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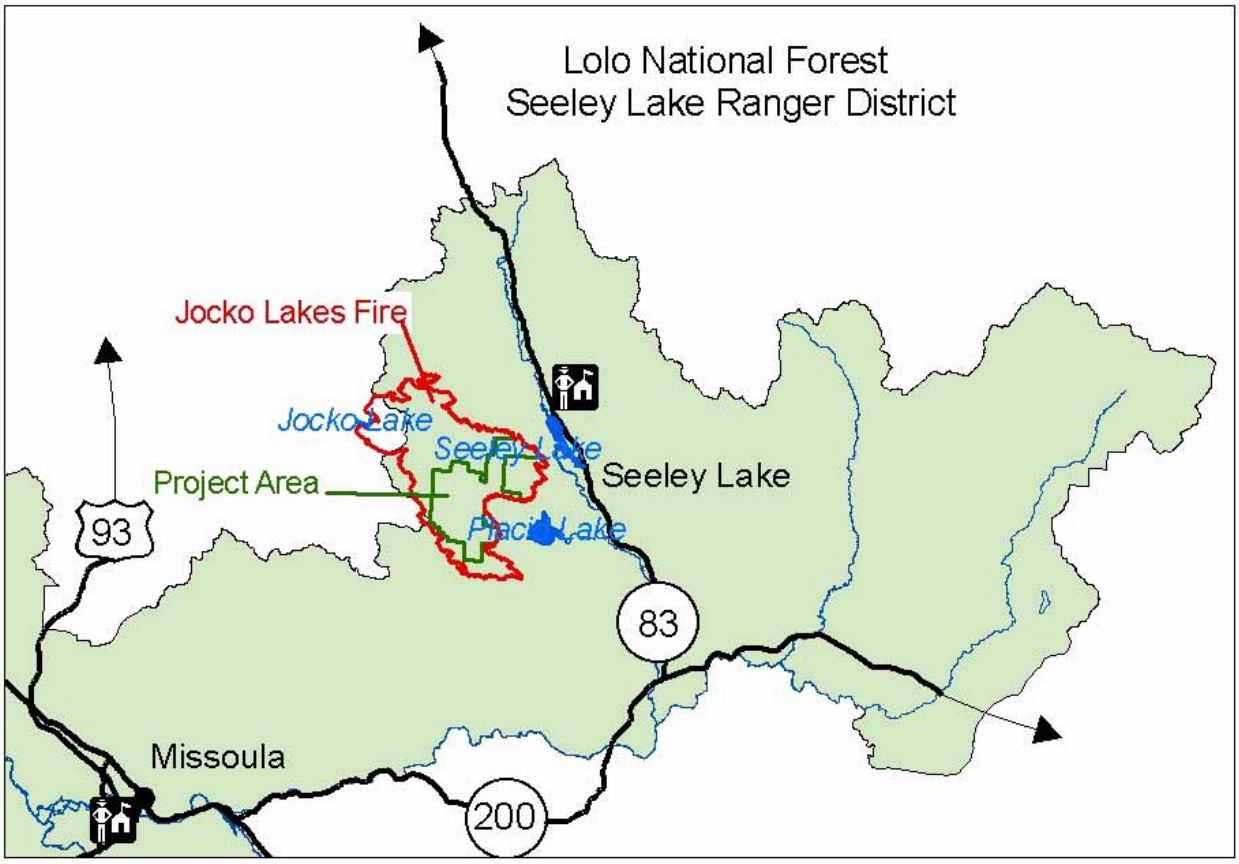
Environmental Assessment

Jocko Lakes Fire Salvage

Seeley Lake Ranger District, Lolo National Forest
Missoula County, Montana



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Summary

The Seeley Lake Ranger District of the Lolo National Forest proposes to salvage 10.6 MMBF of timber that burned in the Jocko Lakes fire of 2007. The Jocko Lakes Fire Salvage project (JLFS) was designed to minimize adverse impacts to the post-fire landscape that could result from salvaging activities. The salvage logging would be limited to approximately 14 percent (approximately 1,648 acres) of the total area of National Forest System (NFS) lands burned by the fire. Other NFS lands within the fire perimeter (about 10,000 acres) would remain in their current post-fire condition. Ninety-four percent of the harvesting would occur during the winter to minimize ground disturbance. The JLFS area is situated in Missoula County, 3 miles south west of the community of Seeley Lake, Montana. A map of the proposed project can be found in Figure 1.

Activities connected to the timber salvage and major resource protection measures would include: maintaining approximately 55 miles of classified National Forest System (NFS) roads, constructing approximately 4 miles of temporary or short-term specified roads; storing or decommissioning 10.7 miles of road; removing 1 and replacing 2 culverts (currently aquatic barriers); and, conducting ground-based noxious weed herbicide treatments on approximately 55 miles of NFS road, landings, and the 10.7 miles of stored or decommissioned roads. Road decommissioning and storage would close 3.8 miles currently open to motorized use.

Salvage activities are proposed within the portion of the Lolo National Forest that is managed for timber production. Seventy eight percent of the acres to be salvaged have a management goal to "optimize sustained timber production" (USDA 1986a, p. III-70, p. III-78, p. III-127). A Forest-wide management goal is to "provide a sustained yield of timber…at a level that will help support the economic structure of local communities and provide for regional and national needs" (USDA 1986a, p. II-1). The local timber industry is important to federal land managers; without it implementing land management activities such as hazardous fuels reduction and other vegetation habitat improvements could be more difficult and expensive.

The purpose of this Environmental Assessment (EA) is to comply with the National Environmental Policy Act (NEPA) and to provide sufficient evidence and analysis for the deciding officer, the Lolo National Forest, Forest Supervisor, to determine whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI) [1].

Acknowledging that any human activity has some affect on our environment, the EA analysis indicates the interdisciplinary team found no unresolved or significant issues. For this reason the Jocko Lakes Fires Salvage Draft Finding of No Significant Impact (FONSI) was prepared and presents our preliminary conclusions regarding whether an EIS is necessary and the potential for significant effects.

[1] 40 CFR 1508.9

Chapter 1 – Purpose and Need for Action

1.1 Introduction

The purpose of this Environmental Assessment (EA) is to comply with the National Environmental Policy Act (NEPA) and to provide sufficient evidence, analysis and basic conclusions for the deciding officer, the Lolo National Forest, Forest Supervisor, to determine whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI) [2]. This EA provides a "hard look" at the question of whether the consequences of the proposed action, given the intensity and the context of the impacts, are "significant."

On August 3, 2007 the Jocko Lakes fire ignited and burned roughly 36,380 acres before the fire was contained in October[3]. The fire killed and mortally damaged trees within the fire perimeter. These trees have commercial value, though their value for timber products is diminishing quickly. The Forest proposes to salvage some of the timber from the burned area in the Jocko Lakes Fire Salvage project (JLFS). **All numbers throughout this EA are approximations**.

The resource reports cited in this EA and additional project documentation can be obtained from the Lolo National Forests' website at http://www.fs.fed.us/r1/lolo/projects/. The abbreviation "PF" is used in this document to cite information located in the project file, along with a document specific identification. The project file is available at the Seeley Lake Ranger District. The abbreviation "Ibid" is used to indicate the cited information came from the same place as the previous citation.

1.2 Need for the Proposal

The portion of the Jocko Lakes fire that is proposed for salvage is within the 52% of the Lolo National Forest that is managed to provide timber to help meet the public's demand for wood based products and support local communities.

The Forest Service is proposing this project in order to:

- **Recover the economic value of dead and fire-damaged trees having a low probability of survival.**

The Lolo National Forest Land Management Plan provides guidance that supports salvaging timber in the Jocko Lakes fire. The first of eight forest wide management goals of the Lolo National Forest plan is to "Provide a sustained yield of timber…at a level that will support the economic structure of local communities and provide for regional and national needs." (USDA 1986a, p. II-1). A forest wide standard is to "Increase the use of the available wood fiber consistent with management objectives and economic principles." (Ibid, p. II-11). Each of the three management where salvaging would occur areas (MA 16, 17, 25) are classified as "suitable for timber production" (Ibid, p. III-71, III-78, II-127). All salvage would occur within Forest Plan management areas that have as a goal "optimize timber growing". Seventy eight percent of the acres to be salvaged have a management goal to "optimize sustained timber production" (Ibid, p. III-70, p. III-78, p. III-127). Salvaging timber from the Jocko Lakes fire helps meet these goals.

[2] 40 CFR 1508.9
[3] Fire is a natural disturbance factor in the Jocko Lakes ecosystem.

Forty five percent of the primary wood product facilities in Montana in 2004 were in the economic impact area considered for this project (Spoelma et al. 2008). While the National Forest is no longer the primary source for wood fiber in the area, providing material to existing industry is important since many land management activities, including hazardous fuels reduction and vegetation habitat improvement would likely be more difficult and expensive without local industry. Product revenue from similar projects has been used to accomplish other needed management activities, reducing the need for appropriating dollars.

Public comments also support salvaging in the Jocko Lakes fire (Section 1.3 and Appendix C). While there is a clear need to salvage there is an equally compelling need, noted by the public and scientific literature, to conduct the salvage in a manner that minimizes potential impacts to the post-fire landscape (Section 1.3 and Appendix C).

1.3 Public Involvement

Public involvement for JLFS started informally with early scoping on October 12, 19 and 30, 2007, while areas of the fire still smoldered. The Seeley Lake District Ranger met on site with interested parties from the environmental community and the logging industry to discuss how to capture timber product value while minimizing impacts. During those meetings the Forest shared and discussed preliminary "design criteria" concepts before the proposed action was initiated. Public input was considered in further refining the "design criteria" and helped to focus the development of the proposed action to create a project that met the purpose and need while addressing environmental and public concerns (PF-L-3). The Forest sent out a press release on December 18, 2007, notifying the public that the Forest was considering salvage opportunities after the Jocko fire.

The JLFS proposal was listed in the January 2008 through March 2008 Schedule of Proposed Actions (SOPA). A scoping letter with the proposed actions was mailed to 58 individuals and organizations including agencies and Tribes on February 15, 2008 and was posted on the Forest web site. A web article was posted in the Missoulian on February 19th and an article appeared in the printed Missoulian on February 20th and in the Seeley/Swan Pathfinder local weekly newspaper on March 6th. Comments were requested by March 21, 2008; however, comments were considered no matter when they were received.

Fourteen individuals and organizations commented on the scoping letter (Appendix C). After considering comments, the interdisciplinary team developed a list of preliminary issues to help guide development of alternatives to the Proposed Action.

The Seeley Lake District Ranger provided updated information to the Seeley/Swan Pathfinder May 9. They published an article about the project on May 22, 2008. On July 15 the District Ranger and Forest Supervisor invited some commenters to a meeting to discuss how their concerns were incorporated into the analysis and used to modify the proposed action. A representative of one of the invited organizations attended (PF-B-21).

This Environmental Assessment and a Draft Finding of No Significant Impact will be made available to the public for a 35 day comment period.

Issue Resolution

Based on public comments received during scoping, preliminary issues were identified as potential undesirable effects that might result from implementing the proposal. Comments ranged from the request to salvage more timber from a larger portion of the burn to doing no salvaging at all and conducting just watershed restoration road work. Further analysis and project development addressed comments either by: modifying the proposed action and its resource protection measures, developing and evaluating an

alternative, incorporating the comment in the analysis, or explaining why the comments do not warrant further agency response. After project development, analysis, and with consideration of all of the public comments, the interdisciplinary team found no unresolved or significant issues.

Appendix C shows the comments received during the scoping process and the disposition or summary of analysis of those comments.

Chapter 2 – Alternatives

The interdisciplinary team developed alternatives in an iterative process. A variety of alternatives were "formulated" and discussed and combined into the following summarized alternatives. Public and internal comment, design criteria, resource information were all used in this iterative process. Alternatives were developed to address issues not necessarily to respond to every commenter's desires.

2.1 Alternatives Eliminated From Detailed Analysis

2.1.1 Alternative 1

Four of the fourteen comment letters received through scoping requested that the Forest consider harvesting more timber than was envisioned in the February 15, 2008 proposed action (Appendix C). The requests included: harvesting more than 17% of the acres burned on National Forest; harvesting with less restrictions; harvest old growth if it no longer meets criteria; harvest trees greater than 21"; and, thin to combat beetle infestation. The consideration of Alternative 1 meets these requests.

The Forest considered both salvaging burned timber and commercially thinning trees to reduce the risk of bark beetle infestation from approximately 2,757 acres (PF-L-6). This would have harvested 24% of the National Forest acres burned in the Jocko fire.

Although Alternative 1 would meet the purpose and need to "Recover the economic value of dead and fire-damaged trees having a low probability of survival" to a greater degree then any other alternative considered, it would harvest trees from areas that had either environmental or public concerns that might require an environmental impact statement to address. Because of the urgency to capture the value of the burned timber before it is lost to decay and checking, and the additional cost and time necessary for an environmental impact statement to be prepared, the Forest decided to eliminate known and potential issues up front to prevent controversy and cumulative effects (PF-I-1).

To this end the Forest drafted "design criteria" as a coarse filter to focus salvage efforts where impacts and public concerns could be minimized (PF-L-3). When preliminary analysis revealed that potential units did not meet the initial design criteria, those units and ultimately this alternative were dropped from further consideration. Reasons for dropping units included: site specific assessment of soil concerns; need for long lengths of temporary road construction to access the burned timber; avoiding use of previously restored roads; locations where skyline yarding was not practical from existing roads; riparian, wet, or MA13 areas; stands which met old growth habitat criteria prior to the fire; areas outside the fire perimeter; and areas not economically feasible to salvage (PF-I -1, I-6, I-13, I-14).

A Forest representative called one of the commenters to explain how their comment was considered in the analysis (PF-B-17).

2.1.2 Alternative 2

Alternative 2 was the proposed action presented to the public on February 15, 2008 (PF-B-6, B-7, B-8). Alternative 2 was a subset of units considered in Alternative 1. The proposal included salvaging burned timber from 1,930 acres of National Forest Land, totaling approximately 10-14 million board feet of timber and associated connected activities. After considering public comments on this proposed action, and conducting additional field analysis, some additional areas were identified for salvage and some of the proposed salvage units, or portions of units, and ultimately this alternative were dropped from further consideration. Units or portions of units were dropped due to wet areas, old growth, access issues and economic feasibility. Alternative 3 is the Modified Proposed Action, representing the modifications made after scoping. Alternative 3 is analyzed in detail in this environmental assessment.

2.1.3 Alternative 4

The Forest considered an alternative, Alternative 4, which would not salvage any timber but would produce a restoration/access management plan (Appendix C). The purpose and need of this project is to salvage timber. This alternative was not analyzed in detail because it does not meet the purpose and need in any way.

The Forest actively pursues restoration efforts as the purpose of many projects, as documented in the 1994 – 2006 Watershed Restoration Report (PF-M-19-54), but that is not the purpose of this project.

Through the Montana Legacy Project, considerable acres could be added to the National Forest System. If this occurs then a broad scale access management, restoration planning effort will follow, which may address some of this commenter's interests (PF-B-21).

The commenter that requested this alternative explained during a meeting with Forest staff that they put this in their comment letter, not with the expectation the Forest Service would forgo the opportunity to salvage, but to keep in the forefront that their preference is for no timber harvest and to focus Forest Service activities on closing and restoring roads (PF-B-21).

2.2 Alternatives Considered In Detail

2.2.1 Alternative 5 – No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. Under a decision to select this alternative, no activities would be implemented in the JLFS to accomplish project or Forest Plan goals. This alternative is analyzed in detail in each of the resource reports which are available on the Lolo National Forest's web site, and the analysis is summarized in this document.

2.2.2 Alternative 3 – Modified Proposed Action

After public input and additional field work, the proposed action sent out during scoping was modified and became Alternative 3, the modified proposed action. During field reconnaissance, we recognized an error made in initial mapping and unit identification. Some initially proposed salvage units contained some old growth. The proposal never intended to salvage from old growth stands, even if it no longer meets old growth criteria (Green et al. 1992) after the fire. Through use of database information and project field reconnaissance to each unit, areas that included stands that at one time met old growth criteria were modified to exclude all old growth stands in Alternative 3. Also, based on field work, boundaries were shifted to conduct the salvage where feasible from an implementation standpoint. Site

specific resource protection measures were also added to Alternative 3 to respond to public comments and enhanced field knowledge.

Alternative 3 will include the following activities[4] (all numbers are approximations): Salvaging 10.6 MMBF of timber from 1,648 acres, planting trees where necessary which is estimated to be 1,170 ac[5], maintaining 55 miles of classified National Forest System (NFS) roads, constructing 4 miles of temporary or short-term specified roads; storing or decommissioning 10.7 miles of road resulting in the closure of 3.8 miles of road currently open to motorized access; removing 1 and replacing 2 culverts (current aquatic barriers); and, conducting ground-based noxious weed herbicide treatments[6] along 55 miles of NFS road and on disturbed areas such as landings and the 10.7 miles of stored or decommissioned roads; and numerous resource protection measures described in detail below.

The road storage or decommissioning, removal and replacement of culverts and weed spraying are mitigations or resource protection measures applied to offset potential effects of the salvage project and would be completed if the salvage project is implemented. This point is made because in some restoration projects (which this is not), numerous resource improvements are identified that would be completed if funds are available. For this project these items will be completed concurrently with salvage if the project is implemented.

These actions would occur between 2009 and 2012 and are further described below.

Salvage

Under Alternative 3, salvage would remove approximately 10.6 MMBF of dead and fire-damaged trees having a low probability of survival (Scott et al. 2002)[7]. The salvage logging would be limited to approximately 14 percent (approximately 1,648 acres) of the total area of National Forest System (NFS) lands burned by the fire. Other NFS lands within the fire perimeter (about 10,000 acres or 86% of the burned area) would remain in its current post-fire condition (PF-M19-63).

Ninety-four percent of the harvesting, 1,559 acres would occur under winter conditions, meaning the ground will either be frozen or snow covered, greatly reducing potential for ground disturbing impacts. Five percent or 77 acres would be skyline yarded; and, one 21 acre unit was analyzed for summer tractor yarding (Figure 1 and Table 3). The summer tractor unit is the only one remaining after modifications were made to the proposed action. It is possible, depending upon the timber sale purchaser's plan of operations, that this unit would also be winter tractor yarded; but, to assure all potential impacts are considered it was analyzed as a summer tractor unit.

Salvage is defined, for this project, as the removal of dead and fire damaged trees. Merchantable trees less than or equal to 20.9 inches DBH that are not needed to meet the snag retention or down wood requirements and which meet the definition of dead or have a high probability of not surviving due to

[4] These activities include actions connected to salvaging timber and some of the primary resource protection measures to minimize and offset potential impacts of the salvaging operations.
[5] This planting would just occur within salvage units. A decision made in January 2008 approved planting, where needed and appropriate in other areas of the Jocko Lakes Fire.
[6] Weed spraying, though addressed in the in the 2007 Weeds EIS and Decision, requires site specific NEPA planning for implementation in this area.
[7] One commenter during scoping expressed concern that by salvaging trees with a low probability of survival a tree that may have lived could inadvertently be harvested. This is a possibility, however the intention is to harvest only trees that are dead, like a cut Christmas tree is dead, but still displays green needles.

delayed mortality are eligible for removal. Trees greater than 21 inches DBH would be left standing on site, unless felled for safety or operational needs.

Dead trees would be defined as those trees, other than western larch, with no green needles. Fire-damaged trees with green needles but with a low probability of survival would be designated for removal by Forest Service personnel using, "factors…from a thorough review of the published literature…tree mortality model outputs, and observations and data from our most recent fire reviews and monitoring plots" (Scott et al. 2002, p. 3). Delayed mortality of fire-damaged trees is caused primarily by insect attack, crown scorch and/or heat killing of the cambium layer within the bole and/or heat killing of the roots near the root crown.

Where winter operations include harvest of western larch, Forest Service personnel would designate cut or leave trees.

Slash, not needed for resource protection measures, may be burned in piles at landings or in skyline cable corridors.

Tree Planting Where Needed

Trees would be planted where natural post fire regeneration is inadequate. It is estimated that 1,170 acres of planting will be needed. Ponderosa pine and western larch, two species identified as at risk in the Northern Region, would be planted where site conditions are favorable for these species. Planting would include the hand placement of the variety of tree species native to the site. Planting often includes scalping of duff from a small area around the planting site and hand placement of woody debris to serve as shade to the newly planted tree. Propagated seeds are collected from the Forest or nearby Forests at similar elevations. Genotypes are the same or similar to native on-site species.

Road Work

Approximately 55 miles of classified National Forest System (NFS) roads would be maintained and used as haul routes. Best management practices, including: road surface reshaping, aggregate surfacing, installation and repair of surface drainage, and culvert replacements, would be applied in the course of maintenance where necessary.

In order to access some units, approximately two miles of temporary road and two miles of short-term specified road would be constructed, and as described in the resource protection measures (Table 4, #45) restored after use.

Temporary roads would be constructed under the supervision of a timber sale administrator and restored one season following purchaser's use. They would be constructed in areas that are not as sensitive to road development such as on flat, well drained topography. Generally, less earth disturbance is required to construct a temporary road (Transportation Report p. 17). The utilization of these roads to shorten log skidding distances can result in less ground impacts. Temporary road miles are estimates.

Short term specified roads would be used for a limited period of time (3-5 years) and then obliterated. The use of these roads limits the undesirable long-term effects of road development and use. Short-term specified road construction is conducted under the supervision of an engineer and is based on a road design developed through an engineering process to avoid resource impacts (Ibid).

Approximately 10.7 miles of road will be stored or decommissioned (6.4 miles and 4.3 miles respectively) before the end of the project (Table 1) as a mitigation/resource protection measure for the salvage to occur. Decommissioning and storing roads would include water-bars or intermittent out-

sloping, removal of culverts, and restoring all watercourses to natural channels & floodplains road surfaces would be ripped 6-12 inches deep, seeded and fertilized. The majority of these roads, 6.9 miles are closed to motorized public access currently. Decommissioning and storage would close motorized access on 3.8 miles of road that are currently open to motorized use. (Table 1)[8]

Ground-based noxious weed herbicide treatments will be conducted along approximately 55 miles of NFS road (roughly 220 acres) and disturbed soil such as landings, temporary roads and the 10.7 miles of stored or decommissioned roads (roughly 98 acres)[9].

Table 1. Roads to be Decommissioned or Stored – Mitigation/Resource Protection Measure and Resulting Changes in Motorized Access

Route Number	Closure Level*	Total
16898	3D	0.9
17457	3D	0.5
17546	3D^	0.2
36000	3D	0.2
36265	3D^	0.3
36279	3D^	0.2
36290	3D	0.7
36295	3D^	0.6
46527	3D^	0.2
46622	3D^	0.1
20632	4	0.4
16001	3S	0.8
16887	3S^	0.8
17455	3S	0.9
36285	3S	0.8
36286	3S	0.1
36427	3S	0.2
4339	3S^	1.3
4347	3S	1.3
60344	3S	0.1
Grand Total	**All Closure Levels**	**10.7**
Total	**Decommission**	**4.3**
Total	**Storage**	**6.4**

*3S -- Retain on National Forest Service Road (NFSR) system in long term storage (self-maintaining); generally up to approx. 20 years.
3D – Decommission, remove from NFSR system, road not needed for 20+ years.
4 - Decommission, remove from NFSR system, road not needed for 30+ years. (Transportation Report Appendix A-1)
^ These 3.8 miles of road are currently open and would be closed to motorized access through implementation of this project.

[8] Vegetation has physically closed Road 36265
[9] Weed treatments will tier to Lolo National Forest Integrated Weed Management Plan (USDA Forest Service, 2007), including approved herbicides, treatment strategies and mitigation measures (Table 4, #66)

Aquatic Barriers Removal or Replacement Measures

One aquatic-barrier culvert would be removed and two aquatic-barrier culverts would be replaced with ones that would accommodate fish passage and 100 year flood flows on Finley Creek (Table 2) as a mitigation/resource protection measure for the salvage to occur. Removal or replacement of these barriers would restore access to approximately 2.5 miles of stream and associated fish habitat within Finley Creek. Culvert removal and replacement includes restoring the stream to a more natural configuration. Where replacements are planned the culverts would be resized to provide for a natural stream meander and bottom configuration.

Table 2. Aquatic Barrier Culverts to be Removed or Replaced – Mitigation/Resource Protection Measure

Culvert ID No.	Action	Road Number	Drainage
1469	Replace	9975	Finley Cr.
1222	Replace	4367	Finley Cr.
1224	Remove	4339	Finley Cr.

Ground-Based Noxious Weed Herbicide Treatments

Herbicide treatments would be made along the 55 miles of haul routes (approximately 220 acres) and where soil has been disturbed, such as on landings and along the 10.7 miles of road that will be stored or decommissioned (approximately 98 acres). Application of herbicides would follow all procedural requirements described within the 2007 Weeds EIS and Decision (USDA FS 2007c).[10] This is a mitigation/ resource protection measure.

Resource Protection Measures

The resource protection measures mentioned above, and additional resource protection measures are explained in the next section.

[10] This EA tiers to analysis in The Final Environmental Impact Statement: Integrated Weed Management on the Lolo National Forest, December 2007. The document is also incorporated by reference, as appropriate, throughout this EA.

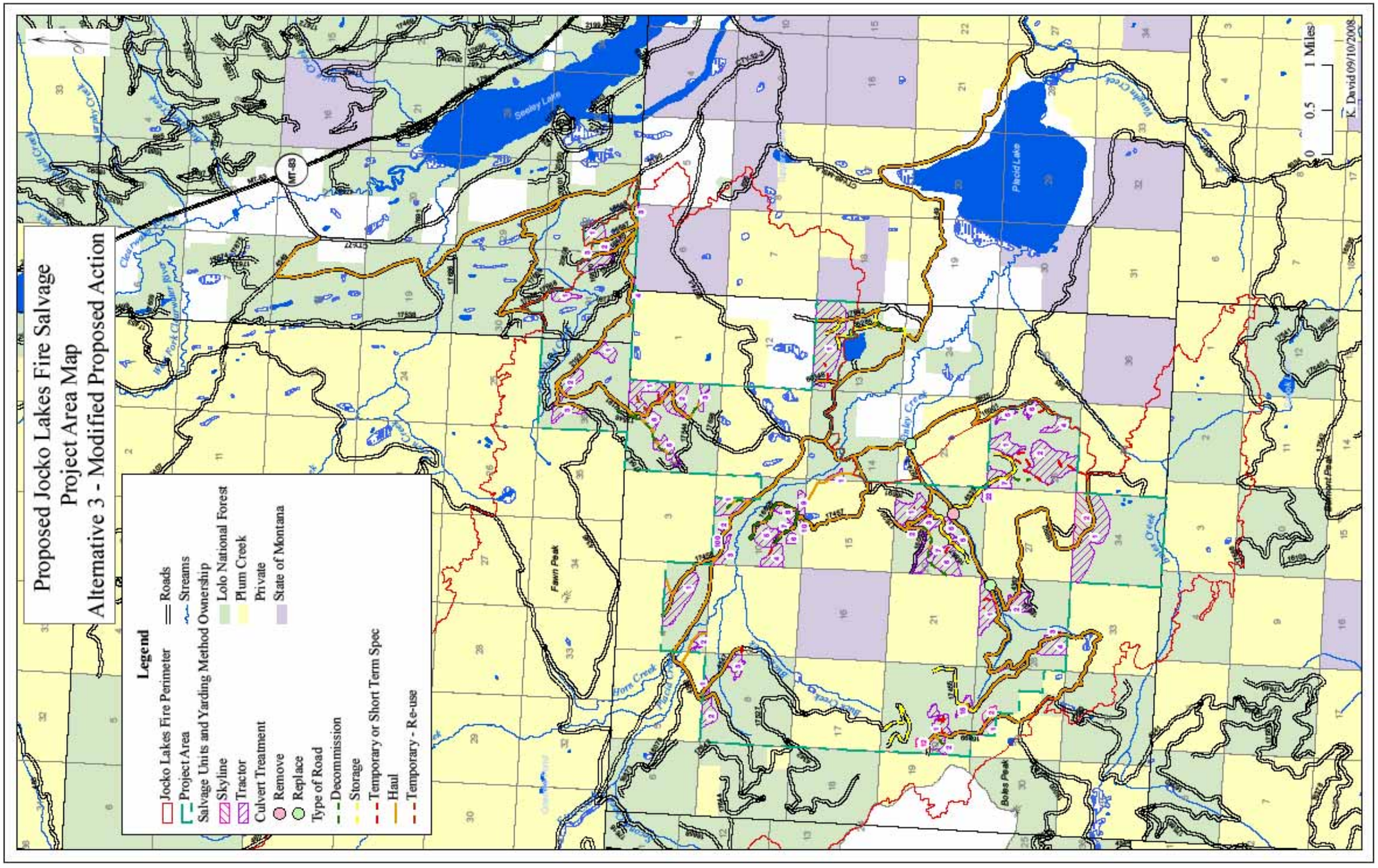

Figure 1. Alternative 3 – Modified Proposed Action Project Area Map.

Table 3. Alternative 3 – Modified Proposed Action Unit Table.

Units	Acres	Logging System	Reforestation	Forest Plan MA
2-1	56	Winter Tractor	Plant	16,25
2-2	48	Winter Tractor	Natural	16
2-3	13	Winter Tractor	Natural	16
2-5	25	Winter Tractor	Plant	16
2-6	18	Winter Tractor	Plant	16
4-1	81	Winter Tractor	Natural	16,25
4-2	13	Winter Tractor	Plant	25
8-1	9	Winter Tractor	Plant	16,25
8-2	27	Winter Tractor	Natural	16
8-3	21	Winter Tractor	Plant	16
10-1	39	Winter Tractor	Natural	25
10-2	6	Winter Tractor	Natural	25
10-3	14	Winter Tractor	Plant	25
10-4	29	Winter Tractor	Natural	16,25
10-5	34	Winter Tractor	Natural	25
10-6	7	Winter Tractor	Natural	16
10-7	7	Winter Tractor	Natural	16,25
10-8	18	Winter Tractor	Natural	16,25
10-9	12	Winter Tractor	Natural	16,25
10-10	3	Winter Tractor	Plant	16
10-100	7	Winter Tractor	Natural	25
13-1	168	Winter Tractor	Natural	16,25
14-1	8	Winter Tractor	Plant	25
20-1	30	Summer Tractor	Plant	16
20-2	21	Winter Tractor	Natural	16
20-12	9	Skyline	Plant	16
20-15	13	Winter Tractor	Plant	16
22-1	47	Winter Tractor	Natural	16,17
22-2	7	Winter Tractor	Plant	16,17
22-3	11	Winter Tractor	Natural	16,17
22-5	16	Winter Tractor	Natural	16
22-6	48	Winter Tractor	Plant	16
22-7	48	Winter Tractor	Natural	16
22-22	4	Winter Tractor	Natural	16
26-1	34	Winter Tractor	Natural	16,25
26-2	104	Winter Tractor	Natural	16,25
26-4	18	Winter Tractor	Natural	23,25
26-5	13	Winter Tractor	Natural	25
26-6	10	Winter Tractor	Plant	23,9
26-7	32	Winter Tractor	Natural	16
28-1	49	Winter Tractor	Natural	16
28-3	7	Winter Tractor	Plant	16
28-4	38	Winter Tractor	Plant	16
28-2a	28	Winter Tractor	Natural	16
29-1	16	Winter Tractor	Plant	16
29-2	12	Skyline	Plant	16
29-4	1	Winter Tractor	Natural	16
31-1	18	Winter Tractor	Plant	16
31-3	29	Winter Tractor	Natural	16
31-4	9	Winter Tractor	Natural	16
32-1	33	Winter Tractor	Plant	16
32-2	15	Winter Tractor	Natural	16
32-3	11	Winter Tractor	Natural	16
34-1	119	Winter Tractor	Natural	16
34-2	56	Skyline	Natural	16
TOTAL	**1,648**			

Table Summaries:

The following provides information for the reader to interpret the data in the Unit Table and correlate it to the Alternative 3 map, and summarizes information in the table

Salvage units are labeled using the section number then the unit number for easy cross-reference with the project area map, Figure 1. This example shows areas 36-1 through 36-3.

Yarding Systems

- **Winter Tractor (1,559 ac., 94%)**
- **Summer Tractor (21 ac., 1%)**
- **Skyline (77 ac., 5%)**

Reforestation

- **Planting (1,170 ac., 71%)**
- **Natural Regeneration (478 ac., 29%)**

Forest Plan Management Areas (MAs) are defined by the Forest Plan, and include a general inventory of resource characteristics and limits of acceptable management activities. The acres and percentage of the salvage units in each MA are in parenthesis.

- **MA 16 (1,272 ac., 77%)** – Lands of varying physical environments which are classified as suitable for timber production; management provides for healthy stands of timber and optimizing timber growing potential and sustained timber production.
- **MA 17 (12 ac., 1%)** – Same as Management Area 16 except that slopes are generally over 60 percent and management is directed at optimizing timber growing potential while maintaining soil productivity on steeper slopes.
- **MA 23 (3 ac., 0%)** – Lands located primarily at elevations below 5,000 feet on south-facing slopes with moderate visual sensitivity; adjacent to or visible from major roads, trails, communities, and other high use areas; classified as suitable for timber production with timber harvest employed to improve or maintain big-game winter range with a visual quality objective of Partial Retention.
- **MA 25 (361 ac., 22%)** – Lands with moderate visual sensitivity, visible from or adjacent to major roads, trails, communities, and other high use areas; classified as suitable for timber production with a visual quality objective of Partial Retention.

2.3 Resource Protection Measures

To aid in developing actions that would be environmentally, technically and economically feasible, the Lolo National Forest developed forest wide "Design Criteria" (PF-L-3). These criteria were considered when developing the scope of this salvage project. As mentioned under the Public Involvement section the Seeley Lake District Ranger solicited input from the Forest's resource staff and some interested publics before the JLFS was proposed as part of the District's early scoping effort. He met with them on site, where the burned timber and effects of the fire could be viewed, and discussed how best to design the salvage project to minimize or eliminate environmental impacts and social concerns, while still meeting the purpose of salvaging dead timber within the portion of the Forest designated for timber production.

The forest wide design criteria, and preliminary input from Forest resource specialists and the public were used as a "coarse filter" during the iterative process of developing the JLFS proposal. This course filter helped to focus the location and type of activities that would be most feasible before the proposal went to the general public for consideration and input. The intention from the beginning was to design a project that would have no significant effects on the quality of the human environment.

The IDT carefully considered all of the public comments received on the proposed action and identified issues. One way issues were resolved was by modifying existing design criteria or adding additional site specific protection measures that reduced to negligible or eliminated the unintended effect (40 CFR 1508.20).

These measures are referred to as **"resource protection measures"** in this document.

Appendix C shows how resource protection measures were used and developed in Alternative 3 to address comments made during scoping.

Some resource protection measurers eliminated the potential for impacts in particular areas simply by avoiding any salvage activities within them.

These include the following:

No new harvest or ground disturbing activities will occur:	**Resource Protection #**
• Within Inventoried Roadless Areas or areas that are unroaded (Figure 1).	1
• Within old growth stands including stands that no longer meet old growth criteria (Green et al. 1992) due to fire. (Vegetation Report p. 8)	2
• In any area that was not reviewed on the ground by a soil scientist (Soils Report p. 1, 21 through 24).	3
No harvest of:	
• 86% of the area burned from the Jocko Lakes fire on National Forest land	4
• Green trees, unless they are fire damaged with a low probability of survival (Scott 2003)[11]; though incidental cutting of green trees for temporary road or landing construction, or cable corridors may occur.	5

[11] Dead trees will be defined as those trees (other than western larch) with no green needles. Fire-damaged trees with green needles will be designated for removal by Forest Service personnel. These trees have a high probability of not surviving due to delayed mortality. Delayed mortality of fire-damaged trees is caused primarily by insect attack,

Additional resource protection measures, specific to implementing the JLFS, are described in Table 4. These resource protection measures are objective based. This means that the desired condition, or the condition to be avoided, will be described. Ways that this objective can be met are also described in the table; however, another method, determined to be equally or more effective in meeting the mitigation objective by a resource specialist and approved by a line officer, could also be used.

crown scorch and/or heat killing of the cambium layer within the bole and/or heat killing of the roots near the root crown. Douglas-fir, Engelmann spruce, grand fir, subalpine fir, western white pine, lodgepole pine, western larch and ponderosa pine having green needles, having heat damage to their cambium layer in the bole or roots near the root crown or trees with high crown scorch will be designated pre-sale. Green insect attacked trees (with boring dust in bark crevices or around the base of boles from insect attacks that are completely around the tree's circumference) may be designated for removal by Forest Service personnel prior to harvest during contract administration. Scott et al. (2002) will be used to help identify trees with low probability of survival (Marking Guidelines).

Table 4. Resource Protection Measures

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Soils	**To maintain soils productivity and reduce detrimental disturbance.**	Reuse existing skid trails where practical. Select trails for the least environmental degradation and optimal efficiency. Skidder/ forwarder trails should be at least 75 feet apart on all units; however, at times it is appropriate to have narrowly spaced (40 feet) trails that are used lightly. Maintain narrow trails.	All tractor units	7
Soils Aquatics		Limit tractor and/or skidder yarding to slopes of 35 percent or less with the exception of short pitches up to 40 percent in consultation with the soils scientist.	20-2	8
Soils		Use skyline harvesting systems on slopes, greater than 35%. Maintain corridors as far apart as is feasible	20-12, 29-2, 34-2	9
Soils		All equipment should stay on designated skid routes, with the exception of feller-bunchers & harvesters.	All tractor units.	10
Soils		Minimize harvester trips off of main trails to three passes where feasible[12].	All tractor units.	11
Soils		Do not place landings on severely burned soils within units unless frozen or snow covered.	2-1, 2-3, 10-100, 13-1, 20-15, 26-1, 26-5, 26-6, and 29-1, areas of severely burned soils.	12
Soils		Where feasible, timber harvesters should place slash in front of the vehicle and work on a slash mat.	All tractor units	13
Soils Wildlife	**To protect soils in severely burned areas or sensitive soils and to minimize potential impacts to grizzly bears (since they hibernate in the winter).**	Operations will be restricted to the winter conditions in these units. Winter conditions guidelines are as follows: 0 inches of frozen soil -- Need 10 inches of settled snow. 2 inches of frozen soil. -- Need 6 inches of settled snow. 4 inches of frozen soil -- No snow cover If necessary, pre-pack snow on designated routes before work commences. This allows soil to freeze and the snow road to solidify.	All tractor units except 20-2	14
Soils Aquatics		Work only when soil is dry. Stop work if trenching or mud is detected, or if you can form a fairly strong clod with the soil in the topmost 6 inches.	20-2	15

[12] A pass is defined as the movement of a vehicle to and from a given destination.

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Soils	**To restore soils with detrimental degradation on over 15% of the area before salvage.**	Following use, place slash on old and new trails at a rate of 25 to 40 tons per acre (TPA). Leave slash throughout the forest at a rate of 15 to 25 tons per acre. Where feasible, debris will encompass a variety of sizes: 40 - 60% of the TPA larger than 12 inches in diameter; 20 - 40% between 12 inches and 6 inches in diameter; 25 - 40% between 6 inches and 1 inch in diameter; 1 -5% green needles.	**ONLY 2-1**	15a
Recreation	**To discourage unauthorized motorized use.**	Skid trails, non-system roads, and paths created during mechanical harvesting would be covered with sufficient slash and /or physical barriers placed to deter unauthorized motorized use.	All units	16
Recreation	**To protect trails and trailheads.**	Protect trails and trail heads during harvest operations. Rehabilitate trail tread and trailheads if damaged during operations.	Boles Point Trail – Units 20-15, 20-1, 20-2.	17
Recreation	**To keep the public informed and reduce safety concerns.**	Notify the recreating public if there will be area, road, or trail closures due to the harvest activities that will be occurring in the project area. Use public notifications at the major access roads, local newspaper, and Forest Web Page.	Project area	18
Recreation		Signs would be posted advising trail users when project activities are going to take place.	Project area	19
Recreation	**To minimize impacts to winter snowmobile use on groomed routes in the project area.**	Establish haul restrictions to allow for winter-time weekend snowmobile use. (Haul routes used as groomed snowmobile trails: Placid Creek Rd. 349; Beaver-Finley Creek Rd. 9974; Archibald Loop Rd. 2192; Archibald Placid Rd. 2191; and Westside Bypass Rd. 2190).	Groomed snowmobile trails used as haul routes (listed to the left)	20
Recreation		When plowing the road, feather the edges of each snowmobile trail crossing in order to prevent impassable vertical snow walls and maintain a 4 inch snow depth on groomed snowmobile trails	Groomed snowmobile trails used as haul routes (listed to the left)	21
Visuals	**To protect the visual quality within scenic corridors and viewsheds.**	Tie unit boundaries where possible to natural landform and vegetation edges. Minimize straight lines and geometric shapes to create vegetative shapes that mimic natural patterns. Unit edges should mimic natural landscape edges to be as naturally appearing as possible.	All Units	22

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Visuals	**Minimize visual effects in Partial Retention VQO so landscape appears slightly altered and activities remain visually subordinate.**	In partial retention VQO areas within view of Placid Creek Road, cut stumps of all size classes low (less then 6 inches on high side of stump), except where there are safety concerns.	10-1, 10-2, 10-3, 10-100	23
Visuals		If there are large concentrations of slash within the immediate foreground (300 feet) of Placid Creek Road they would be lopped and scattered.	10-1, 10-2, 10-3, 10-100	24
Visuals	**Reduce long-term visual effects of marking paint that may be left on site.**	If paint is used for marking leave trees, mark on the back side of tree for a distance of 1 chain from the Placid Creek Road (units 100, 101, 102, 103). Unit boundary marking along Placid Creek road will include stump marks and signs (required by law).	10-1, 10-2, 10-3, 10-100	25
Visuals	**Minimize visual effects of landings and slash debris once the project is completed.**	Where possible, skid trails will not be located perpendicular to the Placid Creek Road corridor to eliminate direct views into log landings and skid trails from this travel route.	Rd. 349	26
Visuals		When possible, use topography and vegetation to screen landings from view of Placid Creek Road. Remove large piles of trees and/or slash by burning, chipping, etc. as soon as possible after project is completed.	Rd. 349	27
Visuals		If vegetation clearing is needed at landings, shape edges to mimic natural patterns and openings, where feasible.	All Units	28
Visuals		Once management activities are complete, scatter slash and debris in landings and re-vegetate. Disperse planting and seeding to mimic existing patterns of the vegetative mosaic.	All Units	29
Wildlife Aquatics	**To eliminate potential impacts to nesting black backed woodpeckers, spring grizzly bear use, and reduce potential sedimentation**	All harvest activity, (felling, yarding and skidding) is restricted from 4/1 - 6/30 across the entire project area. (Meaning operations may only occur between 7/1 and 3/31.).	Entire project area.	30
Wildlife	**To reduce potential impacts to nesting goshawks**	If a goshawk nest is established prior to or during implementation, a 40-acre no-activity buffer would be placed around each active nest to maintain site conditions. Additionally, if a goshawk nest is established, in order to minimize disturbance until fledglings are capable of flight, ground disturbing activities will be restricted (No activity between 4/15 and 8/15) within occupied fledgling areas.	All Units	32

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Soils Wildlife	**To provide downed woody debris for various resources including wildlife and soils.**	On dry sites (Habitat Groups 2 and 3) retain 10-25 tons/acre downed wood. Six inch plus diameter is desirable.	2-1, 2-5, 2-6, 10-6, 13-1, 22-7, 26-1, 26-2	33
Soils Wildlife		On moist sites (Habitat Groups 4 and 5) retain 12-30 tons/acre downed woody debris. Six inch plus diameter is desirable.	2-2, 2-3, 4-1, 4-2, 8-1, 8-2, 8-3, 10-1, 10-2, 10-3, 10-4, 10-5, 10-7, 10-8, 10-9, 10-100, 14-1, 20-1, 20-15, 22-1, 22-3, 22-5, 22-6, 26-5, 26-7, 22-22, 26-6, 26-7, 28-1, 28-2, 28-4, 29-4, 31-1, 31-3, 31-4, 32-1, 32-2, 32-3, 34-1, 36-1, 36-2, 36-3, 20-2, 20-12, 22-2, 28-3, 29-1, 34-2	34
Soils Wildlife		There are many ways to leave an appropriate amount of slash on the ground, including leaving tops and un-merchantable material, in-woods processing, breaking branches with the harvester etc. [13]	All units	35
Wildlife	**To retain large diameter trees for habitat and to address public concerns.**	Most dead timber greater than 21inches diameter at breast height (dbh) would be retained. Exceptions: some large lodgepole pine may be salvaged and snags may be felled for safety, temporary road construction, skid trails, corridors, or landings.	All units	36
Wildlife		To retain habitat for snag-dependent species and species dependent on large-diameter trees, the location of proposed, skid trails and cable corridors would ensure, whenever practical, that trees and snags greater than 21 inches dbh would not be removed during construction.	All units	37

[13] The means to accomplish the woody debris requirement is not mandated, but it is noted that back-hauling slash typically does not meet the desired outcome, as slash ends up in piles close to landings, instead of scattered throughout the unit .

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Wildlife	**To provide snags for wildlife habitat**	For dry sites (Habitat Groups 2 and 3 (VRU 2), retain a minimum of 4 snags per acre greater than or equal 20 inches dbh, or largest available. Select ponderosa pine, western larch and Douglas-fir in order of priority when available.	2-1, 2-1, 2-3, 2-5, 2-6, 10-6, 13-1, 22-7, 26-1, 26-2	38
Wildlife		For moist sites (Habitat Group 4 (VRU 4), retain a minimum of 6 snags per acre greater than or equal to 10 inches dbh, with a minimum of 2 snags/acre greater than 20 inches dbh, or largest available. Up to 12 snags per acre would be desirable. Select ponderosa pine, western larch or Douglas-fir in order of priority when available.	4-1, 4-2, 8-1, 8-2, 8-3, 10-1, 10-2, 10-3, 10-4, 10-5, 10-7, 10-8, 10-9, 10-100, 14-1, 20-1, 20-15, 22-1, 22-3, 22-5, 22-6, 26-5, 26-7, 22-22, 26-6, 26-7, 28-1, 28-2, 28-4, 29-4, 31-1, 31-3, 31-4, 32-1, 32-2, 32-3, 34-1, 36-1, 36-2, 36-3, 20-2,	39
Wildlife		For higher elevation moist sites (Habitat Group 4 (VRU 6) and Habitat Group 5), retain a minimum of 5 of the largest snags /acre, with a desire to have up to 10 per acre.	20-2, 20-12, 22-2, 28-3, 29-1, 34-2	40
Wildlife		In order to maximize potential wildlife use and/or help reduce wind-throw, snags retained should be randomly distributed singly or retained in small clumps (generally 3-15 trees).	All Treatment Units	41
Wildlife		Unless they pose a safety hazard or interfere with operations, un-merchantable trees greater than 9 inches dbh will be left standing.	All Treatment Units	42
Wildlife	**To eliminate potential impacts to elk wallows.**	No harvest will occur within 150 feet of any elk wallow identified during project layout.	All units	43
Wildlife	**To reduce potential impacts to T, E, S species**	If any threatened, endangered, or sensitive species are located during project layout or implementation, a wildlife biologist will be notified. Management activities would be altered, if necessary, so that proper protection measures can be taken. Timber sale contract provisions that require the protection of threatened, endangered and sensitive species would be included in the timber sale contact.	All Units	44

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Aquatics	**To protect aquatic resources by reducing potential sedimentation from roads or salvage activities.**	All temporary roads and landings will be ripped, re-contoured, seeded with approved Lolo NF seed mix and covered with slash or mulch within one season following purchasers' use. Short Term Specified Roads will be decommissioned following sale and post sale activities.	4 miles of temporary/short-term roads.	45
Aquatics		Montana Best Management Practices for Forestry would be met as a minimum on roads used for accessing salvage areas, including provisions of the Streamside Management Zone Law. All activities would comply with Lolo NF Best Management Practices.	Haul routes	46
Aquatics		Prior to timber haul, all BMP and reasonable Soil and Water Conservation Practices designed to control surface drainage from roads would be in place on the following road segments and would be maintained to ensure functionality. All BMPs would be inspected by a hydrologist or fisheries biologist at the end of each operating season to assure their ability to protect water quality during spring snowmelt runoff season. Specific BMPs include: 9974-2: Proposed BMP work includes slash filter windrows at stream crossings. 9975: Proposed BMP work includes: riprap at culvert inlets/outlets, reconditioning 0.89 miles of road, cleaning of 1 CMP, 75 feet of berms and 50 feet of slash filter windrows. 4367: Proposed BMP work includes replacing 2 culverts, 40 feet of ditch construction, 12 drain dips, riprap at culvert inlets/outlets, a rock buttress, reconditioning 2 miles of road, narrowing 195 feet of road, cleaning 5 CMPs, installing 154 feet of open-top drainage structures, and 260 feet of filter slash windrows. Additional maintenance – not included in BMP include: 9975: Brushing 0.89 miles 4367: Brushing 2 miles All other appropriate BMP measures will be implemented as needed.	Haul routes Specifics: 9974-2, 9975, 4367	47
Aquatics		Slash filter windrows would be placed on relief culvert outlets that are within 300 feet of a waterway.	Haul routes	48
Aquatics		Slash filter windrows would be applied to all stream crossings on haul routes BEFORE blading, haul and other project activities occur in order to mitigate 85% or more of the effects of road blading and increased sediment from haul traffic. Slash filter windrows will be maintained during and after haul to ensure effectiveness.	Haul routes	49
Aquatics		INFISH will be applied to assure Riparian Management Objectives are maintained.	All Units	50

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Aquatics		Montana Stream Protection Act (SPA) 124 Permits would be obtained for any activity that would disturb stream channels. U.S. Army Corps of Engineers 404/401 Permits would be obtained for any activities involving stream channels and/or wetlands.	All Units	51
Aquatics		Boundaries of wetlands and RHCAs would be delineated prior to activities to exclude ground-based equipment and other activities.	All Units	52
Aquatics		Erosion control measures (straw bales, wattles, silt fences, hydro mulching, seeding with approved mix, water barring etc.) would be used where necessary and remain in place before and during ground disturbing activities. To ensure effectiveness, erosion control measures would remain in place and functional until disturbed sites (roads, culverts, landings, burn piles etc.) are stabilized, typically for a minimum period of one growing season after ground disturbing activity occurs. This would require regular inspection and may require maintenance. Additional inspections and maintenance would occur following high rainfall events and prior to fall and spring runoff to ensure their effectiveness.	All Units	53
Aquatics		Stream crossings structures, if needed for the short-term specified road would be sized appropriately to meet or exceed natural bankfull channel widths and would be up to BMP standards. Work would be conducted during dry conditions, either naturally or via a clear water diversion to further minimize sediment impacts, and other appropriate construction BMPs would also be applied.	Short term specified roads	54
Aquatics		On temporary roads, sediment buffering devices such as slash filter windrows would be installed below all fill slopes within 300 feet of streams or drainage crossings.	Temporary roads.	55
Aquatics		If winter hauling is to occur, snow drainage holes (areas where drainage can flow through road-side snow berms and off the snow-packed road surface) will be designated prior to winter haul, and kept open throughout the duration of winter hauling	Haul routes – winter haul	56

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Aquatics	**To assure the roads are hydrologically stabilized, minimizing potential impacts to aquatic resources.**	Store - Retain on National Forest Service Road (NFSR) system in long term intermittent storage (self-maintaining); generally up to approx. 20 years. Re-contour or barrier entrance. Water-bar or intermittent out-slope. Remove CMPs & restore all watercourses to natural channels & floodplains. Rip 6-12 inches, seed & fertilize. Scatter slash on road. Treat noxious weeds.	6.4 miles (listed in section 2.2)	57
Aquatics		Decommission - Decommission, remove from NFSR system, road not needed for 20 – 40+ years. Re-contour or barrier entrance. Water-bar or intermittent out-slope. May re-contour along the road. Remove CMPs & restore all watercourses to natural channels & floodplains. Rip 6-18 inches, seed & fertilize. Scatter slash on road. Treat noxious weeds.	4.3 miles (listed in section 2.2)	58
Aquatics		Fish biologist or hydrologist would be notified prior to all stream culvert removals during road decommissioning and of all stream crossing replacements to ensure appropriate alignment and reshaping of the stream channel, bankfull width, floodplain, step-pools and grade control structures, transplants, etc.	Decommissioned roads.	59
Aquatics	**To replace aquatic barriers on haul routes with passable culverts.**	Replace 3 culverts that currently are fish and aquatic organism barriers (on haul routes). Structures will be adequately sized to pass 100 year flood event and will meet or exceed average bankful width at crossing location and will be installed and positioned to allow for natural stream bottom and to mimic natural stream structure including grade, width, floodplain, etc.	3 Culverts (listed in section 2.2)	60
Aquatics Wildlife	**To Protect Aquatic Resources and Improve Wildlife Habitat/Security**	Newly constructed short-term spec. roads will be closed to public access during and following implementation. All temporary roads will be closed to public access during implementation and re-contoured, seeded and covered with slash within one season following purchaser use.	Temporary and Short term specified roads	61
Wildlife	**To Protect Wildlife Habitat / Security**	Existing roads which are currently restricted or closed and utilized for this project would be retained in their pre-project road closure status.	Currently closed routes.	62
Wildlife		The following gated roads access more remote portions of the project area (greater than 1/4 mi. from an open road) and will be used during project implementation. In order to reduce elk vulnerability until hiding cover becomes re-established (@10 years), these roads will remain, as they are currently, closed during the Montana big game season, (rifle and archery) (16001 - sec. 26), (16655, 16687, 16688, 16727, 16729 - sec. 31 & 32), (16898 & 17457 - sec. 10), (17544 - sec. 2) and (16899 & 17455 - sec. 20).	FS Roads 16001, 16655, 16687, 16688, 16727, 16729, 16898, 17457, 17544, 16899, 17455	63

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
Weeds	**To Reduce or Eliminate the Introduction or Spread of Weeds and impacts of herbicides treatment**	Conduct ground-based noxious weed herbicide treatments along approximately 55 miles of NFS road and disturbed soil such as landings, and the 10.7 miles of stored or decommissioned roads in order to mitigate potential weed spread from harvest.	Haul routes, landings and stored and decommissioned roads.	64
Weeds		Include in all timber sale contracts the standard Contract Provisions: C/CT6.351 (or equivalent) – Washing Equipment: This clause requires the purchaser to clean all off-road equipment before moving into project area so that weed seeds are not spread.	Project area	65
Weeds		Weed treatments will tier to Lolo National Forest Integrated Weed Management Plan (USDA FS, 2007c), including approved herbicides, treatment strategies and mitigation measures. Implement mitigation measure 1 – 48 (starting on page 28 of Lolo National Forest Integrated Weed Management EIS 2007). These include evaluating the weed site for sensitive plant habitat, implementing Region 1 weed prevention practices and BMPs, re-vegetating sites with a seed mix that includes native species, following herbicide application law, and posting signs where herbicides are applied.	Haul routes, landings and stored and decommissioned roads.	66
T, E, S Plants	**To minimize impacts to native flora.**	Re-vegetation on disturbed or treated sites should include native plant species as recommended by the USFS-R1 native species policy (USDA-FS 1994). This policy emphasizes the use of locally adapted native plant seed, whenever possible. Native seed or non-persistent, annual grasses will be used. Seeding will be used as a reclamation tool only where resource damage will occur without it. Otherwise, sites will be allowed to re-vegetate naturally from the localized adjacent seed source.	All disturbed sites.	67
T, E, S Plants		If sensitive plants are identified during implementation, the areas will be delineated and no ground disturbing activities would occur within 50 feet.	All	68
T, E, S Plants		By adhering to RHCA buffers, ground-based equipment will be excluded from all wetlands identified as potential *Howellia aquatilis* habitat. (see field maps provided to district) Do not spray herbicide on roadsides where drift could carry it to wetlands (see herbicide label for reducing drift potential)	See mapped locations on Rds. # 16687, 20608, 17682, 2191, 349, 9974-2, 46556, 17457, and 9975.	69
T, E, S Plants		Delineate and buffer (0.1 to .25 miles along road from each end of the road where you enter the camas population zone to ensure site is protected) mapped sites of Common Camas where the population meets the road prior to any herbicide treatment of weeds. Do not spray non-selective herbicide on the roadside in this camas protection zone. Either hand-pull weeds or use a broadleaf selective herbicide within this zone. Camas is a monocot and should not be affected by broadleaf-specific (dicot) herbicide. Use a drift-reducing adjuvant and low boom pressure and spray only when wind is below 10 mph to avoid drift.	Rd. 36279	70

Primary Resource	Resource Protection Measure Objective:	Resource Protection Measure*	Units/Location	Resource Protection #
		Use the site-specific treatment guidelines for herbicide spraying according to the 2007 Weed FEIS (USDA FS 2007c): # 25 Herbicide applications near live water or in areas with shallow water tables will follow label directions. #32 Low boom pressure (less than 40 psi) will be used to reduce drift # 33 Drift-reduction products will be used when needed near sensitive resources # 34 Ground-based herbicide application will occur only when wind speed is 10 mph or less		
T, E, S Plants		Use caution and avoidance of populations of Common camas in the roadside wet areas during road upgrading and keep the soil disturbance confined to the road bed. To allow the population of common camas near road 36279 to expand across the road bed, restore the natural grade level during decommissioning or follow road mitigation for closure level 3D which states that ripping under a level 3 closure would not be needed if it is found that the road bed has re-vegetated. See maps in Field Survey forms for exact locations of Sites # 1, 2, 3, and 4.	Rd. 36279	71
Air	**To assure PM 2.5 air quality standards are met.**	No more than 10 landings and 37 corridor slash piles will be ignited per day; and all pile burning will be halted if, through cumulative effects of other contributors, air quality standards are exceeded.	Landings and pile burning.	72
Air		All pile burning will be halted if, through cumulative effects of other contributors, air quality standards are exceeded.	All	73
Heritage	**Protect cultural and heritage resources**	If previously unknown heritage resources are encountered during implementation of the project, activities will be halted and the Forest Archaeologist will be notified immediately.	All	74
Heritage		Adequately delineate and protect known heritage sites.	4-1, 10-3, 10-100	75

* A resource protection measure may be a design feature that was identified before the project was developed to eliminate or avoid potential undesired effects, or it may be a project specific design feature or mitigation measure developed to minimize or eliminate a known potential effect of this particular action. Another method, determined to be equally or more effective in meeting the resource protection measure a resource specialist and approved by a line officer, could be used. Some resource protection measures will be required of the timber purchaser; others will be paid for by other means.

2.4 Monitoring

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

A. Monitor to determine if unauthorized OHV use is occurring in areas where treatments have been performed. If monitoring reveals this is occurring, steps will be taken to prohibit the use (i.e. signing, barrier installation, increased law enforcement).

B. Monitor post treatment soil conditions to assess the effectiveness of protection measures.

C. Conduct post-salvage stocking exams within all salvage units with 50% or greater overstory mortality to monitor natural regeneration and planting need.

D. Conduct post-planting 1st and 3rd year survival exams.

E. Conduct post-salvage stand exam within all salvage units with less than 50% overstory mortality to assess regeneration success and planting needs.

F. Follow the LNF Integrated Weed Management project (USDA FS 2007b, pages 32-34), the "Effectiveness monitoring of noxious weed treatment" outlined in the BAER Report for Jocko Lakes Fire, and FSM BMPs regarding monitoring noxious weeds (FSM 2081.2)(USDA FS 2001).

G. Monitor herbicide effects on TES plant populations if they are treated. TES plant monitoring would include herbicide used, rate, application type, date of application and effects on TES plants.

H. Monitor to determine if road maintenance and road BMP measures were implemented and to determine their effectiveness. Include culvert replacements. See Hydrology Report (p. 36) for Monitoring details.

I. Monitor to determine if timber BMP and INFISH buffers were implemented and determine effectiveness. See Hydrology Report (p. 36) and Fisheries Report (p. 43) for Monitoring details.

Chapter 3 – Environmental Effects

This section provides a summary of the direct, indirect and cumulative effects of the modified proposed action and of the no action alternative. This section briefly provides the information and analysis that is necessary for the Forest Supervisor to determine whether to prepare a finding of no significant impact or an environmental impact statement[14]. This section is intentionally concise[15]. The associated Jocko Lakes Fires Salvage Draft Finding of No Significant Impact (FONSI) presents our preliminary conclusions regarding whether an EIS is necessary and the potential for significant effects. Additional information, including existing conditions, methodology for analysis, the determination of the effects analysis boundaries, and more details of the effects analysis are contained in the individual resource reports which are available in the project file and online at http://www.fs.fed.us/r1/lolo/projects/ . These reports are cited repeatedly in the following summary.

[14] 40 CFR 1508.9
[15] 40 CFR 1508.9(a)

Appendix D presents activities and natural events known to have already occurred, are currently occurring, or are likely to occur in the vicinity of the proposed Jocko Lakes Fire Salvage project. All of the past activities and occurrences, including the Jocko Lakes fire itself, and actions on adjoining private and state lands, have contributed to the existing conditions for each resource. All of the past, present, ongoing and foreseeable future activities and occurrences were considered to determine if they, in conjunction with direct and indirect effects of the salvage operation, would contribute to a significant cumulative effect on a particular resource. Please see individual resource reports for more detailed cumulative effects information.

3.1 Soils

This information is summarized from the Soils Report which is available on the Lolo National Forest web site. Specific resource protection measures related to soils are described in Table 4.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

For undisturbed to moderately disturbed sites, "no action" would have no direct or indirect negative influences on forest soils. No action would allow these sites to recover naturally from fire (Soils Report p. 16). Indirectly, the "no action" alternative would allow developing litter layers to mature. As vegetation returns to the sites, stands would contribute woody debris to decompose, adding needed organics and soil wood. Microorganisms would quickly inhabit sites and begin decomposition and nutrient cycling. In stands with previous disturbance from harvesting, the no action alternative would allow these sites to continue recovering. Building a forest floor litter layer would help keep nutrients on site and decrease erosion from fire. Over time large woody debris from dead trees would fall on the ground increasing organic matter and water holding capacities on site (Ibid).

Unit 2-1, the only severely disturbed site proposed for treatment the "no action" alternative would have no direct negative impacts, but would create indirect negative impacts by missing an opportunity to actively restore damaged soils. This site would naturally recover in time, approximately 60 to 80 years. Active management can accelerate processes to restore function in 40 to 60 years. These numbers are estimates based on field observations in the Jocko Lake region. (Ibid)

Alternative 3 – Modified Proposed Action

Direct, Indirect and Cumulative Effects

Implementing Alternative 3 would have effects on soils however, based on site specific soil assessments (Soils Report p. 2, p. 21 through 24), and resource protection measures (Table 4, # 7 through 15a) those effects would not be a significant impact to soils because cumulative effects would be within the Region 1 Soil Quality Standards (SQS) for detrimental soil disturbance (Ibid p. 18). SQS are the established standards for protecting soil resources and by meeting them, nutrient cycling, nutrient availability, and soil productivity will be maintained (Ibid).

Evaluation of cumulative effects to soil productivity does not require an integrated "watershed-type" assessment. A larger geographic area such as a watershed or project area is not considered an appropriate geographic area for soil cumulative effects analysis. This is because assessment of soil quality within too large an area can mask or "dilute" site-specific effects. Region 1 policy[16] states the soil quality standards

[16] FSM § 2554.03, 2554.1(1), 2554.1(3)(a.)

should be applied to the activity area. Thus, cumulative effects to soils are evaluated for site-specific activity areas (i.e. proposed vegetation treatment units), but are not evaluated for the entire watershed or project area (Ibid p. 18).

Soil Restoration:

Unit 2-1 is the only proposed salvage unit that currently has detrimental soil disturbance above the 15% threshold identified in the SQS. The SQS (FSM 2554.03) states that "In areas where more than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality" (USDA FS 1999b). Currently Unit 2-1 has 16.7% detrimental soil disturbance from past harvest activity, possibly because harvest occurred during moist soil conditions (Ibid p. 9); a practice that is prohibited with Alternative 3 (Table 4, #15). Resource protection measures (Table 4, # 15a) would move this unit toward a net improvement in soil quality after salvaging, as required in the SQS. Slash would be placed on old and new skid trails at a rate of 25 to 40 tons per acre and throughout the rest of the unit at a rate of 15 to 25 tons per acre. Where feasible, debris would encompass a variety of sizes: 40 - 60% of the tons per acre would be larger than 12 inches in diameter; 20 - 40% between 12 inches and 6 inches in diameter; 25 - 40% between 6 inches and 1 inch in diameter; 1 -5% green needles.

This restoration measure is believed to be an important and effective means to move this unit toward a net improvement in soil quality for the following reasons. The bio-physical resiliency of the soils in this unit has been compromised due to past disturbance and currently natural restorative processes are slow and incomplete (Ibid p. 9). The primary type of disturbance in this unit was from compaction with rutting on skid trails where coarse woody debris is currently lacking (Ibid). Organic matter, including coarse woody debris, is one of the most important elements in retaining soil productivity and long term site health (Ibid p. 4, 8) because it promotes biological activity. Powers, Tiaks and Boyle (1998) states that promoting biological activity, by actions such as adding organic matter, is the best way to remediate damaged soils (Ibid p. 14). Soil flora and fauna associated with organic matter (including mycorrhizae fungi) serve to break up compacted soils (Ibid) and influence many physical characteristics of the soil; such as, soil aggregation and associated water infiltration and gas exchange (Ibid p. 13, 14, 18).

It has been observed throughout the West, including on the Clearwater District of the Nez Perce National Forest, Clackamas District of the Hood River National Forest, Three-Rivers District of the Kootenai National Forest and the Sula District of the Montana State Forest, that there is a tight correlation between logging debris on skid trails and a distinctive lack of compaction (Ibid p. 14). In an unpublished slash-use experiment at the Lubrecht Experimental Forest, near the Seeley Lake Ranger District, it was found that the amount of water-stable aggregates significantly increased when slash was lopped and scattered on severely disturbed soil. Water-stable aggregates and the associated increase in soil porosity began to form two years after treatments were initiated (Ibid).

For these reasons the salvage in Unit 2-1 with the associated restoration (Table 4, # 15a) would reduce soil disturbance and put it on an accelerated trend (40 to 60 years of recovery compared to 60 to 80 years with no action), towards de-compaction (Ibid p. 16 and 19) and therefore a net improvement in soil quality which meets the SQS.

Minimizing of Soil Impacts:

Every potential salvage unit was surveyed on the ground by a soil scientist (Ibid p. 21 through 24). Except for Unit 2-1, discussed above, all proposed salvage units are projected to have less than 15% detrimental soil disturbance after salvage activities, when considered cumulatively with past harvest and fire

disturbances (Ibid p. 18 through 20). This would be achieved because site specific, unit-by-unit soil conditions were field measured and considered for all potential salvage units, and units with soil concerns, or any other concerns, that could not be satisfactorily addressed through protection measures, were dropped (PF-L-6). For the units included in Alternative 3, carefully crafted resource protection measures, explained below, were developed to protect the post-fire soils.

Woody Debris. As discussed briefly under soil restoration, the importance of soil organic matter cannot be overstated (Okinarian, 1996; Jurgensen et al. 1997) (Ibid p. 4). This organic component contains a large reserve of nutrients and carbon, and it is dynamically alive with microbial activity (Ibid). Of the many organic materials incorporated in a forest soil, the woody component is in many ways the most important (Ibid). Due to the 2007 fire, the majority of the salvage units do not currently have the recommended amount of woody debris in contact with the soil (Graham et al. 1994) (Ibid p. 11). Potential woody debris is standing currently in the form of dead trees. After salvaging timber from these units they would have the recommended amount of woody debris left on site (Table 4, # 33 and 34). There are many ways to leave an appropriate amount of slash on the ground, including leaving tops and un-merchantable material, in-woods processing and breaking branches with the harvester (Table 4, #35). Dry sites (habitat groups 2 and 3) would have 10-25 tons/acre downed woody material left on site, with a preference toward 6 inch + diameter material. On moist sites (habitat groups 4 and 5) 12-30 tons/acre downed woody debris would be left on site, again with a preference toward 6 inch + diameter material (Ibid p. 12). These protection measures meet or exceed the requirements in the Forest Plan (USDA FS 1986a) and the Lolo NF Downed Woody Material Guide (USDA FS 2006b) (PF-M-16). According to Graham et al. (1994) and Brown et al. (2003), leaving this woody debris is a highly effective protection measure that provides micro-sites for seedling germination, maintain cooler soil temperatures, increase site water holding capacity, aid in erosion control, and provide carbon for underground biologic activity (Soils Report p. 12).

Winter Tractor. Skidding would occur in winter when there is snow on the ground or when soils are frozen in all ground based units (except unit 20-2 - Table 4, #14) which total 1,559 acres or 94% of all salvage acres. Unit 20-2 is discussed under Summer Tractor below. Harvesting during winter conditions would protect severely burned soils from ground disturbance, but is also planned for units with moderate and low burn severity (Ibid p. 7). Logging on snow and frozen soil is a highly effective method for reducing compaction, rutting, soil displacement and associated issues (Flatten 2003; Philipek 1985) (Ibid p. 13). Winter logging is estimated to create a maximum of 5% disturbance to these units based on Niehoff (2002), on the ground experience, observations and monitoring from previous salvage harvests on the Flathead National Forest and monitoring on the Lolo National Forest on the Seeley Lake Ranger District (Ibid p. 17). In some instances, some of the new disturbance (50%) is expected to overlap with existing disturbance in the unit (Ibid p. 20). This level of additional disturbance is not expected to result in over 15% cumulative disturbance in any unit (Ibid).

Summer Tractor. Unit 20-2 is the only potential summer tractor unit. Summer tractor is appropriate for this unit because it has lower burn severity and more intact litter layers as well as root-tight litter layers and surface mineral soil layers (Ibid p. 17). These conditions offer protection from ground-based equipment. In addition, the gentle slopes of this unit reduce the risk of soil disturbance (Ibid).

Soil impacts would be minimized in this unit because of the following protection measures displayed in Table 4: #7) Existing skid trails would be reused where practical Trails would be selected for the least environmental degradation and optimal efficiency. Skidder/ forwarder trails would be narrow and generally be at least 75 feet apart on all units; however, at times it would be appropriate to have more closely spaced (40 feet) trails that are used lightly. #8) Tractor and/or skidder yarding would be limited to slopes of 35 percent or less with the exception of short pitches up to 50 percent in consultation with the soils scientist. #10) All equipment would stay on designated skid routes, with the exception of feller-

bunchers & harvesters. #11) Harvester trips off of main trails would be minimized to three passes. #12) Where feasible, timber harvesters would place slash in front of the vehicle and work on a slash mat. #15) Work would only be done when soil is dry. Work would be stopped if trenching or mud is detected, or if a fairly strong clod can be formed with the soil in the topmost 6 inches.

Summer logging is estimated to add a maximum of 13% additional disturbance to Unit 20-2 based on Niehoff (2002), on the ground experience, observations and monitoring from previous salvage harvests on the Flathead National Forest and monitoring on the Lolo National Forest on the Seeley Lake Ranger District (Ibid p. 17). This level of additional disturbance is not expected to result in over 15% cumulative disturbance in this unit (Ibid).

Skyline. Three units (20-12, 29-2, and 34-2) with low/moderate or moderate burn severity would be skyline logged (Ibid p. 7). Skyline yarding disturbs only the corridor where the logs are pulled up hill. Biologic resiliency remains intact on skyline units, as it is the combination of compaction and burning that causes significant long-term soil damage (Ibid p. 17). Soil impacts would be minimized in this unit because corridors would be maintained as far apart as is feasible (typically 150 foot spacing) (Table 4, #9).

McIver and Starr (2000) reviewed literature and found skyline yarding disturbed 2.8 percent of the soil in a unit. Lolo National Forest monitoring of skyline yarding on soils similar to those on the Jocko Lakes Fire Salvage Project area found similar disturbance on skyline units (Ibid p.17). This level of additional disturbance is not expected to result in over 15% cumulative disturbance in these units and Region 1 Soil Quality Standards would be met (Ibid).

Temporary Roads. Approximately 4 miles of temporary roads[17] or short-term specified roads would be constructed. These roads would add a small amount of disturbance (generally less than 1%) to the individual units in which they are constructed (Units 2-1, 8-3, 10-4, 13-1, 20-1, 22-1, 22-6, 26-2, 26-6, 26-7, and 28-1) (Ibid p.17). Soil disturbances from temporary roads were considered and are not expected to result in over 15% cumulative disturbance in any of these units and Region 1 Soil Quality Standards will be met (Ibid p. 16).

All temporary roads would be rehabilitated, re-contoured, seeded with approved Lolo NF seed mix and covered within one season following purchasers' use. Short Term Specified Roads would be decommissioned following sale and post sale activities (Table 4, #45).

3.2 Hydrology

This information is summarized from the Hydrology Report which is available on the Lolo National Forest web site. Specific resource protection measures related to aquatics are described in Table 4.

[17] 3.3 miles are linked to specific units. Up to 0.7 miles are included in the effects analysis that may be built in small stretches as needed during implementation. This equates to 2.5 acre if it was all constructed on one site, which is unlikely, and it will not add a significant amount of disturbance to any unit (Ibid p. 18).

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would have no direct, indirect, or cumulative effects to road density or water yield. There would also be no direct effects to water quality (sedimentation or channel stability) associated with Alternative 5.

Indirectly, the existing road system would continue in the short- and long-term to contribute sediment to streams, currently modeled as 448.4 tons per year, within the Project watersheds. Although old, infrequently used roads would continue to re-vegetate, reducing the amount of sediment produced and possibly contributed to streams, all of these old roads would continue to impact watershed hydrology and water quality. Stream channel and road fill scour, channel aggradations, and risk of sediment contribution from failure of undersized stream crossing would persist until otherwise addressed (Hydrology Report p. 23).

The No Action Alternative would not likely contribute to cumulative sediment-related effects to water quality. Existing trends in water quality would likely be maintained. Cumulatively, stream channel impacts may result from post-fire flow increases that may cause large pulses of sediment or water. There would be a greater likelihood of this occurring with the No Action Alternative, since there would be no additional BMPs applied to the road system, and stream crossing culverts would not be upgraded. Impacts from future ground disturbing activities are possible. Activities may include residential development, logging, roading, and fire. Other unforeseen events could combine with the past, present, proposed and foreseeable actions to create cumulative sediment-related effects that impact water quality. Past trends in water quality as identified in TMDL assessment work has identified that water quality in the Project watersheds such as Buck Creek has been impaired partly as result of sediment (Ibid p. 25).

Equivalent clear-cut area (ECA) is a tool used to determining the effects of vegetation removal on water yield (Ibid p. 27). The existing ECA, post Jocko Lakes fire, is well below the 30% level identified in the Forest Plan as a level for potential concern for increased water yields (Ibid p. 29).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would reduce road density in the Finley Slippery 6th Code HUC by 0.1 miles/mile^2. BMP upgrades, road decommissioning and storage, and culvert removal/replacement in Alternative 3 would contribute to both, a small, short-term increase in sediment delivery to streams and an overall, long-term decrease in sediment delivery to streams (17.7 tons annually). Removing one and replacing two undersized culverts would improve stream channel stability. Alternative 3 would have no effect on water yield.

Road Density: No new permanent long-term specified roads would be constructed (Ibid p. 21). A total of 10.7 miles of road would be decommissioned or stored which would slightly reduce road densities by 0.1 miles per square mile in the Finley Slippery 6th Code HUC changing the density from 5 miles/mile^2 to 4.9 miles/mile^2 . Other road closures are small, when looked at on the 6th Code HUC scale, and not detectable in the road density calculations (Ibid). Four miles of temporary or short-term specified roads would be constructed but would be of limited duration (1-5 years depending on timing of construction and closure) and would not affect long term road density because they would be re-contoured to the original hill-slope following use (Table 4, #45) (Ibid).

Water Quality-Sedimentation: Some of the proposed JLFS activities would have no or discountable effects to stream sedimentation. Proposed short term specified and temporary road construction would have minimal effects to water quality because it would occur primarily on mid- to upper slope and ridge top positions (Ibid p. 24) and resource protection measures would further minimize the potential for negative effects (Table 4, #45, 53, 55, 61). A short-term specified road would be built with approximately 210 feet of the road (0.14 acres) (Fisheries Report p. 2) within the Finley Creek RHCA but because NFSR 9974-2 is between the stream and the proposed temp road it would intercept any sediment (Hydrology Report p. 21, 24) and with the resource protection measures mentioned above none would be delivered to the stream. No harvesting or landing construction would occur within the 300' INFISH buffers (Table 4, #50) and therefore these activities would have no measurable or detectable effect to sedimentation of streams (Ibid p.23). Extensive review of research and monitoring that was the basis for establishment of the 300' INFISH buffer requirement (USDA FS 1995) and recent monitoring in the Northern Region gives validation to the conclusion that sediment would not reach streams (USDA FS 2006a) (Ibid).

The following three activities (culvert removal/replacement; road maintenance; and, road storage/decommissioning) would contribute to minor, short-term steam sedimentation, but after the initial sediment pulse, these activities would reduce sediment year after year for a long-term benefit in sediment reduction. Three undersized culverts would be restored by removing one and replacing two with larger structures suitable for fish passage and capable of accommodating larger stream flows and debris. Previous monitoring on the Lolo National Forest (Casselli et al. 1999) demonstrated that stream crossing removal/ replacement may generate 1-2 cubic yards of short-term sediment (1-2.5 tons) in runoff per 500 cubic yards of road fill volume involved. This contribution (up to 2.5 tons) would occur at installation and removal of this crossing if no BMPs are installed during construction. However, with BMPs installation and other resource protection measures (Table 4, #46, 47, 48, 51, 53, 59) potential sedimentation would be reduced considerably (Ibid p. 24). An increase of 5 tons of sediment over several years is estimated based on an assumption of 500 yards of material or less. Long term sediment production from the crossings would be reduced once the culverts are replaced, since they would be at much lower risk of failure.

Most of the national forest system roads are in relatively good condition as a result of extensive road reconstruction and construction activities which have occurred within the analysis area in the last 25 to 30 years in conjunction with several timber sales (Transportation Report, p. 2). The proposed project would result in a total short-term increase of sediment to project streams as a result of road maintenance (Luce and Black 1999) and haul traffic. Road maintenance and reconstruction activities would be conducted to bring roads up to standards (Table 4, #47, 49). This work would be limited and intermittent. Activities would primarily include road blading/grading and cleaning out culverts as necessary before and after haul. Road reconstruction would also include opening up and "grubbing" out vegetation from less than 2 miles of closed roads (Transportation Report p. 18) that would be used for the project and later placed into storage or decommissioned. Disturbance of the road bed material as a result of the blading normally results in a short-term increase in sediment that typically subsides 60-80% within the first two years after blading (Luce and Black 2001). In addition to road blading/grading, road maintenance work for Alternative 3 would also include cleaning and armoring culverts, adding cross drains and adding slash filter windrows or other similar BMP practices at each stream crossing on haul routes (Table 4, #47, 48, and 49). Effective implementation of such practices is expected to provide 85% or more sediment mitigation (Seyedbagheri 1996). This means by implementing Alternative 3 which includes slash filter windrows, sedimentation from existing stream crossings, estimated to currently at 14.9 tons/year, would be reduced by 12.7 tons/year down to 2.2 tons per year (Hydrology Report p. 25).

Road maintenance improvements would be prioritized at stream crossings and along road segments paralleling streams (Table 4, #47).

This increase was the result of modeling the project activities as though they all occurred in the same year, however, they would not likely occur all in the same year as the project would be implemented over several years in several phases. Likewise, the short-term sediment increase would occur in smaller increments over multiple years. The benefits of the road maintenance and BMP application would result in a possible decrease every year following implementation of approximately 12.7 tons per year (Ibid p. 25). Whereas the short-term increase would be a one-time occurrence, the long-term decrease from BMP upgrades would persist every year (Ibid).

Road decommissioning and storage of 10.7 miles would be completed to what is called "Level 3" resulting in a long-term annual reduction in sedimentation of an estimated 5 tons per year. Level 3 storage minimizes the impact of a road because runoff is decreased and infiltration is increased when the hardened road surface is ripped; this also reduces erosion of the road surface. Seeding and re-vegetation of the road surface under a Level 3 closure further slows runoff, increases infiltration and reduces erosion. Level 3 closures further reduce drainage problems because water-barring directs flow off the road, and pulling culverts and re-establishing streams and floodplains through crossings helps to restore hydrologic function of the watershed (Ibid p. 21). Approximately 1.2 miles of road in the headwaters of Buck Creek, which is a stream listed on the 1996 303(d) list, but not on the 2006 303(d) list (Ibid p. 2) will be decommissioned. This will considerably reduce the risk of sediment delivery from that road segment (Ibid p. 24). This road will not be used for timber salvage but will be closed as a resource protection measure as part of the salvage project.

Water Quality-Channel Stability: There would be short-term impacts to the Finley Creek stream channel related to removing and/or replacing of 3 culvert structures and to other stream channels where culverts are removed for road decommissioning and storage but stream channel stability and function would be maintained (Ibid p. 26). The culvert replacements or removal would have long-term benefits to stream channel stability by providing re-naturalized stream segments where culverts are removed and stream simulation where undersized crossings are replaced with structures that allow passage of water, material and aquatic organisms via natural stream processes and functions. Resource protection measures (Table 4, #45, 53, 54, 55, 57, 58, 59, and 60) would ensure stream channel stability and function (Ibid p. 27).

Water Quantity/Water Yield: The equivalent clearcut acres are currently below the 30% threshold that triggers further analysis to determine if water yield increases could occur and the JLFS will have no direct or indirect effect on equivalent clear cut acres and therefore no effect on water yield (Ibid 41).

Percent canopy removal in the salvage units of Alternative 3 is estimated to be close to zero percent on average. The focus of the Jocko Lakes salvage project is to salvage dead trees and leave live trees on site. The trees to be removed are dead, or have a low probability of surviving, so they would not influence water yield appreciably, and would not affect the total evapotranspiration, and change water yield. Because there is no measurable changes in evapotranspiration anticipate from the harvest of dead and trees with a low probability of surviving, the high post-fire water yields are not predicted to change measurably from the proposed salvage harvest.

Effectiveness of Resource Protection Measures: Effectiveness of Best Management Practices and mitigations measures have been investigated in research studies and monitored by the Lolo National Forest as well as by the State of Montana. These studies and evaluations demonstrate that BMPs and mitigation measures can, in general, be effective at preventing erosion and sedimentation and have specifically been implemented effectively by the Lolo National Forest specifically as well as by other national forests in Montana. Results of these studies and evaluations are summarized in the Hydrology Report (p. 33 through 35).

Cumulative Effects

Regardless of alternative, road density would remain relatively high throughout the project watersheds and would continue to impact watersheds. The benefits of road maintenance work/watershed improvements implemented in recent years would persist (Appendix D and Hydrology Report p. 45, 50, 53, 54). Some examples of watershed improvement benefits include reduced erosion and sedimentation from roads, fewer road miles impacting watershed hydrology, fewer stream crossings impacting stream channels, improved fish passage and more available fish habitat (PF-M19-54). No new system road construction is planned on Plum Creek lands or Montana DNRC Lands in conjunction with their salvaging of timber burned in the Jocko Lakes Fire (Ibid p. 21).

Cumulatively, the estimated tons of sediment produced from Alternative 3 (5 tons from culvert removal/replacement) would combine with sediment produced from other activities such as roads, soil disturbing activities on private lands, etc. (Appendix D). However, because the short-term increase associated with project implementation would last only a short time (1-5 years) and would be incremental, not occurring all at once, and because BMP practices and mitigation measures would be implemented effectively, the sediment impact would be limited as much as possible. The overall result would be beneficial, a long-term decrease in sediment of approximately 17.7 tons annually (5 tons from road decommissioning or storage and 12.7 tons from BMP upgrades) in addition to long-term sediment decreases that have occurred watershed-wide as a result of watershed improvements including BMPs, road decommissioning, culvert removals and replacements and stream rehabilitation. The long-term benefit of increasing the amount and quality of available aquatic habitat would be greater than the short-term impact from achieving that benefit (Ibid p. 26).

3.3 Fisheries

This information is summarized from the Fisheries Report which is available on the Lolo National Forest web site. Specific resource protection measures related to aquatics are described in Table 4.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Under this alternative there would be no direct, indirect or cumulative effects to the biological and ecosystem functions and processes that affect fish habitat quantity and quality. No fish barrier culverts would be removed/replaced and no sediment issues would be addressed by road maintenance and decommissioning (Fisheries Report p. 23).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Due to increased short-term sediment generated by the removing/replacing of three aquatic barrier culverts and road maintenance, a short-term negative impact to native salmonids would be expected with Alternative 3. Because one culvert removal and some road obliteration activity is located immediately above likely bull trout spawning gravels, this project would result in incidental take and generate a *"May Affect, Likely to Adversely Affect"* determination for bull trout consultation. This activity would last less than one week and would generate sediment that would affect downstream spawning gravels until the next spring flow (Ibid p. 24). The short-term sedimentation increase *"May Impact Westslope cutthroat trout individuals, but is Not Likely to Result in a Trend toward Federal Listing"* under the Endangered Species Act (Ibid). A separate Biological Assessment regarding effects to federally listed fish species and

critical habitat located within the analysis area was submitted to Fish and Wildlife Service on August 2, 2008 (Ibid).

The same actions that would cause the short-term negative impacts discussed in the paragraph above have the following long-term beneficial effects: restore aquatic species access to 2.5 miles of Finley Creek and associated fish habitat (Ibid p. 24); reduce approximately 12.7 tons of potential stream sedimentation annually over the long-term, reduce potential for substrate embeddedness; and, reduce road density by 0.1 mile/sq mile in one 6th Code HUC (Ibid p. 25).

Alternative 3 would have no effect on: stream temperatures, stream woody debris, pool habitat, off-channel habitat, refugia, floodplain connectedness, stream bank stability, steam width/depth ratios, peak/base flows, or drainage network (Ibid p. 24, 25). The primary reason there would be no effect to these elements is because INFISH buffers would be applied (Table 4, #50) which would restrict activities occurring next to streams. The determination of no effect to these elements includes consideration that approximately 210 feet of a short-term specified road, equivalent to 0.14 acres, would be built within the Finley Creek RHCA. Because NFSR 9974-2 is between the stream and the proposed temporary road it intercepts any potential effects to the stream (Ibid p. 23, 25).

Herbicide application would occur along road sides. Because roads have compacted surfaces they are runoff dominated sites, which increases the risk of herbicide entry into streams. Herbicide applications are covered under the existing Forestwide EIS for noxious weeds (USFS FS 2007c) (Ibid p. 24).

Cumulative Effects

By far the most substantial historical cumulative impact to fisheries has been the introduction of non-native fish. The most serious threat is from hybridization with non-native rainbow trout. Rainbow trout were stocked decades ago to provide recreational fishing and have become well established. Similar to cutthroat trout, rainbow trout spawn in tributaries during the springtime and they do occasionally hybridize with cutthroat trout. The progeny are fertile and over the years the population becomes further and further hybridized (Ibid p. 41). A second threat to cutthroat trout conservation is the presence of non-native brook trout. Like rainbow trout, brook trout were stocked decades ago and they have spread. Juvenile brook trout can out-compete juvenile cutthroat trout (Novinger and Rahel 1999) (Ibid p. 42). The project will not add to this past and ongoing negative effect.

Direct effects of the proposed harvest and road activities would include a short-term increase in sediment production and erosion due to road maintenance, log haul and culvert removal/replacement (Ibid p. 23). Past timber harvest, road construction and maintenance in the area had a minor lingering effect of sedimentation (Ibid p. 43). Road construction inevitably causes sedimentation into streams, especially when the road travels near or across a stream. Road maintenance and BMP work scheduled by the BAER project and Jocko Lakes Fire Salvage project are beneficial to keep erosion from the existing roads to a very minimal level.

Fire suppression has likely had a minor impact on sedimentation. Many miles of dozer and hand line were constructed around the perimeter of the Jocko Lakes fire but little of this was near stream channels. The resource advisors on the fire (a fisheries biologist and hydrologist) provided oversight on rehabilitation requirements and 79 miles of dozer line have been water-barred and 60 miles have been reseeded.

Mitigating effects of potential sedimentation in the Jocko Salvage by winter harvesting over snow, frozen ground and/or by dry soil harvesting over slash mats would reduce the duration of sediment production and erosion. Over time, sediment production and erosion would decrease due primarily to the proposed implementation of road BMPs.

One of the more substantial cumulative impacts to fish has been migration barriers on the existing road system. Fish need connected fish habitat in order to escape temporary stressors (like wildfire) and to exchange gametes during spawning to avoid inbreeding (Ibid p. 41). Three fish barriers will be removed or replaced with this project.

Indirectly, the proposed project would cause a short-term decrease in water quality due to increased sediment production, and long-term increase in water quality due to decreased sediment production. Long-term benefits to fish habitat would occur by removing/replacing three fish barrier culverts. Long-term benefits would offset the short-term impacts.

With mitigation measures, all alternatives meet Forest Plan Standards to maintain or minimize impacts to soil and water. In meeting Forest Plan Standards, all alternatives also meet State Water Quality Anti-degradation laws.

3.4 Wildlife

This information is summarized from the Wildlife Biological Evaluation and Wildlife Report which is available on the Lolo National Forest web site. Specific resource protection measures related to wildlife are described in Table 4.

Species Not Affected

Alternative 3 and 5 would have no effect on the following species, either because the area lacks suitable habitat, or the project would occur outside of the species range: Peregrine falcon, harlequin duck, Townsends big-eared bat, common loon, northern leopard frog, and Coeur d'Alene salamander (Wildlife Report p. 25).

Lynx (Threatened)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would have no direct, indirect or cumulative effects to lynx.

Alternative 3 – Modified Proposed Action

Direct, Indirect and Cumulative Effects

Alternative 3 would not affect any existing suitable lynx habitat, because the Jocko Lakes Fire removed (fire consumed) suitable lynx habitat within the proposed units (Wildlife Report p. 31). Alternative 3 would not decrease the future ability to provide suitable lynx habitat. As a result of salvage harvest, about 1,170 acres are likely to recover sooner due to replanting (Ibid p. 32). Since there would be no direct or indirect effect to suitable lynx habitat there would be no cumulative effect.

Alternative 3 "May Affect, Not Likely To Adversely Affect" lynx. This determination is based on the following rationale (Ibid p. 36):

- Activities planned with this project meet or exceed all objectives, standards and guidelines found in the Lynx Amendment for this type of project.
- Lynx would not be expected to be utilizing the portions of the Lynx Analysis Units being proposed for treatments as they are within a larger block of currently unsuitable lynx habitat.

- The only potential effects to lynx are discountable because they are unlikely to occur, would not change any lynx habitat to unsuitable, and the proposed haul routes primarily cross unsuitable lynx habitat as well.

Grizzly Bear (Threatened)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would have no direct, indirect or cumulative effects to grizzly bear.

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 *"May Affect, Not Likely to Adversely Affect"* grizzly bear. This determination is based on the following rationale (Ibid p. 40):

- The project is not within the NCDE Grizzly Bear Recovery area and is not within Management Situation 1 habitat. A programmatic biological assessment is in place that covers the effects of existing roads, grazing and sanitation/attractants on grizzly bears.
- No new permanent roads would be constructed. The road improvements would be done on existing roads, most of which are closed to the public year-round. After project implementation, there would be more obliterated and decommissioned roads in the immediate project area which translates to enhanced wildlife security.
- Most logging activities would occur during winter (12/1 – 4/1) seasons (Table 4, #14) when bears are typically denning and inactive.
- Based on elevation, slope and aspect, the project area is not high quality denning habitat and the probability of disturbing a denning grizzly bear is low to very low.
- Cover would remain where it currently exists and an accelerated recovery of long-term cover would occur on about 1,170 acres of salvaged stands that would be replanted. Large areas of non-treated burned areas would remain within the project area following project implementation.
- A district wide bear attractant order is in place which requires safe storage of all bear attractants.
- No grizzly bear linkage zones or corridors would be impacted.

Cumulative Effects

Plum Creek lands in and adjacent to the project area have been extensively harvested in the past 40 years. There is limited commercial timber remaining at this time outside of Stream Management Zones. It is unlikely that additional roads will be built for the purpose of timber harvest. The potential exists for these lands to be developed for real estate. Some resource management activities will likely continue to occur on these lands regardless of ownership.

Forest Service lands in this area were substantially changed by the Jocko Lakes Fire, but may continue to provide lower quality suitable habitat for grizzly bears, due to the lack of cover. Over time as cover is restored and insect levels increase in the remaining rotting wood, habitat quality will improve. Logging activities on federal lands in the project area vicinity has occurred over the last 5 or more decades with the

last substantial green harvests occurring in the late 1980s and salvage harvest in the Boles Meadow area more recently (2003-2005).

The scale of this project is moderate (1,648 acres) and involves no new permanent road building or other permanent development. In regard to cumulative impacts on grizzly bears, the anticipated habitat changes related to this project are not substantial. Further, security will be enhanced by more permanent and restrictive road closures. Finally, the District-wide food storage Forest Order should reduce potential for habituation to humans.

Gray Wolf

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

There would be no direct or indirect effects and therefore no cumulative effects to the gray wolf its habitat or prey base under Alternative 5 (Ibid 40).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 will have no effect to the gray wolf. This determination is based on the following rationale (Ibid p. 42):

- Region 1 Programmatic Biological Assessment had a determination of Not Likely to Adversely Affect, 2005.
- There are no known den sites or rendezvous sites within the project area. Montana Fish, Wildlife and Parks (MTFWP) has a good handle on pack activity all across MTFWP Region 2.
- There are no livestock grazing permits on FS lands within the project area and no known livestock grazing occurs on adjacent Department of Natural Resources and Conservation or Plum Creek Timber lands.
- Wolf use of this area is currently low, based on MTFWP data.
- The Seeley Lake area has high ungulate densities. While the fire may have had immediate detrimental impacts, even one year after the fire, forage values and availability have likely increased exponentially. Given that most activity associated with the project would occur in winter, ungulate displacement should be low as most animals would already be on lower elevation winter range.

Cumulative Effects

Approximately 40% of the analysis area has not been affected by the Jocko Lakes fire and although the quality of cover varies, approximately 70% of the NFS lands and 60% of the non-federal lands within un-burned portions of the analysis area currently consist of forested stands that would provide cover for both big game and wolves. Approximately 400 acres of harvest associated with the Hidden Lakes EA was completed in 2008, all of which would be expected to maintain overstory cover on areas treated.

Current activities such as firewood collection, dispersed recreation, mushroom collection and noxious weed treatment along road corridors would continue. While these activities may result in a short-term,

localized source of disturbance to wolves, much of this would be concentrated along open roads and the level of disturbance is not anticipated to increase.

Cumulatively it is expected that ongoing activities identified in Appendix D and anticipated salvage harvest on non-federal lands would result in localized disturbance to both big game and wolves. However it is estimated that approximately 70% of the un-burned portions of the analysis area would continue to provide cover and that security areas would continue to be available both within and adjacent to the burned area for both wolves and big game.

Pileated Woodpecker (Management Indicator Species - MIS)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

No direct effects are anticipated with Alternative 5 and indirect effects are based on the amount and quality of suitable nesting and foraging habitat available. Because no trees would be harvested under this alternative and considering the increase in medium and large diameter snags, it is assumed that all suitable habitat that currently has greater than 50% canopy closure (1,867 acres) would provide nesting habitat conditions preferred by the pileated woodpecker. Because salvage on non-federal lands is expected to remove most of the large diameter snags, as well as many residual trees, any sites harvested on non-federal land are no longer considered suitable nesting or foraging habitat.

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would reduce suitable nesting habitat by 10 acres, a reduction of 0.5% of the nesting habitat available in the project area. The project would reduce the number of snags but would not eliminate the suitability of the nesting habitat on an additional 510 acres or 27% of existing nesting habitat within the project area. Alternative 3 may impact individual pileated woodpeckers but the actions are not expected to cause a local or regional change in habitat quality or population status. (Wildlife Report p. 46, 47)

Due to mortality from the Jocko Lakes fire, approximately 70% of the project area no longer provides the conditions (greater than 60% canopy closure) preferred by this species for nesting (Ibid. p. 44). Of the acreage proposed for salvage, 520 acres are considered suitable nesting habitat. A total of 61 acres of suitable nest habitat are proposed for skyline yarding and of this, 10 acres are close to the minimum threshold for preferred canopy closure. Because skyline yarding would reduce the live canopy within corridors, it is likely that suitable habitat would be reduced in these 10 acres (Ibid. p.46).

Salvage harvest is not expected to reduce suitable nesting on the remaining 510 acres of nesting habitat, nor would it reduce any foraging habitat because of resource protection measures that would preserve necessary habitat components. Resource protection measures would: retain all existing old growth, even if it no longer meets Green (et al. 1992) criteria (Resource Protection Measure #2); retain at least four snags per acre, depending on habitat type; retain trees over 21 inch dbh, with few exceptions; and, retain downed woody debris on all sites proposed for salvage (Table 4, #38 to 42, 36, 33 to 35) (Ibid. p. 46).

The action would not cause a change to population status because by implementing the seasonal harvest restrictions, as required in the resource protection measures (Table 4, #30) all harvest would occur when young are mobile and the potential for mortality would be greatly reduced. Additionally this species is usually tolerant of human activity near the nest and although some birds that are roosting or nesting on a site may move out of the area (http://bna.birds.cornell.edu/bna/species/148/articles/conservation), any

disturbance would be limited to the implementation period (2009-2012) and effects would be short-term in nature (Ibid. p. 46).

Cumulative Effects

One hundred percent of the standing dead would be retained on 10,017 acres or 86% of all the National Forest lands burned in the 2008 Jocko Fire (Vegetation Report, p. 18) and on 5,733 acres or 77% of the National Forest lands in the Jocko Lakes Fire Salvage project area (Wildlife Report p. 47). Modeling shows that the number of snags per acre and DWD across the project area will greatly increase over the next 14 years within all habitat groups (Wildlife Report, p. 23).

The availability of suitable pileated woodpecker habitat on non-federal lands were reduced by past harvest practices and the Jocko Lakes fire. Future cumulative actions on non-federal lands are anticipated to reduce suitable foraging habitat by 3% and suitable nesting habitat by 1% when all suitable habitat on all ownerships is considered. However, Samson (2006) estimates that approximately 90,500 acres of suitable habitat are necessary to maintain a minimum viable population of this species and currently R-1 provides over 20 times as much habitat as is necessary and the Lolo NF alone provides approximately 1.7 times as much habitat as is necessary (Ibid p. 44), regardless of habitat availability on non-federal lands.

The pileated woodpecker is considered widespread and common in Montana (Ibid p. 43). Samson (2006) concluded that short-term viability of the pileated woodpecker in the Northern Region is not an issue because: 1) No scientific evidence exists that the pileated woodpecker is decreasing in numbers, 2) Increases in the extent and connectivity of forested habitat have occurred since European settlement, 3) Well-distributed and abundant pileated woodpecker habitat exists on today's landscape and 4) The level of timber harvest in the Northern Region is insignificant (Ibid p. 47).

Elk (MIS)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

The no action alternative will have no direct, indirect or cumulative effects on elk.

Because the 2007 Jocko Lakes fire greatly altered cover and forage conditions, elk distribution and use of the area is expected to change with or without salvage activities. Due to the reduction in cover from the fire increased hunting mortality could occur. Elk numbers have steadily increased within Hunting District 285, which includes the JLFS area and are currently at or near modern day highs (MTFWP Elk Plan 2004) (Wildlife Report p. 49).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 will have no effect on critical elk winter range (identified by the Montana Fish, Wildlife and Parks) because none exists within the project area (Ibid p. 49). No effect is expected to calving elk. The project would have a beneficial effect of increasing acres of security habitat by 263 acres with road decommissioning and storage. Salvaging dead trees would have no effect on "satisfactory cover" or "riparian cover" but would reduce a small percentage, 5%, (Ibid p. 50) of the "marginal" elk cover available in the project area.

"Satisfactory" cover includes sapling or larger stands that were unburned, and pole or larger stands that were lightly to moderately burned (low end of moderate) and experienced less than 25% basal area

mortality. “Marginal cover” includes sapling and larger stands that were lightly or moderately burned, that experienced less than 50% basal area mortality.

The project could create a short-term disturbance to elk on 1,648 acres proposed for salvage, however 94% of the project would be implemented in winter months and this is not critical winter range habitat.

These effects may impact individuals or habitat, but are not expected to cause a local or regional change in habitat quality or population status. (Ibid p. 54)

A number of factors lead to this determination. (Ibid)

- Over 77% of the JLFS project area would be unaffected by treatment.
- Elk numbers have steadily increased within HD 285 and are currently at or near modern day highs. As a result, and considering that elk distribution and use of the area will shift to take advantage of remaining cover, elk populations are expected to be maintained.
- Because salvage harvest only involves removing of dead wood, or trees with a low probability of survival (Resource Protection Measure # 5), and considering resource protection measures would ensure that downed woody debris would be retained on all sites proposed for treatment (Table 4, #33, 34 and 35), it is anticipated that cover would continue to be provided on over 90% of the sites treated.
- Project design features (no harvest between 4/1 and 6/30, Table 4, # 30) would ensure that timber harvest does not occur during calving and there are no anticipated impacts to calf recruitment and potential disturbance during this period is greatly reduced.
- Proposed road decommissioning and storage would reduce human access and increase available security habitat, which would result in a long-term improvement in elk habitat (Table 4, #61). Also maintaining the existing closure of over eight miles of roads into elk security habitat during hunting seasons is expected to retain security (Table 4, #62 and 63).
- Existing cover/forage ratios within both winter and summer range would be relatively unchanged from the present condition and are consistent with Forest Plan direction.

Additionally, no harvest would occur within 150 feet of any elk wallow identified during layout (Table 4, #43) (Ibid p. 52).

Cumulative Effects

It is expected that ongoing activities identified in Appendix D and anticipated salvage harvest on non-federal lands would, when considered cumulatively with the reduced cover on 150 acres in Alternative 3, contribute to localized reductions in habitat security and cover. Although most of this would occur within portions of the analysis area affected by the Jocko Lakes fire, it is estimated that approximately 70% of the un-burned portions of the analysis area would continue to provide elk hiding cover. Due to the availability of early successional vegetation created by the fire, elk foraging habitat is widespread. However there are large blocks that are greater than 500 feet from cover and these areas would receive little use for 5-10 years, until cover increases (increased downed wood and seedling development). (Ibid p. 53) Considering proposed road storage/decommission would result in a long-term improvement in elk security, and that current elk numbers are at a modern day high, cumulative effects will not cause a local or regional change in habitat quality or population status. (Ibid p. 54)

Northern Goshawk (MIS)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Because there are no direct, indirect or cumulative effects anticipated, Alternative 5 would not be expected to cause a local or regional change in habitat quality or population status for the northern goshawk.(Ibid p. 62).

Structural changes in habitat are expected over time with or without salvage activities. Post-fire suitable habitat will be characterized by more complex vertical structure, than before the 2007 Jocko Lakes fire, with multiple canopy layers. Since the habitat of many prey species are linked to structural habitat components such as snags, downed wood, and vegetative diversity in the understory as well as on a landscape scale (Reynolds et al. 1992), overall this increase in structural diversity is expected to improve goshawk foraging habitat but due to less cover overall, goshawk use in the area is expected to be reduced. (Ibid p. 60).

There would be no change in the level of roads or human access under this alternative (Ibid).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would have no effect to known goshawk nests (Ibid p. 48) and no effects to foraging habitat (Ibid p. 58).

Implementation of this alternative could reduce nesting habitat and post fledgling areas (PFA) in skyline corridors on 69 acres (1% of available habitat in project area) and may result in possible mortality or disturbance to the northern goshawk. However, for the following reasons, implementation of Alternative 3 may impact individuals or habitat, but is not expected to cause a local or regional change in habitat quality or population status (Ibid p. 59, 66):

- Suitable habitat has been surveyed and there are no known goshawk nests within the project area. Also resource protection measures would be in place to protect any new nests established (Table 4, #32) and reduce potential impacts during the breeding season (no timber harvest between 4/1 and 6/30 – Table 4, #30). As a result potential impacts related to nest production and success are expected to be greatly reduced.
- Ninety nine percent of existing nesting and post fledging area habitat within the project area and would continue to provide suitable habitat conditions. Habitat would continue to exist within all watersheds in the analysis area.
- Reductions in total and open road densities and associated human access are expected to improve goshawk habitat over the long-term.
- The Jocko Lakes fire has greatly altered landscape conditions (See Table 20) preferred by this species, which is expected to reduce goshawk use and reduce potential conflicts with proposed activities.
- A Region-wide assessment (Samson 2006b) of goshawk habitat has indicated the following:

- Goshawk habitat in R1 is abundant and well distributed where it occurs naturally, and more forest, and therefore nesting habitat, exists on today's landscape than what occurred historically.
- There have been substantial increases in connectivity for forested habitat since Euro-American settlement.
- The level of timber harvest of the forested landscape in R1 is insignificant in regard to altering goshawk habitat at the population scale.
- No demographic information exists to suggest a decline in goshawk numbers.
- Not a single known nest site in R1 is isolated from other known nests by more than the goshawks' estimated dispersal distance.
- A comparison of habitat estimates for maintaining viable populations indicates that given the natural distribution of habitat, each Forest in R1 has an excess of available goshawk habitat.

Cumulative Effects

Cumulatively during the analysis period (2008-2012) it is anticipated that non-federal salvage and pre-approved NFS harvest approved prior to the Jocko Lakes Fire would occur under both alternatives. However because over 80% of the non-federal salvage occurs in areas that were moderately to severely burned and considering much of the Plum Creek lands did not provide suitable nest habitat prior to the fire, only a 3% reduction in nest habitat and 4% reduction in post fledging area habitat are anticipated (Ibid p. 62).

Fisher (Sensitive)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 will have no short-term (less than 10 years) direct, indirect, or cumulative effects on the fisher or its habitat; however, due to the increased amounts of downed woody debris that would occur in the next 30 years, it is expected that the quality of understory habitat would improve over the long-term (greater than 10 years) under this alternative. It would take decades for overhead cover to become established in severely burned areas.

Because there would be no change in road access under this alternative, potential conflicts with humans would be unchanged.

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would have no effect on the amount of suitable fisher habitat available (as identified by Samson 2006a).

Alternative 3 would create structural changes on 582 acres, 19% of suitable fisher habitat in the project area, but suitable habitat would be maintained because the proposed salvage only removes dead and dying trees, and there are no sites where canopy closure would be reduced to levels that are unsuitable for fisher (i.e. maintain greater than 50% canopy) (Ibid p. 67). Alternative 3 may impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability.

Because there are no treatments proposed within RHCAs or old growth (Green et al. 1992) under Alternative 3, suitable habitat in riparian habitat would be unchanged by the actions of this project. Similarly although a few acres of winter habitat are proposed for treatment (less than 1% of the suitable winter habitat available in the project area), there would be no significant change in this habitat component by salvaging.

Although Alternative 3 would reduce the potential for human conflicts by increasing the remoteness of habitat by reducing open road density, the benefit is considered minor because the project area post-fire landscape presently only provides marginal habitat. Use of the project area by fisher is likely low.

Cumulative Effects

Although past harvest has affected fisher habitat, the Jocko Lakes fire has further reduced suitable fisher habitat within the analysis area (Ibid p. 68). Most remaining habitat occurs on sites that were unburned (4%) or lightly burned (25%), which are scattered throughout the project area.

Ongoing and anticipated future timber harvest is expected to occur on approximately 6,700 acres within the 11,881 acre analysis area, including 6,400 acres of non-federal salvage and 400 acres of previously approved federal harvest (i.e. Hidden Lake EA) (PF-M19-52). Because only partial harvest treatments were approved in the Hidden Lakes EA, habitat conditions would remain relatively unchanged. Also because most of the non-federal salvage occurs in sites that were moderately to severely burned, these areas would only provide marginal habitat conditions and potential impacts would be reduced. The large reduction in cover within riparian habitat resulting from the Jocko Lakes fire would be expected to reduce fisher use and potential impacts under both alternatives (Ibid p. 67).

Wolverine (Sensitive)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Because there are no direct or indirect effects under this alternative, no cumulative effects to wolverine are anticipated (Wildlife Report p.70).

The project has a high total and open road density and receives fairly heavy year-round human use and therefore it currently provides marginal wolverine habitat (USDA FS 1998). There would be no change in access or road density under this alternative so potential conflict with humans will be unchanged. Elk are a food source for wolverines. Elk distribution and use is expected to shift both within and adjacent to the project area, but there is not expected to be a substantial decrease in elk numbers within the affected watersheds. As a result, the suitability of wolverine foraging habitat will remain relatively unchanged (Ibid p. 70).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would have no affect on quality wolverine denning habitat because it does not exist in the JLFS area. It would result in no reduction of wolverine habitat, and would reduce the potential for interactions with humans over the long-term. Alternative 3 may impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability. (Ibid p. 72)

This species often avoids burned areas (Hornocker and Hash 1981 *In* Montana Field Guide 2008), and is not associated with areas with high road densities (Carroll 2001) (Ibid p. 68), so use of the JLFS area by

wolverines would likely be limited to dispersing individuals (Ibid p. 68). Salvaging would reduce stand structure on 1,648 acres, however, this would not change the suitability of the habitat for wolverines, nor would it affect the availability of big game (elk) for wolverine foraging. Road decommissioning and storage will reduce access and potential for interaction with humans if wolverines dispersed through the JLFS area.

Cumulative Effects

Past harvest on federal and non-federal lands has affected suitable habitat, however, the Jocko Lakes fire has had the greatest influence to current habitat conditions within the analysis area. Since 90% of the Jocko Lakes Fire salvaging on non-federal lands will occur on lands that have been moderately to severely burned, it is not expected that this harvest, when considered with the actions of the JLFS will further reduce wolverine habitat (Ibid p. 70, 71).

Northern Bog Lemming and Boreal (Western) Toad (Sensitive)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would have no direct, indirect or cumulative effect, and therefore, no impact on the western toad or northern bog lemming (Ibid p. 75).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would have no direct or indirect effect, and therefore, no impact on the northern bog lemming because there are no activities proposed within any wet meadows or riparian areas, and there would be no long-term increase in motorized use or other human recreational activity (Ibid p. 75).

There would be no effect to preferred western toad breeding habitat because there is no harvest proposed near preferred aquatic breeding habitat or within RHCAs. Western toads have been documented traveling more than 1.5 miles from aquatic habitat following their breeding season. Upland dispersal habitat would likely remain after salvage because some low cover and down woody debris would be maintained on all sites proposed for treatment (Table 4, #33, 34, 35) (Ibid p. 74). Indirect effects to western toad breeding habitat could occur from short-term increased sediment delivery to wetlands and waterways resulting from proposed road work, culvert removal and replacement and timber hauling. However there are no harvest treatments proposed within aquatic or riparian (RHCA) areas. Also Best Management Practices (BMPs) would be in place to protect water quality and fish habitat and considering that INFISH (USDA FS 1995) protection measures would be implemented to protect waterways and wetlands, water quality related impacts should be minimal (Table 4, #45 through #61) (Ibid).

The potential for disturbance or mortality because of short-term increase in use of existing and new roads is extremely remote (Ibid p. 75) because the 2007 fire reduced the quality of dispersal habitat and operating restrictions reduce the chance of human/frog encounters. Over 90% of the project area and over 60% of lands within 300 feet of a stream or water body were burned during the Jocko Lakes fire reducing the probability the area would be used for dispersal. Generally western toads are active from April or May through October in Montana (Montana Field Guide 2008) (Ibid p. 74). Since the JLFS harvest activities

would not occur in April, May or June (Table 4, #30) and since 94% of the project will be winter logged, the period of possible encounters is reduced[18].

Alternative 3 may impact individual western toads or their habitat, but would not contribute in a trend towards Federal listing or cause a reduction of viability.

Cumulative

Since there is no direct or indirect effects o the northern bog lemming by implementing Alternative 3 there is no cumulative effect (Ibid p. 75). Cumulatively, ongoing and future activities (See Appendix D) will affect approximately 800 acres of upland western toad habitat. Twenty acres of riparian habitat preferred for breeding will be affected by non-federal activities. Because these activities largely occur away from breeding habitat and because associated use is believed to be scattered and in-frequent, there is only a remote possibility that impacts to the western toad will occur (Ibid).

Bald Eagle (Sensitive)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would have no direct, indirect or cumulative effect, and therefore, no impact on bald eagles (Ibid p. 77).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would have no impact to bald eagle nesting habitat or concentrated winter foraging habitat because it does not exist in the JLFS area (Ibid p. 77). The potential for disturbing eagles or impacting roost trees by implementing Alternative 3 is extremely remote, because it is unlikely that eagles would be utilizing these areas for roosting or foraging due to the landscape level changes caused by the 2007 fire (Ibid p. 77). If birds are disturbed by project activities there are areas for them to temporarily disperse to.

Human activities have the potential to disturb perching or roosting eagles (Spahr 1991; Steenhof 1978). Of these activities, vehicle traffic is the least disturbing, as long as the vehicles do not stop, since eagles apparently, become accustomed to traffic (Steenhof 1978). The remote potential for disturbance would occur during implementation of the project from activities proposed within ¼ mile of potentially suitable foraging and roosting habitat. These activities include: 86 acres of proposed salvage, 0.1 miles of temporary road construction, approximately 3 miles of road maintenance and 0.9 miles of road storage, and, log haul on FR 349. Although these activities have potential to disturb or temporarily displace eagles, due to the widespread and severe tree mortality that characterizes affected portions of the project area and considering 98% of these treatment areas experienced mortality in excess of 90%, it is unlikely.

Cumulative Effects

Because over 80 percent of MTDNRC and Plum Creek lands proposed for salvage were moderately to severely burned, non-federal salvage does not occur within suitable eagle habitat. As a result and considering the Hidden Lake project area does occur near suitable bald eagle habitat, and that there are no

[18] Average Daily Traffic (ADTs) average 0.8 ADT/mbf. Since 94% of the volume is removed in the winter, that means approximately 636 mbf would require 511 trips in the summer (Partyka 2008 personal communication).

treatments proposed under Alternative 3 near occupied eagle habitat, potential impacts to bald eagle roosting, foraging or nest habitat are unlikely.

Current activities such as firewood collection, dispersed recreation, mushroom collection and noxious weed treatment along road corridors would continue. While these activities may result in a short-term, localized source of disturbance, much of this would be concentrated along open roads and the level of disturbance and potential impacts to the bald eagle are not expected to increase.

Black-backed Woodpecker (Sensitive)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Implementation of Alternative 5 would have no direct, indirect or cumulative effects on the black-backed woodpecker (BBW) or its habitat.

The Jocko Lakes fire greatly increased available habitat for the black-backed woodpecker and currently approximately 64% of the project area would provide high quality habitat under this alternative. Spruce beetle, Douglas-fir beetle, and other wood-boring beetle populations would be expected to increase, creating an adequate prey base for large numbers of black-backed woodpeckers. This high density use would continue for five to six years, after which, black-backed woodpecker populations would begin to naturally decline following the decline in beetle larvae. Within four to eight years, it is expected that population levels would return to pre-fire levels (Werner and Post 1985 In Samson 2006a) (Ibid p. 80).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would reduce or eliminate suitable black-backed woodpecker habitat on 1,062 acres (Ibid p.84) or 1% of habitat available within 30 miles of the project area (Ibid p. 82) and reduce the number of possible high quality territories from nine (no action alternative) to seven (Ibid p. 84). For the following reasons Alternative 3 may impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability (Ibid p.86):

- Implementation of resource protection measures (Table 4, # 30 - no timber harvest during the BBW breeding season) would reduce potential mortality or even disturbance to nesting black-backed woodpecker.
- The Jocko Lakes fire greatly increased available BBW habitat in the area. Because over 85% of the NFS lands within the Jocko Lakes burn perimeter would be unaffected by treatment under Alternative 3, available habitat on NFS lands would be largely unchanged under both alternatives.
- Evidence suggests the black-backed woodpecker is increasing in numbers in the United States (as cited in Dixon and Saab 2000). No demographic information exists to suggest a decline in black-backed woodpecker numbers.
- Black-backed woodpecker habitat is abundant and well distributed across the Northern Region and by Forest. Also distances between areas of suitable habitat are all within 63 miles (dispersal distance).

- Habitat for the black-backed woodpecker has recently increased, and amounts are expected to increase as fires and bark beetle outbreaks continue to increase in size (Gallant et al. 2004, Hessburg and Agee 2003, Hessburg et al. 2005 In Samson 2006b).
- The level of salvage timber harvest of the forested landscape in the Northern Region is insignificant in relation to the needs of this species (Samson 2006a).
- A comparison of habitat required for a minimum viable population to that available indicates well-distributed habitat far exceeds that needed, given the natural distribution of species and their habitats as mapped and according to the scientific literature (Samson 2006b)

Cumulative Effects

Research conducted in Montana (Caton 1996, Hitchcox 1996, Hejl and McFadzen 2000, Powell 2000, Kotliar et al. 2002 In USDA FS 2007a) found the BBW to be restricted primarily to post-fire habitat (Ibid p. 80). Activities that have the greatest potential to result in long-term cumulative effects to the BBW and its habitat include timber harvest (Ibid p. 84). Un-harvested post fire vegetation has not been rare on the Lolo NF or on the Seeley Lake Ranger District since 1980. The Jocko Salvage project would affect a fraction of burned vegetation available and a very small percentage of un-harvested post-fire vegetation (Vegetation Report p. 23). Ninety four percent of National Forest lands burned on the Seeley Lake Ranger District since 1980 have had no pre-fire or post-fire harvest (115,351 acres). Eighty six percent of National Forest lands burned since 1980 on the Lolo National Forest have had no pre-fire or post-fire harvest (293,896 acres) (project file M19-63) (Ibid).

Flammulated Owl (Sensitive)

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would have no direct, indirect, or cumulative effects on the flammulated owl or its habitat. (Wildlife Report p. 89)

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Implementing Alternative 3 would not eliminate any existing flammulated owl habitat. The potential of disturbing owls exists, but the likelihood is very low (Ibid p. 90).

While approximately 4% of the project area provides potentially suitable habitat it is unlikely that suitable habitat within the project area would be utilized either in the short or long term because it is widely scattered and generally consists of relatively small blocks. Preferred landscape conditions did not exist prior to the fire; and the project area has been greatly altered due to the Jocko Lakes fire (Ibid).

While Alternative 3 may result in disturbance or mortality to flammulated owls, with implementation of a project design feature that restricts harvest between 4/1 and 6/30, potential direct impacts would be reduced. Also, although structural conditions would be modified on less than 100 acres of suitable habitat, canopy closure would not be reduced to a level that would make habitat unsuitable Further, all sites proposed for treatment would continue to provide large diameter snags suitable for nesting as no trees larger than 21” DBH would be salvaged. For the following reasons implementation of Alternative 3, may impact individuals or habitat, but would not likely contribute towards a trend in Federal listing or cause a loss of viability:

- No scientific evidence exists that the flammulated owl is decreasing in numbers (Samson 2006a).
- Increases in the extent and connectivity of forested habitat have occurred since European settlement (Ibid).
- Well-distributed and abundant flammulated owl habitat exists on today's Northern Region landscape (Ibid).
- The level of timber harvest in the Northern Region is insignificant in relation to this species' habitat needs (in 2006, 6,876 ha of 9,045,255 ha or 0.08% of the forested landscape) and suitable habitat is well distributed across the Region and Forest (Ibid).

Cumulative Effects

Historic timber harvest in combination with active fire suppression, have contributed to the lack of habitat that currently exists within the project and cumulative effects analysis area. Also because this species requires large diameter snags, past and on-going firewood harvest have further reduced the suitability of habitat on approximately 10 percent of the area near open roads. Prior to the Jocko Lakes fire, preferred large diameter ponderosa pine and Douglas fire forest occurred on approximately five percent of the analysis area. Most of the flammulated owl habitat that existed prior to the 2007 fire no longer contains adequate crown closure to provide suitable habitat. As a result use of the area by the flammulated owl is not expected to occur under either alternative.

Using habitat variables reported in the scientific literature to build habitat relationships models, Samson (2006a) estimated flammulated owl breeding habitat available in each National Forest in R1. These models were then used to query the FIA database, resulting in statistically reliable habitat estimates by National Forest. Results indicate that breeding habitat is well distributed region-wide. Although a modest decline in ponderosa pine from 1942 to present has been reported in 9 of 12 National Forests, Douglas-fir has increased in abundance more substantially, suggesting an overall increase in habitat for the owl.

Although dry, ponderosa pine and Douglas fir habitat are naturally limited on the LNF, FIA estimates show flammulated owl habitat comprises 15,923 acres of the LNF which is 3 times the amount needed to maintain a minimum viable population region-wide (Ibid p. 88). The JLFS project will not eliminate any existing habitat.

3.5 Noxious and Invasive Weeds

This information is summarized from the Invasive Weeds Report which is available on the Lolo National Forest web site. Specific resource protection measures related to weeds are described in Table 4.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

The no action alternative would not directly increase or decrease the spread or introduction of weed plants in the project area because no ground disturbing action would occur. Invasive species currently known within the analysis area would have potential for expansion into the burned area (Weed Report p. 7).

Burned areas are at high risk for invasion of many weed species (Weed EIS 2007 Table 3-11 p 47). This is due to soil structure alteration, loss of organic duff layer, increased light availability, and loss of native seed bank (Zouhar et al. 2008). In areas of high severity fire, the forest canopy is reduced to only dead tree boles to create shade creating suitable habitat for weeds (Ibid p. 3).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

With implementation of Alternative 3 there would be no net increase in weed infestations directly or indirectly due to proposed actions (Weed Report p. 9, 11). This is because activities that typically have a moderate to high relative risk of weed spread or weed introductions would be mitigated to reduce the chance of weed spread and would be aggressively treated and monitored to reduce the chance of weed establishment (Ibid p. 10).

The more bare soil exposed by proposed activities the more germination substrate is available for colonizing weed seeds (Ibid p. 10). Ninety four percent of the project would be salvaged during the winter over frozen ground or compacted snow which reduces the risk of soil disturbance and weed introduction to a low level (Table 4, # 14) (Ibid p. 9).

Unit 20-1 would potentially be harvested in the summer using tractor logging, which means 3 acres {21 acre unit * 13% potential soil disturbance with summer tractor yarding}, would have a high relative risk of weed spread or introduction. Three units are proposed for skyline yarding during non-winter conditions which means 2 acres {77 total acres in 3 units * 2.8% potential soil disturbance}, would have a moderate relative risk of weed spread or introduction. No weeds are present in the summer tractor or skyline units currently (Ibid). Landings, which may cover 64 acres, are another area of relative high weed risk if there was no mitigation. Because all equipment would be cleaned of seeds before brought into the project area (Table 4, #65), and because weed infestations would be treated with herbicides along roads and log landings, and because landings would be rehabilitated and re-vegetated with approved Lolo NF seed mix (Table 4, #64, 66, 45, 67) the risk of weed spread or introduction is reduced in these salvage units and at the landings (Ibid p. 10).

Temporary road construction has a high relative risk of weed spread or infestation on approximately 16 acres if there were no mitigations; however, resource protection measures would assure the temporary roads would be treated with herbicides based on the 2008 weed survey, rehabilitated, re-vegetated with approved Lolo NF seed mix, and closed to public access during and after project use, the risk of weed spread is reduced (Table 4, #64, 65, 45, 61, 67). Follow-up monitoring will further reduce the risk of weed spread (Section 2.4 F and G) (Ibid).

Road decommissioning and storage will break up the compacted soil, creating a prime substrate on approximately 18 acres (assuming 14 feet width of disturbance) for weed germination if weeds were present or arrive via some vector; however, any weeds present on the site would be treated prior to the activity (Table 4, #64). Field survey's in 2008 identified weed presence in preparation for treatments. Additionally, resource protection measures for decommissioned and stored roads include seed and fertilization and treatment of noxious weeds (Table 4, #57, 58, and 67) (Ibid p.10).

Replacement or removal of three culverts would disturb less than 0.1 acres of roadside area. Since these areas will be mulched, seeded with approved mix, and regularly inspected and maintained as needed, (Table 4, #53) the chance of weed spread would be reduced (Ibid).

Cumulative Effects

The treatment and monitoring of weeds within the JLFS project area along with other resource protection measures that contribute to the prevention of weed spread (Table 4, #45, 57, 58, 61, 64, 65, 66, 67), reduces effects to a level where no net increase in weed colonization or spread is expected from proposed actions therefore there will be no cumulative effects. The Weed FEIS (pages 32 -34), which will be

followed with the project states that weed monitoring will take place before, during and after direct weed control treatments (Table 4, #66; Section 2.4F) (Ibid 11).

3.6 Threatened, Endangered and Sensitive Plants

This information is summarized from the Botany Biological Assessment and Evaluation Report which is available on the Lolo National Forest web site. Specific resource protection measures related to threatened, endangered and sensitive plants are described in Table 4.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would have no direct, indirect or cumulative effects to threatened, endangered or sensitive plants or to plants of special interest (Botany Report p. 10). No salvage related funding would be used to control invasive weeds in the area.

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would have no effect on threatened or endangered plants and no impact on sensitive plants because none were found on National Forest lands in the JLFS project area during field surveys in 2008 (Botany Report p. 12 and 13), and if threatened, endangered or sensitive plants are identified during implementation, the areas will be designated and no ground disturbing activities would occur within 50 feet (Table 4, #68). (Ibid p. 11) Effects to rare plant habitat identified within the project area (Howellia aquatilis habitat (Ibid p.14) would not occur because of a specific resource protection measure (Table 4, #69) that will exclude ground-based equipment and other activities, including even the potential of herbicide spray to drift into potential habitat.

The project may impact a few individuals of common camas but will have no effect on the species viability because the species is widespread throughout western North America (NatureServe 2008) and is "of interest" not because of rarity but because it is a traditional food plant of Native Americans. (Ibid p. 14 and 16). There are four large populations, numbering in the hundreds of individuals each in the project area. Resource protection measures reduce the potential to affect even individual common camas plants. The population will be designated where it meets NFSR #36279 prior to herbicide treatment so that it is not sprayed with a non-selective herbicide (a broadleaf specific herbicide would not harm this monocot species) (Table 4, #70). Also, caution and avoidance of the plants will occur during road maintenance (Table 4, #71).

The control of weeds already present throughout the project area that threaten native ecosystems will provide a long-term beneficial effect.

Cumulative Effects

Since no direct or indirect effects to threatened, endangered or sensitive plants are anticipated there are no effects to add cumulatively to the past, present or reasonably foreseeable future actions considered (Ibid p. 15). It is reasonable to assume that controlling invasive weeds throughout the project area will decrease their threat to habitat and benefit threatened, endangered and sensitive plants over the long term (Ibid).

3.7 Recreation

This information is summarized from the Recreation Report which is available on the Lolo National Forest web site. Specific resource protection measures related to recreation are described in Table 4.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would have no direct effects on recreation but some changes to the recreation opportunities after the 2007 fire may occur. Large, high burn severity fires tend to be dangerous for the forest visitors and modify the quality of the recreation setting. Day use may decrease in the project area and be displaced to elsewhere (Recreation Report p. 12). However, recreational mushroom picking will likely occur for a couple years following the fire and firewood collection may increase.

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would have no effect on the area's recreation opportunity spectrum (ROS). It would create a minimal, short-term reduction in snowmobile use and result in a minor displacement of forest visitors who wish to drive, hunt or hike in the post-burn landscape. Effects to off highway vehicle (OHV) use are expected to be minimal.

There would be no effect to the ROS because the area is currently described as "roaded natural". In the roaded natural ROS vegetation management activities, road building and other developments are apparent, and evidence of other users is noticeable (Recreation Report p. 4). Where ground-based logging would be used to salvage trees, evidence of logging would be apparent. Approximately 1,571 acres of ground-based removal is planned in Alternative 3. Skyline removal methods would occur in the southern portions of the project area. About 77 acres of skyline removal is planned in Alternative 3. Changes to the recreation setting due to the effects of these removal methods would be minor because live trees will be retained (Resource Protection Measure 5) as will trees over 21" dbh (Table 4, # 36). Roaded Natural ROS indicators would be met (Ibid p. 9).

Snowmobiling is the most popular winter recreation activity in the area (Ibid p. 4). There would be a minimal, short-term reduction in snowmobile use opportunities because approximately 24.4 miles of designated snowmobile routes are proposed for use as haul routes (Ibid p. 8). This is a minimal impact because resource protection measures will: "Establish haul restrictions to allow for winter-time weekend snowmobile use on haul routes on designated trails" (Table 4, #20). Groomed snowmobile trails used as haul routes include: Placid Creek Rd. 349; Beaver-Finley Creek Rd. 9974; Archibald Loop Rd. 2192; Archibald Placid Rd. 2191; and Westside Bypass Rd. 2190. Protection measures also direct "When plowing the road, feather the edges of each snowmobile trail crossing in order to prevent impassable vertical snow walls and maintain a 4 inch snow depth on groomed snowmobile trails." (Table 4, #21). There are over 160 miles of designated snowmobile routes available for use on the Seeley Lake Ranger District and 750 miles available on the Lolo National Forest so other opportunities would be available during JLFS operations.

Boles Point Trail (0.9 miles), which receives minimal use, would also be closed during harvest activities because it passes through proposed salvage units 20-15, 20-1, and 20-2. Signs would be posted advising trail users when project activities are going to take place (Table 4, #18). It is anticipated that conflicts with trail users would be minimal since most activities are proposed in the winter. This could have a small temporary effect primarily to hunting access but no lasting affect would occur because the trail would be

protected from any potential damage (Table 4, #17) and most of the harvest activity would occur in the winter. The public would be given as much advanced notice as possible as to when these closures would take place (Table 4, #18, 19). Some delays of 30 to 60 minutes or longer on other main system roads are possible, potentially inconveniencing Forest visitors (Ibid p. 8).

Road decommissioning and storage would close 3.5 miles of road currently open to the public that may be used for firewood cutting or hunting. These routes would still be open to non-motorized use and other roads would remain open to provide recreation access in the area.

There is the potential that salvage operations could open up access to OHVs where vegetation and standing dead trees had previously prevented access, but the possibility of this is reduced through resource protection measures. Skid trails, non-system roads, and paths created during mechanical harvesting will be covered with sufficient slash and/or barriers to deter unauthorized motorized use (Table 4, #16). Monitoring will also occur to determine if illegal OHV use is occurring in areas where treatments have been preformed. If monitoring reveals use is occurring, the Forest would take additional actions to discourage use, such as barrier installation, signing or increased law enforcement (Section 2.4A).

Cumulative Effects

Recreation values in the area have changed due to the 2007 Jocko Lakes fire, but recreation activities would continue. Some forest visitors may feel that the area is not as appealing for some recreation activities such as hunting due to the loss of vegetation cover and density (Vaux, Gardner, and Mills 1984; Taylor and Daniel 1984; Hesseln, Loomis and Gonazliez-Caban 2004) (Ibid p.7). The loss of vegetation is not anticipated to deter use of driving for pleasure on roads. The potential for increased unauthorized OHV use because the area is more open from the fire. Cumulative effects are not anticipated, however because resource protection measures will deter use of skid trails, and non-system roads (Table 4, 16). The majority of personal-use products, such as firewood, huckleberry, and mushroom picking, would still be available. Mushrooms and firewood should be plentiful, but huckleberry bushes that burned may take several seasons to reestablish (Ibid, p.15).

3.8 Visuals

This information is summarized from the Visuals Report which is available on the Lolo National Forest web site. Specific resource protection measures related to visuals are described in Table 4.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 initiates no human caused changes to the visual quality of the project area. Untreated areas would continue to have the vertical structure of standing dead trees and any remaining live trees. As dead trees fall, the tree trunks become crisscrossed (i.e. jackstrawed) creating an appearance generally not preferred by viewers. Large amounts of dead woody material are perceived negatively by viewers regardless if the tree mortality is caused by harvesting or natural forces (Ryan 2005). (Visuals Report p. 20).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Short-term visual effects from salvage harvesting are expected. Visual quality objectives (VQOs) of partial retention and modification/maximum modification are expected to be met in one growing season after all project activities are complete with the implementation of Alternative 3.

The foreground viewshed of Placid Creek Road is allocated as partial retention VQO. Partial Retention VQO means that human activities may be evident, but must remain subordinate to the characteristic landscape (USDA FS 1986b). Activities may also introduce form, line, color, or texture which are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape (USDA FS 1974). (Ibid p. 5)

Proposed salvage harvest activity would be most noticeable in units 100, 101, 102, and 103 in areas with high burn severity. Salvage harvest activity may be noticeable in other areas for short durations of view from Placid Creek Road. The viewshed of Placid Creek Road would be affected by salvage harvest with some areas becoming quite open after tree removal. The retention of trees greater than 21 inches diameter at breast height and non merchantable trees would keep some vertical structure and diversity in these treated areas. Proposed activities in the foreground viewing distance of Placid Creek Road may be noticeable, but would remain subordinate to the characteristic landscape being viewed. In untreated areas with greater than 75 percent estimated crown mortality, views from Placid Creek Road would continue to be dominated by a forest of blackened trees, with strong vertical structure. The blackened tree trunks will fade to a silver, gray color in the next few years and eventually fall to the ground resulting in foreground views dominated by downed woody material.

Proposed Unit 13-1 would be viewed from Hidden Lake and its dispersed recreation sites in the foreground viewing distance on the hillside north of Hidden Lake in an area allocated as partial retention VQO. Salvage harvest would be screened from view by shoreline vegetation which did not burn during the fire.

Short-term, three to five years, visual effects are expected because salvage treatment would occur on about 364 acres of partial retention VQO and on about 1,284 acres of modification/maximum modification VQO (Ibid., p. 15). Until the growth of new grasses, shrubs, and planted trees begin to soften the effects of salvage operations the evidence of salvage harvesting in contrast to the un-harvested areas may be noticeable. Eight different resource protection measures however, will minimize potential short-term visual effects (Table 4, #22 to 29) (Ibid p. 13).

Cumulative Effects

Currently, the scenic resources in the project area have been greatly affected by the Jocko fire. Views that once were continuous conifer canopy are now large areas of visible black stems and burned ground (Ibid p. 6). The proposed harvest activities along with the past, present and future actions in the area would result in some short-term effects to scenery resources, but would meet the designated VQOs of partial retention and modification/maximum modification about one growing season after all project activities are complete.

3.9 Forest Vegetation

This information is summarized from the Vegetation Report which is available on the Lolo National Forest web site.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Alternative 5 would not provide commodity outputs. No action would have no effect on regeneration, native flora, or on post fire vegetation or its availability.

There is the potential for future loss of old growth Douglas-fir trees from bark beetle predation. This would open up the overstory canopy, allowing natural regeneration for ponderosa pine and western larch where seed sources exist (Hagle et al. 2000) (Vegetation Report p. 15). Ponderosa pine and western larch are identified as "species at risk" in the Northern Region Overview (USDA FS 1999a) (Ibid p. 9). Some areas will regenerate more slowly than others, but ultimately, all previously forested sites are capable of reforesting. Many of the potential ponderosa pine sites will remain understocked or regenerate to Douglas-fir while the potential western larch sites will regenerate to Douglas-fir and lodgepole pine due to below average seed production in western larch and ponderosa pine prior to fire. Approximately 2,000 acres of planting is planned to begin in the spring of 2008 under a separate decision (Appendix D) which will move those areas from a non-stocked to a stocked condition. Alternative 5 would not remove any trees, and therefore, could not inadvertently remove a tree that would have survived. (Ibid p. 16)

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Implementing Alternative 3 would result in:

- Commodity outputs of approximately 10.6 million board feet.
- Little effect on bark beetle infestation or risk of infestation.
- The possibility a tree that would have survived could be salvaged, but the probability is low.
- Regeneration of Ponderosa pine and western larch, species at risk.
- No impediment of natural regeneration.
- No effect on old growth.
- No impact on native plant species.

Elaboration of some of these effects follows.

Post Fire Mortality: Alternative 3 provides very little direct reduction of bark beetle (Douglas-fir beetle, mountain pine beetle, and western pine beetle) infestation or risk of future infestation of host trees (Ibid p. 19). The limited effect is because it would remove from the area some bark beetle brood infested trees prior to beetle emergence in early summer, meaning there may be fewer beetles to infest residual trees. However, since such a very small percentage of bark beetle infested trees would be removed this beneficial effect is minimal, and future loss of old growth trees (particularly Douglas-fir) from bark beetle predation, is likely (Ibid p. 20). The death of trees could open up the overstory canopy, allowing natural regeneration for ponderosa pine and western larch where seed sources exist (Hagle et al. 2000)

Dead trees are defined as trees with no green needles. These include trees that experienced burn severity that completely burned or scorched the tree crown. With trees that burned less severely (trees with green needles remaining) there is some question as to whether they will ultimately succumb to fire effects, become overwhelmed by bark beetles, or might survive both. Though there are currently no absolute

predictors of mortality/survivability, trained Forest Service employees will estimate fire-damaged trees with a low probability of tree survival. Their assessment will be based on visible fire-damage indicators (Scott 2003, 2002) or conclusive evidence that the tree has been infested by a sufficient number of beetles that it cannot survive (Amman and Cole 1983 and Gibson 2002 personal communication). Since these indicators are not absolute, there is a chance that some trees designated for removal could survive the fire effects or bark beetle predation (Ibid p. 20). However, according to current literature, (Scott 2003, 2002), the probability is low. The intention is to salvage trees that are dead but, some may not look dead yet; similar to a Christmas tree that is dead, but it stays green for a period of time.

Species at Risk & Regeneration: This alternative would establish and retain two species identified as "species at risk" in the Northern Region Overview (USDA 1999a), ponderosa pine and western larch. The species would be established by planting approximately 1,170 acres of trees in locations where natural regeneration is not sufficient to restock the stands. Natural regeneration of these species may be deficient in some burned areas for lack of adequate seed fall (Ibid p 9). Observations by Forest staff indicate that cone production in western larch and ponderosa pine were below average in 2007 indicating that natural regeneration potential for these species is low (ibid p.10). Most cones of these species were mature when the wildfire occurred, so even where cone bearing trees were killed by the wildfire, viable seed protected within the closed mature cones were disseminated in the late summer/early fall of 2007. JLFS would retain all live trees, including ponderosa pine and western larch with the exception of trees in corridors, landings or temporary road locations, and retain all trees greater than 21" DBH with the same exceptions (Resource Protection Measure #5; Table 4, #36) (Ibid p. 18).

Winter logging operations would result in a very low potential of disturbance to soils, natural conifer regeneration and grasses/forbs/brush (Soils Report p. 17). Skyline (77 acres) and summer tractor logging (21 acres) operations have been designed to minimize soil disturbance. Some natural conifer regeneration would be disturbed by these operations. It is anticipated that where natural regeneration exists and is adequate to restock the unit, these operations would not impede that process. Residual snags and coarse wood within salvage units will provide adequate microsites for natural regeneration establishment, survival and growth (USDA FS 2006b).

Old Growth: There would be no effects to old growth forests. All stands were checked for old growth habitat and no salvaging would occur in old growth stands (Green et al. 1992) (Resource Protection Measure # 2). (Ibid p. 8)

Native Plants: Native flora that occur on these landscapes have evolved with wildfire and the area is expected to naturally re-vegetate from surviving or colonizing plants (Ibid p. 10). A resource protection measure for the JLFS project states that "Revegetation on disturbed or treated sites will include native plant species as recommended by the USFS-R1 native species policy (USDA FS 1994)" (Table 4, #67). This policy emphasizes the use of locally adapted native plant seed, whenever possible. Native seed or non-persistent, annual grasses would be used. Seeding would be used as a reclamation tool only where resource damage (including weed infestation) would occur without it. Otherwise, sites would be allowed to re-vegetate naturally from the localized adjacent seed source."

Cumulative Effects

The approximately 2,000 acres of planting planned to begin in the spring of 2008 under a separate decision (Appendix D) will have a positive cumulative effect, when considered with the planting planned in Alternative 3, by moving those areas planted from a non-stocked to a stocked condition and by reestablishing western larch and ponderosa which are considered species at risk (Ibid p. 22).

Bark beetle populations existed prior to the 2008 Jocko Lakes fire and were observed in host trees. The population could increase. The cumulative effects of a population outbreak would chiefly relate to the significant mortality of sawtimber-sized host trees and the environmental conditions associated with standing dead trees that ultimately fall to the ground.

A commenter during scoping expressed concern that un-harvested post fire vegetation was rare (Appendix C p. 14). Un-harvested post fire vegetation is not rare on the Lolo NF or on the Seeley Lake Ranger District. The Jocko Salvage project will affect a fraction of burned vegetation available and a very small percentage of un-harvested post-fire vegetation (Ibid 23).

Over 1/3 of the Seeley Lake Ranger District (38%) and 16% of the Lolo NF has burned since 1980. Ninety-four percent (115,351 acres) of National Forest lands burned on the Seeley Ranger District since 1980 were not harvested either before or after the wildfires. Eighty-six percent (293,896 acres) of Lolo National Forest lands burned since 1980 were not harvested either before or after wildfires (Ibid).

3.10 Fire and Fuels

This information is summarized from the Fire and Fuels Report which is available on the Lolo National Forest web site.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

Under the No Action Alternative it is anticipated that in the short-term (2 - 5 years), if a fire occurred in the JLFS area, direct fire suppression techniques (hand or equipment) could be used in 67% of the area. Direct fire suppression techniques are feasible when flame lengths are less than 8 feet. (Fire and Fuels Report p. 7). Thirty three percent of the area is currently on the border-line between being able to employ direct suppression techniques or requiring indirect attack methods due to control problems such as torching, crowning and spotting (Ibid). Modeling suggests that in 14 years there would be no change in these conditions. (Ibid)

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Implementing Alternative 3 would result in no meaningful difference in overall flame lengths compared with the No Action Alternative and no change in fireline intensity (Ibid). In the short-term (2 - 5 years) after salvage, if a fire occurred in the JLFS area, direct fire suppression techniques (hand or equipment) could be used in 67% of the area. Direct fire suppression techniques are feasible when flame lengths are less than 8 feet. (Fire and Fuels Report p. 7). Thirty three percent of the area would continue to be on the border-line between being able to employ direct suppression techniques or requiring indirect attack methods due to control problems such as torching, crowning and spotting (Ibid). Modeling suggests that in 14 years following salvage there would be no change in these conditions. (Ibid)

In areas proposed for salvage harvesting, the average down woody debris fuel loading would range from 4 to 10 tons per acre in the current condition to 9 to 23 tons per acres in 2022. These values would be well within the desired fuel loading range.

Cumulative Effects

The 2007 Jocko Lake fire burned a significant portion of the analysis area. Prior to the fire, fire suppression over the past 80 years reduced naturally occurring fire events and limited beneficial fire

effects (such as reducing stand densities) and overall size of fires. The accumulated fuels, due to fire suppression, may have influenced the intensity and size of the Jocko fir (Ibid p. 8). Removing trees in the JLFS project would remove some fuels; however modeling indicates it would not cumulatively affect fireline intensity in the project area.

3.11 Air Quality

This information is summarized from the Air Quality Report which is available on the Lolo National Forest web site. Specific resource protection measures related to air quality are described in Table 4.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

The no action alternative would have no immediate direct adverse effects on air quality. If a wildfire were to occur, the potential effects include degraded air quality and reduced visibility, which may be slightly more in Alternative 5 than in Alternative 3, since Alternative 3 would remove some fuels. Emissions from wildfire are typically twice those of a prescribed fire on the same acreage due to greater emission factor (Ottmar 2001), fuel consumption, and fire intensity.

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Alternative 3 would have limited immediate adverse effect on air quality stemming from dust and prescribed pile burning and these impacts would be localized, temporary, transient and within established federal thresholds.

These effects are expected because dust may be created by chipping, chewing and grinding of dead vegetation, loading and processing activities at landing sites and truck transportation of material. These activities are not anticipated to result in significant impacts to regional air quality because of the transitory nature of fugitive dust and because dust abatement, a standard timber sale contract clause for safety and resource protection, would help manage dust during hauling activities.

Limited impacts from pile burning are expected because modeling shows that the resource protection measures for this project limiting the number of piles ignited per day to 10 for landings and 37 for corridor slash piles will assure air quality standards are met; (Table 4, #72). Modeled 24-hour maximum PM 2.5 concentrations emitted from prescribed pile burning in the project area is 32.8 µg/m3 within 0.1 mile downwind of the project area. This is below the federal 35 µg/m3 threshold. Modeling indicates the PM 2.5 concentrations drop off significantly after 0.1 mile. (Air Quality Report, p. 12). The dominant wind direction is from the south blowing north (Ibid, p. 13), away from the Flathead Reservation, which is a Class 1 airshed within a mile west of the project area. However, even if winds came, from the east toward the Reservation, smoke impact modeling indicates air quality standards are met within 600 feet of a burn pile, therefore they would be met in the Class 1 airshed. There would be no significant impacts to this or any other Class 1 airshed resulting from this project (Ibid p. 12).

Burning could produce nuisance smoke, smell or haze under the worst-case scenario that would be confined to the project area (Ibid p. 13).

Cumulative Effects

Proposed prescribed burning would be monitored and coordinated through the Montana/Idaho Airshed Group (Ibid, p. 5). The majority of the legal entities in Montana and Idaho (including the Forest Service)

who create particulates as a result of their burning activities are members of the Montana/Idaho State Airshed Group. Through a Memorandum of Understanding, this group has established a smoke coordination system that provides air quality predictions / restrictions to its members. Prescribed burning is reported to the Airshed Coordinator on a daily basis. If ventilation problems are forecast by the monitoring unit, prescribed burning is either restricted by elevation or curtailed until good ventilation exists (Dzomba 2005) (Air Quality Report, p. 5). Because of the effectiveness of this group, in any given day, there is reduced likelihood that any source associated with this project or any other present or reasonably foreseeable future burning project, would be a significant contributor or exceed air quality standards. If these safeguards failed, and air quality cumulatively exceeded established standards the resource protection measures call for the secessions of all pile burning (Table 4, #73)), so the duration of exceeding would be minimal. This would not be the case in a wildfire situation (Ibid p.13).

3.12 Social and Economic Factors

This information is summarized from the Social and Economic Report which is available on the Lolo National Forest web site.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

If no action was taken there would be no direct or indirect effects on the local economy (Economic Report p. 15).

Alternative 3 – Modified Proposed Action

Direct and Indirect Effects

Implementation of Alternative 3 would result in an estimated net present value for all activities of $927,940. It would produce a total of approximately 259 jobs and $7.8 million of labor income that could be attributed to this project over the course of its implementation (Ibid p. 14 and 15). The actions in Alternative 3 are not expected to have a disproportionately high or adverse human health or environmental effect on minority or low-income populations (Ibid p.17).

Cumulative Effects

The financial efficiency (net present value of $927,940) of the JLFS would not be affected by the past, present, or reasonably foreseeable future actions in the project area. Several projects occurring in the economic impact area, including $343,484 being spent for ongoing Burned Area Emergency Response work, will have cumulative economic impacts. Many activities listed in Appendix D have the potential to contribute cumulatively to jobs and labor income provided by the JLFS (Ibid).

3.13 Heritage

This information is summarized from the Heritage Report which is available on the Lolo National Forest web site. Specific resource protection measures related to heritage are described in Table 4.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

The No Action Alternative would have no direct, indirect or cumulative effects to heritage resources.

Alternative 3 – Modified Proposed Action

Direct, Indirect and Cumulative Effects

Alternative 3 would have no direct, indirect or cumulative effects on heritage sites because known sites would be designated and no ground disturbing activities would occur near these sites. If a previously unknown heritage resource was encountered during implementation of the project, activities would be halted and the Lolo National Forest Archeologist would be notified (Table 4, #74 and 75) (Heritage Report p., 2 and 3). Project specific management plans that provide site protection have been developed (information resides with the Lolo National Forest Archeologist - McLeod 2007) (Ibid p. 3).

There are two federally recognized tribes, the Confederated Salish and Kootenai, in the Jocko Fire Salvage Project area requiring direct consultation as provided by 36 CFR 800. They were contacted as part of normal section 106 consultations for this project as an interested party (Ibid p. 1). No comments were received from any interested parties concerning any potential adverse effects to recorded archaeological sites, nor has there been any concern this project may effect areas of spiritual or traditional use (Ibid).

3.14 Transportation

This information is summarized from the Transportation Report which is available on the Lolo National Forest web site.

Alternative 5 – No Action

Direct, Indirect and Cumulative Effects

There would be no change in the management of the road system therefore the implementation of this alternative would have no effect on the existing condition of the transportation system (Transportation Report p. 15). No fish barrier culverts would be removed/replaced and no sediment issues would be addressed by road maintenance and decommissioning (Fisheries Report p. 23).

Alternative 3 – Modified Proposed Action

Direct, Indirect and Cumulative Effects

Alternative 3 would lead to a reasonable improvement in existing resource conditions that are currently negatively impacted while providing adequate Forest access. (Transportation Report p. 15)

Under Alternative 3, proposed commercial timber treatments would require road access provided by the existing road system as well as some limited additional temporary and short-term new road development. In conjunction with this road utilization, resource protection measures would be applied to the existing roads (including maintenance and BMP work) as well as any new roads to reduce potential near-term and long-term road related resource impacts (Table 4, #16, 18, 20, 21, 45, 46, 47, 48, 49, 54, 55, 56). On the existing road system this would result in a reduction in sediment delivery compared to present conditions. A road management plan would be implemented for the project area that would decommission some roads (4.3 miles) to reduce overall road densities and other roads would be placed in storage (6.4) to reduce their potential for sediment production and delivery (Table 4, #57, 58). Two aquatic barrier culverts would be replaced and one would be removed as part of this salvage project, either paid through timber sale generated funds, if they are available, or through appropriated dollars (Table 4, #60). The culvert to be removed is on a timber haul road that will be stored after timber sale activities are completed (Ibid).

Appendix A – List of Preparers, Consultation and Coordination

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The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

FEDERAL, STATE, AND LOCAL AGENCIES:

Seeley Lake Community Council

Seeley Lake Rural Fire District

Missoula City-County Health Department

MT Department Fish, Wildlife & Parks

MT Department of Natural Resources

MT Department of Natural Resources, Clearwater Unit

MT State Historic Preservation Office

USDI Bureau of Land Management

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Appendix C Jocko Lakes Fire Salvage Comment Tracking, Issues Disposition

Scoping Letters sent to individuals/groups: February 15, 2008

Scoping Advertisement Publication Emailed to Media Date: February 19, 2008`

Scoping Advertisement Publication (Missoulian-web/print) Date: February 19, 2008/February 20, 2008

Scoping Advertisement Publication (Seeley/Swan Pathfinder -print) Date: March 6, 2008

Summary:

The Seeley Ranger District received 206 pages of comments from 14 individuals and organizations (Table 5).

The following two key issues were identified that drove the development of new alternatives to the proposed action. These alternatives were analyzed, but not in detail.

1. What are the effects if more timber was harvested – from a larger percentage of the burn (more than 17% of the acres burned on National Forest) and with less restrictions (harvest old growth if no longer meets criteria; harvest trees greater than 21"; thin to combat beetle infestation)?

2. What are the effects of letting the burned area respond naturally, without logging but with a restoration/access management plan?

After project development, analysis, and consideration of all of the public comments the interdisciplinary team found no unresolved or significant issues.

The following preliminary issues, raised by the public were considered in the analysis of this project. They are presented here as neutral issue statements. Analysis determined that none of these issues are significant, either because: there is no effect; there is no effect on anything important – at any scale that is important; or, the effects are clearly and supportably on the non-significant side of a reasonable, definable, threshold of significance. Table 6 summarizes these conclusions.

1. What are the effects of the project when considered cumulatively with actions on adjacent lands and past, ongoing and future actions?

2. How will salvaging timber affect air quality?

3. How will the project affect natural regeneration (including shading and winter tractor yarding)?

4. Could salvaging inadvertently remove a tree that would live?
5. How will salvage logging affect the spread of tree diseases and insect infestation?
6. How will the project affect OHV and snowmobile access?
7. How will salvaging affect post-fire soils, stream sedimentation and nutrient dynamics?
8. How will temporary road construction affect water quality, wildlife habitat and weed spread?
9. How will salvage logging effect noxious weeds, sensitive plants and biodiversity.
10. How will salvage logging affect plant species that are specialists for early post-fire conditions?
11. How will the project affect critical habitat for wildlife species and species viability?
12. How will the project affect habitat use by elk?
13. Is burned, previously unlogged habitat rare? If so how will salvaging logging affect it?

Comment Tracking and Issue Disposition:

For this environmental analysis process the interdisciplinary team addressed comments received on the proposed action in one or more of the following manners:

1) Modified the proposed action, including changing or adding design features or mitigation (inclusively call **resource protection measures** in this EA) to avoid or minimize an anticipated effect: resulting in Alternative 3 – Modified Proposed Action.

2) Developed and evaluated alternatives to the proposed action

3) Included in analysis

5) Explained why the comments do not warrant further agency response.

Table 5 provides a list of commenters. All comments were reviewed by the IDT. Table 6 displays the primary comments received and how those comments influenced the project design and analysis in the NEPA document. **Key issues,** highlighted in green, are ones for which action alternatives were considered, though not in detail.

Commenters:

Table 5. List of Comment Letters/Emails Received on the Jocko Lakes Fire Salvage Scoping Letter

Mail #	Last Name	First Name	Organization	Street/ PO	City	State	Zip	Type	Date Received	Pages
1	Reimer	Earl						Phone	2/20/08	1
2	Deniger	Ron and Laurie		PO Box 775	Seeley Lake	MT	59868	Letter		1
3	Bennett	Michael		1503 St. Ann	Missoula	MT		Email	2/20/08	1
4	Elmore	Joan						Email	2/20/08	1
5	Leighton	George		3209 Paul Lane	Missoula	MT	59803	Email	2/20/08	1
6	Gossard	Helen		P.O. Box 317	Seeley Lake	MT	59868	Letter	3/3/08	1
7	Turnbull	Les		P.O. Box 423	Seeley Lake	MT	59868	Email	3/3/08	2
8	Garner	Dwayne		2120 Tippenary Way	Missoula	MT	59808	Letter	3/3/08	1
9	Montjoy	Jim	Smurfit Stone	P.O. Box 929	Frenchtown	MT	59834	Emaile d letter	3/11/08	2
10	Dick	Artley		415 East North 2nd	Grangeville	ID	83530	Email	3/14/08	114
11	Rich	Jack	Rich Ranch		Seeley Lake	MT		Email	3/14/08	1
12	Naficy	Cameron	Wildwest Institute; The Lands Council, and the Alliance for the Wild Rockies	P.O. Box 7998	Missoula	MT	59807	Emaile d letter	3/18/08	41
13	Tepp	Frank		7304 Iris Drive	Missoula	MT	59808	Phone and letter	3/21/08	2
14	Long	Mack	Montana Fish Wildlife & Parks	Region 2 Office, 3201 Spurgin Road	Missoula	MT	59804	Letter	3/21/08	1
The following comment was received after the comment period ended. The letter was considered in development of EA. 26 of the pages are duplicates of commenter's 3/14/08 letter.										
15z	Artley	Dick							3/25/08	36

Comments and Issue Disposition:

Key to Subject Codes:

Subject Codes*	
100	**Forest Vegetation**
101	Mature/OG
102	Regeneration
103	Insects & Disease (Bark beetles/Pine beetles)
200	**Botany**
201	Weeds
202	T/E/S
300	**Soils**
301	Soils damage/erosion
400	**Economics**
500	**Proposed Action**
501	Project objectives
502	Project Design
600	**Wildlife**
601	Snag habitat
602	T/E/S
700	**Watershed**
701	Streams protection
702	Water quality
800	**Air Quality**
900	**Process**
901	NEPA
902	Public Involvement
1000	**Information to Note**
1001	General project support
1100	**Cumulative Effects**
1101	Neighboring and Past Activities
1200	**Rec/Scenery**
1201	OHV Use
1202	Scenery
1300	**Special Uses**
1400	**Fire/Fuels**
1500	**Fisheries**

Table 6. List of Comments and Issue Disposition

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
1-1	105 - Weeds	He is considering starting a weed treatment business and would be interested in projects like Jocko Lakes Fire Salvage. Can he get more information on such contract work?	Not a cause/effect of this proposal.	Mr. Reimer was given Andy Kulla's contact information on the same day. No further response necessary.	-
2-1 4-1 5-4 6-1 7-1 8-1 9-1, 7 9-10 11-1	1001 – General support	We support the salvaging in the Jocko Lakes fire area. This is a well planned and timely project.	Not a cause/effect of this proposal.	Statement considered.	-

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
3-1 4-2 7-2 9-4 9-8, 11 7-4 9-5 7-5 9-6 7-6	400 – Economics, 101 – OG, & 601 – Snags, 103 - Insect & Disease	Encourage to harvest as much fire and beetle killed timber as possible. I think more than 17% should be logged, or as much as is economically feasible. I would suggest a much higher acreage, maybe 50%, for this project. Why aren't you harvesting in old growth stands when they no longer qualify as such? Protecting old growth stands when they are no longer old growth makes very little sense to me. Remove the merchantable timber where roads are available. If the opportunity is there to move forward in restoration work on these so called old growth stands, it should be done. Why is most of the dead timber bigger than 21" dbh being retained? I can see retaining a few but not most. I would think these would be some of the best timber to remove and the most valuable. Leaving most dead 21"+ dbh trees is arbitrary and does not properly take into effect the stocking level of trees in this diameter class throughout the burn area. If there is sufficient enough trees of this diameter class to meet wildlife needs, than the excess should be harvested so new growth can occur. I would suggest removing most, if not all, of the burned and insect infested lodge pole pine in all areas outside of the roadless areas. It seems these blow down anyway and should be removed. This salvage project might be a good time to make a concerted effort to combat the pine beetle infestation in this area.	1. What are the effects if more timber was harvested – from a larger percentage of the burn (more than 17% of the acres burned on National Forest) and with less restrictions (harvest old growth if no longer meets criteria; harvest trees greater than 21"; ; thin to combat beetle infestation)?	**Key Issue: Alternative Developed.** **Considered but not in Detail.** Alternative 1, which would have salvaged timber from 2,757 acres, which equals 24% of the National Forest acres burned in the Jocko fire, was considered. This alternative was not analyzed in detail in part because potential resource and social concerns could delay implementation of this time sensitive project (See Section 1.2). Old Growth Analysis. We agree that the design criteria to not salvage stands that no longer meet old growth criteria will not protect old growth stands. This design criteria will assure that the ecological values that large dead trees provides will not be reduced in these stands. Generally we believe that the Forest snag guidelines provide sufficient standing dead habitat however for this particular project a conservative approach is being used because of social concerns with salvaging in former old growth. Economic Analysis & Wildlife Analysis – We agree that the design feature to not remove dead timber over 21" will reduce the economic values of the salvage, however for this particular project a conservative approach is being used to help to address social in salvaging in post-fire areas.	-

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
3-2 5-1 9-2	400 - Economics	This [salvaging] would be a shot in the arm to the economy. Get it done, so many of these salvage sales after burns are not getting done in time to have a merchantable product. Waste of wood is my concern.	Desirable purpose for project.	**Purpose and Need for Project.** The Forest shares the commenter's interest and concern for implementing the salvage project as soon as possible to meet Forest Plan goals. The NEPA planning process, however, will take time and some timber value is likely to be lost prior to implementation.	-
3-3 10-8, 36	1400 – Fire/Fuels 800 – Air Quality	[Salvaging] will be beneficial to those who suffer breathing difficulties. CONVERSELY Post-fire logging can elevate hazardous fuels by removing the least flammable portion of trees (trunks) and generating significant logging slash.	4. How will salvaging timber affect air quality?	**Analysis Issue & Resource Protection Measure Added based on comment:** Resource protection measures will limit the number of piles ignited in a day. Air quality analysis shows through modeling that air quality standards will be met when burning slash on landings and in corridors. If a wildfire occurred, there is a potential for the NAAQS to be exceeded depending on the size and duration of the wildfire. Fuels analysis shows that there would be no change in potential fireline intensity with the modified proposed action and downed woody debris fuel loads would be within the desired fuel loading range.	72, 73
5-2 10-27	100 – Forest Vegetation (Regeneration)	I like the idea of leaving standing dead trees as cover to planted or natural seedlings. But, not too much as this material when it falls could be fuel for a future fire. Logging removes standing trees that provide shade for microsites.	5. How will the project affect natural regeneration (including shading and winter tractor yarding)?	**Analysis Issue:** Vegetation analysis shows that Alternative 3 would rely upon natural regeneration to restock salvage units wherever possible. However, in some cases artificial regeneration may be used to meet management objectives such as the establishment of ponderosa pine and western larch. Timber harvesting operations could damage conifer regeneration in skid trails and landings while at the same time creating bare soils or reduced duff conditions favorable to seral species seed germination and growth. However, given the scale of this potential effect, and the area of natural regeneration unaffected, it is not significant. Winter logging operations would result in a very low potential for disturbance to soils, natural conifer regeneration and grasses/forbs/brush. Residual snags and coarse wood	-

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
				within salvage units would provide adequate microsites for natural regeneration establishment, survival and growth	
5-3 7-3 12-11, 17, 25, 36, 50, 64, 68	1100 – Cumulative Effects (Neighboring, Past, Future Activities)	I didn't see if you took into consideration surrounding private or State cutting area that might create problems when the area of combined ownership is adjacent. I am sure the private land owners, mainly Plum Creek will be much more aggressive in their approach and I suspect the State of Montana will also. I realize the USFS is trying to mitigate this impact, as stated in the analysis, but hopefully this decision was made by forestry professionals and not politicians. Recommendation: Cumulative effects of past, present proposed, and foreseeable future activities should be thoroughly analyzed, not just listed. Where cumulative effects analysis shows significant trends towards impairment, where post-fire logging would tip watershed scale balance toward a disproportionate representation of a singular post-fire habitat, or where post-fire logging would tip a watershed-scale balance toward the presence of too few forest acres in early (< 10-year old) post-disturbance condition, post-fire logging should not be undertaken. Consider past and ongoing grazing impacts.	3. What at the effects of proposed actions when considered cumulatively with actions on adjacent lands and past, ongoing and future actions may be a concern?	**Resource Protection Measure & Analysis Issue:** Because there may be cumulative impacts from previous land management and planned fire salvage on adjacent private and State lands; the Forest is limiting its proposed salvage to a small portion of the public land base that it manages. All Resource Analyses – cumulative effects analysis and cumulative effects worksheets.	4
8-3	801 – OHV Use	Snowmobiles need to be controlled in this area. I have talked to people that have witnessed people driving to the top of peaks in the MMW with their snowmobiles. ATV crowd will take advantage of this now open area. I have a right to expect a forest not a race track for ATVs and snowmobiles on public land.	8. How will the project affect access for OHVs and snowmobiles ?	**Resource Protection Measure Added based on comment and Analysis Issue:** Return some of slash back on approaches to skid trails. Recreation Analysis	16, 18, 19,20, 21

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
9-3	1000 – Info to note	I also feel that your "cautious approach" in designing this project does not address what truly needs to occur on the affected acres…. Further, your statement expressing your concerns with minimizing "any adverse impacts that could occur as part of salvaging activities" negates the positive impacts that salvaging, i.e. logging, will have on this area.	Not a cause/effect of this proposal.	Statement considered.	-
9-9	400 - Economics	I would also stress that economic value is also present in pulpwood and bio-mass and should be considered in your analysis.	Desirable purpose for project.	**Purpose and Need for Action.** Economic Analysis	-
10-2	700 - Watershed	Simply namedropping Beschta does not mean that you even read his conclusions and recommendations	Not a cause/effect of this proposal.	As stated in the scoping document, the Beschta (et al 1995) report was considered in the development of design criteria before the Jocko Lakes Salvage project was even started, and those criteria were used in the identification of potential salvage opportunities, and how that salvage would be conducted. The Beschta report will be considered in detail specific to this project in a paper as part of the analysis for the environmental impact statement.	-
10-1 10-3 10-4	1000 – Info to note	General outrage over project and national leadership issues. EA's and FEISs must disclose respected scientific evidence running contrary to the agency's final management decision	Not a cause/effect of this proposal.	Consideration of opposing scientific viewpoints will be an integral part of analysis of all potential effects to resources in the EA.	-
10-5, 12, 18	100 – Forest Vegetation 1400 – Fire and Fuels	Although logging and replanting may seem like a reasonable way to clean up and restore forests after disturbances like wildland fires, such activity would actually slow the natural recovery of forests and of streams and creatures within them. The offspring of trees that survive fires often contain genes for high fire resistance and are usually much better adapted to a particular site than planted nursery stock.	5. How will the project affect natural regeneration (including shading and winter tractor yarding)?	**Analysis Issue:** Vegetation and Fire Analysis. We are not claiming that are actions are "restoring" or speeding natural recovery. We are salvaging dead timber in a carefully considered manner, based on current available science and professional experience of numerous specialists, which will reduce potential environmental impacts.	

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12-30, 34		Considering the ample evidence that early seral, post-fire habitats are of vital importance to the maintenance of biodiversity, what evidence is there that tree planting is not a harmful practice and what criteria is the FS using to decide where and when planting should occur? How does tree planting contribute to anything but increased fire hazard and the continued treatment of the area as a tree farm?		Natural regeneration will be the preference, but there may be areas where natural regeneration will not provide acceptable stocking areas. Plus larch may be planted to not lose the opportunity to regenerate that species in the post-burn environment. Artificial regeneration may be used to meet management objectives such as the establishment of ponderosa pine and western larch. The determination of natural regeneration failure can take two to five years. Culturists would assess seed fall, germination, seedling survival and "free to grow" status to determine natural regeneration success. Planting would provide the opportunity to increase the occurrence of the seral species at risk by direct establishment at desired numbers and locations in species mixtures suitable to the environment, including shade tolerant species like Douglas-fir.	
10-6, 14, 24 and throug hout 12-1, 14, 15, 22, 24, 26, 32, 52, 54	1000- info to note	Logging after fire does not improve or restore ecosystems. Fire serves an essential role in certain ecosystems. Post-fire logging for fuel reduction is highly speculative. We request the FS adopt the Restoration Principles (DellaSala, et al., 2003) as a screen for proposed actions such as those proposed for the project area. We incorporate them by reference, into this scoping response letter. Ecologically speaking fires do not require a rapid human response. We therefore would request that the LNF not misguide	Not a cause/effect of this proposal.	The purpose of the project is to salvage timber, not restore ecosystems or reduce reburn potential. The project design is to eliminate or minimize unintended and undesirable effects of this action. The Forest actively pursues ecosystem restoration and fuel reduction as the purpose for many projects – but not this one. As such, DellaSala, et al., 2003, which is for projects whose purpose is to restore ecosystems, and Kauffman 2004, which discusses the natural roles of fire, fuel reduction and ecological restoration, do not directly apply to this project; though they were reviewed and considered. DellaSala, et al., 2006 was also considered, including: "The effects of post-disturbance logging require careful consideration of whether to log at all, and if so, how to conduct such logging to minimize negative consequences. If we must conduct post-disturbance	-

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		the public by asserting that their proposed activities represent restoration.		logging for timber production, stringent ecological safeguards must be in place to minimize impacts to terrestrial and aquatic ecosystems." The design features and mitigation measures for this project are designed to reduce or eliminate unintentional or undesirable effects of the salvage. The communication by the District and Forest has been very clear from the earliest stages that Jocko Lakes Salvage project has as its purpose salvage. The commenter who is concerned with the Forest "misguiding the public' told the Ranger during a site visit to Jocko Lakes that they were appreciative that the Jocko Lakes Salvage project was clear and simply a salvage project. They indicated they found projects with timber harvest labeled as "restoration" offensive. This comment indicates this commenter's letter may be a template letter that they did not revise to reflect the specifics of this proposal. We agree that fire has and will continue to play a major and important role in the Jocko Lakes area. Chapter 1 will make this distinction in the Purpose and Need.	
10-7, 9, 11, 13, 17, 20, 29, 32, 37, 39, 41 and throug hout 12-3, 7, 31,	600 - Wildlife	Salvage logging removes critical habitat for species, such as cavity nesting mammals, woodpeckers (Black-backed in particular), invertebrates like highly specialized beetle taxa. Salvage operations should retain more than 104 to 123 snags per hectare (more than 42 to 50 snags per acres) that are more than 23 cm diameter at breast height (dbh), more than 9 inches dbh (Dixon and Saab 2000, Wisdom et al. 2000).	13. How will the project affect critical habitat for wildlife species and species viability?	**Resource Protection Measure and Analysis Issue:** Retain large trees [generally greater than 21" dbh] for biodiversity, legacy, and habitat in non-old growth stands; the Forest is limiting its proposed salvage to a small portion of the public land base that it manages; meet Lolo National Forest snag and woody debris guidelines. Wildlife Analysis shows implementation may affect individuals or habitat but there is no concern for trend toward listing or viability.	2-6, 14, 31-44, 61-63

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38, 41, 42, 44, 49, 58, 75 13-7, 10		Disclose how the project will impact the old-growth wildlife species, and mature forest associated species. Analysis must identify viable populations of MIS, TES, at-risk, focal and demand species of which the individuals in the analysis area are members in order to sustain viable populations. How does the proposed logging strategy account for medium and large tree requirements outside of old growth by forest species that are currently or were historically found in the area? Birds in burned forests have very different snag-retention needs from those cavity nesting bird species that have served as the focus for the development of existing snag management guidelines. How have TES needs been taken into account in the project design? The woodpecker will come back to their natural habitat, Section 26, if you don't cut Unit 26-4. Recommendation: All TES species habitat should be exempt from post-fire logging.			
10-rest of letter	1000 – info to note			Statements considered	-

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10-10, 15, 21, 23, 24, 31 12-8, 63, 69, 71	300 – Soils 700 - Watershed	Erosion can occur where soil disturbance (timber salvage operations) accompanies fire. In the short-term, the adverse effects of high-severity fires…decreased infiltration, increased overland flow, and excess sedimentation in streams, can be greatly exacerbated by the soil disturbance caused by salvage logging. Increased runoff and erosion alter river hydrology by increasing the frequency and magnitude of erosive high flows and raising sediment loads. Recommendations: [1]Avoid logging on steep slopes (> 30 degrees), [2]riparian areas and [3]sensitive soils. Avoid areas where soils were burned by moderate and high severity fires. Full suspension cable or helicopter systems will cause less damage than ground based systems and should be used in virtually all cases. [4]Limit log decks and landing areas. [5]Cumulative effects analysis must be conducted and [6]on site soil surveys performed within each cutting unit. [7]Area-specific knowledge of post-fire logging impacts on soils should be collected from areas previously affected by post-fire logging and applied to design and layout of current post-fire logging proposals. Disclose the scientific research information you have to indicate that helicopter yarding, winter logging, and skidding on slash mat materials will minimize damage to soils.	9. How will salvage logging affect post-fire soils, stream sedimentation and nutrient dynamics?	**Resource Protection Measures and Analysis Issue:** To protect soils multiple design features were specifically applied to protect sensitive post-fire soils including: [6]All areas surveyed for soil conditions prior to developing alternatives ; [3]salvage prohibited on all severely burned or sensitive soils unless the effects of those activities can be mitigated with timing or other means such as skyline or helicopter logging; [1]tractor logging limited to slopes of 35 percent or less with the exception of short pitches up to 50 percent in consultation with the soils scientist; [4]landings prohibited on areas with high soil burn severity; disturbing areas where fire suppression and BAER rehabilitation activities have occurred will be avoided unless those activities were insufficient to restore or protect the soil resource; timber harvest and other ground disturbing activities prohibited (except for restoration activities) in areas where detrimental soil conditions exist over 15 percent or more of the area unless past conditions can be mitigated to below 15 percent following activities; Coarse Woody Debris in harvested stands will be retained at levels that protect soils from future high intensity fires and from loss of soil productivity; Lolo National Forest Down Woody Material Guide – 2006 will be followed. [2]No Activities should occur within RHCAs except for activities intended to improve riparian conditions. Soils Analysis & Watershed Analysis (includes [5]cumulative effects analysis, cumulative effects worksheets and [7]monitoring of other post-fire logging)	3, 7-15a, 33-35, 45-60
10-16 12-59	600 – Wildlife	Despite minimal differences in forage between burned and salvaged sites, elk (and deer and moose) selected un-logged burns and avoided post-fire logged sites. Based on other studies…we infer that elk avoided	13. How will the project affect critical habitat for	**Resource Protection Measure added in response to comment and Analysis Issue:** Wallows, if found or known will be flagged and avoided. Measures taken to retain habitat security. Alt. 3 increases elk security by	43, 61-63

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13-1, 8		salvaged cutblocks because: 1) post-fire logging would reduce habitat effectiveness through removal of dead standing tree cover, and /or 2) elk avoided salvaged areas due to predation risk by humans and wolves associated with logging roads built for salvage. Primarily concerned about harvesting in Unit 26 and in Section 34. He said the clearcut at the end of the road that stops in Unit 26-4 is a major calving area for elk. He said the elk use the ridge between section 26 and 34 heavily. He said it is the only timbered ridge in the area and he is concerned that removing the only tall trees that remain in the area the use by that herd would be altered and he is not aware of an alternate route they could take. In Unit 22-1 there is a swampy bottom flat that the elk hide in and use as a wallow, if salvage please use as much distance to swampy bottom as you can. Section 28-3 and 28-4 are crucial to the animals. In Section 13 the animals are using 10-20 ft. burnt re-growth.	wildlife species and species viability?	closing roads. See Wildlife Analysis for details.	
10-19, 26, 60	201 – Weeds 200 -- Botany	Critical issues will be the extent to which salvage logging may enhance invasions by exotic plants, in particular noxious weeds. Recommendation: Grass seeding is unnecessary and should not be considered an economic or ecological priority. Please include in your analysis the possible effects of noxious weed introduction on sensitive plant populations and other components of biodiversity.	11. How will salvage logging effect noxious weeds, sensitive plants and biodiversity.	**Resource Protection Measures added and Analysis Issue:** Manage known weed populations through treatments including herbicide, mechanical, and prevention.; Minimize management activities in areas where weed populations do not presently exist unless the risk for introducing noxious weeds can be mitigated.; Manage motorized vehicle access in areas where existing weed populations may be spread into adjacent areas free of weeds.; Apply Region 1 native species policy 1994.; Follow guidelines under the Integrated Weed Management on the Lolo National Forest (2007). Weeds Analysis.	16, 64-71

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10-8, 63, 69, 71 12-70, 73	300 - Soils	Approximately two decades after the fire, the shrub (former fire) ecosystem contained less C and more N than the adjacent forest ecosystem. Reconstruction of pre-fire nutrient budgets suggested that most C was exported in biomass during salvage logging and will not be recovered until forest vegetation occupies the site again. Salvage logging may have resulted in longer-term C sequestration in wood products than would have occurred had the logs been left in the field to decay, however." Logging removes biomass needed for soil nutrient recycling. Salvage-logging resulted in elevated soil temperatures, soil compaction and erosion, and reduced rates of nitrogen cycling in soil. Analyze the impacts that salvage logging will have on fungi which enhance soil productivity and conifer regeneration.	9. How will salvaging affect post-fire soils, stream sedimentation and nutrient dynamics?	**Resource Protection Measures and Analysis Issue:** Soils Analysis	3, 7-15a, 33-35, 45-60
10-30 12-4	100 – Forest Vegetation	Salvaged stands also do not host the same understory communities that are found in un-salvaged wildfire stands in the early post-disturbance period. This creates some concern that in the long term, extensive post-fire salvage logging could lead to substantial declines in abundance of plant species which are specialists for early post-fire conditions of mesic stands. Rapid development of desired tree cover … is not necessarily what would happen naturally. These are important points since many plants and animals depend on the naturally slow development of subtle structural characteristics, species compositions, and spatial arrangements of plants associated with post-fire	12. How will salvage logging affect plant species that are specialists for early post-fire conditions?	**Analysis Issue: Vegetation Analysis** Native plant response to wildfire effects would be the primary process. A resource protection measure for the project states that "Revegetation on disturbed or treated sites will include native plant species as recommended by the USFS-R1 native species policy. This policy emphasizes the use of locally adapted native plant seed, whenever possible. Native seed or non-persistent, annual grasses will be used. Seeding will be used as a reclamation tool only where resource damage will occur without it. Otherwise, sites will be allowed to re-vegetate naturally from the localized adjacent seed source."	67

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		environments.			
10-35, 42 12-72	100 – Forest Vegetation (Regeneration) 300 – soils	Post-fire logging destroys much of whatever natural tree regeneration is occurring on a burned site. This is a fundamental concern since these tree seedlings are derived from local seed sources, which are most likely the best adapted to the site. Sexton (1998) documented that post-fire salvage logging over snow, reduced regrowth of ponderosa pine and other species relative to adjacent burned, but unlogged, areas. Naturally regenerating groundcover in unlogged areas also had greater survival and growth than plantings on areas that had been salvaged logged after fire. Notably, these adverse effects of logging on regrowth were from over-snow logging (Sexton, 1998).	5. How will the project affect natural regeneration (including shading and winter tractor yarding)?	**Analysis Issue:** Vegetation Analysis See response above.	-
11-2	1300 – Special Uses	We own and operate an outfitting and guest ranch near the project and for over 10 years we have utilized a FS special use permit to provide guided snowmobile tours within the project boundary. The proposal is compatible with our permitted use of the area.	Not a cause/effect of this proposal.	Recreation Analysis. Include in Past, Present, Ongoing and Future Activities in the area.	-
12-2, 11, 18, 20, 27, 29, 33, 35, 45, 62	100 – Forest Vegetation 600 – Wildlife	Maintain Substantial Areas of Unlogged Post-Fire Habitat--Sizeable areas of unlogged post-fire habitat are very rare in western U.S. landscapes, including the Northern Rockies (Noss et al 2006). This is particularly true of high quality burned habitat, which is often targeted in post-fire logging projects or was logged previous to the fire event but lies within the fire perimeter. Recommendations: Set aside large, continuous areas of previously unlogged, post-fire habitat from post-fire logging proposals.	15. Is burned, previous unlogged habitat rare? If so how will salvage logging affect it?	**Resource Protection Measure and Analysis Issue:** The Forest is limiting its proposed salvage to a small portion of the public land base that it manages. The Forest Service has no control over management on state or private lands within the area, but does consider that management in our analysis. Vegetation Analysis and Wildlife Analysis including cumulative effects analysis and cumulative effects worksheets. Ninety nine percent of all the area burned on the Lolo	

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		Recommendation: … Where cumulative effects analysis shows significant trends towards impairment, where post-fire logging would tip watershed scale balance toward a disproportionate representation of a singular post-fire habitat, or where post-fire logging would tip a watershed-scale balance toward the presence of too few forest acres in early (< 10-year old) post-disturbance condition, post-fire logging should not be undertaken. We are concerned about the extensive history of logging in the Clearwater drainage, the proportionally small remnants of unlogged forest that have been left, and the apparent tendency of the current proposal to enter many of these remnant unlogged stands. Additionally, in a landscape that has been so heavily altered by past management activities, the unlogged remnants which are proposed for logging are among the only areas where natural processes, which have structured and shaped the forest characteristics that native wildlife species depend on, can possibly continue to play this role. Much of the 80% of the burn that won't be treated has been logged or is fragmented and may therefore have reduced functionality with respect to wildlife. "Relative to what historically existed in this area, how much high quality post-fire habitat currently exists, is it distributed in such a manner that it has high functionality for wildlife species dependent on these forest conditions and how will this proposal affect the amount and functionality of the remaining habitat?		National Forest since 1980 has had no post-fire harvest. The same percentage applies to the Seeley Ranger District; 99% of all the area burned has had no post-fire harvest. For this reason, **the commenter's basic premise that substantial portions of post-fire habitat on the National Forest are logged by the Forest is mistaken.** Data shows that over 86% of all the area burned since 1980 on the Lolo National Forest and 94% of the area burned on the Seeley Ranger District was unlogged prior to the fire (since 1940) and had no post fire harvest. That means that approximately 294,000 acres of unlogged post fire habitat exists on the Forest, or approximately 9% of the Forest. Approximately 115,351 acres of unlogged post-fire habitat exists on the Seeley Ranger District, which is 36% of the District. An analysis of the Placid Ecosystem Management Area in 1998 recommended a desired condition of fire-killed dead of 0.5-2% of the landscape, considerably less then exists on the Forest or District today. We recognize that past harvesting on areas that burned, and post-fire salvaging percentages would be different on non Forest Service lands. There is no indication that the 86% of unlogged burned area is disproportionately represented by a singular post fire habitat. Specifically "setting aside" these large areas is outside the scope of this site specific project. However, the cumulative effects analysis will look at the effects of this salvage in the broader context of the availability and type of post fire habitat across the Forest and the Seeley District.	

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		To the extent that the LNF can show that natural processes and habitat arrangements are being provided for by the current proposal, our concerns may be substantially eased. The approach we suggest involves quantifying how much forest of specific cover type, age structure and burn severity will have been logged with the completion of any given alternative compared to what would have existed had the area not been logged at all. This analysis would include previous and proposed logging and should provide a geographically explicit visual of how this is distributed so that factors such as connectivity/fragmentation can also be determined in addition to total amount that exists. This information should then be related specifically to habitat needs of important indicator/sensitive species, such as the goshawk, lynx, grizzly bear, black backed woodpecker, fisher, marten, migratory birds etc.		Within the Jocko Lakes Salvage Project area approximately 4,078 acres that have burned since 1980 that did not have any management activity prior to the fire (since 1940) or after the fire. This means that 56% of all post-fire habitat since 1980 have not been harvested. The proposed salvage in Jocko Lakes represents 0.6% of the area burned on the Lolo National Forest since 1980 and 1.6% of the area burned since 1980 on the Seeley Ranger District.	
12-5, 19, 39, 43, 46	101 – Old growth	Recommendation: Both post-fire and pre-fire old growth should be exempt from post-fire logging. In addition, large live and dead trees should be retained in cutting units. Burned forests with significant living large tree components should not be logged, as they provide necessary components for many post-fire and old growth dependent species and represent the best opportunity for natural, weed-free succession and future old growth.	Not a cause/effect of this proposal.	**Resource Protection Measure**: No old growth stands will be harvested. Large trees [generally greater than 21" dbh] will be retained; however they may be harvested near roads, trails, and high-use areas (recreation sites) where public safety and facility protection is necessary. Only dead trees will be harvested (with the exception of some green trees that will/could be cut for skid trails, corridors, landings etc.) The fact that "No harvest would occur in old growth stands, including stands that no longer meet old growth criteria due to the fire" was stated in the scoping notice. This indicates that this commenter may not have modified their template comment letter to the specifics of this particular project. Vegetation Analysis (as appropriate).	2

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12-6	1200 – Rec.	Recommendation: Inventoried and other unroaded areas should be exempt from post-fire logging.	Not a cause/effect of this proposal.	Proposed action is not within inventoried or other unroaded areas. The fact that "No harvest would occur in Inventoried Roadless Areas" was clearly stated in the scoping letter. This indicates that this commenter may not have modified their template comment letter to the specifics of this particular project.	1
12-9, 56	700 – Watershed 600 – Wildlife 201 – Weeds	Recommendation: [1]New construction should be avoided. [2]Temporary road construction or reconstruction causes much of the damage associated with permanent roads and should therefore be extremely limited. [3]No road construction including temporary, reconstructed or permanent roads should occur in inventoried or other substantial unroaded areas. What condition are the historical roads that will be rebuilt for this project currently in and what impacts will rebuilding them have to project area resources?	10. How will temporary road construction affect water quality, wildlife habitat and weed spread?	**Resource Protection Measures and Analysis Issue:** Road development needed for vegetation management or watershed restoration will be limited to Short-Term Specified or Temporary Roads individually no greater than 1 mile in length. [1]No Long-Term Specified Roads should be constructed. [2]New road development should be minimized and restricted to gentle side slopes, ridge tops and high elevation areas. Roads should not be constructed in RHCAs unless they meet all Riparian Management Objectives. All temporary roads should be obliterated, re-contoured, seeded and covered within one season following purchaser use. Short Term Specified Roads will be decommissioned following sale and post sale activities. [3]The project is not within inventoried roadless or other unroaded areas. BMPs will be applied as appropriate on roads used in the salvage of timber. Watershed, Wildlife, Weeds Analysis.	16, 45, 46, 53, 54, 55, 57, 58, 61, 64

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12-10	700 – Watershed 1500 – Fisheries	Recommendation: [1]Post-fire logging should be designed so that water quality, hydrologic function and aquatic species are not negatively affected. BMPs should not be assumed to be effective at mitigating these impacts. Rather, post-fire logging should be designed to avoid these impacts to the extent possible. [2]Minimizing road building/reconstruction, the number of log decks, [3]using full suspension cable or helicopter logging, logging in winter on frozen soils, protecting riparian areas and [4]leaving substantial basal area on site will help to minimize water quality impairment. Beschta et al (2004) recommend leaving all large trees and 50% of basal area in all other size classes[5]. [5]Watersheds already impaired by past human activities and those which are largely intact should not be subject to post-fire logging.	10. How will temporary road construction affect water quality, wildlife habitat and weed spread?	**Design Features and Analysis Issue:** [1]Actions are designed to minimize impacts to hydrologic resources and aquatic habitat. An overall post-project improvement in water quality and condition will be shown within 303d Water Quality Limited Watersheds (Buck Creek). BMP monitoring shows that they are effective at reducing the risk of sedimentation for all adjacent water bodies. [2]See road design features above. [3]See soil design features above. RHCAs design features. [4]Large trees [generally greater than 21" dbh] will be retained; however they may be harvested near roads, trails, and high-use areas (recreation sites) where public safety and facility protection is necessary. Only dead trees will be harvested. [5] With the goal of maintaining species and natural recovery processes Becshta et al. also recommends leaving at least 50% of standing dead trees in each diameter class. No references or explanations are given for this recommendation. The Forest Service considered this recommendation and the best available science on the number of snags needed in the post fire landscape to provide for wildlife species habitat and soil productivity (JLFS Wildlife Report and Soils Report). One hundred percent of the standing dead will be retained on 10,017 acres or 86% of the Jocko Fire on National Forest lands. The retention requirements determined to assure resource needs are met for the JLFS are displayed in Table Silv-6. Table Silv-8 shows that these retention requirements will be met or exceeded.	16, 45, 46, 53, 54, 55, 57, 58, 61, 64

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				Watershed and Fisheries Analysis ([5]including discussion of salvage in areas of past human activities).	
12-12, 48	100 – Forest Vegetation	Recommendation: No "dying" trees should be removed under the guise of being dead without full analysis and disclosure of the effects of harvesting living trees. Please list scientific citations used to define "dying" criteria for trees that will be harvested because they are considered functionally dead although they are still living. In addition, please fully disclose the assumptions that underlie these criteria, their reliability and/or error, and a detailed explanation of any site specific field data from other areas of the LNF that have previously burned, especially where "dying" criteria were used. What has been learned from these fires and post-fire logging projects about the validity of these criteria or their associated error?	6. Could salvaging inadvertently remove a tree that would live?	**Design Feature and Analysis Issue:** The project will salvage dead timber. Vegetation Analysis: Dead trees are defined as trees with no green needles. These include trees that experienced burn severity that completely burned or scorched the tree crown. With trees that burned less severely (trees with green needles remaining) there is some question as to whether they will ultimately succumb to fire effects, become overwhelmed by bark beetles, or might survive both. Though there are currently no absolute predictors of mortality/survivability, trained Forest Service employees will estimate fire-damaged trees with a low probability of tree survival based on visible fire-damage indicators (Scott 2003, 2002) or conclusive evidence that the tree has been infested by a sufficient number of beetles that it cannot survive (Amman and Cole 1983 and Gibson personal communication). Since these indicators are not absolute, there is a chance that some trees designated for removal could survive the fire effects or bark beetle predation. Large trees [generally greater than 21" dbh] will be retained; however they may be harvested near roads, trails, and high-use areas (recreation sites) where public safety and facility protection is necessary. Only dead trees will be harvested (with the exception of some green trees that will/could be cut for skid trails, corridors, landings etc.)	

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10 12-13	200 - Botany	Seeding has been shown to reduce growth and survival of native species following a fire, and can increase susceptibility of a plant community to invasion by weedy plants (Keeley and Keeley 1986; Barro and Conard 1987; Stone 1993). Recommendation: Grass seeding is unnecessary and should not be considered an economic or ecological priority.	Not a cause/effect of this proposal.	This project does not propose broadcast seeding, as some post fire projects do, so the commenters concerns may not be specific to this project. We will apply Region 1 native species policy 1994 where site specific seeding is needed to protect soils and reduce weed infestation after our salvage activities occur.	-
12-16, 47, 57, 61, 65, 67, 80	1000 – Information to Note (Monitoring)	Monitoring is a valuable and underutilized management activity that should be undertaken with greater frequency and enthusiasm. Please disclose the amounts of snags, recruitment snags, and down woody debris previous logging operations have left in post-fire logged units, so that the public can tell if you've met Forest Plan Standards in those units. Please perform surveys to determine the amounts of snag habitat and down woody debris that exist in similarly stocked burned unmanaged areas for comparison. Please disclose the results of monitoring of detrimental soil conditions following post-fire logging. Please include in the analysis the results of monitoring of noxious weed infestation from past management actions in the Districts fish habitat and watershed conditions. Discuss the actual effectiveness of proposed BMPs in preventing sediment from reaching water courses.	Not a cause/effect of this proposal.	All Resource Analyses will note appropriate monitoring needs and will use past monitoring as available and appropriate.	-

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12-17, 18	1000 – Information to Note	Small post-fire logging sales in watersheds with existing, but not severe, impacts from previous anthropogenic activities are least likely to be challenged. We would like to officially incorporate into our comments the 11-13-07 letter that WildWest Institute provided to the Region 1 office. Where close adherence to the recommendations made in our letter is infeasible, we urge you to be proactive in addressing such issues by providing explicit justification and explanation of the factors which make any such recommendation infeasible and the Lolo National Forest's (LNF's) recommended approach to redressing the issue we raised. Direct contact with our organizations to resolve such discrepancies is desirable and preferable. However, at a minimum we would ask that you address such issues explicitly in future phases of this proposal and its associated public documents (e.g. DEIS).	Not a cause/effect of this proposal.	Project design features were created to minimize environmental impacts and public concerns. Each public comment was considered (including the 11-13-07 letter) very carefully in the design of the project to minimize public concerns while meeting the project objectives. Where project specific recommendations were not incorporated into the proposal an explanation is provided in the Environmental Assessment.	-
12-19	1000 – Information to note	We greatly appreciate that some of our concerns appear to have been addressed by the current proposal, including: road decommissioning, no logging in current or pre-fire old growth, preservation of large trees in proposed logging units, and riparian buffers.	Not a cause/effect of this proposal.		-
8-2 12-21, 51, 79	501 – Project Objectives	I would like to see more road decommissioning than the 15 miles. Jobs would be created; offset the increase in erosion, protect wildlife travel corridors including for T&E species. We believe the best alternative would be one that allows the burned area to respond naturally, not one that proposes destructive logging activities…	2. What are the effects of letting the burned area to respond naturally, without logging but with a restoration/a	Key Issue: Alternative Developed. Considered but not in Detail. In response to this comment the Forest considered an alternative (Alternative 4) that would not salvage any timber and would conduct restoration work, but since this alternative does not meet project objectives to salvage timber within the suitable timber base at all, and since the no action alternative analyzes in detail an alternative with no harvest activity, this alternative was dropped from further analysis.	-

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
		We request the Forest Service (FS) design a restoration/access management plan for these watersheds that will achieve these goals. …a carefully contemplated rather than a hasty response is essential for seeing that the highest priority—restoration—will be accomplished.	ccess managemen t plan?	The purpose and need of the project is to salvage timber, not restore ecosystems. The Forest actively pursues ecosystem restoration and fuel reduction as the purpose for many projects – but not this one. This comment, is in contradiction to conversations the Ranger has had with the same commenter, and statements in the commenter's 11/13/07 letter including: "We have attempted to provide a clear and precise set of recommendations that will not generally prohibit post-fire logging, but rather will constrain the negative ecological effects of post-fire logging." Roads analysis process allows the decision maker to define the analysis area. The Ranger defined the area as the roads necessary for the salvage of the burned timber. We have completed the fire emergency rehab and we will continue to address rehab needs as needed. The Forest has a process in place for planning travel access (current forest plan and travel plan). The Forest Supervisor indicated to a representative of Wildwest at a meeting on 7/15/08 that if the National Forest acquires Plum Creek land, which is being considered, then a Forest-wide access management, road restoration plan and analysis would occur that would encompass the Jocko salvage area. There is a watershed restoration tracking data base and report that shows significant restoration work on the District and across the Forest since 1996 (PF-M).	

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
12-23	1000 – Information to Note	We further request that the agency follow the best available science in developing the basis for and implementation of project activities. We maintain (and the courts have agreed) that this evaluation of scientific information must include that science specifically referred to in comments by the public (such as this letter) or other agencies, as pertaining to the project at hand.	Not a cause/effect of this proposal.	All Resource Analyses will follow best available science and refer to documents mentioned in comments as appropriate.	-
12-28, 53	1400 – Fire/Fuels 100 – Forest Vegetation	The DEIS should therefore include an analysis of the LNF's tacit but historically consistent policy of suppressing wildfires, especially smaller fires that occur under non severe weather conditions.	Not a cause/effect of this proposal.	First we are not completing a DEIS we are conducting an environmental analysis. Fire/Fuels and Vegetation generally discusses the effects of past fire suppression on the fuel conditions the lead to the manner in which the Jocko fire burned.	-
12-37, 40	101	How much old growth was historically present in the project area? How much existed prior to and after the Jocko Lakes Fire? Disclose whether the amount of existing old growth meets standards consider the likelihood that the burned areas had old-growth habitat characteristics enhanced, not destroyed by the fire. Please disclose if the proposed cutting units were, still are, or will, in the foreseeable future, qualify as old growth. Disclose the methodology used to identify each stand as old growth, recruitment old growth, or not old growth.	Not a cause/effect of this proposal.	Vegetation Analysis (as appropriate).	-
12-51	201 – Weeds	There is no guarantee that the money needed for the present management direction will be supplied by Congress, no guarantee that this amount of money will effectively stem the growing tide of noxious weed invasions, no accurate analysis of the costs of the necessary post-treatment monitoring, and certainly no genuine analysis of the long-term costs beyond those incurred by site specific weed control actions.	Not a cause/effect of this proposal.	Comment noted and we will consider that any necessary weed mitigation or monitoring planned in this project is funded and implemented.	-

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
12-53	1400 – Fire/Fuels	We request that you thoroughly disclose and analyze the impacts of wildfire suppression activities on the Forest. What restoration activities have or will be taken to mitigate the impacts of fire suppression actions?	Not a cause/effect of this proposal.	The burned area emergency restoration (BAER) report in the project file, and the affected environment assessment for each resource area in the environmental assessment display the impacts of the Jocko Lakes Fire suppression activities and the actions taken to minimize those effects.	-
12-55	700 – Watershed	Your analysis must carefully consider the postfire stability of roads in the project area.	Not a cause/effect of this proposal.	The Jocko Lakes Fire Salvage Roads Analysis identified the human uses associated with specific portions of the road system and the relative impact that these roads have on the aquatic environment and wildlife habitat. This information was used to provide guidance for road management proposals during Jocko Lakes Fire Salvage NEPA process. Where suppression activities damaged roads needed for the salvage project, they will be or already have been repaired. Three repairs that will occur prior to hauling include: Rd. 9974 was damaged by fire (Finley Creek). 4347 (Buck Creek) pipe (plastic culvert from Plum Creek). 17458 (pipe plastic burned).	-
12-66, 77	700 – Watershed	The NEPA analysis should show whether or not your alternatives would comply with the Clean Water Act and all state water quality laws and regulations. It is extremely important the EIS disclose the environmental baseline for watersheds.	Not a cause/effect of this proposal.	Watershed Analysis.	-
12-76	100 – Forest Vegetation	Pests are a part of even the healthiest eastside ecosystems. Please consider the large body of research that indicates logging, roads, and other human caused disturbance promote the spread of tree diseases and insect infestation.	7. How will salvage logging affect the spread of tree diseases and insect infestation?	Analysis Issue: Vegetation Analysis. Not much of an impact.	-

Mail # - Comment #	Subject Code*	Comment (not necessarily verbatim)	Issue Statement	Issue Disposition	Protect. Measure #
12`-78	400 – Economics	The FS should follow thorough and tell the full economic story of just what the project's impacts would be to taxpayers, not just to local economic interests.	Not a cause/effect of this proposal.	Economics Analysis	-
12-81	900	Before approving a further set of activities the FS must complete the revision of the Forest.	Not a cause/effect of this proposal.	We disagree with this statement. The project follows the 1986 Lolo National Forest Plan direction.	-
13-2, 5, 11	101 – Old growth	How is section 26 not old growth? Never found any indication that the trees that were left were cut before.	Not a cause/effect of this proposal.	**Correction Made.** The commenter is correct that there is some old growth stands in Section 26 (within proposed action units 26-2 and 26-4). These units and other proposed action units that included old growth stands, have been modified to exclude all old growth stands.	-
13-4, 6, 9	1400 – Fire/Fuels	Did the Forest Service back-burn in Section 26. Because I lost 5 tree stands to this fire I would like a map of the areas the forest service back burned.	Not a cause/effect of this proposal.	It is important for the commenter to know that the Forest Service does not allow permanent tree stands on the National Forest unless they are officially permitted. Having tree stands on location for longer then 14 days is a violation of federal law.	-
14-2	1000 – Information to Note	Black bears and grizzly bears would be expected in this project location. Bears are attracted to oil products and machinery lubricants, hoses and seats—in addition to any food products or scraps on site.	Not a cause/effect of this proposal.		-

Appendix D: Past, Present, Future Actions

Past, present and reasonably foreseeable future activities listed in this appendix are activities and natural events known to have already occurred, are currently occurring, or are likely to occur in the vicinity of the proposed Jocko Lakes Fire Salvage project and may contribute cumulative effects.

Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. The analysis for this project found no cumulatively significant issues.

The environmental analysis required under NEPA is forward-looking, in that it focuses on the potential impacts of the proposed action[19]. The past and present activities and natural events have contributed to creating the existing condition, as described in the affected environment sections of this environmental analysis. These activities, as well as reasonably foreseeable activities, may produce environmental effects on resources relevant to the proposal.

Because the proposal's direct and indirect effects vary in time and space depending on the resource or issue being considered, a specific cumulative effects analysis area and timeframe is defined for each resource in Chapter 3, or in the resource cumulative effects worksheets found in the project file. **Information is presented here in different scales** including the Jocko Salvage project area, the Jocko Lake fire perimeter, the six, 6th order HUCs that encompass or are adjacent to proposed salvage units, and for some information the Seeley Ranger District and the Lolo National Forest for a broader context. For most resources the cumulative effects analysis area is smaller than the, 91,467 acres, representing the six, 6th order HUCs that encompass or are adjacent to proposed salvage units. This is an area almost eight times the size of the 11,880 acre Jocko Salvage project area.

The listed events that are not specifically analyzed or mentioned in the resource effects analyses were considered to have no potential effect on the individual resource. These determinations are documented in the cumulative effects worksheets found in the project file.

The projects and activities listed as reasonably foreseeable future activities were gleaned from the Forest's quarterly Schedule of Proposed Actions (SOPA) published April 1, 2008, and from interviewing Forest program managers.

These tables, though comprehensive, may have some unintended omissions due to lack of records or knowledge. The listing is intended to demonstrate that relevant past, present, and reasonably foreseeable future activities are identified and are considered in the analysis of cumulative effects. However, these listings do not stand alone, and are supported with cumulative effects analysis by each resource area (Table 7). Cumulative Effects Summary by Ownership. Actions spanning each column are relevant to past, present and reasonably foreseeable actions.

[19] Council on Environmental Quality, Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, June 24, 2005 Memorandum.

Table 7. Cumulative Effects Summary by Ownership

Actions on All Ownerships	Past	Present (Spring 2008 – Spring 2009)	Reasonably Foreseeable
Wildland Fire	Wildland fires were historically a major disturbance factor throughout history on the Seeley Lake Ranger District. Within the Jocko Lakes Fire perimeter three relatively recent fires have occurred. 1981- Grouse Creek Fire (91 ac.); 1987 Slippery John Fire (10 ac.); and 2003 Boles Meadow Fire (85 ac.). All of these fires are encompassed within the 2007 Jocko Lakes Fire perimeter (Total = 36,000 ac.: National Forest = 11,600 ac. State = 2,100; Private = 19,300; Tribal = 3,000).		It is reasonable to assume wildland fire may occur in the area in the future.
Wildland Fire Suppression	Beginning with the Fire Control Policy of 1935, the Forest Service procedure has been to suppress forest fires as quickly as possible. Suppression efforts for the Jocko Fire included 79 miles of dozer line; 9 miles of hand-line; and retardant drops A map showing the location of these suppression activities is found in the project file.	Suppression of wildland fires, as appropriate will continue. Wildland fire use may be used on portions of the Seeley Ranger District (not within the project area)	Suppression of wildland fires, as appropriate will continue. Wildland fire use may expand, where resource objectives can be met, in the future.
Hunting, Trapping, Predator and Beaver Control	Hunting has been a popular use of National Forest System land and other ownerships. Some predator populations such as wolves and coyotes were reduced in numbers from the project area in the early part of the last century. Trapping of beavers and destruction of their dams occurred has occurred on all ownerships.	Hunting and trapping will continue. A limited amount of coyote and beaver population control may be occurring.	Hunting and trapping will continue. A limited amount of coyote and beaver population control may take place in the future, particularly on and near private property.
Firewood and Other Miscellaneous Forest Product Gathering	Firewood gathering has occurred in the area. Other products gathered in small quantities include post and poles, berries, and Christmas trees.	Gathering will continue.	Will continue. Higher than historic energy costs may increase the public's desire to obtain firewood but air quality concerns may also reduce reliance on this source of fuel in the future.

Actions on All Ownerships	Past	Present (Spring 2008 – Spring 2009)	Reasonably Foreseeable
Mushroom Harvest	Past personal use mushroom harvest likely occurred on all ownerships after past fires.	Fee commercial harvest permits will be issued by the USFS in a designated portion of NFS Land in the Jocko fire perimeter to harvest mushrooms. Personal harvest will also occur. The forest designated mushroom harvest season to commence on May 1 and end on September 30. No camp sites will be designated.	
Snowmobiling	This area has a number of popular snowmobile trails including groomed routes.	Use will continue.	Use will continue.
Driving	Driving, sightseeing, and wildlife viewing on open Forest and private roads have occurred.	Use will continue.	Use will continue.
Road Maintenance and BMPs	Roads on all ownerships have been maintained for use either by all users or for just the individual landowners. Roads used for the transport of forest products are generally maintained to meet Montana Best Management Practices (BMP). Road work to improve surface drainage, stabilize slopes, and reduce erosion and stream sedimentation has occurred.	Will continue.	Will continue.
Hiking trails	Boles Creek trail was maintained in 1993. The trail is probably used mostly by hunters.	Use will continue.	Use will continue.
Power line & Substation	Northwestern Energy has easements and maintains a 230 KV line 100 feet wide across multiple ownerships. There is a substation near the mouth of Finely Creek.	Will continue.	Will continue.
Grazing	There are no Forest Service grazing leases in this area; however, the area has traditionally received grazing use on state land (Section 16) and what were Champion (now Plum Creek) lands. Because of intermingled lands, some unauthorized grazing has occurred on Forest Service land.	May continue.	May continue.

Actions on National Forest System Land Only	Past	Present (Spring 2008 – Spring 2009)	Reasonably Foreseeable
Implementation of Burned Area Emergency Stabilization & Rehabilitation (BAER)	BEAR activities in the Jocko Lakes post-fire environment were initiated immediately after the suppression efforts. Due to weather (snow) some of the BEAR work could not be completed. Please refer to project file for a description of activities. Specific activities that either occurred last fall or will occur before spring 2009 include: 9 miles of handline restored to infiltrate precipitation; 60 miles of dozer line berms pulled back, logs, topsoil, and organic matter put on fireline to blend with adjacent ground to promote infiltration, erosion control implemented including waterbarring; 30 miles of rehabilitated roads seeded with approved seed mix; spot seeding of safety zones, helispots, drop points and staging areas; replaced 3 culverts (Culvert # 1397 on Placid Cr., Trib. #1289 on Slippery John Cr. # 1194 on Grouse Cr.); closed stabilized 2.1 miles of road; storm-proofed 3.25 miles of roads, armored 5 spillways.	Three repairs that will occur prior to any hauling for Jocko Salvage include: Rd. 9974 which was damaged by fire (Finley Creek). 4347 (Buck Creek) pipe (plastic pipe culvert burned). 17458 (plastic pipe culvert burned). Approximately 5.2 miles of road will be decommissioned including re-contouring (Rd. 36210, 36212, 36213, 3614, 4342, 36023, and 36022 in Grouse Creek – outside the Jocko Salvage project area, and 46618 in Slippery John Creek)	
Removal of timber associated with fire suppression and hazard reduction	Approx. 0.5 mbf was removed from fire lines and roadside areas for fire suppression efforts that had commercial value and was sold.	Less then 1 mbf of timber removed for fire suppression or safety remains to be sold.	
Fishing/Camping and Dispersed Sites.	Fishing and camping at Hidden Lake has a long history of use. In 2006 a new vault toilet (SST) was installed to create a healthier atmosphere for Forest visitors. This area does not receive as much dispersed recreation use as compared to the east side of the district, which is mostly wilderness and proposed wilderness.	Use will continue	Fishing and camping use at Hidden Lake is expected to continue to rise.
Special Use Permits	Outfitting and guest ranch near the project has utilized a FS special use permit to provide guided snowmobile tours within the project boundary for over 10 years.	Will continue	Will continue

Actions on National Forest System Land Only	Past	Present (Spring 2008 – Spring 2009)	Reasonably Foreseeable
Fish Stocking & MDFW Non-native fish presence management	Montana Department of Fish, Wildlife and Parks have annually stocked approximately 1,000 westslope cutthroat per year in Hidden Lake. Stocking also occurs in Placid and Seeley lake. Non-native fish are present and are managed by MDFW	Will continue.	Will continue.
Placid lake dam	Placid lake dam is a fish barrier to the Placid drainage.	Will continue.	Will continue.
Stream Rehabilitation	Across the Forest approximately 0.21 miles of stream was rehabilitated in 2007; approx. 4.4 miles (direct channel reconstruction)	This type of work will continue.	This type of work will continue.
Road-Stream Crossing Replacements	Across the Forest approximately 6 stream crossing replacements occurred in 2007; approx. 55 (majority pipe arch & bridge replacements) On the Seeley Ranger District 6 crossings were removed in 2007 and a total of 66 have been removed since 1996.	This type of work will continue.	This type of work will continue.
Miles of Fish Habitat Made Available	Across the Forest in 2007: Culverts Removed: 6.65 miles and Culvert Replacements: 190 miles Across the Forest since 1996: Culverts Removed: 127.6 miles; Diversion Rehabilitation: 13 miles; Total: 330.6 miles On the Seeley Ranger District, 2 miles was made available in 2007 and 18.22 miles have been made available since 1996 by culvert removals and .8 miles was made available in 2007 and 31.5 miles have been made available since 1996 by culvert replacements.	This type of work will continue.	This type of work will continue.
Road Construction	Within the Jocko Lakes project area approximately 64 miles of road have been built on the national forest. The roads are in varying levels of use including roads that are closed and no longer drivable. The majority of roads built on federal lands were completed between 1950 to the mid- 1980s.	No new system roads are being constructed.	Unlikely any new system roads will be built in the reasonably foreseeable future on NFS land.

Actions on National Forest System Land Only	Past	Present (Spring 2008 – Spring 2009)	Reasonably Foreseeable
Road Maintenance	Roads open for motorized use by the public are maintained with safety as a high priority. This primarily involves repairing drainage features and clearing live and down vegetation. Some roads have been closed (via closure orders) year-long or seasonally and are maintained at a lower level. There are approximately 49 miles of road under USFS jurisdiction; 13.4 miles of which are open year-long and receive a higher level of maintenance. Approximately 17 miles of USFS roads are closed year-long and 18.6 miles are closed seasonally. Culvert replaced with bridge at NFSR #2190 and Archibald crossing (completed with KV funds from Archloop Timber Sale).	Will continue.	Will continue.
Road Storage and Decommissioning	Across the Forest approximately 788 miles of road under USFS jurisdiction have been closed or decommissioned since 1996. 51.6 miles in 2007. On the Seeley Ranger District approximately 15.2 miles of road were closed or decommissioned in 2007 and 125.2 miles since 1996. In the past 10-15 years five roads or portions of roads totaling approximately 1 mile, in the Jocko Lakes Fire Salvage analysis area have been decommissioned.		The Jocko Lakes Roads Analysis recommends the storage or decommissioning of 9.6 miles of road within the roads analysis area that are not part of the salvage proposal and may be completed in the reasonable foreseeable future.

Actions on National Forest System Land Only	Past	Present (Spring 2008 – Spring 2009)	Reasonably Foreseeable
Land Acquisition/Exchange	The District acquired a 20 acre lot around the Double Arrow Lookout in T16, R15, S5 just on the edge of the Jocko Fire perimeter, to facilitate management of the lookout and communications site. Forest Service acquired land from Champion Timber Company in 1992 in the Deep Creek Exchange near Hidden Lake.	Will continue.	Will continue.
Noxious Weed Control		Noxious weed control as outlined in the 2007 Integrated Weed Management on the Lolo National Forest Environmental Impact Statement and Decision will take place in the Jocko Fire perimeter.	Will continue.
Irrigation	The BIA ditch takes water from the N. Fk. Placid Creek and carries it over the divide into the Jocko drainage.	Will continue	Will continue
Timber Harvest	Approximately 34,092 acres of timber have been harvested on National Forest System land in the project area since the 1950s within the six, 6th order HUC's that encompass or are next to the project area. An acre of land may have had multiple harvest entries, so a straight percentage of the area that has been treated is not accurate. Within the Jocko Lakes Fire Salvage Project area approximately 4,894 acres of timber have been harvested on NFS land. An acre of land may have had multiple harvest entries, so a straight percentage of the area that has been treated is not necessarily accurate. The majority (67%) of the treatments in the HUC were accomplished in the 1970s and 1980s. Table D-2 details the acres of timber harvest by decade and treatment type. The most recent timber harvest projects are depicted in Table D-3.	Within the Jocko Salvage project area the Hidden Lake Timber Sale planned in 2007 to thin 388 ac. A portion of the area planned for thinning was burned by the Jocko Lakes fire and is included in this Salvage proposal (Unit 131).	

Actions on State and Private Ownership Only (Tribal?)	Past	Present (Spring 2008 – Spring 2009)	Reasonably Foreseeable
State – School Trust Land: Timber Sales including Jocko Fire Salvage and activities	In 1990, the DNRC completed the Double Arrow Timber Sale shelterwood harvesting approximately 2.5 MMBF from 362 acres in **Section 6, and N1/2 Section 8,** Township 16 North, Range 15W – Winter harvest. In the early 1990's, DNRC harvested approximately 1.8 MMBF from approx. 220 acres in **Section 16,** T16N, R16W - In 1991 the Finley Creek Timber Sale harvested approx. 1.8 mmbf of seedtree and overstory removal from 220 acres in **Section 16**, T16N, R16W. Additional harvest entries occurred in the early 1960s. In 1996 Hidden Bugs Salvage Timber Sale and Hidden Bugs Timber Sale Supplemental EA – Under the original timber sale, the DNRC was harvesting approximately 800 thousand board feet of dead, dying, and susceptible lodgepole pine from approximately 125 acres in **Section 18**, Township 16 North, Range 15 West. In addition to timber harvesting, the original activities also included approximately 4 miles of road maintenance, 0.5 miles of new road construction, and 0.25 miles of road decommissioning. In August of 2007, the Jocko Lakes Fire burned approximately 140 acres of the original project area. Under the Hidden Bugs Supplemental EA, the DNRC harvested an additional 70 acres of partially and severely burned timber within **Section 18**. No additional road was constructed but some road maintenance was conducted to meet Montana Best Management Practices. Approximately 5,000 feet of fireline was used as a skid trail, and then it was obliterated. In **Section 6 and 8** of Township 16 North, Range 15 West and **Section 16** of Township 16 North Range 16 West, harvest approx. 8 to 11 MMBF of dead and dying timber from up to 1,503 acres. Approx. 2.75 miles of road constructed and decommissioned approx. 0.5 miles of existing road all within **Section 16.**	The DNRC is currently developing a proposed timber permit to salvage harvest approximately 34 acres of burned timber in Section 36 T16N R16W.	DNRC will plant, starting as early as the spring of 2009, appropriate tree species (western larch, ponderosa pine, and Douglas-fir) in high-severity burned areas to supplement natural regeneration. Approx. 0.5 miles of the new road construction, **Section 16** of Township 16 North Range 16 West, would be removed post-harvest.

Actions on State and Private Ownership Only (Tribal?)	Past	Present (Spring 2008 – Spring 2009)	Reasonably Foreseeable
State – School Trust Land: Road construction, reconstruction (State)	Jocko Salvage Roadwork – In 2007 the DNRC constructed new roads, reconstructed existing roads, and replaced road features within Section 6 of Township 16 North Range 15 West and Section 16 of Township 16 North Range 16 West. Specifically, the DNRC constructed 1.5 miles of new road, reconstructed and maintained 3.6 miles of existing road, and replaced 10 culverts that were at risk of flooding or loss due to fire effects, with larger culverts. Activities are expected to be completed during the fall of 2007.		
State – School Trust Land: Mineral Extraction	A flagstone/rock mineral lease removed approximately 60 tons of material from Sections 6 and 8, Township 16 North, Range 15 West in 2007 (less than 1 ac.).		
Private – Commercial Timber Lands	Since 1999 through 2007 Plum Creek has harvested, with associated actions, approx. 7,600 ac., removing approx. 26 mmbf of timber from their ownership in or near the Jocko Lakes fire perimeter (an area of roughly 18,000 ac.). Approx. 5,400 ac. of the harvest was some stage of regeneration harvest and 2,200 ac. was intermediate harvests.	Additional timber harvest can be anticipated on Plum Creek lands within the Jocko fire perimeter.	Additional timber harvest can be anticipated on Plum Creek lands within the Jocko fire perimeter.
Private Land Development	Within the Jocko Fire perimeter, T16, R16, S12, S ½, has been subdivided and sold to individuals.		
Noxious Weed Control	The State of Montana applies herbicides on State lands near or adjacent to the Lolo NF. These programs treat adjacent areas and roads, State roads and highways within and around the Jocko Salvage area. Adjacent private landowners actively control weeds and some use herbicides. Methods include both aerial and ground application of herbicides.	Weed control is likely to continue.	Weed control is likely to continue.

Project Area Information

Tables 8 through 11 show information for within the 11,881 acre Jocko Salvage Project area. One acre of land may have had multiple activities, including more then one harvest entry; therefore a straight percentage of the area that has had activities (vs. no activity) can not be made with these figures.

Table 8. Past Timber Harvest Activity Acres on National Forest System Land Within the Project Area.

Harvest Type	1950s	1960s	1970s	1980s	1990s	2000s	Total
Regeneration* (acres)	283	933	1,153	1,282	0	0	**3,651**
Intermediate** (acres)	42	185	552	395	38	31	**1,242**
Totals	**325**	**1,118**	**1,705**	**1,677**	**38**	**31**	**4,894**

* includes: patch clearcuts, seed trees, shelterwoods etc. The same acre may receive more than one harvest entry.
** includes: thinning, sanitation and salvage, etc. The same acre may receive more than one harvest entry.

Table 9. Most Recent Timber Sale Projects on NFS Land within the Jocko Salvage Project Area.

Project Name	Year Project was Most Active	Acres of Timber Harvest
Hidden Lakes	2008	386
Arch Loop	2000	31
Archibald	1996	35
Schoolhouse Greenslip	1996	2
Section 24	1989	34
Fallen Arch	1988	21

Table 10. Total Acres and Percentage of the Jocko Salvage Project Area Burned Since 1980.

Jocko Salvage Project Area - Including 2007 Jocko Fire	Acres	% of Project Area Burned
Total Fire Acres in Jocko Salvage Project Areas since 1980 (including 2007 burn – all ownerships)	11,881	100%
Total Acres in Jocko Salvage Project Area (all ownerships)	11,881	

Table 11. Percentage of Area Burned in the Jocko Salvage Project Area Since 1980 with Pre and Post Burn Harvest.

	Acres	% of FS in Project Area Total Burned
FS Acres Burned in Jocko Project Area since 1980 no harvest activity pre or post	4,078	56%
FS Acres Burned in Jocko Project Area since 1980 with post-burn harvest	0	0%
FS Acres Burned in Jocko Project Area since 1980 with harvest prior to burn	3,259	44%
Total FS Acres Burned in Jocko Project Area since 1980	7,337	100%

Six, 6th Order HUCs Within or Adjacent to the Project Area.

Tables 12 and 13 show information for within the 91,467 acres in the six, 6th order HUCs within or adjacent to the project area. One acre of land may have had multiple activities, including more then one harvest entry; therefore a straight percentage of the area that has had activities (vs. no activity) can not be made with these figures.

Table 12. Past Timber Harvest Activity Acres on National Forest System Land in the Six, 6th order HUCs Within or Adjacent to the Project Area.

Harvest Type	1950s	1960s	1970s	1980s	1990s	2000s	Total
Regeneration* (acres)	2,213	4,266	3,232	3,763	1,852	420	**15,746**
Intermediate** (acres)	840	1,135	3,469	2,223	2,038	2,142	**11,847**
Totals	**3,053**	**5,401**	**6,701**	**5,986**	**3,890**	**2,562**	**27,593**

* includes: patch clearcuts, seed trees, shelterwoods etc. The same acre may receive more than one harvest entry.
** includes: thinning, sanitation and salvage, etc. The same acre may receive more than one harvest entry.

Table 13. Past Site Prep and Reforestation Activity Acres on NFS Land in the Six, 6th order HUCs Within or Adjacent to the Project Area.

Activity	1950s	1960s	1970s	1980s	1990s	2000s	Total
Planting (ac.)	844	2,332	1,175	1,552	1,818	150	**7,872**
Natural Regeneration (ac.)	346	2,563	3,337	3,789	873	1,009	**11,918**
Mechanical Site Prep for planting (ac.)	2	521	1,281	1048	333	856	**4,042**

Seeley Lake Ranger District and the Lolo National Forest

One comment we received from the public during the scoping for the Jocko Salvage project expressed concern that high quality post-burn habitat (i.e. habitat that had not been harvested prior to or after a fire) was limited on the Lolo National Forest. We compiled the information in Tables 14 through 17 to consider the context of the Jocko Salvage project, relative to all areas burned within the Seeley Lake Ranger District and harvest pre and post fire, and within the Lolo National Forest. Similar information – for within the Jocko Salvage project area is presented above.

Table 14. Total Acres and Percentage of the Seeley Ranger District Burned Since 1980.

Seeley Ranger District	Acres	% of Seeley District Burned
Total Fire Acres on Seeley RD since 1980 (including 2007 burn)	123,289	38%
Total Acres in Seeley RD	322,591	

Table 15. Percentage of Area Burned on the Seeley Ranger District Since 1980 with Pre and Post Burn Harvest.

Seeley Ranger District	Acres	% of Total Burned
Acres Burned on Seeley RD since 1980 no harvest activity pre or post	115,351	94%
Acres Burned in Seeley RD since 1980 with post-burn harvest	1,074	0.9%
Acres Burned in Seeley RD since 1980 with prior-burn harvest	6,863	5.6%
Total Acres Burned on Seeley RD since 1980	123,289	100%

Table 16. Total Acres and Percentage of the Lolo National Forest Burned Since 1980.

Lolo National Forest (LNF)	Acres	% of LNF Burned
Total Fire Acres on LNF since 1980 (including 2007 burn)	340,505	16%
Total Acres on the LNF	2,092,075	

Table 17. Percentage of Area Burned on the Lolo National Forest Since 1980 with Pre and Post Burn Harvest.

Lolo National Forest	Acres	% of Total Burned
Acres Burned on LNF since 1980 no harvest activity pre or post	293,896	86%
Acres Burned on LNF since 1980 with post-burn harvest	3,464	1%
Acres Burned on LNF since 1980 with prior-burn harvest	43,144	13%
Total Acres Burned on LNF since 1980	340,504	100%