United States Department of Agriculture

Forest Service

Idaho Panhandle National Forest

Coeur d'Alene River Ranger District

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Coeur d' Alene, ID 83814

File Code: 1950

Date: March 15, 2007

Hello –

Enclosed is your copy of the Jo-Cat Environmental Assessment (EA). For the convenience of our interested public and in an effort to conserve paper and reduce publication costs, documents related to this proposal (including the Specialists' Reports, which are not provided with this EA) are also available to the public on our Forest's internet web page:

http://www.fs.fed.us/ipnf/eco/manage/nepa

We have prepared this EA to determine whether or not implementing the proposed activities would result in significant effects warranting preparation of an Environmental Impact Statement. Based on the results of this analysis, a Draft Finding of No Significant Impact is provided with this EA for public review and comment.

Comments should be provided within 30 days of the notice of availability published in the newspaper of record (*Coeur d'Alene Press*). Comments can be submitted several ways: Please **send written comments** to NEPA Coordinator, Coeur d'Alene River Ranger District - Fernan Office, 2502 East Sherman Avenue, Coeur d'Alene, Idaho 83814-5899. Written comments may be **faxed** to the NEPA Coordinator at the Coeur d'Alene River Ranger District office, at (208) 769-3062. Written comments may also be **hand-delivered** to the District's Fernan or Smelterville Offices. Office hours are 7:30 a.m. to 4 p.m., Monday through Friday. **Electronic comments** may be submitted to *comments-northern-idpanhandle-coeur-dalene@fs.fed.us*. The subject line must contain the name of the project for which you are submitting comments. Acceptable formats are MS Word, Word Perfect, or RTF. Regardless of the method used to submit comments, it is the sender's responsibility to ensure timely receipt. Comments received, including names and addresses of those who comment, will be considered part of the public record and will be available for public inspection.

District Ranger Randy Swick is the the Responsible Official for this project (telephone 208-769-3001). For more information regarding the proposal, please contact Project Team Leader Bob Rehnborg or District Ecosystem Staff Officer Sherri Lionberger at (208) 664-2318.

Sincerely,

/s/ Linda McFaddan

LINDA McFADDAN
Deputy District Ranger

enclosure

United States
Department of
Agriculture

Forest Service
Northern Region

Idaho Panhandle
National Forests

March 2007

Coeur d'Alene River Ranger District

Jo-Cat Resource Area
Environmental Assessment

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Table of Contents

Chapter 1 – Purpose and Need for Action

1.A. Overview ..... Page EA-1
1.B. Need for the Proposal ..... Page EA-2
1.C. Document Review Information ..... Page EA-5

Chapter 2 – Alternatives

2.A. Overview of Alternatives ..... Page EA-6
2.B. Proposed Action Alternative ..... Page EA-7
2.B.1. Proposed Activities ..... Page EA-7
2.B.2. Features of the Proposed Action ..... Page EA-7
2.B.3. Mitigation Measures ..... Page EA-15
2.B.4. Implementation and Effectiveness Monitoring ..... Page EA-15
2.C. Summary Comparison of Effectiveness in Meeting the Purpose and Need ..... Page EA-16
2.D. Alternatives Considered But Eliminated ..... Page EA-17

Chapter 3 – Existing Condition & Environmental Impacts

3.A. Introduction ..... Page EA-19
3.B. Issues ..... Page EA-19
3.C. Impacts to Fire/Fuels ..... Page EA-20
3.D. Impacts to Forest Vegetation ..... Page EA-22
3.E. Impacts to TES Plants ..... Page EA-29
3.F. Impacts to Aquatics ..... Page EA-32
3.G. Impacts to Soils ..... Page EA-34
3.H. Impacts to Wildlife ..... Page EA-38
3.I. Impacts to Recreation ..... Page EA-41
3.J. Impacts to Scenery ..... Page EA-43
3.K. Financial Impacts ..... Page EA-44

Appendices

Appendix A ..... Past, Ongoing & Reasonably Foreseeable Activities
Appendix B ..... Public Involvement and Comments
Appendix C ..... Resource Area Maps

List of Tables

Table 1. Comparison of proposed activities on NFS lands in the Jo-Cat Resource Area ..... Page EA-6
Table 2. Units in western larch stands proposed for commercial thinning..... Page EA-7
Table 3. Units proposed for lodgepole pine removal..... Page EA-9
Table 4. Lodgepole pine salvage and overstory removal units..... Page EA-10
Table 5. Proposed adjustments to suitability allocations in the Jo-Cat Resource Area..... Page EA-23
Table 6. Comparison of forest cover types on National Forest System lands ..... Page EA-25
Table 7. Comparison of percent forest structure on National Forest System lands ..... Page EA-27
Table 8. Rare plant guilds affected under the alternatives..... Page EA-30
Table 9. Summary of determination of effects on rare plant species, by guild ..... Page EA-31
Table 10. Comparison of changes to aquatic resources ..... Page EA-32
Table 11. Proportion of harvest activities associated with landtype hazards..... Page EA-35
Table 12. Existing conditions and effects to wildlife..... Page EA-39
Table 13. Predicted high bids, value and timber volume ..... Page EA-44
Table 14. Projects funded by other than timber sale..... Page EA-44

List of Figures

Figure 1. Vicinity map of the Jo-Cat Resource Area..... Page EA-1
Figure 2. View traveling up Forest Highway 9 of Cat Creek Area..... Page EA-2
Figure 3. View from Thompson Pass showing western larch ..... Page EA-2
Figure 4. View of western larch stand associated with Unit 7..... Page EA-7
Figure 5. Photo of lodgepole pine trees infested with mountain pine beetles in Unit 11 ..... Page EA-8
Figure 6. Existing understory similar to conditions in proposed Unit 6 ..... Page EA-10
Figure 7. Talus slope closure location above Unit 7 ..... Page EA-11
Figure 8. Picture of the forest floor showing fuel conditions similar to existing..... Page EA-22
Figure 9. Picture of the forest floor showing a dramatic increase in ground fuels ..... Page EA-22
Figure 10. Two photos representing stand understory or within stand structure ..... Page EA-26

CHAPTER 1 - PURPOSE & NEED FOR ACTION

1.A. OVERVIEW

Vegetation management activities have been proposed on public lands in a 2,266-acre area on the Coeur d'Alene River Ranger District near the Idaho/Montana border in the vicinity of Thompson Pass. This area is located in Jo Gulch, Cat Creek, and a portion of Paragon Gulch. These drainages are located in the headwaters of Prichard Creek which flows into the North Fork of the Coeur d'Alene River. This 2,266-acre area has been identified for the purposes of this analysis as the Jo-Cat Resource Area. An estimated 93 percent of lands (approximately 2,107 acres) within the project boundary are managed by the Coeur d'Alene River Ranger District of the Idaho Panhandle National Forests (IPNF). The remaining 7 percent (approximately 159 acres) are privately owned, belonging to the Coeur d'Alene Placer Mining Company.

The Jo-Cat Resource Area includes all or portions of sections 7-9 and 16-21 of T49N, R6E, Boise Meridian. Forest Highway 9 runs along the southern portion of the resource area. The Jo-Cat Resource Area also includes 369 acres of the 8,674-acre Maple Peak Roadless Area #01-141 (depicted by the hatched area in Figure 1) along its northern boundary. Elevations within the resource area range from 3,500 to 6,500 feet. Much of this area has been identified by the IPNF Forest Plan as to be managed for the long-term growth and production of commercially valuable wood products. These productive areas transition into lands of less commercial interest and more suited for maintenance of existing resource productive potential in the higher elevations.

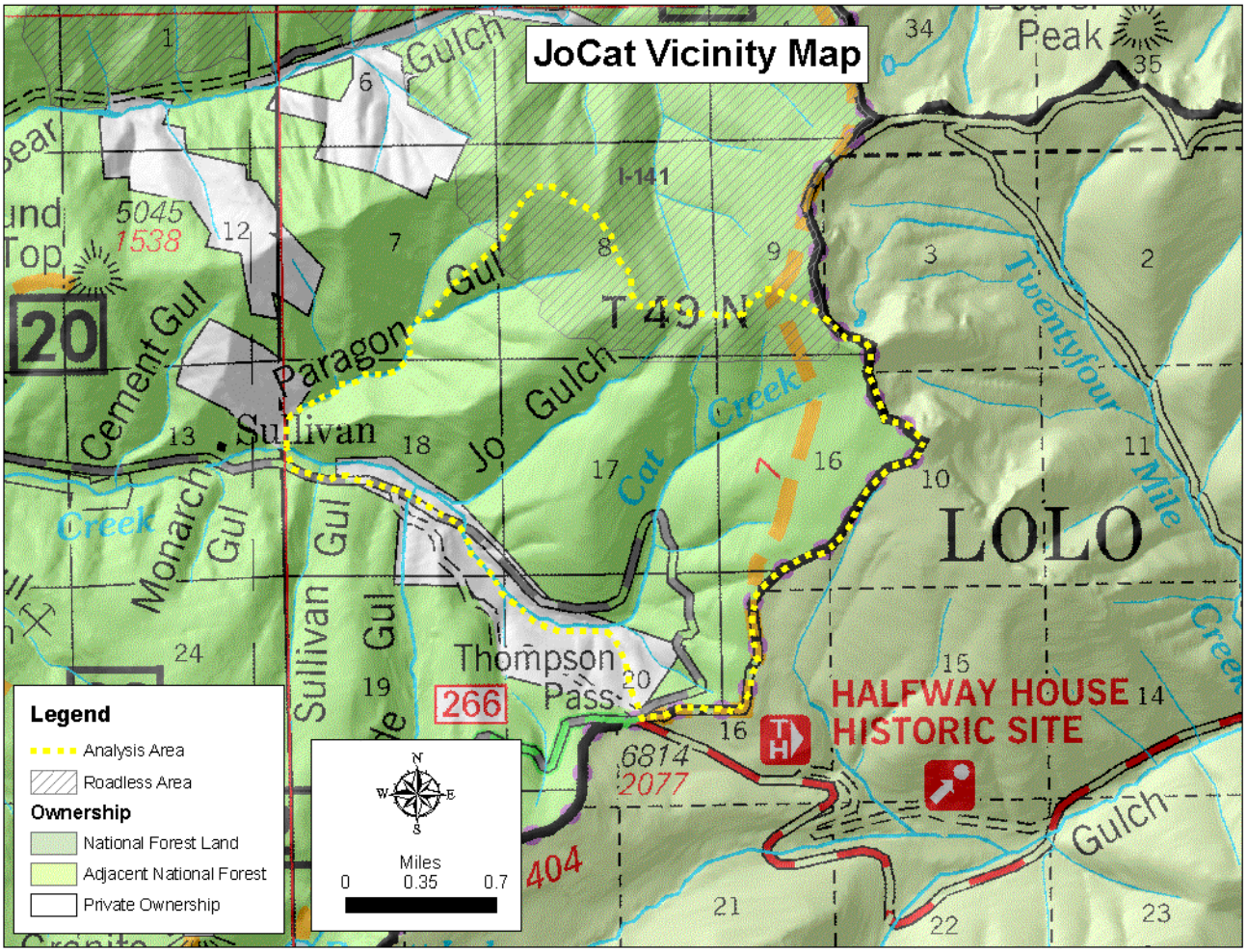


Figure 1. Vicinity Map of the Jo-Cat Resource Area. *The dotted yellow line represents the analysis area boundary; the area hatched with black represents an overlapping adjacent inventoried roadless area.*

1.B. NEED FOR THE PROPOSAL

Mountain pine beetles have been attacking lodgepole pine stands along the Idaho/Montana divide for over 5 years now. This beetle population expansion and resulting timber mortality was first evident on the Coeur d'Alene River District in the vicinity of Lookout Pass. What started as small patches of mortality in 1999 quickly expanded into widespread areas of mortality over the next several years. Timber exam plots in the Lookout area found that most of the lodgepole pine stands had eventual mortality rates of approximately 75 percent for lodgepole pine over 7 inches in diameter (PF Doc. VEG-55). Most of the lodgepole pine that did survive the attacks tended to be in smaller size classes and was not evenly distributed across the landscape.

There appears to be no let up in the outbreak as beetle populations are expanding to the north and west. Lodgepole pine stands in the Thompson Pass area are now under attack. Current sawtimber mortality rates in lodgepole pine stands in the Jo-Cat Resource Area range from 10-70 percent (PF Doc. VEG-57). Exam plots provided by Regional Entomologists show that many of the lodgepole pine stands in the Thompson Pass area are moderate to high risk of beetle infestation. Modeled mortality projections predict that a range of 60-90 percent of the sawtimber size lodgepole pine trees within selected stands will likely die as a result of beetle mortality in the next 10 years (PF Doc. VEG-57).

A considerable amount of commercially valuable lodgepole pine timber is being lost, and projected to be lost, within the Resource Area as a result of the mountain pine beetle outbreak. Forest Plan management direction in this Resource Area is to recover this loss of timber value while still providing for wildlife habitat and other resource needs. The projected mortality rates also raise concerns of fuels build-up over time that would lead to an increased risk of large, high-intensity wildfire in this area (Specialist's Report on Fire/Fuels, p. FF-5, FF-6).

Figure 2. View traveling up Forest Highway 9 toward Thompson Pass (Cat Creek drainage).

We need to recover a portion of the timber value that is being lost to mountain pine beetles.

Figure 3. View from Thompson Pass showing western larch.

Most of the timber in this area is second growth in nature, 90 years of age, the result of the stand replacement wildfire of 1910. Western larch trees make up a considerable amount of the timber component in many of the stands, as seen in the photo to the left.

Western larch is a long-term seral species; promoting western larch on the landscape is recommended by both the Coeur d'Alene Geographic Assessment and the Interior Columbia Basin Assessment.

Western larch is often quick to re-forest a site after a significant disturbance, however over time can succumb to competition if additional disturbances do not occur.

Thinning treatments that would reduce crown and moisture competition and favor diameter growth would help to sustain the larch component over the long term. Reducing stand densities would also reduce the risk of large, high-intensity wildfire that may kill the western larch component of these stands. **We need to promote the healthy western larch component where it exists on this landscape.**

Forest Highway 9 leading up to Thompson Pass has been identified as a Secondary Resource Protection Zone to provide an ingress/egress travel corridor under the Shoshone County Fire Mitigation Plan (PF Doc. FF-02). This route would provide an escape route if a large fire was moving into the Prichard/Murray area from the west. Some vegetative treatments along this roadway would be beneficial to providing a safe travel corridor during a fire event. **We need to reduce potential fire intensities while maintaining the general visual character along the fire escape travel corridor.**

In summary, the purpose and need for this project is three-fold:

- *Recover a portion of the timber value that is (or projected to be) lost to mountain pine beetles.*
- *Promote the existing healthy western larch component where it exists on this landscape.*
- *Reduce potential fire intensities while maintaining the general visual character along the fire escape travel corridor within this project area.*

Each of these is discussed below and described further in the Specialist's Reports on Fire/Fuels and Forest Vegetation (Project File Documents SR-01 and SR-02).

Purpose and Need for Action #1 of 3: To recover a portion of the timber value that is being (or projected to be) lost to mountain pine beetles currently attacking this area.

Existing Conditions: Within the resource area there exists a mosaic of timber stands where lodgepole pine is the predominant species component, accounting for approximately 38 percent of the resource area. Trees within these stands range from 5 to 16 inches in diameter and are approximately 90 years of age. Past experience and scientific evidence suggest that lodgepole pine of larger diameter are favored by the mountain pine beetle. Current lodgepole pine sawtimber mortality rates average 43 percent in stands where lodgepole pine is the predominant species and average diameters are over 8 inches (PF VEG-58). Exam plots provided by Regional entomologists show that many of the lodgepole pine stands in the Thompson Pass area are at moderate to high risk of beetle infestation due to tree size and stocking density. There is nothing to suggest that the mountain pine beetle infestation in this area is about to end. Examinations show that mortality rates are currently increasing. Base on past experience and projected mortality rates, the majority of the stand structure of some of these lodgepole pine stands will be lost to the mountain pine beetle. Projected mortality rates, in stands where lodgepole pine is the predominate species with larger size classes, show that an average of 82 percent of the lodgepole pine sawtimber component will likely be dead in 10 years (PF Doc. VEG-58). This represents a considerable loss of timber volume, especially since the beetle favors the larger diameter trees. High existing and projected mortality rates will also lead to high fuels loadings in the future. This will lead to an increased risk of high intensity wildfire within the resource area that may have widespread adverse effects on timber stands, watersheds, and related resources within the area.

Desired Conditions: It is desirable to retain a mosaic of healthy lodgepole pine stands in this area for diversity. The resource area is located within the Bitterroot Divide South habitat analysis unit (LAU) which is lacking high quality forage habitat for lynx (PF Doc SR-07 p. WL-16). Creation of some openings would improve the amount of high quality forage habitat in the LAU over the long term. Retention of some mortality would provide woodpecker habitat in the short term and create areas of potential lynx denning habitat in the long term. Recovery of existing and expected mortality from some of this area would help meet demands for forest products. Utilization of dead and dying timber would reduce forest product pressures from other sources, such as green healthy trees.

Actions Needed to Achieve Desired Conditions: Salvage of lodgepole pine in this area is recommended. Actual harvest treatment will depend on the amount of mortality, risk assessment, size class, residual species component, and the need to provide for wildlife species and other resources. The beetle population is well entrenched into this area. It is too late to attempt to commercial thin lodgepole pine stands to decrease bark beetle hazard. The same trees that would be favored to leave in a thinning will be the same trees favored by

the beetles for attack. Harvesting some of the lodgepole pine areas with or projected to have mortality from the beetles, removing potential fuels loadings, and introducing fire to stimulate regeneration would lead toward creation of future healthy pine stands. Harvesting some of these stands would recover a portion of the timber value that is being lost in this area and provide this material to local markets to help meet demands for forest products. Not treating some of the lodgepole pine areas will retain some diversity and provide wildlife habitat. Selected areas of timber harvest would also reduce the overall projected fuel loading as a result of mortality, break up the continuity of fuels, and reduce the risk of high intensity wildfire in the resource area. Use of timber receipts to finance the introduction of low intensity fire into selected areas, would also reduce the risk of high intensity wildfire in the resource area over the long term. With the introduction of fire, the treatment areas would favor the re-establishment of these lodgepole pine mosaics and provide future high quality forage habitat areas.

Purpose and Need for Action #2 of 3: To promote the healthy western larch component where it exists on this landscape.

Existing Conditions: There is a considerable component of western larch within the Jo-Cat Resource Area. Approximately 13 percent of the resource area is comprised of timber stands where western larch is a significant component. The larch component is approximately 90 years of age. There are some widely scattered old relic western larch trees within the resource area that survived the 1910 fire and provided a seed source for the second growth larch that is present today. The second growth western larch stands of today are comprised of a mix of other species including Douglas-fir, grand fir, lodgepole pine, subalpine fir, spruce, and mountain hemlock. Western larch is generally part of the dominant and codominant crown structure however, these other species are growing into and crowding many of the healthy larch trees.

Desired Conditions: It would be desirable to have stocking levels of approximately 100 trees per acre within these western larch stands so the larch component would be free to grow. Western larch is very sensitive to crown competition and would benefit from the elimination of trees that are crowding them. Lower stand stocking levels would also reduce nutrient and moisture competition from these other species. This would allow the larch to maximize growth potential, becoming old forest structure over the long term. Old forest structure provides preferred habitats for many wildlife species. Lower crown stocking densities would also reduce the risk of high intensity crown fires within these stands which would likely kill much of the existing western larch.

Actions Needed to Achieve Desired Conditions: Thinning, followed by low intensity fuel treatments, would help the western larch to maintain its competitive advantage over the long term. This would result in healthier stands, with less fire risk, that may allow these stands to reach old forest structure with a high larch component. Not all stands with western larch would be considered for treatment. Stands would be selected for treatment where western larch still has some competitive advantage and where benefits from stocking reduction are apparent. The old relic western larch, in varying degrees of health, are not present in high enough numbers to approach old growth habitat requirements. However, efforts would be made to retain these trees.

Purpose and Need for Action #3 of 3: To reduce potential fire intensities while maintaining the general visual character along the fire escape travel corridor.

Existing Conditions: Forest Highway 9 generally runs low in the Prichard Creek drainage until it turns and crosses Cat Creek and heads toward Thompson Pass. This is the first stretch where large enough stands of timber and steep topography exist between the road and the creek to pose a fire risk from below when traveling through this area. Timber stands along the roadway are dense second growth stands with ladder fuels that could promote high flame lengths

Desired Conditions: There would be a well-spaced overstory stand for several hundred feet below Highway 9, with low ground fuels to reduce the fire intensity coming up to the road and to allow safer travel during a fire event. The appearance of these well-stocked stands of larger trees would retain the general visual character along Highway 9.

Actions Needed to Achieve Desired Conditions: All previously proposed treatments would provide fuels reduction throughout the resource area, however this treatment is focused at the area along Forest Highway 9. A combination of commercial and non-commercial thinning treatment along this roadway would help to meet the desired condition. In areas where larger dominant western larch are present, commercial thinning and low intensity fire treatments would help achieve objectives and be consistent with other needs in the resource area. In areas of smaller timber, less desirable for commercial thinning and prescribed fire treatments, hand treatments could be utilized to understory thin smaller ladder fuels and hand pile and burn ground fuels.

1.C. DOCUMENT REVIEW INFORMATION

The Forest Service has prepared this Environmental Assessment (EA) to determine whether or not implementing the proposed activities would result in significant effects warranting preparation of an Environmental Impact Statement. Based on the results of this analysis, a Draft Finding of No Significant Impact is provided with this EA for public review and comment.

Comments should be provided within 30 days of the notice of availability published in the newspaper of record (Coeur d'Alene Press). Comments can be submitted several ways: Please **send written comments** to NEPA Coordinator, Coeur d'Alene River Ranger District - Fernan Office, 2502 East Sherman Avenue, Coeur d'Alene, Idaho 83814-5899. Written comments may be **faxed** to the NEPA Coordinator at the Coeur d'Alene River Ranger District office, at (208) 769-3062. Written comments may also be **hand-delivered** to the District's Fernan or Smelterville Offices. Office hours are 7:30 a.m. to 4 p.m., Monday through Friday. **Electronic comments** may be submitted to *comments-northern-idpanhandle-coeur-dalene@fs.fed.us*. The subject line must contain the name of the project for which you are submitting comments. Acceptable formats are MS Word, Word Perfect, or RTF. Regardless of the method used to submit comments, it is the sender's responsibility to ensure timely receipt. Comments received, including names and addresses of those who comment, will be considered part of the public record and will be available for public inspection.

For further information or to review project files, please contact District Ranger Randy Swick (208-769-3001) or Project Team Leader Bob Rehnborg (208-769-3054).

CHAPTER 2 – ALTERNATIVES

2.A. OVERVIEW OF THE ALTERNATIVES

Two alternatives were considered in detail – the No-Action Alternative and the Proposed Action Alternative.

The No-Action Alternative analyzed for this project represents the effects of not implementing the proposed activities, as well as the effects of past, ongoing and reasonably foreseeable activities. No new activities are proposed on federal lands in the Jo-Cat Resource Area under the No-Action Alternative.

The Proposed Action Alternative represents the effects of implementing the proposed activities, as well as the effects of past, ongoing and reasonably foreseeable activities (described in Appendix A and the Specialists' Reports). Activities and features of the Proposed Action are described in detail in Section 2.B. Some minor changes have occurred to the Proposed Action from what was identified during initial project development and public scoping to what was analyzed and documented in this Environmental Assessment. Overall treatment acres have declined approximately 10 percent as the result of more accurate measurement of treatment locations on the ground. Specific changes are described in Section 2.B.

Several other alternatives, some suggested by the public, were considered but eliminated from further analysis as discussed in Section 2.D.

Table 1. Comparison of proposed activities on National Forest System lands in the Resource Area.

Harvest Activity	**No-Action**	**Proposed Action**
Commercial thinning to promote existing healthy western larch	0	119 acres
Lodgepole pine removal in stands with mountain pine beetles	0	103 acres
Lodgepole pine salvage	0	30 acres
Lodgepole pine overstory removal	0	13 acres
Non-commercial understory thinning and fuel reduction	0	14 acres
Total commercial harvest	0	265 Acres
Total all treatments	0	279 acres
Yarding Methods	**No-Action**	**Proposed Action**
Tractor	0	64 acres
Skyline	0	81 acres
Cable	0	1 acre
Helicopter	0	119 acres
Fuel Treatment in Harvest Units	**No Action**	**Proposed Action**
Prescribed burning in commercial thinning, lodgepole removal units	0	201 acres
Grapple pile and burn	0	20 acres
Landings	**No Action**	**Proposed Action**
Helicopter log landings constructed ▪ *1 landing (one-third acre) along the reconstructed section of Road 6006, in Unit 5* ▪ *1 landing (one-half acre) along the newly-constructed section of Road 6006, in Unit 12*	0	2
Roads	**No Action**	**Proposed Action**
Permanent road construction	0	1.2 mile
Temporary road construction	0	0.3 mile
Road reconstruction	0	1.8 mile
Timber (Sawlog) Volume	**No Action**	**Proposed Action**
Hundred cubic feet (ccf)	0	3,300
Million board feet (mmbf)	0	1.7
Approximate minimum advertised value	0	$50,000

2.B. DESCRIPTION OF THE PROPOSED ACTION ALTERNATIVE

During scoping, additional field condition data was collected and the location of proposed units were better defined using Global Positioning Systems (GPS) technology. As a result, proposed treatment units are in the same general location as identified in the scoping letter, although they shifted a little to the southwest on the ridge dividing Jo and Cat Creeks. Unit 15 was changed from a lodgepole pine salvage unit to a lodgepole pine removal unit due to additional field assessments of the current mortality rates and stand species composition. One-tenth of a mile less of new system road construction would be needed to provide access to treatment areas. Also, approximately 0.3 miles of temporary ridgetop road would need to be constructed in order to reach needed terrain breaks to accommodate yarding systems in Unit 12. Even with this roadway, portions of unit 12 would need to be helicopter yarded to avoid the need for additional system road development. The temporary roadway would be recontoured after use.

The following description of proposed activities includes the changes in location, treatment methods, and access needs.

2.B.1. Proposed Activities

Commercial Thinning in Western Larch (Approximately 119 acres)

Commercial thinning would occur on a total of approximately 119 acres of western larch stands to increase the long-term resilience and maintenance of the existing overstory western larch component. Thinning would approximate a 20 to 25-foot spacing, leaving about 90 to 110 trees per acre. The largest and healthiest trees would be retained regardless of spacing or species, although some consideration would be given to underburn survival and susceptibility to insects and disease. Diameters of leave trees are expected to range from 10 to 18 inches at breast height.

Figure 4. View of western larch associated with Unit 7 from across the talus slope. Commercial thinning in this area would promote the larch component.

There are several scattered one- to two-acre pockets along the western ridge of Unit 12 where the species component is western larch and lodgepole pine. Residual spacing in these areas may closer approximate a shelterwood harvest since much of the lodgepole pine is infested with beetles. Efforts will be made to retain any larger healthy lodgepole pine to fill in the gaps, but residual tree densities would likely be less than the 90 to 110 trees per acre in these one- to two-acre pockets. All unmerchantable dead would remain standing unless needed to be felled for safety reasons.

Treatment units have been broken into sub-units in order to track differing logging systems. Refer to Appendix C, Resource Area Maps.

Table 2. Commercial thinning units proposed in Western larch stands.

Unit #	Acres	Logging system	Access	Fuels
1	3	Skyline	Reconstructed section of Road 6006 and newly constructed section to link that road to Forest Highway 9	Jackpot burn
2a	3	Tractor	Reconstructed section of Road 6006 and newly constructed section to link that road to Forest Highway 9	Jackpot burn
2b	10	Helicopter (to avoid ground-based yarding on slopes over 35%)	Flown to the landing between Units 5a and 5b on the reconstructed section of Road 6006	Jackpot burn
3	7	Skyline	Reconstructed section of Road 6006 and newly constructed section to link that road to Forest Highway 9	Jackpot burn*
7	18	Skyline	Reconstructed section of Road 6006 and newly constructed section to link that road to Forest Highway 9	Jackpot burn*
12a	10	Skyline	Temporary road and the newly constructed section extending Road 6006 out the dividing ridge between Cat Creek and Jo Gulch	Jackpot burn
12b	20	Tractor	Newly constructed section extending Road 6006 out the dividing ridge between Cat Creek and Jo Gulch	Grapple pile
12c	24	Skyline	Temporary road and the newly constructed section extending Road 6006 out the dividing ridge between Cat Creek and Jo Gulch	Jackpot burn
12d	16	Helicopter (multiple terrain breaks would make skyline yarding very difficult)	Flown uphill to the landing in Unit 12b on the newly constructed section of Road 6006 **or** downill to the landing along Highway 9	Jackpot burn
16	8	Helicopter (the highway and guard rail above the unit would not allow safe skyline yarding)	Flown to the landing between Units 5a and 5b on the reconstructed section of Road 6006	Jackpot burn

**Portions of Units 3 and 7 would be assessed after harvest to ensure leave tree size and species composition would support prescribed fire treatments without causing excessive tree mortality. These areas of the units may be lopped and scattered instead of jackpot burned if tree size and species mix don't support burning.*

Prescribed fire would be introduced into all larch thinning units except in Unit 12b which is currently planned for grapple piling after overwintering. Prescribed fire would treat the smaller activity fuels to reduce the short-term increase in fire risk associated with the commercial thinning activity. No control lines are planned at this time for burn areas, relying on natural fuelbreaks in most locations.

Lodgepole Pine Removal Treatment (Approximately 103 acres)

These treatment units are proposed In stands with a high component of lodgepole pine where considerable mortality is present and in stands that have tree sizes and densities to support a moderate to high risk of projected mortality. All merchantable lodgepole pine would be harvested. Timber harvest would include lodgepole pine down to 5 inches in diameter in conventional (non-helicopter) yarding units and 7 inches in diameter in helicopter units.

The objective within the treatment areas would be to regenerate the units to lodgepole pine. A component of live and dead lodgepole with diameters that range from 8-15 inches would be retained as reserve trees scattered throughout these units to provide an aerial seed source, future snag habitat, and future down woody debris. There would be between 2 to 6 of these lodgepole trees per acre depending on the conditions in the treatment area.

All trees of other species (western larch, douglas-fir, grand fir, mountain hemlock, alpine fir and spruce) would generally be retained within these units, with some consideration being given to removal of trees under 10 inches in diameter that would likely not survive prescribed fire treatments. This harvest of understory trees of other species would only occur in Units 5 and 13, where they comprise a considerable component in portions of these units.

Residual tree components in these lodgepole removal units would vary as the existing stand conditions vary, creating a natural mosaic of openings to commercial thin appearance on any given acre. Units 4, 8, 11 and 15 would be best described as having an irregular group seed tree appearance (leaving approximately 15 trees per acre with a range from 6 to 30 trees per acre). Units 5, 13, and 14 would have more of a irregular group shelterwood appearance (leaving approximately 28 trees per acre with a range from 10 to 50 trees per acre).

These harvests would remove the potential fuels loadings and provide the openings for regeneration establishment.

Table 3. Units proposed for lodgepole pine removal.

Unit #	Acres	Logging system	Access	Fuels
4	3	Helicopter (to minimize ground disturbance and because this small unit would require multiple yarding systems)	Flown to the landing between Units 5a and 5b on the reconstructed section of Road 6006	Underburn
5a	4	Skyline	Reconstructed section of Road 6006	Underburn
5b	24	Tractor	Reconstructed section of Road 6006	Underburn
8	22	Helicopter (to avoid ground-based yarding on steep slopes)	Flown to the landing between Units 5a and 5b on the reconstructed section of Road 6006	Underburn
11a	1	Cable	Newly constructed section extending Road 6006 out the dividing ridge between Cat Creek and Jo Gulch	Lop and scatter
11b	2	Helicopter (to avoid ground-based yarding on slopes over 35%)	Flown to the landing in Unit 12b on the newly constructed section of Road 6006	Underburn
11c	9	Tractor	Newly constructed section extending Road 6006 out the dividing ridge between Cat Creek and Jo Gulch	Underburn
11d	13	Skyline	Newly constructed section extending Road 6006 out the dividing ridge between Cat Creek and Jo Gulch	Underburn
13	6	Helicopter (to avoid considerable road construction)	Flown to the landing in Unit 12b on the newly constructed section of Road 6006 **or** flown downhill to the landing along Highway 9	Underburn
14	14	Helicopter (to avoid considerable road construction)	Flown to the landing in Unit 12b on the newly constructed section of Road 6006	Underburn
15	5	Helicopter (to avoid considerable road construction)	Flown to the landing in Unit 12b on the newly constructed section of Road 6006	Underburn

All removal units are planned for prescribed fire after harvest (except the 1-acre piece in Unit 11 below the new road construction in Cat Creek). With the introduction of fire, the treatment areas would favor the natural re-establishment of these lodgepole pine mosaics and provide future high-quality forage habitat areas for lynx. Some of the lodgepole pine cones are serotinous, needing the heat of fire to open them.

Figure 5. Photo of lodgepole pine trees infested with mountain pine beetles within Unit 11 treatment area. Pitch tubes are evident on the trees.

The only fireline planned at this time is a machine fire line separating Units 5 and 6. All other burning would be without control lines, relying on natural fuelbreaks (low ground fuel component) in most locations.

In Units 4, 5, and 16, slashing of submerchantable trees is proposed. Interplanting of white pine would be scheduled for the openings created in Units 5, 11, and 13 for diversity and to comply with Forest Plan direction. Planting of western larch would not be considered since snowshoe hare habitat, in lynx forage areas, is better provided by regeneration that does not lose its needles in the winter.

Lodgepole Pine Salvage (Approximately 30 acres) and Overstory Removal Treatments (Approximately 13 acres)

Lodgepole pine salvage units were identified where mortality is occurring due to mountain pine beetles, but there is a high component of other tree species present. Salvage units would only remove dead or beetle-infested lodgepole pine trees. Live lodgepole pine would not be harvested. The residual species component would provide enough trees to retain stand structure.

Figure 6. Existing understory similar to conditions in proposed Unit 6.

Logging slash would be lopped and scattered for fuels treatment. Lop and scatter treatments get the fuels onto the ground so they would decompose more quickly.

Treatments in Unit 6 would remove all lodgepole pine trees over 9 inches in diameter (the high risk component of this stand) while leaving the rest of the overstory. The residual overstory would provide some diversity above the existing understory that is already established on this site. The intent in Unit 6 is to allow the climax understory stand that is already established to provide lynx forage habitat in the near term.

Table 4. Lodgepole pine salvage and overstory removal units.

Unit #	Acres	Logging system	Access	Fuels
6	13	Helicopter (to avoid excavating trails and to reduce damage to understory trees)	Flown to the landing between Units 5a and 5b on the reconstructed section of Road 6006	Lop and scatter
9a	9	Helicopter (to avoid ground-based yarding on steep slopes)	Flown to the landing between Units 5a and 5b on the reconstructed section of Road 6006	Lop and scatter
9b	11	Helicopter (to avoid ground-based yarding on steep slopes)	Flown to the landing between Units 5a and 5b on the reconstructed section of Road 6006	Lop and scatter
10a	2	Skyline	Newly constructed section extending Road 6006 out the dividing ridge between Cat Creek and Jo Gulch	Lop and scatter
10b	8	Tractor	Newly constructed section extending Road 6006 out the dividing ridge between Cat Creek and Jo Gulch	Lop and scatter

Non-commercial Fuels Reduction Treatments (Approximately 14 acres)

Non-commercial fuel reduction treatments (understory thinning and slashing with hand piling and burning) would occur in areas that extend for a distance of 200 to 300 feet below Forest Highway 9, from Unit 16 up to Thompson Pass. Understory trees under 10 inches in diameter and larger snags would be cut in these areas to reduce crown bulk density, raise the crown base height, and reduce potential fire intensity coming up to the roadway. An understory commercial thin appearance is expected to be the result.

Transportation System Development (Approximately 6 acres of right-of-way clearing)

Approximately 1.2 miles of new system road construction would be needed to access treatment areas under the proposed action. This includes constructing approximately 0.2 miles, to connect the existing approach road off Forest Highway 9 to Road #6006, and extending the #6006 road for 1 mile around the divide ridge between Cat Creek and Jo Gulch. There are no drainage crossings in the new road construction. Rolling dips would be incorporated into the road design for control of any surface erosion. The new roadway would be

constructed to a 14 foot road width to allow for skyline yarding equipment. Clearing slash would be windrowed in the 0.2 mile segment (link road) for later use during recontouring. Clearing slash would be windrowed or scattered for the rest of the new road construction, although some piling and burning may be needed when crossing the flat ridge. A gate would be installed during the life of the timber sale at the Forest Highway 9 junction. This gate would remain closed except when timber sale activities occur, at which time it would be closed at the end of daily activities. An earth barrier would be installed behind the gate by the purchaser at the end of use, for additional security, and interior roads would be waterbarred and seeded. At the conclusion of post-sale activities, the link road would be recontoured and the talus slope past Unit 7 would be pulled across the roadway, creating an effective closure to any motorized use into the new road construction.

Approximately 1.8 miles of road reconstruction would be needed on Road 6006. Sections of the road would need to be widened from 12 feet to 14 feet from the link road up to the draw before Unit 2 and from the talus slope above Unit 7 to the middle of Unit 8, for a total of 0.4 miles. This widening would generally consist of encroaching into the cutbank or dropping the grade. Eight French-drain rock fords (dipped to eliminate diversion potential) would be established at the existing drainage crossings. This would entail 4 to 6-foot road widening at the draws for alignment and placement of rock. Two truck turnouts would be constructed; one at Unit 2 and the other above Unit 7. Some scattered right-of-way clearing would be needed to remove shoulder trees along this roadway. An effort would be made to retain the few existing large western larch relics along the edge of the road. Loss of a couple of old residuals may occur with the construction of the new roadway, but most would be avoided.

Approximately 0.3 miles of temporary road would need to be constructed on the divide ridge between Cat Creek and Jo Gulch in order to reach reasonable terrain breaks for logging in Units 12a and 12c. Upon completion of use, this roadway would be obliterated by the purchaser and then seeded.

A helicopter landing (approximately one-third acre in size) would need to be constructed along Road 6006 between Units 5a and 5b. Some excavation would need to occur to create an oval landing in this area. Another helicopter landing (approximately one-half acre in size) would need to be cleared in Unit 12b (no excavation is anticipated for this landing). There is a 50 by 100-foot gravel turnout along Forest Highway 9 near the mouth of Jo Gulch that may be feasible to use as a small log landing (refer to section 2.B.3. Mitigation Measures for more information on conditions of use). In addition, use of a service landing within an existing harvest unit on the Lolo National Forest has been approved by the Plains/Thompson Falls Ranger District of the Lolo National Forest (PF TRANS-02).

2.B.2. Implementation Features of the Proposed Action Alternative

The Proposed Action was designed to accomplish project objectives without significantly impacting resources in the Jo-Cat Resource Area. The following are specific guidelines that would be followed during implementation. Refer to the appropriate Specialist's Report as noted for additional discussion of these features.

Features Related to Fuels Management

For more information, refer to the Specialists's Report on Fire/Fuels (PF Doc. SR-01).

After harvest is complete, a fire/fuels specialist and silviculturist would assess fuel conditions in the units and determine whether prescribed burning could be implemented safely and effectively without further fuels treatment. Prescribed burning would only occur when soil moistures are above 25 percent. Approximately 5-10 percent mortality of overstory trees would be anticipated in treated stands as a result of prescribed burning. There is no intent to salvage this type of mortality in the project area. The trees would be retained to provide wildlife habitat and as a source of nutrients.

Features Related to Vegetation Management

For more information, refer to the Specialists's Report on Forest Vegetation (PF Doc. SR-02).

A site-adapted species/seed source would be utilized in all regeneration areas. Site preparation, fuel treatment, and tree planting would occur within five years of harvest. Site preparation and/or fuel treatment may include a combination of slashing, pruning, prescribed burning or grapple piling, depending on post-harvest conditions that meet both site preparation and hazard reduction objectives.

The largest and healthiest white pine would be retained, consistent with White Pine Leave Tree Guideline requirements (PF Doc. VEG-R58). Although efforts would be made to retain the scattered old relic western larch trees within the Resource Area where feasible, some would likely be lost due to road and landing locations and possible safety needs on a tree-by-tree basis.

Features Designed to Protect Threatened, Endangered & Sensitive Plants

There are no known occurrences of Threatened or Endangered plants in the Jo-Cat Resource Area. Known Sensitive plant populations in the Resource Area would be protected to ensure that activities do not contribute to the decline of the species or the need for federal listing.

For more information, refer to the Specialists's Report on TES Plants (PF Doc. SR-03).

Should rare plants be located during implementation, one or more of the following protective measures would be implemented: 1) drop the proposed unit from activity; 2) modify the proposed unit or activity, 3) implement appropriately designed buffers, and/or 4) implement Timber Sale Contract provisions for Protection of Endangered Species, and Settlement for Environmental Cancellation.

Prescribed fire **ignition** would not occur within riparian habitats, although fire would be allowed to burn **into** riparian areas. Higher fuel moistures in riparian habitats during prescribed burning conditions would likely limit the spread of any prescribed fire.

Features Designed to Reduce the Spread of Noxious Weeds

Noxious weed prevention strategies on the Coeur d'Alene River Ranger District are conducted based on the Noxious Weeds Final Environmental Impact Statement and Record of Decision (USDA Forest Service, 2000; PF Doc. CR-028, 029). Measures to protect Threatened, Endangered and Sensitive plant population viability and habitat capability during noxious weed treatment would be implemented following guidelines provided in that document. To help reduce the spread of noxious weeds and prevent the introduction of new invader species, a contract clause related to equipment washing would be used in all construction and timber sale contracts. The timber sale contract would require the purchaser to seed and fertilize skid trails, road cuts and landings. This would also include the seeding of the running surface of the new construction and reconstructed roadways after final blading. Forest Service roads within the project area would be monitored for noxious weeds during the post harvest period and treated as needed.

Features Designed to Protect Aquatic Resources

Best Management Practices (BMPs) – All activities would be designed to protect water quality and aquatic resources through the use of BMPs, which are the primary mechanism to enable the achievement of water quality standards. Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) outlines BMPs that meet the intent and are used in conjunction with the water quality protection elements of the Idaho Forest Practices Act.

For more information, refer to the Specialists's Report on Aquatic Resources (PF Doc. SR-05).

Sediment Reduction Activities – Areas of ground disturbance would be seeded and fertilized as described above. The road system into the area would contain design features which would allow this road to be closed without needing continual maintenance. Existing stream channel crossings would be reconstructed to install french-drain rock fords which would reduce mass failure potential and allow drainage across the roadway without erosion. Rolling dips would be designed into the new road construction to minimize erosion potential. Waterbars would be installed on the road at conclusion of use and the running surface of the road would be seeded and fertilized.

Inland Native Fish Strategy (INFS*) –* In development of the Proposed Action, standards and guidelines of the INFS (USDA Forest Service, 1995, pages A-6 through A-15; PF Doc. CR-003) were used specifically to protect water and aquatic biota within the Resource Area with application of streamside buffers. If Threatened or Endangered fish species are located during project implementation, protective measures would be implemented in compliance with the Inland Native Fish Strategy.

Protection Of Wetlands, Seeps, Bogs, Wallows and Springs – All known or discovered wetlands, seeps, bogs, elk wallows and springs within treatment areas that are less than one acre in size would be protected with a 100-foot "no activity" buffer as prescribed by the District Botanist.

Features Designed to Protect Soils

For more information, refer to the Specialists's Report on Soils (PF Doc. SR-06).

The following practices are designed to minimize the detrimental impacts of soil compaction, displacement, severe burning, and nutrient and organic matter depletion on long-term soil productivity. The use of these practices would insure that the soil quality standards listed in the Forest Plan and Regional Soil Quality Standards would be met. For Best Management Practices, refer to the Specialist's Report on Aquatic Resource.

Tractor yarding - Where present, existing skid trails would be used. All new skid trails would be designated and laid out to take advantage of topography and minimize disruption of natural drainage patterns. Where terrain is conducive, trails would be spaced at least 100 feet or more apart. Mechanized felling and skidding would allow skid patterns to be closer provided slash mats are being utilized. Ground disturbance associated with skid trails would be seeded with the latest seed mix recommended at time of implementation.

Skyline Yarding - The leading end of logs would be suspended during yarding. No yarding across designated RHCA's would occur with this project.

Nutrient Protection - The latest soil nutrient management recommendations from the Intermountain Forest and Tree Nutrient Cooperative (IFTNC) and Rocky Mountain Research Station would be applied to each activity area where organic material is removed as appropriate. Conventional removal (lop and scatter) rather than whole-tree removal would be practiced. The "lop and scatter" technique would be used during intermediate (thinning) as well as final harvest (regeneration) operations. Slash would remain on site over-winter so that mobile nutrients such as potassium can leach from fine materials back to the soil. Broadcast burn or underburns would be "light" in nature.

Where slash is left untreated for prolonged periods of time, determination of fire risk would be made by the district fire management officer. Where fire risk is considered high, especially near the Forest Highway 9 travel route, flexibility would be given to treat slash prior to it being left for 6 months.

Retention of Coarse Woody Debris - Management of coarse woody debris and organic matter in all units would follow the USFS Region 1 guidelines. The majority of harvest units presently display satisfactory coarse woody debris levels, though portions of Units 10, 11, and 12 along the ridge line could benefit from additional material. Cull and breakage material during harvest activities would add to the existing down material. In addition, lodgepole removal units would require that 2-6 live or dead lodgepole pine be retained as well as most trees of other species. This would add to the coarse woody debris component over time.

Protection of soils within specific units – Skid trails would only be permitted on the ridge in Unit 2a. Equipment would be required to remain on the road and winch material down for the remainder of the unit. The existing road that bisects Unit 5b would be incorporated into the skid trail design. Material harvested above this roadway would be required to skid down the road north to Road 6006 and not skidded through the main body of the unit. This would reduce compaction within the treatment area. If feasible, the old mining trail that crosses through Unit 11 would be incorporated into the skid trail pattern for Unit 11c. The old mining trail would be recontoured after harvest activities are completed if utilized.

Temporary Road Construction and Decommissioning - The temporary road providing access to Units 12a and 12c would be re-contoured and seeded after completion of harvest activities.

Protection During Grapple Piling Activities – Grapple piling equipment would operate on a slash mat and existing skid trails on slopes under 35 percent. Burn piles should be small and numerous rather than large and few.

Mechanized felling operations – Mechanized felling would be permitted in all tractor units and in helicopter/skyline Units 2, 5a, 11d, and 12c provided the slopes are 45 percent or less and equipment is walked on slash mats.

Protection During Prescribed Burning Activities - Underburning and pile burning in the harvest units would take place only when the upper surface inch of mineral soil has a soil moisture content of 25 percent. On south-facing dry site units, the prescribed burns should be done in spring-like conditions, when fuel and soil moisture would not result in a severe burn that could produce hydrophobic soils or eliminate the soil duff layer.

Features Designed to Protect Wildlife Habitat

Western white pine and western larch of all sizes would be favored to retain on the site (especially those 18 inches or greater in diameter) unless removal is unavoidable due to safety reasons or special circumstances.

For more information, refer to the Specialists's Report on Wildlife (PF Doc. SR-07).

Road 6006 into the area would be gated during timber sale operations and closed by the timber sale purchaser at the end of daily activities. At conclusion of purchaser operations, an earthen barrier would be installed behind the gate. At the conclusion of post-sale burning and planting operations (not to exceed five years), the new construction between the Forest Highway 9 approach and the reconstruction would be recontoured and the talus slope above unit 7 would be pulled (approximately 150 feet) across the roadway. The temporary road would be recontoured following harvest activities.

Figure 7 -Talus slope closure location above Unit 7.

Incidental trees charred during prescribed burning operations would be retained on site, providing black-backed woodpecker habitat. Any larger concentrations of burn mortality would also be retained unless additional NEPA analysis, disclosure, and documentation are done.

Only selected high mortality areas are being treated with this proposal. This would provide areas of snag concentrations after treatment. Lodgepole removal and salvage units all have small concentrations of snags outside of the unit boundaries that would not be salvaged. Within lodgepole removal units, 2 to 6 live or dead lodgepole pine trees would be left per acre. This is in addition to the residual overstory component of other species that is not included in the harvest prescription. All dead trees that do not meet sawlog merchantability would be left standing within western larch thinning units, unless needed to be felled for safety reasons. Prescribed burning treatments would add to the snag component in the short term and residual live trees would be available for snag recruitment over the long term. Snags across the resource area would be retained to meet the Northern Region (Region 1) Snag Management Protocol (PF Doc. VEG-21, WL-28, WL-29, and WL-43). Snag retention would not be an objective or requirement within hand fuels treatment areas along Forest Highway 9.

If any Threatened or Endangered wildlife species are observed in the resource area during implementation, the district wildlife biologist would determine any project modifications necessary under the timber sale contract provisions to protect the species and its habitat based on applicable laws, regulations and management recommendations for the species. If any Threatened, Endangered or Sensitive species is found to be nesting in an area scheduled for prescribed fire or silvicultural manipulation, activities would be delayed in the area as recommended by the wildlife biologist.

Features Designed to Protect Recreation Facilities

For more information, refer to the Specialists's Report on Recreation (PF Doc. SR-08).

Forest Trail #7 runs through the eastern portion of the Resource Area. This trail is the upper boundary of unit 2 and runs through a portion of Units 4, 5, and 6. This trail would be considered a protected improvement under the timber sale contract. The purchaser would be required to repair any damage to the trail tread and remove any logging slash off of the trail. Repair of the trail tread would require the use of hand tools. The machine fireline separating Units 5 and 6 would not cross the trail. Hand line would be used above the trail if needed. Since trail use is generally low, the trail would be closed during the week when felling or yarding activities are within 200 feet of the trail or when logs are being flown across the trail. This closure would only be permitted on weekdays and the trail would be re-opened to the public for use on weekends and holidays. Since the trail is only affected by a small portion of the treatment area, this closure period is expected to be short duration. Other trail routes are available in the Thompson Pass area, so impact to the public is expected to be minor.

Forest Highway 9 from Murray to Thompson Pass is often groomed during the winter months for snowmobile usage, even though it is not an established groomed route recognized by the Forest Service. To provide for this use, logging operations would be prohibited from December 15 to March 1 unless otherwise agreed. This restriction period has been shortened since county and state officials often try to keep this route into Montana open as long as possible and re-open as early as economically feasible. No grooming occurs on the Montana side of the Forest Highway during winter months.

No activities would be scheduled within the Maple Peak Roadless Area. Lodgepole pine mortality within the roadless area would be retained for woodpecker habitat and future denning habitat for lynx. Prescribed burning activities adjacent to the roadless area may result in fire burning into the roadless area, however it is not expected to encroach more than several hundred feet.

Features Designed to Protect Heritage Resources

Surveys to locate heritage resources within the Jo-Cat Resource Area have been completed (PF Doc. HR-01). All known heritage resource sites would be protected under any action alternative, as directed by the Cultural Resources Management Practices (Forest Plan, Appendix FF; PF Doc. HR-01). Any future discovery of heritage resource sites would be inventoried and protected in accordance with the National Historic Preservation Act if found to be of cultural significance.

2.B.3. Mitigation Measures Associated with the Proposed Action

Approval has been given by Shoshone County to use a turnout along Forest Highway 9 as a log landing (Appendix C – Treatment Area Map). The following measures would need to be incorporated if that landing is used. The landing area is small, so only logs from Units 12d and 13 would be permitted to be flown to this landing. Straw bales would be placed along the Prichard Creek side of the landing to catch any sediment movement. No adjacent coniferous trees would be cut. Approximately four to six cottonwood trees (10 to 12 inches in diameter) would be permitted to be cut for safety. All landing slash would be required to be hauled and not burned on site. Flaggers would be required to control traffic flow on Forest Highway 9 to provide for public safety. Since a small part of this turnout is still on private ownership, additional approvals and measures may apply before use would be granted.

Elsewhere, analysis of proposed activities indicate potential effects that are well within applicable regulatory thresholds (for example, those identified by the Forest Plan, Endangered Species Act, Clean Water Act, etc.); therefore no mitigation measures were identified as necessary to reduce effects to natural resources or the human environment. Refer to Section 4 and the Specialist's Reports for more discussion of effects.

2.B.4. Implementation and Effects Monitoring

The Forest Plan documents a system to monitor and evaluate Forest activities related to timber, visual resources, recreation, cultural resources, wildlife, water/fish, Threatened and Endangered species, minerals, lands and environmental quality (Forest Plan, Chapter IV, pages IV-10 through IV-12; PF Doc. CR-002). For example, sale administrators and other contracting representatives would monitor all timber sales to ensure that activities are conducted in accordance with contract specifications (that activities occur where and when

they should to protect resources such as soils and wildlife, that yarding is accomplished as planned and specified in the contract to protect soils, that seedlings are planted at the appropriate spacing, etc.). Reforestation success in regeneration areas would be monitored until the District silviculturist certifies that they meet stocking requirements.

In addition, BMPs would be incorporated into many different phases of the project. The district hydrologist would review the design of all proposed roads and all road maintenance to assure compliance with BMPs. The engineering representative and the district hydrologist would monitor all new construction, reconstruction and temporary roads to ensure that they were built or restored to specifications. A sale administrator would visit each active cutting unit at a frequency necessary to assure compliance with the BMPs and the timber sale contract. Minor contract changes or contract modifications would be agreed upon and enacted, when necessary, to meet objectives and standards on the ground. Monitoring of BMPs has determined that recent projects on the IPNF have been implemented as designed and have achieved the desired objectives (IPNF Monitoring Reports for 2004 [pp. 37-44, 60; PF Doc. CR-026], 2003 [pp. 41-46, 76-77; PF Doc. CR-022], 2001 [pp.27-40; PF Doc. CR-017], and 2000 [pp. 34-41, PF Doc. CR-016]). Additional information on monitoring is provided in the Specialist's Report on Aquatic Resources (PF Doc. SR-05, Aquatics Appendix C).

2.C. SUMMARY COMPARISON OF EFFECTIVENESS IN MEETING THE PURPOSE AND NEED FOR ACTION

2.C.1. Effectiveness of the No-Action Alternative

Purpose and Need #1 of 3: To recover a portion of the timber value that is being lost and projected to be lost, to the mountain pine beetles currently attacking this area.

The No-Action Alternative would not recover a portion of the timber value being lost or projected to be lost to mountain pine beetles, because no timber harvest would occur. Valuable sawtimber and houselog quality material would not be made available to local markets to help meet the demand for forest products. This material would deteriorate over the next several years and opportunities to recover the timber value would be lost. Local timber demands may need to be met by harvesting green healthy trees from other sources instead of utilizing a component of dead and dying timber.

Purpose and Need #2 of 3: To promote the existing healthy western larch component where it exists on this landscape.

The No-Action Alternative would not respond to this need, because no activities would occur to reduce crown and moisture competition with the western larch component. Continued ingrowth of other species would lead to slower growth of the western larch component and may lead to a considerable amount being overtopped and eventually lost to the future stand structure. The No-Action Alternative would not reduce stocking levels that would reduce the risk of high-intensity wildfire that could consume a considerable component of the healthy larch. The No-Action Alternative would not create conditions that would favor western larch stands reaching old forest structure that could be sustainable over the long term.

Purpose and Need #3 of 3: To reduce potential fire intensities while maintaining the general visual character along the fire escape travel corridor within this project area.

The No-Action Alternative would not respond to this need, because no activities would occur to reduce current fuel loadings below this transportation route. Existing ladder and ground fuels may continue to support an intense crown fire close to the roadway which may not allow for emergency travel along this corridor during a fire event.

2.C.2. Effectiveness of the Proposed Action Alternative

Purpose and Need #1 of 3: To recover a portion of the timber value that is being lost and projected to be lost, to the mountain pine beetles currently attacking this area.

The Proposed Action would recover a substantial portion of the timber value being lost or projected to be lost to mountain pine beetles, resulting in a positive, viable timber sale. Based on the estimated minimum bid that would be accepted, the sale would generate enough funds to pay for reforestation and fuels reduction activities under this project. The Proposed Action would salvage existing dead and infested lodgepole pine trees and harvest live lodgepole pine from stands with moderate to high risk of becoming infested over the next several years. This treatment would also harvest lodgepole pine in smaller size classes within selected treatment areas. This smaller component, though at low risk of beetle mortality, is mature and stagnated and would still not grow after larger trees are removed. A mosaic of openings would be created which would provide forage habitat for lynx and other big game species. A component of long-lived seral species would be introduced into these openings to provide more options for future management. Valuable sawtimber and houselog quality material would be made available to local markets to help meet the demand for these forest products and which may reduce pressures to cut green healthy timber to meet this demand. These treatments would reduce future fuel loadings which could lead to a high-intensity wildfire which could damage other resources in the project area.

No activities would be scheduled within the Maple Peak Roadless Area. Lodgepole pine mortality within the Roadless Area would be retained for woodpecker habitat and future denning habitat for lynx. Prescribed burning activities adjacent to the Roadless Area may result in fire burning into the Roadless Area, however it is not expected to encroach more than several hundred feet. No harvest in this area would occur.

Purpose and Need #2 of 3: To promote the existing healthy western larch component where it exists on this landscape.

Commercial thinning harvest activities would promote the existing western larch component on the landscape and enable western larch stands to reach an old forest structure stage that could be sustainable over the long term. Reducing stocking levels in these stands, followed by prescribed fire treatment, would reduce the risk of high-intensity wildfire that could consume a considerable component of the existing healthy larch.

Purpose and Need #3 of 3: To reduce potential fire intensities while maintaining the general visual character along the fire escape travel corridor within this project area.

Limited commercial thinning (Unit 16) and prescribed fire activities in conjunction with selected non-commercial thinning, hand piling and burning treatments, would reduce current fuel loadings below Highway 9. This would reduce current crown densities and raise crown base heights to reduce fire intensities coming up to this roadway. This route has been identified by the Shoshone County Fire Mitigation Plan as an ingress/egress travel corridor in the event of a fire in the Prichard/Murray area (PF Doc. FF-02).

2.D. ALTERNATIVES CONSIDERED BUT ELIMINATED

Harvest Treatments within the Maple Peak Roadless Area

The Northwest Access Alliance expressed support for an alternative that would harvest all salvageable timber, including insect mortality within the Maple Peak Roadless Area. They voiced concern over illogical unit boundaries, the sacrifice of public values, and the further spread of the beetles if no treatment occurs within the Roadless Area. During project development, considerable thought was given to whether harvest treatments should occur within the Roadless Area. More logical harvest units could be proposed if the unit boundaries were to extend up to the main divide ridge. However, this was not considered because of the following reasons: Entry into inventoried roadless areas is quite controversial and often the subject of appeal and litigation. By the time the administrative review and litigation procedures had run their course, most of the merchantable value of the lodgepole pine in the entire Resource Area would be lost due to deterioration. Under that scenario, the salvage objective of the purpose and need would not be met. It is also important to retain some of the lodgepole pine mortality for black-backed woodpecker habitat and lynx denning habitat. Retaining that habitat component in the roadless area seemed to be the best way to deal with both issues. Reducing the spread of the beetles is difficult to achieve, given its widespread nature, and not part of the purpose and need for this project. For these reasons, this alternative was eliminated from further consideration.

Salvage Only

The Idaho Conservation League suggested an alternative be considered that, among other things, would only provide for a limited salvage effort. A salvage only alternative, though addressing the lost value of the current mortality would not harvest trees likely to die in the next 5-10 years. Salvage only partially meets one aspect of the purpose and need, but not completely. Past experience (PF VEG-55) and modeled projections (PF VEG-57) suggest that 60-90 percent of the lodgepole pine in sawtimber size classes (greater than 7 inches) will die within the Resource Area. The current mortality rate is 43 percent. Salvage only treatments would occur in areas where lodgepole pine is not the majority component of the stand. However, in stands where lodgepole pine is the pre-dominant species, more aggressive lodgepole removal treatments are recommended. This would allow us to remove trees not expected to survive the beetle outbreak with one entry into the area. Repeated entries to salvage trees as they die would not be economical or preferred for wildlife disturbance reasons. Lodgepole removal treatments would also allow utilization of smaller size classes in areas where logging system type (skyline or tractor) would allow for economic extraction. This smaller 5-7" diameter material, though not as likely to be attacked by beetles, is mature and stagnated and not likely to release for additional growth (Specialist's Report on Forest Vegetation, page VEG-7). These small trees would also not likely survive prescribed fire treatments, which are desirable for fuels reduction and the re-establishment of young lodgepole pine. For these reasons, this alternative was eliminated from further consideration.

No Roading

Idaho Conservation League suggested that an alternative be considered that would not build any roads. A true "no road" alternative would not be possible. There are no suitable landing locations along Forest Highway 9 that could accommodate the entire timber sale volume coming into that landing. In addition, the daily expense of flaggers controlling traffic would be cost prohibitive and flight distances would be long. Consideration was given to an option that would only build the 0.2 mile link road along with reconstruction of the existing Road 6006 to Unit 7. An economic analysis of that option showed it would not create an economically viable timber sale (Specialist's Report on Finances, PF Doc. SR-9). The increase in the amount of helicopter yarding, increased yarding distances, and increased cost of post-harvest activities drove expenses too high for a viable timber sale.

The Proposed Action does not represent a maximum roading effort or the most economical treatment option. Even under the Proposed Action approximately 40 percent of the material will be removed utilizing expensive helicopter yarding systems. Extending the existing road increases the amount of conventional yarding systems, shortens helicopter yarding distances, and improves access for post sale activities. The road is located high in the drainage where no stream channel crossings occur so any sediment generated would not be transported into streamcourses. The roadway would be closed to public use during project activities. The roadway can be closed off using natural terrain features such as the talus slope after use. Features can be incorporated to reduce the risk of noxious weed invasion. There are no issues that have been identified or analyzed that would lead to the need to implement the project without road construction. For these reasons, this alternative was eliminated from further consideration.

Non-Commercial Treatments

The Idaho Conservation League suggested an alternative be considered that would primarily utilize prescribed fire and hand thinning treatments in the project area. This would not address the purpose and need to recover a portion of the commercial value of the lodgepole pine being lost, or projected to be lost to the mountain pine beetle, but could potentially address the other aspects of the purpose and need. Burning only treatment in the western larch stands may reduce some of the competition, but the outcome would be uncertain and may not produce the desired end result. Hand thinning treatments in advance of burning may improve the uncertainty of the outcome as far as what trees would be removed, but may provide too much fuel to achieve a cool underburn needed to retain the western larch trees. The costs of such treatments, especially with limited road access, would be high (Specialist's Report on Finances, PF Doc. SR-09, p. FIN-4). The Proposed Action provides the thinning treatment through harvest and the return on the value of the commercial material would provide the financing to support the prescribed fire expense. For these reasons, this alternative was eliminated from further consideration.

CHAPTER 3 – EXISTING CONDITIONS & ENVIRONMENTAL IMPACTS TO OTHER RESOURCES

3.A. Introduction

This section discloses existing conditions and environmental impacts that would occur under the No-Action and Proposed Action Alternatives. Supporting information is provided in the Specialist's Reports as cited. The Specialist's Reports are available online at **http://www.fs.fed.us/ipnf/eco/manage/nepa**, or by contacting Project Team Leader Bob Rehnborg at (208) 769-3054.

3.B. Issues

"Key Issues" can come from the Interdisciplinary Team (IDT) members or the public and are used to formulate alternatives to the Proposed Action. The IDT was able to resolve key issues during the design of the proposal, so none were carried into the analysis. The public did bring up concerns and possible alternatives (see section 2.D. Alternatives Considered but Eliminated), but due to project design, none were considered to be key issues. Public scoping comments and response to comments are provided in the Public Involvement Project Files.

"Other issues" do not lead to new alternatives, but are disclosed and analyzed to display compliance with Forest Plan and/or legal compliance. These are organized by resource with indicators to measure environmental effects of each alternative and are described in Chapter 3.

3.B.1. Issues Addressed in Detail

The issues related to these resource discussions are not significant, but are included to demonstrate compliance with laws or regulations, to address current management concerns, or because they are of public interest, as indicated below:

- ***Fire/Fuels***

  Projected tree mortality to mountain pine beetles is increasing fuel build-up that will lead to an increased risk of large, high-intensity wildfire in this area.

- ***Forest Vegetation***

  Western larch make up a considerable amount of the timber component in the resource area; stand densities are crowding the larch and stalling growth. Lodgepole mortality is also a vegetation concern.

- ***TES Plants***

  Timber harvest, prescribed fire, and roading activities can impact populations of Threatened, Endangered, Sensitive, or other rare plants.

- ***Aquatic Resources***

  Timber harvest, prescribed fire, and roading activities can cause an increase in peak flow, water yield, and/or sediment yield, impacting water quality, water quantity, and aquatic habitat for Threatened, Endangered, Sensitive, and Management Indicator fish species.

- ***Soils***

  Timber harvest and roading activities can result in compacted soils and loss of productivity.

- ***Wildlife***

  Timber harvest and roading activities can reduce habitat for Threatened, Endangered, Sensitive, and Management Indicator wildlife species.

- ***Recreation***

  Timber harvest, prescribed fire, and roading activities can impact recreation facilities and/or opportunities.

- ***Scenery***

  Timber harvest, prescribed fire, and roading activities can reduce the scenic value of the area.

- ***Finances***

  A considerable amount of commercially valuable lodgepole pine timber is being lost or is projected to be lost within the resource area as a result of the mountain pine beetle outbreak.

3.B.2. Issues Not Addressed in Detail

During the course of this analysis, the public and project resource specialists identified other issues that could be relevant to the proposed project. Each issue was considered to determine if or how it is related to the proposal and the level of potential impact. As a result a decision was made whether to address the issue in detail in this EA. There were three situations in which an issue was not addressed in detail: 1) the issue is beyond the scope of this project; 2) there will be little or no effect to the issue of concern; or 3) the issue has been effectively addressed through specific alternative features and/or mitigation measures. These include:

- *Noxious weeds*
  Timber harvest and roading activities result in the spread of noxious weeds.
- *Air Quality*
  Prescribed burning activities can detrimentally affect air quality.
- *Heritage Resources*
  Timber harvest and roading activities can impact existing heritage resources and/or historical sites.
- *Public Safety*
  Timber harvest, prescribed burning and roading activities can pose a risk to public safety.
- *Select Wildlife Species*
  Timber harvest and roading activities can reduce habitat for Threatened, Endangered, Sensitive, and Management Indicator wildlife species.

For each of these, a brief overview of the issue and the reason for not providing further documentation in the environmental assessment is provided in the following discussions.

Noxious Weeds: Noxious weed presence and the risk of weed spread is very low in the Resource Area given the existing condition and the implementation of "Features Designed to Reduce the Spread of Noxious Weeds", in the EA, section 3.C.(3.). Features of the proposed action such as seeding disturbed soils and equipment washing would reduce (but not eliminate) the chance of new weeds being introduced to the Resource Area. Shoshone County, in cooperation with the Forest Service, performs noxious weed control on their right-of-way along Forest Highway 9, further reducing the potential for weed spread along this corridor and into the Resource Area. The TES Plants Project File contains supporting information, including plant survey information related to rare plants and other species of concern such as noxious weeds.

Air Quality: The Forest-wide standard for air quality is to coordinate all Forest Service management activities to meet the requirements of the State Implementation Plans, Smoke Management Plan and Federal air quality standards (Forest Plan, page II-9). This would be done under the Proposed Action, and burning would be conducted in a manner that would meet air quality requirements. The District strictly complies with these procedures, and has had no air quality violations.

Heritage Resources: Surveys to locate heritage resources within the Jo-Cat Resource Area have been completed. Nothing of prehistoric or historic significance was noted during the survey (PF Doc. HR-01). Contractual provisions are in place to protect any possible future discovery of heritage resource sites of cultural significance, in accordance with the National Historic Preservation Act.

Public Safety: The road system in the project area is not currently open to public use. Public vehicle use on the road system would be prohibited during and after project related activities. This would limit public exposure to potential safety issues. Trail #7 would be closed to public use when actively felling trees adjacent to or yarding across the trail. Flaggers would be required to control traffic if landing logs adjacent to or flying across Forest Highway 9 with logs attached. Appropriate warning signs would also be required to be utilized, in accordance with standard contractual provisions.

Select Wildlife Species: The following wildlife species are not discussed in detail in this assessment due to lack of habitat, species distribution, or because concerns are adequately addressed by project design features. These species include: bald eagle, grizzly bear, woodland caribou, flammulated owl, pygmy nuthatch, boreal toad, common loon, harlequin duck, northern log lemming, peregrine falcon, black swift, Coeur d'Alene salamander, Townsend's big-eared bat, fringed myotis, fisher, and non-game and land birds. Refer to Appendix A of the Specialist's Report on Wildlife for specific rationale.

No further discussion of these issues is provided in this EA.

The impacts analyses considered direct, indirect and cumulative effects. Direct effects are caused by the action and occur at the same time and place. Indirect effects occur later in time as a result of the action, but are still reasonably foreseeable. Cumulative effects result from the incremental impact of an action when added to other past, ongoing and reasonably foreseeable actions, regardless of what agency or person undertakes the action. Activities occurring under the Proposed Action are described in Chapter 2 of this document. Past, ongoing and reasonably foreseeable activities and their effects are described in Appendix A.

The discussions below provide the necessary information to determine whether or not to prepare an Environmental Impact Statement. The context of this proposal is limited to the locale of the Jo-Cat Resource Area. Design features included in this proposal (described in Chapter 2, Section 2.B of this EA, and in the Specialists' Reports, PF Doc. SR-01 through SR-8) would minimize and/or avoid adverse effects to such an extent that the impacts are almost undetectable and immeasurable even at the local level, and are therefore not cumulatively significant. Based on this analysis, a draft Finding of No Significant Impact has been prepared and is enclosed with this Environmental Assessment.

3.C. Fire/Fuels

3.C.1. Methodology Used for the Fire/Fuels Analysis

The analysis considered effects of management actions in terms of three fire behavior indicators (flame length, probability of torching, and crowning index). A reduction in these three indicators demonstrates probable success in reducing the risk of a severe wildland fire. **Flame length** is important because only flame lengths of 4 feet or less can be safely attacked directly using hand crews. **Torching** trees produce aerial fire brands making spotting and spread more likely. Torching can be the trigger leading to fire into the timber stand canopy, or crowns. The **crowning index** reflects the density of the tree canopy, and its ability to sustain an active crown fire. When crown fires occur, suppression is extremely difficult and large wildfires usually develop. Refer to the Specialist's Report on Fire/Fuels for more information on these three indicators.

3.C.2. Existing Conditions and Impacts to Fire/Fuels

Existing Conditions

The JoCat Resource Area has a number of stands that are dominated by lodgepole pine, which is heavily infested with mountain pine beetle. This insect epidemic is causing high mortality rates in the lodgepole pine in the Resource Area near the Bitterroot Divide and has been building for several years. The natural progression of mountain pine beetle epidemics in lodgepole pine stands leads to a buildup of forest fuels that will soon be a concern to the fire management agencies in Shoshone County. Due to distance from urban areas and structures, these timber stands are not an immediate, extreme fire danger threat. However, a high intensity wildfire in this area could be the trigger to a large scale fire that may affect communities.

Because of the relatively young age of these stands, there is currently little ground fuel present (Fuel Model 8). Flame lengths and torching would be low. They would only burn rapidly under the most extreme conditions of low fuel moistures and high winds which would likely result in a crown fire event due to the stand densities.

Timber stands with a high component of western larch comprise a considerable part of the Resource Area. Due to the absence or suppression of low to moderate intensity wildfires, these stands have become dense with a mix of tree species. Low to moderate intensity fires would have thinned out some of these other species and favored the more fire resilient larch. Currently, ground fuels are also generally low in these stands, and the three fire behavior indicators would be similar to the lodgepole pine stands described above.

The timber stands along Forest Highway 9, especially below the road, are very dense young sawtimber stands. Ground fuels are a little higher in these areas and understory vegetation denser than described above. With the added understory fuels, torching would likely occur. This torching, in conjunction with steeper slopes, would likely result in a higher probability of crown fire than in other locations.

Effects under the No-Action Alternative

Effects in lodgepole pine stands: Direct and indirect effects to fire and fuel conditions would be minimal if not absent under the No-Action Alternative, because no activities are proposed. This may seem like a reasonable course of action given the existing condition in some of the areas, however this condition will change.

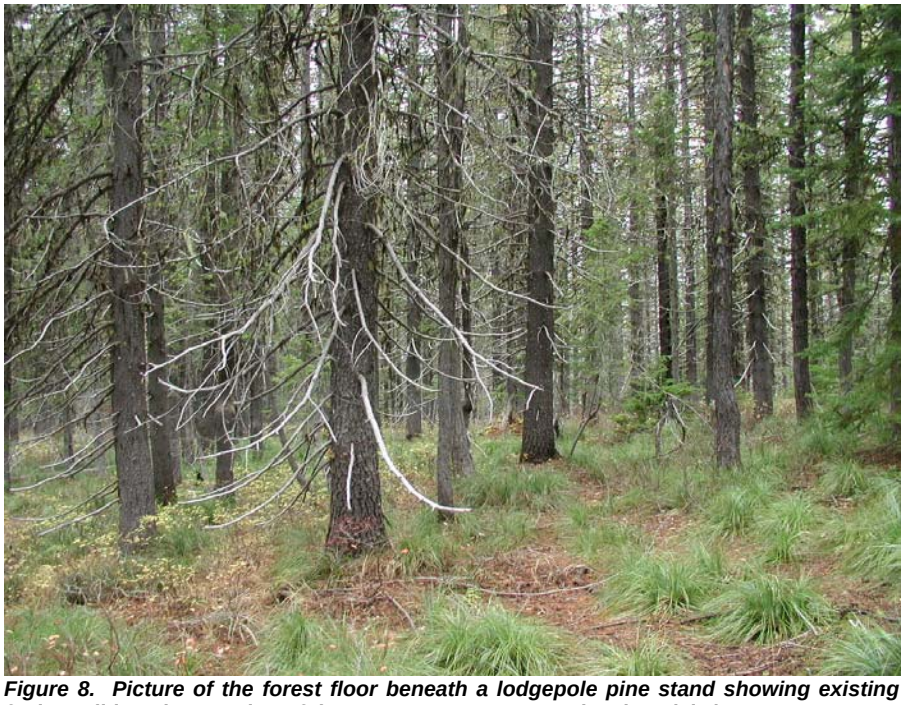


Figure 8. Picture of the forest floor beneath a lodgepole pine stand showing existing fuel conditions in a portion of the Jo-Cat Resource Area (Fuel Model 8).

As the years pass in the lodgepole stands, the dead trees would begin to fall and fuel conditions would rapidly change to an extremely hazardous situation. Ground fuels would dramatically increase to a fuel model 10 (Figure 9). The sheer number of dead tree boles in these stands would ensure that as the trees fall, a large number of boles would remain suspended above the ground and therefore would not decay rapidly. This would lead to a period of 15 to 30 years when the area is likely to contain a layer of tree boles 3 or more feet in depth.

Figure 9. Picture of a representative forest floor under Fuel Model 10 conditions.

Regeneration that naturally grows into this gathering of heavy down fuels would add to the volitilty of the situation. The down trees would provide the intensity and the regeneration would provide the spread. The ground fuels would increase flame length beyond 4 feet, the regeneration would provide the torching mechanism to increase fire spread. The crown index would drop, due to the lack of overstory trees, however the intensity of the fire would likely lead to a crown fire once it reaches more dense stands of timber.

Effects in western larch stands: Under the no action alternative, the direct and indirect effects are that the western larch stands would see a much slower transition to higher ground fuels. However, the torching and crowning index would continue to increase. Competition between the trees in these dense stands would result in a gradual self-thinning process as suppressed trees die and fall to the ground. Since western larch does not do well with competition, many of these trees would likely be western larch. Some Douglas-fir, grand fir, and subalpine fir (more susceptable to insects and disease) would also make up part of the future down tree component. Increased ingrowth by more shade tolerant species would increase potential for torching during a fire event. These "ladder" fuels would provide the mechanism to get fire into the crowns of the trees. This could lead to a stand replacing wildfire and loss of the healthy larch component.

Effects along Forest Highway 9: With no action, direct and indirect effects are that the very dense stands below Forest Highway 9 would continue to add ground fuels through self-thinning. Torching and crowning index is already high, given the laddering of fuels and the steepness of slopes in some areas. The torching and crowning index would be expected to remain high in these areas as ground fuels increase providing the fire intensity and flame length needed to lead to fire up in the canopy. The intensity of heat generated by a crown fire would make it extremely difficult if not impossible to travel on this section of Forest Highway 9 during a fire event.

Cumulative effects under the No-Action Alternative: Effects of past fire suppression policy and actions are a primary factor in determining cumulative effect of this project. The No-Action Alternative reflects the continuation of surface fuel accumulation, as well as the changes in fire behavior associated with a change in forest structure and species. The No-Action Alternative also continues the ingrowth of more shade tolerant species which increase torching and crown fire potential. Successful fire suppression without prescribed fire causes an increase in amount and continuity of the living and the dead material that fuels fires (Saveland 1998, page 4; PF Doc. FF- 18). The continued loss of fire-resistant species (as these trees are crowded and lose their competitive advantage) would continue to lead to forests that are less resilient to fire, meaning that they could experience more pronounced fire effects and an increased amount of mortality associated with a wildfire. Fire behavior would continue toward more intense levels, and therefore be more dangerous to firefighters.

Effects under the Proposed-Action Alternative

Effects in lodgepole pine stands: The Proposed Action includes the removal of mountain pine beetle infested lodgepole pine and trees likely to become infested in the immediate future. As previously discussed under no action, the natural process of dead trees falling to the forest floor has many adverse effects when it occurs over a short period of time and on a large scale as is the usual result of an insect epidemic. Removal of the potential source of heavy fuel loads greatly reduces those adverse effects.

All removal harvests are followed by activity fuel reduction treatments, in this case prescribed fire, so they result in a reduction in surface fuels once activities are completed. Prescribed burning after timber harvest is an important aspect to fire and fuels considerations of the Proposed Action. The direct and indirect effects after harvest treatments are, flame lengths would initially increase as aerial fuels are brought down to the forest floor. This would result in an increase in fire risk for a year or two until prescribed fire treatments occur. The harvest operation would remove the heavy tonnage of large fuels that would eventually become ground fuels if no action is taken. The prescribed fire treatment would remove the smaller fuels left on the ground after the harvest operation. The two treatments combined would lead to greatly reduced flame lengths and fire intensity should an ignition occur. After prescribed fire treatments, surface flame lengths are expected to remain below 4 feet for a long period of time. In most cases, this would allow for direct attack suppression by hand crews should a wildfire occur. Activities that reduce surface fuels (low vegetation, woody fuel, shrub layer) decrease the chances that a surface fire would be able to ignite ladder fuels and canopy fuels (Graham et al. 2004, page 23; PF Doc. FF- 17).

Retention of some beetle mortality areas, such as in the roadless area, would reduce overall effectiveness of fuel reduction treatments across the treatment area, however most of these retention areas are higher in the basin and closer to major ridge lines that may slow fire runs.

Salvage and overstory removal units will have logging slash lopped and scattered. This treatment is not as effective in treatment of fuels as prescribed fire, however it gets the fuels on or close to the ground surface so they will decompose more quickly. This technique is often utilized if other resource considerations, such as residual stand composition and structure, limit the use of prescribed fire.

Effects in western larch stands: The Proposed Action includes commercial thinning harvests to favor western larch. The direct and indirect effects of thinning by timber harvesting would immediately cause an increase in surface fuel loading (flame length), as well as an immediate decrease in ladder (torching) and crown fuels. The unmerchantable branches and other fuels that are left after harvest would substantially increase the fuel load, and consequently the potential flame lengths on any given site. This fuel load would then pose a slash fire hazard for a short period of time, until the fuel on the site is treated with prescribed fire or other slash treatment method such as grapple piling and burning. Once treated, the fuel hazard is dramatically decreased for a considerable amount of time because flame length would remain low. With the removal of the understory and intermediate tree component, ground fuels would be very slow to increase since the stands would no longer be self-thinning. With the removal of this component the mechanism for torching would be removed, so crown fires would be unlikely.

Tree thinning by commercial harvesting can reduce vertical and horizontal continuity of the tree canopy and limit initiation and spread of crown fires, especially when done in conjunction with prescribed burning (PF Doc. FF-21). However, any canopy removal could have the adverse effect of increasing potential mid-flame wind speed, thus increasing flame lengths and spread rates. The increased fuel-level wind speed coupled with increased insolation also leads to lower dead fuel moisture in treated stands during summer. These two factors tend to increase surface fire behavior. However, properly executed treatments also tend to reduce the crown fire potential. Crown fire mitigation treatments can represent a tradeoff – the decrease in crown fire potential comes at the expense of increased surface fire spread rate and intensity. However, the greatly increased spread rate and intensity of crown fires makes this tradeoff reasonable (PF Doc. FF-22). This becomes even more reasonable when thinning to favor western larch. Western larch has a thicker bark and higher crowns so it can likely survive a moderately intense ground fire. Keeping fire from getting into the crowns of the larch would help retain this long-lived seral component over the long term and provide the seed source needed if larger fires occur.

The harvest treatments in the lodgepole pine and the thinning treatment in the western larch not only reduce future heavy fuels loadings and remove ladder fuels that promote torching and crowning they, also create conditions that would allow for the introduction of prescribed fire. Simply introducing prescribed fire into these areas would not lead to desired results. The removal of the trees scheduled for harvest would also provide the financing mechanism for the introduction of prescribed fire, funding that may not otherwise be available.

Effects along Forest Highway 9: Forest Highway 9 has been identified as a Secondary Resource Protection Zone as shown on the Wildland Urban Interface Map, which is part of the Shoshone County Fire Mitigation Plan. To maximize fuel reduction treatments along this route, more aggressive treatments could have been proposed. However, as stated in the purpose and need, retaining visual character of the forested landscape is part of the consideration.

The Proposed Action calls for understory thinning treatments below Forest Highway 9 in a portion of this treatment area. In areas where western larch is a considerable component (unit 16) a commercial thinning treatment is planned. The direct and indirect effects would be the same as discussed above. In other locations hand treatments to reduce existing ground fuels and thin out understory vegetation are planned. Slash from these treatments are planned to be hand piled and burned. These hand treatments, though not as effective as commercial thinning, would have the following direct and indirect effects: Ground fuels would be reduced keeping potential flame lengths low; understory vegetation would be thinned out reducing the likelihood of torching. Since intermediate size trees would not be removed, the crown index potential would not decrease as much as if commercial thinning were to occur. However, with the reduction of potential heat source underneath the crowns, a fire in this area would likely remain on the forest floor except under the most extreme conditions.

Heat and smoke greatly effect the ability of public or emergency vehicles to use travel routes during a wildfire event. By reducing the fuel loading near a public road that is likely to be a main travel route in an emergency event, public safety is aided. This treatment is not an attempt to keep this route open to general public use during a fire event. It would likely be closed even with a ground fire, due to heat, smoke, and safety of firefighting personnel. However, the treatment would allow for emergency use maintaining access for emergency responding personnel and potential evacuees.

Cumulative effects under the Proposed Action: Cumulatively, the Proposed Action would take steps to counteract the effects of fire exclusion as previously noted, with the reduction of future heavy fuel loading (flame lengths) and thinning treatments to reduce live fuels (torching and crowning). Dead and live biomass in the form of surface and crown fuels would be reduced. Treatments designed to increase the proportion of fire-resistant tree species such as western larch in stands will enhance stand fire resilience.

The Proposed Action only treats approximately 10 percent of the resource area. This in itself is not enough to substantially change existing conditions from over 85 years of fire suppression. However, observations of fire movement near fuel treatments indicate that overall fire growth and large fire sizes can be reduced (Finney 2005, page 1721, PF Doc FF-21). The spatial arrangement of vegetation influences the growth of large fires. Patches of vegetation that burn relatively slower or less severely than surrounding patches can reduce fire intensity, severity, or spread rate, or may force the fire to move around them by flanking (at a lower intensity), which locally delays the forward progress of a fire (Graham et al. 2004, page 29; PF Doc. FF-17).

The action alternative contains some conjoined units that will mimic the potential decrease in fire behavior associated with treatment of larger areas. The planned harvest treatments would create a mosaic of vegetation in the resource area. Fuel mosaics can result in delayed fire spread or reduce fire intensity, reducing the risk of unwanted fires escaping initial attack. However, in certain extreme weather conditions, fires often spread by long distance spotting and are not controllable despite previous fuel management activities. However, since fire resiliency in treated stands is improved, even if there is no effect on the control of a large fire, residual trees and an available seed source would likely be retained in some locations.

There are no reasonably foreseeable activities within the Jo-Cat Resource Area. This resource area is located in the headwaters of Prichard Creek along the Idaho/Montana divide. The Prichard/Murray HFRA project, located in the lower and middle reaches of Prichard Creek is designed to treat hazardous fuels closer to the urban interface setting. Timber harvest is planned on private property in primarily in Bear Gulch, with a portion in Paragon Gulch. Harvest activities on private lands are inspected by the Idaho Department of Lands to determine if logging slash disposal meets the Idaho Forest Practices Act.

3.C.3. Consistency with Policies, Laws and Regulations for Fire/Fuels

The No-Action Alternative would not use prescribed fire to help meet the goals of the management areas within the resource area. The alternative would not help develop cost-effective fire programs because it would allow far more intense potential fire behavior to exist in stands that, with treatment, would primarily exhibit low intensity, easily controlled fire behavior. Under the No-Action Alternative, severe fire effects, large wildfire management costs, and fire caused changes in values could reasonably be expected; these results could likely be prevented or reduced with actions that treat forest fuels. The continued succession of fuels and vegetation, mortality from insects and disease, and the exclusion of fire would create areas where the trend in fire behavior characteristics would in time be inconsistent with the goals, objectives and standards established in the Forest Plan. No activity fuels would be created under the No-Action Alternative, so there is no need to treat activity fuels, which is consistent with the Forest Plan.

The Proposed Action would use timber harvest, prescribed fire, and hand fuels treatment to help meet the goals of the management areas within the resource area, consistent with the Forest Plan and the Shoshone County Wildland Urban Interface Fire Mitigation Plan. The alternative would help develop cost-effective fire programs by making substantial progress toward reducing potential intensities of wildfire in areas affected by past fire suppression. The more area treated to restore and maintain stands toward historical species composition, the better the alternative meets the Forest Plan goals. The Proposed Action would best meet the goals, objectives and standards of the Forest Plan because it would reduce the severity of fire effects, the costs of potential wildfire, and fire-caused changes in values on the treated acres. The activity fuels created would be treated in a manner that is consistent with Forest Plan standards.

3.D. Forest Vegetation

3.D.1. Methodology Used for the Forest Vegetation Analysis

The analysis area for existing vegetative conditions and to assess direct, indirect, and cumulative effects to forest vegetation follows the Jo-Cat Resource Area boundary, except when discussing allocated old growth. The analysis area for allocated old growth follows the boundary of Old Growth Management Units (OGMU) 113 (PF Doc. VEG-2). Where appropriate, information is provided at both the resource area scale, old growth management unit scale and the Coeur d'Alene River Basin scale to provide a landscape perspective.

Field reconnaissance was used as the primary tool to analyze the effects of treatments in reference to the purpose and need. This field reconnaissance was accomplished by the certified silviculturist and experienced field foresters, technicians and entomologists. Field notes are found as part of the silvicultural diagnosis at PF Doc. VEG-3.

Other data items used for this analysis include: a) stand data from the timber stand management resource system (TSMRS) and national FSVeg database (stand forest type, size class, habitat type, past harvest, stand basal area, stand tree per acre and tree age, old growth allocation); b) insect and disease aerial detection flight information; c) soils landtype derived vegetation response units (VRU); d) precipitation maps from the State of Idaho; and e) Forest Inventory Assessment (FIA) data (Specialist's Report on Forest Vegetation, pages VEG-4 through VEG-6).

ArcView/ArcMap spatial computer software was used extensively to analyze existing conditions and the proposed action. Copies of the base maps used (along with data associated with map polygons) are found in PF Doc. VEG-2. In addition, a stand base map and basic stand data as well as explanations on how to use available IPNF GIS data sets is found at http://www.fs.fed.us/ipnf/eco/yourforest/gis/index.html#veg.

Professional knowledge and experience with local silviculture, insects and disease conditions and outcomes as well as various silviculture, ecology, fire/fuels and insect and disease references were also used.

The forest vegetation analysis considered two key indicators in determining effects (SR-02, page VEG-3):

- **Forest composition, measured through**
  - *Changes in percent cover types (specifically from Douglas-fir and grand fir to western larch and white pine)*
  - *The portion of the resource area with lodgepole pine and mountain pine beetle in comparison to the amount of that area treated under the alternative*
  - *The portion of the resource area with western larch in comparison to the amount of that area treated under the alternative*
- **Forest structure, measured through**
  - *Changes in percent structural stages (shrub/seedling/sapling, small to medium timber, and mature/large timber)*
  - *Changes in landscape arrangement (size and distribution of patches across the landscape)*

A balance of these conditions would increase the likelihood of a healthy and resilient forest ecosystem sufficient to meet the multiple resource objectives for the area relating to fire/fuels, wildlife, recreation, and aquatics.

3.D.2. Existing Conditions and Impacts to Forest Vegetation

Timberland Suitability

The Forest Plan under Appendix M indicates that on-site inspection may be used to revise timberland suitability. Forest Plan suitability was often based on broad-scale inventory data without the benefit of field verification. The Jo-Cat Resource Area analysis included a detailed stand-by-stand review in the area of proposed treatment units using field data, field reconnaissance, photo interpretation, and professional experience (PF Doc. VEG-17 and 18). This review changed 588 acres from a status of unsuitable for timber production (Management Area 9, which strives to protect areas unsuited for timber production) to suitable (Management Area1 has an emphasis on timber production).

Table 5. Forest Plan Management Areas and Proposed Adjustments to Suitability in the Jo-Cat Resource Area (PF Doc. VEG-17 and 18).

Forest Plan Suitability Changes in the Jo-Cat Resource Area	% of Jo-Cat Resource Area	Proposed Adjustment to MA Designation in Jo-Cat Resource Area (% of resource area)
suitable	51	79
not suitable	48	20

Existing Forest Composition

Forest cover types: Within the Jo-Cat Resource Area, current forest cover types include more Douglas-fir and grand fir than did the previous century. Lodgepole pine and Douglas-fir dominate the landscapes on mid-elevation habitats and subalpine fir/mountain hemlock dominate on the higher elevation habitats. Lodgepole pine is the forest cover type for 19% of the resource area at the stand scale. It actually has a higher representation (38%) when considering stands that have a lodgepole pine component, though it may not be the dominant species. Western larch at the stand scale dominates 6% of the resource area; however, at the finer scale it actually has higher representation (19%) because it so often occurs in combination with other species and less often as a pure type. White pine does not represent a forest cover type at the stand scale.

Private lands make up 159 acres (about 7% of the resource area). Most of these areas are concentrated along riparian areas of Prichard Creek. The habitat types on private land are generally at lower elevation than the National Forest System lands, with a mixture of moist western hemlock/grand fir and a smaller amount of the drier Douglas-fir and grand fir series. Forest cover types on private lands within the resource area are generally Douglas-fir, grand fir and western hemlock

Effects to Forest Composition Under the No-Action Alternative

Under the No-Action Alternative, there would be no activities to restore forest vegetation toward increased resiliency and promote the valuable western larch component. The direct and indirect effects, in areas with western larch component, are that the stands would trend toward less western larch as western larch resilience declines due to competition and stands would trend toward subalpine fir, western hemlock, grand fir and Douglas fir. In areas with high components of lodgepole pine mortality further beetle mortality is expected. This should be expected as this area has been under outbreak attack status by mountain pine beetle for several years. As long as conditions are favorable and susceptible hosts remain, mountain pine beetle would continue this infestation until host depletion (PF Doc. VEG-54). It is projected that 62% to 97% of the lodgepole pine sawtimber component will die over the next 10 years, in areas being considered for treatment.

Cumulatively, in the absence of major disturbance, forest cover types would trend toward climax species (Hagle, 2000, p.2-244; PF Doc. VEG-R34). In subalpine habitats, stands transition to subalpine fir cover types and in mid-elevation habitats, this would be western hemlock, grand fir, and Douglas-fir cover types.

Effects to Forest Composition Under the Proposed Action Alternative

Of the 804 acres of stands in the resource area with a lodgepole pine component, 431 acres have observable dead and dying trees caused by mountain pine beetles. Some lodgepole pine stands have smaller average diameters and are lower risk to beetle mortality; therefore they were not proposed for treatment. Also, a portion of the areas with lodgepole and mountain pine beetle mortality were retained for wildlife habitat and to maintain the integrity of the adjacent roadless area. Forest composition in the untreated portions of the resource area would likely follow the same scenarios as the No-Action Alternative (described earlier).

The Proposed Action treats 146 of the lodgepole pine areas with observed mountain pine beetle mortality with salvage, lodgepole pine overstory removal, and lodgepole pine removal treatments (modified regeneration harvests). This represents 34% of the identified lodgepole pine areas with mountain pine beetle mortality. The remainder of the 431 acres with observed mortality are either in the roadless area (which would not be treated), have mortality that is too scattered for treatment, or have a smaller size class that is not a moderate to high risk of stand mortality even though some mortality is present. However, the largest areas of mortality, or projected mortality, outside of the roadless area would be treated. The direct effect of this proposed treatment is that lodgepole pine cover type would decrease by 1% while the white pine component, through planting, would increase by 2%. In terms of indirect effects; before blister rust introduction, white pine used to be 40-50% of the forest composition of the Coeur d'Alene Basin. Any increase in white pine composition would be beneficial to the resource area and the basin.

Western larch is represented as a stand component on 399 acres (19% of the Jo-Cat Resource Area), of which 285 acres were recognized to have opportunities to improve western larch vigor and resiliency. The proposed action would treat approximately 119 acres where there is a silviculturally treatable western larch component; this represents 42% of the western larch improvement opportunity in the Jo-Cat Resource Area. The direct effect of this treatment is that there would be a 5% increase in the western larch cover type. In terms of indirect effects, the overall ecological value of this age class of western larch is very high. Western larch is very limited within the basin and over the next 20-50 years this resilient western larch would become mature. Treatment of long-lived early serals already close to maturity is an excellent investment in the near and distant future. The opportunity for biological and silvicultural success in the treatment of western larch to show improvement in resilience is limited to ages of 80 to almost 100 years.

Table 6. Comparison of Forest Cover Types on National Forest System lands lands in the Jo-Cat Resource Area (PF Doc. VEG-15 and 23).

Forest Cover Type	Desired Future Condition*	Existing %	No Action	Proposed Action
white pine	20 to 30% for early seral species (white pine and western larch)	0%	0%	2%
western larch (19% of Jo-Cat stands have a western larch component)		6%	6%	11%
lodgepole pine (38% of Jo-Cat stands have a lodgepole pine component)	15 to 25%	19%	19%	18%
Douglas-fir, grand fir and western hemlock	30 to 40%	59%	59%	53%
subalpine fir and mountain hemlock	Less than 15%	9%	9%	9%

**Desired future condition is based on general direction from the Forest Plan, Interior Columbia Basin Assessment, Coeur d'Alene Geographic Assessment, and Regional Overview brought down to the localized scale to fit conditions within the resource area.*

Cumulatively, the Proposed Action would trend the Jo-Cat Resource Area on a positive trend. Overall, long-lived early seral species composition would increase by 7 percent within the resource area with improvement of western larch long term resiliency in commercial thin areas and white pine planting in some regeneration harvest areas. While this change is advantageous at the Jo-Cat Resource Area scale, the number of acres of change in this project is such a small percentage that no change would be reflected at the Coeur d'Alene River Basin scale.

Existing Forest Structure

The interplay of fires and insect and disease mortality has dramatically shaped the structural stages found within the Jo-Cat Resource Area today. As displayed in Table 7, current conditions in the Jo-Cat Resource Area are not even close to any of the desired structural stage amounts. Structural stages on private lands within the resource area are dominated by small/medium timber sizes.

The shrub/seeding/sapling stage represents forest stands less than 35 years old which usually have average tree diameters less than 5 inches at breast height. The small to medium stage represents forest stands generally 36 to 100 years of age with average diameters greater than 5 inches. The mature/large stage represents stands over 100 years of age with average diameters over 9 inches in diameter. Refer to the Specialist's Report on Forest Vegetation (section 4.C) for more specifics related to forest structural classes.

Allocated old growth is a subset of the mature/large structural stage. A detailed review of the old growth in OGMU's 113 took place with this analysis (SR-02, Forest Vegetation, section 4.C, 5). This review found that all previously allocated stands met old growth definitions (PF Doc. VEG-31, 32 and 34). In addition, 2 stands not previously allocated (one of which is in the resource area) met old growth definitions and are now allocated (PF Doc. VEG-31 and 34). Many stands originating after the 1910 fire in OGMU 113 will qualify as old growth over the next 30-50 years, depending on future natural disturbances.

The amount of allocated old growth within the Jo-Cat resource area is 32 acres or 1.5%, involving one 32-acre patch (PF Doc. VEG-34, VEG-35). Allocated old growth within OGMU 113 associated with the Jo-Cat Resource Area is 342 acres or 4.3%, involving four patches with an average size of 84 acres (PF Doc. VEG-34, VEG-35). The patch size of future old growth would increase dramatically over the next 20-50 years based on stands currently in the small/medium stage (representing 96% of the resource area) when combined with current allocated old growth. Depending on disturbance, these areas have the potential of becoming large patches (well over 300 acres in size). Additional information regarding Forest Plan Old Growth Standards is provided in Standard 10d section of the Specialist's Report on Forest Vegetation.

Table 7. Comparison of the percent forest structure on National Forest System lands in the Jo-Cat Resource Area (PF Doc. VEG-8, 16 and 23).

Structural Stage	Jo-Cat Desired Future Condition	No Action		Proposed Action	
		2007 (Existing)	In 2027	After implementation	In 2027
Shrub/seedling/sapling	10-30%	2	15	6	15
Small/medium timber	20-40%	96	34	91	34
Mature/large timber	30-45%	2	51	2	51

**Desired future condition is based on general direction from the Forest Plan, Interior Columbia Basin Assessment, Coeur d'Alene Geographic Assessment, and Regional Overview brought down to the localized scale to fit conditions within the Resource Area.*

Effects to Forest Structure Under the No-Action Alternative

Over the next 20 years, the direct and indirect effects of no action would be about half of the areas currently in the small- medium size (areas burned in 1910 fire) could enter the mature/large stage and about 15% would enter the young stage. This is due to the extent of susceptible hosts and the current and expected mountain pine beetle mortality in lodgepole pine. This assumes there would be no other insect, disease or fire disturbances in the area. Fire risk can increase with fuel buildup. Historically, the fuel buildup associated with mountain pine beetle mortality often resulted in large fires. The structural stages resulting from taking no action at this time would come into the desired future condition ranges in the next 20 years. However, structural stage at the landscape scale is not the only forest structure attribute of importance.

Within-stand structure is also important, and would be characterized by the successional path of their respective habitat types in the area. Habitat types in the Jo-Cat Resource Area are comprised of 52 percent warm/moist, 25 percent dry, 8 percent cool, and 15 percent cold. Without disturbance in the dry and moist now dominated with Douglas-fir and grand fir, multi-storied and/or low canopy conditions are likely, with many Douglas fir and grand fir areas remaining stalled in the small, young stages. The cool and cold habitats would trend toward subalpine fir and mountain hemlock. Without major disturbance, the climax species of the sites would slowly become dominant (PF Doc. VEG-R34).

Figure 10. Two photos representing the stand understory or 'within stand' structure in the Jo-Cat Resource Area.

Subalpine fir habitat types (23 percent of the resource area) were historically characterized by closed canopies of lodgepole pine as well as later successional subalpine fir/mountain hemlock areas with more multi-layered canopies. Without disturbance, the subalpine areas would continue to become more multistoried as insects and disease work with succession.

Cumulatively, landscape conditions in the Jo-Cat Resource Area are being dramatically impacted by mountain pine beetle mortality where susceptible host is present (almost 20 percent of the resource area). Without disturbance, these areas would likely become more dominated by multi-storied stands of lodgepole pine, subalpine fir and Douglas fir. About 19 percent of the resource area currently has a component of western larch. This species is one of the most resilient in the Coeur d'Alene River Basin. Without disturbance, much of this western larch would be replaced due to competition by Douglas-fir and subalpine fir.

Effects to Forest Structure Under the Proposed Action Alternative

The direct effects of lodgepole removal regeneration harvest changes structural stage on 5 percent of the resource area. This harvest is however focused in areas that have or are projected to have high rates of mountain pine beetle mortality, in other words, these areas will change structural stage over time with or without the proposed lodgepole removal harvest. Proposed lodgepole removal harvest areas are more likely to provide a long-term improvement in stand and landscape structure and increased resiliency to native change agents (such as insects, pathogens and fire). This is because some areas move toward increased long-lived serals with supplemental planting of white pine (about 42 acres), representing about 30 percent of the lodgepole removal harvest areas**.** The rest of the lodgepole removal harvest areas will be naturally regenerated to lodgepole pine with the introduction of fire. Not all of the areas with mountain pine beetle mortality are involved in harvest at this time. It can be assumed that over the next 20 years, almost 10 percent more of the area would have enough mountain pine beetle mortality to naturally regenerate to young stands with scattered multistoried overstory (survivors) of lodgepole pine, Douglas-fir and/or subalpine fir.

The Proposed Action would also change the 'within-stand structure' and overall resilience of the western larch on 119 acres (6 percent of the resource area). This would increase the likelihood that these areas would reach the mature and large structural stage with the western larch as a high component of the stands. Though this figure is small, retention of this component and available seed source is important as described under the forest composition discussion. Mature and old western larch are currently rare in the Coeur d'Alene Basin and would continue to be rare in the future, until current young stands with white pine and western larch mature. The window of opportunity to successfully improve resilience of immature western larch by adjusting growing space declines dramatically at about 100 years old. The proposed action would mechanically treat approximately 40 percent of the areas with a viable opportunity to improve long-term western larch resiliency (119 of the 285 acres identified during diagnosis), which is a main objective of the purpose and need. Some western larch stands did not need commercial treatment to retain their dominance, and some have already lost their competitive advantage.

The proposed action does not include any harvest, prescribed burning, or road construction in any allocated old growth.

The indirect effects of the Proposed Action in the future would result in an improved representation of resilient long-lived serals species (white pine and western larch) in the young, mid and mature structural stages. These conditions would be more like the historic condition and the desired conditions than current or no action. Refer to the silvicultural diagnosis for further documentation and literature citations associated with the rationale for these treatments (PF Doc. VEG-3). Because the total number of acres proposed for change in structural stage in this project is such a small percentage of the Coeur d'Alene River Basin, the Proposed Action would not result in a change in structural stages at the overall basin scale.

The Jo-Cat Resource Area is also the cumulative effects boundary for Forest Vegetation. There are no ongoing or reasonably foreseeable activities scheduled (EA Appendix A). The proposed treatments are a positive trend and do have beneficial within stand treatments to reduce fuel loadings and promote western larch. However, due to the small percentage of treatment, the general area is still trending toward a climax species component. Forest structure at the resource area scale is moving toward mature, multi-storied stands. Private lands would continue to trend toward smaller multi-storied structure and climax composition.

3.D.3. Consistency with Policies, Laws and Regulations for Forest Vegetation

Both the No-Action and Proposed Action Alternatives would meet the applicable Forest Plan standards and would be consistent with the Rangeland Renewable Resources Planning Act (RPA) and National Forest Management Act (NFMA), with two exceptions: The No-Action alternative would not use integrated pest management methods or reduce the perpetuation of pest problems; therefore it would not meet Forest Protection Standards 1 and 2. For further information, please refer to the Specialist's Report on Forest Vegetation, pages VEG-21 through VEG-28.

3.E. TES Plants

3.E.1. Methodology Used for the TES Plant Analysis

Methodology Used to Assess Existing Conditions

The term "rare plants" is used to describe all plant species that are listed by the US Fish and Wildlife Service for the Idaho Panhandle National Forests (IPNF). Also included are species designated by the Forest Service as "Sensitive" or "Forest Species of Concern." Complete lists of rare plant species are included in the Project File. For simplicity, common names are used in this EA; scientific names are provided in the Specialist's Report on TES Plants. <u>There are no known occurrences of Threatened and Endangered plants in the Resource Area.</u>

Candidate species are those for which the US Fish & Wildlife Service has sufficient information on biological vulnerability and threats to support proposals to list them as Endangered or Threatened. Slender moonwort is listed as a Candidate species by the US Fish and Wildlife Service and as a Sensitive species by the Forest Service's Northern Region, which includes the IPNFs.

Sensitive species are determined by the Regional Forester to have population viability concerns as indicated by a current or predicted downward trend in populations or in habitat capability, which would reduce the species' existing distribution. There are 28 species of Sensitive plants known or suspected to occur within the Coeur d'Alene subbasin.

The geographic scope of the analysis for sensitive plants is the Jo-Cat Resource Area boundary. A pre-field review was conducted of aerial photos, topographical maps, Idaho Department of Fish and Game Conservation Data Center (ICDC, 2003; PF Doc. TES-3) element occurrence records, Timber Stand Management Records System (TSMRS), U.S. Fish and Wildlife Service National Wetlands Inventory Maps (USDI, 1987; PF Doc. TES-4) and recent literature.

Field surveys were conducted in the resource area during 2006 (PF Doc. TES-16). The intensity of field surveys was based on habitat suitability and the risk of effects to Sensitive plants and habitat due to project activities. During field surveys, only one Sensitive/Forest Species of Concern plant species was found to occur

in the Jo-Cat Resource Area; one Naked Mnium moss population was located on Road 6006 and in a subdrainage of Cat Gulch. For unsurveyed habitat that is highly suitable to support sensitive plants, presence is assumed. Lists of stands that may be potential rare plant habitat are contained in the project file (PF Doc. TES-34).

Analysis and field surveys indicate that the Alpine/Subalpine and Wet/Moist Forest Guilds occur in the Jo-Cat Resource Area, and may be affected by project-related activities; therefore species of these guilds were analyzed in detail. Suitable Dry Forest Guild habitat, though accounting for 10 percent of the Jo-Cat Resource Area (205 acres), would not be directly affected by any project-related activities, so this guild was not analyzed in detail. Effects to this guild are expected to be very low to non-existant.

As described in Features Designed to Protect Rare Plants (Chapter 2), populations would be protected, while some isolated individuals may be impacted by activities.

Methodology Used to Assess Impacts to TES Plants

Indicators used to measure effects on Sensitive plants and suitable habitat include: the type of activity, the amount of each proposed activity, the extent of ground disturbance resulting from activities, and the proximity of known sensitive plant occurrences and suitable habitat to proposed activities. Effects to sensitive plant species or suitable habitat from proposed activities are generally described as very low *(no measurable effect)*, low (not likely affected), moderate (individuals or habitat may be affected, but populations would not, and habitat capability would not be reduced over the long term below a level which could support sensitive plant species), or high (populations may be affected and/or habitat capability may be reduced over the long term below a level which could support sensitive plant species).

3.E.2. Existing Conditions and Impacts to Rare Plants

Existing Conditions: Analysis and field surveys indicate that the Alpine/Subalpine, Wet and Moist Forest Guilds occur in the Jo-Cat Resource Area, and may be affected by project-related activities. Moist and Wet Forest Plant Guilds were grouped for this analysis. Moist Forest Guild plant habitat occurs mainly on northeast to northwest slopes, and in drainage bottoms. Of the Moist and Wet Forest Guild plants, deerfern, moonworts, Henderson's sedge, and naked Mnium moss were determined to have the highest potential to occur in the Jo-Cat area. During 2006 field surveys in the Jo-Cat Resource Area, only one Sensitive or FSOC plant species was found to occur in the Jo-Cat Resource Area: one Naked Mnium moss population was located on Road 6006 and in a sub-drainage of Cat Gulch (PF Doc. TES-16).

Table 8. Rare Plant Guilds Affected in the Jo-Cat Resource Area under the Alternatives.

Rare Plant Guild	Plant Species Potentially Affected	Acres of existing habitat guild in the Resource Area	Acres of guild affected under the No-Action	Acres of guild affected under the Proposed Action
Moist/ wet forest	Deerfern Moonworts Henderson's sedge Naked Mnium	2 acres (< 1% of the Resource Area)	0 acres (0% of guild in Resource Area)	0 acres (0% of guild in Resource Area)
Alpine/ subalpine forest	Leafless bug-on-a-stick Iceland moss lichen Bourgov's astragalus California sedge	388 acres (18% of the Resource Area)	0 acres (0% of guild in the Resource Area)	88 acres (4% of guild in the Resource Area)

Effects under the No-Action Alternative: There would be no direct effect on any Sensitive or Forest Species of Concern (FSOC) plants as a result of implementing the No-Action Alternative. However, there would also be no improvement made to vegetative and watershed conditions, which could in the long term provide suitable sensitive plant habitat. There would be a complex variety of indirect effects. There would be an increased risk to sensitive plants and habitat due to the increase in fuel loads from insect mortality and through time with continuing fire suppression. The greater the fuel loading, the greater the risk of a high intensity burn and stand replacing fire, with possible loss of rare plants and habitat.

The increase in ignition risk and a resulting fire would also have an array of likely effects for sensitive plant species, ranging from beneficial to intolerant, depending on factors like the intensity of the fire, the species ability to survive the event, and compete in early successional habitat. The ability to analyze these effects for all sensitive plant species is limited given our current level of knowledge. Additional discussion of how herbaceous plants respond to fire is provided in the Specialist's Report on TES Plants.

Cumulative effects to alpine/subalpine forest would be low to moderate. Impacts resulting from recent insect activity could include high-intensity, duff-replacing wildfires from predicted high fuel loadings in untreated areas. Some disturbance to rare plant species in this guild may be beneficial as they tend to favor more open disturbed sites. However, populations could be destroyed if such a fire were intense enough. The prospect of recolonization of affected habitat would depend on the extent and duration of habitat alteration and the availability of an adjacent seed source. Cumulative impacts to wet and moist forest habitat would be low. Wet Forest Guild Habitat would be less prone to a stand-replacing wildfire than drier habitat guilds. Impacts to moist forest habitat would be low where canopy cover has not been reduced. More open stands, with higher fuel loads, that may have been affected by insect and disease mortality would be predicted to be low to moderate in relation to risk of stand-replacement wildfire. Some small loss of Moist Forest Guild Habitat likely occurred with the reconstruction of Forest Highway 9. While there were past and possible future activities that affect wet and moist habitats on private lands, the Forest Service has no authority over these activities.

Effects Under the Proposed Action Alternative: Activities under the Proposed Action would directly impact individual Naked Mnium moss plants that occur on Road 6006, but the portion of the population in Cat Gulch and associated habitat would not be affected. The ample amount of suitable habitat in the drainage would provide for the continued existence of this species. While there would be direct and indirect effects to rare plant habitat, potentially suitable habitat for rare plants would gradually be improved. Considering these factors and the implementation features to protect TES plants outlined in Chapter 2, the cumulative effects of the proposed action on rare plant guild species and habitats, overall, would be low.

Table 9. Summary of determination of effects on rare plant species, by guild, for each alternative.

Species Guild	No Action	Proposed Action
Moist/Wet Forest	No impact	May impact individuals or habitat with no trend toward federal listing or loss of species or population viability
Dry Forest	No impact	May impact individuals or habitat with no trend toward federal listing or loss of species or population viability*
Alpine/Subalpine	No impact	May impact individuals or habitat with no trend toward federal listing or loss of species or population viability
Deciduous Riparian	No impact	No impact
Peatland	No impact	No impact
Grassland	No effect	No effect
Aquatic	No effect	No effect

**Impacts may occur because adjacent burning activities, associated with units 13 and 14, could introduce fire a short distance into dry forest habitat.*

3.E.3. Consistency with Policies, Laws and Regulations

Both alternatives would meet the intent of the Forest Plan, the Endangered Species Act, and Regional sensitive plant policies. Features of the Proposed Action designed to protect rare plants would ensure effects are within acceptable limits of applicable policies, laws and regulations.

3.F. Aquatic Resources

3.F.1. Methodology Used for the Aquatics Analysis

The main concerns related to aquatic resources are effects to water quality, changes to stream channels, and fish habitat. Environmental consequences to these resources were measured through changes in the water yield, peak flows, sediment yield. Rain-on-snow was not used as an indicator for this project. This is because 90% of the proposed activity would occur above 4,500 feet in elevation, which typically does not experience rain-on-snow conditions. Rain-on-snow was considered under cumulative effects (See Specialist's Report – Aquatic Resources). The WATSED model was used to compare the cumulative effects of the No Action Alternative and the Proposed Action. Two watershed scales were assessed: Upper Prichard Watershed (Prichard Creek above Eagle Creek) for cumulative effects and the upper Prichard subwatershed (Prichard above Bear Gulch) for more localized effects.

Analysis of effects to fish is based on impacts to threatened, sensitive and management indicator fish (MIS) species. The 1987 IPNF Forest Plan identified westslope cutthroat trout, bull trout, and rainbow trout as potential management indicator species. Of these, westslope cutthroat trout and rainbow trout are known to use streams within the cumulative effects analysis area for this project.

3.F.2. Existing Conditions and Impacts to Aquatic Resources

Existing Conditions: Beneficial uses in streams of the area include salmonid spawning and rearing habitat, cold water biota, primary and secondary contact recreation, and drinking water. Prichard Creek (from its mouth to its headwaters) is identified as water quality impaired based on sediment, metals, and temperature. Prichard Creek is under an approved Total Maximum Daily Load (TMDL) for sediment (as part of the North Fork TMDL, February 2002; Specialist's Report on Aquatic Resources, p. AQ-8). The TMDL identifies coarse sediment as the pollutant of concern and identifies failure of riparian roads and sediment delivered at road crossings over streams as the primary sources of sediment. Past road decommissioning activities on National Forest lands has resulted in a 6 percent decrease in sediment yield in the Upper Prichard Creek watershed. During Forest Highway 9 reconstruction some removal of fish migration barriers has also occurred.

The upper Prichard Creek watershed was identified as "Not Properly Functioning" under the Coeur d'Alene Basin Geographic Assessment. The upper Prichard Creek subwatershed was identified as "Functioning at Risk" (see Specialist's Report on Aquatic Resources, p. AQ-2).

Westslope cutthroat trout have been identified in nearly all perennial fish-bearing streams in the Jo-Cat Resource Area. There is no set or sub-set of data that has identified bull trout populations in Eagle Creek, Prichard Creek, or North Fork Coeur d'Alene River. Confirmed and some unconfirmed reports of individual bull trout in Eagle Creek, the lowest reaches of Prichard Creek, and sections of the North Fork Coeur d'Alene River have been reported. The lower most portion (approximately 6-stream miles) of privately owned stream in Prichard Creek has been designated as critical habitat (Federal Register, October 6, 2004, 50 CFR Part 17). Viable populations of bull trout are currently not present within the cumulative effects area. White sturgeon, burbot, and interior redband are found to occur only in the Kootenai River system and therefore were given no further consideration with this project.

Under the No-Action Alternative, there would be no direct or indirect effects to aquatic resources since no activities would be implemented. Water yield and peak flow values would continue to decrease very slowly (by an average of about 1%) for the next 25 years as vegetation in the subwatershed recovers from past harvest. The subwatershed includes lands down to the mouth of Bear Gulch, past harvest within the resource area on National Forest lands has been very limited. Sediment yield values and trends would not change from existing predicted trends.

Under the Proposed Action, treatment activities would have little to no risk of measurable effects to water yields; the magnitude, intensity and duration of peak flows; and sediment yields in either the short or long term, and the risk to stream channel changes would be low to none (Specialist's Report on Aquatic Resources, pages AQ-19, AQ-22).

Table 10. Comparison of changes to aquatic resources (including activities on private lands).

Indicator	No-Action Alternative (% increase over existing)	Proposed Action Alternative (% increase over existing)
Effects of commercial harvest and resulting canopy openings on **water yield**	Upper Prichard Creek above Eagle 1% Upper Prichard subwatershed above Bear Gulch 1%	Upper Prichard Creek above Eagle 1% Upper Prichard subwatershed above Bear Gulch 1%
Effects of commercial harvest and resulting canopy openings on **peak flow**	Upper Prichard Creek above Eagle 0% Upper Prichard subwatershed above Bear Gulch 0%	Upper Prichard Creek above Eagle 1% Upper Prichard subwatershed above Bear Gulch 0%
Effects of commercial harvest and resulting canopy openings on **sediment yield**	Upper Prichard Creek above Eagle 0% Upper Prichard subwatershed above Bear Gulch 0%	Upper Prichard Creek above Eagle 1% Upper Prichard subwatershed above Bear Gulch 1%

** Upper Prichard watershed showed a 1% greater peak from the proposed action while the smaller subwatershed showed no changes in peak flow. This is the result of some recent tractor-based logging within the larger watershed scale, but downstream and outside the smaller subwatershed.*

The Proposed Action shows a maximum predicted sediment yield increase of 1% above existing in Upper Prichard Creek watershed and Upper Prichard Creek subwatershed. The increase in sediment as modeled is too small to show any measurable effects of sediment in these subwatersheds. There is 1.2 miles of new road associated with the Proposed Action. This road construction could potentially have a greater influence on the results of predicted sediment increases from WATSED compared to the harvest or burning of the units. However, the 1.2 miles of new road construction is far from any stream channel and even though sediment could be eroded and transported down-slope it would be filtered and deposited on the forest floor before reaching the nearest stream channel. Rolling dips would be constructed as prevention of rutting and a maintenance–free method of providing adequate drainage. There would be road reconstruction along Road 6006, with the construction of armored fords at 8 small headwaters stream crossings. Short term sediment delivery would likely occur at the crossings during construction. If a large precipitation event were to occur during or shortly after the reconstruction phase, additional sediment could be routed and delivered to the stream system. Over the long term, improved drainage features along the road surface would slightly reduce sediment and reduce chronic background sediment at the local subwatershed scale.

The risk of measurable sediment under the Proposed Action would be very low for both the larger watershed scale and the smaller subwatershed scale. If sediment increases were to occur, it would be localized only near treatment units and landings located on or near sections of Road 6006 with reconstruction activities. This relatively low level of treatment at the subwatershed scale, application of BMP's, and location of treatments far away from streams as buffered (INFS 1995, PF Doc CR-003) would prevent sediment from being routed down slope to stream channels or into the Prichard Creek. Sediment yield increases under the Proposed Action would not be great enough to cause measurable effects to water quality or impair beneficial uses. In the long term the proposed activities would have no measurable effects to water yield, sediment yield, and overall aquatic health.

Past mining activities altered the flow regime, disrupted natural bedload movement and altered fish habitat condition in much of Prichard Creek and its side drainages. Activities such as dredge and placer mining altered channel condition causing instability and reducing fish habitat and water quality. Hard rock mining constructed roads into side drainages along steamcourses and created contaminated waste rock that added sediment and elevated the levels of heavy metals. These historic activities were widespread and large scale. Mining still occurs today but it is at a smaller scale and modern mitigation measures are now designed into these projects to reduce impacts. Mine cleanup work such as reclaimation of the Paragon and Monarch mill sites has reduced loadings of heavy metals into the creek. This will have long term benefits to fish populations in the affected areas.

The Jo-Cat Resource Area is located up in the headwaters of Prichard Creek drainage. The project was designed with features to protect water quality and aquatic habitat. At the subwatershed scale, which is mostly upstream of the degraded stream segments, there were no measurable increases in sediment yield or water

yield. Based on the headwater location of the project area, and no measureable effects, activities under the Proposed Action would not contribute to the degraded conditions in the lower reaches of Prichard Creek as described above.

Cumulatively, the Proposed Action in conjunction with ongoing and reasonably foreseeable projects would not have any measurable effect to sediment yields. The direct and indirect effects of the Proposed Action on increased peak flow, combined with past, present, and reasonably foreseeable activities would not result in any cumulative effects at the subwatershed scale. Estimated water yield increases are within the historic range of variability for magnitude, intensity, and duration when compared with estimates for past natural events. Estimated peak flow increase would also not effect channel degradation or stream bank erosion. See Specialist Report on Aquatics and EA - Appendix A for more information on effects of past, ongoing and reasonably foreseeable projects on the aquatics resource.

The immeasurable, potential short-term increase in sediment yield, water yield, and peak flow changes may affect individual westslope cutthroat trout, but would **not** lead toward a trend in federal listing. Short-term effects of this project would have **no effect** on designated critical bull trout habitat in the lowest most reaches of Prichard Creek (Specialist's Report on Aquatic Resources, pages AQ-20. AQ-23).

3.F.3. Consistency with Policies, Laws and Regulations for Aquatics

Both alternatives are consistent with applicable Forest Plan standards for water and fisheries. Both would meet requirements of the Endangered Species Act. Based on the distribution of fish species across the Forest, the lack of connectivity between large watersheds, and the limited cumulative effects area, activities in the Jo-Cat Resource Area would not affect viability of any threatened, endangered, sensitive or management indicator fish species on the IPNFs.

Both alternatives would be consistent with requirements of the Clean Water Act. Sediment and metals (the pollutants of concern) would not increase in the water quality limited Prichard Creek drainage. Risk to beneficial uses in all streams of the Jo-Cat Resource Area would not be changed by implementation of this project.

3.G. Soils

3.G.1. Methodology Used for the Soils Analysis

Analysis of the soil resource was carried out utilizing aerial photography, geographic information system (GIS) data, the timber stand database (TSMRS), and the roads database. Hazards from erosion, mass failure, soil productivity, and landtype sensitivity were gathered from landtype descriptions in the Idaho Panhandle National Forests Land Systems Inventory (USDA 1999, PF Doc. CR-019 and SOIL-2; SOIL – Map Appendix, Maps 1 to 6). The proposed action was analyzed to identify those units that would require design modifications to achieve Regional and Forest Plan standards. Discrepancies of acres are possible due to rounding.

Proposed ground-based and other harvest units were field reviewed in 2006 by the Forest Soil Scientist to verify existing soil conditions by conducting the "Onsite Assessment Method" outlined in Niehoff (2002; PF Doc. SOIL-R-44). See soil assessment sheets/data (PF Doc. SOIL-1). Additional documentation of existing conditions are also provided for all units from the forester (PF Doc. SOIL-1). Within the Resource Area, no previous harvest activities were identified in the TSMRS record.

Data lists were developed for all proposed treatment units and summarize existing conditions that include acres of constructed or designated roads (PF Doc. SOIL-5). Potential disturbance for the soil resource was determined using Niehoff's (2002; PF Doc. SOIL-R-44) guidelines for soil NEPA analysis, the Soil Disturbance Spreadsheet (PF Doc. SOIL-7), and field verification (PF Doc. SOIL-1). The disturbance spreadsheet evaluates detrimental disturbance on proposed harvest units for each harvest method based on empirically derived coefficients that were obtained and averaged from numerous monitored sites throughout the Idaho Panhandle National Forests (Forest Plan Monitoring and Evaluation Reports, 1988, 1991, 1993 and 1997; PF Doc. CR-004, CR-007, CR-009, and CR-013). The disturbance spreadsheet is limited to the harvest and slash disposal methods for which coefficients have been determined and its coefficients assume that best management practices (BMPs) have been implemented since 1990. The disturbance spreadsheet does not account for changes in soil types or the recovery of soils over time from existing previous harvest activities, if

present.

Roads are considered a potential source for sediment delivery and are analyzed in detail in the Specialist's Report on Aquatics.

3.G.2. Existing Soil Conditions and Environmental Impacts

Landtypes and Hazard Ratings

Twenty-four landtypes have been identified and mapped in the Resource Area out of which 16 are in harvest units under the proposed action. Descriptions of each landtype, detailed acreages, and maps displaying landtypes and hazards are contained in the project file and the map appendix (PF Doc. SOIL-2, SOIL-3, SOIL-4; SOIL – Map Appendix , Maps 1 to 6). Hazard ratings have also been compiled and are listed in subcategories for mass failure, surface erosion, landtype sensitivity, and soil productivity. These are rated as low, moderate, or high for each landtype.

Table 11. Proportion of harvest activities associated with landtype hazards in Jo-Cat Resource Area.

Landtype Hazard	Low	Low to Moderate	Moderate	Moderate to High	High
Mass failure potential	85% 225 acres	0% 0 acres	14% 38 acres	0% 0 acres	1% 2 acres
Surface erosion potential	100% 265 acres	0% 0 acres	0% 0 acres	0% 0 acres	0% 0 acres
Landtype sensitivity	85% 225 acres	0% 0 acres	12% 32 acres	0% 0 acres	3% 8 acres
Soil productivity	0% 0 acres	20% 53 acres	76% 201 acres	4% 11 acres	0% 0 acres

Mass Failure Potential

Landtypes that exhibit moderate to high mass failure potential are located primarily on side slopes and within stream headlands with incised to steeply incised V-shaped drainages of high relief on concave mountain slopes. After field reviewing the short stretch of high mass failure potential along Road 6006, which has been in place for several decades without apparent degradation, the potential for soil mass movement is low while proper drainage remains intact.

Little research has been conducted to determine if partial cutting affects landslide rates. Megahan et al. (1978, PF Doc. SOIL-R-38) found that landslide occurrence increased only slightly when overstory canopy was reduced from 100 percent to 11 percent, but increased dramatically when canopy closure went below 11 percent. They also found that crown cover from shrubs affected landslide occurrence after 80 percent crown removal and indicated that landslide occurrence is more sensitive to shrub than tree crown removal.

Surface Erosion Potential

The majority of previous disturbances in the Jo-Cat area are associated with mining exploration and small test excavations that occurred in the 1960s and 1970s, but no further development occurred (PF Doc. SOIL-1). The soil disturbance accounts for approximately 3.3 acres of localized compaction and displacement scattered within some of the activity areas (PF Doc. SOIL-5) and is factored into the existing condition for each proposed unit as displayed in the Specialist's Report on Soils (Table SOIL-2).

All soil landtypes associated with the Proposed Action (265 acres) are rated low for surface erosion (Table SOIL-1; PF SOIL-3). The potential for soil erosion concerns on the Coeur d'Alene River Ranger District is not so much associated with harvest treatments as with existing roads (Cacek 1998, PF Doc. SOIL-R-7). The dominant processes in roaded portions are surface erosion from bare soil areas of roads, including the cutslope, fillslope, and travelway. However, Road 6006 is closed to motorized traffic use and has been stable over the past decades with little to no signs of degradation. A total of approximately one-third mile (covering about 1.1 acre) along the existing access Road 6006 is located on landtypes with a moderate subsoil erosion potential rating (SOIL – Map Appendix, Map 6). The area was reviewed during the field visit and does not show any degradation or concerns in regards to the proposed reconstruction of the existing road (also see

Specialist's Report on Transportation). Roads and their associated impacts are analyzed in detail in the Specialist's Report on Aquatics.

Landtype Sensitivity

There are 8 acres of landtypes in the Jo-Cat Resource Area that exhibit high sensitivity; these are situated primarily on low to mid-elevation side slopes and stream headlands associated with steep and deeply incised V-shaped drainages of high relief on straight to concave mountain slopes.

Soil Productivity

The soils found in the Jo-Cat Resource Area owe their productivity to excellent nutrient-holding capacities and other favorable characteristics provided by an ash layer. Organic matter content varies throughout the Resource Area (PF Doc. SOIL-1) but is generally optimum for all surveyed units, which are primarily south and west facing.

Coarse woody debris (CWD) was found to be variable as well (PF Doc. SOIL-1). Some stands contain higher amounts of down wood, generally on the moister west-facing slopes, pockets that were excluded from the 1910 wildfire, or sites that contain elevated tree mortality. Drier south-facing slopes and ridges have lower coarse woody debris levels that often reflect shallower soils or past wildfire activities. Decomposition may also be affected due to light and moisture variations under different canopy densities.

Soils susceptible to reduced productivity potential are generally those located on shallow, rocky steep slopes on southerly aspects. Removal of canopy can affect soil moisture content in several ways. Precipitation may enter previously intercepted areas and provide existing or establishing vegetation with additional needed moisture and increased decomposition rates. Conversely, rain events may increase erosion on the now exposed soil, especially if the potential is high, and reduce the availability of a growing medium. Furthermore, increased sunlight may also support plant growth or heat up soils to the extent that vegetation is inhibited.

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, PF Doc. SOIL-R-4; Frandsen and Ryan 1985, PF Doc. SOIL-R-15; Hungerford et al. 1991, PF Doc. SOIL-R-26; McNabb and Cromack 1990, PF Doc. SOIL-R-36). Project design features, such as increased tree retention, are expected to minimize this effect.

3.G.3. Impacts to Soils

Under the No-Action Alternative, there would be no new management induced detrimental soil impacts in the Jo-Cat Resource Area. Stands currently at high mortality risk would not be treated, which may increase infestation levels and associated risks of stand loss due to wildfire, severe burning, erosion concerns, and loss of soil nutrients. On a landscape scale, the promotion of healthy western larch and re-introduction of white pine would not occur. Timber stands would continue to harbor dead and infested lodgepole and move towards moderate to higher risks of considerable losses.

No direct effects to the soil resource would occur with No Action since there would be no road construction, logging, or fuel treatment activities (PF Doc. SR-06, page SOIL-10). There would be no compaction or displacement beyond what currently exists. 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. Indirectly, in moister habitat sites, the increase in organic matter is a benefiting function to overall soil productivity. In dry habitat types, increases of organic matter may result in a negative response. As the fire risk increases over time due to tree mortality and higher fuel loading, the introduction of weeds and unwanted flora following a fire could lead to higher competition between less desirable and native vegetation. In the absence of such a hot fire, nutrients would be retained on site.

Under the Proposed Action, direct effects of soil-disturbing activities would not exceed Forest Plan and Regional Soil Quality standards (PF Doc. SR-06, pp. SOIL-16, 17). The logging systems proposed for this project consist of a high percentage of skyline and helicopter yarding (76%). Based on past monitoring, this would result in an overall soil disturbance level of approximately 1 to 2 percent for each activity area, excluding existing disturbances (Table SOIL-3, PF Doc. SR-06). Tractor yarding (24%) can have the most detrimental effect to the soil resource. Features Designed to Protect Soils and Site Productivity (described in Chapter 2) would decrease the effect of ground-based yarding systems.

Because drainage courses and riparian zones are buffered and would not be entered or logged, the potential for increased sediment delivery from units on landtypes that exhibit high sensitivity would be minimal. As part of project planning, all drainage courses and riparian zones have a designated buffer zone as recommended by the Inland Native Fish Strategy; the buffer zone would not be entered by any proposed harvest activities. With established buffer zones, the potential sediment increases from fuel or timber management work would be minimal.

An area of moderate mass failure potential is identified below proposed helicopter Units 8 and 9 and within the drainage dividing 9a and 9b. The slopes are steep above and below the road and are of concern due to seepage in the cut slope and extensive pistol butting in the drainage that indicates creep, slope instability, and an increased potential for sediment delivery. A large number of trees, primarily lodgepole, are already dead and dying above the road prism. There is a greater mix of species in the lower portion of Unit 8. Since the proposed treatment would only harvest lodgepole pine trees, more residual canopy would be present in the moderate potential zone. The area associated with unit 9 is of more concern. However, treatment in Unit 9 would only be a salvage of dead lodgepole pine, with no green harvest and no prescribed fire treatments. Considerable canopy would still be present. The draw separating Unit 9 into subunits 9a and 9b would retain a no-harvest buffer. The seep in the road cutbank would also be buffered, which substantially reduces the concern in that area.

Mechanized felling would be permitted, if requested, in all tractor units and selected units where slopes do not exceed 45 percent (Units 2, 5a, 11d, and 12c), provided the equipment is operating on slash mats. The effect of using felling equipment in selected skyline and helicopter units was also analyzed. These units would still meet regional soil quality standards (Table SOIL-2, PF Doc. SR-06; PF SOIL-9).

The proposed vegetative management activities have the potential to cause soil disturbances, such as compaction and displacement, by affecting an estimated 15 acres (6 percent of treatment acres) as designed (PF Doc. SR-06, p. SOIL-11; PF SOIL-9). This would increase to 19 acres (7 percent of treatment acres) if mechanized felling occurs as described above. The construction or reconstruction of roads would have a detrimental effect to site productivity through compaction and displacement on approximately 3.6 miles (this includes approximately 2 miles of already existing road) or 13 acres (PF Doc. SR-06, p. SOIL-13; PF SOIL-5). Helicopter landings would account for another acre of disturbance (PF Doc. SR-06, p. SOIL-12). Combined, the disturbance would be approximately 1 percent of the Resource Area.

Indirectly, the occurrence of a high intensity wildfire would have a high potential for impacts to soils and soil productivity in severely burned areas, especially since the risk of soil erosion increases proportionally with fire intensity (Megahan 1990, p. 146; PF Doc. SOIL-R-37). The proposed vegetation and fuels treatment in the Resource Area would not necessarily prevent lethal wildfires from occurring, but would increase the ability to suppress such a fire should the ignition occur in the treated areas. Vegetation and fuel treatments would reduce the chance that a wildfire could have as severe of an effect on the soils in treated areas as it could in untreated areas because there would be a reduction in the tons per acre of dead and dying fuels on those treated sites (PF Doc. SR-06, pp. SOIL-10).

The Jo-Cat Resource Area is the cumulative effects boundary for the soils resource. Cumulatively, the percent of activity area disturbance on National Forest lands would range from 2 to 3 percent, including old mining exploration activities and Forest Highway 9. There are no ongoing or reasonably foreseeable activities identified for the Jo-Cat Resource Area (EA , Appendix A)

3.G.4. Consistency with Laws, Policies and Regulations Related to Soil Resources

The Features Designed to Protect Soils and Site Productivity (described in Chapter 2) would provide for nutrient protection (consistent with guidelines from the Intermountain Forest Tree Nutrition Cooperative) and retention of coarse woody debris (Graham et al. 1994, PF Doc. Soil-R-21). This would provide for the maintenance of soil productivity within the treatment areas. All harvest units, including past and proposed disturbances, would meet regional soil quality standards The Proposed Action would comply with Forest Plan standards (PF Doc. CR-002, pages II-32 and II-33) and Regional Soil Quality Standards (USDA 1999, PF Doc. SOIL-R-58) related to detrimentally disturbed soils (Table SOIL-2, PF Doc. SR-06).

3.H. Wildlife

3.H.1. Methodology Used for the Wildlife Analysis

The analysis of wildlife included effects on eight species: Gray wolf, Canada lynx, black-backed woodpecker, wolverine, northern goshawk, pileated woodpecker, pine marten, and Rocky Mountain elk. The analysis was based on Forest-wide wildlife habitat suitability (HSI) models that used information related to habitat type, size class, past activities, forest type, elevation, basal area, and number of trees above a specific size class (Specialist's Report on Wildlife, p. WL-8). Data used in wildlife habitat suitability models was validated for each species. Conservation Assessments provided management recommendations and guidelines to assist in maintaining suitable habitat. This information, in conjunction with site visits and scientific literature, is used to assist in planning and in developing project design features that minimize or avoid effects to wildlife and their habitat (Specialist's Report on Wildlife, p. WL-2 through WL-9).

3.H.2. Existing Conditions and Impacts to Wildlife

The analysis revealed that there would be no significant impact to any of the eight species considered, and there would be no loss of viability to populations or species. The table below briefly identifies the species' status and their probability of occurrence in the Jo-Cat Resource Area, and provide a synopsis of the direct and indirect effects to each wildlife species. The determination of effects (shown in bold for each species) considered the cumulative effects as well; further discussion is provided after the table. Cumulative effects to each species is provided in the Specialist's Report on Wildlife.

Table 12. Existing Conditions and Direct and Indirect Effects to Wildlife Species.

Species	Status	Existing Probability of Occurrence
Effects Under the Alternatives		
Gray wolf	Endangered	Moderate: A transient wolf could use the area, but there is no known pack activity in or around the resource area.
Under the No-Action Alternative, there would be no change in elk habitat (elk provide a prey base for wolves). Under the Proposed Action, elk habitat effectiveness would be reduced during activities, but would return to existing levels after activities are complete. Under either alternative, viability of the species would be maintained, since the goal has been met to have 30 breeding pairs well distributed throughout 3 states for 3 successive years. ***The Proposed Action may affect but would not adversely affect the gray wolf or its survival.***		
Canada lynx	Threatened	Moderate: Forage and denning habitat exists, but there have been no recorded observations of lynx in the Jo-Cat Resource Area.
Under the No-Action Alternative, no habitat would be changed to unsuitable habitat. Under the Proposed Action, the low quality forage (capable) habitat would be reduced by 92 acres (which would become pre-forage habitat for the next 25 to 30 years at which time it would provide high quality forage). Under either alternative, the existing high-quality lynx habitat would be maintained, and the resource area would continue to provide low quality forage habitat for the next 25 years. In 25 to 50 years, some of the low quality forage stands would provide large-diameter downed wood for denning habitat. Mortality in lodgepole pine could also provide denning habitat. ***The Proposed Action may affect but would not adversely affect the lynx or its survival.***		
Black-backed woodpecker	Sensitive	High: In addition to beetle-infested lodgepole, high quality habitat created by recent wildfires is available to the black-backed woodpecker. The Revett fire (2 miles south of resource area) created 97 acres of black-backed woodpecker habitat, and the Ulm Peak fire (18 miles north of the resource area) created 4,000 acres of high quality burn habitat for the black-backed woodpecker.
Under either alternative, beetle-killed trees would continue to provide foraging habitat, although some habitat would be reduced with the proposed action. Harvest activities would treat approximately 1/3 of the stands with beetle mortality present, however the highest mortality areas outside of the roadless areas would be treated. These units would still provide a mix of other species after harvest, some of which would be scorched during burning operations and provide a source of forage. Snags across the resource area would meet or exceed Region 1 snag protocol. Treatments that promote larch over the long term would eventually benefit the woodpeckers because larch are a preferred species and provide a long lasting snag on the landscape. ***The Proposed Action may impact black-backed woodpecker individuals or habitat, but would not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***		

Table 12. Existing Conditions and Effects to Wildlife Species, continued.

Species	Status	Existing Probability of Occurrence
Effects Under the Alternatives		
Wolverine	Sensitive	Moderate: The resource area provides some prey, denning, security, and travel habitat for wolverines. Wolverines are likely a sporadic traveler through the area and may occasionally cross the resource area enroute to winter range lower in the Prichard Creek drainage in search of available carrion.
Under the No-Action Alternative, potential stand-replacing fires could decrease cover over the long term. Under either alternative, elk populations would be maintained, so there would be no change in potential food sources for wolverine. There would be no increase in open roads under either alternative, and therefore no increase in the risk of trapping. Viability would be maintained because security patches are provided in the Coeur d'Alene Mountains (Maple Peak Roadless Area) and large patches of refugia are available in the Glidden Roadless Area of the Lolo National Forest. Based on past occurrence of wolverine, presence of potential denning habitat, current recreational use of the area, maintenance of big-game populations, presence of roadless area, and the amount of disturbance predicted, activities ***may impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.***		
Northern goshawk	Old-growth management indicator species	Low: Lack of suitable habitat in the resource area due to the small amount of the seedling/sapling and mature/old components. No goshawks have been sighted in the vicinity of the resource area.
Under the No-Action Alternative, there would be no short-term effects or changes. Over the long term, natural mortality would result in snag and downed log recruitment. Under the Proposed Action, thinning to promote larch would trend trees toward a larger diameter over time and result in the necessary large structure component that is currently absent in the Jo-Cat Resource Area. Prescribed fire activities could enhance forage habitat for goshawks. Under either alternative, habitat would continue to be low in both quality and quantity. Adhering to Region 1 snag protocol (which exceed standards of the 1987 IPNF Forest Plan), maintaining 10 percent old growth across the IPNF, and implementing the design features identified in Chapter 2 would ensure the viability of the goshawk. There is little suitable habitat in the resource area, goshawks are not known to currently nest in the vicinity, activities would not preclude goshawk nesting in the area in the future, and viability across Region 1 is assured. However, since a slight chance that an undetected nest could be lost during activities, the proposed action ***may impact individuals but would not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***		
Pileated woodpecker	Old-growth management indicator species	Moderate: Preferred habitat components of ponderosa pine and large-diameter snags are lacking in the resource area.
Under the No-Action Alternative, there would be no short term effects or changes. The area would continue to be inherently low in habitat for pileated woodpeckers, due to the lack a mature/old forest component, for the next 50 years. Under the Proposed Action, all but 3.5 acres of pileated woodpecker snag habitat would be retained in the Jo-Cat Resource Area. Snags and scorched trees resulting from prescribed fire would provide additional nesting and foraging habitat. Activities ***may impact individual pileated woodpeckers or their habitat, but would not likely contribute toward federal listing or cause a loss of viability to the population or species.***		
Pine marten	Old-growth management indicator species	High: Good to marginal habitat capability for martens in the resource area due to allocated old growth and roadless area.
Under the No-Action Alternative, there would be no short- term effects or changes, and there would be no impact to pine marten. If no disturbance occurs, immature stands would trend toward maturity and provide suitable habitat in 50 years. Under the Proposed Action, there would be a slight (25-acre) reduction in current levels of good to marginal pine marten habitat. This represents a 2 percent change from the current amount of habitat in the resource area. Openings within the resource area as a result of harvest could increase prey for the marten for the short term. ***The activities would not contribute to a trend or loss of viability to the population or species.***		
Rocky Mountain elk	Big-game management indicator species	High: Elk habitat potential for the elk habitat unit is 56%, which is below the Forest Plan goal of 65%. Within compartment 198 the elk habitat potential declines from 58% to 56%, then returns to 58% after closure activities. Cover and forage are not limiting factors within the area.
Under the No-Action Alternative, there would be no short-term changes to elk habitat. Under the Proposed Action, elk habitat potential would be reduced during activities (due to the road construction and reconstruction) even though the road would be gated. Post sale, after installation of earth barrier elk habitat potential would return to current levels. Security would be reduced slightly during activities but would return to existing levels after permanent road re-contouring closures.		

The cumulative effects analyses considered past, proposed, ongoing, and reasonably foreseeable activities. For each wildlife species analyzed, the cumulative effects analysis area was identified based on the species' or guilds' relative home range size in relation to available habitat, topographic features that affect how species move and utilize their home range (such as watershed boundaries), and boundaries that represent the furthest extent of effects (p. WL-10). Maps depicting these wildlife analyses areas are provided by species in the project files (PF Docs. WL-4, WL-12 through WL-14, WL-17 through WL-19, WL-22, WL-23, and WL-31).

The following summarizes cumulative considerations for wildlife. Historically, early mining at the turn of the century in the Prichard drainage resulted in impacts to wildlife. Mining brought human settlement to the drainage. Road building also occurred simultaneously. Human settlement and roads probably resulted in direct loss of animals (i.e. shooting or trapping), particularly large carnivores such as bears, wolves, lions and lynx. Habitat loss associated with this early human settlement and mining activity also resulted in impacts to wildlife. Between 1940 and 1990, logging in the Prichard drainage reduced snag numbers, and some loss of late successional habitats. Improvements to Forest Highway 9 have resulted in a barrier to movement of large ranging species. However, since the road is not plowed in winter, wolverine and lynx can still move freely across the landscape during the winter. Travel routes and security would be maintained over the long term in and adjacent to the resource area.

3.H.4. Consistency with Policies, Laws and Regulations for Wildlife

The No-Action Alternative would be consistent with Forest Plan standards and other applicable laws and regulations because no activities would occur to impact wildlife. The Proposed Action would be consistent with Forest Plan standards and Endangered species Act requirements for the management and protection of wildlife and species based on the location, timing, and treatment methods proposed (as described in Chapter 2, Alternative Descriptions and Features Designed to Protect Wildlife Resources).

3.I. Recreation

3.I.1. Methodology Used for the Recreation Analysis

Determination of the existing conditions for recreation activities, facilities and opportunities is derived from facility inventories, facility maintenance work, observation by recreation specialists and technical personnel, and contact with recreation user groups and individuals. Guidance for management of recreation resources is provided in various National Forest manuals and handbooks, as well as professional publications and documents. Forest Service Recreation Planners also make use of the Recreation Opportunity Spectrum (ROS) as a framework for understanding recreation facilities, opportunities and settings to meet the visitor's needs for a desired set of outdoor recreation experiences.

Each Inventoried Roadless Area is described in detail in the Idaho Panhandle National Forests Plan (FEIS, Addendum to Appendix C, Roadless Area Evaluation). The analysis area studied for effects is the individual Inventoried Roadless Area. Effects on Inventoried Roadless Areas only occur within that area. The roadless area boundaries are established by the Idaho Panhandle National Forest Plan. The Forest Plan direction for management of this area is to provide an opportunity for semi-primitive recreation. Alterations to the IRA boundary can only be approved by the Forest Supervisor (36 CFR. 219.10) and occur during the forest planning or Forest Plan revision process.

3.I.2. Existing Conditions and Impacts to Recreation

Existing Conditions: The only recreational development within the Jo-Cat Resource Area is approximately 2.5 miles of Stateline Trail #7. This trail is a component of the Centennial Trail system, which begins in the Teton Mountains and follows various trails north to the Canadian border. Within the resource area the trail is a single tread route that is located west of the state line divide. This segment of trail runs from Thompson Pass, at 4,860 feet elevation, north to the Maple Peak Roadless Area at 6,100 feet elevation. The trail is open to motorized trail bikes at a very difficult level and is also difficult for horse riding. The 8,674-acre Maple Peak Inventoried Roadless Area #1-141 lies along the north boundary of the Jo-Cat Resource Area. Approximately 369 acres of the roadless area is within the boundary of the Jo-Cat Resource Area.

Effects under the No-Action Alternative: There would be no short- or long-term direct or indirect effects to

recreation opportunities, settings or facilities. Travel along the Stateline Trail would continue as presently managed. Fire risk in the Jo-Cat Resource Area is increasing due to widespread beetle mortality. In the event of a large-scale fire, the trail could be burned over. The Maple Peak Roadless Area would not be affected.

Effects under the Proposed Action: Direct and indirect effects of the proposed activities would be mostly temporary in nature. Harvest activities and burning of woody debris would be of short duration and have only a short-term effect on the recreational setting of the area. The harvest and burning combined would have a minor effect on the community recreation and tourism plans but could, through the temporary effects of short-term trail closures and smoke during burning operations, cause people to avoid the area for a short time. Hunting in the area may be disturbed in and near logging and burning operations. Log haul would increase traffic on roads, warranting additional care for travelers during the operational period, however this would be limited to the junction with Forest Highway 9 since Road 6006 would not be opened to public motorized use. There would be some noise disturbance with the logging activity, especially helicopter operations. However, some noise disturbance from vehicles is already common in the area due to trucks ascending and descending the steeply-graded Highway 9. There would be no effect on winter season travel by snowmobiles other than the remote possibility that an operator might plow snow from Forest Highway 9 for a short period immediately after the Shoshone County Highway Division terminates plowing for the season.

Timber harvest within a portion of Units 2, 4, 5, and 6 would have a direct effect on Trail #7. This trail would be considered a protected improvement under the timber sale contract. The purchaser would be required to repair any damage to the trail tread (using hand tools) and remove any logging slash from the trail. Since trail use is generally low, the trail would be closed when felling or yarding activities are within 200 feet of the trail, or when logs are being flown across the trail. This closure would only be allowed on weekdays; the trail would be re-opened to the public on weekends and holidays. Because there are other trail routes available in the Thompson Pass area, impact to the public is expected to be minor. (Refer also to “Features Designed to Protect Recreation Facilities” in Chapter 2.)

There are no proposed activities within the boundaries of the Maple Peak Roadless Area. Roads within the area will not contribute to incursion of ATV’s and other vehicles into or near the roadless area, because public motorized use would be prohibited in accordance with CFR regulations during sale activities and reinforced with a gate. After activities, road recontouring in two places would physically block access. Units 8 and 15 are located adjacent to the roadless area. Some low intensity fire could enter the roadless area, but it is expected that light fuels and natural fuel breaks would limit fire incursion to a distance of less than 200 feet. Fire fuels management is fully compatible with management direction for roadless areas.

Cumulative effects of the actions proposed for the Jo-Cat Resource Area on Recreation facilities, opportunities and settings are negligible. Temporary disruption of the use of Trail #7 is the only measurable effect which in turn would have no measurable effect on recreation activities in other locations. During operations within the Jo-Cat area, recreation trail hiking opportunities will be available on the Revett Lake Trail 7 and the Blossom Lakes Trail 404. Both are immediately south of Thompson Pass. Trail riding opportunities for motorcycles remain available at the Granite Peak Trail 140 located 5 miles west on Forest Highway 9.

3.I.4. Consistency with Policies, Laws and Regulations for Recreation

Both alternatives would be consistent with Forest Plan standards and other regulations regarding protection of recreation facilities and opportunities, and regarding roadless areas.

3.J. Scenery

3.J.1. Methodology Used for the Scenery Analysis

Scenery management direction is provided by the Forest Plan and is described in terms of Visual Quality Objectives. The objectives are based on the area seen from sensitive travel corridors and on other features that result in a high visual sensitivity level. The visual management system was revised in 1995, and is now known as the Scenery Management System. The revised guidelines are provided in "Landscape Aesthetics: A Handbook for Scenery Management," (USDA Forest Service, 1995).

3.J.2. Existing Conditions and Impacts to Scenery

Existing Conditions: The Forest Plan has designated Forest Highway 9, the Thompson Pass parking area, and Stateline Trail #7 a rating of Sensitivity Level 2, which means that the portions of the Jo-Cat Resource Area that can be seen from these locations must be retained as *partial retention* for foreground views (human activities may be evident, but must remain subordinate to the characteristic landscape) and as *modification* for middle-ground and back-ground views (management activities may visually dominate the original landscape features; however, activities of vegetative and landform alteration must borrow from naturally established lines, form and color at such a scale that the managed areas mimic the surrounding landscape character).

The location where scenic integrity is of greatest concern is the view of the landscape to the west of the Thompson Pass parking area. From this stopping point on Forest Highway 9, Cat Creek and surrounding ridges are highly visible. The Jo-Cat Resource Area forms part of this scene as a middle-ground view. The remainder of the views includes Prichard Creek valley and the slopes of Maple Peak and Round Top forming background views. There is much evidence of human development, the most obtrusive being the large highway road-cut in Cat Creek. Also visible is the natural gas pipeline corridor in Prichard Creek valley.

The present Forest Plan was developed in 1987, since which time Forest Highway 9 has been reconstructed and paved and a large turnout created at Thompson Pass. Traffic on the highway (particularly tourism travel) has increased substantially. As a result, views from Thompson Pass are regarded with more sensitivity than provided for in the Forest Plan.

Effects under the No-Action Alternative: With no proposed activities, there would be no direct or short-term effects to the scenic condition of the area. However, beetle mortality is evident with numerous large patches of red trees. This red appearance is an "eye-catcher" in terms of not the expected green background appearance when looking across the forest terrain. This would likely continue for several years. Eventually, as mortality declines and needle shed occurs, the green background vegetation becomes more apparent. Large concentrations of dead trees may give the general appearance of unhealthy forest conditions. Over the long term, increasing vulnerability to wildfire in the area may bring detrimental changes to the scenic conditions (such as blackened landscape, loss of vegetation, etc.).

Effects Under the Proposed Action Alternative: The Jo-Cat units which are visible from the Thompson Pass viewpoint fall within the Forest Plan visual quality object of *modification*. With this designation, management activities may visually dominate the original landscape features. However, activities of vegetative and landform alteration must borrow from naturally established lines, form and color at such a scale that the managed areas mimic the surrounding landscape character. The modification standard would be met.

Unit 5 would be partially seen as an opening in the tree line to the northeast of the Forest Highway 9 road grade. Units 8 and 9 would be very visible. Unit 8 would form a new opening in the timber cover with 90% of the trees removed; nevertheless the units would meet the VQO of *modification* because they appear as natural opening and are in scale with other human developments in the area. With the design to leave trees of other species in the lodgepole pine removal units, these harvest openings are expected to approach *partial retention* at the landscape level due to absorption qualities of the surrounding landscape. Unit 9 and all other salvage or overstory removal harvests would be barely noticeable.

Units 11, 12 and 13 would be located along the crown of the divide ridge between Jo Creek and Cat Creek. Portions of these units would be visible from Thompson Pass. Unit 11 would appear as an opening that is in scale with and mimics other natural openings in the visible landscape. Unit 12 would be thinned and would blend in very well with larger natural openings in the immediate backround and front ground. Unit 13 is

another unit that would be mostly cleared of trees but would fit in well, with substantial natural-appearing openings surrounding the unit.

Units 14 and 15 would appear as distant background openings that blend in with the large rock fields and timber free openings on the high ridge southwest of Maple Peak.

The road constructed to access Units 10, 11, and 12 would be visible as small breaks in the tree cover. The road would be visible within Unit 11, as enough ground would be exposed to reveal it. The visual effects would be lessened by the gentle slope over which the road would be built. The result of road construction on lesser slopes is that most of the road cut would not be visible. A good example of a visually dominant and immediately noticeable road cut on very steep land is the highway cut in the Cat Creek drainage (Scenery Appendix A).

Of lesser concern is the view that some units would present to vehicles traveling Forest Highway 9, eastbound. In this case the vehicles would be moving at an average highway speed of 45 miles per hour. In order of appearance, a portion of Unit 11 would be visible with its more open character for a short period. The partial harvest of Unit 12 would be visible for a longer period of time but would not be that noticeable to the traveler. Unit 13 would appear as an opening that is softened by natural openings just to the south. Unit 16 is a proposed thinning unit that would be noticable off to the side, but due to the residual tree component would meet *partial retention* along the highway. Treatment units 1, 2, 3, and 7 are all commercial thin harvest and would meet *partial retention*.

Units 8 and 9 are probably of the greatest impact to observers traveling east. To a vehicle ascending the steep grade up Cat Creek, these units would appear in the windshield for about 30 seconds. Unit 9 would have some timber salvaged within it and Unit 8 would be an opening in the tree cover. The *modification* VQO would still be met because the shape and size of the opening would resemble natural forms existing in the area, with one exception. The top of Unit 8 would be adjacent to the Maple Peak roadless boundary (no harvest would occur in the roadless area). This would result in a straight mid-slope line edge, although somewhat lessened by a finger ridge crown in the middle. Over time, this edge is expected to soften as the beetle mortality within the roadless area begins to fall. Some fire encroaching into this area during burning operations may help to expedite the softening of this timber edge.

One other point of scenic concern is the effect of logging and fire line construction in Units 4, 5 and 6 upon the view from Stateline Trail # 7. Features have been designed into this project to minimize visual impacts along the trail (Chapter 2). The units present a foreground view from points on the trail that are within or near them. The VQO for these viewpoints is *partial retention.*

Units 2 and 6 are thinning treatments that would enhance the variety of the scenery by creating a more open stand of forest as opposed to the dense stands that surround this trail in most other locations. Units 4 and 5 would be cleared openings which for a short period (less than three years) would detract from the scenery, but over time the clearings would bring some scenic diversity by creating views out of the dense timber. The proposed harvest would generally leave all trees of other species in these units, providing an irregular arrangement of trees. Though more open, the result is expected to meet *partial retention* objectives. Of the 2.6 miles of Trail #7 that is within the Jo-Cat Resource Area, approximately one-quarter mile would be affected by adjacent treatment; this would be scattered over three separate locations so transitions would not take long periods.

Cumulatively, the collective scenic effects of the Proposed Action would be negligible and would follow similar patterns created by the beetle mortality over time. An ample amount of heavily forested lands would be retained in the Jo-Cat Resource Area and the landscape in the general vicinity has similar features with natural and man-made openings. Refer also to the “Features Designed to Protect Recreation Facilities” in Chapter 2.

3.J.3. Consistency with Policies, Laws and Regulations for Scenery

Both alternatives would be consistent with Forest Plan standards and other regulations regarding protection of scenic resources.

3.K. Finances

3.K.1. Methodology Used for the Financial Analysis

Different revenues and costs are associated with the management activities under the action alternative. To arrive at the expected stumpages a computer program was used to determine the potential stumpage (i.e. gross bid values) of timber harvested. The program runs a regression equation called the Transactions Evidence (TE) appraisal model, used for appraising actual timber sales. The TE appraisal method predicts the value of timber (referred to as stumpage) through the use of several independent variables developed from recent similar sales within Region 1 of the Forest Service (northern Idaho and western Montana). Since the information used is from actual bidding, current local market conditions and production costs for logging and milling are reflected in the predicted rate. Actual District costs were used for fuel reduction, site preparation, planting, new road construction, reconstruction, temporary road construction, maintenance, and erosion control. (See project file, Finances, for all unit information, logging systems and costs.) These direct costs are deducted from the expected stumpage value. Financial efficiency considers anticipated costs and revenues that are part of Forest Service monetary transactions. The financial efficiency of a timber sale is considered separate from other costs associated with NEPA analysis, sale preparation, sale administration and activities outside of the timber sale.

3.K.2. Financial Consequences

Direct and Indirect Effects: Under the No-Action Alternative, there would be no timber harvest, road construction or reconstruction, fuels reduction and site preparation burning, planting, or hand fuelbreak treatments. There would be no monetary costs or revenues associated with this alternative outside of preparation of the NEPA document.

The Proposed Action would result in the harvest of approximately 3,300 CCF of sawtimber. The financial analysis indicates that the sale of this timber would generate more than enough funds to cover reforestion and fuels reduction activities, as shown by the summary of the financial appraisal in Table 13. Pulp and roundwood (trees less than 7-inch diameter) material were not added to the table since they do not carry much value. The predicted high bid uses the stumpage value of timber removed (based on size, species and volume, planned yarding methods such as helicopter, skyline, tractor, and hauling distance), then deducts the contractual costs (fuel treatment, road costs, erosion control) from the value of the timber. A roll back factor is subtracted to lower rates to improve the likelihood of sell. The minimum bid is then determined by adding in the cost of reforestation. This is the minimum that would be accepted for the timber so that the costs of reforestation and fuels reduction are protected by the value of the timber.

Table 13. Predicted high bids, value and timber volume.

	No Action	Proposed Action
Total estimated CCF (sawlog)	$0	3,300
Predicted High Bid ($/CCF)	$0	$26.15
After roll back factor	$0	$-5.55
Minimum rates	$0	$15.05
Minimum advertised value	$0	$49,819

Table 13 portrays the following items: The predicted high bid is above the minimum rate. The appraisal program is predicting a bid above the minimum needed to cover reforestation and fuels reduction costs. When the roll back factor is added, the rates drop negative. This means that the economics of the Proposed Action are border line (there is not as much cushion as we would like between expected bid and what is needed to complete reforestation and fuels treatments). However, the predicted high bid for the proposed action is over the minimum rate needed for reforestation. This means that if the TE appraisal system is predicting correctly, the bid value of the timber (including all costs against it) would more than pay for the needed reforestation work. Hence, a viable timber sale offering is expected as designed under the Proposed Action.

Table 14. Projects Funded by Other than a Timber Sale

Projects	No Action	Propose Action
Fuels reduction burning Units 1,3,16	$0	$10,904
Hand fuels treatments below Highway 9	$0	$15,000

Costs associated with the prescribed burning of Units 1, 3, and 16 would be funded with hazardous fuels reduction (HF) dollars due to their proximity to Forest Highway 9. These areas are within the Secondary Resource Protection Zone identified in the Shoshone County Fire Mitigation Plan. These dollars are not tied to the timber sale, but would use appropriated HF dollars that are available to the District every year. The funding for the hand fuels treatments below Forest Highway 9 would also come from HF dollars.

In order to achieve the purpose and need for this project, a viable timber sale proposal is the best financial solution. A timber sale can place treatments where they would have the most benefit, harvest can recover the value of dead and dying timber, meet forest product demands, reduce stocking levels, and reduce long term fuel loads. This can be accomplished using the value of the timber to finance the activity.

An indirect effect of the proposed action is that jobs and income associated with the alternative may bring the local economy some increased relative stability during the life of the project.

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 analysis focuses on the direct and indirect effects of proposed activities. Past, present and reasonably foreseeable activities on National Forest, Bureau of Land Management and other lands within the local area would probably not have an effect on the economics issues for the alternatives. However, slightly lower helicopter yarding bids might be possible if helicopter yarding is occurring nearby. One possible cumulative effect of this project may be improved financial viability of projects in the Resource Area in the future. By extending the road under the proposed action, more economically feasible vegetative treatment options may be possible if needs arise in the future.

3.K.3. Consistency with Policies, Laws and Regulations for Finances

Forest-wide goals, objectives and standards for finances are not specifically addressed in the Forest Plan. This issue was addressed indirectly in the discussion of community stability. Chapter II of the Forest Plan states, “management activities will continue to contribute to local employment, income, and lifestyles. The Forest will be managed to contribute to the increasing demand for recreation and resource protection while at the same time continuing to provide traditional employment opportunities in the wood products industry.” (Forest Plan, p. II-11.) The Proposed Action would meet this direction.

APPENDIX A
PAST, ONGOING AND REASONABLY FORESEEABLE ACTIVITIES

Introduction

In *Lands Council v. Powell*, the U.S. Court of Appeals for the 9th Circuit held that, under the circumstances presented in the case, proper cumulative impact analysis required some cataloging of past projects and their effect on the current project area. Furthermore, such cataloging should provide sufficient detail to allow for analysis of the differences between prior projects and proposed projects, which could provide the information necessary to consider alternatives that might have less impact on the environment. Within the EA we have provided information of relevant past, present and reasonably foreseeable projects/activities that have occurred, are occurring, or are proposed to occur within each of the resource cumulative effects areas examined in this analysis (EA Appendix A). A discussion of the effects of these past, ongoing, and reasonably foreseeable activities has been provided to promote an informed assessment of environmental considerations and aide in assessing whether one form or another of harvest would assist in meeting the project's purpose and need for action with minimal environmental harm.

The Council on Environmental Quality (CEQ), whose responsibility it is to coordinate federal environmental efforts and work closely with agencies and other White House offices in the development of environmental policies and initiatives, provided guidance to federal agencies on the consideration of past actions in cumulative effects analysis (CEQ Memorandum to the Heads of Federal Agencies regarding Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, June 24, 2005; PF Doc. CR-026). CEQ stated that "the environmental analysis required under NEPA is forward looking, in that it focuses on the potential impacts of the proposed action that an agency is considering. Thus, review of past actions is required to the extent that the review informs agency decisionmakers regarding the proposed action," (CEQ memo, p. 1) They further state, "Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historic details of individual past actions" (CEQ memo p. 2). Cumulative impact is defined in CEQ's NEPA regulations as the "impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions…" (40 CFR 1508.7). CEQ has interpreted this regulation as referring only to the cumulative impact of the direct and indirect effects of the proposed action and its alternatives when added to the aggregate effects of past, present, and reasonably foreseeable future actions (CEQ memo p. 2).

With respect to past actions, during the scoping process and subsequent preparation of the EA, the Forest Service determined what information regarding past actions was useful and relevant to the analysis of cumulative effects. While CEQ found that cataloging past actions and specific information about the direct and indirect effects of a past project's design and implementation could in some contexts be useful to predict the cumulative effects of the proposal, the regulations do not require the Forest Service to catalog or exhaustively list and analyze all individual past actions (CEQ memo p. 3).

The EA has provided a description of known past activities and their effects; however due to the marked difference between past and current land management practices and policies, this analysis did not further aide in assessing whether one form or another of the proposed activities would assist in meeting the project's purpose and need for action with minimal environmental harm. The evolution that has occurred in land management practices (specifically related to roads and timber harvest) is the result of science and our ongoing monitoring actions.

On the IPNFs, early to mid-20th century **road construction activities** focused construction mainly through river valleys, riparian areas, floodplains, and adjacent hillsides. The roads efficiently provided access but decreased the land's effectiveness as wildlife habitat and constricted stream channels, providing a new avenue for erosion and discharge of sediment into streams. Roads on national forest lands often were simply an expansion of existing trails and paths that provided access so that they would accommodate newer equipment and current land uses. In some situations, roads were developed on abandoned railroad beds. In both cases, the location and design were predetermined from the previous use and era. As time progressed, roads were "designed" and located to achieve their primary purpose, which was to provide access and haul product at a minimal cost. In the decades following World War II (1950s –'70s), the road network was rapidly expanded to support the domestic need for lumber in housing construction.

Over the last twenty years, both road design and location have evolved as necessary tools to not only provide efficient access; but also to protect the valuable watershed resources they encroached upon. Forest Service

Best Management Practices (FSH 2509.22 Soil and Water Conservation Practices Handbook) have been incorporated into road construction/reconstruction activities on the forest. Road surfacing (gravel, etc.) was incorporated to not only provide better trafficability; but also to prevent and control erosion from the road surface. Road controls are now being incorporated into designs that reduce the erosive flows in ditches by providing frequent cross-drains to relieve ditch flows, avoid water movement down the road by dispersing the drainage quickly by crowning or outsloping the road surface; stabilize ditches by lining; dispersing drainage water that often carries sediment onto stable, forested slopes before ditches discharge into waterways; and allow new and existing stream crossings to safely pass extreme events (such as a 100-year flood event).

Special construction techniques and designs have been utilized (i.e., full- or partial-benching of roads) to avoid unstable side casting of waste materials; windrowing clearing slash to prevent sediment delivery to streams from construction activities themselves as well as from erosion of road fills and treads that are not yet protected with erosion control vegetation. Some roads now are designed to take advantage of the non-uniformities of the slopes they cross by "rolling grades" and grade breaks to prevent the potential for accumulations of water or excessive ditchflows that have destabilized the road bed or cause surface erosion in the past. Designers and planners develop road networks that avoid highly erosive or unstable slopes utilizing the *land system inventory*, hydrologists, soil scientists, and geotechnical engineers.

Road crossings are being located at more stable sites and crossing designs are now considering water quality and fish passage as primary design criteria, rather than criteria that just account for costs and traffic efficiency. Roads are being located well away from streams and their riparian areas where ever practicable; and the number of crossing sites is being minimized. These features are in stark contrast to past road locations that sometimes resulted in chronic sources of sediments, extended exposure of streams to direct sunlight resulting in temperature elevations, and nearly permanent reductions of the replacement sources of the structural components of streams and aquatic cover, riparian deadfall.

In the past, when a road's utility ended, the road was simply abandoned. These abandoned roads have been a substantial water quality and slope stability issue as they have deteriorated, especially without any maintenance. Current practice is to restore key abandoned or no longer useful roads to a "hydrologically neutral" condition where its remnants are self-maintaining and are no longer disturbing slope stability or the movement of slope water, either on or below the soil surface or the natural functions and adjustments of streams, wetlands, and other water bodies.

Impacts to forest water and soil resources from logging practices and road activities have also been reduced over the past 20 years with the introduction of Best Management Practices (BMPs) and Inland Native Fish Strategy (INFISH) management direction. Based on research studies, current BMPs and INFISH Riparian Habitat Conservation Areas (RHCAs) can reduce sediment yields compared with historical practices (Lee et al 1997, p. 1346, PF Doc. DN-R71; USDA 1995; PF Doc. CR-003).

In 1972, Section 208 of the Clean Water Act Amendments established the regulatory framework for non-point source pollution control thorough use of BMPs. BMPs are defined in Idaho as a practice or combination of practices determined to be the most effective and practicable means of preventing or reducing the amount of pollution generated by non-point sources (IDAPA 20.02.01). BMP monitoring is annually conducted by the forest to validate the implementation and effectiveness of BMPs associated with land management activities. Monitoring results are used to adapt future management actions where improvements in meeting water quality objectives are indicated. Forest monitoring of BMPs indicates that in most cases they continue to function as expected and are meeting their intent (IPNF 2002, 2003; PF Doc. CR-018 and CR-022).

At the time the IPNF Forest Plan was written (circa 1987), the emphasis was on developing a commodity production strategy while minimizing impacts to watersheds and aquatic resources, including fish. The strategy for watershed management was constructed in the Forest Plan as a "maintenance" objective. In some situations, thresholds, or "minimum impact" standards defined the criteria for maintenance. To ensure that watersheds and aquatic resources were maintained during forest management activities, BMPs were applied. Despite the existing forest plan standards and BMPs, the condition of fish habitat on the forest was declining, primarily due to timber harvest and road building activities (IPNF 1992).

In 1995, the Forest Plan was amended to include INFISH management direction (USDA 1995; PF Doc. CR-003), which gave greater protection to aquatic resources, especially riparian-dependent systems. The management direction provided by the INFISH amendment is designed to protect and maintain the structure and function of riparian and aquatic systems. INFISH contains goals for healthy, functioning watersheds, riparian areas, and associated fish habitats; Riparian Management Objectives (RMOs), and performance-

based standards and guidelines for land management activities (i.e., timber, roads, grazing, recreation, minerals, fire/fuels, lands, riparian area management, watershed restoration, fisheries and wildlife restoration). Instead of allowing some "acceptable" level of effects on riparian and aquatic systems, INFISH aims to protect aquatic resources from detrimental effects. INFISH gives riparian-dependent resources priority over other resources in the Riparian Habitat Conservation Areas (RHCAs), so that while RHCAs are not "lock out" zones, activities that occur in them must either benefit riparian and aquatic resources or at least "not slow the rate of recovery below the near natural rate of recovery if no additional human caused disturbance was placed on the system" (USDA 1995; PF Doc. CR-003). Incorporation of the INFISH management direction into the Forest Plan has led to improvement in the condition of aquatic resources by offering greater protections to the critical riparian areas. In addition, INFISH allows for and encourages watershed restoration, which has occurred over the last several years across the IPNF. For example, over 1,300 miles of roads have been decommissioned on the IPNF from 1991-2003 (IPNF 2003; PF Doc. CR-022).

As described in Section 3.C (Table 2), the Proposed Action includes new road construction (1.2 miles), road reconstruction (1.8 miles), and temporary road construction (0.3 mile). There are no stream channel crossings or riparian areas near the new road construction. Eight french-drain type rock fords will be installed in the reconstructed roadway to improve the existing condition. These rock fords do not require maintenance so the road can be left in place and the road put into storage without any potential for mass-failure. The temporary road is located on a ridgetop and will be recontoured after use. Specific BMPs will be followed during implementation of all project activities, as will standards and guidelines of the Inland Native Fish Strategy (Section 3.C.3 "Features"). Monitoring will occur to ensure BMP effectiveness and compliance with the Inland Native Fish Strategy (Section 3.C.5).

Harvest methods and removal of timber products from the national forest has changed substantially over time. Early harvest methods (1950s, '60, and '70) focused primarily on financial objectives of providing low cost wood products. Harvest placement often occurred in the highest volume, easily accessible stands. Timber harvest often occurred within riparian areas and adjacent to streams. Most of the harvest prescriptions were primarily designed to produce healthy young stands with shorter rotation ages.

Modern timber harvest prescriptions and design emphasize desired conditions of the forest after the harvest. This usually results in the retention of various amounts of trees in a post-harvest stand, addressing objectives that may include wildlife habitat, watershed conditions, hazardous fuels, visual quality, soil productivity, forest health and others. On sites determined suitable for timber production, timber harvest may also produce timber products on a regulated basis while compatible with these other resource objectives and values. Some examples where timber production and resource objectives can be achieved simultaneously are:

- *Reducing tree densities to promote existing long-lived, fire-adapted, seral species on the landscape;*
- *Managing tree canopies to limit fire spread from the forest floor to the tree crowns;*
- *Reducing fuel loadings to reduce the risk of high-intensity wildfires;*
- *Designing harvest patterns across the landscape to facilitate wildlife use, such as providing forage openings, irregular shaped for increased edge effect, and retention patterns that follow natural occurences;*
- *Increasing the amount of native western white pine through stocking efforts in openings;*
- *Using variable retention harvests to meet visual management objectives.*

Other elements of modern harvest prescriptions that address specific resource objectives include retention of snags for cavity nesters, retention of down wood for soil nutrition and wildlife habitat, maintaining sediment filtering vegetation near riparian areas, and maintaining vegetation diversity through hardwood retention and protection of rare plants.

Increased environmental awareness has also lead to improvements in logging systems that we use to remove trees from the forest. Early harvests emphasized cheap, labor intensive logging methods, such as railroad, horse, short-distance jammer systems, and tractor logging. Logging systems were selected primarily by the least expensive method to transport the trees from the forest to the mill. This sometimes involved harvesting on steep slopes, creating excessive soil disturbance and increasing the risk of erosion. Streams were sometimes used as a method to transport logs from the harvest site, causing impacts to the aquatic system

and adjacent riparian habitat. Road systems were sometimes dense (10 miles of road per square mile of land area) to facilitate rapid and inexpensive removals, in some cases compromising water quality.

Today's logging systems recognize and reduce the threat of environment harm in a number of ways. Tractor logging generally occurs on slopes 35 percent or less, and is limited to designated locations, reducing soil impacts. Skyline and other cable yarding systems are used on steeper slopes, greatly reducing the amount of soil disturbance. Increasingly, helicopter logging is used, which extends yarding distances and thereby reduces road densities. In the Jo-Cat Resource Area, the Proposed Action (Alternative 2) would complete the harvesting with 45 percent helicopter yarding, 31 percent skyline and other cable yarding, and 24 percent tractor yarding (Section 3.C.1, Table 2). A combination of best management practices and forest plan standards and guidelines aids in the development of low impact design. Monitoring during and after the sale is completed provides a valuable feedback loop that quickly identifies and corrects variances should they occur.

The forest ceased regeneration harvest of allocated old growth stands a number of years ago. Presently, our focus is on maintaining the old growth stands that we have and allocating additional stands for future old growth as they mature. The Jo-Cat Resource Area contains little in the way of old forest structure stands since the area burned during the fires of 1910. However, two old forest structure stands were discovered in the upper reaches of the project area during analysis. These stands meet the requirements for old growth allocation and will be added to the inventory of allocated old growth stands on the Forest. No treatments in allocated old growth stands will occur under the Proposed Action.

In the Jo-Cat Resource Area, the existing fire-resilient species, western larch, will be favored for retention and promoted for long term management by removing in-growth of trees of other species. Lodgepole pine, experiencing and projected to experience a high level of mortality from mountain pine beetle, will be removed in selected areas to recover commercial timber value and to reduce existing and future fuel loadings. Western white pine will be introduced in these areas to increase the amount of long-lived seral component. Activities under the action alternative are consistent with NFMA requirements and Forest Plan standards for vegetation management.

For the above stated reasons, changes in road construction/reconstruction and maintenance practices; implementation of watershed Best Management Practices and management direction under the Inland Native Fish Strategy; and changes in harvest practices and objectives; we believe that an individual analysis of past projects cannot be clearly compared to analysis of the proposed action. However, the incremental effects of the Proposed Action (when added to the effects of the past, present and reasonably foreseeable actions) are displayed, and provide a complete assessment of cumulative effects.

Past Activities in the Jo-Cat Resource Area and Watershed Cumulative Effects Area

The analysis of existing conditions in the Resource and Cumulative Effects Area included both natural events and management-related activities. Natural events include disturbances such as floods, fire, insects, and disease. For a detailed discussion of these disturbances, please refer to the Specialist's Reports on Aquatics and on Forest Vegetation.

Past management activities on National Forest System lands in the Jo-Cat and Cumulative Effects Area were queried from the District's Timber Stand Management Record System (TSMRS) database and checked against timber maps, aerial photographs, and ground surveys. Limited past activity has occurred in the Jo-Cat Resource Area. This is likely explained by the loss of the timber resource during the 1910 fire. Some salvage effort may have occurred after the fire, but there are no records to support this possibility. This area did not provide much commercial timber interest later in the century since the timber component was smaller second-growth. Only as the timber stands in this area have grown, and the timber industry has moved toward utilization of smaller diameter logs, did commercial timber harvest become a possible management tool for this area. Limited past activity is also explained in the Heritage Resource Report which stated "Because the project area is situated mostly on Burke Formation bedrock the potential for mineral evidence was low and this is revealed by the lack of heritage resources." (PF Doc. HR-1)

Some testing for mineral presence occurred in the late 1960's. This testing created the existing road system in the Resource Area and the construction of scattered dozer trails and test excavations. No further mining development occurred. The route of Forest Highway 9 through the Jo-Cat Resource Area has been in place since the early mining days in the Prichard Area (PF Doc HR-1). This roadway was recently reconstructed in the mid 1990's. The reconstruction of the roadway removed approximately 24 acres of timber with the right-

of-way clearing on National Forest lands. A fire occurred in the lower reaches of Cat Creek in the 1970's. Approximately 30 acres burned on private ownership and approximately 13 acres on National Forest lands within the Resource Area. Another 28 acres burned outside the Resource Area on private lands during this fire event. It is believed that the private timber was harvested before the fire. No salvage occurred on NF lands. This, and approximately 30 acres of select harvest on private ownership north of FH 9, are the only disturbances to the Jo-Cat Resource Area.

The Jo-Cat Resource Area is located in the headwaters of the Prichard Creek drainage. To provide a more cumulative assessment of the project in relation to its location, a listing of additional activities that have occurred in the Prichard Creek drainage is provided. These activities are for Prichard Creek above its confluence with Eagle Creek. Information regarding activities from before the mid-1970's was drawn from district timber sale records and historic references, including maps, photographs and newspapers.

A discussion of management activities on lands in the Resource Area and the cumulative effects area is provided below, followed by the effects on key resources (fire/fuels, vegetation, aquatics, soil, and wildlife). Development and vegetation management projects are described in Table A-1; acres are specific to the cumulative effects area, and the same stand may have had harvest occur more than once. Some activities span decades, but were grouped into one decade for summary purposes. Unnamed activities are also included in the summary. Mining activities are described in Table A-2. Historic underground mining activities were described using the Site Inspection Report for the Abandoned and Inactive Mines in Idaho, available from the Idaho Geological Survey or from IPNF Supervisor's Office. Other historic mining activities are from various historical sources.

Table A-1. Description of Past Development and Vegetative Management Activities In the Jo-Cat Resource Area and Cumulative Effects Area. *(Activities within the Jo-Cat Resource Area are in bold letters. All other activities are within the Cumulative Effects Area which contains Prichard Creek down to the mouth of Eagle Creek.)*

Timing	Category	Project Name or Vicinity	Description
Approx. 1883-1900	Early Development	Eagle City and Murray	Gold was discovered in Prichard Creek in 1883, development of trails, wagon roads, Eagle City and Murray followed.
1907-1909	FS Timber Harvest	1908 Prichard Creek	88 acres of salvage and individual tree selection harvesting. Associated construction of logging chutes and trails.
	Railroad Construction	Idaho Northern Railroad	The Idaho Northern Railroad was constructed from Enaville to Murray in 1908. A terminal was extended 6 miles east of Murray for mine ore shipments in 1909.
1910-1939	*No Activities Recorded*		
1940-1949	FS Timber Harvest	1941 Buckskin Gulch 1941 Buckskin Gulch II 1941 Upper Buckskin Gulch 1948 West Buckskin Gulch	74 acres of salvage and individual tree selection harvesting. Approximately 1.5 miles of road construction.
1950-1959	FS Timber Harvest	1955 Alder Gulch East Alder Gulch West Alder Gulch East Fork Alder Gulch	528 acres of salvage and individual tree selection harvesting. 153 acres of shelterwood harvest. Approximately 13 miles of road construction.
	Private Road Construction	Unnamed	Approximately 12 miles of road was built on private land prior to 1960. Roads were likely built for both mining and timber harvest.
	BLM Road Construction	Unnamed	Approximately 14 miles of road was built on lands managed by the Bureau of Land Management. Records before 1950 do not exist, but roads were likely built for both mining and timber harvest.
1960-1969	FS Timber Harvest	Sullivan Gulch 1961 Monarch Sale 1966 Monarch Sale	417 acres of clearcut, 28 acres of salvage, and 8 acres of liberation harvest. Piling, prescribed burning, planting and weeding of harvest units followed in subsequent years. About 8 miles of road were built to complete the logging.
	Road Construction	**Minerals testing in Cat Creek and Jo Gulch**	**Construction of 2.5 miles of road and scattered dozer trails and test excavations throughout area.**

Table A-1. Description of Past Development and Vegetative Management Activities In the Jo-Cat Resource Area and Cumulative Effects Area, continued. *(Activities within the Jo-Cat Resource Area are in bold letters. All other activities are within the Cumulative Effects Area which contains Prichard Creek down to the mouth of Eagle Creek.)*

Timing	Category	Project Name or Vicinity	Description
1970-1979	Private Road Construction	Unnamed	Approximately 7 miles of road was built on private land during the 1970's. Roads were likely built for timber harvest.
	Wildfire	**Unnamed – Prichard/Cat Creek Confluence**	**71 acre man-caused. 58 acres on private, 13 acres on NF lands. Private land logged prior to fire.** (28 of the acres on private are outside Resource Area)
	FS Timber Harvest	Barton Gulch Kings Pass 1971 Moonshine Sale 1974 Moonshine Sale Thompson Overpass Thompson Passover 1978 Moonshine Sale	164 acres of clearcut, 116 acres of salvage, 110 acres of liberation, 46 acres of shelterwood removal. Piling prescribed burning, planting and weeding of harvest units followed in subsequent years. Approximately 8 miles of road was built to complete the logging.
1980-1989	FS Timber Harvest	Idaho Gulch Kings Ridge Monarch Gulch	452 acres of clearcut harvesting. Harvesting was followed by prescribed burning, planting, precommercial thinning, and pruning in subsequent years. 151 acres of commercial thinning. About 10 miles of road was constructed in association with the harvest activities.
	Private Timber Harvest	**Unnamed**	**30 acres of selection harvesting with some road and skid trail construction.**
	Private Timber Harvest	Unnamed	427 acres of thinning, shelterwood, seed tree, clearcut, and salvage harvesting.
1990-1999	FS Timber Harvest	Kings Ridge	36 acres of clearcut harvest. Harvesting was followed by prescribed burning and planting. About 1 mile of road was constructed in association with harvest activities.
	Private Timber Harvesting	Unnamed	1031 acres of thinning, shelterwood, seed tree, clearcut, selection and salvage harvesting.
	Highway Reconstruction	**Forest Highway 9**	**Creation of double-laned paved highway with associated clearing of 24 acres.**
2000-2006	FS Timber Harvest	Unknown King Bug	10 acres of salvage.
	Fire Mitigation Work	Shoshone County WUI Fire Mitigation Program	Defensible space construction for 127 structures, including 61.4 acres non-commercial thinning/pruning, and piling/chipping.
	Private Timber Harvest	Unnamed	351 acres of thinning, shelterwood, seed tree, clearcut, and salvage harvesting.
	Wildfire	Gold Chest Fire	82 acre man-caused fire primarily on private ownership.
	Private Timber Harvest	Cascade Gulch	35 acre clearcut, no new road construction, 30% grapple piled and burned in 2006
	Wildfire	Revett Complex Fire	163 acre lightning caused fire, no direct suppression activities. No salvage harvest planned.

Only an unnamed prospect in upper Paragon Gulch and a fenced ridgetop mine shaft on the Resource Area boundary are within the Jo-Cat Resource Area. All the activities listed below are within the cumulative effects area of Prichard Creek above Eagle. Some roads would have been constructed, many in riparian locations, to access these mines.

Table A-2. Description of Past Mining Activities In the Watershed Cumulative Effects Area.

Project Name	Description of Activity
	Underground Mining
Mother Lode	First located in 1883, it was most productive 1892-1893. Mine consists of numerous drifts and crosscuts at several levels. A 5-stamp mill was built before 1911, and production continued through the 1930's.
Terrible Edith	Located about 1886, the mine produced lead and zinc ore in varying amounts through the 1950's. The mine consisted of more than 3700 feet of drifts and crosscuts.
Gold Back	Little production is known to exist from the Gold Back mine. Development began in the early 1900's and continued as late as 1984, when some gold ore was mined from the property.
Minnie Moore	No information available on the history of this site. Three adits present. Less than 0.5 acres disturbed.
Pilot	The workings consist of two open adits and accompanying dumps. Production occurred in 1906, 1908 and 1928. Exploration occurred in 1959, with little activity since that time.
Golden Chest	The Golden Chest claims were located in 1883, and it is the principal gold mine in the Murray district. In 1938 it had over 13,000 feet of drifts and crosscuts. A mill was located on the site at one time. The mine has an extensive history of production which continues today.
Four Square	Located in 1884, the mine consists of underground workings, a mill site and placer claims. The placer claims are considered active.
King	Production ceased prior to 1938. Thought to have produced about $200,000 worth of gold at the time.
Anchor	Actively developed 1928-1929; credited with Summit district's zinc-lead production in 1939; produced 91 tons zinc-lead ore in 1941, 1,107 tons in 1948, and 400 tons in 1949.
Liberty	The Liberty Mining Co. shipped a small quantity of lead ore from the mine in 1954.
Tiger	A small amount of development work was completed on the property, mostly prior to 1930. No known production occurred.
Daisy Volunteer	Minor placer production is credited to the property around 1906 or 1908 and between 1935 and 1940. No known production from the adit.
Buckeye Boy	One of the early locations in the Murray district, worked first in 1885. At one time, the property had a 2-stamp mill equipped with amalgamating plates. By 1928, the mine had 3,390 feet of workings and shafts. No known work after 1934.
Hawkins	No information available on the history of this site. No waste dump and a minimally disturbed area.
Stonewall	No information available on the history of this site. Single adit. Less than 0.25 acres disturbed.
Badger	All that is known about the history of this mine is that a little placer gold was recovered from the mine in 1939. The site consists of a dry, caved adit and small waste dump (disturbed area is less than 0.1 acre).
Chester Consolidated	About $30,000 of production was derived from this mine in the early days of the mining district. In 1925, some gold was recovered from surface material.
Mountain Lion Group	Site was located in 1884. Consisted of 3 tunnels, associated workings and a 3 stamp mill. Gold ore was treated by amalgamation in 1923, 1926, 1934, 1935, and 1939. Placer gold was produced in 1940, about 72 tons of gold ore was produced in 1941. In the late 1950's, gold was recovered by hydraulicking and sluice boxes, along with a 5 stamp mill with amalgamation plates. Small quantities of gold ore were shipped from the mine in 1964 and 1965.
Lucky Four	Site was worked between 1909 and 1915. Two adits. Less than 0.5 acre disturbed.
St. Peter	Ore was produced from the property in 1954. One adit. Dump site is 50 foot across. Less than 0.25 acre disturbed area.
Gold Cliff	Reports in 1913 of nine tunnels with 7200 feet of workings. A single portal is present. Waste dump area is present near a tributary of Idaho Gulch. Less than 0.5 acre disturbed area.
Phoenix	Exploration work started in 1922. A 700 foot adit and two tunnels were constructed. Reports in the 1950's state that the property had two tunnels, 1200 and 1000 feet long. Small waste dump on site has revegetated with trees. Disturbed area is less than 0.5 acres.
Crown Point	A few short tunnels were run on the claim. No other information is available.
Upper & Lower Monarch	Operations began in 1905 and ran intermittently through 1925. Over 10,000 feet of crosscuts and drifts. Lead and zinc producer. Contained the largest jig tailings in Prichard Creek running for approximately ¼ mile along Prichard Creek. Reclaimation work has occurred.
Upper/Lower Paragon and Black Horse	Operations from 1905 to 1948. Black Horse mine is located between Upper and Lower Paragon. Lead and zinc producers. Numerous adits and dumps sites at each location. A 100 tons/day mill was built at the mouth of Paragon Gulch in 1910 resulting in a considerable waste dump. Site has been reclaimed.

Table A-2. Description of Past Mining Activities In the Watershed Cumulative Effects Area, continued.

Project Name	Description of Activity
Underground Mining	
Silver Strike	Operations from 1911 to 1936. Contains 2 shafts of 1300 feet and two tunnels of 4000 feet. Large producer of lead and silver ore. Located up Granite Gulch. Numerous partially re-vegetated waste sites present.
Bear Top, Orofino, and Ione Mines	Operations from 1905 to 1936. Large lead producer. Numerous underground adits associated with each individual mill. A 150 ton/day mill site on Bear Gulch associated with these mines. Some waste material has been washed away by past flooding. Site reclaimation work planned for 2007.
Silver Scott	Limited history available, but has been active as recent as 1978. Two adits with considerable waste rock, some of which has been eroded away. Disturbed area covers approximately 1 acre.
Giant Ledge	Developed in 1919 and included a mill site. Mill was short term but mine produced intermittently until 1947. Copper and lead ore. Large waste site, partially eroded. Located up Granite Gulch.
Raven	Operated from 1907 to 1936. Three tunnels and 1400 feet of workings. Waste dump is 100 feet by 30 feet, partially revegetated and located along Prichard Creek.
Washington Mining	Little history is known. Approximately 5 adits located in headwaters of Granite Gulch.
Sunrise	Discovered in 1897. Three tunnels and 3000 feet of workings. Approximately 1 acre of disturbance. West fork of Granite Gulch
St. James	Little history known. Two adits not thought to be very extensive. Waste site occupies approx. 1 acre. West fork of Granite Gulch.
Vendetta Chief	Property has two tunnels and approximately 1000 feet of workings. Small waste site partially washed out by stream. Located in west fork of Granite Gulch
Unnamed Prospects	Several unnamed prospects have been documented in the cumulative effects area. Disturbance associated with these prospects is minimal.
Placer and Hydraulic Mining	
Prichard Creek Dredging	From 1917 to 1926 a 7-mile stretch of Prichard Creek was dredged for gold with a large dredging machine operated by the Yukon Gold Company. It is estimated that the dredge worked 11,000,000 cubic yards of material during this time.
Placer Mining	Intense placer mining began in 1884 in Prichard Creek and tributaries. Placer mining had begun to decline in 1886 as the best ground had already been worked. Recreational placer mining continues today on private land within the local area.
Hydraulic Mining	Flumes and ditches were constructed prior to 1886 to carry water from farther up in Prichard Creek to areas such as Fancy Gulch, Dream Gulch and Buckskin Gulch. The water was used to wash the hillside gravels away and recover the gold.
Other Mining Activity	
Mine Reclaimation	Paragon waste site at mouth of Paragon reclaimed in 2003. Waste material moved to Eagle Repository.
Mine Reclaimation	Monarch waste site along Prichard Creek reclaimed in 2003. Waste material moved to Eagle Repository.

Effects of Past Activities on Area Resources

The level of effects of each type of activity varied due to location and implementation standards that were in place at the time. The following describes the effects the activities had on key resources (fire/fuels, vegetation, aquatics, soils, and wildlife).

Effects of Fire Suppression

Most of the Resource Area burned during the 1910 fire. The fire in 1910 burned on the north side of Prichard Creek from Thompson Pass to the west to include Bear and Butte Gulches within the cumulative effects area. Also within the cumulative effects area was an approximate 600 acre reburn in the headwaters of Bear Gulch and an approximate 1500 acre fire in Granite Gulch both which occurred in 1929. In 1936 a fire of approximately 800 acres reburned within the Cement and Bear Gulches. Forest Service and Idaho Department of Lands records show that 42 fires have been detected and suppressed in the Upper Prichard cumulative effects area from 1960 to 2005 (PF Doc. FF-04). The majority of these were kept very small, accounting for a total of just 107 acres burned. The only exceptions are the Cat Creek Fire in the early 1970's, which burned 58 acres on private ownership and approximately 13 acres on National Forest lands, the Gold Chest Fire of 2003, which burned 82 acres primarily on private ownership, and the Revett Complex Fire of 2006, which burned approximately 163 acres on National Forest lands. Approximately 62 percent of

the reported fires were caused by lightning, with the remaining 38 percent human caused. The proximity of the cumulative effects area to communities results in a higher incidence of human-caused fires than occurs in more remote areas.

Effects on fire/fuels: In general, fire suppression has caused an increase in the amount and continuity of both living and dead material that fuels fires. In the Jo-Cat Resource Area, which burned in 1910, most of this increase would be attributed to live fuels. Ground fuels are currently low to moderate, though that will change in the future as bark beetle mortality begins to fall.

Effects on vegetation: Stands have become overcrowded and overstocked with shade tolerant species. Low intensity ground fire would have reduced stocking levels and thinned out less fire resistant species. Fire suppression is likely contributing toward a change in species composition, away from early seral species, such as western larch, which are generally more fire resistant and/or resilient to fire disturbances. This overstocked condition and trend toward change in species composition could influence the intensity and severity of future fires.

Effects on aquatics: Effects of actual fire suppression activities on the watershed is low. Both the Cat Creek fire and the Gold Chest Fire caused some soil disturbance and potential for added sediment to the stream course due to the active suppression and locations of the fires low in drainages. However, due to the limited fire sizes, the effects would likely not be measurable at the watershed scale. The Revett Complex Fire, located higher in the drainage utilized a confine strategy and was not actively suppressed. The Revett Complex Fire is not expected to have any effects at the watershed scale other than a non-measurable change in flows due to loss of canopy.

Effects on soils: Successful fire suppression eliminates the chance of detrimental effects to soil productivity that could result during a serious wildfire (Specialist's report on Soils, p. SOIL-10). On small fires, disturbance is usually limited to hand tools; most hand fire-line construction has only minor (insignificant) impacts to the soil resource. During fire suppression, closed roads may be reopened for fire suppression access and incorporated as fire line. Under current fire suppression practices, disturbed areas are rehabilitated and roads are returned to their previous condition on National Forest lands. In the Resource Area, fire occurrence has been limited since the 1910 fire, which burned over most of the area. The most recent fire (human caused) within the Resource Area occurred in the early 1970s and burned around an already existing small natural opening north of the highway and on private ownership. Within the cumulative effects area, the Gold Chest Fire occurred in 2003 and the Revett Complex Fire occurred in 2006. The Gold Chest and Cat Creek fires were actively suppressed while the Revett Fire employed a confine strategy. Some dozer fireline construction is believed to have occurred on other ownership with the Cat and Gold Chest fires. Other than soil compaction and displacement associated with dozer lines, the soils in these areas have recovered. The Revett fire was not actively suppressed. Soils may need a few years to recover from any hydrophobicity that may have occurred.

Effects on wildlife: Fire suppression has led to a decrease in available habitat for wildlife species that rely on more open forest habitats, such as flammulated owl (open canopy and understory) and northern goshawk (open understory), and species which use snags such as the black-backed woodpecker, pileated woodpecker and flammulated owl. Lack of fire has also prevented the development of stands with higher numbers of wood-boring beetles and abundant snags which black-backed woodpeckers depend on. Flammulated owls would not likely utilize the Jo-Cat Resource Area, but could be present in the lower reaches of Prichard Creek above Eagle.

Effects of Timber Harvest on National Forest System Lands

It is believed that there was not much timber harvest after the 1910 fire, within the Resource Area, because of limited access and possibly due to the intensity of the burn. Much of the upstream portion of the cumulative effects area also had limited access. Salvage after the large fires was primarily focused in the lower reaches in the vicinity of Murray. Some salvage harvest likely took place in areas that could be reached with the technology available at the time, which would include riparian areas and areas adjacent to streams and roads. Recorded harvest activities have occurred on approximately 24 of the acres in the Resource Area, associated with Forest Highway 9 reconstruction. Approximately 10 percent of the National Forest lands in the cumulative effects area has been harvested; approximately 7 percent were regeneration harvested. While some of the areas have had multiple harvest entries, it is not possible to track in the current database if the same acres were harvested or had other non-harvest activities during re-entry, because stands are often

larger than the recorded activity acres. It is reasonable to have multiple harvest entries on some areas because certain silvicultural systems require multiple entries.

Effects on fire/fuels: Within the Resource Area, no past harvest (other than the right-of-way clearing associated with Forest Highway 9) is recorded. In the cumulative effects area, salvage reduced the available large fuels in a portion of the area; any reburn would have been less severe in the areas harvested. Other effects of the various timber harvests in the area over the years are dependent on the characteristics of each harvest activity. Early harvests that left slash lying on the ground would have created a fire hazard for a period of time until the slash decomposed. Any residual slash from those early harvests would be decomposed by now and would not show any measurable effect on potential fire behavior. Harvests on National Forest lands in the last 30 years in the cumulative effects area have treated activity fuels. All of these harvests have occurred on the south side of Prichard Creek and have helped to break up the continuity of fuels and varied size and age classes. This can have an effect on size and rate of spread of larger fires. In general, due to the limited nature of timber harvest within the resource and cumulative effects area, timber harvest has not had much effect on fire and fuels patterns.

Effects on vegetation: Within the Resource Area, no past harvest (other than the right-of-way clearing associated with Forest Highway 9) is recorded. Therefore, past harvests did not affect the present vegetation. Within the cumulative effects area, past timber harvest were often a selection cut that focused on the largest trees. Often these trees would have been long-lived serals such as ponderosa pine, white pine and larch, or large riparian trees such as cedar. Harvest of these trees would have reduced the seed source for natural regeneration of these species. More recent regeneration harvests have planted long-lived seral species back to the site.

Effects on aquatics: Historically salvage logging and regeneration harvest occurred in riparian zones, where these activitvies occurred there most likely was a reduction in the recruitment of large wood to the stream channels. This may have effected channel stability and fish habitat. In stands where past harvest treatments are causing a conversion of the stand to shade tolerant species that are more susceptible to insects and disease, recruitment of large wood may increase in the short term due to increased mortality in the stands. Clearcutting practices, and associated road construction, would have opened the canopy enough to increase peak flows, as well as lead to increased sediment delivery to the stream channels. The effects to stream channels, fish habitat and water temperatures would be dependent on watershed size and the amount of area treated within the watershed.

Effects on soils: Past salvage logging in the cumulative effects area primarily targeted overmature, single tree extractions that began in 1920 and continued through the 1950s, using either horse skidding or cable yarding, which resulted in no substantial impacts to soil (PF Doc. SR-06, page SOIL-10). A few areas were mechanically skidded in the 1950s; those skid trails have high compaction levels. Later harvests included the development of transportation systems into the areas. The road networks create a long term detrimental affect on the soils in localized areas. Tractor yarding in the past created more detrimental soils disturbance than current practices, because tractors were often not limited to skid trails. Later, skyline yarding systems substantially reduced soil displacement and compaction during yarding. Limited past timber harvest activity has occurred in the Resource Area, which is likely explained by the loss of the timber resource during the 1910 fires. Some salvage effort may have occurred after the fire but no records or evidence is available. Besides harvest associated with road and trail building from mining exploration several decades ago, and the right-of-way clearing associated with Forest Highway 9 reconstruction, no commercial logging activities beyond what is currently proposed has influenced soil productivity in the the Resource Area.

Effects on wildlife: Past salvage and selection harvests have reduce the number of large diameter trees that become large snags and down wood in the cumulative effects area. Several sensitive species and management indicator species require this habitat. Past regeneration harvests often remove all trees over large areas creating openings where no snags or residual trees are present. This practice no longer occurs today.

Effects of Timber Harvest on Private Lands

Timing and type of past timber harvest on other ownerships in the Jo-Cat and cumulative effects area were estimated using past aerial photographs, personal observations by Forest Service personnel, and conversations with consulting foresters. The degree of regeneration and amount of ground cover in the harvested units were estimated from observable evidence in aerial photographs. Ground scars seen in the

photographs were also used to determine harvest methods on private lands if logging system was not known. For example, skid trail scars could be observed in the photographs to help determine if a particular area was tractor logged, and skyline corridors were observed to help determine that a unit might have been skyline logged.

Effects on fire/fuels: Timber harvest on private lands tends to remove trees of highest economic value and typically removes large fire-resistant seral species. Natural regeneration is often relied on to fill created openings, which usually favors shade-tolerant Douglas-fir and grand fir over early seral species such as ponderosa pine and western larch, which are more fire resistant. Logging slash can remain untreated on the site, contributing to higher fire intensities should a wildfire occur. However, there is documentation that post harvest fuels treatment and planting to seral species is occurring in some areas. Harvest activities on private lands are inspected by the Idaho Department of Lands to determine if logging slash disposal meets the Idaho Forest Practices Act.

Effects on Vegetation: Generally, harvest on private lands does not effect vegetation on National Forest System lands. Some windfall may occur adjacent to new openings if harvest occurs along the property line.

Effects on aquatics: Water yields were increased due to private timber harvest within the cumulative effects area. This harvest may have opened the canopy enough to increase peak flows as well as lead to increased sediment to the stream channels. The effects to stream channels, fish habitat and water temperatures were dependent on watershed size and the area treated within the watershed. Historically salvage logging and regeneration harvest occurred in riparian zones, where these activitvies occurred there most likely was a reduction in the recruitment of large wood to the stream channels. This may have effect channel stability and fish habitat. Harvest on private lands must now comply with State of Idaho standards for Class I and Class II streams. Some harvest is permitted which may reduce woody debris recruitment and reduce fisheries habitat in proximity of and downsteam of the harvested areas.

Effects on soils: Activity on lands other than National Forest System lands do not contribute to effects of soils within National Forest System lands.

Effects on wildlife: Without knowing the locations or the composition or structure of the stands before and after logging, it is impossible to assess the effects to wildlife of past logging on private land. All larger size classes of trees are often removed, which is detrimental to wildlife habitat needs.

Effects of Fire Mitigation Work on Private Lands

Fuel reduction efforts have been implemented that focus on private lands, primarily around structures within the resource area. These efforts are part of the Shoshone County Wildland Urban Interface Fire Mitigation Program, designed to help homeowners reduce fuels on their property and increase the chances of the home surviving a wildfire. In the last two years, approximately 61 acres of private land were treated to protect 127 structures within the Prichard-Murray Area. Work includes noncommercial fuel reduction activities such as thinning, pruning, piling and chipping, primarily within the home ignition zone of homes. Since this activity occurred in the lower reaches of the cumulative effects area, a considerable distance from the Jo-Cat Resource Area, and the effects were minimal to other resources, this activity will not be discussed further in relation to the Jo-Cat project.

Effects of Mining

Mineral exploration work in the Prichard Creek area began shortly after the gold rush to Murray in 1885. Prichard Creek has a substantial history of mining. Extensive dredge mining for placer gold occurred in the main channel and its tributaries. Soon after the discovery of gold, ore milling sites were established.

Effects on fire/fuels: There are no known effects on fire/fuels from past mining.

Effects on vegetation: Past mining would have minimal effect on the vegetation beyond localized harvest to create supports for mine tunnels. This did not contribute to changes in structure or composition overall.

Effects on aquatics: Past mining activities altered the flow regime, disrupted natural bedload movement and altered fish habitat condition in much of Prichard Creek and its side drainages. Dredge mining totally altered channel condition causing instability removing large wood and reducing fish habitat quality and quanity within the areas of placer mining. Where placer mining occurred most of the vegetation was removed, altering large

wood recrutiment to the channel and negatively affecting channel condition and fish habitat conditions. Hard rock mining constructed roads into side drainages, often running along steamcourses. Ore milling sites produced both jig and floatation tailings, which have added sediment and elevated the levels of heavy metals in Prichard Creek (Specialist's Report on Aquatic Resources, pp. AQ-6). These results also impacted fisheries and their habitat (Specialist's Report on Aquatic Resources, p. AQ-16). Mine cleanup work such as reclaimation of the Paragon and Monarch mill sites has reduced loadings of heavy metals into the creek. This will have long term benefits to fish populations in the affected areas.

Effects on soils: Mineral exploration has contributed to localized detrimental effects to soil productivity through roading, displacement, removal, reworking, and erosion from numerous sites within the cumulative effects area. Within the Resource Area, the disturbance is limited to several scattered dozer trails and associated excavated test pits but no further development occurred.

Effects on wildlife: Extensive placer mining has greatly reduced habitat for nongame and other species in riparian areas; these areas have not recovered decades after the mining ended. Inactive underground mines have created habitat for several bat species, including two sensitive species, Townsend's big-eared bat and fringed myotis.

Effects of Road Construction

Road construction within the Resource Area has been limited. The existing roads into the main body of the Resource Area were constructed around the late 1960's to provide access for some mineral testing operations. The route from Murray to Thompson Falls has been in place since the early mining days. This route was widened and paved in the mid-1990's. Many of the roads within the cumulative effects area were built to provide access for mining purposes early in the century. Additional roading later occurred to provide access for vegetation management. On average, there are about 3.0 miles of road per square mile of land within the cumulative effects area (Specialist's Report on Aquatic Resources, p. AQ-6).

Effects on fire/fuels: Roads provide access and quick response for fire suppression activities, allowing efficient fire protection where a sufficient road network exists. Roads also disrupt the spread of fires – many times small fires stop spreading when they reach a road due to the lack of fuels. Larger fires, however are less affected by roads. Roads may also provide increased public access which can lead to more man-caused fires.

Effects on vegetation: There are minimal effects to vegetation with regard to stand species composition or structure due to road building.

Effects on aquatics: Road construction can have a negative effect on the watershed. Roads adjacent to or crossing streamcourses provide a prime mechanism for sediment to be introduced into streams. High sediment inputs have negatively affected channel conditions and fish habitat in the cumulative effects area. Undersized culverts in old road systems and routing of sediment from roads near stream crossings are likely sources of chronic and background sediment in the watershed. Old mining roads were often constructed up streamcourses resulting in a loss of riparian structure and easy routing of sediment into streams. A road network can also increase routing of overland flows into the stream system quicker than natural conditions which negatively effects channels during peak flow events. (See Specialist's Report on Aquatics.)

Effects on soils: All past roads built for either timber harvest, mining, or general transportation (FH 9) have an irretrievable effect on soil productivity due to compaction and displacement.

Effects on wildlife: High road density and associated motorized traffic displace wildlife from preferred habitats and impacts wildlife security areas, such as elk caving sites, and nesting habitat for neotropical migrant birds. High open road densities also degrades large areas of wildlife habitats near roads by allowing snags to be removed for firewood; this impacts numerous wildlife species which use snags for feeding, cover and/or reproduction. Roads also fragment wildlife habitat patches. High road densities make big game more vulnerable to hunting mortality. Traffic on roads can also cause direct mortality of wildlife from vehicle collisions.

Effects of Forest Highway 9 Reconstruction

Forest Highway 9 was reconstructed in the mid-1990's at which time the alignment was improved and it was upgraded to a two lane paved highway.

Effects on fire/fuels: The reconstruction of this route has provided a quicker ingress/egress route to and from the Murray area. This may be important for evacuation or for providing resources during a large fire event in the area. See Effects of Road Construction above for more information on roads and the effects on fire/fuels.

Effects on vegetation: Approximately 24 acres of forested lands were cleared on the National Forest with this reconstruction project. Much of this clearing will remain permanently cleared as cutbanks and fillslopes along the roadway.

Effects on aquatics: Much of the upper portion of Forest Highway 9 runs parallel to Prichard and Cat Creeks within the riparian influence zone. The road edge and fillslopes seem to be far enough away to not be a continual source of sediment during high water events. Steep cutbanks through the area may be providing some amount of sediment into the system. The reconstruction resulted in a loss of riparian vegetation. Efforts appeared to be made to retain a small vegetation buffer where feasible. Some shading and future wood recruitment to the stream channels has been removed. Fish passage was provided during reconstruction as evidenced by the large structures with gradient controls in the upper Prichard and Cat Creek crossings.

Effects on soils: All roads have an irretrievable effect on soil productivity due to compaction and displacement. The reconstruction of FH9 resulted in a considerable amount of soil disturbance with a running surface and large cut and fill slopes extending through the southern portion of the resource area.

Effects on wildlife: Much of the upper section of this highway is located within or adjacent to riparian areas. Riparian habitats are often the most productive habitats for wildlife providing a variety of hardwoods and down woody debris often used for nesting. Many bird species are associated primarily with riparian areas and many others rely on riparian areas for some part of their life cycle whether it is foraging, denning or cover. The increase traffic associated with this reconstructed road has increased the zone of disturbance to wildlife species. Additional wildlife mortality, associated with increase traffic and speed of travel, is also expected to be an effect on wildlife.

Ongoing and Reasonably Foreseeable Activities in the Watershed Cumulative Effects Area

In addition to past activities, the analysis of cumulative effects includes effects of activities that are currently ongoing or have a reasonable chance of occurring in the local area (that is, the proposed location, timeframe and scope have tentatively been identified).

Table A-3. Ongoing and Reasonably Foreseeable management activities in the Watershed Cumulative Effects Area (Prichard Creek above Eagle).

Name	Description
Unknown King Bug	1 acre of pile burning is planned for 2007.
Idaho Gulch and Kings Ridge	488 acres of precommercial thinning, release and/or pruning for white pine blister rust are planned in the next 20 years for these past timber sales.
Coeur d'Alene Placer Right-of-Way Exchange	An exchange of rights-of-way is planned between the Forest Service and the Coeur d'Alene Placer Mining Company on specific roads that pass through both ownerships.
BLM Murray Project	The Bureau of Land Management manages three parcels near Dream Gulch and Alder Gulch. These parcels total approximately 100 acres in size. Planned treatments would include understory removal of small-diameter trees as well as the salvage harvest of Douglas-fir. The proposed project would utilize helicopter, cable, and tractor yarding systems. Approximately 1000 feet of temporary road construction maybe needed into the parcel west of Dream Gulch. The areas would be both mechanically treated and broadcast burned. Reforestation activities would also occur.
Prichard/Murray HFRA Project	Approximately 75 acres of shelterwood, 67 acres of commercial thinning using helicopter and skyline yarding systems and 179 acres of burn only treatments scheduled to be implemented starting in 2007.
Bear Gulch Private Property Timber Harvest	Approximately 249 acres of seed tree harvest. Currently planned for helicopter yarding. Approximately 50 acres of the 249 in Paragon Gulch. Planned 2007 or 2008.
Bear Top Mine Reclaimation on Private Property in Bear Gulch	Reclaimation of site by State DEQ in 2007. Waste material will be moved to the Mine Waste Repository in Eagle Creek.
Butte Gulch Placer	Placer gold mining affecting approximately 3 acres of National Forest lands. Located in the middle reaches of Butte Gulch. Proposed for 2008.
Gold Butte Test Drilling	Exploratory drilling in the headwaters of Butte Gulch. Proposed for 2007.

The ongoing and reasonably foreseeable projects are located in the cumulative effects area downstream from the Jo-Cat Resource Area. **There are no ongoing or reasonably foreseeable projects within the Jo-Cat Resource Area.** Burning of landing piles associated with the Unknown King Bug timber sale would not have any measurable effect on other resources. The pre-commercial thinning of past regeneration units in the cumulative effects area would generally not be measurable to other resources. Some disturbance to wildlife would occur with the treatment, and some increase in short term fire risk would also occur. The thinning and pruning activity would favor the retention of long-lived seral species which would benefit the vegetative condition for the area. The exchange of right-of-ways itself would have not effect, however it could lead to more harvest activities on private ownership.

The Prichard/Murray HFRA Project will provide fuels reduction treatments near the Murray Area. This will help to reduce potential fire intensities in that area over the long term. Effects to the water quality and aquatic habitat have been shown, through preliminary analysis, not to be measurable within the Prichard Creek watershed with this HFRA project. Restoration activities within the Prichard Creek watershed over the last ten years has been shown to reduce sediment in compliance with the North Fork sediment TMDL. Since no measurable effects would be generated with Prichard/Murray, this positive trend would not be affect. The BLM proposal is in the early stages (District Hydrologist, personal communication). Based on initial proposal information, harvest on lands managed by BLM would create more resilient areas, but would not make a substantial change at the landscape scale.

The 249 acres of seed tree harvest, associated with a Bear Gulch private parcel, is currently planned for helicopter yarding. Helicopter yarding methods would lessen potential sediment risk to the watershed in

terms of roading and yarding methods. The size of opening and the elevational zone may pose some rain on snow concerns. The Bear Gulch drainage is a large watershed, much of which is within the Maple Peak Roadless Area. The large scale of the watershed, with little in the way of harvest activity, will help to lessen the risk of the proposed activity. Helicopter logging operations may disturb wildlife species in the surrounding area.

The Bear Top Mine Reclaimation project will provide disturbance further up the Bear Gulch drainage. The removal of waste material and the reclaimation of the site will be a benefit to the Prichard Creek watershed in reducing metal contaminates in the drainage.

Butte Gulch Placer will involve the re-routing and placer mining of approximately 2000 feet of stream channel in the middle reaches of Butte Gulch. Cutting of riparian vegetation will occur. Proposal will be analyzed under its own environmental assessment. Appropriate features and mitigation measures will be incorporated to reduce impacts of activity. Proposal is in its early stages of development.

Gold Butte exploratory drilling will occur in the headwaters of Butte Gulch on National Forest lands. Only minor ground disturbing activity will occur with drilling in an existing road bed away from riparian areas.

It is anticipated that some level of road maintenance activity will continue to occur on private, BLM, National Forest roads as well as roads under county jurisdiction.

Effects of timber harvest on Other National Forest lands: The Plains Ranger District of the Lolo National Forest does not have any ongoing or reasonably foreseeable planned activities adjacent to the project area to the east of the Jo-Cat Resource Area (per communication with John Errecart, Plains District Silviculturist). An existing road within a seed tree harvest unit on the Lolo National Forest will be utilized as a helicopter service landing under the Proposed Action alternative of this project. Use of this landing location was approved by the Interdiscipinary Team of specialists on the Plains Ranger District (PF Doc. TRANS - 02).

APPENDIX B
PUBLIC INVOLVEMENT & COMMENTS

1. PUBLIC INVOLVEMENT

The January 18, 2006 issue of the **Forests' Quarterly Schedule of Proposed Actions** (PF Doc. PI-01) provided the first notice to the public that a vegetation management proposal was being considered in the Jo-Cat Resource Area and that the proposal would be addressed in an Environmental Assessment as required under the National Environmental Policy Act (NEPA). This project has been identified in each subsequent issue of the Quarterly Schedule to date (PF Doc. PI-02, PI-03, PI-04).

On March 7, 2006, the Jo-Cat proposal was introduced to the U.S. Fish and Wildlife Service so that the proposed action and project design features would incorporate any issues and concerns identified by their agency (PF Doc. PI-05). This step was taken because the project area is located within a lynx analysis unit (LAU) and Canada lynx is listed as a threatened species under the Endangered Species Act.

A **public scoping letter** (PF Doc. PI-06) was mailed to other agencies, adjacent landowners, and those who have indicated an interest in commenting on small sale management proposals. The letter described the purpose and need for vegetation management in the area and provided a detailed description of the proposed action along with general issues in the area. The scoping letter was mailed out on April 19, 2006.

On April 21, 2006, **a legal ad** was published in the *Spokesman-Review* newspaper to inform the public of the formal scoping period for the proposed activities in the Jo-Cat Resource Area, briefly describing the project and to request their input (PF Doc. PI-07).

2. COMMENT LETTERS RECEIVED ON THE JO-CAT RESOURCE AREA PROPOSAL

During scoping, letters were received from the following organizations and agencies:

Norm Bratlie (Northwest Access Allance, May 15, 2006; PF Doc. PI-08)

Jeff Cook (Idaho Parks and Recreation, May 17, 2006; PF Doc. PI-10)

Mike Mihelich (Kootenai Environmental Alliance; May 17, 2006; PF Doc. PI-12)

Jonathan Oppenheimer (Idaho Conservation League, May 22, 2006; PF Doc. PI-14)

Each of these provided comments that helped identify issues and define the analysis of effects and proposed treatments. A response letter was issued to each of those that provided comment directly addressing issues and concerns that were raised (PF Doc. PI-09, PI-11, PI-13, PI-15).

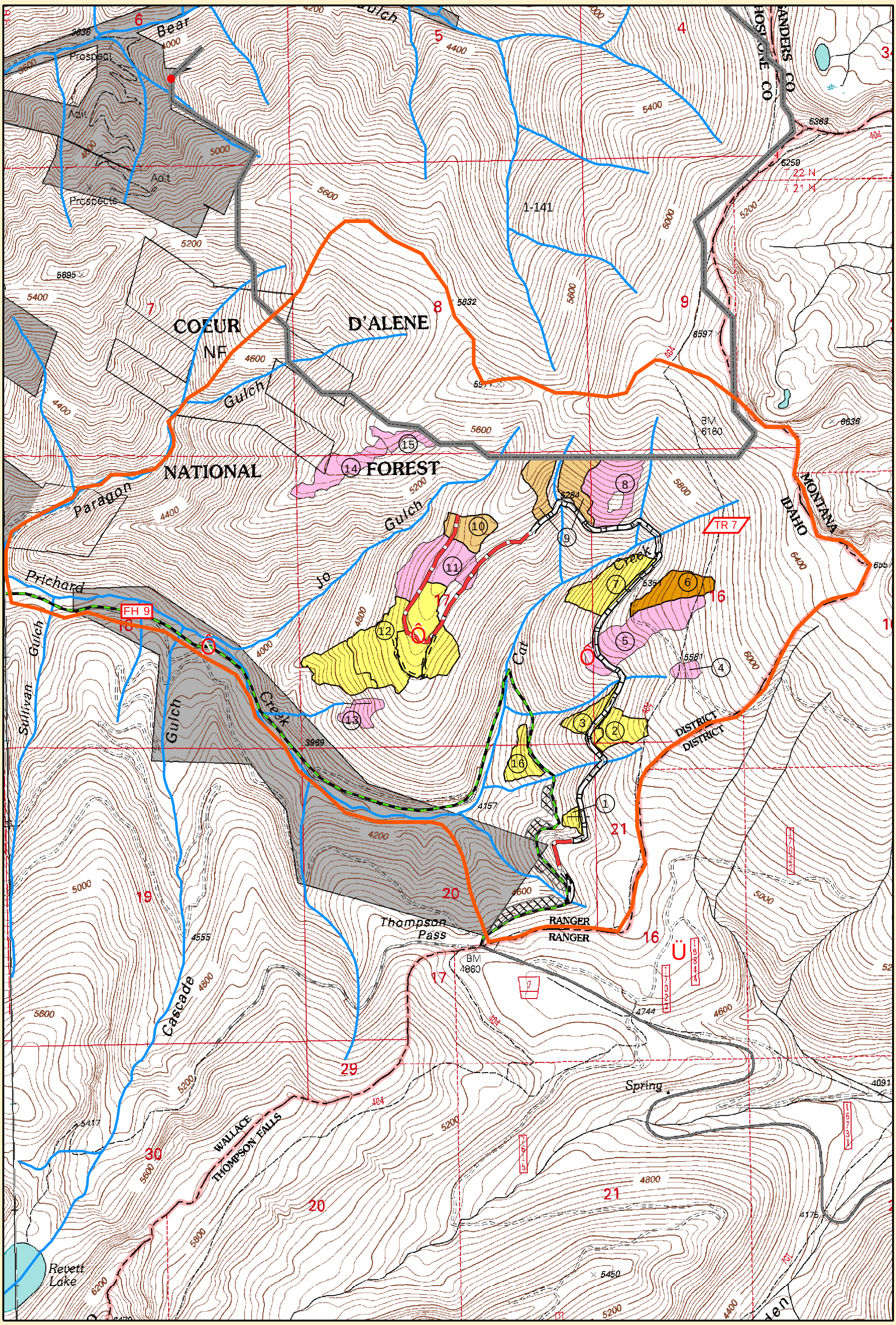
3. PERSONS CONSULTED ON THE JO-CAT RESOURCE AREA PROPOSAL

During scoping, information was gathered or discussed using telephone conversations and email correspondence with the following organizations (PF Doc. PI-17 to PI-20 and PI-23 to PI-26):

Forest Consultant for the Coeur d'Alene Placer Mining Company	Spokane, Washington
Merger Mines	Hayden, Idaho
Idaho General Mining Company	Wallace, Idaho
Idaho Department of Lands	Coeur d'Alene, Idaho
Thompson River Lumber Company	Thompson Falls, Montana
Shoshone County Roads Manager	Wallace, Idaho
Shoshone County Noxious Weed Control	Wallace, Idaho
Plains/Thompson Falls Ranger District, Lolo National Forest	Plains, Montana

APPENDIX C
RESOURCE AREA MAPS

Attached are the Proposed Treatment Map (MAP 1) and the Logging Systems Map (MAP 2). These represent the activities that would be implemented in the Jo-Cat Resource Area under the Proposed Action Alternative.



4

Scale = 1:20000
Contour Interval = 40ft

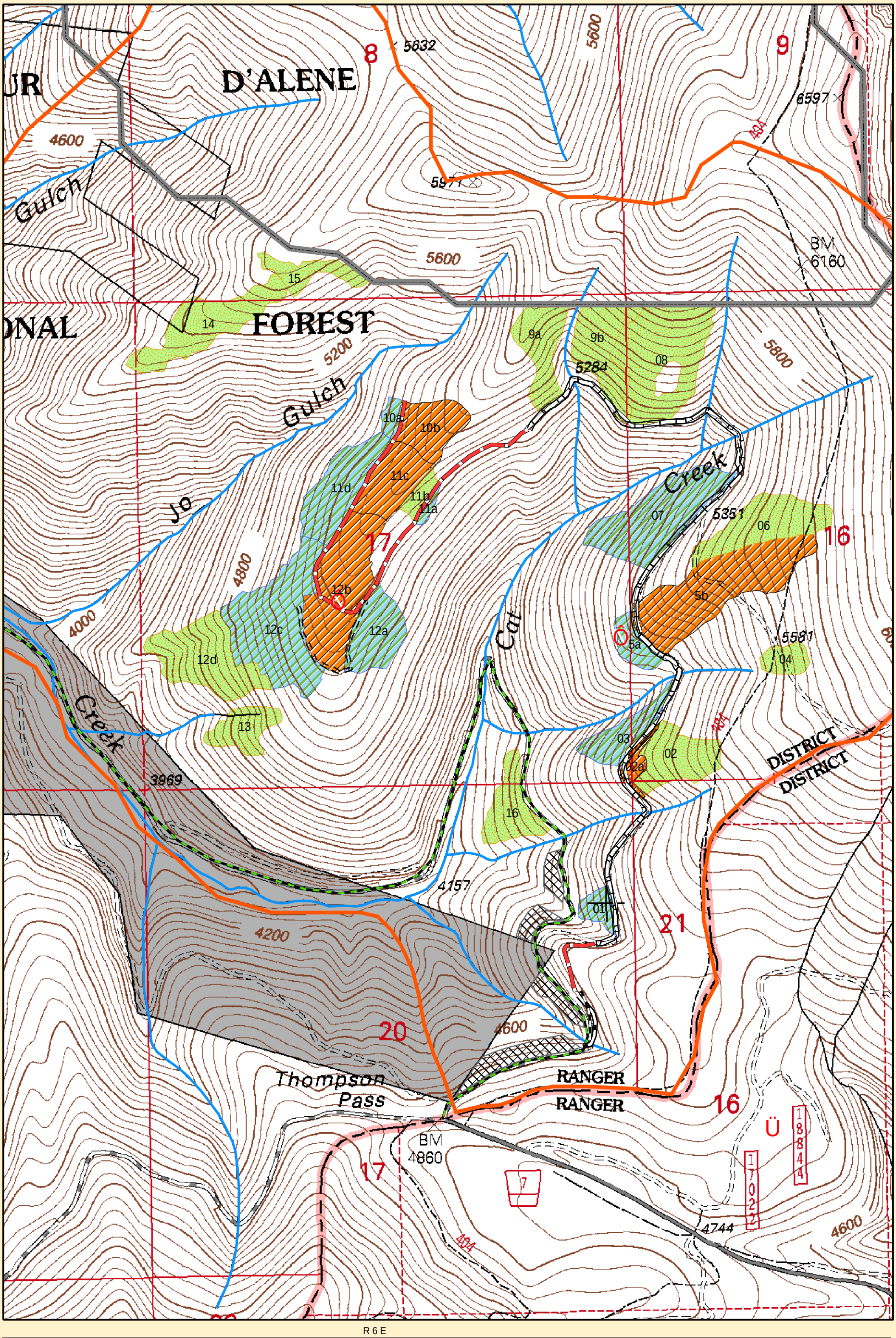
Jo-Cat Analysis Area
Coeur d'Alene River Ranger District
Idaho Panhandle National Forests

Legend

- Helicopter Landings
- FH_9
- Roadless Boundary
- Existing Approach
- New Construction
- Reconstruction
- Temporary Road

Ownership
- Private
- Forest Service
- Hand Fuels Reduction
- Trails
- Project Boundary

Treatments
- Lodgepole Removal
- Lodgepole Salvage
- W. Larch Thinning
- Lodgepole Overstory Removal



4 Scale = 1:12000 Contour Interval = 40ft	Jo-Cat Analysis Area Coeur d'Alene River Ranger District Idaho Panhandle National Forests	Legend Helicopter Landings FH_9 Roadless Boundary Existing Approach New Construction Reconstruction Temporary Road Ownership Private Forest Service Hand Fuels Reduction Trails Project Boundary Logging Method Helicopter Skyline Tractor