United States
Department of
Agriculture

Forest
Service

Northern Region

Idaho Panhandle
National Forests

St. Joe
Ranger District

November
2008

Fallen Bear

Environmental Assessment

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Fallen Bear Environmental Assessment

USDA Forest Service
Idaho Panhandle National Forests
St. Joe Ranger District
Shoshone County, Idaho

INTRODUCTION

This environmental assessment (EA) discloses the foreseeable environmental effects of the Fallen Bear proposal for determining whether or not to prepare an environmental impact statement. The Fallen Bear resource reports cited in this EA can be obtained from the St. Joe Ranger District office in St. Maries, Idaho or from the Idaho Panhandle National Forests website (www.fs.fed.us/ipnf/eco/manage/nepa/index). The EA summarizes the environmental consequences of the alternatives.

The 10,500-acre project area is located approximately 13 miles southwest of St. Regis, Montana and 16 miles east of Avery, Idaho in part or all of Sections 1-6, 9-12, 14, T. 44 N., R. 8 E.; part of Section 36, T. 45 N., R. 7 E.; part or all of Sections 21-36, T. 45 N., R. 8 E.; Boise Meridian (see Project Area and Vicinity Map). The project area is roughly triangular in shape with the St. Joe River forming the southwest boundary, Quartz Ridge forming the northwest boundary, and the ridge between Bruin Creek and Gold Creek forming the east boundary. All lands in the project area are National Forest System lands, but Shoshone County maintains Forest Highway 50 along the southwest boundary of the project area. The project area does not include any designated wilderness or inventoried roadless areas.

NEED FOR THE PROPOSAL

In 2004 the St. Joe Ranger District completed an Ecosystem Assessment at the Watershed Scale (EAWS) and a roads analysis process (RAPS) for the Quartz Gold Analysis Area which encompassed the current Fallen Bear Project Area. These assessments identified management opportunities that would bring the Quartz Gold Area closer to the Forest Plan desired condition. The Quartz Gold Project was not carried forward, and in 2007 an interdisciplinary team narrowed the scope of analysis and conducted an EAWS for the Fallen Bear Area. The team also reviewed the RAPS and concluded that the findings were still valid.

In addition to the EAWS and RAPS, the development of the purpose and need for this project was guided by goals, objectives, and standards in the Idaho Panhandle National Forests Forest Plan as well as information in the “Integration of Forest Planning into Ecosystem Management Toward a Forest Ecosystem Approach: An Assessment for the St. Joe Area” known as the “St. Joe Geographic Assessment”. Information from the Upper Columbia River Basin Integrated Scientific Assessment was also used.

This project is consistent with the, “Region One Integrated Restoration and Protection Strategy” because it would maintain and establish early-seral, resilient tree species; improve watershed conditions through the storage and decommissioning of roads; and improve elk security through changes in road prescriptions.

Purpose and Need

It was determined that there is a need to:

- **Manage the vegetative resources to improve resilience to disturbances such as insects, disease, and fire**
  - There is a need to accelerate or maintain the development of long-lived, early-seral, shade-intolerant species (western white pine and western larch). With the substantial increase in mid-to late-seral species dominance and decrease in early-seral species, forest resiliency following disturbance is decreasing; and the risk of stand loss to insects, disease and fire is increasing.

    Larch, ponderosa pine, and white pine are fire-adapted and relatively drought-tolerant tree species as compared to the mid to late successional species. In the northern Idaho climate these early seral tree species are potentially capable of dominating sites for centuries, and are capable of producing high

biomass and large wood that serve important ecosystem functions. Conversely, hemlock and grand fir are two of the more moisture-demanding tree species in this ecosystem, and are highly stressed during drought periods. Historically unprecedented quantities of drought-sensitive species in an area subject to periodic droughts create increased risk of large-scale insect and disease outbreaks and mortality. Hemlock and grand fir are also more fire-intolerant than the species they replaced, creating a risk of high mortality in any fires that occur.

Douglas-fir and grand fir are very susceptible to root pathogen mortality. Dominance by these species can convert root pathogens from thinning agents to landscape-scale major disturbance agents. Replacement of white pine/larch/ponderosa pine forest types by Douglas-fir/grand fir/hemlock forest types significantly accelerates successional rates, and decreases tall tree canopy cover, large tree and large wood production, and biomass productivity.

- There is a need within the Fallen Bear Analysis Area to promote white pine and larch through active management, and accelerate or maintain large-diameter trees in stands with a high percentage of larch.
- There is a need to reduce the spread of dwarf mistletoe, associated with western larch, in previously harvested seed tree stands. Existing stands with western larch seed trees infected with dwarf mistletoe are increasing the potential of infection to existing regeneration.
- There is a need to reduce stand densities to enhance and encourage resilience to insects, disease, and other disturbances.

- **Reduce management related erosion and sedimentation**

  Aquatic resources would benefit from a reduction in human-caused sediment. The existing road system reduces infiltration and generates sediment. The risk of mass failure is increased where stream-crossing culverts do not comply with the IPNF Forest Plan standard of accommodating a 100-year flood flow.

- **Increase wildlife security**

  Elk Habitat Potential (EHP) is currently below the Forest Plan target for Elk Habitat Unit 10 (Quartz Creek and Gold Creek Drainages). The amount of secure habitat (more than ½ mile from an open road or trail) is a key factor in determining EHP. To increase the amount of secure habitat and trend towards the EHU 10 target, motorized use on existing roads and trails would have to be reduced in the analysis area. To best meet the elk habitat potential, security areas should be well dispersed throughout the analysis area and road closures should be effective in eliminating motorized use on the road system.

- **Provide wood products for local communities**
  - There is a need to contribute to local employment, income and lifestyles (Forest Plan II-11) through long-term growth and production of commercially viable wood products and cost-effective timber production (Forest Plan III-2, III-16).
  - The St. Joe Ranger District committed to providing biomass for the St. Maries Fuels to School Project. The Forest Service will initially supply biomass to get the Heyburn Elementary School biomass heating system going (St. Maries Joint School District #41, 2007, Heyburn Elementary Woody Biomass for Energy Application, Appendix C).

Forest Plan Direction

The need for this proposed action in the Fallen Bear Project Area is based on the Idaho Panhandle National Forests' Forest Plan. The St. Joe Ranger District's proposal would meet the goals in the following management areas:

- MA-1: Timber Production (Forest Plan Vol. 1 p. III-2) Lands are variable. Vegetation is mostly mixed conifer, all major habitat types are present. Goals: Manage lands suitable for timber production for the long term growth and production of commercially valuable wood and protect soil, meet water quality standards, provide wildlife habitat, provide dispersed recreation and meet visual quality objectives.
- MA- 4: Big Game Winter Range with Timber Production (Forest Plan Vol. I p. III-17) Lands are generally below 4,000' elevation. Vegetation includes brush fields and all stages of forest cover. Elk winter range,

white tailed deer winter range. Goals: Manage big game winter range through scheduled timber harvest and permanent forage areas and provide long-term growth and production of commercial wood products, provide cost effective timber production, protect soils, meet water quality standards, provide dispersed recreation consistent with wildlife needs and meet visual quality objectives.

- MA-9: Non-forest lands, lands not capable of producing industrial products or physically unsuitable for timber production (Forest Plan Vol. I p. III-39). Steep slopes, thin soils, and surface rock or rock outcrops. Many lands are on higher ridge tops above 5,000 feet elevation. Goals: Manage to maintain and protect existing improvements and resource productivity potential while meeting visual quality objectives.
- MA-12: National Wild and Scenic River System: St. Joe River (Forest Plan Vol. I p. III-52). The St. Joe River is classified as a Scenic River from Spruce Tree Campground to its junction with the North Fork of the St. Joe River. Goals: Manage the St. Joe River in accordance with the Development and Management Plan (Appendix Z of the IPNF Forest Plan), and maintain and improve big game winter range habitat, provide a full spectrum of river- related recreational experiences, maintain existing water quality and protect important fish habitat, and meet visual quality objectives.
- MA-16: Aquatic Ecosystems and Adjacent Uplands (Forest Plan Vol. I p. III-68): Includes important fisheries streams. Contains a great diversity of vegetation. Provides access with major roads either within or adjacent to the management area. Receives highly concentrated recreation use. Goals: Manage to feature riparian dependent resources and meet or exceed state water quality standards, protect soil productivity, provide cost effective timber production, provide wildlife habitat, provide opportunities for dispersed recreation consistent with riparian protection, and meet visual quality objectives.

SCOPE OF THE PROJECT

Forest planning takes place at several levels: national, regional, forest, and project. Fallen Bear is a project-level analysis. Its scope is confined to addressing the issues and possible environmental consequences of the proposed activities. It does not attempt to address decisions made at higher levels. It would, however, implement direction provided at those higher levels.

The scope of the project refers to both the affected geographical area and the timeframe of the proposal including any connected, similar, or cumulative actions. All proposed activities would occur within the Fallen Bear Project Area. Implementation would begin in 2009 with the following estimated timing of activities. These dates are tentative based upon budgets, workforce, market conditions, and other considerations. Actual dates of implementation and accomplishment could vary.

Activity	Anticipated Timing of Activity
Precommercial thinning, white pine pruning, and dwarf mistletoe treatment	2009 – 2010
Road construction and reconstruction	2010 – 2011
Timber harvest	2010 – 2015
Slash treatment and reforestation	2012 – 2017
Road storage and decommissioning	2010 – 2018

RESPONSIBLE OFFICIAL

The responsible official for this decision is the Forest Supervisor for the Idaho Panhandle National Forests (IPNF). The address for the Idaho Panhandle National Forests is: 3815 Schreiber Way, Coeur d'Alene, Idaho, 83815.

PUBLIC INVOLVEMENT PROCESS

District Ranger, Chuck Mark, met with the Coeur d'Alene Tribe to discuss projects on the St. Joe Ranger District, including the Fallen Bear project, on March 18, 2008 (project file PI-1). The representatives of the tribe did not express concerns about the project. On April 9, 2008 Chuck Mark sent a letter, scoping notice, map of the proposed action, and a comment form to the public (PI-3) concerning Fallen Bear (project file PI-2). The scoping notice explained how the proposal was developed, described the purpose and need for action, listed forest plan management area direction, described the proposed action, and identified preliminary issues. That information was posted on the IPNF website on April 10, 2008 (PI-4). Fallen Bear was first listed on the IPNF's April 2008 Quarterly Schedule of Proposed Actions (PI-5). One individual, six groups, and two agencies provided input during this comment period. Their comments were addressed in the resource reports summarized in this EA or in the Scoping Report (PI-6).

Issues

An issue is a point of undesirable or unintended effect that would or may occur if the proposal were implemented. Preliminary issues include:

- Effects of Vegetative Management and Roads on Water Quality, Water Yield & Fish Habitat – Existing roads, new road construction and commercial timber harvest could produce sediment and increase water yield that may affect water quality and fisheries habitat.

  Issue Measurement Criteria:
  - Changes in water yield (%)
  - Year water yield would return to existing condition
  - Sediment increase from road construction, timber harvest, and fuels treatment (%)
  - Year sediment from road construction, timber harvest, and fuels treatment would return to existing
  - Sediment decrease after completion of all activities (tons/year and %)
  - Number of stream crossings removed and remaining
  - Miles of road segments within 50 feet of stream channels removed
  - Miles of long-term trend of fish habitat function

- Effects of Vegetative Management on Soil Productivity - Soil productivity can be reduced by removal of organic material and associated nutrients or by detrimental impacts such as compaction, displacement, puddling, or severe burning.

  Issue Measurement Criteria:
  - % of detrimental soil disturbance by activity area
  - Discussion of effects on organic matter and coarse woody debris
  - Discussion of effects on nutrient levels
  - Discussion of possibilities of erosion and mass failure

- Effects of Timber Harvest and Road Construction on Wildlife Habitat - Commercial timber harvest and road building may fragment habitat for Threatened, Endangered, Sensitive and Management Indicator Species; affect travel corridors for wildlife; affect interior forest habitat; and have cumulative effects on species and their habitat.

  Issue Measurement Criteria:
  - Relevancy to determine level of analysis: Evidence of species occurrence, capable or suitable habitat present, potential for the proposed action to affect a species or its habitat
  - Disturbance/Access: Open road miles and open road densities
  - Connectivity: # of units w/in travel ways, requiring leave tree retention adjustment, that reduce quality of timbered connection; # of times new road construction would bisect travel corridors
  - Canada lynx: Compliance with NRLMD and acres of stand initiation habitat and acres of regeneration cuts the last decade by LAU; acres and % of secure habitat

- Gray wolf: Open road density, % secure habitat, elk habitat potential
- Fisher (and marten): Acres and % of suitable habitat and open road density
- Wolverine: Open road density, % secure habitat, elk habitat potential
- Flammulated owl: Acres of suitable habitat, number of potential nesting territories, suitable acres w/in territories
- Western toad: Acres of reduced upland timbered habitat quality, number of new stream crossings
- Northern goshawk: # of nest stands or nest areas that would become unsuitable, acres of potential nesting habitat that would be made unsuitable
- Pileated woodpecker: Acres of foraging habitat with reduced quality, acres converted to non-foraging, acres of nesting habitat with reduced quality, acres converted to non-nesting
- Elk: Open road density, acres of secure habitat, % security, elk habitat potential

- Effects of Timber Harvest and Road Construction on Stands that Meet Minimum Criteria for Old Growth – The proposed action includes timber harvest in three stands (approximately 68 acres) that are mature or over mature and meet old growth criteria based on *Old-Growth Forest Types of the Northern Region* (Green and others 2005). These three stands are not currently allocated old growth. In addition to treatment, approximately 0.3 miles or 1.1 acres of new system road construction is proposed through one of the three stands. Forest Plan standards for old growth retention would continue to be met (Old Growth Report pp. 5-7).

  Issue Measurement Criteria:
  - Acres of treatment in stands that meet minimum criteria for old growth
  - Length and acres of road construction through stands that meet minimum criteria for old growth or are allocated for old growth management

ALTERNATIVES

The National Environmental Policy Act (NEPA) requires federal agencies "to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment" (40 CFR 1500.2(e)). This section describes potential management alternatives to address the purpose and need for the Fallen Bear Project Area as described above. It also lists project design features that were identified to avoid or reduce potential adverse effects of proposed activities. The no-action alternative (Alternative A) is required by NEPA (1502.14(d)) and provides a baseline for comparison of environmental consequences of the proposed action. The proposed action (Alternative B) was carefully designed to meet the purpose and need and address environmental concerns in the project area. Scoping comments questioned the need for 3.7 miles of road construction and indicated a desire to have an alternative with no new road construction. After considering comments from the public and additional field review some of the proposed road construction was eliminated, so the proposed action described in this EA includes one mile less road construction than the proposed action described in the Scoping Notice. An alternative with no road construction was considered but was eliminated from detailed study as discussed below. Alternative C was developed to address concerns about impacts of roads and effects to old growth. It would address issues raised by the proposed action by reducing new road construction and reconstruction and not harvesting timber in stands that meet the minimum criteria for old growth.

Alternatives Eliminated From Detailed Study

An alternative with no road construction was considered, but it was not analyzed in detail because it would not be economically viable and it would not adequately address the purpose and need (project file documents PD-16 and E-4). With no new roads the timber volume would not cover the costs of road reconstruction to access the remaining units. We considered temporary roads, but determined they should actually be engineered system roads that would remain for future use. The management areas and proposed silvicultural prescriptions indicate that access to these areas would be required in the future.

Alternative A - No Action

This alternative provides a baseline for comparison of environmental consequences of the proposed action to the existing condition and is a management option that could be selected by the Responsible Official. The results of taking no action would be the current condition as it changes over time due to natural forces and ongoing management.

This alternative continues ongoing management activities such as fire suppression, access management, and road maintenance. Natural processes such as insects and diseases in trees and vegetation succession with fire exclusion would continue their current trends. This alternative would not address identified P&N.

Alternative B - Proposed Action

The St. Joe Ranger District proposes the following activities in Alternative B summarized in the table below and described after the table. The proposed action described in the Scoping Notice for Fallen Bear included 3.7 miles of new road construction and 18.7 miles of road reconstruction. The proposed action was modified to address concerns about the amount of road work and now includes less road construction and reconstruction. Details about each activity are in *Common Features of Action Alternatives* and *Design Features* below.

Table 1 – Summary of Activities Proposed in Alternative B

Proposed Activity	Amount	Estimated Dates
Commercial Timber Harvest	483 acres	2010-2014
New Road Construction	2.8 miles	2010-2011
Road Reconstruction	17.9 miles	2010-2011
Activity Fuel Treatments	502 acres	2012-2016
Precommercial Thinning	775	2009
White Pine Pruning	777	2009
Girdling existing larch seed trees to limit spread of dwarf mistletoe	161 acres	2009
Inoculating girdled trees with heart rot to create cavity habitat sooner	50-100 trees	2009
Planting conifer seedlings	195 acres	2013-2017
Pocket Gopher Control on Planted Areas	195 acres	2014-2018
Changing Road Management Prescriptions	67 miles	2010-2015

Commercial Timber Harvest (Table 2, Map 2) – Alternative B includes timber stand improvement using commercial timber harvest on approximately 483 acres with skyline yarding on approximately 392 acres and tractor skidding on 91 acres. Commercial thinning would be used on 288. Regeneration harvest is proposed where stands have minimal amounts of western larch and white pine. Regeneration harvest is prescribed for a total of 195 acres consisting of the following silvicultural systems: 99 acres of a clearcut with reserves, 72 acres of shelterwood cuts, and 24 acres of seedtree cuts.

New Road Construction and Road Reconstruction (Map 2) - Approximately 2.8 miles of new road construction and 17.9 miles of reconstruction would be necessary to implement the envisioned timber harvesting systems (See Map 2). When timber harvest and associated activities are complete the newly constructed roads would be put into Road Management Prescription C (see discussion below).

Fuel Treatment (Table 2) - Fuel treatments would include 202 acres of underburning with hand fireline construction, 204 acres of lopping, 34 acres of yarding top within 200 feet of roads, and 62 acres of grapple piling slash followed by pile burning.

Planting - Early-seral western white pine and western larch seedlings would be planted on approximately 195 acres in areas proposed for regeneration harvest.

Pocket Gopher Control - Pocket gopher control baiting may be done to control pocket gophers on approximately 195 acres in areas proposed for regeneration harvests if needed to protect regeneration.

Precommercial Thinning & White Pine Pruning (Map 4) – Both action alternatives include approximately 775 acres of precommercial thinning and 777 acres of white pine pruning.

Mistletoe Treatments (Map 4) – Both action alternatives include girdling existing western larch seed trees infected with dwarf mistletoe on 161 acres (See Map 4).

Inoculation to Increase Cavity Nesting Habitat – Both action alternatives include girdling 50 to 100 trees to reduce the spread of dwarf mistletoe would be inoculated with heart rot fungus to increase amount and rate of decay in girdled trees to provide cavity nesting habitat sooner.

Road Management Prescriptions (Tables 3, 4, 5 and Maps 5 and 6) - Changing road management prescriptions on 67 miles of existing road would be implemented as described in Common Features of Action Alternatives and as described in Tables 3, 4, and 5.

Table 2 – Alternative B Commercial Timber Harvest Units

Unit	Acres	Silvicultural Rx	Logging System	Fuel Treatment
CCWR = clearcut w/reserves; CT = commercial thin; SW = shelterwood; ST = seed tree; S = skyline; T = tractor; UB = underburn; GP = grapple pile				
40	40	CCWR	S	UB
96A	6	CCWR	T	UB
96B	8	CCWR	S	UB
97	15	CCWR	S	UB
103	2	CT	S	Lop
109	19	CT	S	Lop, Yard tops within 200 feet of road
127A	10	SW	T	UB
127B	14	SW	S	UB
132	15	CT	S	No fuel treatment
148	19	CT	S	Lop, Yard tops within 200 feet of road, UB
150	15	SW	S	UB
151	13	SW	S	UB
159	21	CCWR	S	UB
165A	4	CT	T	GP
165B	8	CT	S	Lop
167	9	CCWR	S	UB
181	11	ST	S	UB
183A	5	CT	T	GP
183B	8	CT	S	Lop, Yard tops within 200 feet of road
189	28	CT	S	Lop
198A	6	SW	T	UB
198B	14	SW	S	UB
199A	21	CT	T	GP
199B	8	CT	S	Lop, GP
206A	2	CT	T	Lop
206B	20	CT	S	Lop
211A	9	CT	T	GP
211B	14	CT	S	Lop
226	57	CT	S	Lop, Yard tops within 200 feet of road
227A	9	ST	T	UB
227B	4	ST	S	UB
233	21	CT	S	Lop, Yard tops within 200 feet of road
271A	19	CT	T	GP
271B	9	CT	S	Lop
Total	483			

Table 3 – Alternative B Road Management Prescriptions

	Road Management Prescription				
	Open	A Gate	B Barrier	C Long-term Storage	D Decommission
Existing Miles	15.7	21.4	40.4	14.2	3.6
Proposed Miles	5.4	6.2	16.4	32.5	35.0

** These numbers do not include Forest Highway 50*

Table 4 – Existing and Proposed Road Management Rx – Alternative B

Existing Road Management Rx	Alternative B Road Management Rx	Miles
Open Total existing open miles = 15.8	Open	5.4
	Rx B - Barrier	5.4
	Rx C – Long-term Storage	2.0
	Rx D - Decommission	2.9
Rx A – Gate Total existing gated miles = 21.4	Rx A - Gate	6.2
	Rx B - Barrier	4.3
	Rx C – Long-term Storage	8.8
	Rx D - Decommission	2.1
Rx B – Barrier Total existing barriered miles = 40.4	Rx B - Barrier	6.7
	Rx C – Long-term Storage	14.0
	Rx D - Decommission	19.7
Rx C – Long-term Storage Total existing stored miles = 14.2	Rx C – Long-term Storage	7.0
	Rx D - Decommission	7.2
Rx D – Decommission Total existing decommissioned miles = 3.6	**Rx C – Long-term Storage	0.5
	Rx D - Decommission	3.1

** These numbers do not include Forest Highway 50*

*** Alternative B includes the use of 0.5 miles existing roads that were coded as decommissioned. These roads would be used for the timber harvest then be put into Road Management Prescription C (long-term storage). Road 3387UE (0.16 miles) would be reconstructed because not much work is needed to return the road to the standard. Road 3698AUA (0.37 miles) is considered new road construction (NC 3 on Map 2) because more work is needed to establish the road prism.*

Table 5 – Alternative B Proposed Road Management Prescription Changes

		Road Management Prescription (Rx)					Road Management Prescription (Rx)	
Road #	Length	Existing	Proposed		Road #	Length	Existing	Proposed
1223	4.29	A	B		1223UQ	0.32	C	D
1223	0.07	Open	B		1223UR	0.43	B	D
1224	0.78	A	C		1223US	0.46	B	D
1224	0.69	A	D		1223UZ	0.22	C	D
1228	2.21	A	C		1224UA	1.07	A	C
3309	1.65	B	C		1224UA	0.73	A	D
3310	0.35	B	C		1228A	0.53	C	D
3310	0.94	B	D		1231UC	1.34	C	D
3350	2.02	Open	B		214B	0.41	C	D
3351	2.67	A	C		3309UA	0.06	A	C
3368	0.92	A	C		3310A	0.73	B	C
3368	0.64	A	D		3310UA	0.66	B	D
3376	0.65	B	C		3310UB	0.31	B	D
3376	1.40	B	D		3350AZ	0.92	Open	C
3390	0.02	B	D		3350B	0.51	Open	C
3398	1.44	B	C		3351A	1.13	A	C
3398	0.20	B	D		3376A	1.07	B	D
3399	3.33	Open	B		3376AUA	0.43	B	D
3400	1.19	Open	D		3376UB	1.35	B	C
3458	1.00	B	C		3387UC	0.69	B	C
3466	0.98	C	D		3387UD	0.03	B	D
3680	1.69	B	D		3387UE	0.16	D	C
3695	1.42	B	D		3387UH	0.26	B	D
3696	2.15	B	C		3393A	0.26	B	D
3698	0.71	B	C		3398UA	0.49	B	D
3698	1.48	B	D		3399UA	0.42	B	D

3699	1.23	B	D		3399UC	0.77	B	D
1223A	0.32	C	D		3399UD	1.79	B	C
1223UB	0.6	Open	C		3399UD	0.02	Open	C
1223UB	0.54	Open	D		3399UE	0.57	C	D
1223UC	0.60	Open	D		3400UA	0.56	Open	D
1223UD	0.45	C	D		3681UA	0.74	B	D
1223UE	1.04	B	D		3681UB	0.52	B	D
1223UF	0.57	B	C		3681Z	1.11	B	D
1223UF	0.38	B	D		3695UA	0.67	B	D
1223UG	0.62	C	D		3696UA	1.29	B	D
1223UJ	0.39	C	D		3698A	0.96	B	C
1223UN	0.15	C	D		3698AUA	0.37	D	C
1223UO	0.54	C	D		1223US	0.46	B	D
1223UP	0.31	C	D					

Alternative C

Alternative C was developed to address concerns about impacts of roads and impacts to old growth. It would address issues brought forward by the public during scoping by reducing new road construction, reducing the amount of road reconstruction, and not including timber harvest in three stands that meet minimum criteria for old growth (Units 96, 151, and 211). As a result of addressing these issues, Alternative C includes less timber harvest, less road construction, and less road reconstruction than the proposed action. Road management prescriptions changes would be the same as Alternative B except for part of Road 1223 that would be Rx C instead of Rx B. Alternative C includes the following activities summarized in the table below and described after the table. Details about each activity are in *Common Features of Action Alternatives* and *Design Features* below.

Table 6 – Summary of Activities Proposed in Alternative C

Proposed Activity	Amount	Estimated Implementation Date
Commercial Timber Harvest	293 acres	2010-2014
New Road Construction	0.8 miles	2010-2011
Road Reconstruction	7.3 miles	2010-2011
Activity Fuel Treatments	312 acres	2012-2016
Precommercial Thinning	775	2009
White Pine Pruning	777	2009
Girdling existing larch seed trees to limit spread of dwarf mistletoe	161 acres	2009
Inoculating girdled trees with heart rot to create cavity habitat sooner	50-100 trees	2009
Planting conifer seedlings	112 acres	2013-2017
Pocket Gopher Control on Planted Areas	112 acres	2014-2018
Changing Road Management Prescriptions	68 miles	2010-2015

Commercial Timber Harvest (Map 3) – Alternative C includes timber stand improvement using commercial timber harvest on approximately 293 acres with skyline yarding on approximately 248 acres and tractor skidding on 45 acres. Commercial thinning would be used on 181. Regeneration harvest is proposed where stands have minimal amounts of western larch and white pine. Regeneration harvest is prescribed for a total of 112 acres consisting of the following silvicultural systems: 44 acres of a clearcut with reserves, 44 acres of shelterwood cuts, and 24 acres of seedtree cuts.

Road Construction and Reconstruction (Map 3) - Approximately 0.8 miles of new road construction, 7.3 miles of road reconstruction, and 15.3 miles of reconditioning would be required to implement the envisioned timber harvesting systems.

Fuel Treatments (Table 7) - Fuel treatments would include approximately 112 acres of underburning with hand fireline construction, 153 acres of lopping, 28 acres of yarding top within 200 feet of roads, 36 acres of grapple piling slash followed by burning.

Planting - Planting conifer seedlings on approximately 112 acres in areas proposed for regeneration harvest.

Pocket Gopher Control - Pocket gopher control baiting may be done to control pocket gophers on approximately 112 acres in areas proposed for regeneration harvests if needed to protect regeneration.

Precommercial Thinning and White Pine Pruning (Map 4) – Both action alternatives include approximately 775 acres of precommercial thinning and 777 acres of white pine pruning.

Dwarf Mistletoe Treatment (Map 4) – Both action alternatives include girdling existing western larch seed trees infected with dwarf mistletoe on 161 acres.

Inoculation to Increase Cavity Nesting Habitat – Both action alternatives include girdling 50 to 100 trees to reduce the spread of dwarf mistletoe would be inoculated with heartrot fungus to increase amount and rate of decay in girdled trees to provide cavity nesting habitat sooner.

Road Management Prescriptions (Maps 5 and 7 and Tables 8, 9, 10) - Changing road management prescriptions on approximately 68 miles of existing road would be implemented as described in Common Features of Action Alternatives and as described in Tables 8, 9, and 10.

Table 7 – Alternative C Commercial Timber Harvest Units

Unit	Acres	Silvicultural Rx	Logging System	Fuel Treatment
CCWR = clearcut w/reserves; CT = commercial thin; SW = shelterwood; ST = seed tree; S = skyline; T = tractor; UB = underburn; GP = grapple pile				
97	14	CCWR	S	UB
103	2	CT	S	Lop
109	19	CT	S	Lop, Yard tops within 200 feet of road
127A	10	SW	T	UB
127B	14		S	UB
132	15	CT	S	No fuel treatment
159	21	CCWR	S	UB
167	9	CCWR	S	UB
181	11	ST	S	UB
183A	3	CT	T	GP
183B	8		S	Lop, Yard tops within 200 feet of road
189	28	CT	S	Lop
198A	6	SW	T	Lop, GP
198B	14		S	Lop
199A	18	CT	T	GP
199B	11		S	Lop, GP
226A	1	CT	T	GP
226B	56		S	Lop, Yard tops within 200 feet of road
227A	7	ST	T	UB
227B	6		S	UB
233A	1	CT	T	GP
233B	20		S	Lop, Yard tops within 200 feet of road
Total	293			

Table 8 – Alternative C Road Management Prescriptions

	Road Management Prescription				
	Open	A Gate	B Barrier	C Long-term Storage	D Decommission
Existing Miles	15.8	21.4	40.4	14.2	3.6
Proposed Miles	5.4	6.2	10.9	37.5	35.5

** These numbers do not include Forest Highway 50*

Table 9 – Existing and Proposed Road Management Rx – Alternative C

Existing Road Management Rx	Alternative C Road Management Rx	Miles
Open Total existing open miles = 15.8	Open	5.4
	Rx B - Barrier	5.4
	Rx C - Long-term Storage	2.1
	Rx D - Decommission	2.9
Rx A – Gate Total existing gated miles = 21.4	Rx A - Gate	6.2
	Rx C - Long-term Storage	13.1
	Rx D - Decommission	2.1
Rx B – Barrier Total existing barriered miles = 40.4	Rx B - Barrier	5.5
	Rx C - Long-term Storage	15.2
	Rx D - Decommission	19.7
Rx C – Long-term Storage Total existing stored miles = 14.2	Rx C - Long-term Storage	7.0
	Rx D - Decommission	7.2
Rx D – Decommission Total existing decommissioned miles = 3.6	Rx D - Decommission	3.6

** These numbers do not include Forest Highway 50*

Table 10 – Alternative C Proposed Road Management Prescriptions Changes

Road #	Length	Road Management Prescription (Rx)		Road #	Length	Road Management Prescription (Rx)	
		Existing	Proposed			Existing	Proposed
1223	0.07	Open	C	1223UP	0.31	C	D
1223	4.29	A	C	1223UQ	0.32	C	D
1223	1.16	B	C	1223UR	0.43	B	D
1224	0.78	A	C	1223US	0.46	B	D
1224	0.69	A	D	1223UZ	0.22	C	D
1228	2.21	A	C	1224UA	1.07	A	C
3309	1.65	B	C	1224UA	0.73	A	D
3310	0.35	B	C	1228A	0.53	C	D
3310	0.94	B	D	1231UC	1.34	C	D
3350	2.02	Open	B	214B	0.41	C	D
3351	2.67	A	C	3309UA	0.06	A	C
3368	0.92	A	C	3310A	0.73	B	C
3368	0.64	A	D	3310UA	0.66	B	D
3376	0.65	B	C	3310UB	0.31	B	D
3376	1.40	B	D	3350AZ	0.92	Open	C
3390	0.02	B	D	3350B	0.51	Open	C
3398	1.44	B	C	3351A	1.13	A	C
3398	0.20	B	D	3376A	1.07	B	D
3399	3.33	Open	B	3376AUA	0.43	B	D
3400	1.19	Open	D	3376UB	1.35	B	C
3458	1.00	B	C	3387UC	0.69	B	C
3466	0.98	C	D	3387UD	0.03	B	D
3680	1.69	B	D	3387UE	0.16	D	C
3695	1.42	B	D	3387UH	0.26	B	D
3696	2.15	B	C	3393A	0.26	B	D
3698	0.71	B	C	3398UA	0.49	B	D
3698	1.48	B	D	3399UA	0.42	B	D
3699	1.23	B	D	3399UC	0.77	B	D
1223A	0.32	C	D	3399UD	1.79	B	C

1223UB	0.6	Open	C		3399UD	0.02	Open	C
1223UB	0.54	Open	D		3399UE	0.57	C	D
1223UC	0.60	Open	D		3400UA	0.56	Open	D
1223UD	0.45	C	D		3681UA	0.74	B	D
1223UE	1.04	B	D		3681UB	0.52	B	D
1223UF	0.57	B	C		3681Z	1.11	B	D
1223UF	0.38	B	D		3695UA	0.67	B	D
1223UG	0.62	C	D		3696UA	1.29	B	D
1223UJ	0.39	C	D		3698A	0.96	B	C
1223UN	0.15	C	D		3698AUA	0.37	D	C
1223UO	0.54	C	D		1223US	0.46	B	D

Common Features of Action Alternatives

Timber Harvest (Maps 2 and 3)

All harvest would be on lands identified as suitable for timber production (Forest Vegetation Report p. 18). Various harvest methods described below are prescribed depending on individual stand conditions.

Commercial Thin (CT): This is an intermediate harvest that would be used in an immature stand in order to accelerate diameter increment and improve the average form of the trees that remain, without permanently breaking or opening the canopy. No site preparation or planting would be required. The purpose of the treatment is to regulate stand density to promote tree growth and vigor. Generally, smaller trees would be harvested and larger trees would be retained. This treatment can be applied to both even- and uneven-aged stand structures.

Clearcut with Reserves (CCw/R): This is a stand-replacement activity that would remove nearly all the standing crop for the purpose of creating a new, even-aged stand. Reserves would be any tree or group of trees left uncut and kept for part of or the entire next rotation. Reserves would be safe snags; live culls; healthy, early-seral trees; and other individuals /groups of trees with specific resource value scattered throughout stand. This treatment would develop an even-aged stand structure and would include site preparation and reforestation. Reforestation would be accomplished by hand planting a mix of western larch and western white pine.

Seedtree Harvest (ST): This is a regeneration cut in a mature, or near mature, stand to open its canopy to provide conditions suitable for regeneration from the seed of trees retained for that purpose. The majority of the standing crop trees would be removed. Natural regeneration is often supplemented with artificial regeneration to assure rapid stocking of the site and to provide for a desirable species composition.

Shelterwood Harvest (SW): This is a regeneration system in which most of the trees are cut, leaving those needed to provide sufficient shade to produce a new age class in a moderated microenvironment. Additional harvest may be possible sometime in the future. The last or final removal cut would remove the remaining old age class after the new age class has established. This results in continuous coverage of large or small trees.

Road Reconstruction (Maps 2 and 3)

Some existing roads would require reconstruction to their approved traffic service level or would be improved to increase safety, operational efficiency or resource protection (improve drainage and improve water quality). For this document, reconstruction includes rebuilding roads to their original standards. Road drainage may be improved where needed. Reconstruction may include the installation of drain dips and culverts, grading, clearing, dust abatement, and resurfacing. All road reconstruction plans, standards and specifications would provide for minimum needed road width, drainage and safe operation while incorporating measures for mitigating for resource disturbances.

The overall existing condition of roads to be reconstructed is generally inadequate for resource protection or anticipated use or the road is impassable for the design vehicle. Spot reconstruction on some roads would also

occur, where the primary disturbance is confined to a limited area, such as culvert installations, rebuilding a shoulder or addition of turnouts. Areas between the spots generally would need reconditioning (reshaping and processing the road surface and ditches and brushing the shoulders). Most of the work described as reconstruction and reconditioning would actually be maintenance (FSM 7705) to restore the road to its original condition.

Undersized culverts would be replaced on roads that would be reconstructed unless those roads would be stored or decommissioned after this entry. In that case, the culverts would not be upgraded because they would be removed when the road is stored or decommissioned (Transportation Report p. 7).

Fuels Treatment (Tables 2 and 7)

The following fuel reduction activities are prescribed in accordance with silvicultural prescriptions and are intended to facilitate the achievement of silvicultural objectives while fulfilling the requirements of Forest Plan protection standards.

Underburn (UB): To facilitate fuel reduction and aid in reforestation, selected units would be underburned. Typically, either a broadcast or jackpot burn would be realized depending on the amount of available fuel. Burning prescriptions would be designed to accomplish fuel reduction objectives while minimizing mortality to leave trees and probability of escape.

Fireline (FL): Hand fireline would be used on all underburn units around the entire perimeter except where a road would serve as a unit boundary. Firelines would include a fuel break with a hand fireline to mineral soil on the outside edge of the fuel break. Mineral soil will be exposed for a minimum of 12 inches and a maximum 24-inches along the entire length of the fireline. The fuel break is an area within the unit, adjacent to the fire line that is cleared of all vegetative debris larger than 1 inch in diameter and 3 feet long for a minimum width of 8 feet.

Grapple pile and burn piles (GP): To facilitate fuel reduction while protecting remaining trees, woody debris would be gathered and piled mechanically using an excavator. The piles would be burned in the late fall during periods of optimum smoke dispersal and soil moisture content. In order to protect leave trees or leave islands from possible ignition, the piles would not be placed next to them.

Lop: Lopped units would have limbs and unmerchantable tops of harvested trees left in units. These limbs and tops would be lopped to a maximum slash depth of 18 inches. The lopped limbs are more subject to compression by snow loads. This proximity to the ground increases the rate at which the slash decomposes.

Yard Tops within 200 feet of Road (YTR): The unmerchantable tops of all harvested trees would be yarded to the landing while still attached to the uppermost sawlog in the tree. This activity is designed to provide a zone of reduced post-harvest fuel loading that enhances the ability of the road to serve as a fuelbreak and reduces potential for man-caused fires along roads. This activity would reduce post harvest fuel loading in units that cannot be prescribed burned. Tops would only be yarded from the first 200 feet below the road. Not all slash is expected to be yarded, for example the limbs from yarded sawlogs would remain in the unit.

Biomass Removal

Biomass removal for the St. Maries School District Fuels to Schools Project would be a by-product of the proposed fuel treatments. It would not involve any additional or special treatment. Piled material may be used for the Fuels to Schools Project.

Precommercial Thinning & White Pine Pruning (Map 4)

Precommercial thinning would be conducted in stands where stocking levels are potentially limiting tree growth, health, and vigor. Where they are present western larch and western white pine would be the preferred species for release. White pine pruning would be conducted in plantations composed of white pine where pruning would reduce and slow down the spread of blister rust infection. Pruning involves removing the lower branches of a white pine so the white pine blister rust spores in the surround vegetation are not as likely to infect the tree. Slash would be lopped to a maximum depth of 24 inches. Approximately 267 acres of precommercial thinning would be done within the lynx analysis unit (LAU), and 168 acres of that provide lynx

habitat. Precommercial thinning would be consistent with the standards and guidelines in the Northern Rockies Lynx Management Direction Record of Decision.

Mistletoe Treatments & Inoculation (Map 4)

Existing western larch seed trees infected with dwarf mistletoe would be girdled and left standing to reduce the spread of dwarf mistletoe to existing regeneration and to provide snags for wildlife. Work would be done with hand tools.

Fifty to 100 trees girdled to reduce the spread of dwarf mistletoe would be inoculated with heart rot fungus to increase amount and rate of decay in girdled trees to provide habitat for primary cavity excavators and secondary users sooner. Two fungal species would be used to improve the chances of successful inoculation with different tree conditions. Trees would be climbed to inoculate them at varying heights to increase the potential for use by cavity nesters.

Planting

Seedlings would be a mix of early-seral western white pine and western larch.

Pocket Gopher Control

The need for pocket gopher control would be evaluated with regeneration surveys for the first, third and fifth year after planting. Only planted areas that have high mortality due to pocket gophers would be treated. Plantations would be treated by hand application of grain treated with (2.0%) zinc phosphide or (0.5%) strychnine. This grain would be deposited into the gophers' underground burrows at a rate of 1/4 to 1/2 pound per acre. The project would comply with all registered label instructions for zinc phosphide and strychnine bait including application in accordance with Idaho State law. Follow-up treatments may be necessary in some areas to ensure adequate seedling stocking levels.

Road Management Prescriptions (Maps 5 and 6; Tables 3, 4, 5, 8, 9, 10)

Changing road management prescriptions on existing roads would be implemented as described below. Existing legal motorized vehicle use restrictions would not be changed, but physical work on the ground to implement Road Management Prescriptions C and D is intended to eliminate motorized vehicle use. Access changes are not proposed with Road Management Prescription B. Road management prescription changes include the following:

- Open Roads – Open to all vehicles.
- Road Management Prescription A: The use and need for the road is anticipated to occur at a higher frequency than a barriered road. Traffic is controlled with a locked gate. Culverts are not removed. The access management strategy during "closure" periods is to eliminate all vehicles $\geq$50" wide except for administrative use. Roads may or may not be designated for vehicles less than 50".
- Road Management Prescription B: The use and need for the road is anticipated to occur at a lower frequency. The road may remain "closed" for a period of 5 to 15 years between uses but remains on the transportation system for future use. Culverts assessed to have a higher risk of failure would be removed or replaced, and the road surface may be water barred and seeded. Traffic is usually controlled with a physical static barrier (such as a guardrail, concrete or earth barrier). The access management strategy during "closure" periods is to eliminate all vehicles $\geq$50" wide except for administrative use. Use by vehicles less than 50" wide would not change from the existing condition.
- Road Management Prescription C: This is a long-term "storage" with no foreseeable use for the road in the next 15 to 25 years, but the road may be needed at some future date. Some low impact roads that do not have a reasonably foreseeable need in the future, may also be closed at this level. The road would be out-sloped and have the drainage structures removed. The intent of this prescription is to put the road into "long-term storage" where the road is not a sediment source and does not channel water. The road prism is basically left intact but in a condition that would not require any maintenance. All water courses and problem areas would be stabilized. The roadbed may require light scarification, water bars, and/or decompaction. The road would be seeded and/or planted to establish a vegetative cover in the road prism. Motorized vehicle use would be controlled by recontouring the beginning of the road. Roads would remain

on the transportation system. Generally, the access management strategy is to eliminate or prohibit all motorized use while the road is in storage.

- Road Management Prescription D. Roads "closed" at this level generally have a higher potential for failure than Prescription C roads, and they are not needed for management purposes. The road would be decompacted and major fills, embankments, and higher failure risk areas would be pulled up onto the roadbed and be stabilized. Drainage structures would be removed from stream channels, and the adjacent slopes would be restored to resemble natural conditions. The goal of this prescription is to restore site productivity, eliminate the potential of road failures, and reestablish natural water infiltration and drainage patterns. Recontouring or partial pullback is based on site-specific conditions and could range from about 20 to 100 percent of the roads length. Prescription D may require only partial recontouring, only pulling up the amount of fill necessary to stabilize the slope condition. Some cut and fill slopes or parts of cut and fill slopes may be evident in areas of recontouring. Following prescription implementation, roads would be removed from the National Forest Road System. The access management strategy is to eliminate all motorized use.

Road Access During Timber Harvest Operations

Existing gates would remain in place. Temporary gates would be installed on any road that is not behind a gate and is currently barriered. During timber hauling the gate would be closed and locked at the end of each day. For other operations gates would be closed and locked after passage of each vehicle.

Design Features

I. Design Features for All Proposed Activities

A. Aquatic Resources

1. All activities would comply with standards identified in the Inland Native Fish Strategy (INFS) EA Decision Notice and Finding of No Significant Impact, signed in July 1995.
2. Best Management Practices (BMPs) would be used to achieve water quality standards (Water Report Appendix). The Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) outlines BMPs that meet the intent of the water quality protection elements of the Idaho Forest Practices Act, Forest Plan Standards and replaces the Forest Plan Appendix S – Best Management Practices. To ensure water quality protection additional site-specific BMPs may be identified and developed during layout, design or implementation of proposed activities.
3. All treatments would meet or exceed requirements and erosion control guidelines of the Rules and Regulations pertaining to the Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code.

B. Noxious Weeds

The following preventative measures would be taken to reduce the risk of noxious weed introduction and spread in accordance with the St. Joe Weed Control EIS (ROD 10/12/99).

1. All off-road logging and construction equipment (including machinery used in restoration projects) would be cleaned prior to entering the project area to remove dirt, plant parts, and material that may carry weed seeds. A provision would be included in contracts.
2. Mulching agents brought into the project area, such as hay or straw, would be certified weed-free prior to use. On-site slash could be used where roads are recontoured.
3. All seed used for revegetation and erosion-control purposes would be certified weed-free and would be from a native seed mix set by the IPNF.
4. After implementation, project areas would be reviewed for new populations of noxious weeds. If new populations are found more intensive surveys would be conducted, sites would be mapped, and treatment would be scheduled.
5. If new populations of noxious weeds are found, treatment would be implemented in accordance with priorities set by the noxious weed program. New invader species would be slated for eradication

immediately upon discovery. Other weed infestations would be treated according to the direction in the St. Joe Noxious Weed Project EIS and district priorities.

6. All weed treatments would be monitored for effectiveness.

C. Plants (Threatened, Endangered, and Sensitive)

If Threatened, Endangered, and Sensitive (TES) plant species were discovered during project implementation, an agency Botanist would be notified so that measures could be taken to maintain population viability. Measures to protect population viability and habitat for all known and newly discovered occurrences would include altering or dropping proposed units from activity, modifying the proposed activity, or implementing buffers around plant occurrences. Contract provisions for protection of Endangered Species, and settlement for environmental cancellation would be included in contracts.

*No site-specific design features would be needed for plants because all the TES plant sites are outside treatment areas and away from road work.

D. Recreation

1. A recreation specialist would be consulted to determine if additional project level assistance is needed during project implementation.
2. Temporary closures of recreation sites to public use would be set up to minimize public exposure to operational safety hazards. Closures may include roads, trails, dispersed camp sites, other recreation sites, or larger geographic areas depending on operational hazards.

E. Wildlife

Canada Lynx: All project activities would follow standards and guidelines established in the Northern Rockies Lynx Management Direction (USDA 2007). See project file for a list of applicable standards and guidelines.

II. Design Features for Commercial Timber Harvest

Existing gates would remain in place. Temporary gates would be installed on any road that is not behind a gate and is currently barriered. During timber hauling the gate would be closed and locked at the end of each day. For other operations gates would be closed and locked after passage of each vehicle.

A. Aquatic Resources

1. All alternatives would implement standard riparian habitat conservation area (RHCA) widths specified by Inland Native Fish Strategy (INFS) (Table 11). These buffer zones are no-entry for harvest and equipment. Exceptions are described in the Standards and Guidelines, General Riparian Area Management (RA-2) that states: “Trees may be felled in Riparian Habitat Conservation Areas when they pose a safety risk”. When necessary to fall trees for skyline/cable units, the sale administrator may approve the individual trees required to be felled and ensure that they remain where dropped.

Table 11 - Standard Riparian Habitat Conservation Area (RHCA) Widths

INFS Category	Description	RHCA Width
1	Fish bearing streams	300 feet from either side of channel
2	Permanent, flowing, non-fish bearing stream	150 feet from either side of channel
4	Seasonally flowing or intermittent streams Wetlands <1 acre Landslide prone areas	100 feet from either side of channel (priority watersheds)

2. All treatments would comply with objectives described in Appendix O of the IPNF Forest Plan, Stream Protection.
3. Areas of recent or historic landslides and landslide-prone areas constitute Category 4 – RHCA (INFS) buffers. Harvest activities would avoid landslides and landslide prone areas using INFS buffers.

4. Wetlands identified during field review or harvest preparation would be protected by INFS buffers (50 feet for those less than one acre and 150 feet for those greater than one acre). A resource protection provision in contracts would protect wetlands that may be discovered during operations.

B. Soils

1. Ground-based equipment for harvest and site prep activities:
   a. Ground-based operations would be limited to slopes equal to or less than 35%.
   b. Only approved skid trail locations would be allowed.
   c. Where terrain is conducive, trails would be spaced at maximum distance, except where converging at intersections.
   d. Equipment would not be operated under saturated conditions and in moist or wet depression areas.
   e. Only areas that are reasonably accessed by ground-based equipment would be treated, and no trails would be excavated to facilitate access.
   f. To minimize disturbance (soil compaction or displacement), practices such as skidding and mechanical harvesting would occur on existing skid trails and over slash when available. Units would be designed to utilize directional falling.
   g. The leading end of logs would be suspended during skidding.
2. Skyline Yarding: The leading end of logs would be suspended during yarding.
3. The Intermountain Forest Tree Nutrition Cooperative assembled data suggesting that nutrient levels may be conserved in treatment units by allowing logging slash to stay on site through a wet season of 4 to 6 months not including June through September. By leaving sufficient levels of wood on site, long-term soil productivity would be protected.
4. Nutrient sources such as needles and limbs would be maintained on site by allowing slash to over-winter prior to all slash disposal treatments (Intermountain Forest Tree Nutrition Cooperative, Garrison and Moore 1998) except where tops would be yarded.
5. Tops of trees would be removed only along a maximum buffer of 200 feet below roads in Units 109, 148 (Alt B only), 183, 226 and 233 (226B and 233B in Alternative C).
6. *Managing Coarse Woody Debris in Forests of the Rocky Mountains* (Graham and others 1994) would be used to retain sufficient levels of coarse woody debris on site after slash disposal. Special attention to meet coarse woody debris levels would be given to Units 151, 183A, and 183B that are currently low. The following recommendations would be used in prescriptions:

Table 12 - Recommended Coarse Woody Debris Retention*

Site Conditions	Coarse Woody Debris
Drier to dry end of moist sites	7-14 tons/acre
Moist sites	17-33 tons/acre

**(Graham and others 1994)*

C. Cultural Resources

1. All known cultural resource sites, eligible or potentially eligible to the National Register of Historic Places, would be protected or mitigated as directed by the National Historic Preservation Act.

2. Any future discovery of cultural resources, archaeological sites or caves would be inventoried and protected if found to be of cultural significance. A provision would be included in all contracts to ensure protection of the sites. A discovery plan for the protection of cultural resources would be included in contracts in case of cultural resource discovery during project implementation.

3. Project activity will avoid any trails and/or portions of trails that contain historic or cultural characteristics. Any historic or culturally significant trail will be avoided through coordination with a qualified Zone or Forest level archaeologist to ensure that no significant cultural resources are adversely affected.

D. Recreation

1. Dispersed recreation sites off of open roads e.g. Road 1223 at the junctions of Roads 1231, 1223UD, 1223UM, that would be temporarily eliminated during logging would be restored or rehabilitated including removing slash and logs. During operational use signs would be posted to inform forest users of the temporary closure of the site due to project implementation.
2. In areas where logging traffic may interfere with recreational traffic warning signs would be placed to inform visitors of logging activities.
3. Blackjack Trail 86 and Haggerty Trail 5 corridors would be protected where tread exists. The Trails Coordinator would flag the corridors of the trails where tread is not evident prior to harvesting or road construction. Slash and logs would be removed from the trail corridor and/or trail heads.
4. Avoid placing skid trails within 100 feet of recreation sites (e.g. dispersed sites, trails) where practical.

E. Visual Quality

1. Harvest unit preparation and silvicultural personnel would work closely with the District or Forest visual staff to determine that design criteria are adequate for each application.
2. Activities would remain visually subordinate to the characteristic landscape, repeating the form, line, color and texture common to the surrounding area with differences in qualities of size, amount, intensity, direction and pattern.
   a. Form, line color and textures not frequently found in the characteristic landscape might be introduced in these units. Changes would remain subordinate to the visual strength of the characteristic landscape.
   b. Openings in these areas would repeat natural openings frequently found in the characteristic landscape so completely they would not be evident.
   c. In seed tree units transition basal area density from unit boundary into harvest unit (seed tree units) to avoid hard unit boundary lines.

F. White Pine Leave Tree Guidelines (Schwandt and Zack 1996)

These guidelines would be utilized in all silvicultural prescriptions for timber harvest. The objective of these guidelines is to retain and protect genetic resources which may contribute to long-term white pine restoration.

G. Wildlife

1. Threatened, Endangered, and Sensitive Wildlife Species Management: Contract provisions for protection of Threatened, Endangered, and Sensitive (TES) species, and settlement for environmental cancellation would be included. If TES species and/or significant habitat are discovered before or during project implementation the Sale Administrator and the District Wildlife Biologist would be notified so that if needed, measures could be taken to avoid impacts and meet Forest Plan Standards. Measures could include altering or dropping proposed units, modifying the proposed activity, or implementing buffers.

2. Goshawk:

a. <u>Nests:</u> Existing nests and those found before and during project implementation would be protected with a 40-acre no-activity buffer (Brewer and others 2007).

b. <u>Post-Fledging Areas (PFA)</u>: Proposed project activities would be suspended in the PFA of active goshawk nests between April 15 and August 15. After August 15th, treatment-related activities may commence within the PFA but outside the nest area (Brewer et al. 2007). Restrictions may be removed after June 30 if the nest is determined by the district biologist to be inactive or unsuccessful. Vegetation treatments in the PFA are designed to meet guidelines for PFA (Reynolds and others1992; Brewer and others 2007):

   i. 20% or less in shrub/seedling/sapling class

   ii. 60% or more in immature and older/larger size classes

   iii. 50% canopy cover on 60% of pole and larger size classes

iv. Created openings are less than two acres with a minimum of 300 feet between existing or other created openings, and snag guidelines are applied on each acre of created opening non-regeneration treatment in immature and older/larger stands is thinning from below using irregular spacing of leave trees

3. Townsend's Big-Eared Bat: Mine adits found in the project area with potential habitat for bats would have a no-harvest buffer of 500 feet around the entrance to the adits (Pierson and others 1999). No activity is proposed within ½ mile of the known mine adit, and it currently does not have breeding colonies.

4. Wildlife Travel and Movement Corridors: Maintenance of landscape-level connectivity and minimization of fragmentation was incorporated into the design of all alternatives with timber harvest. Travel cover along ridges and saddles was identified and considered in terms of connectivity (project file). Site-specific mitigation measures for units with proposed vegetation removal in designated travel corridors are found in Table 14.

   Openings on ridge tops within designated corridors: Travel cover would be maintained and vegetation management would avoid making openings (i.e. areas with <30% canopy cover) within 200 feet of the ridgetop or 400 feet if the other side of the ridge does not provide cover. Where openings would be created on ridges designated as potential travel corridors they would meet the following criteria:

   a. Less than 300 feet wide (Heinemeyer and Jones 1994)

   b. Limited to one side of the ridge top (USDA 1995)

   c. Minimum of 800 feet between openings (IPNF Forest Plan, Appendix Y [Leege 1984])

   d. None to be situated in a saddle (Heinemeyer and Jones 1994)

5. Big Game Security: To provide big game security, timber harvest in adjacent drainages would have a ridgeline between the disturbance and security areas. In larger contracts, subdivisions or scheduling of harvest units would be utilized to maintain adequate security (IPNF Forest Plan, Appendix Y [Leege 1984]).

6. Cavity Nesting Species: Recommendations for snag numbers, size and species from the Northern Region Snag Management Protocol (NRSP) (January 2000) would be met where these or higher levels exist. The retention of snags and snag replacements would be applied at the stand scale of every 5 to 25 acres (Bull and others 1997). Live trees would be retained at five times the number of snags recommended in the NRSP for snag recruitment.

7. To meet the objectives listed above in Table 13 Snag Guidelines:

   a. Silvicultural and burning prescriptions would protect large diameter snags (unless deemed unsafe) and green tree replacement snags. They would also retain recommended levels and distribution of coarse woody debris during site preparation and fuels treatment.

   b. Snags that show signs of decay, lose bark, or broken tops would not be designated for harvest (Bull and others 1997). Exceptions would be made for safety, road construction, and log landings.

   c. Specific details on snag and leave tree selection from the Reserve Tree Guide (USDA Forest Service IPNF 1995) and the Snag and Woody Debris Guidelines (IPNF Forest Plan Appendix X) would be followed to reach objectives of the Northern Region Snag Management Protocol; and worker safety.

   d. The species priority for selection as snags or live leave trees is as follows: western larch, ponderosa pine, western redcedar, Douglas-fir, grand fir, hemlock, lodgepole pine, spruce, alpine fir, and white pine. After size and species, preferred wildlife leave trees would be selected based on showing signs of: wildlife use, decay, broken tops, hollows, rot, brooms, loose bark, and other defects. All hardwood trees would be retained. (IPNF Forest Plan, Appendix X)

   e. Snags cut for safety reasons would be left in the unit, preferably where they fall.

Table 13 - Snag Guidelines

Forest Type	Snags/Acre
Warm, dry ponderosa pine, Douglas-fir	1-2 snags >20" diameter at breast height (dbh)
Cool Douglas-fir, warm grand fir, slope <30%	4 snags >20"dbh
Cool Douglas-fir, warm grand fir, slope >30%	6-12 total snags with 2-4 >20" dbh
Cool, wet, & dry spruce, grand fir, hemlock, & subalpine fir	6-12 total snags with 2>20" dbh
Low elevation western redcedar, hemlock	12 total snags with 4>20" dbh
High elevation spruce/fir/lodgepole pine	5-10 snags >10" dbh
Whitebark pine/limber pine	All available

8. Site-specific design features for wildlife

Table 14 - Site Specific Mitigation Measures and Design Features for Wildlife

Objective	Site-Specific Mitigation Measure and Design Feature
Maintain Lynx Foraging Habitat	Stands that are lynx habitat proposed for daylight thinning of planted rust-resistant white pine will retain 80% of the winter snowshoe hare habitat. Northern Rockies Lynx Management Direction (USDA 2007). **This applies to the following stands: 231-1-35, 231-1-45, 231-3-17, 231-3-18, 232-1-09, 232-1-20, 232-1-28**
Maintain Connectivity and Minimize Fragmentation	Avoid placing skyline corridors on ridge tops designated as travel corridors. Maintain canopy cover of stands at > 30% for all designated corridors (Heinemeyer and Jones, 1994). The minimum wildlife corridor width would be 400 feet (USDA 1995). **This applies to proposed harvest units in designated travel corridors: 96,148,150, 151,165,183,198,199, 206, 211, 226, 227, 233, 271**
Maximize Habitat Use by Big Game (Elk)	**In Units: 40, 96(A & B), 97, 151, 159, 167, 181, and 227(A & B):** The units would be no greater than 1,000 feet wide and should be bordered on all sides by cover habitat that is a minimum of 800 feet wide.
Facilitate Big Game Movement	Slash depths on ridge tops within designated corridors would be less than 1½ feet depth within 400 feet of ridge top (IPNF Forest Plan, Appendix Y [Leege 1984]). **This applies to proposed harvest units in designated travel corridors: 96, 148, 150, 151, 165, 183, 198, 199, 206, 211, 226, 227, 233, 271.** **Slash depths along new and reconstructed roads** should not exceed 1.5 feet. If this level of slash disposal is not practical, 16-foot wide openings through the slash every 200 feet should be created, especially on ridges and game trail crossings (IPNF Forest Plan, Appendix Y [Leege 1984]).

III. Design Features for Fuel Treatment and Site Preparation

A. Air Quality

1. Proposed burning activities follow procedures outlined by the North Idaho Smoke Management Memorandum of Agreement. Currently, the period of air quality monitoring and restriction is March 1 to November 30.
   a. During this period, all burning by the Forest Service is regulated to prohibit or restrict burning where stagnant weather conditions result in poor smoke dispersion and by conducting prescribed burns when ventilation and air quality conditions are good.
   b. The project is within Airshed 12, which contain no EPA designated non-attainment areas for pollutants. The project area does not contain any Class I Airsheds as designated by the Clean Air Act.
   c. Burning during any time of the year is regulated by the Idaho State Department of Environmental Quality, which issues burning closures when necessary to protect air quality. The Forest Service cooperates with the State by requesting approval to burn through the Montana/Idaho Airshed Management System in compliance with the Idaho State Implementation Plan.
   d. Particulate matter projections would be sent to the North Idaho Smoke Management Group one day prior to ignition.

2. Measures used to reduce effects of prescribed burning on air quality would include:
   a. Broadcast and understory burning would be accomplished as much as practical when on-site fuel and weather conditions are less conducive to total consumption of duff and larger fuels, with a resultant reduction in total emissions.

b. Scheduling ignitions when air quality is least likely to be threatened.

c. Slash piles would be constructed as clean as practical and be burned as dry as practical to enhance efficient combustion.

B. Aquatics

To avoid adverse effects to fish and redds when using streams for prescribed burning control, water removal may not exceed 90 gallons per minute and pumping sites would be located away from spawning gravels. The intake hose would be screened to prevent accidental intake of small fish. An emergency spill clean up kit would be on site in the unlikely event of a fuel spill outside the containment system.

C. Fire/Fuels

All firelines, whether constructed by machine or hand tools, will be waterbarred at time of construction to the standard IPNF fire rehab specifications. Firelines will not be constructed through any moist zones or riparian areas in which the micro-site conditions can be relied upon to check the spread of fire during normal prescribed fire conditions. Surface fuels may be removed from these areas as necessary, but fireline construction would not occur.

D. Soils

1. Prescribed burning would be done when soil moisture in the upper surface inch of mineral soil has a moisture content of 25% or more by weight or 60 to 100 percent duff moisture (IPNF Updated Soil Guidelines 1998). This is particularly important in Units 40, 96A & B, 97, 103, 127A & B, 132, 148, 150, 206A, 206B, and 211A, and 211B where soil productivity on the primarily west- and south-facing slopes is reduced and could be impacted through severe burning of the often shallow soils.
2. Grapple-piling would occur on existing skid trails and over slash when available. See additional design criteria for use of ground-based equipment during timber harvest operations above.
3. Silvicultural and burning prescriptions would retain sufficient levels of coarse woody debris on site after slash disposal (Graham and others 1994). See design features for soils during timber harvest above.

E. Wildlife

1. Snags: Burning prescriptions would protect large diameter snags and live trees for snag recruitment. They would also retain recommended levels and distribution of coarse woody debris during site preparation and fuels treatment.
2. Small Mammal Habitat: In harvest units where slash piles are created, one pile unburned per five acres would be left to supply potential fisher rest sites, provide cover for small animals (prey habitat) and serve as potential lynx den sites (USDA 1995). Piles left should be those closest to standing timber, such as the unit edge or a large cluster of leave trees.

IV. Design Features for Non-Commercial Vegetation Treatment

A. Gopher Control

The following criteria would be followed during gopher baiting project implementation:

1. Product labels and manufacturer's recommendations for use would be followed.
2. No gopher baiting treatment:
   a. within INFS RHCA buffers;
   b. in areas with saturated soil;
   c. during periods of, or forecasted periods of heavy precipitation.
3. Treated bait would not be stored or transferred within 300 feet of any stream or live water.
4. Treated bait would not be directly applied to or discarded in open water bodies such as lakes, streams, ponds, and wetlands.
5. Treated bait would be applied by a licensed applicator in accordance with Idaho State law.
6. Initial setting of bait would usually occur after July 1.

7. A mandatory provision for bait spill cleanup and disposal would be included in the contract.
8. The application of bait would be monitored by a Forest Service employee, who has been trained in animal damage control.
9. Follow-up gopher control effectiveness surveys would be completed. Any evidence of non-target wildlife or fish mortality would be would be collected and be reported to the District Fisheries Biologist or Wildlife Biologist.
10. Existing closed gates used to access units would be locked after each entry and exit.
11. Activity behind closed gates and earth barriers would be scheduled for completion prior to August 30th. An extension may be allowed based on extenuating circumstances (fire, weather, etc.) after interdisciplinary review.
12. Earthen barriers removed to allow access for project activities would be replaced upon completion of the unit and before August 30th.
13. Roads that have naturally revegetated would not be cleared to improve access.

B. Precommercial Thinning

1. The maximum diameter of felled trees would be 7 inches. Cull trees that exceed the 7 inch diameter limit would be left to provide stand structure diversity.
2. Snags or dead trees would not be cut unless required for safety reasons. Snags cut for safety reasons would be left in the unit, preferably where they fall.
3. Directional felling would be used to minimize slash depths. Trees that cannot be directionally felled would be bucked in lengths not to exceed 6 feet.
4. Established game trails would be kept clear of slash by directional felling and/or slash pullbacks to maintain travel linkages.
5. Activity may occur within the 75-foot buffer after review by district fisheries biologist or hydrologist, and silviculturalist to determine the width of the buffer need to achieve RMOs. Otherwise, a 75-foot no-activity buffer would be maintained along all wetted defined channels, springs, and seeps within and adjacent to thinning units.
6. Existing closed gates would be locked closed after each entry and exit.
7. Activity behind closed gates or other restrictive device would be completed by the opening of the any weapon general elk season.
8. Earthen barriers or other access restriction devices removed to allow access for project activities would be replaced with an effective device of similar design upon completion of the unit – no longer than one week later - and before the opening of the any weapon general elk season.
9. Activity would be conducted using existing access – i.e. no brush would be cleared or other improvements made to roads/trails that would change existing access.

C. Dwarf Mistletoe Treatments

Dwarf mistletoe treatment units would be reviewed on the ground by the district fisheries biologist or hydrologist and the district silviculturist to determine the width of the buffer needed to achieve RMOs.

D. Fungal Inoculation of Girdled Trees

1. Mistletoe trees within riparian habitat conservation areas (RHCAs) would not be girdled.
2. The maximum inoculation density would be 0.5 trees per acre

V. Design Features for Road Treatments

The barrier proposed to be placed on Road 1231 would be a guardrail barrier so that it would be more easily removed than an earthen barrier in case emergency access is required.

A. Aquatics

1. Road maintenance/reconstruction: Limb trees greater than 12” diameter at breast height (d. b. h.) unless tree removal is necessary for safety reasons. It trees are felled within the RHCA, they shall be left onsite

unless their presence limits sight distance and poses a further safety hazard. Trees felled within the RHCA will require a review by a fisheries biologist.

2. Activities in and around streams: Activities such as culvert replacement, culvert removal associated to road removal, etc. would occur after July 15th and prior to September 1st.
3. Road Management Prescriptions C and D at a minimum would have: all culverts removed, all fill within the stream crossing sites removed, stream gradient and valley side-slopes returned to near natural conditions for 200 feet on both sides of stream, and road surfaces decompacted to a minimum of 18 inches where possible to facilitate and augment infiltration (See Road Management Prescriptions described previously).
4. Road Management Prescriptions C and D treatment areas would be fully recontoured for 300 feet, a sight-distance, or whatever distance is effective to eliminate motorized access (See Road Management Prescription described previously).
5. Areas of recent or historic landslides and landslide-prone areas constitute Category 4 – RHCA (INFS) buffers. Road construction activities would avoid landslides and landslide prone areas using INFS buffers.

B. Noxious Weeds

To the degree practicable gravel used for road maintenance would be certified from weed free-sources. Gravel sources would be inspected for the presence of noxious weeds prior to utilization of gravel in the project area as appropriate.

C. Old Growth

No timber harvest would occur in allocated old growth stands.

D. Recreation

Where new road construction or reconstruction crosses Trail 86, the trail would be reconstructed where the tread is destroyed and permanent signs would be installed to direct hikers to the trail location.

E. Wildlife

1. Goshawk
   a. Nests: Existing nests and those found before and during project implementation would be protected with a 40-acre no-activity buffer (Brewer and others 2007).
   b. Post-Fledging Areas (PFA): Proposed project activities would be suspended in the PFA of active goshawk nests between April 15 and August 15. After August 15th, treatment-related activities may commence within the PFA but outside the nest area (Brewer and others 2007). Restrictions may be removed after June 30 if the nest is determined by the district biologist to be inactive or unsuccessful.
2. Big Game Security: Road Management Prescription C may require obliteration for a distance of 300 feet, a sight-distance, or whatever distance is effective to eliminate motorized access. The amount and type of obliteration required would be the minimum needed to effectively prevent motorized vehicle use. This would vary depending on the slope and vegetation present.
3. Snags: To meet the objectives listed above in Table 13 Snag Guidelines, snags that show signs of decay, lose bark, or broken tops would not be designated for harvest (Bull and others 1997). Exceptions would be made for safety, road construction, and log landings.

Mitigation

The Proposed Action includes design features to avoid the need for mitigation. No mitigation actions are required to implement the proposed action because analysis of effects did not indicate a need for any mitigation.

Monitoring

The following monitoring would be included as part of the proposed action:

- The St. Joe Ranger District would coordinate with the Coeur d'Alene Tribe for pre-treatment surveys and monitoring of on site gopher baiting applications.
- Soils on some units where ground-based equipment is proposed to be used for skidding on all or parts of the unit would be monitored after completion of harvest and fuel treatment activities. Proposed activities are expected to meet Forest and Regional soil quality standards, but monitoring is included to verify expected results.
- After implementation, project areas would be reviewed for new populations of noxious weeds. If new populations are found more intensive surveys would be conducted, sites would be mapped, and treatment would be scheduled.
- A Forest Service employee trained in animal damage control would monitor the application of gopher bait.
- Follow-up gopher control effectiveness surveys would be completed. Any evidence of non-target wildlife or fish mortality would be would be collected and be reported to the District Fisheries Biologist or Wildlife Biologist.

Anticipated Timing of Activities

- Precommercial thinning, white pine pruning, dwarf mistletoe treatment): 2009 or 2010
- Road construction and reconstruction: 2010
- Timber harvest: 2010 or 2011; expected completion: 2015
- Slash and Reforestation: 2012 - 2017
- Road storage and decommissioning: 2010-2018

Comparison of Alternatives

Table 15 – Comparison of Proposed Activities by Alternative

Proposed Activity	Alternative A	Alternative B	Alternative C
Timber Harvest	0	483 acres	293 acres
Ground-based	0	91 acres	45 acres
Skyline	0	392 acres	248 acres
Road construction	0	2.8 miles	0.8 miles
Road reconstruction	0	17.9 miles	7.3 miles
Fuel treatments			
Underburning	0	202 acres	112 acres
Lopping	0	204 acres	153 acres
Yarding tops w/in 200 feet of road	0	34 acres	28 acres
Grapple pile and burn piles	0	62 acres	36 acres
Tree Planting in Timber Harvest Units	0	195 acres	112 acres
Pocket Gopher Control	0	195 acres	112 acres
Timber Stand Improvement			
Precommercial Thinning	0	775	775
White Pine Pruning	0	777	777
Mistletoe Treatments	0	161	161
Inoculation to Increase Cavity Nesting Habitat	0	50 to 100 trees	50 to 100 trees

Table 16 – Comparison of How Alternatives Address the Purpose & Need

Measurement Parameters	Alternative A		Alternative B		Alternative C	
Improve resilience of the vegetative resources to disturbances such as insects, disease, and fire (Forest Vegetation Report p. 16)						
Composition in project area of long-lived, early-seral tree species in western larch / white pine forest types	Acres	%	Acres	%	Acres	%
	453	4	705	7	594	6
Stand Structure in project area:						
Brush-seedling sapling	2056	20	2251	21	2155	21
Pole-small-medium	3446	33	3380	32	3352	32
Mature-large	2164	21	2035	19	2091	20
Allocated Old Growth	2845	27	2845	27	2913	28
Stand Density:						
Reduction in stand density through intermediate harvest	0	-	288	3	182	2
Improve growing conditions for overstocked seedling/sapling stands	0	-	775	7	775	7
Reduce the spread of dwarf mistletoe in previously harvested seed tree units.	0		161 acres		161 acres	
Measurement Parameters	**Alternative A**		**Alternative B**		**Alternative C**	
Increase Watershed Support of Aquatic Resources						
Sediment (Water Resources Report pp. 27, 33, 34)	Existing production (tons/year)		Decrease in Sediment		Decrease in Sediment	
			%	Tons/year	%	Tons/year
Haggerty/Shady/face drainages	52.8		22	11.6	22	11.6
Tumbledown Creek	2.1		11	2.1	11	2.1
Bruin Creek	17.2		53	17.2	53	17.2
Stevens Creek	0.3		1	0.3	2	0.6
Miles of road decommissioned	0		31.4		31.9	
Culverts removed or upgraded	0		115		115	
Number of undersized culverts left in place	18		4		10	
Measurement Parameters	**Alternative A**		**Alternative B**		**Alternative C**	
Increase Wildlife Security (Wildlife Report p. 58)						
Elk Habitat Potential						
Bruin Elk Analysis Unit	.37		.47		.50	
Tumbledown Elk Analysis Unit	.42		.47		.62	
Entire Quartz Gold Elk Habitat Unit 10	.42		.44		.46	
Acres of secure habitat						
Bruin Elk Analysis Unit	195		440		589	
Tumbledown Elk Analysis Unit	0		284		1,119	
Entire Quartz Gold Elk Habitat Unit 10	1308		1950		2934	
Open Road Density (miles per square mile)						
Bruin Elk Analysis Unit	4.0		2.6		2.5	
Tumbledown Elk Analysis Unit	2.4		2.3		1.6	
Entire Quartz Gold Elk Habitat Unit 10	2.9		2.7		2.6	
Provide wood products for local communities						
Volume of timber produced (CCF) (Economic Report p. 4)	0		16,469		9,721	
Acres of yarding tops that would be piled and may be used for the Fuels to Schools Project	0		34 acres		28 acres	

Table 17 – Comparison of How Alternatives Address Issues

Indicators	Alternatives		
Issue – Effects of Vegetation Management & Roads on Water Quality, Water Yield & Fish Habitat	**A**	**B**	**C**
Changes in water yield (%)	0	1% to 2%	0.8% to 1.5%
Year water yield returns to existing	n/a	2013 - 2020	Sooner than 2013-2020
Sediment from road construction, timber harvest, and fuels treatment			
Increase (%)	0	1% to 5%	0.2% to 1.2%
Year sediment returns to existing	n/a	2010-2020	Similar to Alternative B
Sediment decrease after completion of all proposed activities (tons per year / %)			
Haggerty / Shady / face drainages	n/a	11.6 tons / 22%	11.6 tons / 22%
Tumbledown Creek	n/a	2.0 tons / 11%	2.1 tons / 11%
Bruin Creek	n/a	17.2 tons / 53%	17.2 tons / 53%
Stevens Creek	n/a	0.3 tons / 1%	0.6 / 2%
Number of stream crossings removed	0	107	115
Number of stream crossings remaining	168	61	53
Miles of road removed w/in 50 feet of stream channels	0	2.7	2.9
Trend of fish habitat function			
Miles of streams with improving fish habitat function	0	15.2	19.8
Miles of streams with status quo fish habitat function	19.8	4.6	0
Miles of streams with degrading fish habitat function	0	0	0
Issue – Effects of Vegetation Management on Soil Productivity	**A**	**B**	**C**
% of detrimental soil disturbance by activity area	0	≤ 13%	≤ 13%
Discussion of effects on organic matter and coarse woody debris	No change	Soils Report pp. 18-19	Soils Report pp. 18-19
Discussion of effects on nutrient levels	No change	Soils Report p. 20	Soils Report p. 20
Discussion of possibilities of erosion and mass failure	No change	Soils Report pp. 20-21	Soils Report pp. 20-21
Issue – Effects of Timber Harvest & Road Const. on Wildlife Habitat	**A**	**B**	**C**
Disturbance/Access:			
Open road/trail miles	52.1	39.7	33.2
Open road/trail densities (mi/mi^2)	3.2	2.4	2.0
Connectivity:			
# of units w/in travel ways	0	15	6
# of units requiring leave tree retention adjustment	0	5	1
# of units reducing quality of timbered connection	0	11	7
# of times new road construction bisects travel corridors	0	6	2
Canada lynx:			
Stateline-Quartz LAU			
Acres of stand initiation habitat	2547	2551	2547
Acres of regeneration cuts last decade	558	562	558

Indicators	Alternatives		
Gold Creek LAU			
Acres of stand initiation habitat	1316	1408	1355
Acres of regeneration cuts last decade	462	554	501
Acres of secure habitat	195	724	1708
% of secure habitat	1.9	6.9	16.2
Gray wolf:			
Open (ATVs and full-size) road/trail density (mi./sq. mi.)	2.9	2.7	2.6
% secure habitat	3.2	4.8	7.2
Elk habitat potential	.42	.44	.46
Fisher (and marten):			
Suitable habitat (acres / %)	3382 / 37.2	2945 / 32.4%	3116 / 34.2
Open road density (mi./sq. mi.) / vulnerability risk	3.2 / high	2.4 / high	2.0 / high
Wolverine:			
Open (ATVs and full-size) road/trail density (mi./sq. mi.)	2.9	2.7	2.6
% secure habitat	3.2	4.8	7.2
Elk habitat potential	.42	.44	.46
Flammulated owl:			
Acres of suitable habitat	994	981	994
Number of territories	16	16	16
Suitable acres within territories	820	820	820
Western toad:			
Acres where treatments would reduce upland timbered habitat quality	0	123	68
Number of new stream crossings with new road construction	0	2	0
Northern goshawk:			
# of nest stands or nest areas that would become unsuitable	0	3	2
Acres of potential nesting habitat that would be made unsuitable	0	185	113
Pileated woodpecker:			
Acres of foraging habitat with reduced quality	0	366	229
Acres of habitat converted to non-foraging	0	125	69
Acres of nesting habitat with reduced quality	0	321	199
Acres of habitat converted to non-nesting	0	110	54
Elk:			
Bruin Area			
Open (including ATVs) road density (mi./sq.mi.)	4.0	2.6	2.5
Secure acres	195	440	589
% security	4.0	9.0	12.1
Elk habitat potential	.37	.47	.50
Tumbledown Area			
Open (including ATVs) road density (mi./sq.mi.)	2.4	2.3	1.6
Secure acres	0	284	1,119
% security	0.0	5.0	19.8
Elk habitat potential	.42	.47	.62

Indicators	Alternatives		
Quartz Gold Elk Habitat Unit 10			
Open (including ATVs) road density (mi./sq.mi.)	2.9	2.7	2.6
Secure acres	1308	1950	2934
% security	3.2	4.8	7.2
Elk habitat potential	.42	.44	.46
Issue #4 – Effects of Timber Harvest & Road Const. on Stands that Meet Min. Criteria for Old Growth	**A**	**B**	**C**
Acres of treatment in stands that meet minimum criteria for old growth	0	68	0
Length and acres of road construction through stands that meet minimum criteria for old growth but are not allocated	0	0.3 miles / 1.1 acres	0
Length and acres of road construction through stands that are allocated for old growth management	0	0	169 feet / 0.03 acres

ENVIRONMENTAL CONSEQUENCES

This section provides a summary of the environmental impacts of the alternatives considered in detail. It provides the necessary information to determine whether or not to prepare an environmental impact statement. Further analysis and conclusion about the potential effects are available in reports for each resource and other supporting documentation cited in those reports. As noted previously, these reports are online at www.fs.fed.us/ipnf/eco/manage/nepa/index or in the project file located at the St. Maries office of the St. Joe Ranger District.

Past, Present, and Reasonably Foreseeable Future Activities

Forest Service Handbook 1909.15.15.1 provides guidance on the consideration of past actions in cumulative effects analysis. It states "…regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." It goes on to say, "…the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions."

Past, present, and reasonably foreseeable actions were considered for analysis of cumulative effects where appropriate for each resource (see resource reports). Past actions considered in cumulative effects analysis include those that contributed to establishing the baseline conditions of the project area today (Table 18). A list of past, present, and reasonably foreseeable activities is provided in the Management Activity Report. Table 18 provides a summary of activities that were considered in the cumulative effects analyses and include those that occurred in the past, are still occurring, may occur, or may continue for an undetermined amount of time into the future. More detail is found in the Management Activity Report.

Table 18 – Past, Present, and Reasonably Foreseeable Actions

Action	Past	Present	Future
Timber Harvest	X		
Tree Planting	X		
Precommercial Timber Stand Improvement	X		
Prescribed Burning for Site Preparation and fuels treatment	X		
Wildfires	X		**unknown**
Fire Suppression	X	X	X
Clearing Brush and Trees to Maintain Helispots	X	X	X
Wildlife Burns	X		
Road Construction	X		
Road Decommissioning	X		
Road Maintenance	X	X	X
Conrad Campground	X	X	X
Public Activities: firewood cutting, driving roads, camping, snowmobiling, hunting, hiking, berry picking, fishing, Christmas tree cutting	X	X	X
Trail Maintenance	X	X	X
In-stream Fisheries Habitat Improvement Projects	X		
Spraying Herbicides to Control and Prevent Noxious Weeds Under the St. Joe Noxious Weed EIS	X	X	X
Outfitting: • Simmons/Quartz Designated Outfitter Area: year-round operations; snowmobile use for hunting operations only on routes open to public; horseback tours; Whitetail Peak Spike Camp • Fishing in St. Joe River from Red Ives to Avery • Rafting in St. Joe River from Spruce Tree CG to Avery	X	X	X
Baffling a culvert under FH 50 at Bruin Creek	X		
Large woody debris removal from Bruin Creek	X		
Eureka Mine	X		
Installing bat-friendly grate to close Eureka Mine for safety			X

This list does not include the proposed activities. Past, present, and reasonably foreseeable actions were considered for each resource where they apply.

Air Quality (Project File Section AQ)

Alternative A - No Action

Direct and Indirect Effects (Air Quality Report p. 5)

This alternative would have no immediate adverse effect on air quality, and air quality would remain good except in the event of a wildfire.

The potential for air quality degradation and reduced visibility may increase with Alternative A compared with the other alternatives because of the potential of wildfire in untreated areas. Fuel accumulation from ongoing tree mortality in the analysis area would potentially increase fire intensity and severity if a wildland fire were to occur within the analysis area. Consumption of increased fuel loads and understory biomass would increase the amount of smoke emissions. These emissions may remain in the local and surrounding airsheds for a period of a few days to several weeks depending on fire size and intensity. Research has found that emissions are greater from contemporary fires, even though they have burned fewer acres annually than fires historically did. This trend occurs because consumption of fuel per unit area burned has been greater in the current period than that of the preceding historic period (USDA, USDI 1997). The potential wildfire scenario that could occur in areas not treated in Alternative A would not be regulated and could result in greater particulate production per acre in the absence of fuel treatment and hazard reduction through timber harvest or prescribed fire, and has good potential to occur during poor dispersion conditions and drier conditions with more available fuel.

Cumulative Effects (Air Quality Report p. 5)

Current management activities in this area contribute little additional pollutants. The primary source of pollution would be from vehicle exhaust, wood smoke, and dust from traffic. The noxious weed treatment that may occur under the St. Joe Weed Control Project EIS and ROD would have short-term, localized impact on air quality because of the drift of spray particles. Generally the greatest part of this drift would settle within 25 feet of the site, although small amounts could carry greater distances (USDA Forest Service 1993). The smell of

chemicals such as 2, 4-D may also persist at a spray site for several days following spraying. Human inhalation environmental exposures of herbicides would be less than occupational exposures since spray operators, involved with activities on the spray units, are more likely to be subject to spray mist than is a casual visitor. A casual forest visitor would be expected to receive an inhalation exposure of far lesser magnitude than that of a person applying herbicides (USDA Forest Service 1984). All other activities (Air Quality Report p. 7) would have no measurable effect on air quality in the project area. Pollution from vehicle exhaust, camp fires and road dust in the area is light. It is reasonably foreseeable that smoke from wildfires from outside the project area would have some derogatory effect to the air quality within the project area during the summer months.

Regulatory Consistency (Air Quality Report p. 5)

The No-Action Alternative would comply with the Idaho Panhandle Forest Plan, North Idaho Smoke Management Plan, and the Clean Air Act. The Clean Air Act does not apply to wildfire emissions.

Alternatives B and C

Direct and Indirect Effects (Air Quality Report p. 6)

The smoke emissions from prescribed burning activities could adversely affect air quality for short periods. Dust may increase from road construction, maintenance, and stabilization as well as project-associated vehicular traffic. Dust is generally a very temporary and local problem. Road dust is primarily a minor local nuisance settling near the source. Dust is also generated at differing times than prescribed fire activity.

Alternatives B and C emissions predicted by the First Order Fire Effects Model (FOFEM) range from 277 to 287 tons of PM10. However, the proposed prescribed burning would likely occur over at least a three-year time period and would be conducted only when atmospheric conditions are judged favorable. Given a three-year time frame for fuel activities, the annual expected smoke emissions would be between roughly 90 and 95 tons per year, depending upon the alternative selected.

Idaho's Department of Environmental Quality (DEQ) and the Montana/Idaho Airshed Group monitor air pollutants and issue guidance that is intended to minimize burning during times when such activities would result in violations of the State standards, including unacceptable impacts to non-attainment areas. The Forest Service, as a participating partner of the Montana/Idaho Airshed Group, voluntarily ceases burning operations to avoid violations of State standards whenever such guidance is provided by local air quality regulators.

Broadcast burning of activity-created fuels would occur either in early spring when regional smoke production from all wildland sources has been historically low, or during selected fall periods when on-site conditions are less conducive to smoldering and consumption of large fuels. Piles would be burned from late fall to early winter. Smoke and particulate matter would flow to the northeast and would dissipate rapidly during good to excellent dispersion days.

Proposed activities may temporarily affect air quality in the St. Regis area, the only residential area likely to be affected. Effects would be from the down- canyon winds at night bringing smoke into the area until daytime lifting of the smoke occurs. Forest visitors to the developed and undeveloped campgrounds along the St. Joe River corridor may experience pooling of smoke affecting these sites. Smoke produced from prescribed fire would be dispersed generally to the northeast by prevailing winds over unpopulated forest lands. The smoke that reaches other populated areas to the northeast would be lifted high in elevation and would primarily contribute to general regional haze.

Noxious weed spraying would have short-term, localized effects in the area of spraying. The area may be sprayed for noxious weeds according to the St. Joe Noxious Weed Control EIS. The impact from spraying would be very minimal to the air quality in the project area. The proposed weed treatment would have short-term, localized impact on air quality because of the drift of spray particles. Generally the greatest part of this drift would settle within 25 feet of the site, although small amounts could carry greater distances (USDA Forest Service 1993). The smell of chemicals may also persist at a spray site for several days following spraying. Human inhalation environmental exposures would be less than occupational exposures since spray operators involved with activities on the spray units are more likely to be subject to spray mist than a casual visitor. A forest visitor should be expected to receive inhalation exposure orders of magnitude less than that of a person applying herbicides (USDA Forest Service 1984).

Cumulative Effects (Air Quality Report pp. 6-7)

Prescribed fire from both inside and outside the project area has generated smoke during the spring and fall months. Agricultural burning restrictions applied to agricultural areas to the west have reduced levels of regional haze since restrictions were implemented. Pollution from vehicle exhaust, camp fires, and road dust in the area are low. Wildfires from outside, as well as those from inside the project area generate smoke during the summer months. Wildfire smoke has been reduced in the Fallen Bear Area during the fire suppression era where fires were kept small and quickly extinguished.

Regulatory Consistency (Air Quality Report p. 7)

Prescribed burning would be monitored and controlled by airshed regulations to avoid violation of air quality standards, in compliance with the North Idaho Smoke Management Plan, as directed in the forest plan. Requirements of the North Idaho/Montana State Airshed Group (notification of planned burning one day in advance) allows the Idaho DEQ to place restrictions on or prevent burning if it determines that air quality standards can not be met, which meets the Clean Air Act. The annual production of $PM_{2.5}$ and PM_{10} for the Fallen Bear project is expected to be less than 100 tons, and the project is expected to meet the Clean Air Act.

Aquatics (Project File Sections W & F)

WATER RESOURCES (Project File Section W)

Alternative A - No Action (Water Resources Report p. 20)

Direct, Indirect, and Cumulative Effects

There would be no direct change to existing beneficial use support. Modeling shows reduction in risks of erosion and sedimentation. The Idaho Department of Environmental Quality identified the St. Joe River and its tributaries as impaired due to stream water temperatures that exceed water quality standards, but no stream temperature TMDLs are developed for the St. Joe River. No direct change in stream temperature would occur because there would be no change in vegetation with riparian habitat conservation area (RHCA) buffers; however, stream temperatures may be reduced over time by increased stream shade as vegetation continues to grow in RHCAs adjacent to streams.

Major streams in the project area are functioning for the existing water and sediment yield and are believed to be in adjustment. Stream processes of storing and transporting material delivered to them appear to be functioning without unnatural changes. Stream channel form and process is not expected to change, and there would be no adverse change in estimated flood flows and annual water or sediment yields.

Alternative B

Direct and Indirect Effects

The proposed activities, overall, are expected to increase beneficial use support (Water Resources Report p. 29) because:

- Proposed activities would not change stream temperature.
- The small predicted increase in water yield is not outside the range of natural variability and would not be appreciable in the peak flows the stream channels historically experienced.
- The short-term increase in sediment is not substantial and is not likely to affect stream channel form or process.
- Overall, sediment would decrease once all activities are completed.
- Potential pollutant entry points would be reduced from the removal of 64% of existing stream crossings and reduction of 58% in road mileage within 50 feet of stream channels.

The estimated water yield peak increases would be between one and two percent for affected drainages in Alternative B and would return to existing discharges between 2013 and 2020 (Water Resources Report p. 24).

Overall, sediment would be lowered after completion of proposed activities because of the reduction in sediment resulting from a 64% reduction in road crossings and removal of 58% of road mileage within 50 feet of stream channels (Water Resources Report pp. 27-28) when roads are stored and decommissioned; but road construction, timber harvest and prescribed burning would temporarily produce 1 to 5% additional sediment

(Water Resources Report p. 25). The temporary sediment increase is not expected to be appreciable or measurable in project area streams (Water Resources Report p. 25). Of the 168 existing culverts at stream crossings, 107 would be removed when roads are stored or decommissioned. Four undersized culverts would be left in place where the roads would not be used for hauling logs (Water Resources Report p. 27).

No appreciable effects to stream channel form are expected from changes in water yield or sediment yield because the magnitude of the estimated water yield peak increase would be small (0.5 – 0.7 CFS) and of short duration and the short-term sediment increase would be small in magnitude with an overall decrease in sediment once all activities are completed (Water Resources Report p. 26). Channel pattern is not expected to change because the streams are confined by valley walls (Water Resources Report p. 26).

No substantial change is expected in stream channel processes of storing and transporting material because the estimated small increase in water yield would not substantially change stream flows outside the realm of natural conditions and sediment size would not shift appreciably and sediment aggradation is not expected (Water Resources Report p. 26).

No direct or indirect effect to streambank vegetation is expected because no management activities would occur that would change vegetation composition or structure in riparian habitat conservation areas, therefore no change in stream temperatures is expected as a result of proposed activities (Water Resources Report p. 26).

No changes are expected in longitudinal hydrologic connectivity because no dams or diversions or change in base flow conditions are proposed. Little change is expected in the lateral hydrologic connectivity of the stream to any floodplain because frequency of inundation would not diminish from proposed activities, no levees are proposed, and no appreciable channel incision is expected because scour is not expected from the minor water yield increase (Water Resources Report p. 28).

Wetlands would not be affected by proposed activities. No wetlands have been identified within the project area, and design features would protect wetlands if any are found during implementation of the proposed activity (Water Resources Report p. 28).

White pine pruning, precommercial thinning, girdling and inoculating larch trees, and planting conifer seedlings are not expected to have any effect because there would be no ground disturbance or only minimal ground disturbance from seedling planting, no substantial removal of vegetative cover and no use of soil compacting mechanized equipment. These activities involve the use of hand-held and manually operated loppers, seedling planting tools and chainsaws. There would be no substantial change in water yield or sediment generation from these activities (Water Resources Report p. 23).

Effects of proposed gopher control through the use of pesticides were documented in the St. Joe Ranger District Pocket Gopher Control Project Decision Memo dated January 24, 2008. The effects would be applicable to the same proposed activity in the Fallen Bear Project Area. Following the identified design features would prevent substantial direct or indirect effects to the water resource (Water Resources Report p. 23).

Cumulative Effects (Water Resources Report pp. 29-32)

The existing stream channel form and processes are the cumulative result of all past and present activities on the stream channel. These activities include timber harvest and related activities, precommercial timber stand improvement, road construction, road maintenance, road-related mass failures, Conrad Crossing Campground, trail construction and maintenance, and in-stream fish habitat improvements. Large woody debris removal in Bruin Creek likely had an effect, but those effects are likely no longer present. Reasonably foreseeable future activities (road maintenance, use and maintenance of Conrad Crossing Campground, recreational use of the area by the public, trail maintenance, closing a mine adit with a bat-friendly gate) are not expected to appreciably affect stream channel form or processes because of BMP implementation, dispersed activity location and timing, relatively low impact with minimal ground disturbance or no additional new ground disturbance.

Cumulative effects from proposed activities combined with effects from past, present or foreseeable activities are not expected to appreciably affect stream channel form or processes because of the small changes in water and sediment yield over short time frames and the overall net reduction in sediment. Aggradation is not expected to occur. Road-related mass failure sediment has been assimilated into the stream channels of Haggerty and Bruin Creeks, and these stream channels adjusted to this input in the same way as if these were natural mass failures. The stream channels have adjusted to their current water and sediment yield as evidenced by the relative stability of stream channels, the current riparian vegetation and the amount of large

woody material present. Channel pattern and channel classification are not expected to change cumulatively from proposed activities when combined with past, present or foreseeable activities because of relatively stable cross-sections, the existing riparian vegetation, amounts of LWD and the confined nature of the stream channels.

Cumulative effects from estimated sediment levels associated with Alternative B are not expected to be appreciable in the St. Joe River immediately downstream from the project area streams because: 1) the estimated increase is small; 2) the short-term nature of the estimated increase; 3) some portion to all of the estimated sediment increase would be stored within the project area stream channels and floodplains; 4) the estimated increase would not cause aggradation or likely be even measurable at a downstream location; 5) there would be a substantial overall estimated decrease in sediment once all activities are completed which would improve downstream conditions and downstream beneficial use support.

No change in stream temperature is expected from the proposed activities because there would be no change in vegetation within the RHCA buffers, so stream temperatures may decrease from increased stream shade as vegetation continues to grow in RHCA areas adjacent to stream channels.

Alternative C

Direct and Indirect Effects

The proposed activities, overall, are expected to increase beneficial use support (Water Resources Report p. 36) because:

- Proposed activities would not change stream temperature.
- The small predicted increase in water yield is not outside the range of natural variability and would not be appreciable in the peak flows the stream channels historically experienced.
- The short-term increase in sediment is not substantial and is not likely to affect stream channel form or process.
- Overall, sediment would decrease once all activities are completed.
- Potential pollutant entry points would be reduced from the removal of 68% of existing stream crossings and reduction of 64% in road mileage within 50 feet of stream channels.

Water yield peak increases would be between 0.8 and 1.5 percent for affected drainages in Alternative C and may recover more quickly than they would for Alternative B because fewer acres would be harvested and fewer miles of road would be constructed (Water Resources Report p. 33).

Overall, sediment would be lowered after completion of proposed activities because of the 0.6 to 17.2 percent decrease in sediment resulting from road recontouring and storage (Water Resources Report p. 34); but road construction, timber harvest and prescribed burning would temporarily produce between 0.2 and 3.9 percent additional sediment (Water Resources Report p. 33). The temporary sediment increase is not expected to be appreciable or measurable in project area streams (Water Resources Report p. 33). Of the 168 existing culverts at stream crossings, 115 would be removed when roads are stored or decommissioned. Ten undersized culverts would be left in place where the roads would not be used for hauling logs (Water Resources Report p. 27).

No appreciable effects to stream channel form are expected from changes in water yield because the magnitude of the estimated peak increase is small (0.5-0.7 cfs) and of short duration, returning to pre-activity levels within 4 to 11 years. Stream channel form is not expected to be substantially affected by the estimated sediment increase because the short-term increase in sediment is of small magnitude and there would be an overall 2 to 53% estimated decrease in sediment once all activities are completed. Sediment storage is not expected to appreciably affect channel form at any given location because substantial aggradation is not expected even though sediment may be temporarily stored within stream channels. Channel pattern and channel classification are not expected to appreciably change from changed sediment yield and size because of relatively stable cross-sections, the existing riparian vegetation, amount of LWD and the confined nature of the stream channel (Water Resources Report p. 35).

No substantial change is expected in the stream channel processes of storing and transporting material because the estimated small increase in water yield would not substantially change stream flows outside the realm of natural conditions. Stream channel transport processes are not expected to substantially change as a

result of the short-term estimated sediment increase from Alternative C activities because there would not be an appreciable shift in sediment size and aggradation is not expected to occur (Water Resources Report p. 35).

No direct or indirect effect to stream bank vegetation is expected because no management activities would occur that would change vegetation composition or structure in riparian habitat conservation areas, therefore no change in stream temperatures is expected as a result of proposed activities (Water Resources Report p. 35).

No changes are expected in longitudinal hydrologic connectivity because no dams, diversions, or change in base flow conditions are proposed. Little change is expected in the current lateral hydrologic connectivity of the stream to the floodplain because frequency of inundation would not diminish from Alternative C activities, no levees are proposed, and no appreciable channel incision is expected because scour is not expected from the minor water yield increase (Water Resources Report p. 35).

Wetlands would not be affected by proposed activities. No wetlands have been identified within the project area, and design features would protect wetlands if any are found during implementation of the proposed activity (Water Resources Report p. 35).

White pine pruning, precommercial thinning, girdling and inoculating larch trees, and planting conifer seedlings are not expected to have any effect because there would be no ground disturbance or only minimal ground disturbance from seedling planting, no substantial removal of vegetative cover and no use of soil compacting mechanized equipment. These activities involve the use of hand-held and manually operated loppers, seedling planting tools and chainsaws. There would be no substantial change in water yield or sediment generation from these activities (Water Resources Report p. 23).

Effects of proposed gopher control through the use of pesticides were documented in the St. Joe Ranger District Pocket Gopher Control Project Decision Memo dated January 24, 2008. The effects would be applicable to the same proposed activity in the Fallen Bear Project Area. Following the identified design features would prevent substantial direct or indirect effects to the water resource (Water Resources Report p. 23).

Cumulative Effects (Water Resources Report pp. 36-37)
The cumulative effects of Alternative C are not substantially different than those discussed for Alternative B, above. Overall effects are expected to be somewhat less than that of Alternative B because Alternative C would have 55% of the harvest and 23% of the new road construction compared to Alternative B.

The existing stream channel form and processes are the cumulative result of all past and present activities on the stream channel. These activities include timber harvest and related activities, precommercial timber stand improvement, road construction, road maintenance, road-related mass failures, Conrad Crossing Campground, trail construction and maintenance, and in-stream fish habitat improvements. Large woody debris removal in Bruin Creek likely had an effect, but those effects are likely no longer present. Reasonably foreseeable future activities (road maintenance, use and maintenance of Conrad Crossing Campground, recreational use of the area by the public, trail maintenance, closing a mine adit with a bat-friendly gate) are not expected to appreciably affect stream channel form or processes because of BMP implementation, dispersed activity location and timing, relatively low impact with minimal ground disturbance or no additional new ground disturbance.

Cumulative effects from proposed activities combined with past, present or foreseeable activities are not expected to appreciably affect stream channel form or processes because of the small changes in water and sediment yield over short time frames and the overall net reduction in sediment. Aggradation is not expected to occur. Road related mass failure sediment has been assimilated into the stream channels of Haggerty and Bruin Creeks, and these stream channels adjusted to this input in the same way as if there were natural mass failures. The stream channels have adjusted to their current water and sediment yield as evidenced by the relative stability of stream channels, the current riparian vegetation and the amount of large woody material present.

Cumulative effects from estimated sediment levels associated with Alternative C are not expected to be appreciable in the St. Joe River immediately downstream from the project area streams because: 1) the estimated increase is small; 2) the short-term nature of the estimated increase; 3) some portion to all of the estimated sediment increase would be stored within the project area stream channels and floodplains; 4) the estimated increase is not substantial or likely even measurable at a downstream location; 5) there would be a substantial overall estimated decrease in sediment once all activities are completed which would improve downstream conditions and downstream beneficial use support.

No change in stream temperature is expected from the proposed activities because there would be no change in vegetation within the RHCA buffers. Stream temperature may become reduced from increased stream shade as vegetation continues to grow in RHCA areas adjacent to stream channels. The proposed activities are, overall, expected to increase beneficial use support.

Regulatory Consistency – Alternatives B & C (Water Resources Report pp. 37-38)

Forest Plan

Alternative B and Alternative C are consistent with the Forest Plan goals and standards because management activities would implement BMPs; RHCA buffers would be implemented to protect water quality; and proposed activities would not appreciably change water quality or stream channel form or processes.

Clean Water Act

Alternative B and Alternative C are consistent with the goals and objectives of the Clean Water Act because management activities would not appreciably change the physical processes of storage and transport of material delivered to stream channels. Stream channel form and processes are not expected to appreciably change from management activities because of relatively stable cross-sections, riparian vegetation, amount of LWD and confined nature of the stream channels. The biological integrity of waters within the project area are not expected to appreciably change from management activities because temperature and organic inputs would not change because of RHCA buffers; the short-term small estimated sediment increase would not cause aggradation; and effects from proposed activities are not outside the range of natural variability. The biological integrity of waters within the project area should improve once all activities are complete and the overall sediment yield is reduced. No change is expected to the chemical composition of waters within the project area because no chemical additives are proposed; no change in riparian vegetation within RHCAs; and the risk of contamination would be reduced because of the reduction in the number of road/stream crossings and the reduction in the amount of road mileage within 50 feet of stream channels.

State Water Quality Laws and Regulations

Alternative B and Alternative C are consistent with Idaho State Water Quality Standards because non-point source pollution would be managed through the use of BMPs in completing management activities. No appreciably change to water quality and beneficial use support is expected from the estimated short-term water or sediment yields; the long-term reduction in sediment would improve water quality and beneficial use support. No change in stream temperatures is expected because of RHCA buffers. Stream channel form and processes are not expected to appreciably change from management activities.

Executive Orders 11988 & 11990

Alternative B and Alternative C are consistent with the Executive Orders 11988 and 11990 because management activities would not affect floodplains or wetlands.

NFMA

Alternative B and Alternative C are consistent with NFMA because watersheds would not be irreversibly harmed and the implementation of RHCA buffers would protect the water resource and not adversely affect water conditions.

FISHERIES (Project File Section F)

Alternative A - No Action (Fisheries Resource Report p. 18)

Direct and Indirect Effects

None of the identified limiting factors would be altered in any of the streams of the project area. The management activities proposed in the action alternatives, which could alleviate these concerns (road decommissioning and culvert removal or replacement) would not occur.

Cumulative Effects

The status of streams in the project area would not change. Streams would have a slow improvement to stream temperature conditions due to continued growth of previously harvested riparian stands. Migration barriers on Highway 50 would remain. Road maintenance would continue to occur which would ensure that culverts that are maintained have a reduced risk of failure, thus reducing the risk of sediment increases from those locations.

Effects of Activities Common to Both Action Alternatives (Fisheries Resource Report pp. 16-19)

White pine pruning, girdling larch seed trees, and inoculating girdled larch would have no effect to the fisheries resource because work would be done with hand tools with no ground disturbance. Precommercial thinning may increase the rate of growth of remaining trees thus providing benefits to channels in the long term. There will be no direct effects to fish species or aquatic habitats as a result of implementing pocket gopher control with the identified design features. Indirect effects to fish in or near the proposed project area are possible but are not likely to occur. It is unlikely that strychnine or zinc phosphide would come in contact with streams and therefore would not indirectly affect fish (Fisheries Biological Assessment for Pocket Gopher Control 2008-2018).

Alternative B

Direct and Indirect Effects of Alternative B

Tumbledown Creek (Fisheries Resource Report pp. 20-21)

The proposed timber harvest would have no effects on stream conditions due to the minimal amount of harvest in the Tumbledown drainage and the use of buffers. The Water Resources Report indicates that proposed activities would result in no appreciable increase in sediment, therefore the timber harvest proposed in Alternative B would result in no change to in-stream habitat. Fuel treatments would have no adverse effects, and reforestation activity would have beneficial effects. New Road construction would be minimal, would be located near the ridge, and would not cross any streams. Following use, the road would be put into long-term storage and would not contribute to road density within the drainage. Road reconstruction would occur mainly on roads near the ridge. The location of these roads and the use of design features would reduce potential for negative impacts from road reconstruction and road maintenance. Road decommissioning and storage would decrease road density from a high density level to a moderate density level. The reduction in roads and the location of the remaining roads would help to reduce the effects of road density on the stream habitat. Although this reduction is an improvement over current conditions, the remaining moderate road density does not entirely meet desired condition because areas with low road densities maintain aquatic strong holds (Lee and others 1997). The number of stream crossings (indicating sediment production) would improve from a “poor” condition to a “good “condition. In the short term, this would add sediment to the stream channel during implementation; however, in the long term this activity would benefit the streams in Tumbledown drainage.

Bruin Creek (Fisheries Resource Report pp. 22-23)

Timber harvest associated with this alternative would create no effects to the stream conditions due to the minimal amount of harvest in the Bruin Creek drainage and the use of buffers. The Water Resources Report indicates that proposed activities would result in no appreciable increase in sediment, therefore proposed harvest activities would result in no change to in-stream habitat. Fuel treatments would have no adverse effects, and reforestation activity would have beneficial effects. The proposed road construction in the Bruin Creek drainage would cause little sediment increase to stream channels except for one segment with the only proposed stream crossing because the roads would be constructed near the ridge or midslope. Following use, the road would be put into long-term storage and would not contribute to road density within the drainage. Design Features I.A.1-3 and V.A.2 would be implemented to reduce the potential for sediment introduction from the new road and the stream crossing. Design features V.A. 1 and 2 would reduce potential for negative impacts from road reconstruction and road maintenance. All undersized culverts on reconstructed roads would be replaced with correctly sized culverts. This would create a short-term increase in sediment during installation but in the long term it would reduce the risk of culvert failure, which could cause large inputs of sediment. Road decommissioning and storage would decrease road density from an extremely high-density level to a high-density level. The reduction in roads and the location of the remaining roads would help to reduce the effects of road density on the stream habitat. Although this reduction is an improvement over current conditions, the remaining high road density does not entirely meet desired condition because areas with low road densities maintain aquatic strong holds (Lee and others1997). The number of stream crossings (indicating sediment production) would improve from a “poor” condition to a “moderate “condition. In the short term this would add sediment to the stream channel during implementation; however, in the long term this activity would benefit the streams in the Bruin drainage. A moderate rating for stream crossings, however, does not entirely meet the desired condition.

Stevens Creek (Fisheries Resource Report p. 24)

The proposed timber harvest would not create negative impacts to the fish habitat of Stevens Creek because the harvest would be a commercial thin on a 28 acres, located high in the drainage and no-entry bufferstrips would be utilized. Fuel treatments would have no adverse effects. Road storage and decommissioning would reduce road density from a high level to a moderate level. The remaining roads would have a reduced influence on the fish habitat because the majority of them are high in the drainage. The exception is FH 50 which crosses near the mouth. Reducing stream crossings may cause a short-term increase in sediment, but in the long term it would benefit the stream channels.

St. Joe River, face drainages, and non-fish-bearing drainages (Fisheries Resource Report p. 25-26)

The proposed timber harvest would create no effects to the stream conditions in the St. Joe River due to the minimal amount of regeneration harvest (1.8% of the face drainages) and the use of buffers. The Water Resources Report indicates that the proposed activities would result in no appreciable increase in sediment (5% increase) or water yields (2% increase), therefore proposed timber harvest activities would result in no change to stream habitat. Fuel treatments would have no adverse effects, and reforestation activity would have beneficial effects. The proposed road construction would cause little sediment increase to stream channels because it would not include any stream crossings and would occur near a ridge. Design Features I.A.1-3 and V.A.2 would be implemented to reduce the potential for sediment introduction. Following use the road would be put into long-term storage and would not contribute to road density within the drainage. Design features V.A. 1 and 2 would reduce potential for negative impacts from road reconstruction and road maintenance. All undersized culverts on reconstructed roads would be replaced with correctly sized culverts. This would create a short-term increase in sediment during installation, but in the long-term it would reduce the risk of culvert failure which could cause large inputs of sediment. Road density would decrease from a high density level to a moderate density level. The reduction in roads and the location of the remaining roads would help to reduce the effects of road density on the stream habitat. However, Highway 50 would continue to lie within the RHCA and thus have an influence on the river habitat. The reduction in road density would be an improvement over current conditions; however, the remaining moderate road density would not entirely meet desired condition because areas with low road densities maintain aquatic strong holds (Lee and others 1997). The stream crossings criteria (indicating sediment production) would improve from a “poor” condition (2.4 crossings/stream mile) to a “moderate “condition (0.9 crossings/stream mile). During implementation this would add sediment to the stream channel; however, in the long-term this activity would benefit this segment of the St. Joe.

Cumulative Effects of Alternative B

Tumbledown Creek (Fisheries Resource Report p. 21)

Actions proposed in this alternative would produce no adverse effects and would provide beneficial effects from the reduction in road density and the number of stream crossings. The combination of proposed management activity effects; the effects of past, present, and reasonably foreseeable future activities (Fisheries Resource Report pp. 16-17); and the existing condition indicate the fisheries habitat within Tumbledown Creek would maintain adequate fish habitat conditions.

Bruin Creek (Fisheries Resource Report p. 23)

Actions proposed in this alternative would produce no adverse effects and would provide beneficial effects from the reduction in road density and the number of stream crossings. Although there would be an improvement due to the reduction in road densities, densities would continue to be at a level that reduces the quality of the stream habitat for fish. The continued presence of Road 1223 within the RHCA would continue to be a source for sediment introduction because of its close proximity to the stream. The reduction in stream crossings and the replacement of many undersized culverts would be an improvement however; sediment would still be at a moderate level. The combination of effects from proposed management activities, the effects of past, present, and reasonably foreseeable future activities (Fisheries Resource Report pp. 16-17); and the existing condition indicate the fisheries habitat within Bruin Creek would improve to an adequate condition. However, the stream would continue to be in a moderately altered/moderate risk condition due to the culvert under FH 50 which would remain a migration barrier.

Stevens Creek (Fisheries Resource Report p. 24)

The combination of management activity effects (i.e., the road decommissioning and culvert removal); the effects of past, present, and reasonably foreseeable future activities (Fisheries Resource Report pp. 16-17); and the existing condition indicate the fisheries habitat within Stevens Creek would trend towards adequate condition. The stream would continue to be in a Moderately altered/moderate risk condition due to the culvert under FH 50 which would remain a migration barrier.

St. Joe River, face drainages, and non-fish-bearing drainages (Fisheries Resource Report p. 26)

Actions proposed in this alternative would produce no adverse effects and would provide beneficial effects from the reduction in road density and the number of stream crossings. The combination of effects from proposed management activity entering the St. Joe from Tumbledown, Bruin and Stevens Creeks; the effects of past, present, and reasonably foreseeable future activities (Fisheries Resource Report pp. 17-18); and the existing condition indicate the fisheries habitat within this section of the St. Joe River would improve to an adequate condition. However, the continued presence of FH 50 would maintain this segment of the St. Joe in a Moderately altered/moderate risk condition.

Alternative C

Direct and Indirect Effects of Alternative C

Tumbledown Creek (Fisheries Resource Report p. 21)

The proposed activities would result in an overall benefit to the streams in the Tumbledown drainage. The proposed timber harvest would create no effects to the stream conditions due to the minimal amount of harvest and the use of buffers. The Water Resources Report indicates that there would be no appreciable increase in sediment due to proposed activities; therefore, the timber harvest proposed in Alternative C would result in no change to in-stream habitat. Fuel treatments would have no adverse effects, and reforestation activity would have beneficial effects. Effects from new road construction would be minimal because the amount of road construction would be minimal (0.62 miles), it would be located near the ridge, and would not cross any streams. Following use, the road would be put into long-term storage and would not contribute to road density within the drainage. Road reconstruction would occur mainly on roads near ridges. The location of these roads and the use of Design Features V.A. 1 and 2 would reduce potential for negative impacts from road reconstruction and road maintenance. Road decommissioning and storage would decrease road density from a high-density level to a low-density level. Reducing road density to a low level and removing roads near the streams would benefit the stream habitat. The number of stream crossings (indicating sediment production) would improve from a “poor” condition to a “good “condition, and only one crossing would remain. In the short term this would add sediment to the stream channel during implementation; however, in the long term this activity would benefit the streams in the Tumbledown drainage.

Bruin Creek (Fisheries Resource Report p. 23)

The proposed timber harvest would result in no effects to the stream conditions due to the minimal amount of harvest and the use of buffers. The Water Resources Report indicates that proposed activities would not result in an appreciable increase in sediment; therefore, the proposed harvest activities would result in no change to in-stream habitat. Fuel treatments would have no adverse effects, and reforestation activity would have beneficial effects. There would be no effects to fisheries from the proposed new road construction because the amount of new road construction is very limited (0.15 miles), does not cross any streams and would be put into long-term storage following use. Road reconstruction and road maintenance would utilize Design Features V.A. 1 and 2 to reduce potential for negative impacts. All undersized culverts on reconstructed roads would be replaced with correctly sized culverts. This would create a short-term increase in sediment during installation, but in the long term it would reduce the risk of culvert failure which could cause large inputs of sediment. Road storage and decommissioning would decrease the road density rating from an extremely high-density level to a high density level. The reduction in roads and the location of the remaining roads would help to reduce the effects of road density on the stream habitat. The remaining road density does not entirely meet the desired condition even though this reduction is an improvement over current conditions. The stream crossings criteria (indicating sediment production) would improve from a “poor” condition to a “moderate “condition, but a moderate rating for stream crossings does not entirely meet the desired condition. In the short term removing stream crossings would add sediment to the stream channel during implementation; however, in the long term this activity would benefit the streams in the Bruin drainage.

Stevens Creek (Fisheries Resource Report p. 24)

This alternative would improve drainage conditions. No timber harvest or fuel treatment is proposed in the Stevens Creek drainage with this alternative, therefore there would be no effect to the channel. Road density would be reduced from a high density to a moderate density, and the number of stream crossings would also be reduced.

St. Joe River, face drainages, and non-fish-bearing drainages (Fisheries Resource Report pp. 26-27)

The proposed timber harvest would result in no effects to the stream conditions due to the minimal amount of harvest and the use of buffers. The Water Resources Report indicates that there would be no appreciable increase in sediment due to proposed activities, therefore the proposed harvest activities would result in no change to in-stream habitat conditions. Fuel treatments would have no adverse effects, and reforestation activity would have beneficial effects. No new road construction is proposed in face and non-fish bearing drainages. Road reconstruction and road maintenance would utilize Design Features V.A. 1 and 2 to reduce potential for negative impacts. All undersized culverts on reconstructed roads would be replaced with correctly sized culverts. This would create a short-term increase in sediment during installation, but in the long term it would reduce the risk of culvert failure which could cause large inputs of sediment. Road storage and decommissioning would decrease road density from a high-density level to a moderate density level. The reduction in roads and the location of the majority of the remaining roads would help to reduce the effects of road density on the stream habitat. However, FH 50 would continue to lie within the RHCA and thus have an influence on the river habitat. The remaining moderate road density level does not entirely meet desired condition even though the reduction in road density would be an improvement over current conditions. The stream crossings criteria (indicating sediment production) would improve from a “poor” condition (2.4 crossings/ stream mile) to a “moderate “condition (0.9 crossings/stream mile). This would add sediment to the stream channel during implementation; however, in the long term it would benefit these stream segments.

Cumulative Effects of Alternative C

Tumbledown Creek (Fisheries Resource Report p. 21)

Specific actions proposed in this alternative would produce no adverse effects and would provide beneficial effects from the large reduction in road density and the number of stream crossings. The combination of effects from proposed management activities; effects from past, present, and reasonably foreseeable future activities; and the existing condition indicate the fisheries habitat within Tumbledown Creek would trend this stream toward an unaltered condition.

Bruin Creek (Fisheries Resource Report pp. 23-24)

Actions proposed in this alternative would produce no adverse effects and would provide beneficial effects from the reduction in road density and the number of stream crossings. Although there would be an improvement due to the reduction in road densities, densities would continue to be at a level that reduce the quality of the stream habitat for fish. The continued presence of Road 1223 within the RHCA would continue to be a source for sediment introduction because of its close proximity to the stream. The reduction in stream crossings and the replacement of many undersized culverts would be an improvement; however, this element (sediment) would still be at a moderate level. The combination of effects from proposed management activities; the effects from past, present, and reasonably foreseeable future activities; and the existing condition indicate the fisheries habitat within Bruin Creek would improve to an adequate condition. However, the stream would continue to be in a moderately altered/moderate risk condition due to the culvert under FH 50 which would remain a migration barrier.

Stevens Creek (Fisheries Resource Report p. 25)

The combination of effects from proposed management activities (i.e., road decommissioning and culvert removal); the effects from past, present and reasonably foreseeable future activities; and the existing condition indicate the fisheries habitat within Stevens Creek would trend towards adequate conditions**.** However, the stream would continue to be in a moderately altered/moderate risk condition due to the culvert under FH 50 which would remain a migration barrier.

St. Joe River, face drainages, and non-fish-bearing drainages (Fisheries Resource Report pp. 26-27)

Specific actions proposed in this alternative would produce no adverse effects and would provide beneficial effects from the reduction in road density and the number of stream crossings. The combination of effects from proposed management activities entering the St. Joe from Tumbledown (improving trend), Bruin (improving water quality trend) and Stevens Creeks (improving water quality trend); the effects of past, present, and reasonably foreseeable future activities; and the existing condition indicate the fisheries habitat within this section of the St. Joe River would improve to an adequate condition. However, the continued presence of FH 50 would maintain this segment of the St. Joe in a moderate altered/moderate risk condition.

Consistency with Forest Plan and Regulatory Framework (Fisheries Resource Report p. 27)

IPNF Forest Plan and Inland Native Fish Strategy (INFS):

Compliance with the IPNF Forest Plan and INFS Guidelines apply to activity implemented or authorized by the Forest Service. Viability of management indicator species (MIS) would be maintained under all alternatives (project file).

Standard 1 and Standard 2 (as replaced by INFS): This standard would be met in Alternatives B and C.

Standard 3 does not apply to this project because none of the streams identified in that standard are located in this project area.

Standard 4 would be met. New road construction would provide for fish passage and known passage problems on Forest Service roads utilized by the timber sale would be corrected.

Standard 5 was met. Information in Fallen Bear Fisheries Resources Report used fisheries surveys to coordinate activities with other resources. Road decommissioning and culvert replacement would benefit the fishery when they are implemented.

Standard 6. The intent of this standard is being met due to the extensive review of the stream systems and the implementation of standards described in INFS.

National Forest Management Act (NFMA): Both action alternatives would meet NFMA requirements by providing for diversity fish communities and improving habitat of management indicator species (MIS), bull trout and westslope cutthroat trout.

Endangered Species Act (ESA): Neither of the action alternatives would jeopardize the continued existence of bull trout, the listed species that historically was found in the project area. A biological assessment will be completed when an alternative is selected for implementation.

Executive Order 12962: All alternatives would maintain habitat and thus would not affect the fishery potential, which in turn would not reduce the potential for recreational fishing opportunities. All alternatives include as a part of their proposals culvert replacements/removals and road decommissioning. These activities would increase recreational fishing opportunities by improving habitat thus improving the carrying capacity of the streams.

Regional Directive 2670/1950 (August 17, 1995): Information provided in this document is the basis for the determinations documented on biological evaluation forms (project file).

Botany (Project File Section B)

NOXIOUS WEEDS

Noxious weeds primarily exist along travel corridors, dispersed use areas, and other disturbed areas.

Alternative A - No Action (Noxious Weed Report pp. 7-8)

Direct and Indirect Effects

The No-Action Alternative would not directly or indirectly increase or decrease the spread of noxious weeds in the project or surrounding area. Weed populations may have a small decline in some areas as canopy cover increases. Populations would persist longer along roads and trails due to more frequent disturbances and higher light levels for longer periods than in surrounding forest stands. Without disturbance, established weed species in the project area are not expected to rapidly expand since many of the suitable areas for weed colonization have already been infested. The greatest threat from noxious weeds under this alternative is from the introduction of new and potential invader species by way of existing roads and trails.

Cumulative Effects

Overall, the effect of the No-Action Alternative is expected to result in a static trend or in a slight increase in weed numbers within the area over time if control methods are not employed. Weed control activities within the project area would be scheduled as funding and other priorities allow. Road construction, timber harvest, recreational use, vehicular traffic, mining, and natural events have all contributed to the introduction and encroachment of weeds into the area as well as the habitat fragmentation and reduction of native species diversity in the area. Firewood collection; recreational use of roads, trails, and dispersed sites; road maintenance; and fire suppression could result in new disturbed sites available for colonization by weeds, and they do offer the possibility of introduction of new species of weeds.

Alternative B (Noxious Weed Report pp. 8-13)

Direct and Indirect Effects

Alternative B is expected to result in a static trend or in a slight increase in weed numbers in the project area over time. Timber harvest and road construction in Alternative B would have risk for noxious weed spread and establishment; but activities that reduce road access would, over time, result in a reduction of vectors for weed spread.

The direct effect of ground-disturbing activities on noxious weeds is to increase the area available for colonization. The greatest potential for the establishment of noxious weeds comes from activities that disturb the soil and open the canopy to the greatest extent. In this respect new road construction, skid trails, log landings, and regeneration timber harvests using ground-based logging methods have the highest potential to create suitable weed habitat. Alternative B includes 195 acres of regeneration harvest, 91 acres of ground-based logging, and 2.8 miles of new road construction. Road reconstruction, reconditioning, storage, and decommissioning impact areas that are already disturbed and would create additional new potential habitat, but less than the originally disturbed area. Alternative B includes 18.7 miles of reconstruction and similar amounts of road storage and decommissioning as Alternative C. Road storage and decommissioning would reduce opportunities for weed spread in the long term, but would increase disturbance outside the existing road surface in the short term. Some previously disturbed areas have existing native vegetation that would also be susceptible to invasion by non-native weed species.

Fuel treatments may have direct effects through physical disturbance and, considering all types of proposed treatments, they would have a moderate to high risk for noxious weeds spread and establishment. Monitoring and treating noxious weeds after treatments would assist in reducing the spread of weeds. Lopping, yarding tops, and underburning would have low risk for noxious weeds spread and establishment because these treatments result in a low amount of ground disturbance. Grapple piling and burning the piles would have a moderate risk for noxious weeds spread and infestation because of the potential amount of ground disturbance. An indirect effect may result from the addition of nitrogen to the soil, temporarily increasing plant growth, following an underburn. Depending on the available seeds in the area, either native plants would be stimulated reducing the potential for noxious weeds or, if noxious weed seeds are available in the soil, further spread would occur at a higher growth rate than in the absence of the added nitrogen.

Precommercial thinning and white pine pruning would increase canopy openings only slightly, but they would result in a low amount of disturbance and have low risk for the spread of noxious weeds. Girdling trees to reduce the spread of mistletoe and inoculating them with heartrot fungus are highly unlikely to affect the spread of noxious weeds. Tree planting has very low risk for weed spread and establishment. Pocket gopher control baiting would have no potential to spread existing noxious weeds or introduce new species.

Alternative B would comply with the Forest Plan for moderate control through implementation of design features to reduce the introduction and spread of noxious weeds (Noxious Weed Report p. 17).

Cumulative Effects (Noxious Weed Report pp. 12-13)

The cumulative effects on noxious weeds for Alternative B are expected to result in a static trend or in a slight increase in weed numbers within the area over time. Past activities such as timber harvest, road and trail construction, fuels treatments, prescribed burns, and recreational use resulted in the introduction and spread of weeds in the area. Current and reasonably foreseeable firewood collection; recreational use of roads, trails, and dispersed sites; road maintenance; installation of a bat-friendly gate on the Eureka mine tunnel; and fire suppression could result in new disturbed sites available for colonization by weeds and offer the possibility of introduction of new species of noxious weeds to the watershed. Weed control within these areas would be scheduled as funding and other priorities allow. While timber harvest and road construction proposed in Alternative B would have a higher risk for noxious weeds spread and establishment than the existing condition, reducing road access would result in a reduction of vectors for spread over time.

Alternative C (Noxious Weed Report pp. 13-17)

Direct and Indirect Effects

Alternative C is expected to result in a static trend or in a slight increase in weed numbers in the project area over time. Alternative C includes 190 fewer acres of proposed timber harvest and two miles less road construction than Alternative B. Prescription types are the same, and harvest methods are not significantly different between action alternatives; however, the decreased ground disturbance would reduce the potential risk of noxious weed invasion and spread compared to Alternative B.

The direct effect of ground-disturbing activities on noxious weeds is to increase the area available for colonization. The greatest potential for the establishment of noxious weeds comes from activities that disturb the soil and open the canopy to the greatest extent. In this respect new road construction, skid trails, log landings, and regeneration timber harvests using ground-based logging methods have the highest potential to create suitable weed habitat. Alternative B includes 112 acres of regeneration harvest, 45 acres of ground-based logging, and 0.8 miles of new road construction. Road reconstruction, reconditioning, storage, and decommissioning affect previously disturbed areas and would create additional new potential weed habitat. Alternative C includes 7.3 miles of reconstruction and similar amounts of road storage and decommissioning as Alternative B. Road storage and decommissioning would reduce opportunities for weed spread in the long term, but would increase disturbance outside the existing road surface in the short term. Some previously disturbed areas have existing native vegetation that would also be susceptible to invasion by non-native weed species.

Fuel treatments may have direct effects through physical disturbance and, considering all types of proposed treatments, they would have a moderate to high risk for noxious weeds spread and establishment. Monitoring and treating noxious weeds after treatments would assist in reducing the spread of weeds. Lopping, yarding tops, and underburning would have low risk for noxious weeds spread and establishment because these treatments result in a low amount of ground disturbance. Alternative C includes 147 fewer acres of these treatments than Alternative B. Grapple piling and burning the piles would have a moderate risk for noxious weeds spread and infestation because of the potential amount of ground disturbance. Alternative C includes 26 fewer acres of grapple piling and pile burning than Alternative B. An indirect effect may result from the addition of nitrogen to the soil, temporarily increasing plant growth, following an underburn. Depending on the available seeds in the area, either native plants would be stimulated reducing the potential for noxious weeds or, if noxious weed seeds are available in the soil, further spread would occur at a higher growth rate than in the absence of the added nitrogen. Alternative C proposes 90 fewer acres of underburning than Alternative B.

Precommercial thinning and white pine pruning would increase canopy openings only slightly, but they would result in a low amount of disturbance and have low risk for the spread of noxious weeds. Girdling trees to reduce the spread of mistletoe and inoculating them with heartrot fungus are highly unlikely to affect the spread of noxious weeds. Tree planting has very low risk for weed spread and establishment. Pocket gopher control baiting would have no potential to spread existing noxious weeds or introduce new species.

Alternative C would comply with the Forest Plan for moderate control through implementation of design features to reduce the introduction and spread of noxious weeds (Noxious Weed Report p. 17).

Cumulative Effects (Noxious Weed Report pp. 16-17)

The cumulative effects on noxious weeds for Alternative C are expected to result in a static trend or in a slight increase in weed numbers within the area over time. Alternative C, when compared to Alternative B, would have less ground disturbance and more restrictive road access. Therefore Alternative C would have a lower risk to noxious weed spread compared to Alternative B. Past activities such as timber harvest, road and trail construction, fuels treatments, prescribed burns, and recreational use resulted in the introduction and spread of weeds in the area. Current and reasonably foreseeable firewood collection; recreational use of roads, trails, and dispersed sites; road maintenance; installation of a bat-friendly gate on the Eureka mine tunnel; and fire suppression could result in new disturbed sites available for colonization by weeds and offer the possibility of introduction of new species of noxious weeds to the watershed. Weed control within these areas would be scheduled as funding and other priorities allow. While timber harvest and road construction proposed in Alternative C would have a higher risk for noxious weeds spread and establishment than the existing condition, reducing road access would result in a reduction of vectors for spread over time.

THREATENED, ENDANGERED, AND SENSITIVE (TES) PLANTS (Botanical Biological Assessment and Evaluation)

No federally listed Endangered plant species are suspected to occur in the Idaho Panhandle National Forests. Threatened species, water howellia (*Howellia aquatilis* A. Gray) and Spalding's catchfly (*Silene spaldingii* Wats.) may be present in the Idaho Panhandle National Forests and have the potential to occur on the St. Joe Ranger District, but to date neither have been found. The St. Joe Ranger District recognized 25 sensitive plant species. One occurrence of clustered lady's slipper (*Cypripedium fasciculatum*) near the project boundary away from proposed activities was found during surveys. There are currently 26 recognized Species of Concern on the St. Joe Ranger District. One occurrence of *Dodecatheon dentatum* (white shootingstar) and six occurrences of *Mimulus clivicola (*North Idaho monkeyflower) are known from previous surveys, District sensitive plant records, and Idaho Department of Fish and Game Conservation Data Center (ICDC) Element Occurrence records. All of the Species of Concern sites are outside of proposed activity areas, with four of the North Idaho monkeyflower sites occurring on the project boundary. No additional occurrences of TES plants were discovered.

Alternative A - No Action (Botanical Biological Assessment and Evaluation p. 7-8)

Direct and Indirect Effects

The no-action alternative is expected to result in no impact to TES plant species and their habitats.

Cumulative Effects

The cumulative effect of no action is expected to result in a very low risk to TES plant species and their habitats. Road construction, timber harvest, recreational use, vehicular traffic, mining, and natural events have contributed to encroachment of weeds into the area and have reduced native species diversity. Current and reasonably foreseeable activities (firewood gathering; recreational use of roads, trails, and dispersed sites; road and trail maintenance, installation of a bat-friendly gate on an old mine tunnel; and fire suppression could result in new disturbed sites available for colonization by weeds which could affect TES plant habitats.

Alternative B (Botanical Biological Assessment and Evaluation p. 7-8)

Direct and Indirect Effects

The proposed activities would have no direct effect on Water howellia (*Howellia aquatilis*) and Spalding's catchfly (*Silene spaldingii*) and no direct impact on any of the sensitive species that may occur in the project area. Water howellia is not suspected to occur and has not been found in the Fallen Bear Project Area. Potential habitat for Spalding's catchfly was surveyed and no plants were found. One occurrence of clustered lady's slipper is known within the analysis area, but it is outside proposed activity areas and would not be directly impacted. One occurrence of *Dodecatheon dentatum* (white shootingstar) and six occurrences of *Mimulus clivicola (*North Idaho monkeyflower) are known within the analysis area. These sites are all outside of the proposed activity areas. No new TES species occurrences were found during surveys. The proposed

activities would have no direct impact to TES plants; however indirectly, the potential risk of weeds to TES could increase.

Cumulative Effects

Past and ongoing activities within the project area have led to habitat modification and fragmentation. Road construction, timber sales, recreational use, vehicular traffic, mining, and natural events have contributed to encroachment of weeds into the area and have reduced native species diversity. Current and reasonably foreseeable activities within the project area (firewood collection; recreational use of roads, trails, and dispersed sites; road and trail maintenance, closing a mine tunnel with a bat-friendly gate, and fire suppression) could result in new disturbed sites available for colonization by weeds, and they do offer the possibility of introduction of new species of weeds to the area which could impact habitat for TES species. The proposed activities would have no direct impact to TES plants; however indirectly, because of the potential risk of weeds there would be an increased risk to TES. Therefore, because the risk of weeds is slightly higher for Alternative B, the risk to TES would be slightly higher with Alternative B.

Alternative C

Direct and Indirect Effects

The proposed activities would have no direct effect on Water howellia (*Howellia aquatilis*) and Spalding's catchfly (*Silene spaldingii*) and no direct impact on any of the sensitive species that may occur in the project area. Water howellia is not suspected to occur and has not been found in the Fallen Bear Project Area. Potential habitat for Spalding's catchfly was surveyed and no plants were found. One occurrence of clustered lady's slipper is known within the analysis area, but it is outside proposed activity areas and would not be directly impacted. One occurrence of *Dodecatheon dentatum* (white shootingstar) and six occurrences of *Mimulus clivicola (*North Idaho monkeyflower) are known within the analysis area. These sites are all outside of the proposed activity areas. No new TES species occurrences were found during surveys. Proposed activities would result in no direct impact to TES plants, but indirectly they may result in an increase in noxious weeds as a potential threat to TES plant species.

Cumulative Effects

Past and ongoing activities within the project area have led to habitat modification and fragmentation. Road construction, timber sales, recreational use, vehicular traffic, mining, and natural events have contributed to encroachment of weeds into the area and have reduced native species diversity. Current and reasonably foreseeable activities within the project area (firewood collection; recreational use of roads, trails, and dispersed sites; road and trail maintenance, closing a mine tunnel with a bat-friendly gate, and fire suppression) could result in new disturbed sites available for colonization by weeds, and they do offer the possibility of introduction of new species of weeds to the area which could impact habitat for TES species. Proposed activities would result in no direct impact to TES plants, but indirectly they may result in an increase in noxious weeds. The risk of weeds is slightly lower for Alternative C than it is in Alternative B, therefore the risk to TES would be slightly lower with Alternative C.

Cultural Resources (Project File Section CR)

Alternative A - No Action (Cultural Resources Report p. 2)

Under Alternative A, current management practices would continue. This would result in no effects to the historic or cultural sites within the Fallen Bear Project Area.

Alternative B (Cultural Resources Report pp. 2-3)

Direct and Indirect Effects

Activity implemented under this alternative would have the potential to adversely affect one cultural site in the project area. A historic trail runs through the project area, and two timber harvest units are adjacent to the trail. Logging activities could damage the trail's integrity by removing the blazed trees that mark the trail's route, and ground disturbing activities like log skidding would damage the trail tread where it is still intact. Activities would avoid culturally significant trails because Design Feature II. C-3 would implement a buffer that would retain the trail's historic feel and look.

Cumulative Effects

Past timber harvesting and road construction in the Fallen Bear Project Area have caused adverse effects to a historic trail. Road construction has obliterated many segments of the trail tread, and logging activity has removed some of the blazed trees that marked the trail location. Because portions of the historic trail have been damaged and/or obliterated, the location of the trail is patchy and its integrity has been compromised. Proposed timber harvest on and adjacent to the trail has the potential to remove more of the historic blazes, continuing the degradation of the trail. Design criteria would be implemented to avoid these impacts. Both of the harvest units that are along the trail would be pulled back creating an effective buffer along this trail. No blazed trees would be harvested, and no ground-disturbing activity would take place within one tree length of the trail location where it still exists.

Alternative C (Cultural Resources Report p. 3)

Direct and Indirect Effects

Alternative C would not affect any cultural sites. It does not include timber harvest units near the historic trail, adverse effects to the site would not occur.

Cumulative Effects

Although past activities in the project activity have caused adverse effects to the historic trail in the project area, activity under Alternative C would not contribute or overlap with these effects, and would not cause any additional effects to the cultural resources in the project area.

Consistency with Forest Plan and Regulatory Framework (Cultural Resources Report p. 3)

Forest Plan

All alternatives adhere to the forest plan which calls for the preservation of significant cultural resources in place whenever possible. All significant cultural resources in the project area will be preserved in accordance with the Forest Plan. Alternatives A and C would not cause effects to cultural resources, and Alternative B includes design features that would protect and preserve all cultural resources in the project area from adverse effects.

National Historic Preservation Act

Qualified archaeologists systematically inventoried and analyzed the Fallen Bear Project Area. All appropriate design criteria and mitigation measures are in place. No cultural resources would be adversely affected by this project. Consultation with the State Historic Preservation Office and Native American groups was completed in accordance with the National Historic Preservation Act.

Economics (Project File Section E)

Project Salability (Economic Report p. 3)

The estimation of project salability was based on a transaction evidence appraisal model, which took into account logging systems, timber species and quality, volume removal per acre, lumber market trends, costs for slash treatment, and the cost of specified roads, temporary roads and road maintenance. The estimated high bid for Alternatives B and C indicate that the project is feasible. The revenue estimates from the salability analysis are used in the financial efficiency analysis discussed below.

Financial Efficiency (Economic Report pp. 3-4)

The financial efficiency analysis is specific to the timber harvest and ecosystem management activities associated with the alternatives (as directed in Forest Service Manual 2400-Timber Management and guidance found in the Forest Service Handbook 2409.18) Costs for sale preparation, sale administration, regeneration, and ecosystem restoration are included.

This analysis is not intended to be a comprehensive benefit-cost or PNV analysis that incorporates a monetary expression of all known market and non-market benefits and costs that is generally used when economic efficiency is the sole or primary criterion upon which a decision is made.

The No-Action Alternative, Alternative A, has no costs or revenues associated with it. Alternative B is financially efficient for the timber sale and all proposed ecosystem management costs. Of the action alternatives, Alternative B has the highest timber sale PNV at $578,608 and the highest PNV for the timber sale plus other proposed ecosystem management costs, at -$336,709. Alternative C has a lower timber sale PNV ($394,736) due to the reduced acres of treatment and a lower PNV for the timber sale plus other proposed ecosystem management costs ($-586,136). The higher cost of ecosystem projects in Alternative C is due to the reduced amount of Road Prescription C and D covered in the timber sale. Fewer roads would be needed for timber harvest in Alternative C, so fewer roads would be stored or decommissioned with the timber sale.

A reduction of financial PNV in any alternative as compared to the most efficient solution is a component of the economic trade-off, or opportunity cost, of achieving that alternative. The No-Action Alternative would not harvest timber, plant trees, or take other restorative actions and, therefore, incur no costs. Alternatives B and C are anticipated to create woody biomass that would be available for the use of the Heyburn Elementary Forest Woody Biomass for Energy Project. As indicated earlier, many of the values associated with natural resource management are non-market benefits. These non-market values are discussed in the various sections this document.

Cumulative Effects

Many factors influence and affect the local economies, including changes to industry technologies, economic growth, international trade, and the economic diversity and dependency of the counties. This project is not expected to have any cumulative effect. However, the jobs and income associated with the action alternatives may bring the local economy some increased relative stability during the life of the project. Alternatives B and C are anticipated to create woody biomass that would be available for the use of the Heyburn Elementary – Forest Woody Biomass for Energy project.

Environmental Justice (Project File Section EJ)

No disproportionate impacts to minority or low-income populations were identified through public involvement efforts over the course of this analysis. District Ranger, Chuck Mark, discuss the project with representatives of the Coeur d'Alene Tribe during a meeting on March 18, 2008, and they did not express concerns. All alternatives comply with Environmental Justice Executive Order 12898.

Fire and Fuels (Project File Section FF)

Alternative A - No Action

Direct and Indirect Effects (Fire and Fuels Report p. 11)

Continued fire suppression in this alternative would result in continued fuel accumulation and increased fire behavior characteristics, which would subsequently reduce the likelihood of keeping unwanted fires small. Fire suppression efforts within the analysis area cannot be expected to keep all unwanted ignitions small indefinitely without treatments that would reduce fire intensity characteristics. Potential flame lengths are expected to increase in the absence of disturbances such as harvesting, thinning, or fire that change stand characteristics that contribute to crown fire potential. As surface flame lengths increase, potential success of initial attack suppression actions becomes less likely. Alternative A would result in an increasing trend in flame lengths in the absence of management activities. Stands proposed for treatment (that would not be treated with this alternative) currently have, and would tend to maintain, a high probability of torching. Modeling indicates stands currently have and would maintain high crown fire potential over the next 50 years. Road access for fire suppression would not be affected relative to present levels of access.

Cumulative Effects (Fire and Fuels Report pp. 11-12)

Excluding natural fire since the early 1900s has reduced long-term retention of early seral conifers and other early seral plants in a fire-created mosaic across the landscape. Harvesting activities occurring since the 1960s that subsequently resulted in the regeneration of western larch and western white pine have contributed to the perpetuation of long-lived early seral species.

Keene and others (2002) provide a discussion of the ecological effects of fire exclusion that contribute to increased fire behavior characteristics. Fire exclusion causes forest composition to change from early-seral, shade-intolerant tree species to late-seral, shade-tolerant species, while stand structure changes from single-

layer to multiple-layer canopies. An important stand characteristic that changes with advancing succession in the absence of fire is the amount of dead and live biomass or fuels, which tend to increase. Fuel loading generally increases in the absence of fire because of a myriad of ecological factors. First, long fire return intervals allow live fuels longer times to grow and dead fuels longer periods to accumulate on the ground. Next, crown fuels increase because late-seral, shade-tolerant species tend to have more biomass in the forest canopy due to their high leaf areas and because biomass tends to be well distributed over the height of the trees. Stand leaf area generally increases over successional time because shade-tolerant species retain needles longer, have higher leaf-area-to-sapwood ratios, and have more leaf mass in the crown than shade intolerant species. Higher leaf area usually requires additional conducting tissue for support, which means the tree may need to produce more branch and twig wood along greater portions of its stem. Because late seral species are shade tolerant, there are many smaller seedlings and saplings present in the understory to take advantage of any gaps in the canopy. The greater crown biomass distributed along greater parts of the stem, coupled with high seedling and sapling densities, can create the ladder fuels that allow flames from surface fires to climb into the forest canopy and result in crown fires.

Surface fuel loading increases in the absence of fire because the greater crown biomass ultimately results in increased leafy and woody material accumulating on the forest floor in the absence of fire. Dense crowns also reduce the amount of solar radiation that reaches the forest floor, which may lower soil temperatures resulting in decreased decomposition rates and still higher branch and litter accumulations. Duff and litter depths generally increase proportionate to the crown closure and leaf area because of the additional needle fall and reduced decomposition.

Landscapes tend to become more homogeneous as fire is removed and in the absence of other disturbance because succession eventually advances all stands to similar communities dominated by shade-tolerant species. Even though late-seral species may differ across a landscape depending on site, the multi-layer structures of these late-seral stands are nearly identical across most biophysical settings. Landscape structure (spatial distribution of patches) also changes with fire exclusion as landscapes generally become less fragmented, have lower patch density, and evolve decreased patch diversity, which often results in more contagion, corridors, and large patches. Larger patches and high homogeneity tend to foster more continuous crown and surface fuels, which can then burn in large fires that result in still larger patches.

Alternative A would maintain high crown fire potential for at least the next 50 years. Flame lengths would tend to increase over time. Probabilities of torching would tend to remain high or gradually increase from current levels with a few exceptions.

If human activities associated with recreation increase, then the risk of human-caused ignitions such as abandoned camp fires, vehicle exhaust, and cigarette smoking would also increase; however, most fires occurring in the analysis area have been caused by lightning.

Alternatives B & C

Direct and Indirect Effects (Fire and Fuels Report pp. 12-14)

The proposed harvest and subsequent activity fuel reduction would affect potential fire characteristics within treated stands by removing and rearranging existing live and dead fuel loads and by changing the influences of wind, temperature, and relative humidity within the harvested stands. The proposed harvesting and fuel reduction activities would facilitate the retention and establishment of western larch which is resilient to fire. Timber harvest would promote conditions for safe and effective wildland fire management by maintaining fire suppression access through existing road maintenance and by altering fuels and fire behavior within harvested stands and. Timber harvest would immediately increase fuel loading, but subsequent fuel reduction treatments would reduce the fuel loads the year of harvest or, at the latest, within five years of harvest.

Regeneration harvests create a short-term increase in fire hazard until the site preparation and hazard reduction burning is accomplished (Alternative B = 195 acres; Alternative C = 112 acres). Regeneration harvests may result in an on-site fuel loading of up to 30 tons/acres of fine fuel (less than 3 inches diameter) until prescribed burning is accomplished. Quick shrub growth and conifer regeneration is expected to reestablish solar and wind sheltering of surface fuels within 5-10 years in regeneration harvests with a corresponding reduction in fire behavior potential.

Regeneration harvest with subsequent fuel reduction and site preparation activities would create effective fuel breaks by affecting both surface flame lengths and crown fire indices. The canopy cover and crown bulk density would be reduced and the remaining vegetation would not sustain crown fire until conifers reclaim

dominance of the canopy. Modeling indicates that stands representing clearcutting with reserves, shelterwood and seedtree harvesting show an immediate and significant increase in potential flame length. Subsequent prescribed burning for slash disposal and site preparation reduce potential flame lengths to 2 to 5 feet for the rest of the modeled period. Clearcutting retains the least canopy, allowing the greatest increase in surface wind speed while commercial thinning retains the most canopy (amongst the harvesting scenarios) allowing comparably greater reduction of surface wind speed which directly influences flame lengths.

The probability of torching would be immediately reduced in all harvests through either elimination of canopy (clearcutting) or removal of ladder fuels, increasing crown base height, decreasing fuel bed depth, and reducing fuel loading. As regeneration becomes tall, 10 to 30 years after harvest depending on harvest method, the probability of torching increases even though flame lengths decrease. The decrease in flame lengths is due in part to decomposition of fuels, but most likely to the reduction of surface wind speed due to the establishment of canopy. The probability of torching increases because of the increased area having trees with crowns near the ground that are also considered the primary overstory.

Prescribed fires would be generally low-severity and low to moderate intensity burns implemented when conditions are conducive to short-duration fires with little chance of escape. The result would be reduction of fine fuel loads resulting from harvest activities and subsequent reduction in fire hazard.

Alternative B includes 196 acres in which lopping is the only slash treatment, and Alternative C includes 139 acres in which lopping is the only slash treatment. More intensive slash disposal treatments (yarding tops, grapple piling, or prescribed burning) are not prescribed for these units due to one or more of the following factors: 1) fire intolerant species would still be heavily represented in the stand following harvest, 2) a majority of the species in the stand would be fire tolerant but would be too small to survive prescribed burning, 3) slopes are too steep for grapple piling, 4) there is no road access for mechanized equipment, or 5) retention of slash is desired for the purpose of nutrient cycling.

Commercial thinning, regardless of slash treatment method, reduces the probability of torching, increases the crowning index, and reduces potential fuel accumulation by promoting healthy stands and by reducing ladder fuels. The fire resiliency of commercially thinned stands would improve so long as the surface fuel hazard is not substantially increased by the harvest activities or is reduced after harvest activities are complete. Commercial thinning reduces crown bulk density and can reduce potential crown fire initiation and spread as long as increases in potential surface fire intensity caused by slash do not overshadow the gains of crown bulk density reduction. Project design includes yarding tops, lopping, grapple piling, and under burning to minimize potential increases in post-harvest surface fire intensity and/or severity (see Tables 3 and 7 for type of fuels treatment associated with each unit).

Areas that are commercially thinned and only have lopping prescribed (Alternative B = 83 acres; Alternative C = 30 acres) would initially have greater surface flame lengths than they had prior to harvesting due to increased surface fuel loading, increased solar insolation, and decreased wind sheltering due to decreased canopy cover. Lopping does not reduce post harvest activity fuel loading. It does however, reduce the depth of the post harvest fuel bed and increase the compaction, or density, of the activity fuels. Therefore, lopped fuels exhibit less intense fire behavior characteristics than fuels that are not lopped even though fuel loading is not affected. Lopped fuels should also decompose more readily than fuels that are not lopped because they are closer to the forest floor where biotic decomposers can more readily affect them.

Timber harvest would promote conditions for safe and effective wildland fire management in the project area by affecting live and dead fuels in ways that are beneficial to fire management. The harvest openings with slash treatment would provide distinct reductions in potential fire behavior, which would provide tactical advantages in managing any kind of fire. Harvested areas would be long-term fuel breaks, providing perimeter control options for fire managers during future wildland or prescribed fires. The thinning and partial cuts would increase possibilities of future prescribed fire application in these areas. Commercial thinning with subsequent grapple piling of fuels would mimic low- to moderate-intensity fire effects on structure and composition. Commercial thinning would also reduce live fuel loadings to levels that are more advantageous to future stand maintenance and/or resilience to fire and pathogens. When analyzed at the watershed scale, Alternative B is expected to provide more positive benefits than Alternative C due to the greater amount of fuel treatments and increases in access due to road construction.

Reduction of crown bulk density by pre-commercial thinning of the overstory reduces potential for active crown fire initiation and spread, especially when combined with low potential surface fire intensity. However, slash resulting from pre-commercial thinning activities increases fire hazard within thinned stands until it is incorporated into the forest floor by snow compaction and decomposition. The increased hazard gradually

decreases as the needles and fine twigs fall from the slash, reducing but not eliminating the elevated hazard. Increased fuel loading resulting from pre-commercial thinning slash, by comparison, would be less than for the commercial thinning harvest. This is because the size of the trees felled is much smaller in stands proposed for pre-commercial thinning than it is for those in the stands proposed for commercial thinning. Slash resulting from pre-commercial thinning would be lopped to a depth of no greater than two feet.

The proposed road decommissioning would reduce the potential for roadside human-caused ignitions by reducing accessibility. The proposed road decommissioning may result in an increase of the average cost per acre for fire suppression within the areas affected by reduced motorized access. This would be due to reduced access for fire engines and water tenders, increased response-times and potential increases in the use of aerially-delivered firefighters and supplies. In contrast, the proposed harvesting would provide opportunities to utilize changes in fuel types as natural barriers to fire spread that may allow managers to provide for an increase in firefighter safety, more readily reduce suppression costs, reduce disturbance associated with traditional suppression actions, and/or realize resource benefits from wildfires in accordance with fire management plan direction.

Cumulative Effects (Fire and Fuels Report pp. 14-16)

The action alternatives would reduce the potential for ignitions from any source to result in undesirable effects within the project area. Alternative B has a greater potential to reduce future undesirable effects from wildfire than Alternative C due to the greater amount of fuel treatments and increases in accessibility.

Fire suppression has been effective in the Fallen Bear Analysis Area for nearly 100 years. The incremental effect of suppressing each small fire in the watershed, over time, has promoted late seral species rather than early seral species, thereby changing forest structure and, in turn, changing the way the ecosystem responds to fires. The existing road network, a result of previous road construction, has enhanced fire suppression efforts. Past harvesting, the effects of the 1910 fire, and the impacts of white pine blister rust, in combination have resulted in an under representation of large, old, early-seral species within the analysis area. The improved growth of existing early-seral trees through commercial thinning would contribute to the reestablishment of large, old, western white pine and western larch over time. Reforestation efforts after regeneration harvests would also focus on the reestablishment of healthy populations of fire-resistant early seral species.

Because of the improvements in crowning index, flame length, and probability of torching over time realized in managed stands, containment and confinement opportunities would improve for fire managers responding to unplanned ignitions in the future. The projected reductions in flame length and probability of torching would also improve opportunities for application of prescribed fire within the treated stands as the growth of trees improves their likelihood of surviving light underburning. Areas that would be treated under the action alternatives are relatively small in comparison to the project area in its entirety; however, the positive effects realized would be enhanced in many cases due to the spatial relationships between treatment units and areas of previous management activities.

If human activities associated with recreation increase, then the risk of human-caused ignitions such as abandoned camp fires, vehicle exhaust, and cigarette smoking would also increase; however, most fires occurring in the analysis area have been caused by lightning.

The action alternatives would reduce the potential for ignitions from any source to result in undesirable effects within the project area. Alternative B has a greater potential to reduce future undesirable effects from wildfire than Alternative C due to the greater amount of fuel treatments and increases in accessibility. Project features such as fuel reductions that reduce potential for undesirable wildfire effects would maintain effectiveness regardless of future fire management strategies. Project features such as increases in accessibility that enhance effectiveness of wildfire suppression would be effective as long as fire suppression strategies are implemented in the project area.

Consistency with Forest Plan and Laws (Fire and Fuels Report p. 16)

Prescribed burning and mechanical treatment of activity fuels proposed in both action alternatives are consistent with direction in the Forest Plan and the Idaho Forest Practices Act.

Forest Vegetation (Project File Section FV)

Alternative A - No Action

Direct and Indirect Effects (Forest Vegetation Report pp. 9-12)

Forest Composition

Alternative A, which proposes no stand treatment, would maintain the existing conditions and trends of the forest stands which are proposed for treatment in other alternatives. This alternative would continue the current trend of decreasing the contribution of western larch and western white pine in species composition within the project area. White pine blister rust would continue to infect and kill all or most of the remaining naturally occurring western white pine as well as the natural regeneration resulting from these existing seed sources. Western white pine is currently a minor component in the forest stands considered for treatment in this assessment and would continue to decrease under Alternative A. The percent composition of western larch and western white pine dominated stands, currently five percent in this project area, would decrease with Alternative A.

Alternative A would not treat western larch seed trees infected with dwarf mistletoe. By not treating these infected trees, the spread of larch dwarf mistletoe would continue into the next generation of western larch. This would cause increased mortality, reduced growth rates and loss of vigor, reduced cone and seed production, and increased susceptibility to other damaging agents. The increased impacts from dwarf mistletoe would only increase the risk of suppressing western larch in these stands and reduce its ability to maintain at least a co-dominate or dominate position.

Alternative A proposes no commercial harvest to encourage retention and/or establishment of western larch within the project area. As a result, the composition of western larch would depend on the survival of existing trees. In the absence of fire or other thinning agents (natural or human-caused) the more shade-tolerant species would continue to develop and compete with the western larch. In areas where root rot or other forest pathogens are performing the thinning effect, some retention of larch, if present, is expected. In those areas, however, the natural regeneration would continue, and little long-range benefit in the retention of western larch is expected. The live shading from the more shade-tolerant species would result in decreased diameter and height growth. The existing western larch in the stands considered for treatment in other alternatives is demonstrating a current decline in live crown and growth rate. In the absence of fire or other thinning agents, the decline in western larch is expected to continue and over time western larch would be substantially reduced or even eliminated from these stands under Alternative A.

Under Alternative A, stand composition is expected to change over time with a continued reduction in the existing component of intolerant early-seral species and a continued increase in more shade-tolerant mid- and late-seral species. As a result of this shift in species composition, the risk of losses to insect and disease would increase. Potential losses would be expected because of the existing disease and insects in these stands (*Armillaria ostoyae, Echinodontium tinctorium, Phaeolus schweinitzii and Dendroctonus pseudotsugae, Scolytus ventrails, Cronartium ribicola*).

The shift in stand composition to more shade-tolerant species (predominantly Douglas-fir, grand fir and hemlock) would also increase the risk and extent of loss from fire. These species are less adapted to surviving fire than are the more shade-intolerant seral species. As these more fire-sensitive species increase as a percent of stand composition, the risk of losing entire stands increases should fire occur.

Forest Structure

Alternative A would result in no direct management induced changes to forest structure.

Indirectly, forest structure would change over time. In the majority of the stands, the trees are competing for growing space. Competition would result in a decline in western larch and western white pine because the susceptibility to disease and insect attack would increase over time as both diameter and height growth increase for all trees in the stands.

The shrub/seed/sapling stand size classes are expected to continue to develop towards the pole/small/medium size classes. In the absence of stand –replacing disturbances creating replacement opportunities, coupled with the existing smaller age classes continuing to transition to larger age/size classes, a decrease in these smaller size classes would be expected over time.

The pole/small/medium stand size classes are relatively close to historic conditions. Although growth rates are declining, these stands are expected to continue development towards the older and larger size classes. This development trend is expected to occur at a relatively slow rate due to reducing growth and vigor resulting from increased stocking levels. Little change in growth rates, stand densities, species composition or other stand characteristics would be expected in the foreseeable future in the absence of disturbance associated with the action alternatives.

The mature and large size classes would be expected to increase over time in the absence of disturbance. This is predominantly the result of in-growth from the younger/smaller size classes. Wildfire is a potential to cause change in this age/size class, however, the current fire suppression policy would continue which reduces the probability of fire as a primary vector for change. The potential exists for other natural disturbance, more particularly insect or disease outbreaks, to act as stand replacing agents and influence a shift of impacted stand towards younger/smaller size classes.

The occurrence of root disease is currently at endemic levels within the project area. With declining growth and vigor, these stands are expected to have increasing effects of root disease. Increased mortality from root disease and other agents can be expected in the larger sized, more susceptible trees. This would create small openings due to losses of individual and small groups of medium and large trees throughout the project area. These openings would regenerate with shade-tolerant species. As we lose the larger trees over time, the vertical structure in these stands would be reduced, as well as mean tree size. Over time, this would create a more homogeneous structure, one with fewer crown classes, within the individual stands as well as for the project area in general. As a result, over the next 30 to 50 years, these stands are expected to decrease in mean diameter and decrease in canopy closure resulting from individual tree and small group mortality. This could potentially extend the time needed for these stands to achieve a large/mature size class and reduce the number of acres in the large/mature size class.

Cumulative Effects (Forest Vegetation Report pp. 12-13)

Alternative A of this project would cumulatively maintain the current composition trends in this project area. There would be an incremental reduction of seral species within the project area. The number and extent of western larch, western white pine and ponderosa pine would continue to decrease on almost all areas within the project area. The number and extent of grand fir, western hemlock, and Douglas-fir would continue to increase. An exception to this would be those areas that were previously reforested and/or pre-commercially thinned to promote early-seral species composition.

The effects of Alternative A on species composition would only differ by the incremental changes within the project area. This would be predominantly through losses in the existing western larch and western white pine components, and increases in the grand fir component.

Over the next 25 to 30 years, stands throughout the project would continue to grow bigger trees and move towards larger size classes in the absence of disturbance of fire or other disturbance agents. Due to species composition and the expected increase in the incidence of root disease and insect damage, this trend towards larger tree sizes is expected to begin a subsequent decline. Over the longer term, tree heights and spacing are also expected to become more homogenous by only incremental amounts.

Alternative B

Direct and Indirect Effects (Forest Vegetation Report pp. 13-15)

Forest Composition

Alternative B would regenerate 195 acres currently occupied predominately by grand fir, Douglas-fir and western redcedar with potentially long-lived seral species, primarily western larch and western white pine with clearcuts w/reserves, shelterwood cuts, and seed tree cuts. Openings as a result of these proposed regeneration treatments would range from nine to 40 acres in size. This would result in an increase of 195 acres of long-lived, early-seral species through artificial regeneration (planting). Site preparation for planting would be done using prescribed burning. Some mortality in reserve trees would be expected, however mitigation measures would be implemented to reduce those effects from fire. Reserve trees killed during site preparation operations would be left on site. They would contribute course woody debris and snags.

In areas proposed for planting with conifer seedlings, pocket gopher control (gopher baiting) activities are anticipated. Pocket gophers can adversely impact stocking and reestablishment of new stands by foraging on the roots of the new trees and causing mortality. When the opportunity exists, pocket gophers seem to prefer

foraging on the roots of the planted early-seral western larch and western white pine over other naturally regenerated species. These control activities reduce the overall mortality of planted seedling, and in particularly early seral western larch and western white pine. The direct effect of gopher control on forest composition is improved retention of these species as a component of the new establishing stand.

Commercial thinning would maintain and/or increase the presence of long-lived, shade intolerant species in stands proposed for intermediate treatment. There would be a slight increase in earl seral representation, predominantly western larch, on approximately 151 acres where this species is present but is a minor stand component. On an additional 57 acres where western larch has a higher representation the forest type is expected to change from grand fir/Douglas-fir to western larch. Approximately 63 acres of existing western larch forest type proposed for treatment would be maintained in the that forest type in the long term through preferential removal of species other than western larch and western white pine.

The proposed stand treatments have a potential to increase the current incidence of root and stem decays in susceptible species within the treatment areas. Increased representation of western larch and western white pine is expected to reduce the impacts of root and stem decays in the treated stands. Reduced impacts would be accomplished by reducing the presence of susceptible species, Douglas-fir and grand fir. Stand loss to insects and other diseases is expected to remain at endemic levels as a result of increased representation of long-lived, early-seral species as well as improved growth and vigor in the areas proposed for treatment.

Pre-commercial thinning is proposed in 45 stands totaling 775 acres, and white pine pruning is proposed in 45 stands totaling 777 acres. Pruning greatly lowers the risk of blister rust infections (Schnepf and Schwandt 2006). Seven of these stands, involving approximately 168 acres, would be thinned and pruned according to the Northern Rockies Lynx Management Direction as discussed in the Fallen Bear Wildlife Report. Species composition in these stands currently are composed of a mixed conifer including early seral (western larch and western white pine). With selective thinning, emphasis would be on the retention of early seral species. Western larch seedlings infected with dwarf mistletoe would be cut to reduce the affected trees and the spread of dwarf mistletoe in the stand.

Girdling existing dwarf mistletoe-infected western larch seed trees is proposed to reduce the spread of dwarf mistletoe. Eleven stands consisting of approximately 161 acres previously harvested using a seed tree silvicultural prescription, are the target of this treatment. Girdling would kill western larch seed trees left as residual trees from the previous harvest that are infected with dwarf mistletoe (*Arceuthobium laricis)*. Girdled trees would be left standing to meet other resource needs as snags or course woody debris. Dwarf mistletoe (a parasite) is dependent upon its host, in this case western larch, for water and nutrients (Beatty and others 1997). The intent of this treatment is to reduce the spread of dwarf mistletoe to the western larch understory by killing infected western larch seed trees (Beatty and others 1997). Treating these infected seed trees simultaneously would kill the tree and would kill the dwarf mistletoe by removing its water and nutrient source. In addition girdled trees may be inoculated with heartrot fungus to create cavity nesting habitat as discussed in the Fallen Bear Wildlife Report. Decay will not spread from inoculated trees to nearby healthy treees. Nearby healthy trees risk the same chance of becoming infected with or without the presence or inoculated trees in the stand (Hildebrand and Packs 1997).

Forest Structure

Alternative B would directly change forest structure on all proposed harvest units. The areas proposed for clearcut w/reserves, shelterwood cut, and seed tree cuts would directly change structure of 195 acres within the project area. This treatment would result in even-aged stands with the larger reserve trees scattered throughout the treatment area as an overstory above the planted and naturally regenerated new age class. The larger trees would remain the dominate structure in these stands. These treatments would decrease the vertical structure and increase the horizontal structure on 195 acres through creation of openings (ranging in size from 9 acres to 40 acres) in the existing homogeneous stand density.

Change in structure in commercial thin treatment units would reduce stand density by an average of 45% and open the canopy cover by corresponding amount. This harvest treatment would remove smaller trees and favor retention of larger diameter and more vigorous trees and would increase individual tree growth and vigor. This would result in developing mature/large-sized trees over a shorter period than would be expected with no treatment. The vertical structure would have less variation because of the removal of smaller tree classes. Additionally, stand density and crown closure would be reduced. These stand characteristics would increase over time. Commercial thinning harvest activities would affect up to 288 acres. These treatments would not

directly change stand size class due to few trees currently in the large/mature size class currently present in these stands.

The pre-commercial thinning (775 acres) and seed tree treatment activities (161 acres) would not directly affect forest structure. Treatment would increase the growth and vigor in the stands. Selection of trees to be pre-commercially thinned would reduce the impacts of blister rust on western white pine, reduce the risk or spread of dwarf mistletoe in western larch and reduce the effects of root rots on susceptible species. Stands would remain in the brush/seedling/sapling size class.

Cumulative Effects (Forest Vegetation Report pp. 15-16)

Forest Composition

The contribution of long-lived seral species to stand composition is expected to increase. This would be the result of preferential removal of species other than long-lived early seral species in intermediate treatment activities and reforestation activities that preferentially select, maintain, and promote long-lived early seral tree species within the stands. Cumulatively, there would be an increase of approximately 3 percent in the project area in the composition of long-lived early seral species from vegetation management activities.

Forest Structure

Overall, size classes would change approximately 1-2% within the project area. Stand densities would be reduced on approximately 1,063 acres or 10% of the project area through intermediate harvests and precommercial thinning.

Cumulatively, only a small incremental increase in tree and stand size class resulting from vegetation management activities within this project area is expected. The tree and stand size classes in intermediate harvest areas are expected to increase due to retention of larger tree classes combined with improved growth and vigor of trees and stands. In areas receiving regeneration treatments the tree and stand size classes are expected to decrease due to removal of overstory trees. In areas proposed for pre-commercial thinning the tree and stand size classes are expected to increase over a shorter period of time due to improved growth and vigor resulting from treatment.

Cumulatively, the decrease in vertical structure and increase in horizontal structure for the project area overall would be small, or incremental. The vertical structure complexity is expected to decrease, and horizontal structure complexity is expected to increase within the project area. This is due to removal of tree classes (vertical structure) and creation of openings (horizontal structure) related to various management activities. Both of these structural elements would increase in the complexity over time.

Cumulatively, the effects of insects and disease on vertical and horizontal structure, as well as tree/stand size class would be incremental. Root and stem decays are expected to still be present in treatment stands after treatment, but they would remain at low (endemic) levels due to increased stand vigor. In areas not treated, tt is expected that root and stem decays would continue to impact stands at current levels or have the possibility of a more epidemic level. Losses from insects and diseases other than root/stem decays are expected to decrease due to the improved growth and vigor resulting from management activities. An exception to this is the losses of western white pine due to blister rust, which is expected to continue at or near the current rate in untreated stands. Loss due to white pine blister rust in proposed pruning stands may be reduced. The effects of slight decrease in tree/stand size class and vertical structure, and a small increase in horizontal structure are expected. This is primarily due to the improvement in growth, vigor and improvement in species composition throughout the project area. On sites with mixed species composition, where seral and climax species occur together with root disease organisms, infection and mortality of susceptible species have the potential to prolong the seral phase (Rippy and others 2005).

Alternative C

Direct and Indirect Effects (Forest Vegetation Report p. 17)

Forest Composition

Alternative C would regenerate 112 acres with clearcuts with reserves, seed tree cuts, and shelterwood cuts. This would have the same effects as discussed in Alternative B except fewer acres would be treated. Opening would range from nine acres to 24 acres in size. Regeneration in these units would be predominately artificial (planting) and would increase the representation of long-lived early-seral species by 112 acres. Site preparation, planting and pocket gopher control would have the same effects as Alternative B.

Commercial thinning in Alternative C would have the same affects as in Alternative B, but with fewer acres of treatment. Proposed commercial thinning would cause a slight increase of representation of long-lived early seral species, predominately western larch, on 115 acres. Additionally, on 29 acres the forest type is expected to change to western larch through the retention of western larch and reduction of late seral species. With the preferential removal of species other than western larch, approximately 21 acres of existing western larch forest type proposed for treatment would be maintained.

Timber stand improvement, mistletoe treatment and tree inoculation activities proposed in Alternative C would be done as described in Alternative B. Activities are proposed on all of the same acres, and treatments would be done to meet the same goals and objectives described in Alternative B.

Forest Structure

Alternative C would directly change forest structure on all proposed harvest units. This change in structure in commercial thin treatment units would reduce stand density by an average of 43% and open the canopy cover by corresponding amount. This treatment harvest would have the same impacts on forest structure as discussed in Alternative B. Commercial thinning activities would affect up to 182 acres. Treatment is not expected to change the stand size class in any of the treatment units.

Proposed regeneration treatment harvests would directly change stand structure on 112 acres. The effects of these treatments on the stands would be the same as in Alternative B, except fewer acres would be treated. These treatments would decrease the vertical structure and increase the horizontal structure on 112 acres through creation of openings (ranging in size from nine acres to 24 acres) in the existing homogeneous stand density.

The pre-commercial thinning (775 acres) and mistletoe treatment activities (161 acres) would not directly affect forest structure. Treatment in these stands would increase the growth and vigor in the stands and reduce the risk or spread of dwarf mistletoe infecting the stand. Stands would remain in the brush/seedling/sapling size class after the treatment.

Cumulative Effects (Forest Vegetation Report pp. 18)

Forest Composition

Cumulatively, only a small increase (approximately 2 percent) in the contribution of long-lived seral species is expected to result from vegetation management activities within this project area. Increase in the contribution of long-lived seral species to stand composition would be the result of preferential removal of species other than long-lived early seral species in intermediate treatment activities and reforestation activities that preferentially select, maintain, and promote long-lived early seral species within the stands.

Forest Structure

Cumulatively, only a small incremental increase in tree and stand size class resulting from vegetation management activities within this project area is expected. Overall, size classes would change approximately 1% within the project area. Stand densities would be reduced on approximately 957 acres or 9% of the project area through intermediate harvests and precommercial thinning.

Consistency with Forest Plan and Regulatory Framework

All alternatives are consistent with Forest Plan goals, objectives and standards. All action alternatives comply with Forest Plan Appendix A, Summary of Timber Information and Vegetation Management, providing direction for silvicultural practices on the Idaho Panhandle National Forests. The activities described for the action alternatives are consistent with this direction. Proposed management activities are designed to improve stand health and vigor, and maintain or enhance species composition and stand structure. This would minimize risk of stand loss from forest insects and disease as well as reduce risk of stand loss to weather, fire or other disturbances. All proposed openings are within size limitations directed by NFMA and Forest Service Manual (1921.12e). Stands proposed for clearcutting have reached culmination of mean annual increment as defined in Forest Service Manual (1921.12f). Openings would be naturally or artificially regenerated. Review of regeneration indices for the District and the project area (project file FV-2) display adequate ability to regenerate these openings within the five year period as directed in NFMA and the Forest Plan. All proposed vegetative treatments integrated other resource needs through project design during alternative development and analysis. All proposed vegetative treatments are on lands classified as suitable for timber production (project file FV-4).

Inventoried Roadless Areas (Project File Section IRA)

Alternative A - No Action

There would be no effect to any inventoried roadless areas.

Alternative B

The proposed activities would not occur in or adjacent to any inventoried roadless areas (project file IRA-1 and IRA-2). There would be no direct, indirect, or cumulative effect to any inventoried roadless areas.

Alternative C

Activities would not occur in or adjacent to any inventoried roadless areas (project file IRA-1 and IRA-2). There would be no direct, indirect, or cumulative effect to any inventoried roadless areas.

Old Growth (Project File Section OG)

The Fallen Bear Project involves one Old Growth Management Unit (OGMU) on the Avery portion of the St. Joe Ranger District, OGMU 27. OGMU 27 has approximately 10,524 acres in National Forest System lands with approximately 2,845 acres (27%) of those acres allocated to old growth management. Forest Plan standards for old growth retention are currently met in OGMU 27 (Old Growth Report pp. 5-7).

Alternative A - No Action

Direct, Indirect, and Cumulative Effects (Old Growth Report pp. 3-4)

There would be no direct/indirect or cumulative effects resulting from Alternative A, no action, on either existing allocated old growth or other stands known to meet old growth criteria. Forest Plan standards for old growth retention would continue to be met (Old Growth Report pp. 5-7). There would be no effects from current and reasonably foreseeable activities including weed control, road and trail maintenance, pocket gopher control, fire suppression, and public recreation (i.e. berry picking, hiking, hunting, wood gathering and similar activities). No cumulative effects on allocated old growth are expected as a result of these other activities.

Alternative B

Direct and Indirect Effects (Old Growth Report p. 4)

Alternative B would result in no direct/indirect or cumulative effects on existing allocated old growth, but it does propose treatment activities in three stands (approximately 68 acres in Units 96, 151, and 211) that are mature or over mature and meet old growth criteria based on *Old-Growth Forest Types of the Northern Region* (Green and others 2005). These three stands are not currently allocated old growth. After treatment these stands would not meet old growth criteria (Green and others 2005). In addition to treatment, approximately 0.3 miles or 1.1 acres of new system road construction is proposed through one of the three stands (Old Growth Report p. 8). Forest Plan standards for old growth retention would continue to be met (Old Growth Report pp. 5-7).

Cumulative Effects (Old Growth Report p. 4)

There would be no direct or indirect effects from current and reasonably foreseeable activities including weed control, road and trail maintenance, pocket gopher control, fire suppression, and public recreation (i.e. berry picking, hiking, hunting, wood gathering and similar activities). No cumulative effects on allocated old growth are expected as a result of these other activities.

Alternative C

Direct and Indirect Effects (Old Growth Report pp. 4-5)

Alternative C does not propose treatment in stands that meet minimum criteria for old growth, but approximately 169 feet or 0.03 miles new system road would be constructed through an allocated old growth stand that does meet minimum criteria for old growth. No other activity or timber harvest is proposed within allocated old growth or within stands that meet minimum criteria for old growth according to Green and others (2005).

This alternative includes the construction of approximately 169 feet or 0.03 miles of system road construction that would affect an estimated 0.1 of an acre or 0.2% of an allocated old growth. The road would be located on the southeast corner of the allocated old growth stand to have minimal affect on it (Old Growth Report p. 9). Based on the location and length of the road construction, the effect on old growth patch 6 (276 acres) would be approximately 0.04 %, and the effect on the allocated old growth within OGMU 27 (2,913 acres) would be approximately 0.003%. After the construction and use of this road, it would be placed into Road Management Prescription C (long-term storage), which would recontour the portion of the road through the allocated old growth stand.

If Alternative C were selected three additional stands totaling 68 acres would be allocated for old growth management. With the allocation of these acres the total allocated old growth in OGMU 27 would be increased from 2,845 acres (27%) to 2,913 acres (28%).

Cumulative Effects (Old Growth Report p. 5)

There would be no direct or indirect effects from current and reasonably foreseeable activities including weed control, road and trail maintenance, pocket gopher control, fire suppression, and public recreation (i.e. berry picking, hiking, hunting, wood gathering and similar activities). No cumulative effects on allocated old growth are expected as a result of these other activities combined with activities proposed in Alternative C.

Recreation (Project File Section R)

No Action

Alternative A would have no direct, indirect, or cumulative effect to recreation-related resources. Recreation activities (driving for pleasure, ATV and motorcycle riding, hunting, camping, snowmobiling, hiking, fishing, wildlife viewing and gathering forest products including berries, firewood, mushrooms, etc.) would continue. Trails and dispersed campsites would not be affected. Motorized vehicle access would not change. The St. Joe Wild and Scenic River Corridor would not be affected. Recreation Opportunity Spectrum (ROS) classes would not change.

Alternative B

The Wild and Scenic St. Joe River is just outside of the southern boundary. The southern tip of one harvest unit proposed for commercial does fall within the quarter mile boundary of the Wild and Scenic corridor. It cannot be viewed from the corridor due to the topography, distance and intervening forest. Also this unit meets the VQO of retention (Visual Quality Report). There would be no negative effects to the Wild and Scenic River corridor. There are no effects to the Wild and Scenic River Corridor.

Alternative B would not change any criteria for the ROS classes that would promote a change, therefore, there are no changes to the ROS classes.

Both action alternatives would temporarily displace three popular dispersed camp sites that are just forward of barriered roads (Roads 1223UM, 1223UD, 1231) that would be utilized for harvest operations. This displacement could be over a fairly long time (2-8 years) depending on timber markets and how quickly the purchaser opens the road for use and then closes it back and rehabilitates the site. These camp sites are primarily used during hunting season, but they have devoted cliental. Design features require restoring/rehabilitating the sites after harvest operations.

Alternative B proposes units that would minimally affect Haggerty Trail 5. Unit 96A, a clearcut with reserves, borders the trail. With design features being followed, the trail itself would be protected. There would be minimal effect to the seen area for people traversing the trail through that unit. There are two road crossings of this trail currently and these roads will be reconstructed. Since the crossings already exist and design features require protection of the trails, there would be no additional effects to the Haggerty Trail.

Alternative B includes a precommercial thinning unit on the boundary of Trail 5 that would not affect this trail.

Both action alternatives propose harvest units, road reconstruction and new road construction that would affect the Blackjack Trail 86 corridor. Alternative B has one new road crossing, one road reconstruction that crosses the trail corridor, two commercial thin units, one seed tree unit and one shelterwood unit that would affect the bottom part of the trail corridor in Section 3. Harvesting and road construction/reconstruction would affect approximately 1,500 feet of this trail. Following the design features, such as protecting the corridor and rebuilding destroyed tread at road crossings, would help alleviate effects from the harvesting. Effects from

harvest units would diminish with time for the hiker, but the new road construction would result in one more road crossing.

Motorized vehicle access would be reduced. For Alternative B, vehicles *over* 50 inches wide would have 10.3 fewer miles of road to travel, and vehicles ≤ 50 inches wide would have 25.5 fewer miles of road to travel.

Alternative C

The Wild and Scenic St. Joe River is just outside of the southern boundary. The southern tip of one harvest unit proposed for commercial does fall within the quarter mile boundary of the Wild and Scenic corridor. It cannot be viewed from the corridor due to the topography, distance and intervening forest. Also this unit meets the VQO of retention (Visual Quality Report). There would be no negative effects to the Wild and Scenic River corridor. There are no effects to the Wild and Scenic River Corridor.

Alternative C would not change any criteria for the ROS classes that would promote a change, therefore, there are no changes to the ROS classes.

Both action alternatives would temporarily displace three popular dispersed camp sites that are just forward of barriered roads (Roads 1223UM, 1223UD, 1231) that would be utilized for harvest operations. This displacement could be over a fairly long time (2-8 years) depending on timber markets and how quickly the purchaser opens the road for use and then closes it back and rehabilitates the site. These camp sites are primarily used during hunting season, but they have devoted cliental. Design features require restoring/rehabilitating the sites after harvest operations.

Alternative C includes a precommercial thinning unit on the boundary of Trail 5 that would not affect this trail.

Both action alternatives propose harvest units, road reconstruction and new road construction that would affect the Blackjack Trail 86 corridor. Alternative C has one new road crossing and one road reconstruction that would cross the trail corridor, one commercial thin unit, one seed tree unit, and one shelterwood unit that would affect the bottom part of the trail corridor in Section 3. Harvesting and road construction/reconstruction would affect approximately 2,200 feet of this trail. Following the design features, such as protecting the corridor and rebuilding destroyed tread at road crossings, would help alleviate effects from the harvesting. Effects from harvest units would diminish with time for the hiker, but the new road construction would result in one more road crossing.

Motorized vehicle access would be reduced. For Alternative C, vehicles *over* 50 inches wide would have 10.4 fewer miles of road to travel, and vehicles ≤50 inches wide would have 25.6 fewer miles of road to travel.

Cumulative Effects

New road construction in Alternatives B and C would have cumulative effects to the value of Trail 86. The new road construction would result in one more road crossing for a trail that already has several crossings. In the eyes of many hikers, this reduces the value of this trail. There would be no cumulative effects to the Wild and Scenic River Corridor.

Compliance with Forest Plan and Regulatory Framework

Alternatives would not affect the spectrum of recreational experiences available on the St. Joe River and therefore would comply with Management Area 12 (National Wild & Scenic River System) direction. Action alternatives would comply with Forest Plan direction because design features for providing for public safety and protecting existing trails are incorporated in the alternatives, and the proposed units are within the Roaded Modified portion of the project area. The project area would continue to provide for variety of dispersed recreation and opportunities for the public to enjoy their National Forests with any of the alternatives.

Soils (Project File Section S)

No-Action

Direct and Indirect Effects (Soils Specialist Report pp. 15-16)

No new management-induced detrimental direct and indirect impacts would occur in the Fallen Bear Project Area. There would be no compaction or displacement beyond the currently existing levels. Nutrients would continue to cycle, build up at current rates, and not be subject to removal due to harvest and fuel treatment activities.

With the No-Action Alternative, no new management-induced detrimental direct or indirect impacts would occur in the Fallen Bear Project Area. There would be no compaction or displacement beyond the currently existing levels. Conversely, none of the existing roads would be decommissioned. With current management (including fire suppression) soil potassium, nitrogen, and other nutrients would continue to cycle, build up at current rates, and not be subject to removal due to harvest or fuels reduction. Soil nutrient cycling would continue at low rates from rock weathering, atmospheric deposition (mostly nitrogen), and nitrogen fixation. Soil nutrients would be bound in organic matter complexes and slowly released through decay. Timber stands would continue to reflect past management practices that selectively harvested seral species. Increases in the representation of less nutrient-demanding species (western larch, western white pine) would be delayed or may only occur as the result of wildfire.

Throughout the silvicultural landscape, tree mortality from pathogens, insects, and weather events would continue as in the past, which has a direct influence on the area's recycling of organic matter and changes in fuel loading. Stands currently at high mortality risk would not be treated, which may increase insect and disease infestation levels and associated risks of stand loss due to wildfire, severe burning, erosion concerns, and loss of soil nutrients. On a landscape scale, ecosystem composition improvement and the promotion of more fire-resilient species, such as western larch, would not occur. Several timber stands would continue to harbor increased fuel loads and move towards moderate to higher risks of losses should a fire occur.

Fuel buildup would continue to contribute to the risk of high-intensity wildfires that may be difficult to suppress and could kill much of the vegetation in both upland and riparian areas. High soil temperatures produced during high-intensity fires create water repellant surface soil conditions that greatly reduce water infiltration and increase overland flow and erosion (Niehoff 1985). Increased runoff combined with a lack of vegetation cover to protect slopes and filter sediments could lead to increased peak stream flows, excessive sediment delivery, and consequent adverse impacts to soil quality.

The introduction of weeds and unwanted flora following a fire could lead to higher competition between less desirable and native vegetation. Weeds can increase erosion, reduce soil moisture, and deplete nutrient levels (DiTomaso 2000). Because the roots of many noxious weeds are deeper than native grasses, they also contribute less organic matter near the soil surface. Refer to the Fallen Bear Noxious Weed Report for additional details.

Cumulative Effects (Soils Specialist Report p. 16)

No cumulative effects to soils would take place as no harvest and fuel treatments would occur. When combined with the effects of past and ongoing fire suppression, not implementing the proposed activities would further increase the risk of severe stand-replacing fires (compared to areas that are proposed for treatment in the other alternatives) that could increase the potential for locally severe fire effects on soils. Reasonably foreseeable activities are not likely to result in substantial adverse effects on soil productivity in these units.

With no new activities, no new management-induced detrimental cumulative impacts would occur in the Fallen Bear Project Area. No cumulative effects to soils would take place as no harvest and fuel treatments would be added. Conversely, none of the existing roads would be decommissioned.

When combined with the effects of past and ongoing fire suppression, not implementing the proposed action would continue the risk of severe stand-replacing fires in areas that would otherwise be treated with the action alternatives. Should such a fire occur, the continued accumulation of dead and down fuel loads could contribute to an increased potential for locally severe fire effects on soils, including physical alteration of soil structure and development of hydrophobic layers.

Alternatives B & C

Direct and Indirect Effects (Soils Specialist Report pp. 16-21)

The discussion for Alternatives B and C is combined to avoid repetition because effects described for timber harvest, fuel treatments, organic matter, coarse woody debris, nutrients, yarding tops, and soil movement would be the same or less for Alternative C.

Alternatives B and C would meet Region 1 soil quality standards and IPNF Forest Plan Standards because long-term detrimental disturbance is not expected to exceed 13% in any proposed activity area, so full productivity potential would be maintained on at least 87% in every activity area. Potential detrimental disturbance could affect up to 23 acres of the 483 acres proposed for treatment in Alternative B and 13 acres out of the 293 acres proposed in Alternative C.

Coarse woody debris would be maintained at recommended levels (design feature: Graham and others) in all units so that preservation of ecosystem function is expected. Meeting or exceeding Regional guidance for coarse woody debris retention would adhere to the Forest Plan Standard to maintain sufficient microorganism populations for site productivity. Where yarding of tops is proposed, design features, including nutrient management recommendations, would ensure compliance with the Forest Plan Standard to maintain sufficient nutrient capital.

Detrimental Soil Disturbance (Soils Report p. 16)

Design features and best management practices (BMPs) to protect soil and site productivity would be implemented as part of the action alternatives to ensure that activities are consistent with Forest and Regional standards in terms of soil compaction, displacement, and nutrient retention. The BMPs would have a high effectiveness in minimizing soil compaction and displacement, address seeding of disturbed areas, limit operations when soil moistures are high, and address conduct of logging.

Timber Harvest: Timber harvest activities may affect soils. All landings associated with skyline and ground-based harvest would be located along existing or new system roads. There would be no equipment on the high banks above the cut slopes of roads. All of the proposed harvest units under all alternatives would meet Regional soil quality and Forest Plan standards. The level of soil disturbance increase depends primarily on the amount or lack of existing skid trails. Activity units that have had little prior disturbance show a greater incremental increase in potential detrimental disturbance than those units that contain a network of already existing skid trails. Proposed skyline units that were previously yarded with the same logging system have little to no additional impacts because existing corridors are generally reused. Soil compaction effects can last for decades but are reversible. Soil displacement that mixes or removes the volcanic ash surface layer reduces soil moisture holding capacity and associated productivity. The proposed action includes post-harvest monitoring of some units where ground-based equipment is proposed to be used for skidding on all or part of the unit. Soils would be monitored after completion of harvest and fuel treatment activities. Proposed activities on units are expected to meet Forest and Regional soil quality standards but monitoring is included to verify expected results.

Road Decommissioning: Road decommissioning (Road Management Prescription D) would put approximately 157 acres (Alternative B) and 159 acres (Alternative C) of National Forest System land on the path to recovery towards a productive land base.

Road Maintenance: No additional soil impacts would occur from proposed road maintenance activities such as blading, drainage improvements, and surfacing on existing dedicated roads.

Fuels Treatments: Prescribed burning would be done when soil moisture in the upper surface inch of mineral soil has a moisture content of 25% or more by weight or 60 to 100 percent duff moisture. Past monitoring has shown that burning under these conditions has minimal to no impacts on soil productivity. Design features also require piling machinery to utilize existing trails and stay on slopes less than 35 percent to prevent soil disturbance in excess of guidelines. Design features for grapple piling require operation of equipment over slash mats whenever enough material is available, preferentially re-using existing skid trails if present. Forest Plan monitoring and research indicates reduced soil disturbance if equipment is operated on a slash mat. Only areas that could be reasonably accessed would be treated and none of the trails would be excavated to facilitate access. The residual logging debris that would be lopped and scattered or that could not be grapple piled and burned would increase potential fire intensity and severity for a few years until snow could compress the debris and the fine organics would decompose. Severe burning and ground disturbance could create bare

soils and encourage noxious weed infestations. Design features are therefore incorporated to lessen disturbance impacts in activity areas in order to prevent long-term impacts to the soil resource.

Pre-commercial Thinning, White Pine Pruning, and Dwarf Mistletoe Treatments: All of this work would be done by hand (chainsaws and hand tools), and the cut trees and branches would be left on site with no further treatment. Since there would be no soil compaction and no removal of biomass, there would be no detrimental effect on soil productivity or quality. Nutrients held within the cut trees and branches would be released. These treatments are not discussed further in terms of soils.

Gopher Baiting: No detrimental impacts to the soil resource are expected from gopher baiting. A reduction in gopher activity would actually reduce the mixing and displacement of soils in localized areas. Gopher baiting is not discussed further in terms of soils.

Organic Matter & Coarse Woody Debris (Soils Report p. 17)

Timber Harvest: Harvesting the tree bole (and bark) would remove about ±43 percent of the tree's potassium (Garrison-Johnston and others 2004) which may cause indirect effects to vegetation as nutrient sources are removed from site. However, the logging slash from tree limbs, tops, and unmerchantable pieces would remain within all harvest units (except tops would be removed in portions of Units 109, 148 [Alternative B only], 183B, 226B, and 233B) and would be lopped and scattered or be left over at least one wet season before being burned or piled. This would allo the foliage and branches to leach and recycle some of their nutrients, primarily potassium, back into the soils' organic layer. Harvest activities are not expected to reduce soil organic matter because existing organic matter would be not be removed from the forest floor. Harvest activities may actually increase material that would contribute to the organic surface layer through limbs and tops left on-site. Existing organic matter would not be diminished by harvest activities, but organic matter recruitment would likely be less in those portions of units identified for yarding tops. No reduction in the current existing CWD levels would occur from harvest activities because material would not be removed from the forest floor. Design features recommend CWD levels based on Graham and others (1994) and would provide protection against soil erosion as well as a long-term source of nutrients and organic matter (Brown and others 2003). The amount of coarse woody debris would likely be kept at the lower end of the recommendations in several locations near main roads in order to reduce fuels reduction requirements. The majority of harvest units currently display a mix of satisfactory coarse woody debris levels though Units 151, 183A, and 183B are presently on the lower end of material.

Fuel Treatment: No long-term measurable negative effects on organic matter and coarse woody debris are anticipated from post-harvest underburning when soil moisture in the upper surface inch of mineral soil has a moisture content of 25% or more by weight or 60 to 100 percent duff moisture (Niehoff 1985 and 2002). When soils have adequate moisture conditions to retain their biological, chemical, and physical integrity, effects from the loss of forest floor can be minimized (Barnett 1989; Erickson and White 2008; Frandsen and Ryan 1985; Hungerford and others 1991; McNabb and Cromack 1990). In south and southwest facing units, the prescribed burns would have limited detrimental effects when executed when the upper surface inch of mineral soil has a moisture content of 25% or more by weight or 60 to 100 percent duff moisture. When burn piles are large, nutrient losses from heat and volatilization could be considerable. In some cases, burning of the slash piles may create localized patches of hydrophobic soils for a short period (as much as one to two years) but the areas are generally not large or extensive enough to alter slope hydrologic responses or long-term soil productivity. However, on an unpredictable site-specific basis, some drier sites may underburn at a severity level that removes all of the protective duff and litter layers, even under managed fire conditions. The duff and litter layer is important in protecting the soil horizons, both as reducing erosion potential and in maintaining soil moisture. Litter prevents the breakdown of soil aggregates and lessens the velocity of any overland flow, thereby decreasing the erosion potential (Beschta and others 2004). Direct effects of prescribed underburning and pile burning could potentially remove woody debris that would otherwise provide long-term nutrients to the soil as the decay process occurs (Page-Dumroese and others 2006a). Burning when soil moisture content is high helps to maintain coarse woody debris and organic matter requirements.

Nutrient Levels (Soils Report p. 20)

Timber Harvest: One specific nutrient, potassium, appears to decrease tree mortality by promoting biochemical defense compounds and plays an important role in forest health (Entry and others 1991; Mika and others 1993; Moore and others 1994). Because underlying rocks are the primary source of potassium and since some of the local underlying rocks show deficiencies (Garrison-Johnston and others 2007), recycling of vegetation that contains potassium can potentially counter reductions. Fine residue (foliage and branches) contains over half

of a tree's potassium distribution and would remain throughout at least one wet season within proposed harvest units. This would allow potassium and other nutrients to leach out of the fine residue and back into the soil where they would be available for future uptake by vegetation.

Nutrient levels are not expected to decline sufficiently to irreversibly impair soil productivity because slash would be left over a wet season (except where tops would be yarded) or left on site where fuels would be lopped. This would allow for leaching of nutrients from slash into the soil (Garrison and Moore 1998). Lopping is proposed for almost half of the units although in some the material would be piled and burned or grapple piled after over-wintering.

Fuels Treatment: Five units that would be commercially thinned also include yarding tops for 200 feet below the roads to reduce post-harvest fuel loading, lessen the likelihood of fire along travel corridors, and to provide control during underburning (Unit 148). Yarding tops would remove nutrients, but residual timber in the commercially thinned units would be approximately 60-80%. Limbs and branches on the remainder of the trees would remain in the unit. Removal of tops would likely result in about twice as much potassium loss as bole-only yarding, so areas where tops would be yarded for 200 feet below the road may sustain a greater nutrient loss than the remaining activity areas. However, soil productivity within activity areas is not expected to be irreversibly damaged because limbs and branches not attached to the top and those breaking from the tops during removal would remain on site and contribute to the nutrient pool. Lopping would occur in the remainder of all five units with no additional equipment entering the activity area with the exception of Unit 148 (Alternative B only), which would be underburned. Slash would remain on site over a wet season so that mobile nutrients, such as potassium, can leach from fine materials back into the soil. Broadcast burns would be "light" in nature and would foster the release of tied up nutrients. Over-wintering slash allows the release and makes available stored potassium, benefiting western larch, ponderosa pine, and western white pine which require less potassium for growth and maintenance than Douglas-fir and grand fir (Garrison and Moore 1998; Garrison-Johnston and others 2007). Precipitation (Stark 1979) and weathering of rocks will continue to make additional nutrients available on site. Annual needle, leaf, and twig fall, forbs, and shrub mortality will continue to recycle nutrients as well. At this time, management recommendations from the IFTNC (Garrison and Moore 1998) are used as guidelines for maintaining sufficient potassium on a site.

Soil Movement (Erosion, Mass Failure) (Soils Report p. 20)

Timber Harvest: Soil erosion is not expected because of residual canopy and ground cover, operation of mechanical equipment on a slash mat when available combined with other BMPs, and the overall low risk of surface erosion. Harvest activities are proposed in landtypes rated with low surface erosion potential on 100% of the proposed activity areas. Harvest activities are not proposed on landtypes rated with high mass failure potential because proposed units would be buffered by ½ the height of a site potential tree to exclude such areas and there would be no proposed harvest activities within the buffer. No change in mass failure potential is expected from the proposed harvest activities because of low and moderate mass failure potential ratings in the activity areas and residual stocking. As part of project planning, all drainage courses and riparian zones would also have an INFISH designated buffer zone that would not be entered by any proposed harvest activities. With established buffer zones, the potential sediment increases from fuel or timber management work is minimal. The high sensitivity areas within Units 181 and 159 fall within these buffer zones.

Road Construction: None of the newly proposed road segments are located on landtypes with high hazard ratings. Megahan and King (2004 p. 209) attribute roads as having the greatest effect on mass failure of all practices associated with forest management.

Cumulative Effects (Soils Specialist Report pp. 21-23)

Few cumulative effects are anticipated in the proposed activity areas because the majority of units have had little to no past disturbance. Combining the existing and predicted detrimental impacts of activities, long-term cumulative soil impacts would affect no more than 13% of the activity areas, therefore meeting Region 1 soil quality standards. When existing and proposed system roads are incorporated, cumulative soil impacts would affect no more than 20% of the activity areas, therefore meeting forest plan standards. Current or reasonably foreseeable future activities would not affect soils in the proposed treatment units.

Compliance with Forest Plan and Regulatory Framework (Soils Specialist Report pp. 23-24)

Forest Plan

The proposed activities would comply with Forest Plan Standards for maintaining soil productivity.

Forest Plan Soil Standard #1

Alternatives B and C would comply with this standard because all proposed activity areas would be at or below soil quality limits for disturbance and would maintain the acceptable productivity potential for managed vegetation. Including system roads within harvest units, the proposed activities have the potential to disturb a total of 37 acres with Alternative B and 21 acres with Alternative C.

Forest Plan Soil Standard #2

Alternatives B and C would comply with this standard because logging slash from tree limbs and un-merchantable pieces would remain within all harvest units that already contain satisfactory CWD levels. Large woody debris retention would follow the research guidelines of Graham and others (1994) to ensure the maintenance of site productivity. Coarse woody debris levels in Units 151, 183A, and 183B that currently contain reduced amounts would be increased by logging residue to meet appropriate levels after harvest activities are completed.

Forest Plan Soil Standard #3

Alternatives B and C would comply with this standard because provisions to maintain sufficient nutrient capital would include leaving lopped limbs and branches from the remainder of the trees that would be yarded with attached tops. Nutrients would also be provided from foliage and limbs that break from tops as they are moved to the landing. All yarding of roadside trees along a 200 foot buffer would occur in units proposed for commercial thinning that would retain 60 to 80 percent of the current stand volume.

Region 1 Soil Quality Standards

All alternatives would comply with Region 1 soil quality standards. The proposed activities would comply with Regional Soil Quality Standards (USDA 1999) related to maintaining 85% of an activity area's soil at an acceptable productivity potential. All alternatives would comply with this standard because none of the proposed units are expected to surpass disturbance limits of 15% and existing detrimental disturbance is below 15% in all proposed activity areas. The greatest impacts are expected to be ~13% in Units 96A, 127A, 165A, 183A, 198A, 199A, 206A, 211A, 227A, and 271A which means that at least 87% of the activity areas would retain their full productivity potential. The remaining units would maintain more area in conditions with full productivity potential due to fewer impacts from logging with a skyline system. Satisfactory levels of local organic matter would be maintained. Harvest activities may actually increase material that would contribute to the organic surface layer through limbs and tops left on-site. Existing organic matter would not be diminished by harvest activities, but organic matter recruitment would likely be less in those portions of units identified for yarding tops. Coarse woody debris in units with satisfactory levels would be maintained. Coarse woody debris levels in Units 151, 183A, and 183B that currently contain reduced amounts would be increased by logging residue to meet appropriate levels after harvest activities are completed.

Unique Characteristics of the Geographic Area

No Action

There would be no changes to unique characteristics of the project area.

Alternatives B & C

Alternative B has the potential to adversely affect one cultural site with two timber harvest units proposed next to a historic trail (Cultural Resources Report p. 2). Alternative C would not affect any cultural sites (Cultural Resources Report p. 3). The project area does not contain any parklands, prime farmlands, or ecologically critical areas. Alternatives B and C would not have negative effects to the St. Joe River Wild and Scenic corridor, and there would be no indirect or cumulative effects to the Wild and Scenic River corridor (Recreation Report pp. 7-8). There are no wetlands in the project area, and design features would protect wetlands found during implementation (design features; Water Resources Report p. 28).

Visual Quality (Project File Section VQ)

No Action (Visual Quality Report p. 5)

Direct, Indirect, and Cumulative Effects

There would be no direct, indirect, or cumulative effects to visual quality. The visual characteristics of the area would constantly change as the natural vegetation proceeds through normal life cycles. The areas that have been previously harvested would continue to appear more natural as the trees and other natural vegetation develops.

Alternatives B and C (Visual Quality Report pp. 5-7)

Direct, Indirect, and Cumulative Effects

All proposed activities are designed to and will be implemented to meet Forest Plan visual quality objectives (VQOs). This includes timber harvest units and road construction. All other activities such as pre-commercial thinning, white pine pruning, and girdling of mistletoe infected trees would have no effect on visual quality and would meet VQOs (SIOs). The visual characteristics of the area would constantly change as the natural vegetation proceeds through normal life cycles. The areas that have been previously harvested would continue to appear more natural as the trees and other natural vegetation develops.

Wildlife (Project File Section WL)

All alternatives are consistent with applicable goals, direction, standards, and guidelines from the forest plan for the management of wildlife habitat and species populations. The alternatives, to varying degrees comply with other direction and recommendations regarding management of the various components of wildlife habitat. The alternatives comply with applicable conservation strategies for wildlife species. All alternatives are consistent with the Endangered Species Act, the National Forest Management Act, and other laws providing direction and requirements for the management of wildlife species and habitat (Wildlife Report p. 62).

Some elements of wildlife habitat require a detailed analysis and discussion to determine potential effects. Other elements may not be affected; may be affected at a level that does not influence use, occurrence, or the decision to be made; or can be adequately addressed through design of the project. These elements then do not necessarily require detailed analysis. Wildlife species were reviewed for their relevancy to the proposed activities and the wildlife analysis areas. The following species were not analyzed further, and the rational for this is given in the Wildlife Report (pp. 6-15): woodland caribou, grizzly bear, bald eagle, black swift, black-backed woodpecker, Coeur d'Alene salamander, common loon, fringed myotis, Harlequin duck, northern bog lemming, peregrine falcon, pygmy nuthatch, Townsend's big-eared bat, and moose.

Effects of pocket gopher control are discussed in their own section (Wildlife Report pp. 15-16) because of the potential to affect more than one species. A potential concern is the possibility of non-target mortality. The main species that could be affected are mice and other small rodents. Strychnine or zinc phosphide killed gophers appear to present little hazard to mammalian or avian predators. There should be no adverse effects on non-target wildlife species from the proposed pocket gopher control.

DISTURBANCE / ACCESS (Wildlife Report pp. 17-19)

Alternative A - No Action

Direct, Indirect and Cumulative Effects (Wildlife Report p. 18)

There would be no new road construction or reconstruction with this alternative. No existing gated roads would be opened to access proposed timber sale units. No roads would be stored or decommissioned to address watershed, fisheries or wildlife concerns. The open road density would remain high, at 3.2 miles per square mile for the project area. Conditions for wildlife related to access (i.e. fragmentation, security, vulnerability), would not change under the No-Action Alternative.

Alternative B

Direct, Indirect, and Cumulative Effects (Wildlife Report p. 19)

Alternative B would improve conditions for wildlife related to access (i.e. fragmentation, security, vulnerability). It would build a total of 2.8 miles of new system road and reconstruct 17.9 miles of road in the project area to access proposed treatment units. New roads would be stored (Road Management Prescription C) following

post-sale activities. This alternative would open the gates on Roads 3723 and 1223 to access proposed logging units, but gates would remain in place. This would result in a temporary increase in open road density for the duration of the timber sale activity. This short-term increase would mainly be limited to the 3- to 5-year duration of the timber sale. In order to limit disturbance/access during operations the gates would be closed and locked at the end of each day during timber hauling and would be closed and locked after passage of each vehicle for other operations. Road decommissioning and changes in road management (which reduce the miles of road that may impact wildlife including roads open to any vehicle) would combine to decrease the total road density and reduce the open road density to a level of 2.4 miles per square mile. Gated roads opened to treat timber sale units would be restored to their previous gated condition, although gates may be moved to more effective closure locations.

Alternative C

Direct, Indirect, and Cumulative Effects (Wildlife Report p. 19)

Alternative C would improve conditions for wildlife related to access (i.e. fragmentation, security, vulnerability). It would build a total of 0.8 miles of new system road and reconstruct 7.3 miles of road in the project area to access proposed treatment units. New roads would be stored (Road Management Prescription C) following post-sale activities. Alternative C would open the gates on Roads 3723 and 1223 to access proposed logging units resulting in a temporary increase in open road density for the duration of the timber sale activity. The short-term increase would mainly be limited to the 3- to 5-year duration of the timber sale. In order to limit disturbance/access during operations the gates would be closed and locked at the end of each day during timber hauling and would be closed and locked after passage of each vehicle for other operations. Road decommissioning and changes in road management which reduce the miles of road that may impact wildlife (including roads open to any vehicle) would combine to decrease the total road density, and reduce the open road density to two miles per square mile. Gated roads opened to treat timber sale units would be restored to their previous gated condition, although gates may be moved to more effective closure locations.

CONNECTIVITY FOR WILDLIFE (Wildlife Report pp. 20-22)

Alternative A - No Action

Direct, Indirect and Cumulative Effects (Wildlife Report p. 20)

This alternative would not build any roads or propose any commercial timber harvest. Existing forest habitat conditions are a result of previous management activities and natural conditions. Existing travel cover would be maintained in the project area; but it could be affected by natural processes such as vegetation succession and insect and diseases in trees. There would be no impact on the travel corridors that were identified and mapped for analysis purposes. Conditions in the project area for wildlife movement and travel would not be changed from the existing situation. The No-Action Alternative would not have any adverse effects on connectivity.

Alternatives B and C

Direct and Indirect Effects (Wildlife Report pp. 21-22)

Proposed harvest activity would not create permanent barriers to movement. The proposed action and alternatives were designed with an objective of minimizing impacts on traditional areas of wildlife movement. Where feasible proposed new road construction is placed lower on the hillside to avoid impacts to ridges and saddles. Proposed harvest units were also designed to minimize impacts to ridges and saddles. In addition, design criteria of the project would further minimize impacts on wildlife travel and movement and would provide for continued use of typical travel ways. Both alternatives would maintain areas for travel and movement for potential use by wildlife.

Alternative B

Direct and Indirect Effects (Wildlife Report pp. 20-21)

Alternative B includes fifteen proposed units that are partially within identified travel ways. In five of these units (3 regeneration and 2 commercial thin), leave tree retention would need to be adjusted within the travel corridor to meet canopy cover needs. Although the design criteria would retain at least 30% canopy cover in the travel corridor portion of all these units, the potential reduction in cover would likely affect wildlife movement. Five of the proposed units (3 commercial thin, 2 regeneration) on the west side, and six proposed units (4 commercial thin, 2 regeneration) on the east side of Tumbledown Creek form blocks of mature, closed canopy timber.

These blocks connect timbered habitat in the river corridor to upland timbered habitat. Treatment of these stands would reduce the quality of this timbered connection for wildlife, both in terms of travel and habitat effectiveness. Four of the new roads to be constructed bisect travel corridors in six locations. Road design criteria of the project would minimize impacts and would provide for continued use, as all of these road-associated openings would be well under 100 meters wide. Alternative areas for movement by wildlife exist and opportunities for travel would be maintained.

Alternative C

Direct and Indirect Effects (Wildlife Report p. 21)

Alternative C proposes six units that would partially overlap identified travel ways. In one of these units (a seedtree cut), leave tree retention would need to be adjusted within the travel corridor to meet canopy cover needs. Although the design criteria would retain at least 30% canopy cover in the travel corridor portion of the units, the potential reduction in cover likely would affect wildlife movement. Two proposed units (1 commercial thin, 1 regeneration) on the west side of Tumbledown Creek and five proposed units (3 commercial thin, 2 regeneration) on the east side of Tumbledown Creek contribute to or form blocks of mature, closed canopy timber. These blocks connect timbered habitat in the river corridor to upland timbered habitat. Treatment of these stands would reduce the quality of this timbered connection for wildlife, both in terms of travel and habitat effectiveness. Alternative C does not include three units on the west side of Tumbledown Creek, so it would maintain the majority of this timbered connection and reduce impacts on wildlife compared to Alternative B. One of the two new roads would bisect travel corridors in two locations. Design criteria of the project would minimize impacts and would provide for continued use. Alternative routes of travel exist and opportunities for travel by wildlife would be maintained.

Alternatives B and C (Wildlife Report pp. 21-22)

Cumulative Effects

It is unlikely that there would be any further changes in permanent impediments to movement. Existing forest habitat conditions reflect results of previous management activities and natural conditions. The effects of past, present, and reasonably foreseeable actions would continue to affect and alter wildlife movement in and through the analysis area. Based on the implementation of travel cover guidelines, as well as existing and foreseeable conditions, the area will still maintain corridors suitable for wildlife movement. It is unlikely that these alternatives would have unacceptable, irreversible and irrevocable adverse impacts on connectivity due to the relatively limited amount of regeneration harvest and road-building proposed with these alternatives, design features of the alternatives, and the conscious desire to minimize impacts through alternative design. Alternative areas for movement by wildlife exist and opportunities for movement and travel would be maintained.

THREATENED AND ENDANGERED SPECIES

Canada Lynx (Wildlife Report pp. 23-29)

No Action

Direct and Indirect Effects (Wildlife Report p. 26)

The No Action Alternative would not change the existing conditions in either of the lynx analysis units (LAUs). The amount and distribution of denning habitat would be unchanged, and stand initiation habitat would remain below 30%, meeting Northern Rockies Lynx Management Direction (NRLMD) standards. Current road management would continue, so the amount of secure habitat within the project area would remain low, and the open road density would remain high. There would be no change to the designated snowmobile trail system.

Cumulative Effects (Wildlife Report p. 26)

The existing lynx habitat conditions are a result of previous management activities and natural conditions. There are no present or reasonably foreseeable federal actions that would measurably affect lynx habitat in the project area. The amount of winter hare habitat would increase over time as currently unsuitable stand initiation seedling stands grow into the sapling size class. Some of the forage stands would grow out of suitable winter hare habitat condition as these sapling stands become pole sized stands. Based on stand ages and sizes, more seedling stands would become winter hare habitat than saplings stands would become pole

stands. Overall, the net effect should be a small increase in winter hare habitat over the next 10-30 years. There should be little change over time to the rest of the lynx habitat in the project area. Within the project area, the high open road densities, and resultant low amount of secure habitat would continue unchanged under this alternative. The over-snow trail system and conditions for snowmobile use would not change under this alternative. Both LAUs would continue to meet the standards of the NRLMD. There would be no effect on lynx through this alternative.

Precommercial Thinning in Alternatives B & C

Direct and Indirect Effects (Wildlife Report pp. 26-27)

Approximately 352 acres of the proposed precommercial thinning are in the lynx analysis units (LAUs), and of that roughly 168 acres are in lynx habitat. This equates to 20% or less of each init in lynx habitat.

Precommercial thinning was consulted on with the United States Fish and Wildlife Service (USFWS) in the Biological Assessment (Revised) of the Northern Rockies Lynx Amendment (USDA 2007a), and it was addressed in the USFWS Biological Opinion on the effects of the Northern Rocky Mountain Lynx Amendment (USDI 2007). This activity is consistent with management direction in the NRLMD Record of Decision (ROD) and the USFWS Biological Opinion, (including applicable Reasonable and Prudent Measures and Terms and Conditions). The acres of precommercial thinning in lynx habitat by LAU would be reported as part of the required monitoring incorporated from the USFWS Biological Opinion (USDA 2007, attachment 1, p.9).

This activity is an exception to Standard VEG S5 in the NRLMD which states: " 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: …5. For daylight thinning of planted rust-resistant white pine where 80% of the snowshoe hare habitat is retained…" (USDA 2007, attachment 1, p.3, 4).

All the units to be precommercially thinned are in the seedling or sapling stage, and this would not change after thinning. Seven units in lynx habitat are proposed for daylight thinning to promote planted rust-resistant white pine. This would reduce the canopy cover of saplings and seedlings by no more than 20% within those units. The thinning would result in less available forage for snowshoe hare for a short period estimated to be less than ten years. There would be an increase in the amount of small (2-6" diameter) down wood throughout the thinned stands from trees felled to release the white pine. Post treatment fuel loads are not expected to become a fire hazard due to the relatively low amount of area actually treated, 20% or less of each unit in lynx habitat, and because any slash created would be lopped and scattered.

Cumulative Effects (Wildlife Report p. 27)

The existing lynx habitat conditions are a result of previous management activities and natural conditions. The proposed precommercial thinning would have no measurable effect on forest stand size class within or beyond the project area. Thinned seedling and sapling stands would remain seedling and sapling stands with slightly more open conditions. Due to the reduction in competition, the smaller seedlings and saplings are expected to increase in growth and cover in the decade following treatment, over time essentially replacing the hare forage lost through the daylight thinning of the white pine. The treated white pine are expected to have an increased chance of survival and persist long enough to provide a valuable component in the stand as well as a future seed source. There are no reasonably foreseeable activities that would impact forest vegetation within the project area or the LAUs. For reasons stated above, there would be no cumulative effects from the proposed precommercial thinning beyond those covered in the current Biological Opinion.

Alternative B

Direct and Indirect Effects (Wildlife Report pp. 27-28)

Both LAUs would continue to meet the standards and guidelines of the NRLMD, and overall, conditions for lynx should improve. The changes in lynx habitat are not expected to adversely affect the ability of the project area to support lynx. The arrangement and distribution of denning and stand initiation hare habitat would remain good across the project area and LAUs. Following completion of all activity the amount of stand initiation habitat would increase by four acres in the Stateline-Quartz LAU and 92 acres in the Gold Creek LAU. The change is less than 1% in both LAUs and with inconsequential effects on lynx habitat conditions. The stand initiation habitat in both LAUs would remain well below the 30% upper limit set as an NRLMD standard. The amount of lynx habitat regenerated would be less than 1% in each LAU, also remaining well below the 15% per decade standard. Four acres (1 stand) of lynx habitat in the Stateline-Quartz LAU and 118 acres (5 stands) in the Gold Creek LAU would be cut with the proposed timber harvest. The treatment of this small a percentage

of lynx habitat would have inconsequential effects on lynx habitat conditions. Most of the proposed logging is either not in lynx habitat (3 stands), or not in the LAUs (15 stands). The proposed activities would not reduce snowshoe hare habitat in multi-storied mature or late successional forest. Denning habitat would be reduced by the proposed regeneration harvest of 4 and 92 acres in the Stateline-Quartz and Gold Creek LAUs, but would remain well distributed in the project area and throughout the LAUs. There would be 6,316 (Stateline-Quartz LAU) and 9,938 (Gold Creek LAU) acres of mature timber for potential denning habitat remaining. Another 26 acres in the Gold Creek LAU would be commercially thinned with the proposed timber harvest. This stand would still qualify as lynx habitat, although the quality would be reduced. The amount of decommissioning and long-term storage proposed for existing roads, coupled with the proposed road management changes, would increase the amount of secure habitat in the project area. Open road densities would be reduced from existing levels in the portion of the LAUs within the project area. The decreased open road density and increased amount of secure habitat in both LAUs should improve conditions for lynx in the project area. The maintenance of canopy cover in travel corridor stands would continue to allow movement throughout the project area. No change in the amount of snowmobile use is anticipated as a result of project implementation, and there would be no change to the designated snowmobile trail system.

Cumulative Effects (Wildlife Report p. 28)

The existing lynx habitat conditions are a result of previous management activities and natural conditions, and the changes in lynx habitat as a result of the proposed activities are not expected to adversely affect the ability of the project area to support lynx. Both LAUs would continue to meet the standards and guidelines of the NRLMD. The maintenance of canopy cover in travel corridor stands would continue to allow movement throughout the project area. Reasonably foreseeable activities would not impact forest vegetation within the project area or the LAUs. No change in the amount of snowmobile use is anticipated as a result of project implementation, and there would be no change to the designated snowmobile route (which is outside of the LAUs) in the project area. For these reasons the activities (excluding precommercial thinning) in this alternative may affect but are not likely to adversely affect lynx or lynx habitat.

Alternative C

Direct and Indirect Effects (Wildlife Report pp. 28-29)

Both LAUs would continue to meet the standards and guidelines of the NRLMD, and overall, conditions for lynx should improve. The changes in lynx habitat are not expected to adversely affect the ability of the project area to support lynx. The arrangement and distribution of denning and stand initiation hare habitat would remain good across the project area and LAUs. No commercial timber harvest would occur in lynx habitat in the Stateline-Quartz LAU with this alternative. The acres of stand initiation habitat present and the amount of regeneration harvest over a ten year period would not change in this LAU. Following completion of all activity the amount of stand initiation habitat would increase by 39 acres in the Gold Creek LAU. This would increase the stand initiation habitat to 8.5% of the lynx habitat in the Gold Creek LAU, remaining well below the 30% upper limit set as an NRLMD standard. The amount of lynx habitat regenerated is 0.2%, increasing the total to 3.1% in the LAU, also remaining well below the 15% per decade standard. Approximately 39 acres (2 stands) of lynx habitat would be cut with the proposed timber harvest in the Gold Creek LAU, and none would be harvested in the Stateline-Quartz LAU. The treatment of this small a percentage of lynx habitat would have inconsequential effects on lynx habitat conditions. Most of the proposed logging is in either not lynx habitat (3 stands), or not in the LAUs (10 stands). The proposed activities would not reduce snowshoe hare habitat in multi-storied mature or late successional forest. The arrangement and distribution of denning and stand initiation hare habitat would remain good across the project area and LAUs. Denning habitat would be reduced by the proposed regeneration harvest of 39 acres in the Gold Creek LAU, but would remain well distributed in the project area and throughout the LAU; with 9,991 acres of mature timber for potential denning habitat remaining. The decreased open road density and increased amount of secure habitat in both LAUs should improve conditions for lynx in the project area. The amount of decommissioning and long-term storage proposed for existing roads, coupled with the proposed road management changes, would increase the amount of secure habitat in the project area. Open road densities would be reduced from existing levels in the portion of the LAUs within the project area. No change in the amount of snowmobile use is anticipated as a result of project implementation, and there would be no change to the designated snowmobile trail system.

Cumulative Effects (Wildlife Report p. 29)

Both LAUs would continue to meet the standards and guidelines of the NRLMD. The existing lynx habitat conditions are a result of previous management activities and natural conditions. The changes in lynx habitat as a result of the proposed activities are not expected to adversely affect the ability of the project area to support lynx. The maintenance of canopy cover in travel corridor stands would continue to allow movement throughout the project area. Reasonably foreseeable activities would not impact forest vegetation within the project area or the LAUs. No change in the amount of snowmobile use is anticipated as a result of project implementation, and there would be no change to the designated snowmobile route (which is outside of the LAUs), in the project area. For these reasons the activities (excluding precommercial thinning) in this alternative may affect but are not likely to adversely affect lynx or lynx habitat.

Gray Wolf (Wildlife Report pp. 29-31)

Alternative A - No Action

Direct, Indirect and Cumulative Effects (Wildlife Report p. 31)

This alternative would not change any of the existing conditions within the project area; therefore, it would have no effect on the gray wolf. No activities are proposed, and the amount of open roads and trails would remain high, limiting the amount of secure habitat available for elk and deer, and therefore wolves. Potential travel corridors would retain their existing cover; however the elk habitat potential would remain below the desired target of .50.

Alternatives B and C

Direct and Indirect Effects (Wildlife Report p. 31)

There are no known dens or rendezvous sites in the project area; and the likelihood of direct effects is very low due to the nature of occurrence of wolves. There would be no impact on any known wolf den or rendezvous site, no consequential increase in the likelihood of human wolf conflicts, and no adverse change to the prey base. Travel corridors would be maintained, however there would be a reduction in their effectiveness in a few spots due to the number of units logged and roads constructed within potential travel corridors. Both action alternatives would decrease the open road density, with a resultant increase in secure habitat and elk habitat potential (EHP). Given the amount of past harvest in the project area (Map 7), the reduction in timber cover would have a greater impact on ungulates than would the creation of future forage in proposed regeneration cut openings. Each of these alternatives would improve conditions for wolves and wolf prey by varying degrees. Alternative C shows the most improvement in secure habitat and EHP, with less impact on cover and travel corridors than Alternative B.

Cumulative Effects (Wildlife Report p. 31)

Although there is evidence of occasional use of the area by wolves, there has not been the consistent, repeated amount of use that would indicate pack activity. Existing conditions for wolves are a result of previous management activities and natural conditions, and the proposed activities are unlikely to affect wolves due to their wide-ranging nature and the relative lack of preference for special habitat. Based on the maintenance or improvement of the prey base, (as shown by the increase in elk habitat potential), design criteria which would avoid adverse impacts (e.g. by maintaining corridors/linkages, avoiding den and rendezvous sites), and no consequential change in the likelihood of human wolf interactions; the federal actions evaluated in this proposal would not cause any adverse cumulative effects. The action alternatives are not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of proposed critical habitat.

SENSITIVE SPECIES

Fisher and Marten (Wildlife Report pp. 32-38)

Alternative A - No Action

Direct and Indirect Effects (Wildlife Report p. 36)

There would be no change in habitat conditions for fisher and marten under the No-Action Alternative. The amount of suitable habitat and overall analysis area habitat quality would not change from existing conditions.

Current road management would continue, and there would be no change in the open road system or the amount of riparian roads present; therefore, the trapping-vulnerability risk would remain high in the project area.

Cumulative Effects (Wildlife Report pp. 36-37)

Existing fisher and marten habitat conditions are a result of previous management activities and natural conditions; and Alternative A would not change habitat quality, the amount of suitable habitat, or the ability of the area to support fisher and marten. This alternative would have no impact on fisher/marten. Habitat quality for fisher/marten in the project area would not change because this alternative would not affect any mature or suitable habitat. The amount of suitable habitat and the ability of the area to support fisher/marten would also remain unchanged. There would be no riparian road treatment and consequently no long-term improvement in the condition of these roaded riparian corridors as it relates to fisher/marten. There would be no road storage or decommissioning to reduce open road densities, so the current high trapping-vulnerability risk would also remain unchanged.

Alternative B

Direct and Indirect Effects (Wildlife Report p. 37)

Approximately 437 acres of suitable fisher habitat would become unsuitable through canopy reduction, the likely decrease in the presence of large dead and downed logs, and a change to an early successional size class in areas proposed for clearcut and seedtree treatments. Suitable habitat would be reduced to 2,945 acres which is a 4.8% reduction from existing conditions. This is approximately 13% of the suitable fisher habitat in the project area. This alternative would convert 110 acres of suitable mature forest habitat to a seedling stage. This would be a reduction of 1.2% in the amount of suitable, mature habitat in the analysis area. Riparian buffers in harvest and precommercial thinning units would maintain riparian habitat during and after the proposed activities. Open road densities would be reduced from 3.2 to 2.4 mi/mi^2 in the project area. Despite the improved conditions the trapping–vulnerability risk would remain high. Approximately 7.5 miles of riparian road would be recontoured under this alternative, contributing to an improvement in future riparian habitat conditions. Of this total approximately three miles of road encroaching on riparian areas (within 50 feet of the stream) in the project area would be recontoured. This would begin the process of restoring/moving the riparian habitat closer to desired conditions thereby improving habitat for fisher and marten.

Cumulative Effects (Wildlife Report p. 37)

Existing forest habitat conditions are a result of previous management activities and natural conditions. The proposed activities, when added to the existing condition, are not expected to adversely affect the ability of the project area as a whole to provide fisher/marten habitat. While the overall moderate quality of the analysis area would not change with this alternative, the 13% reduction in the amount of suitable habitat could slightly reduce the ability of the project area to support fisher/marten. This degree of change in timbered vegetation is not expected to adversely affect the ability of the project area as a whole to provide fisher/marten habitat. Approximately 87% of the suitable mature forest habitat in the project area would remain untreated. Although the trapping-vulnerability risk would not change, the 25% decrease in open road densities is expected to somewhat offset the decrease in suitable habitat, as would the improvement in riparian conditions where roads would be recontoured. This alternative may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Alternative C

Direct and Indirect Effects (Wildlife Report p. 38)

Approximately 266 acres of suitable fisher habitat would become unsuitable through canopy reduction, the likely decrease in the presence of large dead and downed logs, and a change to an early successional size class in areas proposed for clearcut and seedtree treatments. Suitable habitat would be reduced to 3,116 acres which is a 3% reduction from existing conditions. This is 7.9% of the suitable fisher habitat in the project area. This alternative would convert 54 acres of suitable mature forest habitat to a seedling stage. This would be a reduction of 0.6% in the amount of suitable, mature habitat in the analysis area. Riparian buffers in harvest and precommercial thinning units would maintain riparian habitat during and after the proposed activities. Open road densities would be reduced from 3.2 to 2.0 mi/mi^2 in the project area. Despite the improved conditions the trapping–vulnerability risk would remain high. Approximately 8.3 miles of riparian road would be recontoured under this alternative, contributing to an improvement in future riparian habitat conditions. Of this total approximately 3.2 miles of road encroaching on riparian areas (within 50 feet of the stream) in the

project area would be recontoured. This would begin the process of restoring/moving the riparian habitat closer to desired conditions thereby improving habitat for fisher and marten.

Cumulative Effects (Wildlife Report p. 38)

Existing forest habitat conditions are a result of previous management activities and natural conditions. The proposed activities, when added to the existing condition, are not expected to adversely affect the ability of the project area as a whole to provide fisher/marten habitat. With less than a 1% reduction in mature timber habitat, the overall moderate quality of the analysis area would be essentially unchanged with this alternative. The 3% reduction in the amount of suitable habitat is unlikely to affect the ability of the project area to support fisher/marten. Approximately 92% of the suitable mature forest habitat in the project area would remain untreated. This degree of vegetation change is not expected to adversely affect the ability of the project area as a whole to provide fisher/marten habitat. Although the trapping-vulnerability risk would not change, the 38% decrease in open road densities is expected to somewhat offset the decrease in suitable habitat, as would the improvement in riparian conditions from road recontouring. This alternative may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Wolverine (Wildlife Report pp. 38-40)

Alternative A - No Action

Direct, Indirect and Cumulative Effects (Wildlife Report p. 39)

As the no-action alternative does not change any of the conditions for wolverine within the project area, it would have no impact on wolverines.

Alternatives B and C

Direct and Indirect Effects (Wildlife Report p. 40)

Based on the lack of suitable habitat within the project area, there would be no disturbance to potential natal denning habitat. Neither of the action alternatives would change the amount or location of the designated snowmobile route within the project area. Alternatives B and C would decrease the open road/trail density, with a resultant increase in secure habitat and elk habitat potential. The value of the increase in secure habitat for wolverines is somewhat offset by the remaining open road/trail system in both alternatives, which remains above the 1 mi/mi^2 level that characterizes quality wolverine habitat. Due to the improvement of conditions for elk (potential carrion), both of these alternatives would improve conditions for wolverines by varying degrees. Conditions would improve slightly more with Alternative C than with Alternative B.

Cumulative Effects (Wildlife Report p. 40)

Existing forest habitat conditions are a result of previous management activities and natural conditions. The proposed activities, when added to the existing condition are unlikely to affect wolverines due to their wide ranging nature and the relative lack of preference for special habitat. Based on an absence of natal den sites to be affected, the maintenance or improvement of the prey base (as shown by the increase in EHP), design criteria which would avoid adverse impacts (e.g. by maintaining corridors/linkages), lack of change to the designated snowmobile route, and an increase in secure habitat; the proposed actions would not cause any adverse cumulative effects. These alternatives may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Flammulated Owl (Wildlife Report pp. 40-43)

Alternative A - No Action

Direct, Indirect, and Cumulative Effects (Wildlife Report pp. 41-42)

The No-Action Alternative would result in no management-created changes to habitat conditions for flammulated owls. The increase or decrease in canopy cover resulting from normal growth and mortality would not make a measurable difference over the short term, i.e. 10-20 years. The potential of the analysis area to continue to provide flammulated owl habitat would be unchanged with this alternative. This alternative would have no impact on flammulated owls.

Direct, Indirect, and Cumulative Effects Common to Alternatives B and C (Wildlife Report p. 42)

Both action alternatives would precommercial thin some capable flammulated owl habitat. This thinning would reduce existing canopy to enhance growth and survival, generally favoring white pine and larch. Most capable stands to be treated are not Douglas-fir cover types. As these stands are all seedling and sapling class, it would take many decades for any stand favoring Douglas fir to become suitable habitat. The precommercial thinning of capable flammulated owl habitat would have essentially no effect on owls or their habitat for the next 10-20 years. The absence of a ponderosa pine component further reduces the potential value of these stands for future flammulated owl nesting.

Alternative B

Direct and Indirect Effects (Wildlife Report p. 42)

This alternative would harvest timber from 15 capable habitat stands (285 acres). All these stands would still be unsuitable habitat. Eleven of the stands do not have Douglas-fir and/or ponderosa pine forest types, and the timber size is too small in two stands. Field reviews of the three stands with Douglas-fir cover types showed they are not suitable habitat. All three stands would have insufficient cover after treatment and would remain unsuitable, capable habitat. This alternative would treat one 13-acre stand of habitat currently considered suitable for flammulated owls, making it unsuitable due to the reduction in canopy cover. This stand is not large enough to be counted as a viable territory, and has no ponderosa pine in it. The amount of suitable habitat in the project area would be reduced by 1.3%.

Cumulative Effects (Wildlife Report p. 42)

Effects of previous management activities combined with natural conditions resulted in existing habitat conditions for flammulated owls. The proposed activities, when added to the existing conditions would have inconsequential effects on flammulated owls. Given the amount of suitable territories present and the time needed for capable stands to become suitable habitat, the treatment of capable habitat is not a major factor in the determination of effects. The proposed action does not treat any suitable home ranges, therefore the number and distribution of home ranges through the project area remains unchanged. This alternative treats 13 acres of suitable habitat, a reduction from 994 to 981 acres. The loss of 1.3% of the suitable habitat outside of home ranges would have inconsequential effects on flammulated owls. For the above reasons this alternative may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

Alternative C

Direct and Indirect Effects (Wildlife Report pp. 42-41)

This alternative would harvest timber from eight capable habitat stands (124 ac.). Seven of these stands are currently unsuitable because they do not have a Douglas-fir or ponderosa pine cover type. The one stand with a Douglas-fir cover type is unsuitable because it has an immature sawtimber size class. All these stands would remain unsuitable, capable habitat after treatment. This alternative does not treat any potential territories or habitat currently considered suitable for flammulated owls.

Cumulative Effects (Wildlife Report p. 43)

Existing forest habitat conditions are a result of previous management activities and natural conditions. Given the amount of existing suitable nest territories present, and the time needed for capable stands to become suitable habitat, the treatment of capable habitat is not a major factor in the determination of effects. The amount and distribution of suitable territories would not be changed with the implementation of this alternative. There would be no reduction in the amount of suitable habitat present. Because the treatment of capable stands has no measurable effect on potential flammulated owl habitat, and there would be no treatment of any suitable habitat, this alternative would have no impact on flammulated owls.

Western Toad (Wildlife Report pp. 43-45)

Alternative A - No Action

Direct, Indirect and Cumulative Effects (Wildlife Report p. 44)

There would be no change to habitat conditions for western toads with the No Action Alternative; therefore, this alternative would have no impact on western toads.

Alternatives B and C

Direct and Indirect Effects (Wildlife Report p. 44)

Habitat alterations from timber harvest and recreation have not been shown as causative agents for population declines (Loeffler 1998 p.11). Given the amount of mesic, timbered stands present, and the relative scarcity of any ponds or wetlands, it is likely that breeding habitat is limiting for western toads in the project area. The riparian buffer zones or riparian habitat conservation areas (RHCAs) established on creeks in the project area would protect potential breeding habitat, and it would not change. The small elk wallow-pools would be protected by at least 50-foot no-entry buffer zones. These no-entry buffers would also protect the portions of timbered stands near water that would be most likely to be used by toads. The predicted small, inconsequential changes in water yield are unlikely to adversely impact potential breeding habitat (see Water Resources Report). The majority of the proposed timber harvest (360 acres in Alternative B; 225 acres in Alternative C) would be intermediate treatments and would be unlikely to cause the potential mesic timbered habitat to become unsuitable. Some overhead cover would be retained in these units, which would keep the cool, moist forest conditions favored by toads. Clearcut and seed tree units are also proposed (123 acres in Alternative B; 68 acres in Alternative C) that would likely reduce upland timbered habitat quality for toads due to the drier, more open conditions created.

This species can breed in roadside ditches and can be found in upland habitat that would not have any special protection. Some mortality occurs to adults and metamorphs in these situations, but it is unlikely to be significant to the population as a whole because of the low level of traffic on forest roads and the high number of other opportunities for breeding habitat (i.e. wet meadows, ponds, etc.) throughout the forest. The highest potential for mortality would occur on existing open roads adjacent to potential breeding habitat. The proposed road decommissioning and storage (67.5 miles in Alternative B; 73 miles in Alternative C), especially of riparian roads (7.5 miles in Alternative B; 8.3 miles in Alternative C), may tend to decrease the risk of mortality; but this effect is difficult to measure in any meaningful way, and is not expected to be consequential. Two new creek crossings would be constructed for proposed new road construction in Alternative B. One crossing would be near potential breeding habitat, and could affect breeding toads, if any were present. These new roads would be put into long-term storage after use. There are no creek crossings proposed with the new road construction in Alternative C.

Cumulative Effects (Wildlife Report pp. 44-45)

For reasons listed above, any cumulative mortality from any alternative is unlikely; and potential adverse effects would not significantly exceed existing levels of risks to the species. The protection of potential breeding habitat along streams, and only minor changes to timbered habitat toads may use, coupled with the low probability of western toad presence, means these alternatives may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. The impacts from proposed federal actions under all alternatives would not contribute appreciably to existing impacts and would not affect population viability.

MANAGEMENT INDICATOR SPECIES

Northern Goshawk (Wildlife Report pp. 45-51)

Alternative A - No Action

Direct, Indirect, and Cumulative Effects (Wildlife Report p. 49)

This alternative does not propose any vegetation treatment, and the existing forest structure and cover is expected to remain relatively unchanged in the near future. There would be no change to potential nesting or foraging habitat conditions with the No-Action Alternative. The ability of the project area to continue to provide

suitable goshawk home ranges would be unchanged with this alternative, and it would have no impact on goshawks or their habitat.

Alternative B

Direct and Indirect Effects (Wildlife Report p. 49)

Alternative B includes timber harvest in seven potential nest stands and nest areas in each home range. Of the 14 treated nest stands and nest areas, two potential nest areas would become unsuitable in the Bruin Creek Home Range and one would become unsuitable in the Tumbledown Creek Home Range. Approximately 119 acres of potential goshawk nesting habitat would become unsuitable in the Bruin Creek drainage. Approximately 66 acres of potential nesting habitat would be made unsuitable in the Tumbledown Creek drainage. Most treated stands would either retain at least 40% cover or have an untreated portion of the stand that remains suitable nesting habitat.

Foraging habitat suitability would be relatively unchanged from existing conditions under Alternative B. This alternative would move foraging habitat in the Tumbledown Creek Area further from its desired condition, but changes in the Bruin Creek Area would be inconsequential and conditions would still be above the target. The most important forage habitat components are the trees that are ≥9" d.b.h. and the amount of canopy cover ≥50%. The Bruin Creek Area shows a 1.7% decrease in trees ≥ 9", and a 5.2% decrease in the ≥50% cover category from existing conditions. This level of change is inconsequential as the Bruin Creek Home Range would still have slightly over the 60% target in these key timber size classes preferred for foraging habitat. The Tumbledown Creek Area would have a 0.8% decrease in trees ≥ 9", and a 5.6% decrease in the ≥50% cover category from existing conditions. The decrease in the amount of ≥9" tree size class is also inconsequential, as the level would remain well above the 60% target. While 5.6% is a small decrease, the ≥50% canopy cover amount starts below the desired 60% level, and this alternative moves it further from the desired condition.

The proposed shelterwood cuts and commercial thinning would not change the existing size class structure. Foraging habitat quality would be affected, with some stands (especially those reduced to below 50% canopy cover), decreasing in quality; and in a few stands that were densely timbered, forage quality would be increased; however all stands given intermediate treatments would remain forage habitat. The seven proposed clear-cut and seedtree units would affect foraging suitability by converting timbered stands to the grass/forb/shrub stage. In the Bruin Creek drainage, both key values for foraging habitat would remain above the desired level. In the Tumbledown drainage, the slight reduction of one of the key values further below the desired level is expected to have a minor effect on forage habitat quality.

Cumulative Effects (Wildlife Report p. 50)

Existing goshawk habitat conditions are a result of previous management activities and natural conditions. Proposed activities, when added to the effects of previous management activities, would not change the overall ability of the project area to support goshawk Both suitable nesting and foraging habitat would be treated with these alternatives, but the changes resulting from these alternatives would not change the overall ability of the project area to support goshawk. There is an abundant amount of nesting habitat in the project area. As a minimum, a suitable home range needs six suitable nest stands or areas (Brewer and others 2007 p.35). Both potential home ranges have well over this amount, with 35 in Bruin Creek and 50 in Tumbledown Creek. Given the amount of suitable nesting habitat present, the loss of three nest stands is inconsequential. With one home range fully suitable, and the other's foraging habitat quality only slightly reduced, this alternative does not change the overall ability of the project area to support goshawk. Therefore, the implementation of this alternative may impact individual goshawks and goshawk habitat, but is not likely adversely affect the use of the project area by goshawks.

Alternative C

Direct and Indirect Effects (Wildlife Report p. 50)

Alternative C includes timber harvest in four potential nest stands and nest areas in the Bruin Home Range and seven in the Tumbledown Home Range. Of the 11 nest stands and areas proposed to be treated, two potential nest areas would become unsuitable in the Bruin Creek Home Range and none would become unsuitable in the Tumbledown Creek Home Range. Approximately 81 acres of potential goshawk nesting habitat would become unsuitable in the Bruin Creek drainage, and 32 acres of potential nesting habitat would be made unsuitable in the Tumbledown Creek drainage. Most treated stands would either retain at least 40% cover or have an untreated portion of the stand that would remain suitable nesting habitat.

Foraging habitat suitability would be relatively unchanged from existing conditions with Alternative C. The Bruin Creek Area would have a 0.9% decrease in trees ≥ 9" and a 1.8% decrease in the ≥50% cover category from existing conditions. This level of change is inconsequential as the Bruin Home Range would still have slightly over the 60% amount desired in these key timber size classes preferred for foraging habitat. The Tumbledown Creek area would have a 0.5% decrease in trees ≥ 9" and a 4.3% decrease in the ≥50% cover category from existing conditions. The decrease in the amount of ≥9" tree size class is also inconsequential, as the level would remain well above the 60% target. While 4.3% is a small decrease, the ≥50% canopy cover amount starts below the desired 60% level, and this alternative moves it further from the desired condition. This alternative affects less goshawk habitat than Alternative B.

The proposed shelterwood cuts and commercial thinning would not change the existing size class structure. Foraging habitat quality would be affected. Some stands (especially those reduced to below 50% canopy cover) would decrease in quality, and a few stands that were densely timbered would increase in forage quality; however, all stands given intermediate treatments would remain forage habitat. The five proposed clearcut and seedtree units would affect foraging suitability by converting timbered stands to the grass/forb/shrub stage.

Cumulative Effects (Wildlife Report p. 51)

Existing goshawk habitat conditions are a result of previous management activities and natural conditions. Proposed activities, when added to the effects of previous management activities, would not change the overall ability of the project area to support goshawk. Both suitable nesting and foraging habitat would be treated with this alternative, but the changes would not affect the overall ability of the project area to support goshawk. There is an abundant amount of nesting habitat in the project area. Both potential home ranges have well over the minimum of six suitable nest stands or nest areas (Brewer and others 2007 p. 35) for suitable home ranges, with 35 in Bruin Creek and 51 in Tumbledown Creek Given the amount of suitable nesting habitat present, the loss of two nest stands is inconsequential. In the Bruin Creek drainage, both key values for foraging habitat would remain above the desired level. In the Tumbledown drainage, the slight reduction of one of the key values further below the desired level is expected to have a minor effect on forage habitat quality. With one home range fully suitable, and the other's foraging habitat quality only slightly reduced, this alternative does not change the overall ability of the project area to support goshawk.

Pileated Woodpecker (Wildlife Report pp. 51-57)

Alternative A - No Action

Direct, Indirect and Cumulative Effects (Wildlife Report pp. 53-54)

This alternative does not propose any vegetation treatment, and the existing forest structure and cover is expected to remain relatively unchanged in the near future. There would be no change to potential nesting or foraging habitat conditions with the No-Action Alternative. Alternative A does not reduce any suitable habitat, and the amount of higher quality habitat provided by old growth stands would persist in the project area. Succession would continue on mature stands and improve their suitability for pileated habitat, as tree size increases and snags continue to be produced. The ability of the project area to continue to provide suitable pileated woodpecker home ranges would be unchanged with this alternative. Alternative A would have no impact on pileated woodpeckers.

Alternative B

Direct and Indirect Effects (Wildlife Report pp. 54-55)

Winter Foraging Habitat: Overall, with 6,940 acres (66.0%) of untreated foraging habitat, the ability of the project area to support pileated woodpeckers would be maintained. Alternative B includes 125 acres of regeneration harvest (clearcuts and seed tree cuts) that would change the size class structure of these units. These stands would become openings after treatment, and would no longer be considered able to provide foraging habitat. They would remain unsuitable for pileated woodpecker winter foraging for decades, until they reached an immature sawtimber size class. This would reduce the winter foraging habitat by 1.2% to 7,306 acres (69.4%), which is still an ample supply to provide for all potential home ranges in the project area. Alternative B would affect habitat conditions for woodpeckers on 366 stand acres with 294 acres of commercial thinning and 72 acres of shelterwood cuts. The reduction in canopy cover and basal area along with incidental removal of snags for safety would reduce the quality of winter forage habitat. Commercial thins and shelterwood cuts do not become openings for pileated woodpecker foraging habitat because they could still provide winter foraging habitat by retaining low to moderate canopy levels, mature stand structure, and snags

and leave trees. These stands would provide marginal habitat quality after commercial thinning and shelterwood treatment.

Nesting Habitat: Overall, with 6,481 acres (61.6%) of untreated nesting habitat, the ability of the project area to support at least four and up to ten home ranges would be maintained. Proposed regeneration harvest would change timber structure in stands that provide nesting habitat, and approximately 110 acres would become openings after treatment and would no longer provide nesting habitat. They would remain unsuitable for pileated woodpecker nesting for decades until they reach a sawtimber size class. Timber harvest would affect 16 acres of optimal nesting habitat in one stand, reducing it to 2,869 acres or 27.3% of the project area. The remaining 94 acres would affect suitable nesting habitat, reducing it to 3,933 acres or 37.4% of the project area. This would reduce the overall nesting habitat to 6,802 acres (64.6%), which still exceeds the minimum 200 acres of suitable nesting habitat per home range, which would be a total of 2,000 acres for this project area. Alternative B would affect nesting habitat conditions for woodpeckers on 321 stand acres with 294 acres of commercial thinning and 72 acres of shelterwood cuts (45 acres treat immature sawtimber stands not classified as nesting habitat). Approximately 36 acres of optimal nesting habitat would be affected, along with 285 acres of suitable nesting habitat. Optimal nesting habitat would be reduced to 2,833 acres or 26.9% of the project area. The reduction in canopy cover and basal area along with incidental removal of snags for safety would reduce the quality of nesting habitat. Commercial thins and shelterwood cuts are not considered openings because these stands could still provide potential nesting habitat by retaining moderate canopy levels, mature stand structure, and snag and leave trees. These stands are considered to provide marginal habitat quality after commercial thinning and shelterwood treatment.

Cumulative Effects (Wildlife Report p. 55)

Existing pileated woodpecker habitat conditions are a result of previous management activities and natural conditions. Proposed activities, when added to the effects of previous management activities, would not adversely impact pileated woodpecker populations. The project area's ability to support pileated woodpeckers should improve over time on untreated stands. Based on the level of suitable habitat maintained it is not likely that this alternative would adversely impact pileated woodpecker populations. The amount of mature nesting and feeding habitat remaining, the design features (i.e. snag retention levels, RHCA buffers), and prescriptions (i.e. thinning), used on treated stands, would maintain the suitability of the analysis area for pileated woodpeckers. This alternative would reduce foraging habitat by 125 acres (1.7%) and reduce the quality of another 366 acres (4.9%). Untreated forage acres would be reduced by 4.2%. Optimal nesting habitat (allocated old growth) would be reduced by (1.8%), and untreated stands would continue to age and increase tree size. The trend for continuing tree mortality through insect and disease agents is expected to persist (Forest Vegetation Report). The amount (1.6%) and quality (4.6%) of suitable nesting habitat would decrease slightly with this alternative.

<u>Alternative C</u>

Direct and Indirect Effects (Wildlife Report p. 56)

Winter Foraging Habitat: Overall, with 7,133 acres (67.8%) of untreated foraging habitat, the ability of the project area to support pileated woodpeckers would be maintained. Alternative C would reduce foraging habitat by 69 acres, and reduce the quality of another 229 acres. It would change the size class structure of 69 acres with regeneration harvest (clear-cuts and seed tree cuts). These stands would become openings after treatment, and would no longer provide foraging habitat. They would remain unsuitable for pileated woodpecker winter foraging for decades until they reached an immature sawtimber size class. This would reduce the winter foraging habitat by 0.6% to 7,362 acres (70.0%), which is still an ample supply to provide for all potential home ranges in the project area. The 185 acres of commercial thin treatment and 44 acres of shelterwood cuts would affect habitat conditions for woodpeckers on 229 stand acres. The reduction in canopy cover and basal area along with incidental removal of snags for safety would reduce the quality of winter forage habitat. Commercial thins and shelterwood cuts are not considered openings for pileated woodpecker foraging habitat because they could still provide winter foraging habitat by retaining low to moderate canopy levels, mature stand structure, and snags and leave trees. These stands are considered to provide marginal habitat quality after commercial thinning and shelterwood treatment.

Nesting Habitat: Overall, the ability of the project area to support at least four and up to ten home ranges would be maintained with 6,658 acres (63.3%) of untreated nesting habitat. Approximately 54 acres of suitable nesting habitat would become openings after regeneration harvest, and would no longer provide nesting habitat. They would remain unsuitable for pileated woodpecker nesting for decades until they reached a

sawtimber size class. This alternative does not propose timber harvest in optimal nesting habitat. Regeneration harvests would reduce suitable nesting habitat to 3,973 acres or 37.7% of the project area. This would reduce the overall nesting habitat to 6,858 acres (65.2%) which still exceeds the minimum 200 acres of suitable nesting habitat per home range, which would be a total of 2,000 acres for this project area. Alternative C would affect 199 acres of suitable nesting habitat for woodpeckers with commercial thin treatment and shelterwood cuts. No treatment of optimal nesting habitat is proposed. The reduction in canopy cover and basal area along with incidental removal of snags for safety would reduce the quality of nesting habitat. Stands that are commercial thinned and shelterwood cut are not considered openings. These stands could still provide potential nesting habitat by retaining moderate canopy levels, mature stand structure, and snags and leave trees. They would provide marginal habitat quality after commercial thinning and shelterwood treatment.

Cumulative Effects (Wildlife Report p. 57)

Existing pileated woodpecker habitat conditions are a result of previous management activities and natural conditions. Proposed activities, added to the effects of previous management activities and continuing future tree mortality would not adversely impact pileated woodpecker populations. Based on the level of suitable habitat maintained it is not likely that this alternative would adversely impact pileated woodpecker populations. The amount of mature nesting and feeding habitat remaining, and the design features (i.e. snag retention levels, RHCA buffers), and prescriptions (i.e. thinning), used on treated stands, would maintain the suitability of the analysis area for pileated woodpeckers. The project area's ability to support pileated woodpeckers should improve over time on untreated stands. Alternative C would reduce untreated forage acres by 2.4%. It would maintain optimal nesting habitat (allocated old growth) at existing levels, and untreated stands would continue to age and increase tree size. The trend for continuing tree mortality through insect and disease agents is expected to persist (Forest Vegetation Report pp. 13, 16). The amount (0.8%) and quality (2.9%) of suitable nesting habitat would decrease slightly with this alternative.

Elk (Wildlife Report pp. 57-62)

Alternative A - No Action

Direct and Indirect Effects (Wildlife Report p. 60)

The No-Action Alternative would not change the existing conditions in any of the elk analysis units. There would be no new road construction with this alternative, and no road decommissioning or storage would occur. The elk habitat potential (EHP) and amount of secure habitat would remain low, and the open road density would remain high. The EHP ranges from .35 to .47 in the elk analysis areas, and the EHP for the Quartz Gold Elk Habitat Unit (EHU) 10 would remain at .42 which is below the .50 minimum habitat level set by agreement between the Forest Service and the Idaho Department of Fish and Game. Four of the individual elk analysis areas would have no secure habitat. Travel corridor cover and the existing level of good quality elk habitat would not change.

Cumulative Effects (Wildlife Report p. 60)

Existing elk habitat conditions are a result of previous management activities and natural conditions, and Alternative A would not change conditions for elk. No present or reasonably foreseeable federal actions would measurably affect elk habitat in the project area. The EHP for the Quartz Gold EHU 10 would remain at .42 which is below the .50 minimum habitat level set by agreement between the Forest Service and the Idaho Department of Fish and Game. The high open road densities (2.9 mi./mi.^{2}), and resultant low amount of secure habitat (1,308 ac., 3.2%), would continue unchanged under this alternative.

Alternative B

Direct and Indirect Effects (Wildlife Report pp. 60-61)

This alternative would decrease habitat conditions for elk in the project area over the short term, but following completion of all timber harvest and stand improvement activities and road decommissioning and storage, the EHP would improve in the two elk analysis areas within the project area. The Bruin Creek Analysis Area EHP would increase 27% from .37 to .47; and the Tumbledown Creek Analysis Area EHP would increase by 12% from .42 to .47. The amount of secure habitat would increase, and the open road densities would be reduced from existing levels in both areas. This alternative would harvest timber from fifteen units along travel corridors. Timber harvest in the blocks along the ridges west and east of Tumbledown Creek would likely decrease the ease of movement between summer and winter range. Although a design feature would retain a minimum level

of canopy in designated travel corridors, the reduction in cover along the ridgetop portions of these proposed units would decrease travel corridor quality from the existing condition. The reduction in canopy in proposed treatment units, particularly in those with current moderate to high levels of elk use, is likely to decrease the habitat quality for elk over the short term (i.e. ≤ 10 years). Forage levels are expected to increase in regeneration units, which would increase habitat quality. This effect would take several years to be fully realized, as the new shrub growth progresses.

Cumulative Effects (Wildlife Report p. 61)

This project would only affect about 25% of the cumulative effects area for elk (the Quartz Gold EHU 10), so it is not expected that the overall EHP can be increased enough to meet the target of .50. The overall EHP for EHU 10 would be improved from .42 to .44 (a 5% change), which is still below the target level called for in the Forest Plan and set by agreement between the Forest Service and the Idaho Department of Fish and Game. Elk habitat security would be increased, and this will have a positive and long-term effect on elk in both the project and cumulative effects area. The EHU open road density would be reduced to 2.7 mi./mi.^{2}, and the secure habitat would be increased by 642 acres to 4.8% of the Quartz Gold EHU. The Bruin and Tumbledown analysis areas would reduce open road density to 2.6 and 2.3 mi./mi.^{2}, and increase secure habitat to 9% and 5% respectively. Although this is an improvement in conditions for the Bruin and Tumbledown areas, this level of security is still below 20% and therefore would still have a negative effect on the EHP.

Alternative C

Direct and Indirect Effects (Wildlife Report p. 61)

Alternative C would decrease habitat conditions for elk in the project area over the short term, but the EHP would improve in the two elk analysis areas within the project area following completion of all timber harvest and stand improvement activities and road decommissioning and storage. The Bruin Creek Analysis Area EHP would increase 35% from .37 to .50; and the Tumbledown Creek Analysis Area EHP would increase 48% from .42 to .62. The amount of secure habitat would increase, and the open road densities would be reduced from existing levels in both areas. Alternative C would harvest timber from seven units along travel corridors. Timber harvest in the block along the ridge east of Tumbledown Creek would likely decrease the ease of movement between summer and winter range. Although a design feature would retain a minimum level of canopy in designated travel corridors, the reduction in cover along the ridgetop portions of these proposed units would decrease travel corridor quality from the existing condition. The reduction in canopy in proposed treatment units, particularly in those with current moderate to high levels of elk use, would likely decrease the habitat quality for elk over the short term (i.e. ≤ 10 years). Forage levels are expected to increase in regeneration units, which would increase habitat quality. This effect would take several years to be fully realized, as the new shrub growth progresses.

Cumulative Effects (Wildlife Report p. 62)

This project only affects about 25% of the cumulative effects area for elk (the Quartz Gold EHU 10), so it is not expected that the overall EHP can be increased enough to meet the target of .50. The overall EHP for Quartz Gold EHU 10 would be improved from .42 to .46 (a 10% change), which is still below the target level called for in the Forest Plan and set by agreement between the Forest Service and the Idaho Department of Fish and Game. Elk habitat security would be increased, and this will have a positive and long term effect on elk in both the project and cumulative effects area. The completion of post sale road decommissioning and storage would affect conditions for elk in the project area and the EHU. The EHU open road density would be reduced to 2.6 mi./mi.^{2}, and the secure habitat would be more than doubled by 1,626 acres to 7.2% of the Quartz Gold EHU. The Bruin and Tumbledown Analysis Areas would reduce open road density to 2.5 and 1.6 mi./mi.^{2}, and increase secure habitat to 12% and 20% respectively. Although this is an improvement in conditions for the Bruin and Tumbledown areas, this level of security is still below 20% and therefore would still have a negative effect on the Bruin EHP.

Organizations, Businesses, Individuals, Agencies, and Tribes Notified of the Proposed Action

Organizations:

Alliance for the Wild Rockies
Kootenai Environmental Alliance
Wildwest Institute
The Lands Council
Idaho Conservation League
Defenders of Wildlife
Friends of the Clearwater

Businesses:

Stimson Lumber
Bennett Lumber Products, Inc.
Regulus Stud Mills, Inc.

Individuals:

T. Livingston
M. Lowrey
D. Artley
M. Tihonovich
J. Juel
M. Silvers
C. Farrell
J. Peek

Federal, State, and Local Agencies:

Idaho Department of Environmental Quality Surface Water Section
Idaho Dept of Parks & Recreation
Idaho Department of Fish and Game
Idaho State Historic Preservation Office
USDI Fish & Wildlife Service

Tribes:

Coeur d'Alene Tribe of Idaho

List of Preparers

Name	Education	Experience	Project Duties
Kimberly Frymire	BS Biology w/ Botany Emphasis	11 years	Botany (Noxious Weeds, TES Plants)
Tracy Gravelle	BS Forest Engineering	28 years	Trails, Recreation
Lisa Hawdon	BS Biology	20 years	Team Leader, Fisheries
Cornie Hudson	BS Forestry w/ Recreation minor	22 years	Public Relations
John Macy	BA Geography	18 years	Water Resources
James McFarland	BS Forestry - Forest Ecosystem Management	2 years	Forest Vegetation Old Growth Economics
Barbara Montgomery	ARC and Associated Software	13 years ARC, 18 years data management	GIS Analyst
Lynette Myhre	BS Forest Resource Management	21 years	Writer/Editor
Steve Nelson	AAS Wildlife Management	31 years	Visual Quality
Edwin Odegaard	Forest Engineering Institute Certified Check Cruiser	23 years	Logging systems
Dennis Riley	BS Environmental Science BS Wildlife Biology	23 years	Wildlife
Regina Rone	BS Environmental Science, BS Geology, MS Geology	7 years	Soils
Destry Scheel	Technical Fire Management	20 years	Air Quality Fire and Fuels
Sarah Wilson	BA Anthropology	2 years	Cultural Resources
Frank Yurczyk	BS Forest Management	35 years	Transportation