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Table 1. Mud Creek Project species eliminated from detailed analysis

SPECIES	Preferred Habitat	Species Present?	Determination[1,2]	Rationale for Elimination from Detailed Analysis	Applicable Design Features[3]	References
Threatened and Endangered Species (USDI-FWS 2020) T- Threatened						
Grizzly Bear (T) *Ursus arctos horribilis*	May use a variety of habitat types on Forest lands. Somewhat of a habitat generalist and highly variable between seasons, local populations, and individuals.	No	NE	• No species occurrence. • Not designated as "may be present "in the project area. • Grizzly bears have not been documented in any of the Grizzly Bear Analysis Units in or around the project area.		• Information for Planning and Consultation (IPAC), Environmental Conservation Online System (ECOS), US Department of Interior - Fish and Wildlife Service, accessed 01/05/2021
Yellow-billed Cuckoo (T) *Coccyzus americanus*	Riparian willow-cottonwood forests (>200 acres) along low-gradient rivers and streams, and in open riverine valleys that provide wide floodplain conditions (greater than 325 feet).	No	NE	• No species occurrence. • No suitable habitat. • Not known to occur on the BNF. • Insufficient habitat in project area to support a breeding pair.		• Information for Planning and Consultation (IPAC), Environmental Conservation Online System (ECOS), US Department of Interior - Fish and Wildlife Service, accessed 01/05/2021
Regional Forester Sensitive Species present on Bitterroot National Forest (USDA-FS 2011)						
Birds						
American peregrine falcon *Falco peregrinus anatum*	Cliff nesting (ledges); aerial foraging over open areas for small to medium-sized bird species prey.	Yes	NI	• Nesting habitat is limited to rocky cliff areas. • Proposed activities would not occur in suitable habitat and would not affect nesting habitat. • Minimal, temporary effects to individual falcons flying overhead from project activities. • Design features will eliminate impacts to nesting falcons.	• See EA Appendix A	• Montana Natural Heritage Map Viewer 2020 • Marks et al. 2016

SPECIES	Preferred Habitat	Species Present?	Determination[1,2]	Rationale for Elimination from Detailed Analysis	Applicable Design Features[3]	References
Bald Eagle *Haliaeetus leucocephalus*	Nesting trees/platforms near large rivers or lakes; available fish and water bird species prey.	Yes	NI	• Nesting areas are limited to large riparian areas on the West Fork Bitterroot River and Painted Rocks Lake . • Minimal, temporary effects to individual eagles flying overhead from project activities. • Design features will eliminate impacts to nesting eagles.	• See EA Appendix A • RHCA	• The Bald and Golden Eagle Protection Act (1940) • National Bald Eagle Management Guidelines (US Dept of Interior Fish and Wildlife Service 2007) • Montana Natural Heritage Map Viewer 2020
Mammals						
Northern bog lemming *Synaptomys borealis*	Wet riparian sedge meadows, bogs, fens	No	NI	• No species occurrence. • No suitable habitat.		• Montana Natural Heritage Map Viewer 2020
Townsend's big-eared bat *Corynorhinus townsendii*	Roosts in caves, mines, rocks and buildings. Forages over tree canopy, over riparian areas or water. Hibernates in caves or mines. Temporarily roosts in large snags.	No	NI	• Minimal to no potential for occupancy or disturbance. • No moderate or optimal predicted suitable habitat in the analysis area. • Cave/mine roosting habitat is limited/non-existent within the analysis area.	• RHCA	• Montana Natural Heritage Map Viewer 2020
Amphibians						
Coeur d'Alene Salamander *Plethodon idahoensis*	Spray zones near waterfalls or seeps in fractured bedrock.	No	NI	• No species occurrence. • No suitable habitat.		• Montana Natural Heritage Map Viewer 2020
Northern Leopard frog *Rana pipiens*	Non-forested ponds. Possibly extirpated from Bitterroot drainage.	No	NI	• No species occurrence. • No suitable habitat.		• Montana Natural Heritage Map Viewer 2020

SPECIES	Preferred Habitat	Species Present?	Determination[1,2]	Rationale for Elimination from Detailed Analysis	Applicable Design Features[3]	References
Western toad (Boreal toad) *Bufo boreas*	Mostly associated with wetlands and wet areas during the day, may range wider to drier sites during nighttime. Somewhat of a terrestrial habitat generalist; but largely associated with wetlands; breeds in ponds, slow streams.	Yes	NI	• Proposed activities may cause direct mortality to toads that are on the ground in these areas, but unlikely as activity is limited in and around RHCAs. • Road use and mechanical equipment would only pose a threat to toads during half of the year, as toads would be hibernating underground in winter. • Mortality threats largely eliminated from project activities because toads tend to associate with wetlands during the day while project activities are occurring.	• RHCA	• Montana Natural Heritage Map Viewer 2020

[1] The determination of effects for federally listed species (threatened or endangered) is limited to: (1.) NE - No effect; (2) NLAA - May effect - Not likely to adversely affect; (3) LAA - May effect - Likely to adversely affect; and (4) BE - Beneficial effect. Options in determination of effects for proposed federally listed species are: (1.) No effect; (2.) NLJ - Not likely to jeopardize the continued existence of the species or result in destruction or adverse modification of proposed critical habitat; (3.) Likely to jeopardize the continued existence of the species or result in destruction or adverse modification of proposed critical habitat. The determination is based on the presence of suitable habitat.

[2] Update to Forest Service Northern Region Sensitive Species List 2011. Options in determination of effects: (1) NI - No impact; (2) MIIH - May impact individuals, but is not likely to cause a trend to Federal listing or loss of viability; (3) LAA - Likely to result in a trend to Federal listing or loss of viability; and (4) BI - Beneficial impact. There would be "no impact" to sensitive species determined to be absent from the project area and not included in this table. The determination is based on the presence of suitable habitat.

[3] RHCA- Riparian Habitat Conservation Area

Table 2. Mud Creek Project species analyzed in further detail

SPECIES	Preferred Habitat	Species Present?	Determination[1,2,3]	Biological Evaluation section
Threatened and Endangered Species (USDI-FWS 2020) T- Threatened				
Canada Lynx (T) *Lynx canadensis*	Cool, moist habitat types dominated by subalpine fir/lodgepole pine/Engelmann spruce; vertical structural diversity in the under story for denning and abundant snowshoe hare prey; lack of human disturbance during denning .	No. Bitterroot National Forest is designated as "unoccupied" by the US Department of Interior - Fish and Wildlife Service.	NLAA	See ISSUE 1 Section
Regional Forester Sensitive Species present on Bitterroot National Forest (USDA-FS 2011)				
Birds				
Black-backed woodpecker *Picoides arcticus*	Burned or insect-killed snag concentrations, limited to 5 or 6 years following mortality. Individuals may occur in green forests with concentrations of insect-killed snags.	Possible. Few (< 5) recorded observations between 2001-2003 west of Painted Rocks Lake.	(No Action) - NI (Action Alt) - MIIH	See ISSUE 2 Section and black-backed woodpecker analysis section
Flammulated owl *Otus flammeolus*	Mature and old growth ponderosa pine with snags and open understory, with abundant moth species prey. Secure nesting habitat (< 35% canopy cover)	Possible. Few (<5) recorded observations between 2005-2008 near Rombo Creek Campground.	(No Action) - NI (Action Alt) - MIIH	See ISSUE 2 Section and flammulated owl analysis section
Mammals				
Bighorn sheep *Ovis canadensis*	Grasslands or open forest with steep, rocky escape cover. Semi-open to open vegetation types preferred.	Yes	(No Action) - NI (Action Alt) - MIIH	See ISSUE 2 Section and bighorn sheep analysis section
Fisher *Martes pennanti*	Moist coniferous forested types (including mature and old growth spruce/fir), riparian/forest ecotones. Suitable habitat predominantly along larger tributary streams in Bitterroot Mountains.	Multiple recorded detections since 1985 in the project area (BNF 2019, MNHP 2020)	(No Action) - NI (Action Alt) - MIIH	See ISSUE 2 Section and fisher analysis section
Gray wolf *Canis lupus*	Habitat generalist.	Yes	(No Action) - NI (Action Alt) - MIIH	See ISSUE 2 Section and gray wolf analysis section

Wolverine *Gulo gulo*	Large areas of unroaded security habitat; secure denning habitat in high elevation boulder talus or under log debris; ungulate carrion in winter. Suitable denning habitat in high elevation areas in Bitterroot and Sapphire ranges.	7 recorded detections between 2017-2018 along the western edge of the Project area (BNF 2019).	(No Action) - NI (Action Alt) - MIIH	See ISSUE 2 Section and wolverine analysis section
Management Indicator Species and other important species on Bitterroot National Forest (USDA-FS 1987)				
Elk *Cervus canadensis*	Habitat generalist. Winter range in lower elevation conifer/shrub/grasslands.	Yes	(No Action) - ME (Action Alt) - GB	See ISSUE 3 Section
Pine Marten *Martes americana*	Mature and older lodgepole, subalpine fir and spruce forests with abundant down logs.	Multiple recorded detections in the project area (MNHP 2020)	(No Action) - ME (Action Alt) - ME	See ISSUE 4 Section
Pileated woodpecker *Bonasa umbellus*	Mature and older lower to mid-elevation conifer forests or cottonwood gallery forests with large snags and down logs.	Multiple recorded detections in the project area (MNHP 2020)	(No Action) - ME (Action Alt) - GB	See ISSUE 4 Section

[1] The determination of effects for federally listed species (threatened or endangered) is limited to: (1.) NE - No effect; (2) NLAA - May effect - Not likely to adversely affect; (3) LAA - May effect - Likely to adversely affect; and (4) BE - Beneficial effect. Options in determination of effects for proposed federally listed species are: (1.) No effect; (2.) NLJ - Not likely to jeopardize the continued existence of the species or result in destruction or adverse modification of proposed critical habitat; (3.) Likely to jeopardize the continued existence of the species or result in destruction or adverse modification of proposed critical habitat. The determination is based on the presence of suitable habitat.

[2] Update to Forest Service Northern Region Sensitive Species List 2011. Options in determination of effects: (1) NI - No impact; (2) MIIH - May impact individuals, but is not likely to cause a trend to Federal listing or loss of viability; (3) LAA - Likely to result in a trend to Federal listing or loss of viability; and (4) BI - Beneficial impact. There would be "no impact" to sensitive species determined to be absent from the project area and not included in this table. The determination is based on the presence of suitable habitat.

[3] There is no specific determination for Forest Management indicator species related to ESA or NEPA. Determination of effects are categorized as: (1) GB - General Benefit; (2)ME - Minimal Effect; or (3)N - Negative Effect.

Table 3. Bitterroot National Forest Plan Direction related to wildlife

Forest Plan Component	Applicable Wildlife Direction
Forest-wide goal	Provide habitat to support viable populations of native and desirable non-native wildlife and fish.
	Maintain habitat for the possible recovery of threatened and endangered species.
	Maintain riparian flora, fauna, water quality and recreation activities.
Forest-wide Management Objectives	Provide optimal habitat on elk winter range.
	Maintain habitat to support viable populations of wildlife species.
	Maintain vegetative diversity on land where timber production is a goal of management.
	Participate and cooperate in threatened and endangered species identification, recovery, and protection.
	Maintain sufficient old-growth habitat on suitable timberland to support viable populations of old-growth dependent species.
Desired Condition of the Forest End of First Decade	Current wildlife populations and distribution are desirable and only minor changes will have occurred. Habitat diversity will have been changed only by insects, disease, and wildfire on the 70 percent of the Forest assigned to wilderness and roadless; and by the harvest of sawtimber on only 6 percent of the 30 percent outside of wilderness and roadless.
	Winter forage supplies for big-game animals will have increased slightly as forest canopies were removed and forage areas treated to improve production. Thermal and hiding cover will occupy more than 40 percent of the winter range area.
Desired Condition of the Forest End of the Fifth Decade	Minor changes in wildlife populations and distribution will have occurred. Habitat diversity will have been changed only by natural forces on the 70 percent of the Forest assigned to wilderness and roadless; and by the harvest of sawtimber on about 30 percent of the 30 percent outside of wilderness and roadless.
	Winter forage supplies for big-game animals will have increased significantly as timber canopies were removed and forage areas created to improve production. Cover on winter range will have been maintained at the desirable level of 40 percent of the winter range area.

Table 4. Bitterroot National Forest Plan Management Area Goals

Management Area	Management Goals	Acres	Percent
1	Emphasize timber management, livestock and big game forage production, and access for roaded dispersed recreation activities and mineral exploration. Assure minimum levels for visual quality, old growth, and habitat for other wildlife species.	11873	24%
2	Optimize elk winter ranger habitat using timber management practices. Emphasize access for mineral exploration and roaded dispersed recreation activities. Provide moderate levels of visual quality, old growth, habitat for other wildlife species and livestock forage.	14687	30%
3a	Maintain the partial retention visual quality objective and manage timber. Emphasize roaded dispersed recreation activities, old growth, and big game cover. Provide moderate levels of timber, livestock forage, big game forage and access for mineral exploration.	11894	25%
5	Emphasize motorized and non-motorized semi-primitive recreation activities and elk security. Manage big game winter range to maintain and enhance big game habitat. Manage existing road corridors to provide recreation access.	8066	17%
8a	Manage at the minimum level, but protect timber, soil, water, recreation, range and wildlife resources on adjacent management areas. Maintain existing uses and facilities.	132	<1%

Table 5. Other Relevant Law, Regulation, or Policy applicable to the Mud Creek Project

Law, Regulation, or Policy	Direction	How Project Complies with Statute
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.	Complies: Impacts to sensitive species have been minimized. See Biological Evaluation 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 [16 USC § 1604(g)(3)(B)].	Complies: All affected animal species were considered and provided for based on the suitability and capability of the land.
Endangered Species Act 1973	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.	Complies: Project actions are not likely to jeopardize the continued existence of any proposed, threatened, or endangered species. See Biological Assessment (cite doc #) and grizzly bear, lynx, and wolverine analysis sections.
Bald and Golden Eagle Protection Act	The Bald and Golden Eagle Protection Act (16 USC § 668a-d) prohibits any form of possession or taking of both bald eagles and golden eagles. The Final Rule's definition of disturb is defined in regulations at 50 CFR 5226; 22.3 AS: "To agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding feeding, or sheltering behavior. …" (USFWS, 2010.03.23, P. 4). The management goal is prevent the decline of breeding populations (USFWS, 2010.03.23, P. 4).	Complies: Proposed treatments are consistent with applicable laws, regulations, policy and direction for bald and golden eagles under this Act. See BE (cite doc #) and bald eagle analysis section.
Migratory Birds, EO 12962 of January 10, 2001	Executive Order 13186 requires agencies to ensure that environmental analyses evaluate the effects of federal actions and agency plans on migratory birds, with emphasis on species of concern. The Forest Service is required by the NFMA to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple use objectives." A wide variety of Neotropical Migratory Bird species are dependent on a landscape with diverse vegetation.	Complies: Proposed treatments are consistent with applicable laws, regulations, policy and direction for migratory bird species addressed in this analysis.

Table 6. Issues addressed

Issue Addressed	Section of Document	Type of Change Likely (Cause-Effect relationship)	Intensity of Likely Change (How much)	Context of Likely Change	Why this Likely Change and in this Context is/is not a Significant Impact
1. How would the project affect Threatened and Endangered Species?	See Environmental Consequences to Threatened and Endangered Species Analysis Section	Implementation of the proposed action will not perceptibly degrade species distribution, habitat suitability or quality. Changes in habitat arrangement, diversity, distribution or fragmentation may occur due to vegetation management activities.	Refer to Chapter 2 of the EA for the specific acreage amounts that may be affected from the proposed action or alternative.	Context of change largely depends on Canada Lynx life history. Refer to Threatened and Endangered Species Analysis Section.	Terrestrial Threatened and Endangered Species present in the project area are limited to Canada Lynx. The proposed action and applicable design features will minimize effects such that project activities are not likely to adversely affect Threatened and Endangered terrestrial Species (TES).
2. How would the project affect Regional Forester Sensitive Species?	See Biological Evaluation for Regional Forester Sensitive Species and Management Indicator Species on the Bitterroot National Forest Sections	Implementation of the proposed action will not perceptibly degrade species distribution, habitat suitability or quality. Changes in habitat arrangement, diversity, distribution or fragmentation may occur for some species due to vegetation management activities.	Refer to Chapter 2 of the EA for the specific acreage amounts that may be affected from the proposed action or alternative.	Context of change largely depends on species life history. Refer to table 8 (Appendix A) regarding species analyzed in further detail and rationale for species dropped from further analysis.	Impacts to various species relies heavily on life history requirements including habitat preference and home range. Sensitive Species present on the Forest have home ranges that vary from less than 1 acre (some amphibians) to >100,000 acres (wolverine). The proposed action and applicable design features will minimize effects such that project activities are not likely to cause a trend to Federal listing or loss of viability for Regional Forester Sensitive Species (SS); or adversely impact Management Indicator Species (MIS) of the Bitterroot National Forest.
3. How would the project affect elk and their habitat, including: quality and abundance of winter range; habitat effectiveness; and vulnerability/security?	See elk analysis section of the Biological Evaluation	Implementation of the proposed action will likely enhance the quality, abundance, and distribution of forage for elk and other large ungulates through removal of trees, prescribed burning, and noxious weed treatments.	Refer to the elk analysis section of this report for detailed analysis, discussion, and rationale regarding the importance of forage for elk and other ungulate species within the context of the proposed action or alternative.	Over 39,000 acres may be treated by some form of prescribed fire which would directly benefit forage quality for elk and other ungulates to some degree.	See elk analysis section. The elk population continues to grow in the analysis area and across the Bitterroot National Forest despite the lack of recommended thermal cover. Recent science illustrates the importance of elk forage distribution, availability, and quality to elk population dynamics.

Issue Addressed	Section of Document	Type of Change Likely (Cause-Effect relationship)	Intensity of Likely Change (How much)	Context of Likely Change	Why this Likely Change and in this Context is/is not a Significant Impact
4. How would the project (including the old growth amendment) affect wildlife species associated with or dependent on old growth (Management Indicator Species)?	See old growth section	Implementation of the proposed action is designed to retain old growth status for any stands being treated that meet the Green et al. (1992, errata corrected 2011) criteria. With the project-specific amendment, the plan standards to maintain old growth would still apply, but the amendment improves the method for measuring the amount of old growth in the project area and evaluating project effects, by modifying the criteria used to identify old growth based on better scientific information than was used in 1987 when the Bitterroot Plan was developed. No change to effects on wildlife species associated with or dependent on old growth is expected from this amendment.	Refer to Chapter 2 of the EA and the Vegetation and Silviculture Specialist Report (PF-SILV-001) and the Fuels Specialist Report (PF-FUELS-001) for the specific acreage amounts that may be affected from the proposed action or alternative.	The project is designed to retain the amount of current old growth habitat, and enhance forested stands that are approaching old growth status that may be affected by the proposed action. Wildlife species associated with or dependent on old growth habitat will be minimally affected. Refer to the old growth analysis section.	Analyzed species may have some degree of effect from the proposed action on old growth, largely beneficial. Neither species analyzed are endemic to only the project area. Proposed activities will not appreciably change the amount, extent, or distribution across the landscape, and will increase heterogeneity of forest habitat types and complexity at the landscape scale, which may provide beneficial effects to species distribution and connectivity.

Table 7. Activities or Events Considered for Cumulative Effects

Activity/Event	Past	Ongoing	Reasonably Foreseeable Future
Large Wildfires	X		X
Fire Suppression	X	X	X
Small Wildfires	X	X	X
Historic Snagging Operations	X		
Timber Harvests – Private Lands	X	X	X
Timber Harvests - FS Lands	X		
Site Preparation (Slashing, Dozer Piling, Dozer Trampling, Prescribed Burning, Pile Burning)	X		X
Tree Planting	X		
TSI (Weed and Release, Pruning, Pre-commercial Thinning)	X		X
Insects/Disease - Vegetation	X	X	X
Noxious Weed Treatments	X	X	X
Road Construction – FS Lands	X		
Trail Construction - FS Lands	X		
FS Road Decommissioning	X		
Motor Vehicle, ATV, and Snowmobile use on Designated Routes and Areas	X	X	X
Motor Vehicle use off Designated Routes and Areas	X	X	X
Hunting	X	X	X
Recreational use	X	X	X
Road and Trail Maintenance – FS and County	X	X	X

Table 8. Biological Evaluation Summary

SPECIES	Determination[1]	Potential Acres Impacted	Direct Effects	Indirect Effects
Regional Forester Sensitive Species present on Bitterroot National Forest (USDA-FS 2011)				
Birds				
Black-backed woodpecker *Picoides arcticus*	(No Action) - NI (Action Alt) - MIIH	• Up to 4,800 acres of commercial regeneration treatments. • Up to 8,900 acres commercial intermediate treatments. • Up to 2,150 acres of targeted treatments for cavity nester habitat. • Up to 39,320 acres of prescribed fire treatments.	Proposed activities may disturb nesting woodpeckers through noise or potential removal of nest trees by felling or burning.	Indirect effects could be both beneficial and slightly adverse. The proposed action could treat up to 39,320 acres with prescribed fire which would improve foraging habitat, but may damage nest trees. Vegetation management (13,700 acres of treatment in beetle-affected stands) may reduce potential nesting habitat (snags).
Flammulated owl *Otus flammeolus*	(No Action) - NI (Action Alt) - MIIH	• Up to 4,800 acres of commercial regeneration treatments. • Up to 8,900 acres commercial intermediate treatments. • Up to 2,150 acres of targeted treatments for cavity nester habitat. • Up to 39,320 acres of prescribed fire treatments.	Proposed activities may disturb nesting owls through noise or potential removal of nest trees by felling or burning if nest location is unknown. Known nest trees will be protected.	Indirect effects could be both beneficial and slightly adverse. The proposed action could treat up to 39,320 acres with prescribed fire which may improve foraging habitat, but may damage unknown nest trees. Vegetation management (13,700 acres of treatment in beetle-affected stands) may enhance old growth characteristics preferred by flammulated owl, but may also simplify or reduce preferred foraging habitat.
Mammals				
Bighorn sheep *Ovis canadensis*	(No Action) - NI (Action Alt) - MIIH	• Up to 3,682 acres of targeted treatments for bighorn sheep habitat enhancement. • Up to 39,320 acres of total prescribed fire treatments that may benefit bighorn sheep.	Proposed activities may disturb and displace bighorn sheep temporarily from preferred habitats through noise, human activities, or prescribed fire.	Indirect effects will be largely beneficial. Targeted treatment areas for prescribed fire will enhance forage and reduce encroaching conifers. Adverse effects include potential noxious weed invasion of recently burned areas.

SPECIES	Determination[1]	Potential Acres Impacted	Direct Effects	Indirect Effects
Fisher *Martes pennanti*	(No Action) - NI (Action Alt) - MIIH	• Up to 4,800 acres of commercial regeneration treatments. • Up to 8,900 acres commercial intermediate treatments. • Up to 39,320 acres of prescribed fire treatments.	Proposed activities may disturb and displace any fisher temporarily from preferred habitats through noise, human activities, or prescribed fire.	Indirect effects could be both beneficial and slightly adverse. Proposed activities would simplify the habitat in some areas by removing canopy cover, layers, coarse wood, and diseased and damaged trees. Greater heterogeneity on the landscape scale would be realized by creating diversity by breaking up monotypic stands of even-aged trees, creating openings, and enhancing regeneration.
Gray wolf *Canis lupus*	(No Action) - NI (Action Alt) - MIIH	• Up to 4,800 acres of commercial regeneration treatments. • Up to 8,900 acres commercial intermediate treatments.	Proposed activities may disturb and displace any wolves temporarily, or disrupt any denning or rendezvous sites through noise, human activities, or prescribed fire.	Indirect effects could be both beneficial and slightly adverse. Proposed activities could result in vegetation removal that would open sight distances and reduce hiding cover for wolves, thus potentially increasing mortality from hunting. Prescribed fire may benefit ungulate use of the area, thus potentially increasing prey availability.
Wolverine *Gulo gulo*	(No Action) - NI (Action Alt) - MIIH	• Up to 4,800 acres of commercial regeneration treatments. • Up to 8,900 acres commercial intermediate treatments. • Up to 39,320 acres of prescribed fire treatments.	Proposed activities may disturb and displace any wolverine temporarily through noise, human activities, or prescribed fire.	Indirect effects could be both beneficial and slightly adverse. Proposed activities would simplify the habitat in some areas by removing canopy cover, layers, coarse wood, and diseased and damaged trees. Greater heterogeneity on the landscape scale would be realized by creating diversity by breaking up monotypic stands of even-aged trees, creating openings, and enhancing regeneration.

[1]Update to Forest Service Northern Region Sensitive Species List 2011. Options in determination of effects: (1) NI - No impact; (2) MIIH - May impact individuals, but is not likely to cause a trend to Federal listing or loss of viability; (3) LAA - Likely to result in a trend to Federal listing or loss of viability; and (4) BI - Beneficial impact. There would be "no impact" to sensitive species determined to be absent from the project area and not included in this table. The determination is based on the presence of suitable habitat.

Table 9. Modeled Bighorn Sheep Habitat in the Analysis Area

Habitat Quality	Acres in Analysis Area	Percent of Analysis Area	Acres in Project Area	Percent of Project Area
Low	3,106	1%	264	1%
Moderate	15,634	4%	1,132	2%
Highest	33,962	9%	2,411	5%
Highest	40,274	11%	2,536	5%
Total	**92,976**	**26%**	**6,343**	**13%**
	Analysis Area Acres		Project Area Acres	
	357,965		48,486	

Table 10. Bitterroot National Forest Plan standards related to elk management.

Chapter	Topic	1987 Forest Plan Component	Section	Part	Subpart	Forest Plan Language
II	Forest Wide Management Standards	Standard	F	1	e(11)	Elk population status will be used as an indicator of commonly hunted ungulate species and the status of their habitat.
				1	e(12)	Big-game cover/forage relationships, as described in Guides for Elk Habitat Objectives (USDA, 1978), will be a consideration in planning timber management activities.
				1	e(13)	The recommendations in the "Coordinating Elk and Timber Management" report will be considered during timber management and transportation planning (Lyon, et al, 1985).
				1	e(14)	Manage roads through the Travel Plan process to attain or maintain 50 percent or higher elk habitat effectiveness (Lyon, 1983) in currently roaded third order drainages. Drainages where more than 25 percent of roads are in place are considered roaded. Maintain 60 percent or higher elk habitat effectiveness in drainages where less than 25 percent of the roads have been built.
				1	e(15)	If, for three years running, the bull elk harvest during the first week of the hunting season exceeds 40 percent of the total bull harvest, additional fall road closures will be considered.

Table 11. Acres and percent of cover and forage in winter range in the analysis area.

Area	Acres	Percent
Elk Analysis Area	355,449	
Winter Range	94,401	27%
Winter Thermal Cover ≥ 60 % Canopy	10,287	11%
Winter Thermal Cover ≥ 70 % Canopy	1,474	2%

Table 12. Acres and percent of cover and forage in winter range in the analysis area.

Area	Acres	Percent
Elk Analysis Area	355,449	
Winter Range	94,401	27%
Satisfactory Winter Cover	10,287	11%
Marginal Winter Cover	35,560	38%
Forage[1]	38,409	41%

1Forage is described in Thomas et al. 1988 as "all areas that do not meet the definition of satisfactory or marginal cover". The Vmap model excluded areas of water, slopes > 75%, and urban and sparse areas, as elk are seldom found in these areas in the winter.

Table 13. Order Drainages that intersect the project area boundary.

3rd Order Drainage	Status	Sq. Miles	Current Open Rd Miles	Density (Rd Miles/Sq. Miles)	EHE Density Standard	Meets EHE?
01a453-1	Roaded	2.47	14.99	6.07	2	NO
01a453-2	Roaded	7.16	16.27	2.27	2	NO
01a454-1	Roaded	4.43	15.81	3.57	2	NO
01h437-1	Unroaded	6.04	5.96	0.99	1	YES
01h446-2	Unroaded	1.13	2.62	2.32	1	NO
01h447-1	Unroaded	11.95	1.77	0.15	1	YES
01h447-2	Unroaded	0.42	0.23	0.55	1	YES
01i433-1	Roaded	8.00	25.41	3.17	2	NO
01i436-1	Roaded	8.25	41.63	5.05	2	NO
01i436-2	Roaded	4.23	7.47	1.77	2	YES
02e425-1	Unroaded	2.13	1.88	0.88	1	YES
02e427-1	Roaded	3.44	7.69	2.23	2	NO
02f427-2	Roaded	2.87	7.47	2.60	2	NO
02f427-3	Roaded	2.09	0.72	0.34	2	YES
02f428-1	Unroaded	0.69	3.08	4.45	1	NO
02f428-2	Roaded	3.76	2.82	0.75	2	YES
02f430-1	Unroaded	4.41	0.48	0.11	1	YES
02f430-2	Roaded	5.34	20.84	3.90	2	NO
02f430-3	Roaded	2.14	3.04	1.42	2	YES
02f431-1	Unroaded	2.59	2.62	1.01	1	NO
02f432-1	Unroaded	11.91	0.06	0.01	1	YES
02f432-2	Unroaded	1.69	4.90	2.89	1	NO
02f434-1	Roaded	7.92	33.18	4.19	2	NO
02f435-1	Unroaded	3.07	0.43	0.14	1	YES
02f435-2	Unroaded	4.03	0.58	0.14	1	YES
02f435-3	Unroaded	3.85	0.41	0.11	1	YES
02i452-1	Unroaded	3.39	1.79	0.53	1	YES
02i452-2	Roaded	4.20	12.02	2.86	2	NO

Table 14. Cover/Forage acreage and percentages for the analysis area and project area.

Optimum Habitat Proportions (USDA-FS 1978)					Analysis Area				Project Area			
					Total Area		Winter Range		Total Area		Winter Range	
					Total Acres:	355,345	Total Acres:	94,401	Total Acres:	48,473	Total Acres:	27,407
		% of Net Area	+/-	Total %	Acres	%	Acres	%	Acres	%	Acres	%
Hiding Cover		25%	5%	40%	69,839	20%			9,365	19%		
	Winter	20%					10,781	11%			3,388	12%
Thermal Cover		15%			42,596	12%			6,150	13%		
	Winter	20%					10,283	11%			3,219	12%
Forested Forage		40%	10%	60%	210,489	59%	71,134	75%	34,709	72%	21,714	79%
Open Forage		20%			71,152	20%	6,441	7%	2,684	6%	966	4%

Table 15. Acres and percent of security areas in the analysis area.

Area	Acres	Percent
Elk Analysis Area	355,449	
Forested Security Areas	194,464	55%
All Areas > .5m from open road during rifle season and > 250 acres	258,579	73%

Table 16. Wildlife Species associated with or dependent on Old Growth Evaluation Summary

SPECIES	Determination[1]	Potential Acres Impacted	Direct Effects	Indirect Effects
Management Indicator Species on Bitterroot National Forest (USDA-FS 1987)				
Pine Marten *Martes americana*	ME	• Up to 4,800 acres of commercial regeneration treatments. • Up to 8,900 acres commercial intermediate treatments. • Up to 39,320 acres of prescribed fire treatments.	Proposed activities may disturb and displace pine marten temporarily through noise, human activities, or prescribed fire.	Indirect effects could be both beneficial and slightly adverse. Proposed activities would simplify the habitat in some areas by removing canopy cover, layers, coarse wood, and diseased and damaged trees. Greater heterogeneity on the landscape scale would be realized by creating diversity by breaking up monotypic stands of even-aged trees, creating openings, and enhancing regeneration.
Pileated woodpecker *Bonasa umbellus*	GB	• Up to 4,800 acres of commercial regeneration treatments. • Up to 8,900 acres commercial intermediate treatments. • Up to 2,150 acres of targeted treatments for cavity nester habitat. • Up to 39,320 acres of prescribed fire treatments.	Proposed activities may disturb nesting woodpeckers through noise or potential removal of nest trees by felling or burning.	Indirect effects could be both beneficial and slightly adverse. Proposed activities, other than regeneration harvest, are designed to favor retention of large-diameter trees and retain low-to-moderate canopy cover, limiting the indirect impacts to pileated woodpeckers.

1There is no specific determination for Forest Management indicator species related to ESA or NEPA. Determination of effects are categorized as: (1) GB - General Benefit; (2)ME - Minimal Effect; or (3)N - Negative Effect.