dead lodgepole falling over. The Moose Creek project would speed the timeline of forests regenerating by manually removing dead lodgepole and opening the understory to sunlight to catalyze regeneration of trees. This would also increase the age class diversity of the entire project area which is expected to increase habitat for a variety of goshawk prey species. There is about 600 acres of privately owned lands in the project boundary and it may be harvested at any time.

The proposed project activities, which is primarily clearcut regeneration harvest of lodgepole pine, would add to those acres of clearcut since the 1970s, wildfire, and beetle infestation, and any potential acres that would be harvested on private lands, that have had or will have the effect of removing habitat available to the goshawk. However, ample acres of nesting and post-fledging habitat would remain to provide the requisite amount per home range. The Moose Creek Project boundary is 20,138 acres which could provide habitat for four goshawk territories. After implementation of the Moose Creek Vegetation Project and considering any potential future harvest, there would still be over 10,000 acres of nesting and post-fledging area habitat available, which could continue to support four nesting pairs of goshawks.

Conclusions/Summary of Effects

The northern goshawk is a management indicator species for the Lewis and Clark National Forest for old growth forest as a special habitat need. As previously discussed, research conducted since the 1986 Forest Plan has shown that goshawks are not dependent on old growth forest, although they do use it. The Moose Creek Vegetation Project will not affect old growth habitat. All proposed action was surveyed for old growth characteristics as described in Green et al. (1992) and where old growth was found in minimum patch sizes of 20 acres or more, it was removed from the proposed action (see Old Growth report in the project record). The Moose Creek Vegetation Project is being designed to meet the Farm Bill Categorical Exclusion criteria; therefore, all silvicultural treatments will be designed to maximize old growth and large trees to promote stands resilient to insect and disease threats.

The Lewis and Clark Forest Plan directs that active goshawk nesting territories be monitored as a 100% sample annually and a variability which would initiate further evaluation is a decrease of 10% or more in active nesting territories. There has been no such decrease since 2012, and monitoring has been occurring regularly since 2006; see monitoring summary in project record for details.

Overall, the Moose Creek Vegetation Project is expected to impact individual goshawks or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. This conclusion is based on the following:

- The Moose Creek Project, if implemented, would maintain more than enough nesting (at least 240 acres per territory) plus enough post-fledging habitat (an additional 420 acres) per 5,000 acre territory to support four goshawk nesting pairs.
- No ground disturbing activities would be allowed inside known occupied PFAs from 15 April through 15 August to protect goshawk pair and young from disturbance during the breeding season or until fledglings are capable of sustained flight. When flight feathers fully develop and harden, then goshawk young are capable of sustained flight, which takes approximately 30 days after fledgling from the nest. Site-specific data would continue to be used and if needed, timing restrictions would be designed to reflect variations in fledgling dates.
- No nesting stands would be affected by this project because nest trees would be protected with a 40 acre buffer.
- Some threshold of change in habitat due to forest management practices can cause an area to be unsuitable for goshawks, and that level of change may vary by geographic region (USDI-FWS 1998). Conversely, lack of disturbance can result in increased densities of trees above some threshold that would make the habitat unsuitable for nesting goshawks. Experimental data on the effects to goshawks of forest management and fire management and fire suppression is lacking. Goshawks nest in forests that evolved under a diversity of fire regimes including mixed-severity and stand-replacing events (Brewer et al. 2007). The Moose Creek Project has been designed to restore timber stands toward reference condition which is assumed to result in benefits toward all wildlife species that evolved with reference conditions.

In summary, goshawk habitat would continue to be available at the project level and beyond. Forest-wide there is enough goshawk habitat to maintain a viable population for the entire Northern Region (the following is excerpted from Samson (2006)).

- Goshawk habitat in R1 is abundant and well distributed where it occurs naturally, and more forest, and therefore nesting habitat, exists on today's landscape than what occurred historically.
- There have been substantial increases in connectivity for forested habitat since Euro- American settlement.
- The level of timber harvest of the forested landscape in R1 is insignificant.
- The suppression of natural ecological processes has increased and continues to increase the amount of forested habitat.
- Not a single known nest site in R1 is isolated from other known nests by more than the goshawks' estimated dispersal distance.
- The northern goshawk is secure in terms of persistence (http://www.natureserve.org/explorer/serve/NatureServe; accessed October 16, 2016.
- Below (and not above) a threshold of 20 to 30% of historical habitat amounts, the effects of fragmentation (i.e. patch size and isolation) are suggested to have a negative impact on species persistence. No indication exists that forested ecosystems in R1 have reached the 20 to 30% threshold of historical.

- Forested systems in R1 are more extensive and are less fragmented than in historical (~1800 A.D.) times from an increase in conifers into grasslands (Hessburg and Agee 2003; Gallant et al. 2003; Hessburg et al. 2004 in Samson 2006).
- The effects of habitat fragmentation on birds are less in the western United States compared to the Midwestern and eastern United States because western landscapes were naturally more fragmented in historical times.
- A comparison of habitat estimates for maintaining viable populations to that available on each Forest indicates that habitat is available in excess to that needed, given the natural distribution of the species and its habitat as mapped and according to the scientific literature.

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Snag Habitat Report for Moose Creek Vegetation Project

Prepared by Allison Kolbe, December 27, 2016

Snags, or standing dead trees, provide important structural features and habitat for wildlife. Snags are used by wildlife species for roosting, denning, foraging and shelter. Woodpeckers and nuthatches are primary cavity nesters because they excavate their own cavities in snags where they nest and roost. Woodpeckers often excavate a new nest cavity each year and thereby old nest cavities are available for secondary cavity nesters.

Large (greater than 15" diameter at breast height) snags persist longer and can accommodate live processes of more species than smaller snags; they are particularly valuable because of their natural rarity on the Lewis and Clark National Forest (Bollenbacher et al. 2008).

The Forest Plan includes Management Standard C-4 (Wildlife Trees) (USDA Forest Service 1986, pages 2-35 to 2-36). This standard recommends 1) sizes and numbers of hard snags to be retained (see Table below), 2) keep all soft snags which are not a safety or fire hazard, 3) locate wildlife trees adjacent to natural openings, near water, in valley bottoms, or in aspen groves, if possible, 4) cluster wildlife trees in important habitat, rather than spacing them uniformly in an area, 5) retain larger diameter wildlife trees wherever possible, 6) concentrate wildlife trees away from roads, 7) leave deformed, cull, and spike-topped trees for future wildlife trees, 8) retain deadwood, 9) create snags where needed, 10) protect snags during prescribed fire, and 11) keep down trees for wildlife feeding sites.

Lewis and Clark Forest Plan 2-35:

Recommended hard snag numbers and size, including primary cavity nesting species present

Timber Type	Woodpecker species	DBH minimum	Snags/100 acres
Douglas Fir/Ponderosa Pine	Hairy	10 inch	158
Riparian/Aspen	Downy	6 inch	300
Lodgepole Pine	Northern three-toed	10 inch	72
Subalpine Fir/Whitebark Pine	Northern three-toed	10 inch	108
Mixed Conifer	Black-backed three-toed	10 inch	135

Bull et al. (1997) recommended density of snags for the interior Columbia River Basin (west of the Continental divide), based on studies in that area, that are higher than those recommended by the Lewis and Clark National Forest Plan. Their recommendations are also based on open versus closed canopy conditions of various species of forest, for which we do not have a direct comparison in the way we report snag numbers. The Lewis and Clark National Forest is on the eastern side of the Continental divide where the inherent capability of the forests are not as productive as those on the west side of the divide due to shorter and cooler growing seasons (Arno 1979). Due to the climatic differences between east and west of the Continental divide, the recommended density of snags by Bull et al. (1997) are not directly applicable to the Lewis and Clark National Forest. Bollenbacher et al. (2009) found snag

densities and large-live trees among three geographic areas to have a statistically significant difference, suggesting that snag analysis and management plans pertaining to snags should be formulated by geographic region and not extrapolated from one area to another.

Estimates of Snags on the Lewis and Clark National Forest and in the Moose Creek Project Area

In December, 2008 the Region One Vegetation Classification, Mapping, Inventory and Analysis Report 08-07 v2.0, Estimates of Snag Densities for Eastside Forests in the Northern Region (USDA Forest Service 2008, hereafter Eastside Snag Report) was completed. This is considered best available scientific information regarding snag densities for National Forests east of the Continental Divide (US District Court 2016).

The Eastside Snag Report (Bollenbacher et al. 2008) analyzed Forest Inventory and Analysis data for the five eastside National Forests (Beaverhead-Deerlodge, Custer, Gallatin, Helena, and Lewis and Clark). Forest Inventory and Analysis (FIA) data is a systematic, standardized system of data collection on forested plots. The sampling design is statistically defensible providing estimates of forest parameters (including snag count by diameter class) and standard error calculation.

The analysis was broken out in several ways, including plots located within and outside wilderness and roadless areas, plots by lodgepole and all other dominance groups, and plots by habitat type group (warm, cool and cold) for the other dominance groups. The Eastside Snag Report did not report snags by species forest type other than by lodgepole. The report provides ranges of snags by forest based on this analysis (USDA Forest Service 2008, Appendix C, Table 5, page 53). The Table below displays the results of the analysis for the Lewis and Clark. The data are the 90% confidence interval estimates derived from the plots of the entire forest (see Bollenbacher et al. 2008 for a complete discussion).

Snags per acre for the entire Lewis and Clark National Forest for snag analysis groups: lodgepole pine (PICO) dominance groups and all other dominance groups by habitat type group: by diameter class (USDA FS 2008, Appendix C, Table 5, page 53)

Dominance Group	Habitat Type Group	90% CI Ranges for Snags per acres by diameter class (Mean)		
		> 10.0" DBH	> 15.0" DBH	> 20.0" DBH
All other Groups	Warm	2.0 – 6.9 (4.2)	0.4 – 2.2 (1.2)	0.0 – 0.3 (0.1)
	Cool	7.8 – 15.1 (11.3)	1.5 – 3.3 (2.3)	0.3 – 1.1 (0.6)
	Cold	4.1 – 24.6 (12.9)	0.4 – 4.8 (2.4)	-
PICO	All	7.3 – 17.9 (12.2)	0.8 – 3.7 (2.1)	0.0 – 0.7 (0.3)

The base FIA data is appropriate for coarse-level (Ranger District, mountain range, or Forest) analysis. The Lewis and Clark NF has intensified the base grid four times to get mid-level data. The intensified grid data was collected during 2009 and 2010. The intensified grid data for the Little Belt Mountains was queried for dead trees per acre by diameter class (any tree species).

The Forest silviculturist generated a snag report for all species using FIA intensified grid data for the entire Little Belt Mountains as displayed in the following table.

Estimate of Dead Trees Per Acre for Little Belts from FIA data with 90% Confidence Interval			
Diameter at Breast Height	Estimate	Confidence Interval Low	Confidence Interval High
10.0-14.9	6.91	5.93	7.94
15.0-19.9	1.73	1.28	2.21
20.0-24.9, 25.0 plus	0.45	0.24	0.68
Total Greater than 10.0	9.09	7.45	10.83

The silviculturist also generated a snag report using FIA intensified grid data for all tree species greater than or equal to 10" diameter at breast height (DBH) and for all species that were not lodgepole, juniper, or aspen at the same diameter class. This report was run for the Sheep Creek 5th hydrologic unit code (HUC) that includes the Moose Creek Vegetation project area. The Sheep Creek watershed is 124,500 acres. The estimate of snags per acre for the 5th code HUC watershed is displayed in the table below.

Estimate of Dead Trees Per Acre Sheep Creek Watershed from FIA data with 90% Confidence Interval				
5th code HUC	Species	Estimate Based on (#of) Subplots	Confidence Interval Low	Confidence Interval High
Sheep Creek 1003010304	All Species Snags ≥ 10" DBH	13.90 (71) 1,390 snags/100 acres	9.29 929 snags/100 acres	19.02 1,902 snags/ 100 acres
	Snags ≥ 10" DBH; Species other than Lodgepole, Juniper, Aspen	5.09 (71) 509 snags/100 acres	2.37 237 snags/100 acres	8.56 856 snags/100 acres

Snag data also comes from data collected in the field during project survey for old growth. Over 8,500 acres of forest were surveyed for old growth forest condition in the Moose Creek Project area during

field seasons of 2015 and 2016. Number of snags per acre in different size categories are estimated with a walk through survey of each timber stand, and forest type is recorded. This information was extrapolated to estimate the number of snags per acre across the entire project boundary area (see project record for details). Unlike FIA data, the snag data collected during old growth survey was not designed as a systématic, standardized system and therefore has no associated confidence intervals. Any timber stand that would potentially be proposed for management action in association with the Moose Creek Vegetation Project was surveyed for old growth; snag data is collected as part of this process.

The current condition of snags per acre in two size categories and total snags per acre over 10" diameter at breast height are displayed in the table below based on extrapolations from project level survey. For all forest types except for riparian/aspen, the current condition of the project area exceeds the minimum number of snags per 100 acres as recommended by the Forest Plan. The riparian/aspen forest type snags per acre is based on a very small sample size of only 4 acres of this forest type surveyed, and therefore is likely erroneous. This is due to the fact that forest management actions are rarely proposed in these areas due to streamside management zones and sensitive soils types, and therefore only a few acres of this forest type were surveyed for the Moose Creek Project.

Current condition of snags in Moose Creek Project Area	Snags Per Acre 10-15" DBH	Snags Per Acre >15" DBH	Total Snags Per Acre >10" DBH
All Forest Types	3.05	0.71	3.76
Douglas-fir	3.42	1.15	4.57
Riparian Aspen	1	0.5	1.5
Lodgepole	2.79	0.63	3.42
Subalpine fir	5.27	1.54	6.81
Mixed Conifer	3.4	0.79	4.19

Estimate of Snags per Acre Post-Project

The appropriate scale of snag standards is at the total treatment unit acreage or even the entire project area (Bollenbacher et al. 2008).

A conservative approach is used to calculate remaining snags per acre after Moose Creek Vegetation project implementation. The Moose Creek Vegetation project would affect 2,210 acres of forest types that contain snags. It is assumed that management actions would remove all snags in proposed project units. The removal of 2,210 acres of snag habitat would not drop the snags per 100 acres below Forest Plan standards when considering snags at the geographic extent of the Sheep Creek Watershed, Little Belt Mountains or entire Lewis and Clark Forest areas.

The unit of survey for old growth survey is the timber stand, and proposed project units in many cases bisect individual timber stands. To calculate remaining snags per acre after implementation it was assumed that all of the snags in a timber stand were found in those acres contained by the proposed project unit and it was assumed that all snags in project units would be removed. The post-project condition of snags in the Moose Creek Vegetation project area based on project level survey is displayed below and a column is included to compare the Forest Plan standard for each forest type.

Post-Project condition of snags in Moose Creek Project Area	Snags Per Acre 10-15" DBH	Snags Per Acre >15" DBH	Total Snags Per Acre >10" DBH	Total Snags Per 100 Acres >10" DBH	Forest Plan Standard Snags/100 acres >10" DBH
All Forest Types	2.03	0.5	2.53	253	Not applicable
Douglas-fir	2.68	1.02	3.7	370	158
Riparian Aspen	1	0.5	1.5	150 *based on small sample size	300 * based on 6" DBH
Lodgepole	1.78	0.42	2.2	220	72
Subalpine fir	1.12	.15	1.27	127	108
Mixed Conifer	2.42	0.59	3.01	301	135

In all cases, the post-project condition of snags would meet Forest Plan standards. The riparian/aspen type should be disregarded due to small sample size as discussed above and the fact that the Moose Creek project would not affect this forest type.

Douglas-fir snags are more important for wildlife than are lodgepole snags because they have thicker bark, tend to be larger trees, and persist on the landscape longer. Bats are known to roost under bark, and larger trees provide structure and foraging for a greater number of wildlife species. The project includes design criteria to leave all Douglas-fir snags that are 12" diameter at breast height to the extent possible to provide roosting habitat for bats and structure and forage for snag dependent species.

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Migratory Birds Report for Moose Creek Vegetation Project

Introduction

Executive Order #13186 (January 10, 2001): "Responsibilities of Federal Agencies to Protect Migratory Birds" was issued by President Bill Clinton in furtherance of the purposes of the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Acts, the Fish and Wildlife Coordination Act, the Endangered Species Act, and the National Environmental Policy Act. This order requires including effects of federal actions on migratory birds as part of the environmental analysis process.

Affected Environment

Neotropical migratory birds are those bird species that migrate to more northerly latitudes to breed on the Helena-Lewis and Clark National Forest each summer. Come fall, these species migrate south to spend the winter months. Generally speaking the birds arrive in the spring to set up territories for breeding purposes. Young are raised and fledged by mid-summer. Most species leave the Forest by mid to late summer.

A report issued by several organizations and Federal agencies summarized the general condition of birds across the US (NABCI 2009, 2011). It painted a picture of declines in multiple species across a variety of habitats. Climate change was one of the contributing factors to these declines, and is likely to continue impacting birds into the future. As the climate warms, breeding seasons and migrations are being altered. These activities may become out of sync with prey abundance, and climate change may also impact where and when those food items are available. This reinforces the need to have resilient habitat that is better able to handle climate change.

In 2008 the USFWS released a report titled "Birds of Conservation Concern" in which they listed species of concern by Bird Conservation Regions (USFWS 2008). That report helps focus conservation effort on the species that need it. The Forest lies within Bird Conservation Region (BCR) 10 (Northern Rockies). Listed below are the species of concern for that BCR, not all of which are found on the Forest.

Page 26 of USFWS Birds of Conservation Concern 2008

Table 8 BCR 10 (Northern Rockies U.S. portion only) BCC 2008 list.10

Bird Species	Determination
Bald Eagle (b)	No impact; see wildlife report for details.
Swainson's Hawk	No impact. This species lives in open grasslands, sage flats and sometimes agricultural grounds. The Moose Creek Vegetation project would not affect this type of habitat, therefore there would be no impact to the Swainson's hawk.
Ferruginous Hawk	No impact. The ferruginous hawk uses

	prairies, deserts and open range as habitat. The Moose Creek Vegetation project would not affect this type of habitat, therefore there would be no impact to the ferruginous hawk.
Peregrine Falcon (b)	No impact; see wildlife report for details.
Upland Sandpiper	No impact. Habitat of the upland sandpiper includes grasslands with low to moderate forb cover, low woody cover, and moderate grass cover. This type of habitat is not found in and would not be affected by the Moose Creek Vegetation project.
Long-billed Curlew	No impact. Habitat of the long-billed curlew includes mixed-grass prairie habitats and moist meadows as breeding habitats. Curlews nest in open, short-statured grasslands and avoid areas with trees, dense shrubs or tall dense grasses. This type of habitat is not found in and would not be affected by the Moose Creek Vegetation project.
Yellow-billed Cuckoo (w. U.S. DPS) (a) – sightings in riparian	No effect. The yellow-billed cuckoo is not found east of the continental divide, and the USFWS does not consider this species to be on the Lewis and Clark National Forest. Therefore the Moose Creek Vegetation project would have no effect on this species.
Flammulated Owl	No impact; see wildlife report for details.
Black Swift	No impact. The black swift chooses nesting sites that are shaded, sheltered spots on vertical cliffs or on damp rock behind waterfalls where they are inaccessible to predators. Black swifts forage on insects while flying, often very high in the sky. There are no known occurrences of black swift in the Little Belt Mountains and the project would not affect nesting habitat of this bird. The project is not expected to change the availability of insects for prey.
Calliope Hummingbird	Addressed in this report, see discussion below.
Lewis's Woodpecker	Addressed in this report, see discussion below.
Williamson's Sapsucker	Addressed in this report, see discussion below.
White-headed Woodpecker	No impact. The white-headed woodpecker is only known as an accidental species (less than 20 verified observations) in Montana. As this

	species is not a resident of the state of Montana, the Moose Creek Vegetation project would have no impact on this species.
Olive-sided Flycatcher	Addressed in this report, see discussion below.
Willow Flycatcher (c)	Addressed in this report, see discussion below.
Loggerhead Shrike	No impact. Habitat for the loggerhead shrike is semi-open areas with short vegetation such as grasslands, agricultural fields, where there are scattered shrubs and trees. The Moose Creek Vegetation project would affect forested habitat only, therefore no impacts to loggerhead shrikes are anticipated.
Sage Thrasher	No impact. The sage thrasher is a sagebrush obligate species, and is dependent on large, unfragmented sagebrush habitats for breeding. The Moose Creek Vegetation project would not affect sagebrush habitat, therefore no impacts to sage thrashers are anticipated.
Brewer's Sparrow	No impact. The Brewer's sparrow breeds in sagebrush habitats. The Moose Creek Vegetation project would not affect sagebrush habitat, therefore no impacts to Brewer's sparrows are anticipated.
Sage Sparrow	No impact. The sagebrush sparrow breeds in sagebrush habitat. The Moose Creek Vegetation project would not affect sagebrush habitat, therefore no impacts to sagebrush sparrows are anticipated.
McCown's Longspur	No impact. The McCown's longspur habitat is sparse short grass plains, plowed and stubble fields and bare or nearly bare ground. The Moose Creek Vegetation project would affect forested habitat only, therefore no impacts to McCown's longspurs are anticipated.
Black Rosy-Finch	No impact. The black rosy-finch breeds on mountain peaks in rocky areas, often near persistent snowfields above timberline. The Moose Creek Vegetation project would affect forested habitat only, therefore no impacts to black rosy-finches are anticipated.
Cassin's Finch	Addressed in this report, see discussion below.

(a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR

Environmental Consequences

Responses of migrant birds to timber harvest and burning (prescribed or wildfire) depends upon their individual habitat preferences and needs. Regeneration harvest removes forest cover used by some species (e.g. brown creeper, golden-crowned kinglet, hermit thrush) and at the same time creates grass, forbs, and shrub habitat used by other bird species (e.g. American kestrel, calliope hummingbird, chipping sparrow). This activity also produces "edge" habitat that still other bird species use (e.g. dark-eyed junco, western tanager, Townsend's warbler). Edge habitat often is similar to forest stands created with partial cutting (e.g. commercial thinning, shelterwood). Species using edge are often found in partial cut stands, so this management practice may provide additional habitat for these species (Hutto and Young 1999).

The Montana Natural Heritage Program, Forest Records, and other records of species occurrence for the Moose Creek Vegetation project area were consulted in order to determine which of the Birds of Conservation Concern may be present in the project area. For those species who may be found in the project area and/or whose habitat is found in the project area, and are not already addressed in the wildlife report for Moose Creek Vegetation project, a discussion of associated habitats and expected effects to those habitats are discussed below.

Calliope Hummingbird (*Selasphorus calliope*)

The Calliope Hummingbird lives in open shrubby areas near streams, meadows, and canyons in the mountains and breed from 4,000 feet to near the treeline. They may be found in second growth forests after a fire or logging and in willow and alder thickets. Their main food source is floral nectar and small insects.

The Calliope Hummingbird may be impacted by habitat threats to aspen, coniferous forest, montane riparian, montane shrub land, and springs habitat. The Moose Creek project is proposing aspen restoration which would enhance habitat for this and other bird species. The Project also proposes to clear-cut lodgepole stands and apply prescribed fire to some forested stands, which will affect habitat that year but will likely provide second growth forests for the Calliope Hummingbird in subsequent years. Activities in montane riparian, and springs habitats would be avoided through Best Management Practices in the Moose Creek project, and the project proposed no activities in montane shrub land. Most of the project area is coniferous forest and would not affect the Calliope Hummingbird's more shrubby and open habitat. Overall, the Moose Creek Project would likely increase Calliope Hummingbird habitat.

http://imnh.isu.edu/digitalatlas/bio/birds/swifts/cahu/cahu_inf.htm
https://www.audubon.org/field-guide/bird/calliope-hummingbird

Williamson's Sapsucker (*Sphyrapicus thyroideus*)

The Williamson's Sapsucker breeds in montane spruce-fir, Douglas fir, lodgepole pine, ponderosa pine forests, and mixed deciduous-coniferous forests with quaking aspen from 4,900 to 10,500 feet. This species is a cavity nester and uses snags or live trees with dead heartwood,

which the males excavate for their nesting sites. Suitable nesting snags generally are more common in old forests than in younger ones.

This project contains many treatments within potential Williamson's Sapsucker's habitat and will reduce the overall number of snags available for nesting. However, old growth habitat (see old growth report) and snag habitat will remain (see snag report) for snag dependent species and other areas of the Little Belt Mountains continue to provide habitat, in addition to future insects and disease that will provide future snag habitat. The Moose Creek Project will also restore aspen habitat, which is important to this species where an aspen-conifer mixed habitat seems to be especially important. Due to old growth designation and aspen restoration as part of this project, habitat for this woodpecker species is expected to be provided for in the Moose Creek Project area.

http://www.audubon.org/field-guide/bird/williamsons-sapsucker
http://explorer.natureserve.org/servlet/NatureServe?searchName=Sphyrapicus thyroideus

Olive-sided Flycatcher (*Contopus cooperi*)
The Olive-sided Flycatcher prefers montane coniferous forests at mid- to high- elevations, often along edges where the forest meets meadows, rivers, and clearings provided naturally or by clear cut harvests. This species is also found in post-fire habitat and generally seems to prefer forests with low canopy cover. It is common in areas with spruce and aspen and uses snags for foraging and singing perches.

The Moose Creek Vegetation project will likely result in increased habitat for the Olive-sided Flycatcher; lodgepole pine clear cuts will result in more edge habitat between harvested areas and untreated forest. Thinning stands for forest improvement will decrease canopy cover which will also result in increased habitat.

http://www.audubon.org/field-guide/bird/olive-sided-flycatcher
http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABPAE32010

Cassin's Finch (*Haemorhous cassinii*)
The Cassin's Finch occurs in every major forest type and timber harvest regime in Montana, but are especially common in ponderosa pine and post-fire forests. It can also be found in riparian cottonwood areas and forests of pine and Douglas-firs, and is less common in lodgepole pine stands. It occasionally winters in more open forests of lower elevations. This finch's diet consists of seeds, buds and berries.

This project is not expected to have significant effects on the Cassin's Finch because project activities would not affect ponderosa pine, recent post-fire forests or cottonwood stands. The project will affect primarily lodgepole pine, where this bird species is found less commonly.

https://www.audubon.org/field-guide/bird/cassins-finch
http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABPBY04030

Lewis's Woodpecker (*Melanerpes lewis*)
Habitat is open forest and woodland; often logged or burned; primarily ponderosa pine and cottonwood. Distribution is closely associated with open ponderosa pine forest and is strongly associated with fire maintained old growth ponderosa pine. Lewis's woodpeckers are also known to occur in river bottom woods and forest edge habitats. In Montana the species is ranked S2B, on breeding habitat at risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state. There is no ponderosa pine habitat in the project area, and the project would not affect river bottom woods habitats, and therefore, the project would not affect the Lewis' woodpecker.

http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABNYF04010

Willow Flycatcher *(Empidonax traillii)*
The willow flycatcher is a summer breeding resident found across the state of Montana. Willow flycatchers breed in moist shrubby areas, often with standing or running water. Deciduous trees and shrubs, especially willows are typical habitat. These flycatchers eat mostly insects and some berries in the fall.

Activities in montane riparian, and springs habitats would be avoided through Best Management Practices in the Moose Creek project. There are no project activities proposed in montane shrub lands. Therefore, the project would not affect the willow flycatcher.

https://www.allaboutbirds.org/guide/Willow_Flycatcher/lifehistory
http://www.audubon.org/field-guide/bird/willow-flycatcher

In addition to the species of birds already mentioned in this report, there are many common species of migratory birds that are likely to be found in the project area. Species such as dark-eyed junco, chipping sparrow, yellow-rumped warbler, Swainson's thrush, red crossbill, pine siskin, and ruby-crowned kinglet are a few examples.

Project Description

The Moose Creek Project boundary area is 20,138 acres and is primarily forested with only about 10% of the project boundary being in a non-forested condition. Lodgepole pine is the tree species with the greatest abundance of canopy cover, basal area or trees per acre (plurality) in the Moose Creek Project boundary at about 60% of area. Douglas-fir is the tree species with the next greatest plurality covering about 17% of the project boundary area. Other species present are subalpine fir (11%), Engelmann spruce (2%), and whitebark pine, limber pine, aspen, and ponderosa pine all at less than 1%.

The project proposes vegetative treatment for approximately 2,353 acres. The majority of acres (approximately 2,000 acres) of total proposed treatment would be regeneration harvest of

lodgepole pine which has had various levels of mountain pine beetle-caused mortality and moderate to high levels of dwarf mistletoe and western gall rust infection. The project proposes commercial thin treatments in Douglas-fir dominated stands to reduce Douglas-fir beetle and western spruce budworm susceptibility. Pre-commercial thinning within the Wildland Urban Interface would reduce stand density, improve tree growth, remove infected lodgepole, and create a future stand with reduced mountain pine beetle hazard. The project also proposes treatments to enhance aspen and whitebark pine across about 50 acres and 80 acres respectively; in addition, aspen where found in small patches within treatment units dominated by other tree species would be enhanced.

The project would create approximately 8.5 miles of new temporary road and temporary use would occur over an existing road or trail template on another 31 miles that are currently closed to public use. All temporary roads constructed would be decommissioned no later than three years after the date on which the project is completed, and 5.1 miles of existing road template would also be decommissioned after use. Any trails used would be restored to their previous condition. Approximately 34 miles of existing road that is open to the public may be utilized as haul routes. These routes would receive maintenance to meet Best Management Practices as applicable. No new permanent roads would be added to the forest transportation system. This proposal does not include travel management planning.

Mechanized equipment would be used to harvest timber and trucks would be used to remove timber from the forest. Harvesting may occur during any month of the year; some units would likely be harvested only when soils are frozen or snow is on the ground to prevent soil disturbance in sensitive areas. Other units would be harvested during spring, summer or fall seasons.

Prescribed fire in the form of pile burning, jackpot burning or broadcast burning may be applied in any unit to promote regeneration or enhance aspen. The sum of project activities would result in units being entered on several occasions over the course of the length of the project to harvest timber, prepare for prescribed fire, to apply prescribed fire, to perform restocking survey and/or to apply weed treatment. Additionally, if temporary road was built to access a unit, up to three years' time after project completion is allowed for the road to be decommissioned.

The estimated period of operation of activities may be over 5 years or more once the project decision is signed.

Direct and Indirect Effects

Direct effects to migratory birds include:

- Destruction of ground nests caused by ground disturbing activities such as logging, prescribed fire, and construction of temporary road.

- Displacement of individual animals from a specific location that is being used for reproduction or rearing of young due to disturbance from human use.
- Direct mortality of adult or juvenile birds.

Indirect effects to migratory birds include:

- Loss of vegetation supporting prey and forage items.
- Reduction or alteration of vegetative cover, structure, or composition used for nesting or foraging as a result of vegetation management and prescribed fire.
- Reduction of mountain pine beetle, Douglas-fir beetle, and spruce budworm prey items.
- Reduction of dwarf mistletoe which creates snags for cavity nesting birds, forage for species such as grouse, and nesting platforms.

In the short-term, vegetative treatments would directly influence bird community density through disturbance and alteration of stand composition and structure or indirectly through loss of nesting, foraging, or roosting habitat. Vegetative treatments can also affect nest site suitability, availability, prey abundance, predator success, forage quality, and plant vigor. Treatments would alter habitat for various species of Neotropical migratory birds, changing stand structure and composition. Some species would benefit from this alteration while others would not. Some impacts may only be short-term. Overall, the long-term sustainability of the habitat would be increased as stand density and structure are restored to be more representative of historic conditions while increasing the heterogeneity of forested stands. It is assumed that the suite of Neotropical migrants have evolved under historical forested conditions and would find optimal habitat when the current forested conditions most closely approximate what was available historically. See Little Belt Mountains Landscape Assessment Project 2013 for details about vegetation departure from reference condition.

Harvest of mountain pine beetle infected and killed lodgepole pine will reduce insects available to migratory birds (as well as woodpeckers) for foraging. The majority of the acres of mountain pine beetle infestation in the project area occurred from 2007 through 2010. Woodpeckers and other bird species feed on developing or overwintering larvae beneath the bark. The life cycle of the mountain pine beetle is typically 1 year (may be up to 2 years depending on temperature) for larval development. Wood boring beetles will often subsequently infest trees that were first infested by mountain pine beetle, which prolongs the foraging opportunity for another 2 to 3 years. Therefore, of the lodgepole regeneration units proposed for the Moose Creek Vegetation project, very few acres would be currently infested with beetles at this time. However, according to a forest health protection report on the Moose Creek area, the majority of beetle-caused mortality has already occurred but there are individual younger trees within these stands that may be susceptible to beetle attacks in the future. Therefore regeneration harvest of lodgepole pine would remove future potential beetle foraging opportunity in the Moose Creek project area. This is not expected to be significant to beetle foraging species because there are hundreds of thousands of acres across the Lewis and Clark forest of lodgepole pine in a similar condition that would remain available and the removal of 2,000

acres of this type of habitat is expected to be insignificant. See black-backed woodpecker report and snag report for details.

Lodgepole regeneration will affect species, such as crossbills, that depend on seeds of conifers for their forage. Approximately 30 percent of the lodgepole in these regeneration units are dead which means they do not provide cones for seed foragers now or in the future. Many of the trees that remain alive are infected by dwarf mistletoe which is a parasite that causes cone production of its host species to decrease, and eventually causes death in the host tree. Also, of the trees that remain alive, many will be susceptible to wind throw as their dead standing neighbors begin to fall over which increases the wind in the stands for this wind-infirm species. These decadent lodgepole stands are not prolific seed sources and likely are not important as seed foraging sources as other types of forested stands in the area. Crossbills are considered an eruptive species because they are very nomadic and can move in response to cone crop availability. Other bird species that forage on seeds will move to areas that contain this resource. Of the entire 20,000 acre project area, the Moose Creek Vegetation project would affect only about 2,400 acres of vegetation, leaving many acres in tact for seed foragers.

Regeneration harvest of lodgepole pine would also reduce the dwarf mistletoe available to birds as foraging and nesting habitat. This is not expected to be significant to birds because dwarf mistletoe infected trees is not a limited habitat. On the Lewis and Clark National Forest, it is estimated that 37% of the lodgepole pine acres are infected by this parasite. Across the forest it is estimated that there are several hundred thousand acres of lodgepole pine infected with this parasite, therefore, removal of 2,000 acres of this type of habitat is not expected to be significant to Neotropical migrants and other bird species that use dwarf mistletoe for foraging and/or nesting.

Regeneration harvest of lodgepole pine may immediately provide habitat for species such as mountain bluebird, Townsend's solitaire. In 10 to 20 year old clear cuts warbling vireos, MacGillivray's warblers, rufous hummingbirds, American kestrels and broad-tailed hummingbirds were more abundant than in uncut stands (Hutto et al. 1993).

In the Douglas-fir treatment units, large trees would remain, smaller trees would be thinned, canopies would be opened, and therefore more sunlight would reach the forest floor within the treated dry forest stands. These factors would aid in maintaining or improving habitat for species adapted to these conditions (Lyons et al. 2008). There would be a reduction of Douglas-fir beetle and spruce budworm in these Douglas-fir stands, however, as those stands that are infected with one or both pathogens have been targeted for treatment. Migratory species such as warblers are known to forage on spruce budworm when it is abundant, but do not depend on any one type of insect because warblers forage on other insects as well (McMartin et al. 2002). Spruce budworm is common across the Lewis and Clark National Forest, from 2007 through 2015 annual aerial detection survey found an average of 98,000 acres of forest infested by spruce budworm. Removal of a few hundred acres of spruce budworm habitat is expected to be insignificant to Neotropical migrants and other bird species that forage on spruce budworm.

Removal of this same few hundred acres that also contains Douglas-fir beetle is expected to be insignificant to Neotropical migrants and other bird species. Although woodpeckers do not appear to forage on Douglas-fir beetles or their larvae, they do forage on the woodborer larvae that develop in trees after they have been killed by Douglas-fir beetles or other mortality agents. Therefore, this is not expected to be a specialized forage source, and the effects of losing a few hundred acres of Douglas-fir beetle habitat are expected to be similar to the effects of removing 2,000 acres of lodgepole pine mountain pine beetle habitat in terms of foraging loss.

Douglas-fir snags are more valuable as wildlife snags than are lodgepole pine snags, and project treatments are designed to prevent death of large Douglas-firs, so therefore snag recruitment on these few hundred acres would be reduced. Across the entire project area, Douglas-fir timber type occurs on about 3,423 acres, and therefore more than 3,000 acres of this Douglas-fir would remain in the project area. Across the project area there is currently 457 snags per 100 acres in Douglas-fir type forest and after the project is implemented there is estimated to be 370 snags per 100 acres remaining available as habitat. This more than meets Forest Plan standards for snag retention; see snag report for details. Reduction of snag recruitment and removal of snags in Douglas-fir that would be treated to improve health of stand is not expected to be significant to Neotropical migrants or other wildlife that use snags.

The Moose Creek Vegetative project would remove snag habitat, which is important for some species of migratory birds. However, there is an abundance of snag habitat in the project area due to the high amount of lodgepole pine mortality across the Lewis and Clark forest and snag habitat would continue to remain in great abundance after the project is completed. Across the Lewis and Clark National Forest, there has been a recent epidemic of mountain pine beetle infestation which caused snags to form across several hundred thousand acres. The amount of snag habitat removed by the project would be insignificant in comparison and is not expected to result in a trend toward Federal listing or loss of viability for any species in this group. See black-backed woodpecker report and snag report for details on the amount of snag habitat available.

Riparian Habitat Conservation Areas (RHCAs) corridors would largely be untreated within the analysis area. Riparian buffers function as corridors and provide habitat for a variety of species (Lehmkuhl et al. 2007). RHCAs would remain largely intact and left untreated by the Moose Creek Vegetative project, leaving this important habitat available to the migratory species that depend on it.

Old growth stands provide important habitat for Neotropical migrants such as hairy woodpeckers, western wood-pewees, brown creepers, golden-crowned kinglets, Swainson's thrushes and Townsend's warblers (Hutto et al. 1993). Proposed treatment units were surveyed for old growth forest condition. All old growth found in the project area that meets Forest Plan standards has been dropped from proposed project activities and will be preserved as such. This project would not affect old growth habitat and therefore no effects to old growth dependent Neotropical migrants are expected.

During the prescribed fires there may be additional negative impacts from smoke and disturbance, or even mortality to nestlings if nests are located on the ground or in small trees or shrubs. Mitigation is included to avoid, if possible, broad-cast prescribed burns in the spring during breeding season in order to avoid direct mortality. However, even if spring burns are done prior to nesting there would be a loss of potential habitat in the short-term until shrubs, grasses, and small trees grow back (Pilliod et al. 2006). In the long-term the herbaceous and shrub layer would return to pre-fire conditions or actually improve with more light available to the forest floor. There may be a loss of adults, fledglings, and nests of Neotropical migratory birds during the implementation of the project. A seasonal restriction to cover the entire project area and extend the period that activities would be limited is not practicable in accomplishing the purpose and need for the project, thus a seasonal restriction on activities for Neotropical migratory birds has not been imposed upon the project. This may result in the short-term negative effects described above, but the proposal would yield sustainable Neotropical migratory bird habitats in the area. Therefore the implementation of the proposed action would affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability for any species in this group. In the long-term the proposed action would return habitats to a state nearer what would have been present historically under natural disturbance regimes.

Cumulative Effects

The area analyzed for cumulative effects includes the Moose Creek Vegetation project boundary. The time period examined included the entire life of project activities, as well as into the past to cover such activities as previous fire suppression and timber harvest.

Cattle grazing has occurred within the project area for decades and would continue to occur in the project area as currently permitted. Areas previously not available to cattle for grazing because dense stands or down wood that prevented cattle movement through those areas would become more open in the treatment stands and may allow cattle easier access through the project area. This access could allow increased access to riparian areas and aspen clones, which could be impacted by cattle grazing. Aspen clones that benefited from treatments under the proposed action could be grazed by cattle, negating the benefits of release. Conversely, cattle grazing by being more spread out, may overall reduce impacts to shrubs and aspen because use may no longer be concentrated.

The effects of past firewood removal can be seen in the loss of snags along the open roads in the project area. User-built roads have been, and are being built, to access new areas for the removal of snags for firewood. Snag losses would be expected to continue into the future under the current management strategies. Roaded access would continue to allow the removal of snags and down wood. As snags disappear from the edges of Forest Service managed roads, users would likely continue to pioneer roads into new areas to access this material. Snags created by under burning in the treatment stands would also be subject to loss from firewood gathering, especially in those areas proximate to open roads. However, as discussed previously,

the mountain pine beetle epidemic has created an abundance of snags across the project area and across the Little Belt Mountains and the loss of snags to firewood harvest is not expected to cause a significant effect to Neotropical migratory birds.

The effects of past timber harvest have contributed to a variety of age classes in the project area. Primarily in the Moose Creek project area, the past timber harvest has been lodgepole pine regeneration due to the abundance of this forest type and regeneration being a typical harvest system for lodgepole. To some degree, this has been a surrogate for the lack of wildfire which would have created a mosaic of regeneration across the project area would it not have been for the suppression of wildfire over the past century and introduction of grazing which likely decreased the amount of wildfire due to grass fuel reduction. Many of these past harvest units are now mature lodgepole stands and those harvested in the last 40 years or so are providing young forest habitat conditions. Currently, there is an abundance of forests in middle-aged condition and a lack of forests in young condition. The Moose Creek Vegetation project is designed to help return the condition of the forest toward reference condition and is overall expected to create better habitat for a wider variety of Neotropical migrants.

Cumulative impact of reduction of insects between previous harvest and proposed harvest is likely insignificant due to the epidemic of mountain pine beetle infestation.

Grazing, timber harvest, fire suppression, and other activities would likely continue on adjacent ownerships as well. These activities would have similar effects as those discussed above on NFS lands.

Regulatory Framework and Consistency

There are no specific goals or standards for migratory land birds in the Lewis and Clark Forest plan. The Moose Creek Vegetation project would be in compliance with the "Executive Order titled "Responsibilities of Federal Agencies to Protect Migratory Birds," as a wider range of successional habitats would be available in the project area after project completion. This wide range of successional habitats would contribute to the maintenance of habitat and populations for a variety of Neotropical migratory bird species.

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Moose Creek Vegetation Old Growth Report

December 29, 2016

The Forest Plan has an old growth forest objective "A minimum of 5 percent of the commercial forest land within a timber compartment should be maintained in an old growth forest condition. A minimum stand size of 20 acres is recommended for old growth management." A minimum stand size is recommended because in very small patch sizes, old growth cannot provide the environment needed for many species to function. Edge effect can effectively negate the benefit of having a larger contiguous microclimate of old growth.

All potential project units that contained mature timber were surveyed for old growth condition during development of the Moose Creek Vegetation Project during the field seasons of 2015 and 2016. Technicians were trained to identify plants, habitat type, measure and age trees, and count number of snags and trees per acre. Old growth condition was determined using parameters published in *Old Growth Forest Types of the Northern Region*, Green et al. 1992, errata 2011 Appendix 3. Potential old growth (POG) was also identified when it was estimated that forest might meet old growth criteria within 50 years' time.

We used ArcMap to delineate contiguous tracts of old growth (OG) at least 20 acres in size. We also identified additional OG tracts that are nearby these ≥20 acre tracts, and that are connected to the larger tracts by mature forest that was identified as Potential Old Growth. A summary of these OG tracts can be found at
file:///O:\NFS\LewisClark\Project\MooseCreekVegetaton\Documents\Specialist\Wildlife\OGandLynx\MooseVegOGanalysis.xlsx. The GIS map used for this analysis can be found at T:\FS\NFS\LewisClark\Project\MooseCreekVegetation\GIS\Workspace\GMunger\MooseVegOGanalysis.mxd.

There are 5,414 acres of commercial timber in Timber Compartment 709 and 21,291 acres of commercial timber in Timber Compartment 711. Approximately 8,600 acres have been surveyed to determine old growth forest condition in these timber compartments. Extrapolating from the number of acres of old growth found per acre surveyed, there are likely 3,434 acres of old growth that have not been identified in Compartments 709 and 711.

	Acres of Commercial Timber	5% of Commercial Timber Acres	Total Acres of Old Growth Found	Total Acres of Old Growth Found in Blocks of ≥20 Acres	Additional OG acres linked with ≥20 acre blocks via mature habitat
Compartment 711	21,291	1,065	920	604.6	51.7
Compartment 709	5,414	271	186	25.4	0

As displayed in the table, the total number of known acres of old growth forest does not meet the Forest Plan standard in these compartments. However, we are preserving all old growth found, and will

not be affecting any old growth, therefore, the Moose Creek Vegetation project meets the Forest Plan standard for old growth.

The current capacity of this project area to recruit and retain abundant and high quality old growth is strongly limited. The Moose Creek Vegetation project area is dominantly (60% plurality) composed of lodgepole pine-dominated forest. Of the 55 timber stands comprising our ≥20 acre OG tracts, 45 contained only lodgepole pine OG, 4 contained lodgepole pine and subalpine fir OG, 4 lodgepole pine and Engelmann spruce OG, 1 lodgepole pine and whitebark pine OG, and 1 contained only Engelmann spruce OG. Recent widespread, intensive mountain pine beetle epidemic has dramatically reduced the extent of lodgepole pine OG in the Moose Creek Vegetation project area, particularly since the beetle attacks primarily the largest diameter trees in an outbreak area. Consequently, many previously OG lodgepole pine stands in the project area are now largely composed of widely-spaced, stunted, small-diameter lodgepole pines, often with an understory component of previously suppressed shade-tolerant seedlings and saplings such as Douglas-fir, subalpine fir, and Engelmann spruce. Most of these stands are many decades, perhaps centuries from recruiting into OG status again. In addition, anecdotal observations from surveyors suggest that a) some, perhaps most, of the remaining lodgepole pine OG in the project area retains densities of OG-qualifying-sized trees that border on the low end in terms of OG-qualifying densities (a forest tract qualifies as OG based on species-specific parameters for tree age, size, and density), and b) some of the lodgepole pine OG in the project area that survived the mountain pine beetle outbreak is nevertheless currently of poor quality/health.

Given this situation, we took great care to avoid proposing activities that might diminish the existing OG resource in the Moose Creek Vegetation project area. Although we did not survey every timber stand contained within the Moose Creek Vegetation project boundary, we did survey wherever project-related management activities were proposed. Indeed, proposed activity unit boundaries were redrawn on multiple occasions specifically to avoid diminishing the OG resource. In short, we may not know where every 20+ acre tract of OG is within the project area boundary, but we certainly know where it isn't.

Unit Number	Wildlife Notes
1	POG is of poor quality, likely will not develop into OG due to extensive disease according to T. Murphy, silviculturist, there are 3 small (less than 2.5 acres each) patches of OG separated by distances of 200 and 500 feet, therefore nothing to designate as a functioning patch of OG, not lynx habitat, no wildlife changes to this unit
2	Not OG, not lynx, no wildlife changes to this unit
3	Stands 71106054 and 71106076 have adjoining OG for a total of 21 acres, and stand 71106054 is also lynx habitat, wildlife drops this from unit 3, remainder of unit has PICO POG which is of poor quality
4	Stands 71103116 and 114 each have about 12 acres of OG, and stand 117 has about 10 acres OG, plus 71103091 has 2.4 acres OG that adjoin for a total of at least 37 acres of OG; there may be more OG because 116 and 117 were only partially surveyed based on the Unit boundary. Additionally, there is lynx habitat in this unit in 70003091, 71103120, and 71103117 for a total of at least 14 acres. OG and lynx habitat were removed.
5	Some aspen found in Unit 5 where it had been previously logged. Some patches of lynx habitat, but not contiguous into a 5 acre patch. Adjacent stands were reviewed for lynx habitat as well to see if lynx habitat would adjoin the lynx identified in Unit 5 to make a

	larger patch. Stand 71101071 to the south could potentially be a post and pole unit with diameters less than or equal to 5" DBH and stand 71101041 is stem exclusion where it connects to 71101013. There is no OG in the Unit. No wldlf changes to this unit
6	No OG, not lynx, no wldlf changes to this unit
7	71103090 was only partially surveyed because of the Unit boundary, but it is very likely that the OG continues into the other portion of 03090, and also into 71103029, therefore this 14 acre piece plus a 1.6 acre piece in 71103066 will be reserved for old growth. Additionally a 8.7 and a 6.8 piece of OG out of 71103067 and 71103084 were reserved as OG as well. Other patches of OG in this unit are isolated and less than 10 acres. Just a few patches of lynx habitat, not reserved.
8	Two small patches of OG, no lynx, no wldlf changes
9	Drop entire unit due to lynx habitat and OG. 71107111 is 5.9 acres OG, 109 is 14.3 ac OG, 107 is 6.9 ac OG for 27 ac OG
10	11 acres of lynx habitat in middle of unit, dropped from unit
11	71106045 is 18 acres of OG adjacent to 71106027 which has 20 acres of OG in 2 pieces separated by POG, collected together for an OG reserve of 38 acres. There are another 3.8 acres and 9 acres of OG that are almost connected that should be reserved. Recommend to drop entire unit.
12	Almost entire unit is lynx habitat and OG is 24 acres. Recommend to drop entire unit
13	A large portion of this unit is OG which is adjacent to other OG. 165 acres which is near former Unit 9 of 27 ac OG and former Unit 12 which is 24 acres OG
14	Has some POG which isn't remarkable in the general area, no lynx habitat, no wldlf changes to this unit
15	Old growth and lynx habitat excluded from unit.
16	Some lynx habitat to exclude, in general no changes.
17	There is lynx habitat to exclude, 2 small pieces of OG which will not be retained, not connected, less than 3 acres each
18	Removed lynx habitat
19	No changes, less than 2 acres of OG
20	No changes, some POG
21	Most of unit is lynx habitat, dropping entire unit
22	Lynx habitat was removed, so other changes
23	Removed lynx habitat
24	Removed lynx habitat, no OG to save.
25	This unit is at least half lynx habitat, removed.
26	Almost entire unit is lynx, unit dropped.
27	Half lynx habitat removed.
28-34	No lynx habitat, no OG habitat, no wldlf changes
35	Lynx habitat removed, no OG
36	Lynx habitat removed, no OG
38	Lynx habitat to remove, no OG to designate
39	Lynx habitat removed
40	No lynx habitat, no OG habitat, no wldlf changes
41	Lynx habitat removed
43	Lynx habitat removed
44	Drop entire unit for lynx habitat

45-46	Unit 45 has some patches of OG amounting to no more than 5 acres, no changes, does not look from aerial imagery that there is adjacent old growth

Contents

Black-backed woodpecker

Introduction

Within Montana, the black-backed woodpecker (*Picoides arcticus*) is not a federally listed or candidate species with the USFWS, nor is it currently petitioned for listing. This species has an S3 state status, which is defined as "potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas." This species is identified by the Northern Region as a Sensitive Species. The black-backed woodpecker has a global conservation status rank of G5 – demonstrably widespread, abundant, and secure (www.natureserve.org).

Sensitive species are those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: (a) a significant current or predicted downward trend in population numbers or density or (b) a significant current or predicted downward trend in habitat capability that would reduce a species' existing distribution. Sensitive species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing.

There are records of black-backed woodpeckers in the Little Belt Mountains, but no known records of this species in the project area. No black-backed woodpeckers were observed during the field seasons of

2015 and 2016 while wildlife technicians were completing survey for goshawk, old growth and Canada lynx habitat. However, the black-backed woodpecker is not easily observed and would only be expected to be present in low density, if at all, due to lack of recent post-burn habitat in the project area. North American Breeding Bird Survey provides population trend estimates for black-backed woodpeckers, see project record for details.

Habitat

The black-backed woodpecker is a primary cavity nester in that they excavate their own cavities most often in dead or dying trees. The black-backed woodpecker responds to outbreaks of their primary prey, wood-boring beetles, and to bark beetles in conifer forests following windfall, disease, or wildfire. Black-backed woodpecker populations fluctuate widely. It is possible that populations reach source levels (providing enough successful reproduction for dispersion) in recent burns, but may drop to sink levels (successful reproduction too low for long term self-sustaining populations) during periods between large burns (Hutto 1995). Hutto (1995) proposed that this species is primarily restricted to early post-fire coniferous forest and populations are maintained by patchworks of recently burned forests. Pierson et al. found that black-backed woodpeckers are able to travel long distances and can disperse as far as 90 to 120 km between burns.

Post-fire areas may provide optimum habitat and irruptive population increases have been observed in this environment, but annual variability of fire occurrence, size and severity across a given landscape is high. Large areas of recent insect infested and killed trees are likely the next most optimum habitat, and variability of occurrence and size is also high for this habitat. Mid to late seral forests containing relatively abundant snags and dying trees provide some habitat between disturbance events, although this type of habitat cannot support the density of woodpeckers that more forage rich habitats can.

Measures for Project Effects to Black-backed Woodpeckers

As noted, the black-backed woodpecker is an irruptive species that forages opportunistically on outbreaks of beetles in recently burned and infested habitats. As such, it tends to be generally rare across forest conditions that are not experiencing significant disturbance events. The most important measure for effects to optimal black-backed woodpecker habitat is the amount of salvage logging in recently burned areas. A more difficult to quantify measure is wildfire suppression because it likely prevents the formation of future black-backed woodpecker habitat, but to what degree is impossible to know.

Unburned areas are considered to be not optimal for black-backed woodpeckers, due in part to documentation that nesting success is not as high as in burned habitats. Vierling et al. (2008) found that nest success in moderate to high severity post-burns is extremely high (80-100%) and Bonnot et al. (2008) and Nappi and Drapeau (2009) found much lower nesting success in unburned areas (40-65%). Powell (2000) noted lower densities of black-backed woodpecker pairs in beetle-killed than burned forests in both the northern Rockies and eastern Cascades, suggesting that bark beetle outbreaks are not equivalent to burned forests in foraging value. However, there may not be recent post-burn habitat available at all times within the dispersal capability of this species. A measure for effects to sub-optimal

black-backed woodpecker habitat is the amount of salvage logging in forests recently infested by beetles.

A third type of foraging habitat for the black-backed woodpecker is old growth forest, and mid to late seral forests containing relatively abundant snags and dying trees. These forest types provide some level of habitat for wood-boring beetles, but in terms of productivity they provide less habitat for woodpeckers than does recent beetle infested forest which in turn has less rich foraging habitat than recently burned forest. The Forest Plan provides direction for these forest types including direction for old growth forest and for snag habitat. The Forest Plan has an old growth forest objective "A minimum of 5 percent of the commercial forest land within a timber compartment should be maintained in an old growth forest condition. A minimum stand size of 20 acres is recommended for old growth management." The Forest Plan direction for black-backed woodpecker snag habitat is to have 135 snags that are a minimum of 10" diameter at breast height per 100 acres in mixed conifer timber type. Therefore, these are measures for effects to black-backed woodpecker habitat based on the Forest Plan.

A habitat threshold for population viability for black-backed woodpecker was determined by Samson (2005, amended March 6, 2006). This measure will be used to ensure that a threshold of habitat is available to support a viable population of black-backed woodpeckers.

Methodology

In order to obtain acres of salvage of post-burn habitat, fire history and forest harvest records were queried. As noted, it is not possible to guess the number of acres of post-burn habitat that might have happened in the absence of fire suppression. Acres of salvage of post beetle infestation were also queried from forest records using an assumption that any harvest that occurred from 2008 through 2015 was a harvest of an area providing second quality foraging habitat for black-backed woodpecker. This conservative assumption will be used when assessing effects to black-backed woodpecker because analysis has not been done to ascertain where the year of harvest has occurred within 5 years of infestation by mountain pine beetle or other beetles to determine optimal foraging time. Acres of general snag habitat harvested are included as acres of second quality foraging habitat harvested, again, as a conservative way to analyze effects to black-backed woodpecker.

Forest Inventory and Analysis (FIA) data is a systematic, standardized system of data collection on forested plots. The sampling design is statistically defensible providing estimates of forest parameters (including snag count by diameter class) and standard error calculation. The base FIA data is appropriate for coarse-level (Ranger District, mountain range, or Forest) analysis. The Lewis and Clark NF has intensified the base grid four times to get mid-level data. The intensified grid data was collected during 2009 and 2010. The intensified grid data for the Little Belt Mountains was queried for dead trees per acre by diameter class (any tree species).

Snag data also comes from data collected in the field during project survey for old growth. Over 8,500 acres of forest were surveyed for old growth forest condition in the Moose Creek Project area during field seasons of 2015 and 2016. Number of snags per acre in different size categories are estimated with a walk through survey of each timber stand, and forest type is recorded. This information was

extrapolated to estimate the number of snags per acre across the entire project boundary area. A conservative approach was used to calculate remaining snags per acre after project implementation by assuming that all snags in project units would be removed.

Old growth information for the Moose Creek Vegetation project area comes from project field survey. Estimates of old growth for the entire Lewis and Clark National Forest is estimated from FIA data.

The work of Samson (2005, amended March 6, 2006) will be consulted to determine population viability for the black-backed woodpecker.

Habitat in the Moose Creek Project Area

Recent post-burn forest is considered optimal foraging habitat for the black-backed woodpecker. The most recent wildfire to occur in the Moose Creek project area was the Moose Mountain fire in 2012 which was 26 acres. Optimal foraging time for black-backed woodpeckers after wildfire has been reported to be within five years after a fire (Hutto 1995, Dixon and Saab 2000). This is due to wood-boring beetles that colonize after wildfires become less abundant over time. The Moose Mountain fire was not salvage harvested, and may still be providing some wood-boring beetle foraging, although with the small size of the fire and the number of years since burn it likely isn't important as foraging habitat. The Coyote Creek fire occurred in 1996 and was 3,400 acres; most of this fire occurred just outside the Moose Creek Vegetation project boundary. There was a salvage timber harvest of the Coyote Creek fire area; 282 acres were clear-cut in 1998. Likely this area provided high quality black-backed woodpecker foraging habitat for several years after the fire, except for what was salvaged, although no longer does so. Across the Little Belt Mountains there has been no sizeable wildfire that has occurred since 2012 to note.

Although it contains very little recent post-burn habitat, the Moose Creek Vegetation project area does include thousands of acres of mountain pine beetle infested forest. Harvest of mountain pine beetle infested and killed lodgepole pine will reduce insects available to woodpeckers for foraging. The majority of the acres of mountain pine beetle infestation in the project area occurred from 2007 through 2010. Woodpeckers feed on developing or overwintering larvae beneath the bark. The life cycle of the mountain pine beetle is typically one year for larval development. Once the larvae develop into adult beetles, they emerge from the tree and fly to infect other trees. Wood-boring beetles will often use trees killed by bark beetles for habitat. This extends the foraging opportunity for black-backed woodpeckers in mountain pine beetle killed forests to three to five years after initial infection. Therefore, by 2015, the majority of acres infested by mountain pine beetle likely no longer provide foraging habitat for black-backed woodpecker.

Overall there was 30 percent mortality across the Moose Creek Vegetation project area from the mountain pine beetle outbreak according to the Region's Forest Health Protection Report (Forest Health Protection Trip Report 2016). These dead trees provide general forest snag habitat for nesting and foraging for the black-backed woodpecker.

Overall number of snags per acre in two size categories and total snags per acre over 10" diameter at breast height are displayed in the table below. This information is extrapolated from project area survey as discussed in Methodology above.

Current condition of snags in Moose Creek Project Area	Snags Per Acre 10-15" DBH	Snags Per Acre >15" DBH	Total Snags Per Acre >10" DBH
All Forest Types	3.05	0.71	3.76
Lodgepole	2.79	0.63	3.42
Douglas-fir	3.42	1.15	4.57
Subalpine fir	5.27	1.54	6.81
Riparian Aspen	1	0.5	1.5
Mixed Conifer	3.4	0.79	4.19

Old growth also provides habitat for the black-backed because mature forest tends to have snags and decaying trees which provide some level of habitat for wood-boring beetles. The field survey for the Moose Creek Vegetation project verified there to be at least 1,106 acres of old growth and based on extrapolation of results, it is expected that there are several thousand more acres in the timber compartments that contain the project area, see old growth report for further details.

Habitat in the Lewis and Clark National Forest

The Rocky Mountain Ranger District on the Lewis and Clark National Forest is primarily wilderness where many acres have burned in recent years and have not been salvaged due to wilderness designation. Since 2012, 113,705 acres have burned, and only 288 acres were outside the Rocky Mountain Ranger District. Since 2015, 72,017 acres have burned. These acres should provide optimal foraging habitat for black-backed woodpecker through about 2020.

Recent insect infestation data is monitored through annual Aerial Detection Surveys and reported by number of acres infested and by damage agent on the Lewis and Clark National Forest. Results are not yet available for survey flown in 2016. The results of the annual survey from 2012 through 2015 are displayed in the table below. As the optimal foraging time frame for black-backed woodpeckers of a post-fire or post-insect infested forest has been reported to be three to five years after an event, current black-backed woodpecker foraging habitat is all acres infested since 2012 which totals 132,850 acres on the Lewis and Clark National Forest.

	2012	2013	2014	2015

Total Acres of Mountain Pine Beetle Infestation on the Lewis and Clark National Forest	92,721	33,844	5,746	539

Insect infestation that occurred longer than five years ago provides abundant snag habitat for black-backed woodpeckers. Aerial Detection Surveys were queried for the years 2007 through 2011 for the Lewis and Clark National Forest. The total acres of beetle infested forest from 2007 through 2011 is 861,609 acres.

	2007	2008	2009	2010	2011
Total Acres of Mountain Pine Beetle Infestation on the Lewis and Clark National Forest	19,300 *partial survey	52,666	379,914	341,810	67,919

In December, 2008 the Region One Vegetation Classification, Mapping, Inventory and Analysis Report 08-07 v2.0, Estimates of Snag Densities for Eastside Forests in the Northern Region (USDA Forest Service 2008, hereafter Eastside Snag Report) was completed.

The Eastside Snag Report (USDA Forest Service 2008) analyzed Forest Inventory and Analysis data for the five eastside National Forests (Beaverhead-Deerlodge, Custer, Gallatin, Helena, and Lewis and Clark).

The analysis was broken out in several ways, including plots located within and outside wilderness and roadless areas, plots by lodgepole and all other dominance groups, and plots by habitat type group (warm, cool and cold) for the other dominance groups. The Eastside Snag Report did not report snags by species forest type other than by lodgepole. The report provides ranges of snags by forest based on this analysis (USDA Forest Service 2008, Appendix C, Table 5, page 53). The Table below displays the results of the analysis for the Lewis and Clark. The data are the 90% confidence interval estimates derived from the plots of the entire forest (see USDA Forest Service 2008, for a complete discussion).

Snags per acre for the entire Lewis and Clark National Forest for snag analysis groups: lodgepole pine (PICO) dominance groups and all other dominance groups by habitat type group: by diameter class (USDA FS 2008, Appendix C, Table 5, page 53)

Dominance Group	Habitat Type Group	90% CI Ranges for Snags per acres by diameter class (Mean)		
		≥ 10.0" DBH	≥ 15.0" DBH	≥ 20.0" DBH
All other Groups	Warm	2.0 – 6.9 (4.2)	0.4 – 2.2 (1.2)	0.0 – 0.3 (0.1)
	Cool	7.8 – 15.1 (11.3)	1.5 – 3.3 (2.3)	0.3 – 1.1 (0.6)
	Cold	4.1 – 24.6 (12.9)	0.4 – 4.8 (2.4)	-
PICO	All	7.3 – 17.9 (12.2)	0.8 – 3.7 (2.1)	0.0 – 0.7 (0.3)

The Forest silviculturist generated a snag report for all species using FIA intensified grid data for the entire Little Belt Mountains as displayed in the following table.

Estimate of Dead Trees Per Acre for Little Belts from FIA data with 90% Confidence Interval			
Diameter at Breast Height	Estimate	Confidence Interval Low	Confidence Interval High
10.0-14.9	6.91	5.93	7.94
15.0-19.9	1.73	1.28	2.21
20.0-24.9, 25.0 plus	0.45	0.24	0.68
Total Greater than 10.0	9.09	7.45	10.83

The silviculturist also generated a snag report using FIA intensified grid data for all tree species greater than or equal to 10" diameter at breast height (DBH) and for all species that were not lodgepole, juniper, or aspen at the same diameter class. This report was run for the Sheep Creek 5th hydrologic unit code (HUC) that includes the Moose Creek Vegetation project area. The Sheep Creek watershed is 124,500 acres. The Estimate of Snags per Acre for the 5th code HUC watersheds is displayed in the table below.

Estimate of Dead Trees Per Acre Sheep Creek Watershed from FIA data with 90% Confidence Interval				
5th code HUC	Species	Estimate Based on (#of) Subplots	Confidence Interval Low	Confidence Interval High
Sheep Creek 1003010304	All Species Snags ≥ 10" DBH	13.90 (71) 1,390 snags/100 acres	9.29 929 snags/100 acres	19.02 1,902 snags/ 100 acres
	Snags ≥ 10" DBH; Species other than Lodgepole, Juniper, Aspen	5.09 (71) 509 snags/100 acres	2.37 237 snags/100 acres	8.56 856 snags/100 acres

An analysis titled Detailed Estimates of Old Growth and Large-Snags on the Lewis and Clark National Forest (Bush, Leach 2004) used all forested FIA plots located on the Lewis and Clark National Forest to estimate the proportion of old growth on all forested lands on the LCNF. Results indicate that there is 12% old growth with a 90% confidence interval of 10% to 15%.

Samson (2005, amended March 6, 2006) provided estimates for a black-backed woodpecker habitat threshold for a minimum viable population across the Northern Region of 29,406 acres. In 2008,

estimates of available black-backed woodpecker post-fire and insect-infested habitat based on Samson's work were updated using FIA data; black-backed nest habitat on the Lewis and Clark National Forest (LCNF) was estimated at 219,362 acres (USDA Forest Service 2008). This means that in 2008 there was seven times more available black-backed woodpecker habitat available on the LCNF alone than is necessary to maintain a viable population across the entire Northern Region.

Environmental Consequences

Direct and Indirect Effects to Black-backed Woodpecker

Direct effects of the Moose Creek Vegetation project would be mortality to adults or juveniles through timber harvest where there is an active nest in a tree that is felled. The likelihood of this occurring would be low given that few woodpeckers would currently be inhabiting the project area due to the current condition of the project area being third quality foraging habitat as described above. If this were to happen through project implementation it is expected to be insignificant to the population viability of black-backed woodpeckers because there is currently a large amount of quality foraging habitat currently available to support 402[1] black-backed woodpeckers, many more than is needed for a viable population (50 breeding individuals, see Samson, June 6, 2006).

Indirect effects of the Moose Creek Vegetation project include loss of foraging and nesting habitat for the black-backed woodpecker. Across the 2,353 acres of project treatment area, approximately 2,210 acres contain snags and trees that have been infested by insects and also contain trees that are susceptible to infestation in the future. Lodgepole pine stands would be regenerated through clear-cutting, and Douglas-fir dominated stands would be made healthier through commercial thinning which would remove general forest snag foraging and nesting habitat for the majority of the 2,210 acres. The majority of acres (over 2,000) of treatment proposed is lodgepole clearcut.

The trees that have not yet been infected by mountain pine beetle are still susceptible to mountain pine beetle and could support another outbreak in the near future. At this time very few of the acres of lodgepole regeneration units proposed for the Moose Creek Vegetation project are currently infested with beetles or with subsequent infection by wood-boring beetles. However, removal of these lodgepole stands (and removal of trees within Douglas-fir stands) would preclude them from becoming black-backed foraging habitat in the future as they are prone to a subsequent mountain pine beetle and Douglas-fir beetle infestation. The current state of the project area foraging opportunity for black-backed woodpeckers is third quality, general snag habitat. Therefore the project would remove the potential for future second quality foraging habitat from forming, and would remove third quality

[1] According to Samson (2006), 50 breeding individuals are necessary for a minimum viable population and 178 acres is the home range size for a black-backed woodpecker. Using the number of acres of forest burned since 2015 on the LCNF, subtracting a few hundred for acres of salvage harvest, and dividing by home range size results in an estimate that the Lewis and Clark can support at least 402 individual black-backed woodpeckers, which is many more than is needed for a viable population. Likely the LCNF could support even more individuals given the many acres of snag habitat on the forest.

habitat entirely. The 2,210 harvested acres would likely not be foraging habitat for at least 80 or more years.

The Forest Plan direction for black-backed woodpecker snag habitat is to have 135 snags that are a minimum of 10" diameter at breast height per 100 acres in mixed conifer timber type. FIA data reported shows results that more than meet the FP standard; at the finest scale reported (5th code HUC), average snags per 100 acres in timber types excluding lodgepole is 509 in the Sheep Creek 5th code HUC. Snags per acre have also been measured for the Little Belt Mountains and for the entire Lewis and Clark National Forest; in both these estimates, Forest Plan direction is exceeded for black-backed woodpecker habitat. Using data from any of the FIA estimates of snags results in removal of snags for the Moose Creek Project across 2,210 acres would not reduce the snags per 100 acres below 135; this meets Forest Plan direction for mixed conifer habitat for the black-backed woodpecker.

Estimates of snags per acre after project implementation was projected using project survey data. For mixed conifer forest, the post-project condition is estimated to be 301 snags >10" diameter at breast height per 100 acres, and this is more than meets the Forest Plan standard for black-backed woodpecker snag habitat. See table for details.

Post-Project condition of snags in Moose Creek Project Area	Snags Per Acre 10-15" DBH	Snags Per Acre >15" DBH	Total Snags Per Acre >10" DBH
All Forest Types	2.03	0.5	2.53
Lodgepole	1.78	0.42	2.2
Douglas-fir	2.68	1.02	3.7
Subalpine fir	1.12	.15	1.27
Riparian Aspen	1	0.5	1.5
Mixed Conifer	2.42	0.59	3.01

Cumulative Effects

Analysis Area

The Lewis and Clark National Forest will be used as the spatial boundary for determining population viability of black-backed woodpecker because this species responds to stochastic events that may occur with many miles between pockets of disturbance such as recent post-fire and recent beetle infestation events. These woodpeckers are known to disperse over long distances to use these ephemeral food-rich habitats. The Lewis and Clark National Forest is 2,000,056 acres and therefore large enough to have pockets of recently disturbed forest providing optimal foraging habitat to black-backed woodpeckers at most times.

Five years into the future will be used as the temporal boundary for considering effects to black-backed woodpecker post-burn and post-beetle infested habitat because the optimal foraging time frame for black-backed woodpeckers has been reported to be three to five years after these events. Five years is also an appropriate length of time when considering reasonably foreseeable actions that may add cumulatively to the effects of the Moose Creek Vegetation project due to the duration of optimal foraging habitat.

Projects and other activities that have effects to black-backed woodpecker that may add to project effects to result in cumulative effects are discussed here. Effects to recent post-burn habitat are assumed to be more significant to black-backed woodpecker than effects to recent beetle-infested habitat which in turn are assumed to be more significant to black-backed woodpecker habitat than old-growth and mid to late seral forest (general snag) habitat.

Affects to future post-burn habitat are hard to foresee as we cannot predict wildfires that may occur on the Lewis and Clark National Forest (LCNF). If a wildfire were to occur in an accessible area, it is very likely that some of the burned area would be salvage logged which would remove optimal habitat for the black-backed woodpecker. Fire suppression will continue to occur on the LCNF, but the future effects to black-backed woodpecker habitat are impossible to quantify. Wilderness areas will likely provide post-burn habitat in the future, as fires that occur in wilderness are not actively suppressed nor are they salvage logged.

Past effects to recent post-beetle infested habitat include timber harvest across the Lewis and Clark Forest. The mountain pine beetle epidemic began in about 2007, so any harvest from 2007 forward is considered here for past effects to black-backed woodpecker habitat. Due to the hundreds of thousands of acres of mountain pine beetle infested habitat since 2007, it was deemed unnecessary to look back further in history for past logging of snag habitat because the recent beetle epidemic created snag habitat in an unprecedented fashion when compared to the previous 100 years of known forest history.

For a conservative analysis, all harvest since 2007 is assumed to be recent post-beetle infested. Projects such as Roadside Hazard, Blankenship, Mass Geis, Miller Bingham, Showdown Hazard Tree, Sheep Creek Aspen and Monarch-Neihart have contributed to removal of 2,267 acres of black-backed woodpecker habitat.

Reasonably foreseeable effects to recent post-beetle infested habitat include forest management projects that have been planned but not yet implemented. This includes the Upper Sheep Creek and Castle Mountain projects along with units from projects mentioned in the above paragraph that have not yet been implemented; which would remove an additional 4,268 acres of black-backed woodpecker habitat.

From 2012 to 2015 on the Lewis and Clark National Forest, new mountain pine beetle infestation has created 132,850 acres of foraging and nesting habitat. Considering that 1,674 acres have been harvested since 2012, an additional 4,268 acres are planned to be harvested in the near future through projects already planned such as Upper Sheep Creek and Castle Mountain and adding to these the 2,210 acres

planned in the Moose Creek project, there would be 124,698 acres of recent mountain pine beetle infested habitat available to black-backed woodpecker on the LCNF.

Although several thousand acres of recent post-beetle infested black-backed woodpecker habitat have been and will be harvested on the Lewis and Clark National Forest hundreds of thousands of acres of snag habitat have been created by the mountain pine beetle epidemic. These acres in addition to the 113,705 acres that have burned since 2012 (where no more than a few hundred were salvage logged) are expected to provide habitat for a viable population of black-backed woodpeckers on the Lewis and Clark National Forest.

Conclusion

Determination

Analysis of FIA and project data shows that across the Lewis and Clark National Forest, number of available snags more than meets the Forest Plan standards for the black-backed woodpecker and the reduction of snag habitat by the Moose Creek Vegetation project would not decrease snags below Forest Plan standards.

The Forest Plan standard for old growth is met because the project would not affect old growth; see old growth report for details.

The Moose Creek Vegetation Project **May Impact Individuals or Habitat, but would Not Likely Contribute to a Trend toward Federal Listing or Loss of Viability to the Population or Species** for the black-backed woodpecker.

Rationale

The amount of foraging and nesting habitat that is created each year through insect infestation and wildfire on the Lewis and Clark National Forest is far greater than has been removed through harvest, and far greater than those acres that will be removed through harvest over the next five years leaving adequate amounts to support a viable population of the black-backed woodpecker. The level of forest management compared to the extent of the mountain pine beetle epidemic is insignificant.

Post-burn habitat is the highest quality black-backed woodpecker habitat; since 2015, 72,017 acres have burned on the Lewis and Clark National Forest (LCNF), and none of it will be salvaged. This should provide optimal habitat for black-backed woodpecker through 2020. Samson (2005, amended March 6, 2006) figured that to support a viable population for the entire Northern Region that 29,406 acres of habitat would be needed; the amount of recent post-burn habitat alone available just on the LCNF is more than double this.

Recent (2012-2015) post-beetle infested forest provides nesting and foraging habitat to the black-backed woodpecker. When considering the past and planned timber harvest of this habitat, there would still be 124,698 acres of recent beetle infested habitat available to black-backed woodpecker on the LCNF. This is more than twice what Samson (2005, amended March 6, 2006) figured was needed to support a viable population across the entire Northern Region.

Old growth and mid to late seral forests with abundant snags also provide some level of black-backed woodpecker habitat, although it is not as high quality foraging as recent post-burn and post-beetle infestation. Across the LCNF, there is estimated to be 240,000 acres of old growth forest. It is very unlikely that any old growth forest would be removed through timber harvest, and therefore old growth remains available to black-backed woodpeckers as habitat.

Due to the mountain pine beetle outbreak of 2007-2011, there is over 800,000 acres of abundant snag habitat. Although a small portion of this has been and will be harvested, including 2,210 acres in the Moose Creek Vegetation project, the majority of this remains available to black-backed woodpeckers as habitat.

Black-backed woodpeckers are capable of dispersing long distances and can easily access any of their foraging habitat on the LCNF as described above.

Evidence suggests the black-backed woodpecker is increasing in numbers in the United States (as cited in Dixon and Saab 2000) and there is no scientific evidence to suggest that the black-backed woodpecker is decreasing in numbers (see also Breeding Bird Survey trend data in project record).

There is an increase in the extent and connectivity of forested habitat since European settlement (Samson 2005, amended March 6, 2006). Habitat is abundant, has recently increased, and further increases are expected as fires and insect outbreaks continue to increase in size and in a pattern distinctly different from that evident historically. The amount of salvage timber harvest or overall timber harvest (0.09%) across the forested landscape of Region 1 is insignificant (Ibid.). If this species is dependent upon either post-fire or insect infested habitat, this habitat is well distributed across the Region and by Forest (Ibid.). As aerial detection surveys indicate, insect infested forest continues to happen and is likely not a limiting factor on the Lewis and Clark National Forest.

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Moose Creek Vegetation Project
Transportation Map
Helena - Lewis and Clark NF
2017

Road Legend

- Culvert Repair or Upgrade
- Temporary Bridge

Treatment, Level of Closure

- Maintenance of System Road
- Reconstruction of System Road
- Construction of Temporary Road (Decommission after project completion), Level 5
- Construction of Temporary Road (Decommission after project completion), Levele 5P
- Reconstruction and Storage after project completion, Level 1
- Reconstruction and Storage after project completion, Level 2
- Reconstruction and Storage after project completion, Level 3
- Reconstruction and Decommission after project completion, Level 5
- Reconstruction and Decommission after project completion, Level 5P
- Reconstruction (Decommission back to trail after project completion)

Legend

- Harvest Units
- PreCommercial Thinning Units
- White Bark Pine Units
- Aspen Treatments
- Boundary - 20,138ac.
- Ownership Non-USFS

N W E S

Rocking Chair Park ▲ · Moose Park ▲ · Moose Creek Campground · Moose Mountain ▲ · Sheep Creek Campground

WET CR · INDIAN CR · ALLAN CR · MOOSE CR · KINNEY CR · DANIELS CR · WOLSEY CR · JUMPING CR · ADAMS CR · RANCH CR · SHEEP CR

Rd T1-1 · Rd T2-2 · Rd 6408 · Rd 6408001 · Rd 6456 · Rd 6427 · Rd T7-3 · Rd 6427T017 · Rd 204 · Rd 20772 · Rd 2071 · Rd T43-1 · Rd T24-1 · Rd 6409 · Rd T17-1 · Rd 6412 · Rd 6410 · Rd 6410T004 · Rd 6410-A · Rd T16-2 · Rd 6404008 · Rd 6404 · Rd 6411 · Rd T14-1 · Rd T14-3 · Rd 6415 · Rd 6414 · Rd 6413 · Rd T36-1 · Rd T35-1 · Rd 119 · Rd 6416

1 · 2 · 3 · 6 · 7a · 7b · 8 · 15 · 15a · 16a · 16b · 17 · 18 · 19 · 20 · 22 · 23a · 23b · 24a · 24b · 27 · 28 · 29 · 31 · 32 · 33 · 34 · 35 · 36 · 38a · 38b · 38c · 38d · 38e · 38f · 38g · 38h · 38i · 38j · 38k · 38l · 38m · 38o · 38q · 39 · 40 · 41 · 41a · 43 · 46 · A · B · C · D · E · G

0 1.25 2.5 5 Miles

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Great Falls, Montana 59405
406-791-7700

Road Closure Levels

Level Allowed Suffix /E, /P /E Entrance Oblit, /P Path	Typical Device Site specific situation dependant	Typical Treatment All treatments are as-needed.
1	Gate	-Blade, seed, fertilize; Normal drainage (BMP's) -Treat noxious weeds
2	Gate, guardrail, concrete, earth barrier or re-contour intersection	-Type III dip, waterbars OR outslope -Scarify, seed, fertilize -May scatter slash -Treat noxious weeds
3-S Storage	Re-contour intersection (entrance oblit) or rock/earth barrier as needed.	-Waterbar or outslope -Remove CMP's & restore watercourse -Ditch relief pipes can remain w/ waterbars -Light scarify, seed,as needed -Treat noxious weeds
5 Decommission	Re-contour	-Re-contour entire prism -Remove all CMP's and restore watercourses -Seed and fertilize -Scatter slash on slopes -Treat noxious weeds -Path where appropriate (5P)

Moose Creek Vegetation Project Decision Map
Helena - Lewis and Clark NF
2017

Disclaimer:
The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those for which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify or replace GIS products without notification. For more information contact:

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1220 38th Street North
Great Falls, Montana 59405
406-791-7700

Legend

- Temporary Road (Decommission after project completion)
- Reconstruction and Storage after project completion
- Reconstruction of Permanent System Road
- Maintenance of Permanent System Road
- Harvest Units
- PreCommercial Thinning Units
- Whitebark pine Units
- Aspen Treatments
- Boundary - 20,138ac.
- Wildland Urban Interface
- Ownership Non-USFS

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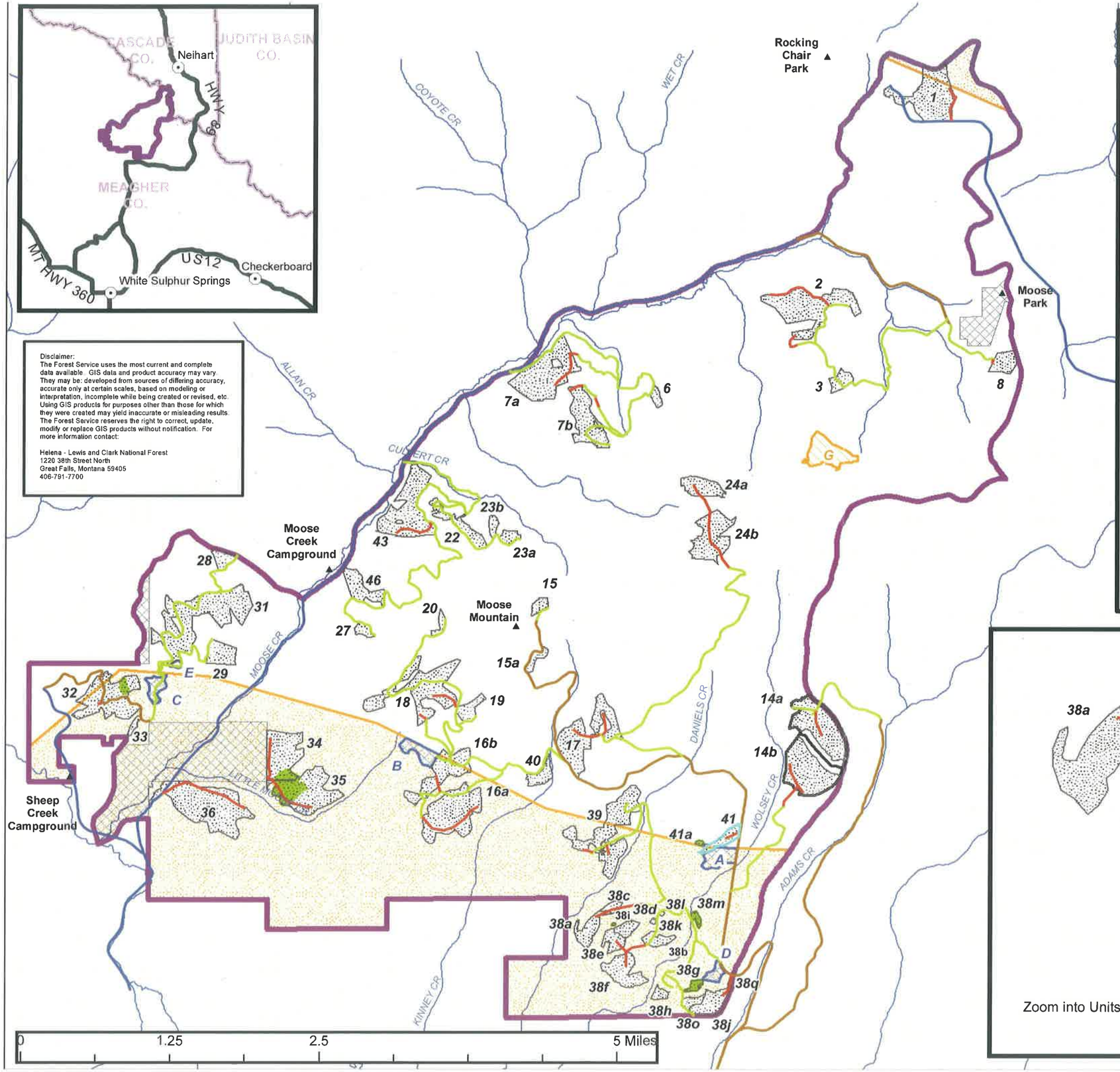

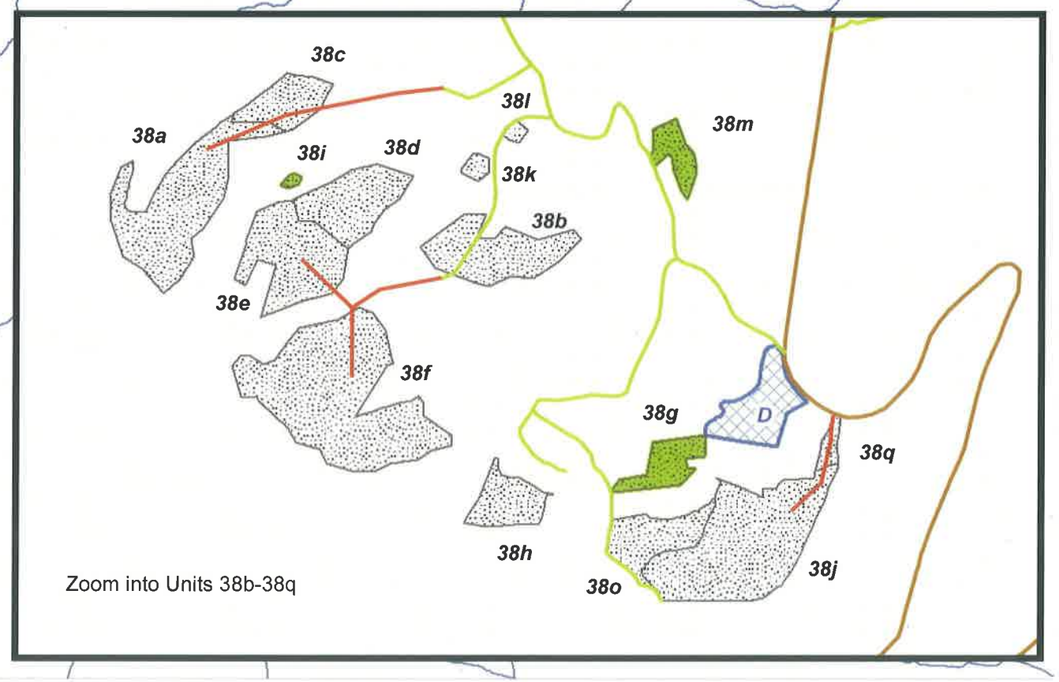

Zoom into Units 38b-38q