Jocko Lakes Fire Salvage

Transportation Analysis

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August 8, 2008

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Introduction

The transportation analysis will discuss the access needs and road development associated with the proposed Jocko Lakes Fire Salvage Project. This analysis will also identify the recommended management for the roads under Forest Service jurisdiction within the project area that are used for project access. A Roads Analysis Process (RAP) for the general project area was conducted to provide information for the management and disposition of the affected project roads. Existing conditions and long-term management objectives were analyzed in the RAP to disclose issues relative to the human uses of the road system and the aquatic and wildlife resources.

Regulatory Framework

The Forest Plan provides direction for management of the transportation system. The standards most pertinent to the Jocko Lakes Fire Salvage project are:

> Standard 15, "The application of best management practices will assure that water quality is maintained at a level that is adequate for the protection and use of the National Forest that meets or exceeds Federal and State standards" (Forest Plan, page II-12)
>
> Standard 49, "Lolo National Forest roads will be the minimum number and meet the minimum design standards possible while still meeting safety, user, and resource needs" (Forest Plan, page II-17)
>
> Standard 52, "Manage Forest roads to provide for resource protection, wildlife needs, commodity removal and a wide range of recreation opportunities." (Forest Plan, pages II-18 through II-20).

Management Area direction outlined within the Forest Plan further specifies standards for the development and management of the transportation system.

The following regulatory requirements and Forest Service policy and guidance provide additional direction for transportation system management.

- 36 CFR 212, et al. revises regulations concerning the management, use, and maintenance of the National Forest Transportation System.
- Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA, Forest Service. 1999. Misc. Rep. FS-643. Washington, D.C. 222p.) provides guidance and direction to address the project transportation system and the existing and long-term road management objectives.
- Forest Service Manual 7700 – Transportation System contains objectives, policies, responsibilities and transportation analysis requirements. Sub section 7703.2 addresses management opportunities and provides guidelines for managing the forest transportation system by maintaining and reconstructing needed roads as well as decommissioning of unneeded roads.

Analysis Area

The Jocko Lakes Fire Salvage project area is the primary area of analysis for the transportation system. This includes an intensive assessment of various types of road mileages and road densities in individual National Forest sections where timber treatment project activities would occur. Roads information was provided for the cumulative effects analysis of other resources. This information was provided at the scale appropriate for each particular resource. This transportation analysis also includes an assessment of the

haul routes that provide road access to the project area. The primary haul routes include the Placid Creek Road (NFSR 349), Grouse Creek Road (NFSR 4342), Buck Creek Road (NFSR 4347), Beaver Finley Creek Road (NFSR 9974), Archibald Loop Road (NFSR 2192) and the West Side Bypass Road (NFSR 2190).

Analysis Methods

The Roads Analysis Process completed for the Jocko Lakes Fire Salvage project assessed the current condition of the road system relative to affected resources and identified the future access needs provided by the transportation system. As part of the Roads Analysis, feasible road management opportunities were identified.

The current conditions of potential project roads were identified by an intensive field evaluation in the fall of 2007. At that time existing deficiencies in the implementation of BMPs were identified and additional BMP needs were recorded.

Existing Road System in Project Analysis

The following is a description of the existing roads in the project areas and also the potential primary haul routes from the project areas. Most of the roads discussed are under Forest Service jurisdiction; however, several roads that may be used are under private jurisdiction. The existing roads under Forest Service jurisdiction in this analysis consist of National Forest System roads (NFSR) and other existing roads which presently are identified in the Forest transportation atlas as having an “undetermined” (UND) status. System roads are authorized for use to access Forest resources. An undetermined road is an existing non–system road that has not been evaluated for long-term need as a system road.

Non-System (Undetermined) Roads – Generally these roads were developed 25–45 years ago to access the timber resource for commercial timber removal. The high road densities that are characteristic of this road development are inappropriate for current yarding technology and land management philosophy. Most of these non-inventoried roads are not drivable by motorized vehicles due to re-vegetation. This re-vegetation may have obliterated these roads through natural processes but in some cases, specific conditions such as soil compaction and the presence of un-maintained and inadequate drainage structures at creek crossings will continue to generate sediment.

National Forest System Roads - These consist of arterial roads such as roads 349 and 2190 which provide primary access for resource management, timber haul and recreational activities; collector roads 4347, 4367 and 2191 which provide primary access for resource management and timber haul, and local roads like 17458, 16899 and 16001 that are used predominately for intermittent timber resource harvest and management activities. (See "Condition and Needs" discussion below). The relatively good condition of most of these roads is a result of extensive road reconstruction and construction activities which has occurred within the analysis area in the last 25 to 30 years in conjunction with several timber sales.

The previous and proposed timber harvest activities in the area will provide opportunities for the decommissioning and obliteration of some timber access system and non-system roads since these roads will no longer be needed for timber harvest activities in the foreseeable future.

Road Decommissioning – Activities that result in the stabilization and restoration of unneeded roads to a more natural state. (36 CFR 212.1).

In the last 10 to 15 years, several National Forest System roads in the Jocko Lakes Fire Salvage analysis area have been decommissioned. These roads were used to access the timber resource for the management of commercially available timber stands. Access to these stands will not be needed for at least 20 years.

The following National Forest System roads have been decommissioned within the analysis area. The closure level identified for each road indicates the type of techniques applied during the decommissioning process. (See attached closure level definitions, Fig. A-1 in the Appendix).

Table 1. National Forest System roads decommissioned within the analysis area prior to Jocko Fire Salvage.

Road	Section*	Mileage	Closure Level	Comments
20600	32 T17N R15W	0.27	3D	Previously existing road. Decommissioned in 1997.
20601	32 T17N R15W	0.30	3D	Previously existing road. Decommissioned in 1997.
20608	31 T17N R15W	0.29	5	Newly constructed road. Decommissioned in 1999.
20616	30 T17N R15W	0.05	5	Newly constructed road. Decommissioned in 2005.
20617	30 T17N R15W	0.05	5	Newly constructed road. Decommissioned in 2005.

* Indicates the section number of the section included in the project analysis area. Portions of Road 20600 are not included in sections that are part of the project analysis area, therefore only the mileage in Section 32 is indicated.

Existing Road Mileage and Densities in Project Areas

The following table identifies road mileages and road densities for the roads within the project areas. These project areas consist of contiguous tracks of National Forest land in individual sections in which timber treatment activities are proposed.

Table 2. Existing road mileage and densities in project area.

Section	Township Range	National Forest System Roads (NFSR)		Undetermined Roads (FS Jurisdiction)		Totals (All roads under Forest Service jurisdiction)		Other Roads[a]		Totals (For all road types in areas considered)	
		Miles	Density[b]	Miles	Density[b]	Miles	Density[b]	Miles	Density[b]	Miles	Density[b]
2	16N 16W	3.65	***3.65***	1.20	***1.20***	4.85	***4.85***	0.00	***0.00***	4.85	***4.85***
4	16N 16W	1.83	***3.67***	0.22	***0.44***	2.05	***4.10***	0.18	***0.36***	2.23	***4.46***
8	16N 16W	3.14	***3.14***	1.25	***1.25***	4.39	***4.39***	0.39	***0.39***	4.78	***4.78***
10	16N 16W	2.69	***3.05***	0.45	***0.51***	3.14	***3.57***	0.18	***0.21***	3.32	***3.77***
13	16N 16W	4.07	***4.07***	1.44	***1.44***	5.51	***5.51***	0.60	***0.60***	6.11	***6.11***
14	16N 16W	2.19	***2.93***	1.69	***2.25***	3.88	***5.17***	0.28	***0.37***	4.16	***5.55***
20	16N 16W	2.84	***2.84***	0.15	***0.15***	2.99	***2.99***	0.00	***0.00***	2.99	***2.99***
22	16N 16W	4.40	***4.40***	0.84	***0.84***	5.24	***5.24***	0.11	***0.11***	5.35	***5.35***
26	16N 16W	1.47	***1.47***	0.28	***0.28***	1.75	***1.75***	0.00	***0.00***	1.75	***1.75***
28	16N 16W	3.81	***3.81***	2.72	***2.72***	6.53	***6.53***	0.00	***0.00***	6.53	***6.53***
29	16N 16W	1.33	***3.50***	0.40	***1.06***	1.73	***4.55***	0.00	***0.00***	1.73	***4.55***
30	17N 15W	3.41	***3.41***	1.49	***1.49***	4.90	***4.90***	0.00	***0.00***	4.90	***4.90***
31	17N 15W	4.53	***4.53***	0.86	***0.86***	5.39	***5.39***	0.00	***0.00***	5.39	***5.39***
32	17N 15W	4.29	***4.29***	0.65	***0.65***	4.94	***4.94***	0.00	***0.00***	4.94	***4.94***
34	16N 16W	0.72	**0.72**	0.00	***0.00***	0.72	**0.72**	0.00	***0.00***	0.72	***0.72***
36	17N 16W	4.64	***4.64***	1.56	***1.56***	6.20	***6.20***	0.00	***0.00***	6.20	***6.20***
		Total Miles	**Average Density**	**Total Miles**	**Average Density**	**Total Miles**	**Average Density**	**Total Miles**	**Average Density**	**Total Miles**	**Average Density**
		49.01	***3.38***	**15.20**	***1.05***	**64.21**	***4.43***	**1.74**	***0.12***	**65.95**	***4.55***

[a] Includes private roads on National Forest land and private roads on private land included in the road density assessment. The private roads on NF land are roads under the jurisdiction of the Plum Creek Timber Company where they have obtained a non cost share easement on a road on National Forest land.
[b] Miles of road per square mile.

Existing Management of National Forest System Roads

The following is a brief summary which identifies the existing management of motorized access on National Forest System Roads (NFSR) within the project areas identified above. The road management designations are based on the Lolo National Forest Travel Plan.

Open System Roads:

Approximately 13.43 miles (27 percent of NFSR roads). These roads are open to all motorized access yearlong depending on snow and road surface conditions.

Seasonal Restriction on Motorized Access:

Approximately 18.60 miles (38 percent of NFSR roads). There are two types of seasonal restrictions in the analysis area.

"**K" Restriction** – 17.28 miles, (35 percent of NFSR roads). (Administrative motorized access is allowed on a limited basis). Roads with a "K" road management classification are subject to a variable restriction on road use. In the analysis area these are roads which are designated snowmobile routes when snow conditions allow, hence the variable timing of the road use restrictions. During the implementation of the restriction, snowmobiles are the only motorized vehicles allowed on the road. These roads are otherwise open for public use by motorized vehicles if road conditions are acceptable.

"**E" Restriction** – 1.32 miles, (3 percent of NFSR roads). (Administrative motorized access is allowed on a limited basis during implementation of public restriction). All public motorized access is restricted from Oct. 15 to June 15.

Yearlong Restriction on Motorized Access:

Approximately 16.98 miles, (35 percent of NFSR roads). There are two types of yearlong restrictions on motorized use on the identified roads.

"**A" Restriction** - (2.51 miles, 5 percent of NFSR roads). Administrative motorized access is allowed on a limited basis. Under an "A" road restriction, all public motorized access is restricted yearlong.

"**B" Restriction** - (14.47 miles, 30 percent of NFSR roads). Administrative motorized access is allowed on a limited basis. Under a "B" road restriction, public motorized access is restricted yearlong except snowmobiles are only restricted from Oct. 15 to Dec. 1.

The following table identifies the road mileages by management type for the National Forest System roads in the individual project areas.

Table 3. Road mileages by management type within each section where management is proposed.

Section	Township / Range	Open miles	Open %	"K" miles	"K" %	"E" miles	"E" %	"A" miles	"A" %	"B" miles	"B" %
2	16NR16W	0.11	***3***	1.69	***46***	0.00	***0***	0.00	***0***	1.86	***51***
4	16NR16W	1.05	***57***	0.78	***43***	0.00	***0***	0.00	***0***	0.00	***0***
8	16NR16W	2.12	***68***	0.00	***0***	0.00	***0***	0.00	***0***	1.01	***32***
10	16NR16W	0.06	***2***	1.22	***46***	0.00	***0***	0.00	***0***	1.40	***52***
13	16NR16W	1.57	***39***	0.00	***0***	0.00	***0***	2.50	***61***	0.00	***0***
14	16NR16W	1.01	***46***	1.18	***54***	0.00	***0***	0.00	***0***	0.00	***0***
20	16NR16W	0.00	***0***	0.00	***0***	0.00	***0***	0.00	***0***	2.84	***100***
22	16NR16W	2.75	***63***	1.22	***28***	0.00	***0***	0.00	***0***	0.43	***9***
26	16NR16W	0.72	***49***	0.00	***0***	0.00	***0***	0.00	***0***	0.75	***51***
28	16NR16W	1.51	***40***	2.30	***60***	0.00	***0***	0.00	***0***	0.00	***0***
29	16NR16W	0.91	***68***	0.21	***16***	0.00	***0***	0.00	***0***	0.21	***16***
30	17N 15W	0.02	***1***	1.50	***44***	0.99	***29***	0.00	***0***	0.89	***26***
31	17N 15W	0.00	***0***	1.66	***37***	0.33	***7***	0.00	***0***	2.54	***56***
32	17N 15W	0.00	***0***	2.25	***53***	0.00	***0***	0.00	***0***	2.02	***47***
34	16NR16W	0.72	***100***	0.00	***0***	0.00	***0***	0.00	***0***	0.00	***0***
36	17N 16W	0.87	***19***	3.28	***71***	0.00	***0***	0.00	***0***	0.49	***10***
Totals:		**13.43**	***27***	**17.28**	***35***	**1.32**	***3***	**2.51**	***5***	**14.47**	***30***

National Forest System Roads (Condition and Needs)

(See Attached Maps, Figs. 1 and 2)

Project Access Roads:

The following roads provide access to the project areas. They are used intermittently for timber haul, administrative access and for dispersed recreational activities depending on the relative public access management. Some of these roads have been reconstructed or improved in the last 20 years in association with National Forest timber sales. In addition, the Plum Creek Timber Company has made some improvements on roads that they share with the Forest Service. Although most of the roads have received improvements additional reconstruction to reduce sediment production and delivery is recommended. This reconstruction would generally be associated with the implementation of "Best Management Practices" (BMPs). Listed below are the types of mitigation techniques that could be applied to the roads on a selective basis as needed.

(A) - Add or replace gravel surfacing. On the project road system this only would be needed on a limited basis to be applied intermittently for short distances where surface stability is inadequate. For example, several areas on Rd. 349 have been identified where surface rutting occurs when the road is water saturated and severe dusting occurs under dry conditions. Other roads that had previously demonstrated similar conditions have recently been surfaced with gravel. Approximately 2.5 miles of NFSR 9974 was surfaced with gravel in 2003 under the Boles Salvage Sale.

(B) - Add more road surface drainage control structures. Although many of the roads have received additional surface drainage structures there are still critical segments particularly on higher risk portions where more drainage structures are needed. In addition, some of the existing drainage dips need reshaping and some opentops need replacing. In some cases, drainage dips were used on grades that are too steep for effective drainage control and will need to be replaced with opentops.

(C)- Add additional ditch relief pipes. A portion of the erosion potential is associated with the existing ditches. Since there is a concentration of hydraulic energy in the ditches, additional ditch relief pipes would reduce erosion potential by reducing the hydraulic energy within the ditch. Probably more prevalent on the project road system are ditch pipes that were damaged in the fire such as plastic pipes that melted; pipes that need cleaning and pipes that were improperly installed and need replacing or re-installing or they need extensions or reductions in length to reduce outlet erosion.

(D) - Construct sediment traps at cross drains. To insure that sediment movement is limited, sediment traps should be installed at cross drains which are within 300 feet of streams. Cross drains are items such as ditch relief culverts, drain dips, open tops and rubber belts. Slash windrows are a relatively inexpensive but very effective sediment traps. Existing vegetation and flatter topography may be sufficient to inhibit sediment movement in some cases. As a result of the fire, in some areas much of the vegetation has been reduced and is presently not sufficient to act as a natural sediment barrier. The construction of sediment traps becomes more important in these cases.

(E) - Construct sediment traps below roads which are within 100 feet of streams. If adjacent ground is relatively flat and has sufficient vegetation to trap sediment, constructed sediment traps may not be needed. The need for sediment traps either at cross drains or below the road fill is particularly evident along the portion of Rd. 9974 which is located adjacent to Finley Creek. The fire destroyed over 600 Feet of slash filter windrow that was constructed at critical locations along this road.

(F) - Add fill armoring below surface drainage structures. Armoring the fill below road surface drainage structures is essential to prevent erosion in sensitive soils from concentrated road surface runoff. Although the need for fill armoring varies throughout the project area, fill erosion is evident where exposed sensitive soils occur on high fills particularly where vegetation has been reduced by the fire.

(G) - Place rock in culvert catchbasins. Install drop inlets at catchbasins with high backslopes. Rock is used to prevent erosion around the culvert inlet and to stabilize the backslope of the catchbasin. Backslope sloughing and general erosion within a catchbasin can become a significant source of sediment, particularly when catchbasin backslopes are relatively high. When catchbasin backslopes exceed about 10 feet, a drop inlet to the culvert should be used to reduce backslope height.

(H) - Control road drainage and sediment transfer at stream crossings. Uncontrolled road erosion at several crossings is contributing sediment directly to the stream. To control this problem, the following techniques could be implemented:

- Inslope road to ditch within 200 feet of the creek crossing. This will keep surface runoff from carrying sediment over the road fill in close proximity to the creek.
- Place a sediment trap such as a slash filter windrow below a road fill which is within 100 feet of a crossing.
- Place check dams in the ditch upslope of the creek crossing to reduce hydraulic energy and to trap sediment.
- Install a ditch relief pipe prior to the crossing if possible so that ditch water which is carrying sediment does not enter the stream. A sediment trap would be located below the outlet of this pipe.
- Construct a sediment basin at the end of a ditch above a crossing to trap sediment. This would be done if a ditch relief pipe was not possible due to the proximity of the creek.

- If soils are erosive, surface road with gravel to a distance of 200 feet on either side of the crossing.
- Install free draining rock berm on fill shoulders in vicinity of crossing to trap sediment.

Individual road conditions and recommended maintenance and BMP mitigation is identified in the following table.

Table 4. Road conditions and recommended maintenance and BMP mitigations.

Road No.	Road Maint. Needs[a]	Primary Road Maint. Actions Needed[b]	BMP Needs Rd. Prism	BMP Items Rd. Prism	BMPs at Major Drainages	Aquatic Risk Rating[a]	Comments
349 (1-3)	Low	Blade	NA	Done under Boles Salvage T.S 2004-2005	Done under Boles Salvage T.S. 2004-2005	Not analyzed in Roads Analysis	
349 (3-19)	Low	Blade	Medium	A, H	YES[b]	1 – 4.75	Road surfacing needed in areas prone to dusting and rutting.
4342 (19-23)	Low	Brush, blade, reshape dips	Medium	B, E, F, G, H	YES	4.25 - 7.25	Sediment entrapment at creek crossing (MP 0.13) needed.
4347 (22-22c)	Medium	Brush, blade, reshape dips & catchbasins, clean cmps	Medium	B, C, D, F, G	See[c]	3	
46372 (20-21)	Medium	Blade, clear individual trees	Low	B, D	NO	2	This road is essentially a wheel-track road on flat ground.[d]
17458 (16-18)	High	Clear trees, brush, Reshape ditch, dips and catchbasins, Replace ditch CMP	High	B, D, F, G	NO	1- 2.5	It is difficult to drain this road because much of it is located on a steep grade with relatively flat adjacent slopes.
46617 (17-19)	Medium	Clear trees on shoulder, brush, blade, reshape dips	NA	None	NO	1	Road is located on relatively flat grade. Existing drainage features need maintenance but are otherwise adequate for this low risk road.
46622 46527 (14-15)	Medium	Blade, clear individual trees	NA	None	NO	1	This road is essentially a wheel-track road on flat ground in a low risk area. Major reconstruction is not needed or recommended.
60348 11-12	Medium	Blade, brush	Medium	A, B	NO	NA – Was not included in Jko Roads Analysis	Gravel would be added to portions of the road to improve road surface and enhance drainage.
17642 6b-10 36285 5b-7 36427 8-9	Medium	Blade, brush	Medium	B, C	NO	NA – Was not included in Jko Roads Analysis	Roads in the Hidden Lake area were reviewed in Hidden Lake Fuels Reduction EA

Road No.	Road Maint. Needs[a]	Primary Road Maint. Actions Needed[b]	BMP Needs Rd. Prism	BMP Items Rd. Prism	BMPs at Major Drainages	Aquatic Risk Rating[a]	Comments
9974 (13-52)	Medium	Blade, reshape berm, replace ditch CMP and opentops	High	E, H	YES	8.25	The portion of this road that needs significant maintenance and additional BMP work is the segment located next to Finley Creek[e]
9974 (52-54)	Low	Blade	NA	None	NO	2.5 – 5.75	BMPs added under recent timber sales were undamaged by fire or fire suppression activities.
17457 (28-33)	Medium	Blade, brush, reshape dips and catchbasins, clean CMPs	Low to Medium	B, D, G	NO	1 - 7.25	The highest risk rating is on the portion located next to the drainage. The road generally has a flat grade with sufficient drainage control and there is vegetation to act as a natural sediment trap.
16898 (31-32)	Medium	Individual tree removal, brush, blade, clean CMPs	Low to Medium	B, F	NO	3	
46560 (29-30b)	High	Clear trees, brush, reshape dips, blade, intermittent reshape of road prism	Low	B	NO	3 (On portion under FS jurisdiction)	Much of this road is located on flat ground with a low potential for sediment delivery.
9975 (34-35)	Low	Blade, brush, clean CMP	Medium	H	YES	4	The deficiency in BMPs is primarily at the drainage crossings.
16001 (35-36)	Medium	Blade, brush, clean CMPs, reshape dips and catchbasins	Medium	B, F	NO	1	
16003 (37-42)	Medium	Blade, brush, individual tree removal, reshape dips & catchbasins, clean CMPs	Medium	D, F, G	NO	2	
36290 (42-43)	Medium	Blade, brush, individual tree removal	Medium	B	NO	5.5	
17620 (40-41)	Medium	Blade, brush	Low	B	NO	1.5	

Road No.	Road Maint. Needs[a]	Primary Road Maint. Actions Needed[b]	BMP Needs Rd. Prism	BMP Items Rd. Prism	BMPs at Major Drainages	Aquatic Risk Rating[a]	Comments
16887 (38-39)	Low	Blade, brush, clean CMPs	Low	B, F	NO	2	
4339 (44-45)	High	Blade, heavy reshape of road surface, clear trees ,brush, reshape catchbasins, clean CMPs	High	A, B, D, E, F, G, H	YES	4.75	This road has intermittent portions that are badly rutted indicating local poor soil conditions and poor surface drainage. At a minimum, adding gravel surfacing in the vicinity of Finley Creek[f]
4367 (46-47)	Medium	Blade, brush, clean CMPs, reshape dips & catchbassins	Medium to High	B, D, E, F, G, H	YES	4.75	
16892 (47-49)	Low to Medium	Blade, brush, clean CMPs, reshape dips	Low	B, F, G	NO	1.5	
46802 (49-50) & Rd. (50-51)	Medium	Blade, brush	Low	B	NO	Not part of Roads Analysis. No rating identified.	This is a private road therefore no Roads Analysis was conducted so there is no risk rating. Risk rating would be low though due to ridgeline location of roads.

[a] Aquatic risk rating based on a scale of 1 to 10 with 10 being the highest risk to causing aquatic resource degradation. Ratings were developed by Forest Hydrologist and Fisheries Biologist and were identified in the Roads Analysis for the project for each road. The pre-dominate range of ratings is shown if the road had several risk rating segments. (See Appendix A-2 and A-3).

[b] BMPs on NFSR 349 at Slippery John Crk. (Pt.14B) and Placid Crk. tributary (Pt. 14C) provided in association with replacement of stream crossing structures under BAER implementation at these sites. Additional BMPs should be applied to Beaver Creek crossing. (No. 1288)

[c] BMPs on NFSR 4347 at Grouse Crk. (Pt. 22b) provided in association with replacement of stream crossing structure under BAER implementation at this site.

[d] Appropriate reconstruction would involve the construction of a turnpike road section using ditches on either side of the road to define the road prism and improve drainage; however, since this road is generally located on a bench with a relatively low resource risk and would be used to access a limited amount of timber volume, no major reconstruction is recommended. The most significant BMP item is the installation of a drainage structure near the intersection with NFSR 4342 to control sediment delivery potential to the creek below the intersection.

[e] the segment that is located next to Finley Creek. Several road drainage features were damaged by fire suppression operations and by the fire. All of these features were recently installed as BMPs in association with National Forest and Plum Creek timber sales in the region. Several opentops and earthberms that were constructed as sediment traps were damaged during fire suppression activities. In addition, approximately 600 feet of slash filter windrow and a Plum Creek installed plastic ditch relief culvert were consumed by the fire.

[f] At a minimum, adding gravel surfacing in the vicinity of the Finley Creek crossing would be recommended to prevent rutting during log haul if this road remains a long-term road. In lieu of graveling at this site, the control of timber haul to dry conditions would be needed. The consideration of a change in road management for this road which is presently open to public use is recommended unless sufficient BMP and road reconstruction techniques are applied to all portions of the road.

Status of Culverts in Fish Bearing Streams

There are 5 culverts that are located on fish-bearing streams that inhibit fish passage and are also incapable of passing a 100-year flood (Q 100) event. These culverts are listed below in order of their priority for replacement or removal. A probable replacement structure is also indicated. (See Maps, Fig. 1 for location of culverts).

Table 5. Culverts that inhibit fish passage in the project area

Culvert ID No.	Road No.	Priority for Replacement or Removal	Drainage	Existing Structure	Bankfull Width[b]	Potential Replacement Structure
1469	9975	1	Finley Cr.	48" CMP	10 ft.	14' x 4'-7.5" x 40'L BA[c]
1224	4339	2	Finley Cr.	57" x 38" CMPA	8 ft.	Remove existing structure
1222	4367	3	Finley Cr.	42" x 29" CMPA[a]	5 ft.	87" x 63" x 38'L CMPA
1391	9975	4	Finley Cr. Tributary	30" CMP	5 ft.	87" x 63" x 44'L CMPA
1288	349	5	Beaver Cr.	57" x 38" CMPA	8.5	142" x 91" x 48'L CMPA
1391	9975	4	Finley Cr. Tributary	30" CMP	5 ft.	87" x 63" x 44'L CMPA

[a] CMPA - corrugated metal pipe arch.
[b] Width of stream surface at normal yearly high water level.
[c] Bottomless Arch – corrugated metal pipe in arch configuration that has no bottom portion but instead is attached to concrete footings on either side of the creek.

Cost Share and Right-of-Way

(Maps: Fig. 1 and 2)

The analysis area was originally located in a Cost Share Agreement Area. The parties which were involved in this agreement were the Forest Service, Champion International Corporation (CIC), and Plum Creek Timber Lands Incorporated (PC). Plum Creek is now the primary private landowner in the area since they acquired CIC lands in 1992. The following road segments were cost shared under the original agreement and all or portions of these segments would be used for timber haul depending on the timber treatment alternative; the mutual obligations and easements associated with these roads are still effective. The Forest Service has obtained an easement for administrative and public access on all of the segments of the following roads which are located on private and state land. Road segments identified would provide general access to the project areas from the county roads. Several roads such as NFSR 9974 have segments that are cost shared that extend beyond the project area road system.

Table 6. Cost Share Road Segments.

Road	Cost Share Segment
NFSR 349	County Rd. 68 to Jnc. with NFSR 4348 (Pt. 1 to First Creek near NF boundary)
NFSR 4342	Jnc. with NFSR 349 to Jnc. with NFSR 17527 (Pt. 19 to Pt. 23b)
NFSR 46372	Jnc. with NFSR 4342 to section line 4/9 (Pt. 20 to Pt. 21).
NFSR 4347	Jnc. with NFSR 4342 to section line 17/20 (Pt. 22 to Pt. 25b).
NFSR 17458	Jnc. with NFSR 349 to property boundary (Pt. 16 to Pt. 18).
NFSR 9974	Jnc. with NFSR 349 to Jnc. with NFSR 16899 (Pt. 13 to Pt. 54). (Cost share continues beyond this point on NFSR 9974).
NFSR 9975	Jnc. with NFSR 9974 to Jnc. with NFSR 16001 (Pt. 34 to Pt. 35). (Cost share continues beyond this point on NFSR 9975 to section line 25/26).
NFSR 16001	Jnc. with NFSR 9975 to section line 23/26 (Pt. 35 to Pt. 35b).
NFSR 17457	Jnc. with NFSR 9974 to section line 10/15 (Pt. 28 to Pt. 29b).
NFSR 16003	Jnc. with NFSR 9974 to section line 21/22 (Pt. 37 to 40b).
NFSR 17620	Jnc. with NFSR 16003 to section line 15/22 (Pt. 40 to Pt. 41).
NFSR 4367	Jnc. with NFSR 9974 to Jnc. with NFSR 16892 (Pt. 46 to Pt. 47).
NFSR 16892	Jnc. with NFSR 4367 to section line 34/35 (Pt. 47 to Pt. 48).
NFSR 16899	Jnc. with NFSR 9974 to section line 19/20 (Pt. 54 to Pt. 55b).
NFSR 4345	Jnc. with NFSR 2192 to section line 35/36 (Pt. 70 to Pt. 71c).

Existing Non-Cost Share Easement:

NFSR 4339 (SW SW Sec. 23, T16N R16W), NFSR 16001 (SW NW and NW SW Sec. 25 T16N R16W). – The federal government has obtained non-cost share easements on the portions of these roads on Plum Creek land and thus has jurisdiction over these portions even though they are on Plum Creek land.

Materials Condition

The pre-dominate materials in the analysis area are derived from Precambrian Belt rock. In general this parent rock provides excellent road construction material; however, since the region has been heavily glaciated there is significant complexity in material types resulting from the transport and deposition of material as well as the physical effects of glacial action on the landform. The material types common to analysis area are listed below.

Colluvial Deposits:

Generally found at the mid to upper elevations, these sites contain material that was weathered on site. These deposits generally provide good road construction material particularly at the upper elevations due to a wide range of particle sizes that often contain a significant component of gravel.

Glacial Tills:

In the project area, these are generally found in the areas of low to moderate relief. Rounded, cobble and boulder sized rock can be encountered in glacial tills, thus, problems with oversized material can occur. These soils are poorly drained in basins and depressions; in these areas, high water tables can be intercepted near the surface. Cut-slope instability can be a problem in some situations depending on the relative extent of finer grained sandy material in the soil matrix. Although these problems can occur, these soils can be relatively good road construction material if roads are located to avoid potential problem areas.

Alluvial Deposits:

These deposits are generally found at the lowest elevations on relatively flat ground adjacent to major drainages and lakes along the valley bottom. Soils in these deposits are predominately composed of fine textured silts and sands associated with stream and lake deposition. The water table is often close to the surface and can be intercepted within a constructed road prism. These soils are typically unstable under loading and will develop ruts from vehicle traffic. Long-term roads constructed in this material should be constructed with a turnpike road prism to promote road sub-grade drainage and gravel surfacing may be necessary to provide adequate road surface stability. Short-term road construction and use in this material should occur during the dry season or winter in order to avoid the need for turnpike road construction and the problems with surface rutting. Where practical, snow road construction may be appropriate to minimize soil disturbance.

Gravel and Riprap Source:

The gravel and riprap sources will generally depend on the relative location in the project area of the improvements requiring this material. It is likely that work on roads that are tributary to NFSR 349 (Placid Lake road) will obtain material from the following sources.

Second Creek Pit (NE ¼ NE ¼ Section 1 T16N R17W, contains pit run aggregate composed of argillite and quartzite parent material).

This long-term gravel pit is located on National Forest land in the Second Creek drainage on the western perimeter of the project area and is accessed by NFSR 349, 4346 and 17616. This gravel source contains open graded pit-run material which requires some blending at the pit to provide a suitable range of particle sizes. This pit would provide gravel for any proposed surfacing in this portion of the project area. The present pit development has occurred on a ridge located east of a relatively dry draw. Recently this area has been producing relatively poorly graded blocky material which has required grid rolling to produce suitable gravel. The next entry into the pit would probably occur on the ridge west of the draw where there is more extensive available gravel that could be utilized without additional processing.

Riprap Source (SW ¼ NE ¼ Section 15 T16N R16W, Plum Creek land)

This is the only significant source of riprap presently identified in this portion of the project area. Use of this material will require permission from Plum Creek but since much of the proposed work will occur on roads that are shared with Plum Creek this material should be available.

In the Archibald Loop area, gravel would probably be obtained from one of several commercial sources in the Seeley Lake area since it would be more cost effective due to shorter haul distances. Although it is possible that the Plum Creek riprap source would be used for the Archibald Loop area another possible source of high quality rip rap is available on National Forest land at the long-term pit in the Uhler Creek area (NE Section 15, T18N R16W). The haul distance from this pit to the Archibald Loop area is about 15 miles compared to about 7 miles from the source on Plum Creek land.

Environmental Consequences

Alternatives Considered:

The alternatives are briefly described in relation to the transportation system.

Direct, Indirect, and Cumulative Effects of Alternative 3 (See Maps: Figs. 7 and 8).

Under Action 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, mitigation would be applied to the existing roads as well as any new roads to reduce potential near-term and long-term road related resource impacts. 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 to reduce overall road densities and other roads would be placed in storage to reduce their potential for sediment production and delivery. Most of the road decommissioning and storage would be implemented in conjunction with funds generated from the proposed timber sale but some decommissioning and storage would require funding from other sources. Fish passage in the project area would be improved by replacing or removing culverts that are presently an impediment to the movement of fish in critical habitat. Two of these structures 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. The culvert to be removed is on a timber haul road that will be stored after timber sale activities are completed.

Forest Plan Consistency and Regulatory Compliance for Alternative 3

Provided that all management requirements were fulfilled, Alternative 3 is consistent with all relevant Forest Plan and other regulatory standards and guidelines. The proposed activities would lead to a reasonable improvement in existing resource conditions that are currently negatively impacted while providing adequate Forest access.

Direct, Indirect and Cumulative Effects for Alternative 3

Alternative 5 (No Action) There would be no change in the management of the road system therefore the implementation of this alternative would have no affect on the existing condition of the transportation system.

Cumulative Effects

No roads would be decommissioned consequently there would be no change in the existing road densities. Resource degradation would continue to occur as a result of these high road densities. The existing mitigation features designed to reduce road related sediment production and delivery would prevent some sediment transfer to adjacent streams but road generated sediment would continue to degrade the aquatic resources. Road crossings at streams would continue to impede fish passage and would not pass 100-year flood events.

Forest Plan Consistency and Regulatory Compliance for Alternative 5

The No Action Alternative partially fulfills regulatory and Forest Plan direction because the existing resource mitigation applied to the roads has reduced some road related resource impacts; however, improvements are needed as previously described. The existing road system provides sufficient access for current activities associated with Forest management and public Forest use.

Summary of Issues Related to the Transportation System under Action Alternative 3:

No transportation issues were raised during public scoping. Issues related to the transportation system’s affects on other resources are covered I those resource reports.

The primary purpose of this portion of the document will be to identify and evaluate issues associated with the requirements of commercial timber haul access and the condition of the existing road system in the project area. A summary of the issues is identified below.

A) Road development and use associated with commercial timber treatments. -This road development could have near and long-term effects on various resources in the analysis area. The identification of the type and extent of this road development is necessary to assess potential effects.

B) BMP implementation. – Many of the existing roads that would be used for timber haul under the proposed project are at risk for causing aquatic resource degradation. The application of additional Best Management Practices (BMPs) to these roads would reduce these risks through the use of a variety of mitigation techniques.

C) Fish passage culverts. – There are a number of culverts that are a barrier to fish passage. These culverts should be replaced with structures that allow easy fish passage and can also accommodate Q-100 flood events or they should be permanently removed.

D) Road access management. – High road densities in the analysis area contribute to resource degradation. It would be beneficial to close or decommission some roads to reduce road related impacts. These road management changes could affect resource management access and public motorized access.

E) Economics. – The application of Best Management Practices to the road system, the decommissioning of roads and the replacement of existing culverts to provide fish passage and accommodate Q-100 flood events would be relatively costly. The identification of the estimated costs of these activities is useful to help determine the magnitude of funding requirements and the timing of the implementation of these improvements.

F) Permits for road use and construction. – Access to several proposed treatment areas would be improved by accessing through adjoining Plum Creek land either by use of an existing Plum Creek road or by a short segment of construction on Plum Creek land. These activities would require a road use permit or a permit to construct a road from Plum Creek.

Effects of Alternative 3 by Issue

(Issue A) Road Development and use Associated with Commercial Timber Treatments.

The implementation of the action alternatives would result in near-term and long-term effects on the road system and resources in the analysis area through the road development and utilization activities that would occur under alternatives that require timber treatment access. Consideration of the timber treatment access road mileage associated with the following items would be an indication of the relative effects of alternative implementation on the road system and the implications of these changes to the road system in relation to other resources.

Long-term Road Construction. Alternative 3 includes no long term road construction.

Short-term Specified Road Construction. These roads are used for a limited period of time and are then obliterated; thus, only temporary improvements in road access are realized. The use of these roads limits the undesirable long-term effects of road development and use but could cause short-term undesirable impacts to sensitive resources. 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. Short-term specified roads are generally used when roads are needed for a limited period of time from one to about

ten years and in areas where resource conditions may be sensitive to road development and thus would require an engineered design.

Temporary Road Construction. These roads are constructed under the supervision of a timber sale administrator and are used for a period of one year or less and then are obliterated. They are 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. The utilization of these roads to shorten log skidding distances can result in less ground impacts. The actual extent of this road development is typically not determined until the timber removal is being conducted. Any identification of temporary road development in this report is an estimate that may be modified during actual timber sale operations.

Long-term Road Reconstruction. The majority of this road work would be designed to reduce sediment delivery from National Forest System Roads by implementing BMPs; therefore, the long-term effect of this reconstruction should be an improvement in water quality. (See Issue B, “BMP Implementation” below for more specific discussion on BMP applications under the alternatives).

Short-term Specified Road Reconstruction. For the project area, this would involve the reconstruction of substandard road segments to allow access for yarding and hauling activities under a timber sale. Earthwork and vegetation removal associated with reconstruction may result in a short-term increase in sediment production. BMPs would be applied as needed but since these roads would be used for a short period, BMP implementation would not necessarily be as extensive as those implemented for a long-term road. Instead, the limitation of use to dry conditions and the application of temporary, less expensive techniques such as drivable water bars during periods of non-use would be sufficient to satisfy BMP requirements. In the project area, most of the reconstruction on short-term roads would consist of the clearing and reshaping the road surface and some BMP implementation.

Short-term and Temporary Road Decommissioning (Newly Constructed Roads). All newly constructed short-term roads and temporary roads used for timber treatment access would be decommissioned using Level 5 closure techniques (See Appendix, Table A -1, “Road Closure Levels”). Basically, this involves recontouring the road prism to the shape of the natural landform. There would be a long-term benefit from this obliteration but the earthwork during recontouring activities could increase the risk of short-term sediment production.

Short-term Road Decommissioning or Storage (Existing Roads). All existing roads that are used only for short-term access to the proposed timber sale would be decommissioned or stored after use through implementation of a Level 3S, 3D, 4 or 5 closure. (See Appendix, Table A -1, “Road Closure Levels” and “Road Management” section below and attached Maps, Figs. 3, 4, 7 and 8). There would be a long-term benefit from this road management implementation but this activity could increase the risk of short-term sediment production.

Table 7. Road development mileage for timber treatment access.

	Alternative 3	Alternative 5 (no action)
Long-term Road Construction	0	0
Short-term Road Construction	2.0	0
Temporary Road Construction	1.3[a]	0
Total Road Construction	**3.3**	**0**
Long-term Road Reconstruction	32.2	0
Short-term Road Reconstruction	6.5[b]	0
Short-term Road Decommissioning (New Construction)	2.0	0
Temporary Road Decommissioning (New Construction	1.3	0
Short-term Road Decommissioning (Existing Roads)	3.5	0
Short-term Road Storage (Existing Roads)	3.9	0

[a] Some additional temporary roads may be constructed on a limited basis within the treatment areas. These would be in low risk areas and would be relatively short in length.
[b] Portions or all of roads 36285, 20632 and 60344 (0.98 miles) will not need reconstruction.

(Issue B) Implementation of Best Management Practices (BMPs) on Timber Haul Roads.

There are a number of roads in the analysis area that would remain on the transportation system as long-term roads under all alternatives. Road mitigation techniques would be implemented on these roads prior to project timber haul to reduce road impacts on sensitive resources. This mitigation would be applied in the form of "Best Management Practices" (BMPS). The full range of BMP techniques would be applied to roads as needed. (See BMP discussion in "Affected Environment"). For the affected roads, the most commonly applied BMP work applied would include:

- Installation of surface drainage structures.
- Additional ditch relief culverts.
- Sediment traps in the vicinity of the creeks.
- Placement of rock in catch-basins for stabilization and sediment reduction.
- Placement of riprap below surface drainage structures to reduce fill erosion.
- Reduction of over-width road sections.
- Gravel surfacing for stability and erosion control if needed in areas that have not already been graveled.

BMP implementation on short-term roads is also necessary to reduce the risk of resource degredation from road development. Since these roads are used for a short period of time which is generally equal to the duration of road use required for timber sale related activities, some of the techniques applied may be different than those applied on a long-term road. For example, drivable waterbars may be used in lieu

drain dips because the promotion of efficient travel is not as important on these roads. In addition, the control of haul during unsuitable conditions can be an effective means to reduce resource impacts because lower traffic use makes this feasible. The table below indicates the application of BMPs to long-term and short-term roads.

Table 8. Long-term road and short-term road BMP implementation.

	Jocko Project Haul	BMP Implementation	BMP Implementation
		Alt. 3	**Alt. 5** (no action)
Jocko Project Haul on Long-term National Forest (NF) Roads	46.67		
Jocko Project BMP Implementation on Long-term NF Project Haul Roads		32.19	
BMP Implementation under Previous Projects on Long-term NF Project Haul Roads		13.83	13.83
Jocko Project Haul on Short-term National Forest Roads	7.44		
Jocko Project BMP Implementation on Short-term NF Project Haul Roads		6.46	
BMP Implementation under Previous Projects on Short-term NF Project Haul Roads		0.98	0.98
Jocko Project Haul on Plum Creek Roads	0.83		
Jocko Project BMP Implementation on Plum Creek Project Haul Roads		0.83	
Totals	**54.94**	**54.29**	**14.81**

Note that no BMPs were not applied to NFSR 4349 (0.65 miles) since this road is in a low risk area and is presently under county maintenace.

Table 9. Identification of previous BMP implementation on Jocko project haul roads.

Road	Miles	Project	Implementation Date	Comments
Long-term National Forest Project Roads:				
349	9.33	Boles Salvage TS	2005	
		Jocko Fire BAER	Summer-Fall 2008	This includes BMP implementation at culvert replacements at Slippery John Crk. and Placid Crk. trib.
9974	4.07	Boles Salvage TS	2005	BMP structures on these portions of 9974 were not afftected by the fire or fire suppression activities.
17642	0.43	Hidden Lake Fuels Redux TS	Summer 2008	
Total	**13.83**			
Short-term National Forest Project Roads:				
20632 60344 36285	0.39 0.04 0.55	Hidden Lake Fuels Redux TS	Summer 2008	
Total	**0.98**			

(Issue C) Removal or Replacement of Culverts that are Fish Barriers.

There are three culverts within the analysis area that inhibit fish passage on fish-bearing streams and are incapable of passing a Q-100 event that will be replaced or restored with Alternative 3. The table below identifies these culverts and indicates the probable method of removal or replacement under the action alternative. (See "Affected Environment" for existing and proposed replacement structures and attached map, Fig. 1).

Table 10. Removal or Replacement of Culverts that are fish barriers with funding under the timber sale" or with appropriated funds.

Culvert ID No.	Road No.	Priority For Replacement or Removal	Drainage	Alternative 3	Alternative 5 (no action)
1469	9975	1	Finley Cr.	Replace Required implementation with funding under the timber sale.	No Action Existing impediment to fish and Q-100 flood passage continues.
1224	4339	2	Finley Cr.	Remove Required implementation with funding under timber sale after TS use.	No Action Existing impediment to fish and Q-100 flood passage continues.
1222	4367	3	Finley Cr.	Replace Required implementation with funding under the timber sale.	No Action Existing impediment to fish and Q-100 flood passage continues.

(Issue D) Road Access Management.

Implementation of action Alternative 3 would affect the management of road access for selected existing roads in the project area that are under Forest Service jurisdiction. Changes to the existing road management were designed to mitigate road impacts on critical resources while providing sufficient access for Forest management and Forest user activities.

Road Management Objectives:

The road management objectives that are listed below were developed as a guide for management of roads in the analysis area. These objectives were selectively used to develop a road management strategy for each project road under the action alternative. The Roads Analysis process was utilized to provide information to develop and apply the objectives. See Figures A-2 and A-3 in the Appendix for the "Jocko Lakes Fire Salvage Roads Analysis" narrative and road ratings.

- Reduce sediment delivery from the road system by implementing appropriate mitigation and road management.
- Reduce road density to improve watershed conditions.
- Provide for motorized recreational access.
- Provide for long-term intermittent access for resource management.
- Provide short-term access for resource management.
- Provide access for fire treatment and suppression activities.

- Provide for non-motorized recreation access.

Summary of the Mileage of Proposed Changes in the Management of Motorized Access on Existing National Forest System Roads (NFSR) under Action Alternative 3

The following table indicates the change in mileages under Alternative 3 from the existing condition for the types of management of motorized access on National Forest System Roads (NFSR) in the project area.

Table 11. Summary of mileage of proposed changes in the management of motorized access.

Sec.		Decom Store	Open miles	"K" miles	"E" miles	"A" miles	"B" miles
2	Alt. 5[a]		0.11	1.69	0	0	1.86
	Alt. 3	0.11	0	1.69	0	0	1.86
Change in NFSR Miles			***-0.11***				
4	Alt. 5		1.05	0.78	0	0	0
	Alt. 3		1.05	0.78	0	0	0
Change in NFSR Miles			***No Change***				
8	Alt. 5		2.12	0	0	0	1.01
	Alt. 3		2.12	0	0	0	1.01
Change in NFSR Miles			***No Change***				
10	Alt. 5		0.06	1.22	0	0	1.40
	Alt. 3	1.40	0.06	1.22	0	0	0
Change in NFSR Miles							***-1.40***
13	Alt. 5		1.57	0	0	2.50	0
	Alt. 3	1.51	1.57	0	0	0.99	0
Change in NFSR Miles						***- 1.51***	
14	Alt. 5		1.01	1.18	0	0	0
	Alt. 3		1.01	1.18	0	0	0
Change in NFSR Miles			***No Change***				
20	Alt. 5		0	0	0	0	2.84
	Alt. 3	2.14	0	0	0	0	0.70
Change in NFSR Miles							***-2.14***
22	Alt. 5		2.75	1.22	0	0	0.43
	Alt. 3	1.36	1.39	1.22	0	0	0.43
Change in NFSR Miles			***-1.36***				
26	Alt. 5		0.72	0	0	0	0.83
	Alt. 3	1.53	0.02	0	0	0	0
Change in NFSR Miles			***-0.70***				***-0.83***
28	Alt. 5		1.51	2.30	0	0	0
	Alt. 3		1.51	2.30	0	0	0
Change in NFSR Miles			***No Change***				
29	Alt. 5		0.91	0.21	0	0	0.22
	Alt. 3	0.04	0.91	0.21	0	0	0.18
Change in NFSR Miles							***-0.04***
30	Alt. 5		0.02	1.50	0.99	0	0.89
	Alt. 3		0.02	1.50	0.99	0	0.89
Change in NFSR Miles			***No Change***				
31	Alt. 5		0	1.66	0	0	2.54
	Alt. 3		0	1.66	0	0	2.54
Change in NFSR Miles			***No Change***				

Sec.		Decom Store	Open miles	"K" miles	"E" miles	"A" miles	"B" miles
32	Alt. 5		0	2.25	0	0	2.02
	Alt. 3		0	2.25	0	0	2.02
Change in NFSR Miles			***No Change***				
34	Alt. 5		0.72	0	0	0	0
	Alt. 3		0.72	0	0	0	0
Change in NFSR Miles			***No Change***				
36	Alt. 5		0.87	3.28	0	0	0.49
	Alt. 3	0.13	0.74	3.28	0	0	0.49
Change in NFSR Miles			***-0.13***				
Totals	Alt. 5		**13.43**	**17.28**	**1.32**	**2.51**	**14.47**
	Alt. 3		**11.13**	**17.28**	**1.32**	**1.00**	**10.06**
	Change in NFSR Miles		***-2.3***	**0**	**0**	***-1.5***	***-4.4***

[a] Alt. 5 (no action alternative equals existing condition)

Road Management Definitions:

"K" Restriction. Variable restriction on motorized access generally used to exclude wheeled motorized access on roads to provide for winter recreational activities such as snowmobiling.

"E" Restriction. Public motorized access is restricted from Oct. 15 to June 15. Administrative motorized access is allowed.

"A" Restriction. Public motorized access is restricted yearlong. Administrative motorized access is allowed.

"**B" Restriction**. Public motorized access is restricted yearlong except that snowmobiles are only restricted from Oct. 15 to Dec. 1. Administrative motorized access is allowed.

Proposed Road Management Changes for Existing National Forest System Roads (NFSR) and Existing Non-system (UND) Roads under Action Alternative 3

The management of the roads listed below would change under the action alternative. These proposed changes are based on the Roads Analysis conducted for the project area as well as other resource considerations evaluated during the NEPA process. (See Appendix A-1 for closure level definitions and A-4 for recommended road management and attached maps, Figs. 3, 4, 7 and 8).

Table 12. Alternative 3 changes to road management restrictions and closure levels.

Road No.	Map Segment (Maps: Figs 7&8)	Length Miles	Existing Road Management, Closure Level	Proposed Road Management	Proposed Closure Level
16001	35b-36	0.83	B, Cls Lvl 1	Storage	3S
16887	38-39, 39-39b	0.60, 0.21	Open	Storage	3S
16898	31-32	0.92	B, Cls Lvl 1	Decommission	3D
17455	52b-53, 53-53c	0.18, 0.71	B, Cls Lvl 1	Storage	3S
17457	29b-33	0.49	B, Cls Lvl 1	Decommission	3D
17456	64-68, 68-68b	0.03, 0.21	Open	Decommission	3D
36000	80-81	0.15	B, Cls Lvl1	Decommission	3D
36265	45b-45c	0.28	Open[a]	Decommission	3D
36279	65-66	0.20	Open	Decommission	3D
36285	6-7, 7-7b	0.72, 0.11	A, Cls Lvl1	Storage	3S
36286	5c-5d	0.1	A, Cls Lvl1	Storage	3S
36290	42-43, 43-43b	0.4, 0.3	B, Cls Lvl 1	Decommission	3D
36295	68-69	0.64	Open	Decommission	3D
36427	8-9	0.25	A, Cls Lvl1	Storage	3S
4339	44-45	1.28	Open	Storage	3S
4347	25b-25c	1.27	B, Cls Lvl1	Storage	3S
46527, 46622	14-15	0.32	Open	Decommission	3D
46560	29b-30	0.22	See table note[a]	B Restriction	1 or 2[b]
60344	3-4, 4-4b	0.04, 0.05	A, Cls Lvl1	Storage	3S
20632	4-5	0.39	A, Cls Lvl1	Decommission	4

[a] Vegetation has physically closed this road.
[b] Closure level would depend on consultation with Plum Creek

Summary of the Mileages of the Types of Road Closure Levels Applied to Existing National Forest System Roads (NFSR) and Existing Non-system (UND) Roads under Alternative 3:

The following tables identify the miles of the types of road closure levels that would be applied under Alternative 3 to existing National Forest System Roads (NFSR) and non-system (UND) roads. (See A-1 in the Appendix for the characteristics of each road closure level). Note that a road that is decommissioned under a level 3D or higher would be removed from the National Forest Road System and would no longer function as a road.

Table 13. Alternative 3 summary of applied closure level mileages on National Forest System Roads.

National Forest System Roads (NFSR)	
	(Miles)
1) Open to Closure Level 3S	2.09
2) Open to Closure Level 3D	0.24
3) B Restriction, Closure Level 1 to Closure Level 3S	2.16
4) A Restriction, Closure Level 1 to Closure Level 3S	2.00
5) B Restriction, Closure Level 1 to Closure Level 3D	1.41
6) A Restriction, Closure Level 1 to Closure Level 4	0.39
Total NFSR Stored	**6.3**
Total NFSR Decommissioned	**2.0**

Table 14. Alternative 3 summary of applied closure level mileages on non-system roads.

Non -System Roads (UND)	
	(Miles)
2) Open to Closure Level 3D	1.44
4) A Restriction, Closure Level 1 to Closure Level 3S	0.10
5) B Restriction, Closure Level 1 to Closure Level 3D	0.85
Total Non-system Roads Stored	**0.1**
Total Non-System Roads Decommissioned	**2.3**

Evaluation of the Effects of the Level of Road Closure Applied to Roads under Action Alternative 3

(1) (2) (Open to Level 3S or 3D)

Accessibility: (Proposed new closure device – boulders or 50-100 ft. of road prism recontouring). All wheeled motorized public and administrative traffic would be eliminated for a period of up to approximately 20 years under a 3S or at least 20 years under a Level 3D. Under a 3S the road would be in storage and could be re-opened for access at anytime after the closure although typically the period of closure would probably be at least 10 years. Snowmobile access if allowed and non-motorized access would be difficult due to re-vegetation and the removal of drainage crossings.

Sediment Production Mitigation: Road surface ripping and seeding and fertilizing would promote re-vegetation and reduce erosion potential.

(3) (4) (Level 1, A or B Restriction to Level 3S)

Accessibility: (Proposed new closure device – boulders or 50-100 ft. of road prism recontouring). Under an “A” restriction, the road is presently closed yearlong to all public motorized vehicles. Under a “B” restriction, the road is presently closed yearlong to all public motorized vehicles except that snowmobiles are only prohibited access from Oct. 15 to Dec. 1. Implementation of a Level 3S Closure would close the road segment to all wheeled motorized public and administrative access for a period up to approximately 20 years. Snowmobile access if allowed and non-motorized access would be difficult due to re-vegetation and the removal of drainage crossings.

Sediment Production Mitigation: Roads that are closed yearlong to public wheeled motorized traffic can have relatively extensive road surface vegetation therefore the reduction in sediment production by additional re-vegetation under a Level 3S closure would not be as dramatic as would be realized with the closure of an open road. Re-vegetation of the road prism would be promoted by seeding and fertilizing and road surface ripping would promote water infiltration. These techniques would reduce sediment production.

(5) (Level 1, “B” Restriction to Level 3D)

Accessibility: (Proposed new closure device – boulders or 50-100 ft. of road prism recontouring). These roads are presently closed yearlong to all public motorized vehicles except that snowmobiles are only prohibited access from Oct. 15 to Dec. 1. Under a Level 3D closure, these roads would be physically closed to all wheeled public and administrative motorized traffic for a period of at least 20 years. If allowed, snowmobiles could use the area previously dedicated to the road but entrance barriers, the removal of culverts and re-vegetation of the road surface would make snowmobile use difficult. Non motorized traffic would also become more difficult due to these physical changes to the road condition.

Sediment Production Mitigation: Deep ripping of the road surface under a Level 3D would promote soil de-compaction and water infiltration which would result in a reduction of sediment production.

(6) (Level 1 "A Restriction to Level 4)

Accessibility: (Proposed new closure device – boulders or road prism recontour for 100-150 feet). A road that is presently closed yearlong to public motorized access would be physically closed to all public and administrative motorized access for a period of at least 30 years. The road surface would be ripped and since portions of the road prism would also be recontoured, it would become more difficult to re-establish a road closed under a Level 4 closure in comparison to a road closed under a Level 3D closure.

Sediment Production Mitigation: Same as Level 3D above except that in areas where the road prism would be recontoured sediment production would be further reduced by re-establishing natural drainage patterns and by eliminating exposed road prism surfaces.

Road Density Reduction through Implementation of Changes in Road Management

High road densities in the analysis area contribute to the degradation of resources that are sensitive to road development and utilization. National Forest System roads (NFSR) and non-system roads have been identified for decommissioning because they are no longer needed. Implementing these changes in road management would lower road densities and could result in a reduction in road related degradation to sensitive resources.

Alternative 3 (Action Alternative)

Implementation of road management changes on National Forest System Roads (NFSR) and non-system roads (UND) under the action alternative would result in changes in National Forest road mileages and densities in the project areas. Roads that would be decommissioned would receive mitigation that would reduce undesirable road related resource effects. These decommissioned roads would no longer function as roads and would be officially removed from the National Forest road network for a period of at least 20 years under a Level 3D closure or progressively longer under higher closure levels. (See Appendix A-1 for description of road closure levels). The table below identifies these changes for the action alternative within the context of overall road mileages and densities in the project areas.

Alternative 5 (No Action)

No road management changes would occur in the project areas. No roads would be decommissioned consequently there would be no change in the existing road densities. Resource degradation would continue to occur as a result of these high road densities.

Table 15. Road density changes in project area.

Section	Alt.	National Forest System Roads (NFSR)		Non-system Undetermined Roads (FS Jurisdiction)		Totals (All roads under Forest Service jurisdiction)		Other Roads		Totals (For all road types in areas considered)	
		Miles	Density[b]	Miles	Density[b]	Miles	Density[b]	Miles	Density[b]	Miles	Density[b]
2	***Alt. 5***[a]	3.65	***3.65***	1.20	***1.20***	4.85	***4.85***	0.00	***0.00***	4.85	***4.85***
	Alt. 3	3.54	***3.54***	0.36	***0.36***	3.90	***3.90***	0.00	***0.00***	3.90	***3.90***
4	***Alt. 5&3***	1.83	***3.67***	0.22	***0.44***	2.05	***4.10***	0.18	***0.36***	2.23	***4.46***
8	***Alt. 5&3***	3.14	***3.14***	1.25	***1.25***	4.39	***4.39***	0.39	***0.39***	4.78	***4.78***
10	***Alt. 5***	2.69	***3.05***	0.45	***0.51***	3.14	***3.57***	0.18	***0.21***	3.32	***3.77***
	Alt. 3	1.28	***1.45***	0.08	***0.09***	1.36	***1.55***	0.18	***0.21***	1.54	***1.75***
13	***Alt. 5***	4.07	***4.07***	1.44	***1.44***	5.51	***5.51***	0.60	***0.60***	6.11	***6.11***
	Alt. 3	3.72	***3.72***	1.44	***1.44***	5.16	***5.16***	0.60	***0.60***	5.76	***5.76***
14	***Alt. 5&3***	2.19	***2.93***	1.69	***2.25***	3.88	***5.17***	0.28	***0.37***	4.16	***5.55***
20	***Alt. 5***	2.84	***2.84***	0.15	***0.15***	2.99	***2.99***	0.00	***0.00***	2.99	***2.99***
	Alt. 3	2.84	***2.84***	0.00	***0.00***	2.84	***2.84***	0.00	***0.00***	2.84	***2.84***
22	***Alt. 5***	4.40	***4.40***	0.84	***0.84***	5.24	***5.24***	0.11	***0.11***	5.35	***5.35***
	Alt. 3	4.40	***4.40***	0.15	***0.15***	4.55	***4.55***	0.11	***0.11***	4.66	***4.66***
26	***Alt. 5***	1.47	***1.47***	0.28	***0.28***	1.75	***1.75***	0.00	***0.00***	1.75	***1.75***
	Alt. 3	1.47	***1.47***	0.00	***0.00***	1.47	***1.47***	0.00	***0.00***	1.47	***1.47***
28	***Alt. 5&3***	3.81	***3.81***	2.72	***2.72***	6.53	***6.53***	0.00	***0.00***	6.53	***6.53***
29	***Alt. 5&3***	1.33	***3.50***	0.40	***1.06***	1.73	***4.55***	0.00	***0.00***	1.73	***4.55***
30	***Alt. 5&3***	3.41	***3.41***	1.49	***1.49***	4.90	***4.90***	0.00	***0.00***	4.90	***4.90***
31	***Alt. 5&3***	4.53	***4.53***	0.86	***0.86***	5.39	***5.39***	0.00	***0.00***	5.39	***5.39***
32	***Alt. 5&3***	4.29	***4.29***	0.65	***0.65***	4.94	***4.94***	0.00	***0.00***	4.94	***4.94***
34	***Alt. 5&3***	0.72	**0.72**	0.00	***0.00***	0.72	**0.72**	0.00	***0.00***	0.72	***0.72***
36	***Alt. 5***	4.64	***4.64***	1.56	***1.56***	6.20	***6.20***	0.00	***0.00***	6.20	***6.20***
	Alt. 3	**4.51**	**4.51**	**1.56**	**1.56**	**6.07**	**6.07**	**0.00**	**0.00**	**6.07**	***6.07***
		Total Miles	**Average Density**	**Total Miles**	**Average Density**	**Total Miles**	**Average Density**	**Total Miles**	**Average Density**	**Total Miles**	**Average Density**
	Alt. 5	**49.01**	***3.38***	**15.20**	***1.05***	**64.21**	***4.43***	**1.74**	***0.12***	**65.95**	***4.55***
	Alt. 3	**47.01**	***3.24***	**12.87**	***0.89***	**59.88**	***4.13***	**1.74**	***0.12***	**61.62**	***4.25***

[a] Alt. 5 the no-action alternative represents the existing condition.
[b] Miles per square mile

(Issue E) Economics

BMP improvements, culvert replacement, gravel surfacing and road decommissioning and storage will be relatively costly. The identification of these costs will help indicate the feasibility of the road mitigation implementation proposed under the action alternative. All costs represent the cost of implementation; engineering costs and other preliminary costs such as field data acquisition are not included.

Table 16. Estimated costs of the project road system for timber haul under Alternative 3.

	Alternative 3
Reconstruction Cost[a]	$213,000
Reconstruction (miles)	39.48[c]
Gravel Cost[b]	$112,000
Short-term Road Construction Cost	$38,000
Short-term Road Construction (miles)	2.01
Temporary Road Construction Cost[d]	$17,000
Temporary Road Construction Miles	1.31
TOTAL COST	**$380,000**

[a] These costs do not include the cost of culvert replacement to improve fish passage. See discussion below.
[b] This is the cost of proposed gravel on roads 349, 2190 and 2192.
[c] Although haul would occur on approximately 55 miles of forest roads, only about 40 miles would need reconstruction because about 15 miles of reconstruction occurred under other projects in the last 5 years . See "(Issue B) Implementation of Best Management Practices (BMPS) on Timber Haul Roads."
[d] These costs include the cost of obliteration of the temporary road.

Explanation of Costs:

Reconstruction Cost - These costs are primarily associated with the implementation of BMPs (Best Management Practices). This would include the full range of BMPs but the most common techniques utilized include: Additional ditch relief culverts and surface drainage structures… Sediment traps in the vicinity of creeks…Placement of rock in catchbasins for stabilization and sediment reduction…Placement of riprap below surface drainage structures to reduce fill erosion…Reduction of over-width road sections. Typically, these BMP costs account for over 75 percent of the road costs after the cost of gravel is deducted. The other portion of the reconstruction cost is essentially a deferred road maintenance cost associated with such items as the reshaping of drainage structures, brushing and blading.

Gravel Cost - All of the road segments that have recommended graveling have a tendency to rut when sufficient water saturation occurs and also when dry, in some cases these roads develop significant dusting conditions under heavy traffic use. Since crushed aggregate would be required for these roads in some cases and haul distances are significant, the unit cost of the gravel would be relatively high; estimated costs range from about $25 to $30 per cubic yard or approximately $40,000 to $50,000 per mile depending on the haul distance, gravel source and quantities required per segment.

Short-term Road Construction and Temporary Road Construction Cost -This is the cost of constructing new short-term and temporary roads needed to provide additional access to project timber treatment areas. The cost per mile for the short-term road construction is higher because these roads are generally constructed in more resource sensitive locations and may be used for a longer period therefore they require more costly mitigation techniques. In addition, short-term roads are often constructed on steeper slopes that require more excavation and clearing costs.

Estimated Costs of the Implementation of Road Closures under Alternative 3 (See Appendix, Fig. A-1and Maps: Figs. 7 and 8)

Road closures would be implemented with timber sale funds on existing project timber haul roads that would be closed under Alternative 3. A select set of existing roads would also be closed under Alt. 3 using other funds. These roads include roads that are tributary to the timber haul roads and a road segment in upper Buck Creek that is recommended for storage to provide additional mitigation of project activities.

Table 17. Alternative 3 estimated cost to implement road closures on existing roads.

Costs of Implementing Closures on Existing Roads				
Closure Type	**Using Timber Sale Funds**		**Using Other Funds**	
	(Miles)	**(Cost)**	**(Miles)**	**(Cost)**
Storage: Level 3S	3.90	$18000	2.45	$14000
Decommission: Level 3D	3.15	$13000	0.79	$3000
Decommission: Level 4	0.39	$2000	------	-----
TOTAL:	**7.44**	**$33000**	**3.24**	**$17000**

Table 18. Alternative 3 estimated costs of implementing closures on constructed short-term roads

Costs of Implementing Closures on Constructed Short-term Roads				
Closure Type	**Using Timber Sale Funds**		**Using Other Funds**	
	(Miles)	**(Cost)**	**(Miles)**	**(Cost)**
Decommission: Level 5	2.01	$9000	0	0
TOTAL:	**2.01**	**$9000**	**0**	**0**

Note: All short-term roads constructed for the project would be closed under a Closure Level 5.

Estimated Costs to Replace Culverts in Fish-Bearing Streams under Action Alternative 3 (See attached Map: Fig. 1 for location of culverts)

The following table identifies the estimated cost of replacement for culverts in the project area that are presently an impediment to fish passage.

Table 19. Alternative 3 estimated costs to replace or remove fish barrier culverts with funding under the timber sale or with appropriated funds.

Culvert ID No.	Road No.	Priority For Replacement or Removal	Drainage	Disposition Of Structure	Potential Replacement Structure	Cost
1469	9975	1	Finley Cr.	Replace Required implementation with funding under the timber sale.	14' x 4'-7.5" x40'L BA[a]	$74000
1224	4339	2	Finley Cr.	Remove Required implementation with funding under timber sale after TS use.	NA	Cost of removal is included in the cost of 3S Closure on Rd. 4339
1222	4367	3	Finley Cr.	Replace Required implementation with funding under the timber sale.	87" x 63" x 38'L CMPA[b]	$36000

[a] Bottomless Arch – corrugated metal pipe in arch configuration that has no bottom portion but instead is attached to concrete footings on either side of the creek.
[b] CMPA - corrugated metal pipe arch.

Estimated Total Road Related Costs under Action Alternative 3

The costs below represent a consolidation of the costs identified separately in the previous tables. The estimated total costs for recommended work that would be charged to the proposed timber sale under the action alternative is identified and the estimated costs of road related work that would need additional funding from other sources is also identified. Note that the cost of obtaining permits to use existing Plum Creek roads or to construct short road segments on Plum Creek land is not indicated below. These costs can vary significantly depending on negotiations with the private landowner.

Table 20. Estimated total road related costs under Alternative 3, timber sale funds.

	Alternative 3
Reconstruction Cost	$213000
Gravel Cost	$112000
Short-term Road Construction Cost	$38000
Temporary Road Construction Cost	$17000
Road Closure Implementation	$42000
Culvert Replacement	$110000
TOTAL	**$532000**

Table 21. Estimated costs of road closures that will require other funds.

	Alternative 3
Road Closure Implementation	$17000
TOTAL	**$17000**

(Issue F) Permits for Road Use and Construction under Alternative 3

Road Use and Construction Permits:

The following existing Plum Creek roads would be required for project access under Alternative 3. Utilization of these roads would require a road use permit from Plum Creek. (See Maps: Fig. 7)

Table 22. Roads requiring permits for road use and construction.

Road	Segment	Comment
46560	29-29b	Although this is on National Forest land, Plum Creek has a non-cost share easement on this road segment. Use of this road under the proposed Jocko Lakes project would require a road use permit from Plum Creek since they have jurisdiction over this portion of the road.
46560	30-30b	Road use permit needed.
16892 46802 Un-numbered Road	48-49 49-50 50-51	Road use permit needed.

Table 23. Road construction requiring permits.

Road	Segment	Comment
S2-26C	51-51b	A portion of this short-term project road would be constructed on Plum Creek land to reach a treatment area in Section 26.
Short jump landing	Near Pt. 30b	A short segment of road (less than 150 ft) would be constructed through Plum Creek to a landing in a treatment area on National Forest land in Section 10.
T3-8	Near Pt. 22c	Approximately 450 ft of temporary road would be constructed on Plum Creek land to reach a landing on National Forest land in Section 8.

FIG. 1

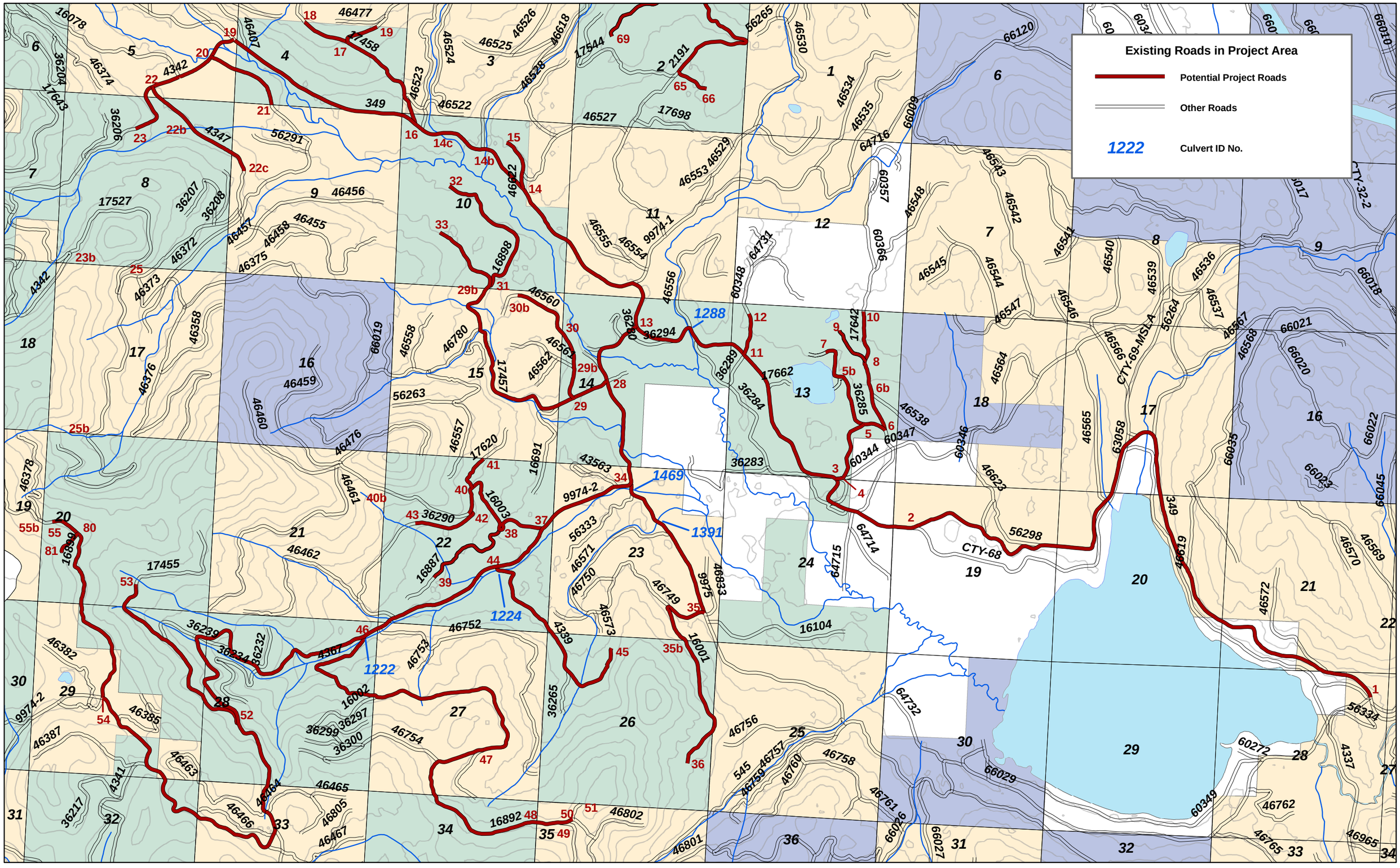

Existing Roads in Project Area
Potential Project Roads
Other Roads
1222
Culvert ID No.
CTY-68
CTY-69-MSL-A
CTY-32-2

FIG. 2

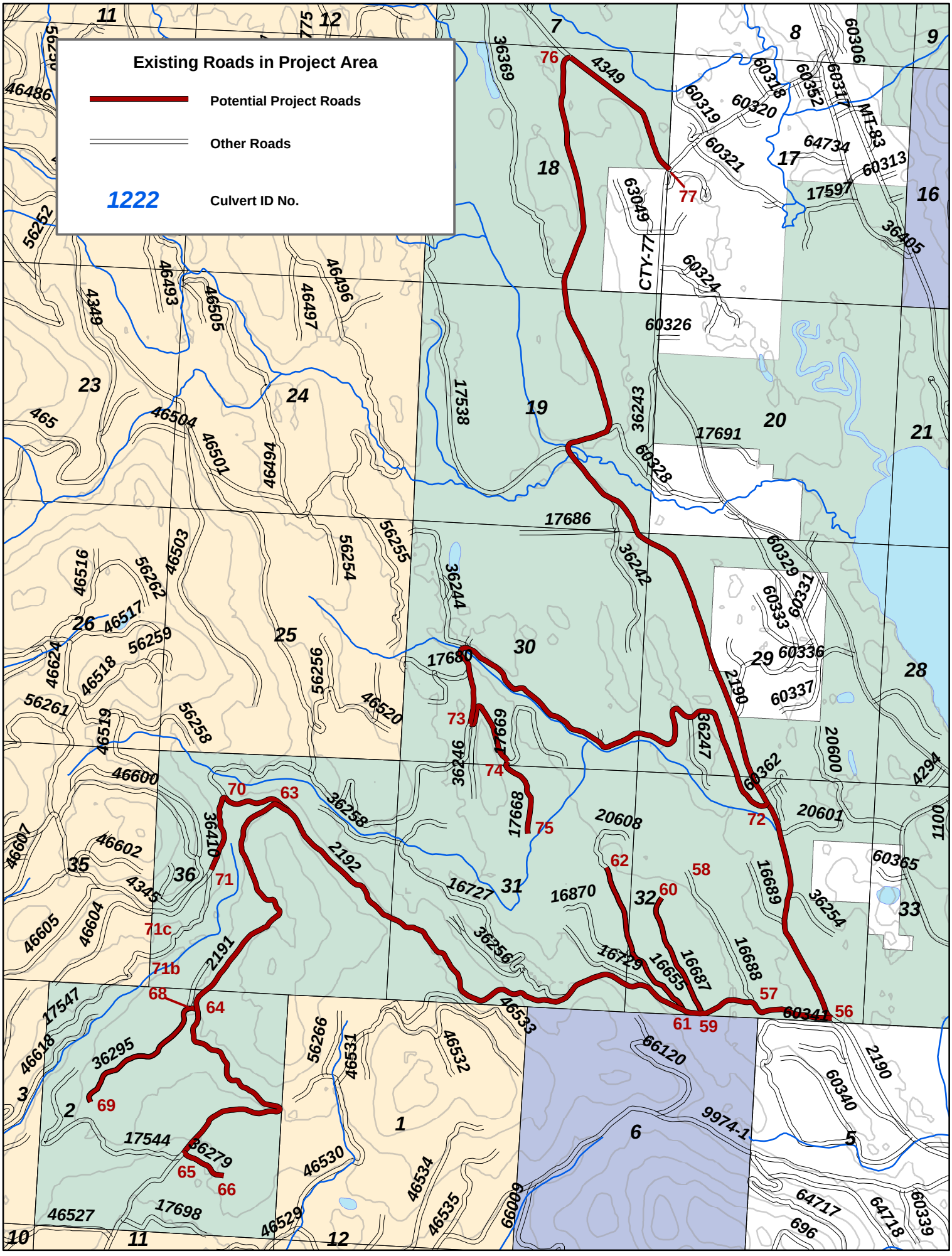

Existing Roads in Project Area
Potential Project Roads
Other Roads
1222
Culvert ID No.
CTY-77
MT-83

FIG. 3

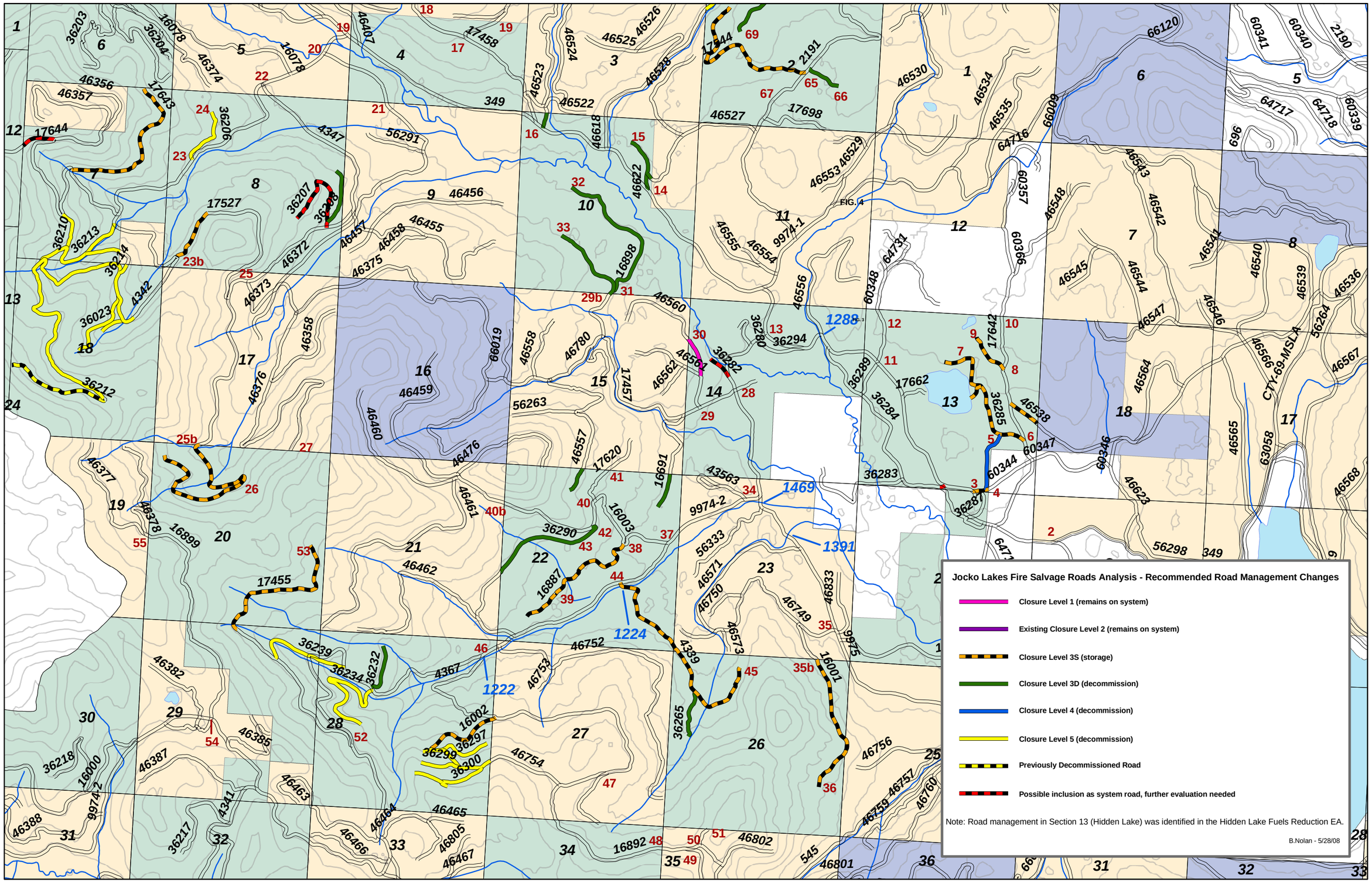


FIG. 4
Jocko Lakes Fire Salvage Roads Analysis - Recommended Road Management Changes
Closure Level 1 (remains on system)
Existing Closure Level 2 (remains on system)
Closure Level 3S (storage)
Closure Level 3D (decommission)
Closure Level 4 (decommission)
Closure Level 5 (decommission)
Previously Decommissioned Road
Possible inclusion as system road, further evaluation needed
Note: Road management in Section 13 (Hidden Lake) was identified in the Hidden Lake Fuels Reduction EA.
B.Nolan - 5/28/08

FIG. 4

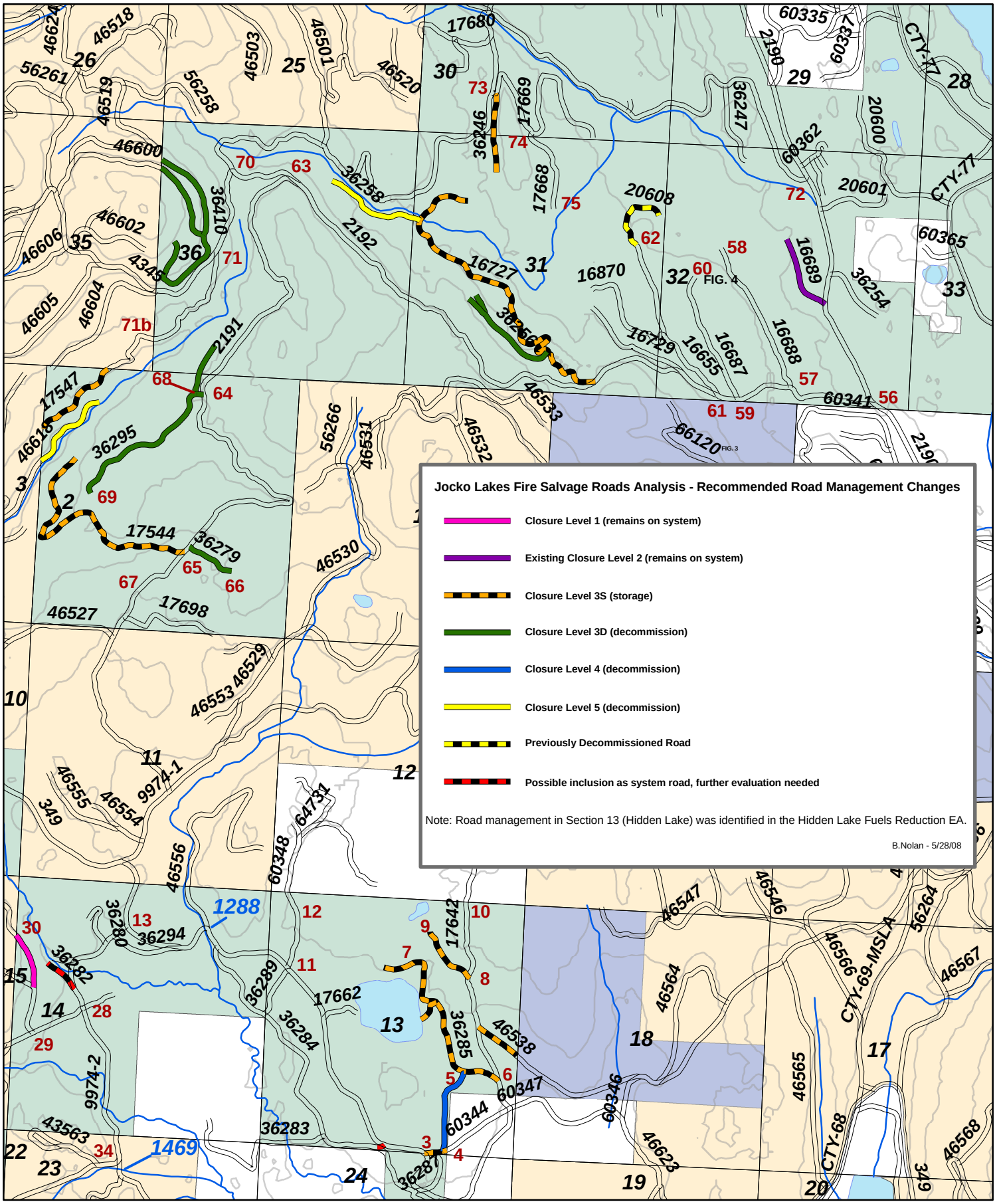

Jocko Lakes Fire Salvage Roads Analysis - Recommended Road Management Changes
Closure Level 1 (remains on system)
Existing Closure Level 2 (remains on system)
Closure Level 3S (storage)
Closure Level 3D (decommission)
Closure Level 4 (decommission)
Closure Level 5 (decommission)
Previously Decommissioned Road
Possible inclusion as system road, further evaluation needed
Note: Road management in Section 13 (Hidden Lake) was identified in the Hidden Lake Fuels Reduction EA.
B.Nolan - 5/28/08
FIG. 4
FIG. 3
CTY-77
CTY-69-MSLA
CTY-68

FIG. 5

Road Analysis and Management Segments

(Jocko Lakes Fire Salvage Project)

FIG. 6

Road Analysis and Management Segments

(Jocko Lakes Fire Salvage Project)

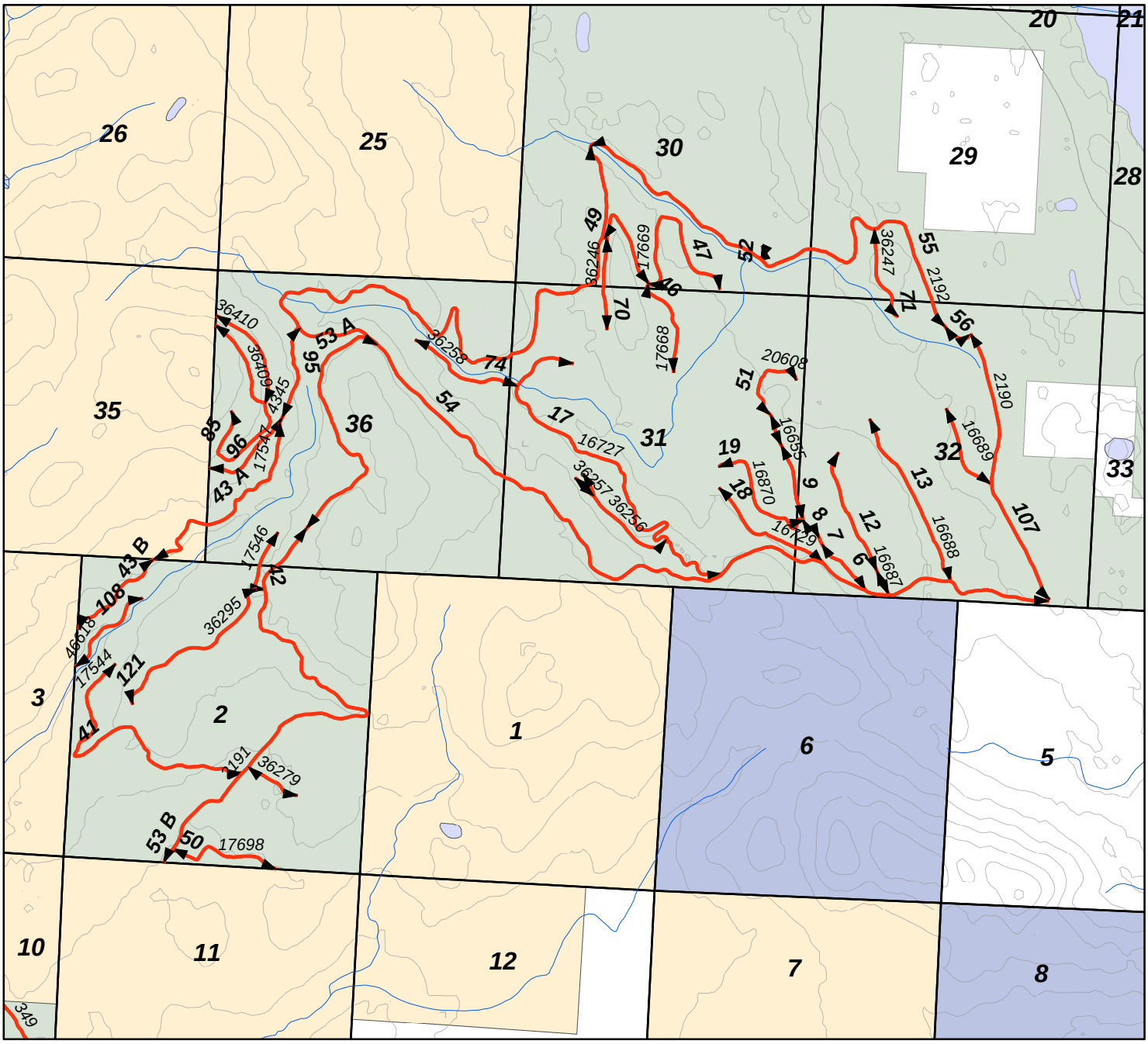


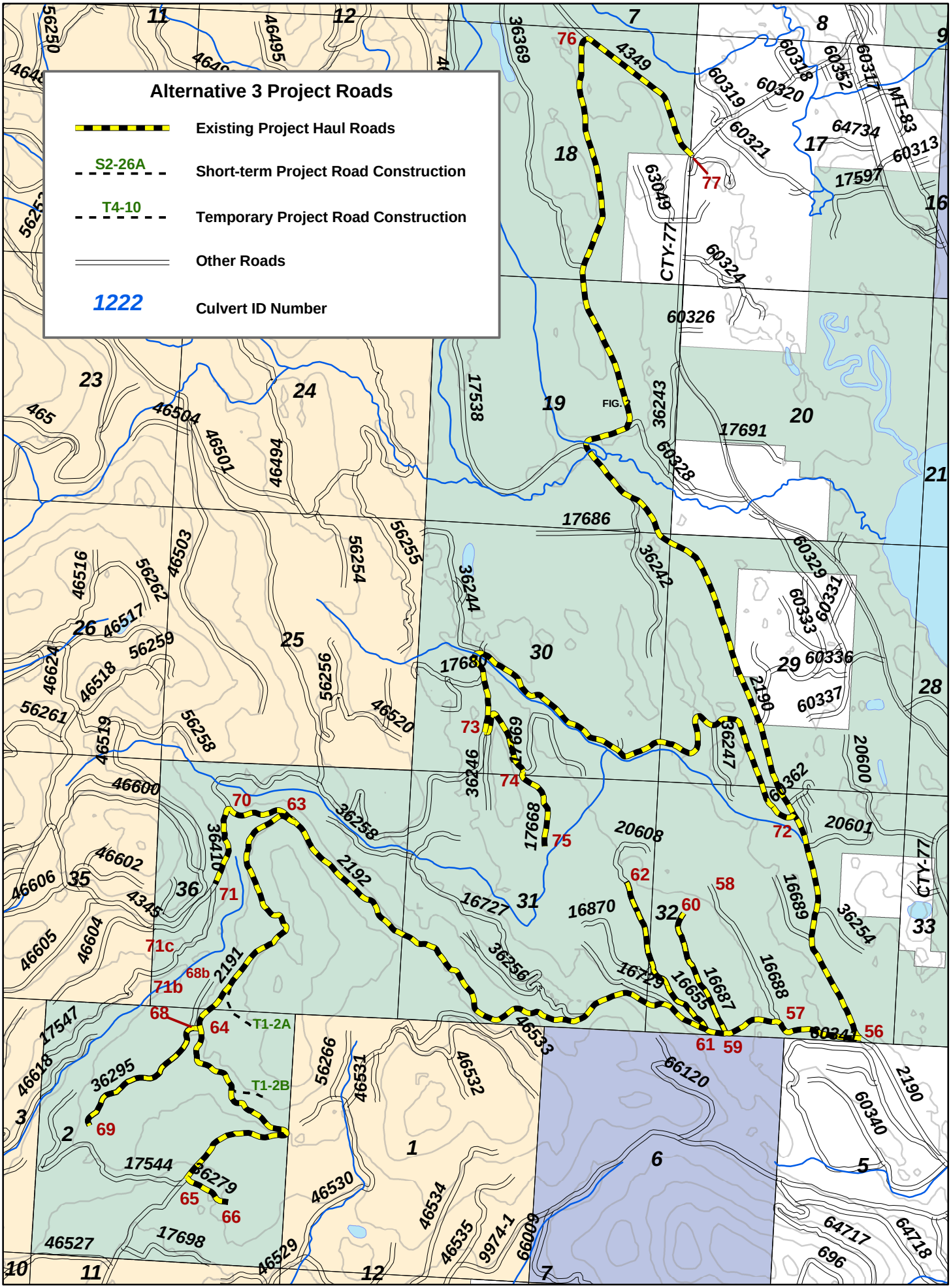
FIG. 7

Alternative 3 Project Roads

- Existing Project Haul Roads
- S2-26A — Short-term Project Road Construction
- T4-10 — Temporary Project Road Construction
- Other Roads
- 1222 — Culvert ID Number

FIG. 2

FIG. 8


Alternative 3 Project Roads
Existing Project Haul Roads
S2-26A
Short-term Project Road Construction
T4-10
Temporary Project Road Construction
Other Roads
1222
Culvert ID Number
T1-2A
T1-2B
CTY-77
MT-83
FIG. 7

Jocko Lakes Fire Salvage Transportation Analysis Appendix A-1

Table A - 1. Lolo National Forest road closure levels.

LEVEL	DEVICE	MITIGATION	STATUS
1	Gate	Blade, seed, fertilize. Normal drainage. Treat noxious weeds.	Remains on NFSR system; Maintenance Level 1
2	Gate, guardrail, concrete or earth barrier, or Recontour at intersection	Type III dip , drivable waterbars, or outslope. Scarify 2-3 inches, seed & fertilize. May scatter slash on roadway. Treat noxious weeds.	Remains on NFSR system; Maintenance Level 1; if custodial care won't be performed, consider Closure Level 3 (self-maintaining).
3S Storage **3D** Decommission	Recontour at intersection or Rock or earth barrier	Waterbar or intermittent outslope. Remove CMPs & restore all watercourses to natural channels & floodplains. Rip 6-12 inches, seed & fertilize. May scatter slash on road. Treat noxious weeds.	**3S** -- Retain on 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 generally.
4	Recontour at intersection or Rock or earth barrier	Waterbar or intermittent outslope. Selective recontour along the road. Remove CMPs & restore all watercourses to natural channels & floodplains. Rip 12-18 inches, seed & fertilize. Scatter slash on recontoured slope. Treat noxious weeds.	Remove from NFSR system, road not needed for 30+ years generally.
5	Recontour	Recontour the entire road prism to almost pre-road conditions. Remove CMPs & restore all watercourses to natural channels & floodplains. Seed & fertilize. Scatter slash on recontoured slope. Treat noxious weeds.	Remove from NFSR system; road access not needed for 40+ years

- The mitigation and obliteration techniques which would be applied under the various closure levels would be used as needed on a site specific basis.

Examples:

- Ripping under a Level 3 closure would not be needed on a road which has revegetated since ripping is performed to promote revegetation;
- A Level 3 closure might be appropriate for a road not needed for 40+ years, depending on specific resource concerns.
- Type of weed treatment depends on the level of closure and extent of weed establishment.

- Only CMPs at drainages would generally be removed. CMPs which are used to drain ditches will generally not be removed unless they are located within an area to be recontoured under a Level 4 or 5 closure or the ditch carries a significant amount of water.
- Levels 3 through 5: Provide short-term sediment buffering (straw bales, coconut mats, etc.) at stream crossing-road recontour interfaces.

Jocko Lakes Fire Salvage Roads Analysis
Seeley Lake Ranger District
Appendix A-2

INTRODUCTION

Roads analysis is an integrated approach to transportation planning that considers ecological, social and economic issues that are associated with road system development and use. The roads analysis process is designed to provide information for the land manager that can be used to make decisions about road management. The Jocko Lakes Fire Salvage Roads Analysis will identify the human uses associated with specific portions of this road system and the relative impact that these roads have on the aquatic environment and wildlife habitat. A numerical rating matrix will be developed for individual road segments that will disclose the characteristics of the road relative to a select set of human use and aquatic and wildlife criteria. This information can be used to provide guidance for road management developed during Jocko Lakes Fire Salvage NEPA process.

In the questions addressed portion of this roads analysis, an alphanumeric code is identified that corresponds to the questions section of the Forest Service handbook “Roads Analysis: Informing Decisions about Managing the National Forest Transportation System “, Appendix 1 (USDA Forest Service 1999). This code is linked to a specific consideration related to roads that has been formulated as a question. Each of the road rating categories represented in the Jocko Lakes Fire Salvage Roads Analysis addresses a set of these questions that is pertinent to the analysis area. The Roads Analysis handbook should be reviewed for more information.

NOTE: See the accompanying spreadsheet for the numerical ratings of individual road segments under the road rating categories associated with human uses and the aquatic environment and wildlife habitat.

HUMAN USE RATING CRITERIA

The objective of the human use portion of the roads analysis is to identify the level of importance road systems have to human use activities in the Jocko Lakes Fire Salvage Analysis Area. It also identifies primary activities or combination of activities road systems are used for. Social values vary greatly among users. Users with similar interests have different perceptions of what constitutes appropriate access. It is not possible to satisfy every individual or group of individuals, nor is it possible to identify what people will desire tomorrow or into the next decade. It is however possible to observe trends and at least make some qualitative estimates of what future needs may be. Generally we lack sufficient data to make accurate quantitative predictions. This exercise will attempt to show the major categories of human use that exist today on a broad scale without attempting to make quantitative predictions of future needs.

Due to an overlap in social needs, it is important to keep in mind the scale of the population of users being considered; is it small scale/local community, medium scale/multiple community, large scale/regional, or very large scale/national importance? This consideration will help the decision maker determine whether management of a particular road segment will have a direct or indirect effect on the user.

For the Jocko Lakes Fire Salvage Roads Analysis, Human Uses evaluation is divided into four categories: Access Required by Law, Agreements and Permits, Recreation Access, Resource Management Access and Fire Management Access.

ACCESS REQUIRED BY LAW, AGREEMENTS AND PERMITS

This includes access needs necessary to meet legal requirements such as the Alaska National Interest Conservation Act (ANILCA), treaty requirements, easements, Memorandums of Agreement (MOAs), or various kinds of permits. These provide the limitations the forest manager has to work with and must consider in regards to legal requirements and agreements or commitments to other parties. Occasionally there are conflicting legal requirements. Agreements can be modified, but they are often long-term and can limit road management options.

Questions Addressed:

- - Legal basis (GT-1, 2, and 3)
- - Special Use Permits (SU-1)

Rating Criteria:

Identify areas and road segments where allocations involve Public Laws such as ANILCA or where treaty requirements apply.

Identify areas that have active permits, easements or binding agreements.

Identify areas that have special use permits involved.

Relative ranking is based on the above information:

High (10) – Agreements or permits exist, there are no reasonable alternatives or options available to meet identified needs or public law requires road access be provided.

Medium (7) - Agreements or permits exist, but there are alternatives or options available to meet identified needs.

Low (3) - There are short-term commitments, which will expire or can be replaced with suitable alternatives.

None (0) - No access is required by law, agreement etc.

Data sources:

Special Uses Data System (SUDS)

Forest Land Use Report (FLUR)

INFRA

Lolo National Forest Right of Way Status Book

RECREATION ACCESS

Road development, maintenance, and decommissioning can change the type, quantity, quality, and accessibility of roaded recreation opportunities. The presence of roads and their associated maintenance levels help determine which members of the public can or will want to have access to the recreation opportunities served by the roads.

Questions Addressed:

- - Demand for roaded recreation (RR-1)
- - Effects of road management on quantity, quality or type of roaded recreation opportunities (RR-2)
- - Participation in roaded recreation (RR-4, 5)

Rating Criteria:

1. Identify the existing roaded recreation opportunities.
2. Identify roaded recreation demand and participation.
3. Identify public's relative desire and expectation for existing and future roaded recreation.

Relative ranking is based on the above information:

High (10) – Used for multiple recreational activities in several seasons.

Med. (7) – Used regularly for seasonal motorized or non-motorized access.

Low (3) – Limited use for motorized or non-motorized access.

None (0) – Not used or rarely used for recreational access.

Data Sources:
Lolo Forest Plan

Lolo Travel Management Map

Snowmobile Trail Map for Lolo Creek Area

District assessment of recreational uses in Jocko Lakes Fire Salvage area

RESOURCE MANAGEMENT ACCESS

Resource Management Access addresses the importance of road systems for administration, management, or protection of forest resources. For the Jocko Lakes Fire Salvage Roads Analysis, Resource Management Access is divided into timber and silvicultural management access.

Questions Addressed:

- - Commodity production. (TM 1, 2)
- - Administrative Use needs (AU-1)
- - Value of road for management of insect, disease and parasites. (EF 3)
- - Value of road for access to timber stands needing silvicultural treatment. (TM 3)

Timber Management Access

Access may be needed for both short-term and long-term timber management as identified by the Lolo Forest Plan. The forest plan has identified Management Areas (MAs) that are considered suitable for

timber production. Rankings for the Jocko Lakes Fire Salvage analysis area are based on the assumption that the preliminary commercial treatment areas identified by the silviculturist would be treated, therefore the rankings reflect the relative need for access to do additional treatments in the future after the proposed Jocko Lakes Fire Salvage project was completed. The rankings do not include the consideration of the need for access for possible unforeseen events such as the salvage of timber killed by wildfires, insects and windthrow.

Rating Criteria:

1. Identify locations of suitable timber management areas.
2. Identify those areas that may need treatment within 20 and 40 years.
3. Identify levels and types of access necessary to meet these strategies.
4. Review the research, monitoring, or inventory requirements of land management plans.

Relative ranking is based on the above information:

High (10) - Current contracts exist within area accessed by road segment.

Medium (7) -Access is necessary for timber management in the short term (less than 20 years).

Low (5) - Access is needed for implementation of management strategies for the mid term (20-40 years).

Very Low (3) - Access is needed for the long term (greater than 40 years).

None (0) - Access segment is not needed for future timber management.

Data sources:
Analysis Files for Timber Sales and other projects

Past Harvest Layer

5-year action plan

MA allocation (suitable base maps)

Area Transportation Plans

Silvicultural Management Access

Access may be needed for both short-term and long-term non-commercial silvicultural management within the analysis area. This includes pre-commercial thinning, release, and planting and potentially some insect and disease treatments. These may be areas where past decisions and commitments are in progress. Most of these areas will be within the suitable timber base as identified in the Lolo Forest Plan.

Rating Criteria:

1. Identify project areas and land allocations where access is necessary to facilitate silvicultural treatments to protect forest resources and values.
2. Identify those areas that may need treatment within 20 years, 20-40 years and greater than 40 years.

3. Identify levels and types of access necessary to meet these strategies.

Relative ranking is based on the above information:

Very High (10) - Current contracts or commitments exist within area accessed by road segment.

High (8) - Access is necessary for silvicultural treatments in the near term (less than 20 years).

Medium (5) - Access is needed for implementation of silvicultural management strategies for the mid to long term (20-40 years)

Low (1) - Access is not needed for silvicultural management within 40 years.

Data sources:
Analysis Files for Timber Sales and other projects

Past Harvest Layer

MA allocation (suitable base maps)

Infestation maps for insect and disease surveys

FIRE MANAGEMENT ACCESS

Fire Management Access addresses the importance of road systems for administrative use associated with fuels management and the protection of forest resources from wildfire. The fire management section is divided into Fire Suppression Efficiency and Effectiveness, and Fuels Management.

Fire Suppression Efficiency and Effectiveness

Question Addressed:

- - Value of road for Forest Service and cooperator to suppress wildfires. Fire risk can be based on a combination of fire intensity mapping and knowledge of past fire occurrence. Fire intensity mapping is based on current vegetation, slope, aspect, elevation, and landform. This factor is considered highly important and is given a heavy numerical weighting. (PT-2)

- - Importance of road system for firefighter safety. (PT 3)

Rating Criteria:

1. Identify road segments that will contribute to quick, and cost effective initial attack.

2. Identify road segments that will be effective in suppression of fires under most conditions.

3. Identify road segments that increase firefighter safety.

Relative rankings are based on the above information:

High (10) - Road segment is essential for initial attack and management of large fires in the area.

Medium (6) - Road segment will moderately benefit initial attack and large fire management in the area.

Low (3) - Little benefit to initial attack or large fire management.

Data sources:
Pre Attack facility map (helispots, water sources, etc)

Risk, Hazard and Value Assessment Map (see fire management plan)

Lolo NF Fire Management Plan

National Fire Plan

Federal Wildland Fire Management Policy and Program Review

Fuels Management

Questions Addressed:

- - How does the road system affect fuels management? (PT 1)

Rating Criteria:

1. Identify road segments needed in the next 20 years to accomplish fuels management objectives.

2. Identify those road segments that will contribute to a much lower cost and greater effectiveness of fuels treatment when considered in context of the Lolo Forest Plan.

Relative rankings are based on above:

High (10) - Road segment is needed to access proposed fuel treatment in the next 10 years and will significantly reduce costs if road is used.

Medium (5) - Road segment most likely needed to access fuel treatment areas in the next 20 years and will reduce costs of treatment if used.

Low (1) - Little to no benefit for future fuel treatment.

Data sources:
National Fire Plan

Map of areas outside of natural fire return interval

Risk, Hazard and Value Assessment Map (see Fire Management Plan)

Lolo NF Fire Management Plan

Federal Wildland Fire Management Policy and Program Review

AQUATIC RATING CRITERIA

The objective of the Aquatic Assessment is to characterize how the transportation system may be influencing watershed processes and aquatic habitat at the watershed and site scale. The purpose of this activity is to assess the active or potential impact of the existing road system upon the aquatic environment. The assessment addresses potential aquatic impacts by assessing the interaction of roads with the following criteria:

1. Geologic Hazard (Potential interaction between roads and the geology)

2. Sediment Contribution (Potential sediment contribution from entire road template)
3. Stream and Floodplain Function (Potential effect of road template on stream and floodplain structure and natural processes).
4. Fish Barriers (Potential effect of road crossings on the movement of fish and possibly other semi-aquatic and terrestrial species)
5. Hydrologic Conductivity (Potential effects to watershed runoff quantity and quality).

Development of the Aquatic Impact, At Risk Criteria

Aquatic criteria affecting watershed processes and aquatic habitat were developed to capture key elements associated with roads as they link to aquatic environments. In the “Questions Addressed” section, an alphanumeric code corresponds to the section in the “Roads Analysis Handbook”, Appendix 1. This code is linked to an ecological consideration, which has been formulated as a question. Each risk factor being evaluated is addressing one or more of these questions. The appendix should be consulted for more information on the risk factor, including a list of potential indicators (tools) that may be considered to appropriately rate each factor. The term “at risk fish” in this document refers to fish listed as Threatened or Endangered under the Endangered Species Act.

Criterion Number 1: Geologic Hazard

This criterion was developed to assess the natural risk of mass wasting as an effect on roads, or the potential for roads to initiate mass movement events. Three forms of mass movement were identified: debris slides (shallow rapid landslides); earth slumps (fairly deep land slides); and deep-seated landslides.

On the Lolo NF debris slides are not common. However, when they occur they often are associated with a combination of coarse and fine textured soils combined with rocks and wood of various sizes and origins. Landslides are also uncommon on the Lolo National Forest under non-managed conditions, but may be initiated by road cuts or changes in drainage associated with roads.

The interpretation of mass wasting hazard was taken from the Land Systems Inventory of the Lolo NF (Potential for Landslides). Potential for landslides is a rating of the relative probability of downslope movement of masses of soil and rock material under natural or non-managed conditions. The ratings are based on the characteristics of the various land types on the Forest, which were grouped as follows:

Very High Geologic Hazard – LSIs: 41KA, 41SA, 43SA, 61SA

High Geologic Hazard - LSIs: 16UA, 26UA, 30SA, 30SB, 40KA, 40QA, 43QB, 48KA

Moderate Geologic Hazard - LSIs: 30BB, 30GB, 30KA, 30Kab, 30KBb, 41QA, 30PA, 30PE, 45UA, 48QA, 60KA, 60KB, 61MD, 61QC, 61QD, 64SB

Low Geologic Hazard -All Other LSIs

Questions Addressed:

- - Mass wasting (AQ –3)

Rating:

Although large scale landslides are infrequent, the Geologic Hazard was considered to be an important factor because the analysis addresses roads in a relative sense to impact. In other words, for the Jocko Lakes Fire Salvage Analysis Area, Geologic Hazard allows a relative rating on the potential downward

movement of shallow slumps as a mass wasting process, as road interact with runoff and groundwater, steepness of terrain, and different soil types, parent geology, and horizon depths. Each road segment will receive a rating for:

Geologic Hazard:

(10) (Highest Risk) - Greater than 75% of road segments are located on land types occurring in the Very High Hazard category.

(8) - Either 50 to 75 % of the segments are located on Very High category or greater than 75% are located on High Hazard risk category.

(5) - Less than 50% of the segments are located on the Very High Hazard category or 50 to 75% are located on the High Hazard category.

(3) - "Short" segments at high-to-very high risk or the landform is Moderate Hazard.

(1) - Low Hazard

Criterion Number 2: Sediment Contribution

This criterion addresses the potential for roads to contribute sediment to drainageways in the form of surface runoff and template failure as it relates to the roads proximity to the stream.

The size and amount of sediment that may be delivered from roads to streams depends on the sediment eroded from roads, the distance between roads and streams (shorter distances create a higher potential for sediment delivery), the amount of obstructions on the ground (logs, etc. that cause flow to be disrupted and sediment to be deposited before reaching channels), slope steepness, flow concentration or dispersal flow events (concentrated flow commonly routes sediment for hundreds or thousands of feet), and the number or density of stream crossings in an area. Closer proximity of roads to streams also creates a higher probability of delivering other pollutants (e.g., road oils and salts) to streams.

Surface erosion occurs on roads due to erosion of the road surface, erosion of ditches, cut and fill slopes, and accelerated mass failures, including minor slumping. Surface erosion of the road is sensitive to road design, road maintenance, geologic hazard, and the materials comprising the road (e.g., native surface—and its relative erodibility-- vs. graveled; sediment lead-out ditches and sediment detention basins vs. ditches routed directly into drainageways). Road surface, and design and maintenance of drainage structures can influence the amount of road surface erosion. Insufficient drainage structures, including ditch-relief culverts, can also result in accelerated surface erosion from roads.

Sediment derived from road failure can have several sources. Roads crossing areas of higher geologic hazard or with unstable fill slopes may contribute to accelerated mass wasting initiated by the failure of the fill slope. Culverts at stream crossings can be a sediment source if the culvert is under-sized and the hydraulic capacity is exceeded or the culvert inlet is plugged, causing stream flow to overtop the road. Large amounts of sediment or mass wasting can also be generated if the plugged culvert results in failure of the crossing resulting in a debris flow, or when the culvert is overrun resulting in the stream flowing down the road surface eroding the surface and fill. Ditch relief culverts that erode fill material directly into streams, result in rills, or concentrate water by other means are other sediment sources.

Questions Addressed:

- - Generated Surface Erosion (AQ – 2)
- - Mass Wasting (AQ – 3)

- - Stream crossing influence on local stream channels and water quality (AQ – 4)
- - Potential for pollutants to enter surface waters (AQ – 5)
- - "Hydrologic connectivity" between the road system and the stream system (AQ – 6)

Rating:
Following is the rating used for road sediment contribution. All exposed or disturbed surfaces have a higher potential of soil detachment, erosion, and delivery than native ground surfaces; however, some soil types from the Lolo Land Systems Inventory, Lolo "Land Type Groups" 3 and 6 are considered more sensitive soils. These soils are found in terrain that is glaciated with high water tables and when encountered are very susceptible to sediment delivery when exposed or disturbed. Consequently, this assessment addresses all soils, but places emphasis on these sensitive soils where and when appropriate.

(10) (Highest Risk) – More than 50% (by observation) of the segment lengths are within:

a) 100 feet of a stream with terrain of any steepness,

b) 300 foot of a stream with adjacent sloped hillsides, or

c) The road segment makes multiple stream crossings.

(8) - Between one-third and one-half of the segment lengths are within:

a) 100 feet of a stream with terrain of any steepness,

b) 300 foot of a stream with adjacent sloped hillsides, or

c) The road segment makes multiple stream crossings.

(5) - Any road segments in LTG 3 or 6 are within the 300 feet, or for any other LTG more than one-half of the road segments are within:

a) 100 feet of a stream with terrain of any steepness,

b) 300 foot of a stream with adjacent sloped hillsides, or

c) The road segment makes multiple stream crossings.

(3) – Between one-third and one-half of the road segment lengths in any LTG are within:

a) 100 feet of a stream with terrain of any steepness,

b) 300 foot of a stream with adjacent sloped hillsides, or

c) The road segment makes multiple stream crossings.

(1) – All other cases

Criterion Number 3: Stream and Floodplain Function

This criterion addresses the potential of how roads affect stream and floodplain function. This is primarily related to the roads proximity to the stream and floodplain as well as affects to vegetation.

Stream response to external influences will vary by stream type with corresponding variance in risk to both stream and human resources. Depending on valley confinement, stream energy, morphology, bank material cohesion, and bed material size, streams naturally have tendencies to migrate vertically or laterally, and consequently, when disturbed or constricted, they will respond differently. Road prisms can confine streams when they extend into floodplains, affecting a stream's ability to migrate laterally and to properly function; the degree of impacts depends on the proximity to a channel and channel type. Sediment storage and transport capacity greatly varies by channel type, which directly affects stability and risks associated with road crossing constriction. The role that vegetation plays in stream stability also differs by channel type.

Floodplains provide many functions and multi-resource benefits. They allow the channel to laterally adjust and are also important regulators of stream flow, stream energy, and water quality. Over bank floodwaters infiltrate and are stored in the floodplain, allowing for increased water availability and slower late-season releases back into the stream. Floodplains reduce peak runoff magnitudes and healthy riparian vegetation captures pollutants. When higher magnitude flows are confined within the channel due to loss of floodplain capacity (e.g., via road occupancy of floodplains), major stream instability, land, and facility loss and/or maintenance is common. Wetlands are often associated with healthy, functioning, floodplains (due to favorable water conditions); loss of floodplains by road occupancy may reduce wetland extent, too.

Roads that are close to streams also hamper or eliminate the distribution and rigor of riparian, including large trees for large woody debris recruitment. Loss or reduction in these contributions affects shading, both aquatic and terrestrial habitat, energy dissipation, stream and stream bank structure, litter and sediment delivery. For this analysis, a site potential tree height is considered to be 120 feet. Roads that parallel within a site potential tree height are likely to have a greater long-term impact to stream function as they required the removal of trees that potentially would have entered the stream.

Questions Addressed:

- - Modification of surface and subsurface hydrology (AQ – 1)
- - "Hydrologic connectivity" between road and stream system (AQ – 6)
- - Effects on wetlands (AQ – 8)
- - Alteration of physical channel dynamics (AQ – 9)
- - Effect on shading, litterfall, and riparian plant communities (AQ – 11)

Rating:

Based on Rosgen stream classification and road proximity to the stream:

(10) (Highest Risk) – a) More than one-half the road segment lengths are along Rosgen stream type C or E' channels and within 100 feet of the stream course, or b) any channel type where the road is within the distance of a site potential tree height.

(8) – a) Between one-third and one-half of the road segment lengths are along Rosgen stream type 'C or E' channels and within 100 feet of the stream channel, or b) more than one-half of the road segment lengths are along Rosgen stream type 'B' channels and within 100 feet, or c) any channel type where more than one-half of the road is within the distance of a site potential tree height.

(5) – a) Less than one-third of road segments are within 100 feet and are along Rosgen 'C or E' channels, or b) between one-third and one-half of the segment lengths are along Rosgen 'B' channels within the 100 feet or c) any channel type where less than one-third of the road is within the distance of one potential tree height.

(3) – Any road segments are along Rosgen 'B' channels and within 100 feet, or any stream type where roads encroach within a distance of a site potential tree height.

(1) – Any other case.

Criterion Number 4: Fish Barriers:

Upstream barriers to fish movement can have significant effects to fish populations, as well as semi-aquatic and terrestrial species in some situations. Culverts that are acting as barriers can prohibit access to the following critical habitats: spawning, rearing, overwintering, and thermal refugia. Any of these habitats or a combination of them may be a major limiting factor to the local population and a lack of access to them could have detrimental effects.

This criterion addresses roads affect on the passage of fish. Other semi-aquatic species are not known to exist in this area and terrestrial passage is not of concern because of the low traffic volume and speed.

Region One of the Forest Service has developed a standard definition of fish passage. The definitions use a resident-adult (six inch) westslope cutthroat during bankfull flows and resident-juvenile westslope cutthroat trout at the streams baseflow. During the summer of 2002 and 2003 the Lolo National Forest surveyed approximately 700 culverts in streams that were presumed to be fish bearing and utilized the standardized fish passage definition provided by the Region.

Questions Addressed:

- - Affects to migration and movement of aquatic organisms (AQ – 10)
- - Affects to fishing, poaching and direct habitat loss for at risk aquatic species (AQ – 12)
- - Affects to areas of exceptionally high aquatic diversity or rare or unique species (AQ – 14)

Rating:

(10) (Highest Risk) - Road segment contains a stream crossing(s) that meets Region One's definition of an upstream barrier to fish passage.

(0) - Road segment contains no fish bearing stream reaches or stream crossings conform to meeting Inland Native Fish Strategy (USDA Forest Service 1995) requirements of a Q100 flow and meet Regional One Guidance (USDA Forest Service 2003) of providing for aquatic organism passage.

Criterion Number 5: Hydrologic Conductivity

This criterion addresses the ability of roads to intercept natural runoff and route it to the stream system.

Water moves from hillslopes to valley bottom via surface and subsurface paths. Roads affect both types of flow when they cut across hill slopes and/or require the filling of depressions that interrupt these natural paths. Road cutslopes or ditches intercept surface runoff and groundwater, accelerating the movement of such flow toward stream crossings. This action frequently increases soil erosion risks and routing efficiencies, which deliver road derived sediments and contaminants to streams and can alter peak flows and channel characteristics downstream.

"Hydrologic connectivity" is defined by any road segment having a continuous surface flow path between any part of the road prism and a natural stream channel during runoff events. Precipitation runoff mechanisms including rain-on-snow, spring snowmelt and convectional storms should be considered when evaluating a road segment's hydrologic connectivity. Indicators of these effects include: a) water interception on road surfaces and ditch lines; b) absences of ditch line relief culverts or cross drains, or interruption and detention of flows by road fill; c) Increased delivery efficiency of these flows by flow routing down ditchlines and routing water efficiently to streams.

Hydrologic connectivity may also provide an indication of the efficiency of transporting pollutants (e.g., road salts) directly to stream channels.

Questions Addressed:

- - Effects to surface and subsurface hydrology (AQ – 1)
- - Potential for pollutant entry to surface waters (AQ – 5)
- - Effects to water quality and quantity (AQ – 6)

Rating:

The rating combines several attributes of the location that affect the amount of runoff likely to be present (wetter land types, higher elevation slope positions and north aspects) with the potential of the road segment to deliver runoff to a channel (multiple stream crossings and/or frequent lengths parallel to a channel). This rating entails more qualitative integration than the geologic hazard, sediment or stream confinement ratings.

Indicators addressed in the rating below are:

- - Riparian roads (roads paralleling streams)
- - Stream crossings
- - Road hillslope position and aspect

(10) (Highest Risk) – All indicators of more overland flow and direct contribution to stream channels present.

(8) - Multiple stream crossings and/or long segments parallel to channels. Not necessarily LTG 3 but north aspect or higher slope position. The long segments parallel to channels is the more important attribute.

(5) – Generally north aspect and higher elevations, not LTG 3, frequent segments parallel to channels and/or frequent stream crossings.

(3) - Frequent segments parallel to channels and/or frequent stream crossings regardless of overland flow availability.

(1) - All other cases.

WILDLIFE RATING CRITERIA

The wildlife portion of the roads analysis focuses on elk and lynx distribution and habitat within the Jocko Lakes Fire Salvage analysis area. The Lolo National Forest lynx analysis units (LAUs) coverage

was used to determine the extent of lynx habitat within the project area. Montana Fish, Wildlife and Parks elk habitat data was used to determine elk habitat suitability. The MTFWP data set includes information on summer range, critical summer range, winter range and critical winter range. The entire analysis area is considered summer range. Only a portion of the area is considered winter range; there are no areas of critical summer or winter range present. Winter range was analyzed differently due to the winter being a time when disturbance can have a greater impact on elk, especially when winter range is limited.

Elk Habitat

Road-associated factors that could affect this species include hunting, poaching, collisions, movement barriers, displacement/avoidance, habitat loss and fragmentation (USFS 1997, Singleton and Lehmkuhl 1998, Canfield et al. 1999, Wisdom et al. 1999).

This analysis addresses, in part, terrestrial wildlife roads analysis questions TW (1), TW (2), and TW (3) identified in Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA Forest Service 1999).

Questions Addressed:

- - Direct effects on terrestrial species habitat (TW – 1)
- - Affects to habitat by facilitating human activities (TW – 2)
- - Affect to legal and illegal human activities i.e. trapping, hunting, poaching (TW – 3)

Rating:

The entire analysis area is within summer elk range. GIS was used to identify the road management of roads within the winter range; these roads were evaluated independently of roads outside winter range. The relative risk to elk habitat for each road is dependent on the access management for the road. Roads that are open to more access have a higher risk of causing negative effects on the quality of elk habitat. The classification matrix for assigning risk values to roads was as follows:

<u>For roads within winter range:</u>

(10) (Highest Risk) - Road is open yearlong.

(7) - Road has a variable closure.

(5) - Road has a seasonal closure.

(3) - Road is closed yearlong.

<u>For roads not within winter range:</u>

(7) (Highest Risk) - Road is open yearlong.

(5) – Road has a variable closure.

(3) - Road has a seasonal closure.

(1) - Road is closed yearlong.

Lynx Habitat

The Canadian lynx is listed as threatened under the Endangered Species Act. Several questions remained unanswered concerning the relationship between lynx and roads. McKelvey et al. (1999) found no evidence that narrow, forest roads at relatively low road densities affected habitat use by lynx. However, their analyses did not address potential indirect effects of roads on habitat quality for lynx. There is some additional speculation that roads used during the winter for snowmobile routes may increase the interactions between lynx and other competitors such as bobcat and coyotes (Buskirk et al. 1999). Therefore, to err on the conservative side, road associated factors and lynx are considered in this analysis.

Question Addressed:

- - Direct effects on terrestrial species habitat (TW – 1)
- - Affects to habitat by facilitating human activities (TW – 2)
- - Affect to legal and illegal human activities i.e. trapping, hunting, poaching (TW – 3)

Rating:

A large portion of the analysis area is within the LAU (lynx analysis unit). Road management within the LAU was identified and evaluated independently of road management outside the LAU. Roads in the LAU that allow more unrestricted access, particularly snowmobile access have a higher risk for causing undesirable impacts on lynx habitat. Outside the LAU, increases in general accessibility would have a negative effect on lynx populations but not to the extent experienced within the LAU. The classification matrix for assigning risk values to roads was as follows:

<u>For roads within the LAU:</u>

(10) (Highest Risk) - Road is open yearlong.

(7) - Road management allows for only partial restriction on snowmobile access. Generally a restriction from Oct. 15 to Dec.1 which is not the period of highest snowmobile use.

(5) - Road management restricts snowmobile access during the normal high use period of the winter season.

(3) - Road is closed yearlong to public motorized access.

<u>For roads not within the LAU:</u>

(3) (Highest Risk) - Road is open yearlong.

(1) - Road has a seasonal closure.

Jocko Lakes Fire Salvage Roads Analysis Data Appendix A-3

Jocko Lakes Fire Salvage Roads Analysis Road Ratings				Human Use Rating								Aquatic Rating							Wildlife Rating	
												Hydrology						Fish		
Route No.	Segment No.	Length Miles	Map Code	Req. by Law	Recreational Use	Timber Management	Silvicultural Management	Fire Suppress.	Fuels Management	TOTAL	AVG	Geologic Hazard	Sediment Contribution	Stream & Floodplain function	Hydrologic Conductivity	TOTAL	AVG.	Fish Barriers	Elk	Lynx
349	113	1.70	K	10	10	3	1	10	10	44	7.33	1	8	5	5	19	4.75	10	5	7
349	116A	1.78	OPEN	10	10	7	8	10	10	55	9.17	1	1	1	1	4	1	0	7	3
349	116B	1.53	K	10	10	5	5	10	10	50	8.33	1	1	5	3	10	2.5	10	7	3
2190	107	0.97	K	0	10	7	8	10	10	45	7.50	1	5	3	1	10	2.5	0	5	1
2191	53A	0.94	K	0	10	5	5	10	10	40	6.67	1	3	1	3	8	2	0	5	1
2191	53B	1.86	K	0	10	3	1	10	10	34	5.67	1	3	1	3	8	2	0	5	1
2192	54	5.30	K	10	10	7	8	10	10	55	9.17	1	5	3	3	12	3	0	5	1
2192	55	1.79	K	0	10	7	8	10	10	45	7.50	1	10	10	10	31	7.75	0	5	7
2192	56	0.11	K	0	10	7	8	10	10	45	7.50	1	5	1	1	8	2	0	5	1
4339	87	1.35	OPEN	0	7	3	1	10	10	31	5.17	1	5	5	8	19	4.75	10	5	1
4342	88	0.18	OPEN	10	10	3	1	10	10	44	7.33	1	1	1	1	4	1	0	7	3
4342	89	0.73	OPEN	10	10	3	1	10	10	44	7.33	1	8	5	3	17	4.25	0	7	10
4342	90	0.41	OPEN	10	10	3	1	10	10	44	7.33	1	10	10	10	31	7.75	0	7	10
4342	91	1.26	OPEN	10	10	3	1	10	10	44	7.33	1	10	10	10	31	7.75	10	7	10
4342	92A	0.44	OPEN	0	7	3	1	10	10	31	5.17	3	10	10	10	33	8.25	0	7	10
4342	92B	0.55	OPEN	0	7	3	1	10	10	31	5.17	3	10	10	10	33	8.25	0	7	10
4342	93	0.60	OPEN	0	7	3	1	10	10	31	5.17	3	8	3	8	22	5.5	0	7	10
4342	94	1.04	OPEN	0	7	3	1	10	10	31	5.17	3	8	3	8	22	5.5	0	7	10
4345	95	0.33	OPEN	10	10	3	1	10	10	44	7.33	1	1	1	1	4	1	0	7	10
4345	96	0.34	OPEN	10	10	3	1	10	10	44	7.33	1	1	1	1	4	1	0	7	10
4347	97	1.33	OPEN	10	10	3	1	10	10	44	7.33	1	5	3	3	12	3	10	7	10
4347	98A	0.29	OPEN	10	10	3	1	10	10	44	7.33	1	1	1	1	4	1	0	7	10
4347	98B	1.29	B	10	7	3	1	10	10	41	6.83	1	1	1	1	4	1	0	7	10
4347	98C	1.29	B	0	3	3	1	10	10	27	4.50	1	8	5	8	22	5.5	0	7	10
4367	99	2.02	OPEN	10	10	3	1	10	5	39	6.50	1	5	5	8	19	4.75	10	7	10
9975	105	1.08	OPEN	10	10	3	1	10	10	44	7.33	1	5	5	5	16	4	10	3	7
9975	106	0.01	OPEN	10	10	3	1	10	10	44	7.33	1	1	1	1	4	1	0	3	7
16001	1	0.25	OPEN	10	7	3	1	10	10	41	6.83	1	1	1	1	4	1	0	7	10
16001	2	0.02	OPEN	10	7	3	1	10	10	41	6.83	1	1	1	1	4	1	0	7	3
16001	3A	0.21	B	10	3	3	1	10	10	37	6.17	1	1	1	1	4	1	0	7	3
16001	3B	0.83	B	0	3	3	1	10	10	27	4.50	1	1	1	1	4	1	0	7	3
16002	4	0.46	OPEN	0	3	3	1	10	5	22	3.67	1	1	1	1	4	1	0	7	10
16003	5	1.39	OPEN	10	10	3	1	10	10	44	7.33	1	1	3	3	8	2	0	7	10
16655	6	0.22	B	0	7	5	5	10	10	37	6.17	1	3	1	3	8	2	0	3	1
16655	7	0.02	B	0	7	5	5	10	10	37	6.17	1	3	1	3	8	2	0	3	1
16655	8	0.09	B	0	7	5	5	10	10	37	6.17	1	3	1	3	8	2	0	3	1
16655	9	0.26	B	0	3	5	5	10	10	33	5.50	1	3	1	3	8	2	0	3	1
16655	10	0.11	B	0	3	5	5	10	10	33	5.50	1	3	1	3	8	2	0	3	1

Jocko Lakes Fire Salvage Roads Analysis Road Ratings				Human Use Rating								Aquatic Rating							Wildlife Rating	
												Hydrology						Fish		
Route No.	Segment No.	Length Miles	Map Code	Req. by Law	Recreational Use	Timber Management	Silvicultural Management	Fire Suppress.	Fuels Management	TOTAL	AVG	Geologic Hazard	Sediment Contribution	Stream & Floodplain function	Hydrologic Conductivity	TOTAL	AVG.	Fish Barriers	Elk	Lynx
16687	11	0.09	B	0	3	5	5	6	5	24	4.00	1	3	1	3	8	2	0	3	1
16687	12	0.45	B	0	3	5	5	6	5	24	4.00	1	3	1	3	8	2	0	3	1
16688	13	0.63	B	0	3	8	7	10	10	38	6.33	1	5	1	3	10	2.5	0	3	1
16689	14	0.32	B	0	3	8	7	6	5	29	4.83	1	1	1	1	4	1	0	3	1
16691	15A	0.50	B	10	1	3	1	10	5	30	5.00	1	5	3	3	12	3	0	3	1
16691	15B	0.09	B	0	1	3	1	10	5	20	3.33	1	5	3	3	12	3	0	3	1
16691	16	0.11	B	0	1	3	1	10	5	20	3.33	1	1	1	1	4	1	0	3	1
16727	17	1.45	B	0	3	5	5	10	10	33	5.50	1	5	3	3	12	3	0	3	1
16729	18	0.46	B	0	3	5	5	3	1	17	2.83	1	1	1	1	4	1	0	3	1
16870	19	0.46	B	0	3	5	5	3	1	17	2.83	1	1	1	1	4	1	0	3	1
16887	20	0.82	OPEN	0	10	3	1	10	5	29	4.83	1	5	3	3	12	3	0	7	10
16892	21	1.22	OPEN	10	7	3	1	10	5	36	6.00	1	1	1	3	6	1.5	0	7	10
16898	22	0.99	B	0	1	3	1	10	5	20	3.33	1	3	5	3	12	3	0	3	3
16899	23	0.31	OPEN	10	10	3	1	10	5	39	6.50	1	3	1	3	8	2	0	7	10
16899	24A	0.19	OPEN	10	10	3	1	10	5	39	6.50	1	3	1	3	8	2	0	7	10
16899	24B	0.25	B	10	7	3	1	10	5	36	6.00	1	3	1	3	8	2	0	7	10
16899	25	0.22	B	10	7	3	1	10	5	36	6.00	1	3	1	3	8	2	0	3	7
16899	26	0.38	B	10	7	3	1	10	5	36	6.00	1	3	1	3	8	2	0	7	10
16899	27	0.03	B	10	7	3	1	10	5	36	6.00	1	3	1	3	8	2	0	7	10
17455	28	0.41	OPEN	0	10	3	1	10	5	29	4.83	1	3	1	3	8	2	0	3	7
17455	29	0.61	OPEN	0	10	3	1	10	5	29	4.83	1	8	3	5	17	4.25	0	3	7
17455	30	0.18	B	0	7	3	1	10	5	26	4.33	1	8	3	5	17	4.25	0	3	7
17455	31	0.71	B	0	7	3	1	10	5	26	4.33	1	5	3	3	12	3	0	3	7
17457	32	0.23	OPEN	10	7	3	1	10	5	36	6.00	1	1	1	1	4	1	0	7	10
17457	33	0.10	OPEN	10	10	3	1	10	5	39	6.50	1	1	1	1	4	1	0	7	10
17457	34	1.15	B	10	7	3	1	10	5	36	6.00	1	10	8	10	29	7.25	0	3	7
17457	35	0.02	B	10	7	3	1	10	5	36	6.00	1	1	1	1	4	1	0	3	7
17457	36	0.58	B	0	0	3	1	10	5	19	3.17	1	1	1	1	4	1	0	3	7
17457	37	0.04	B	0	0	3	1	10	5	19	3.17	1	1	1	1	4	1	0	3	7
17458	38	0.66	OPEN	10	10	3	1	10	5	39	6.50	1	3	3	3	10	2.5	0	7	10
17458	39	0.30	OPEN	10	10	3	1	10	5	39	6.50	1	1	1	1	4	1	0	7	10
17527	40A	0.90	B	10	0	3	1	10	5	29	4.83	3	1	1	1	6	1.5	0	3	7
17527	40B	0.31	B	0	0	3	1	10	5	19	3.17	3	1	1	1	6	1.5	0	3	7
17544	41	1.08	B	0	7	3	1	6	5	22	3.67	3	1	1	1	6	1.5	0	3	7
17546	42	0.24	OPEN	0	10	3	1	3	5	22	3.67	3	1	1	1	6	1.5	0	7	7
17547	43A	0.76	B	10	0	3	1	10	5	29	4.83	3	1	1	3	8	2	0	3	7
17547	43B	0.37	B	0	0	3	1	6	5	15	2.50	3	1	1	3	8	2	0	3	7
17620	118	0.23	OPEN	10	10	3	1	6	5	35	5.83	3	1	1	1	6	1.5	0	7	10
17643	44A	0.41	OPEN	10	10	3	1	6	5	35	5.83	3	5	3	3	14	3.5	0	7	10
17643	44B	0.94	OPEN	0	10	3	1	6	5	25	4.17	3	5	3	3	14	3.5	0	7	10

Jocko Lakes Fire Salvage Roads Analysis Road Ratings				Human Use Rating								Aquatic Rating							Wildlife Rating	
												Hydrology						Fish		
Route No.	Segment No.	Length Miles	Map Code	Req. by Law	Recreational Use	Timber Management	Silvicultural Management	Fire Suppress.	Fuels Management	TOTAL	AVG	Geologic Hazard	Sediment Contribution	Stream & Floodplain function	Hydrologic Conductivity	TOTAL	AVG.	Fish Barriers	Elk	Lynx
17644	45	1.26	OPEN	10	10	3	1	6	5	35	5.83	3	5	3	3	14	3.5	0	7	10
17668	46	0.35	E	0	3	8	7	6	5	29	4.83	3	1	1	1	6	1.5	0	5	3
17669	47	0.63	E	0	3	8	7	3	1	22	3.67	3	1	1	1	6	1.5	0	5	3
17682	48	0.01	E	0	3	7	8	6	5	29	4.83	3	1	1	3	8	2	0	5	3
17682	49	0.36	E	0	3	7	8	6	5	29	4.83	3	1	1	3	8	2	0	5	3
17698	50	0.40	B	10	3	3	1	6	5	28	4.67	3	5	3	5	16	4	0	3	3
46372	114A	0.17	OPEN	10	10	3	1	6	1	31	5.17	3	1	3	1	8	2	0	7	10
46372	114B	0.32	OPEN	10	10	3	1	6	1	31	5.17	3	1	3	1	8	2	0	7	10
9974-2	102	5.12	K	10	10	5	5	10	10	50	8.33	3	10	10	10	33	8.25	0	7	10
9974-2	103	0.48	OPEN	10	10	3	1	10	5	39	6.50	3	10	5	5	23	5.75	0	7	10
9974-2	104	1.78	OPEN	10	10	3	1	10	5	39	6.50	3	3	1	3	10	2.5	0	7	10
36022	57	0.14		0	0	3	1	3	1	8	1.33	3	10	10	10	33	8.25	0	10	10
36023	58	0.45		0	0	3	1	3	1	8	1.33	3	8	5	5	21	5.25	0	10	10
36206	59	0.35		0	0	3	1	3	1	8	1.33	3	5	1	3	12	3	0	10	10
36207	60	0.57		0	0	3	1	6	5	15	2.50	3	1	1	1	6	1.5	0	10	10
36208	61	0.33		0	0	3	1	3	5	12	2.00	3	1	1	1	6	1.5	0	10	10
36209	62	0.19		0	0	3	1	6	1	11	1.83	3	1	1	1	6	1.5	0	10	10
36210	63	0.22		0	0	3	1	6	1	11	1.83	3	1	1	1	6	1.5	0	10	10
36212	64	0.61		0	0	3	1	10	5	19	3.17	3	1	1	1	6	1.5	0	10	10
36213	65	0.66		0	0	3	1	6	5	15	2.50	3	10	10	10	33	8.25	0	10	10
36214	66	0.37		0	0	3	1	6	5	15	2.50	3	8	3	5	19	4.75	0	10	10
36232	67	0.28		0	0	3	1	6	1	11	1.83	1	1	1	1	4	1	0	5	5
36234	68	0.84		0	3	3	1	6	5	18	3.00	1	10	10	10	31	7.75	0	5	5
36239	69	0.56		0	0	3	1	3	1	8	1.33	1	10	10	10	31	7.75	0	10	10
36246	70	0.32		0	0	8	7	3	1	19	3.17	1	8	5	3	17	4.25	0	5	5
36247	71	0.33		0	3	8	7	3	5	26	4.33	1	3	5	3	12	3	0	5	5
36256	72	0.41		0	0	3	1	3	1	8	1.33	1	1	1	1	4	1	0	5	5
36257	73	0.09		0	0	3	1	3	1	8	1.33	1	1	1	1	4	1	0	5	5
36258	74	0.41		0	0	3	1	3	1	8	1.33	1	10	10	10	31	7.75	0	10	10
36265	75	0.28		0	0	3	1	6	5	15	2.50	1	10	10	10	31	7.75	0	5	5
36279	76	0.20		0	3	3	1	3	5	15	2.50	1	1	1	1	4	1	0	5	5
36282	77	0.15		0	7	5	5	3	1	21	3.50	1	10	10	10	31	7.75	0	5	5
36290	78	0.70		0	0	3	1	6	5	15	2.50	1	8	8	5	22	5.5	0	5	5
36295	121	0.64		0	7	3	1			11	2.75	1	1	1	1	4	1	0	3	7
36297	79	0.42		0	0	3	1	3	1	8	1.33	1	1	1	1	4	1	0	10	10
36298	80	0.33		0	0	3	1	3	1	8	1.33	1	1	1	1	4	1	0	10	10
36299	81	0.23		0	0	3	1	3	1	8	1.33	1	1	1	1	4	1	0	10	10
36300	82	0.30		0	0	3	1	3	1	8	1.33	1	1	1	1	4	1	0	10	10
36301	83	0.17		0	0	3	1	3	1	8	1.33	1	1	1	1	4	1	0	10	10
36408	84	0.03		10	10	3	1	3	1	28	4.67	1	1	1	1	4	1	0	3	3

Jocko Lakes Fire Salvage Roads Analysis Road Ratings				Human Use Rating								Aquatic Rating							Wildlife Rating	
												Hydrology						Fish		
Route No.	Segment No.	Length Miles	Map Code	Req. by Law	Recreational Use	Timber Management	Silvicultural Management	Fire Suppress.	Fuels Management	TOTAL	AVG	Geologic Hazard	Sediment Contribution	Stream & Floodplain function	Hydrologic Conductivity	TOTAL	AVG.	Fish Barriers	Elk	Lynx
36409	85	0.81		0	0	3	1	6	5	15	2.50	1	1	1	1	4	1	0	5	5
36410	86	0.38		0	0	3	1	6	5	15	2.50	1	1	1	1	4	1	0	5	5
46521	100	0.09		0	0	3	1	6	1	11	1.83	1	10	10	10	31	7.75	0	5	5
46527	110A	0.22		0	7	3	1	6	1	18	3.00	1	1	1	1	4	1	0	5	5
46527	110B	0.05		0	7	3	1	6	1	18	3.00	1	1	1	1	4	1	0	5	5
46557	117	0.15		0	0	3	1	6	1	11	1.83	1	1	1	1	4	1	0	5	5
46560	119B	0.22		10	3	5	5	3	1	27	4.50	1	3	5	3	12	3	0	5	5
46617	111	0.22		3	7	3	1	6	1	21	3.50	1	1	1	1	4	1	0	7	10
46618	108	0.36		0	0	3	1	6	1	11	1.83	1	10	10	10	31	7.75	0	3	7
46622	101	0.10		0	7	3	1	10	1	22	3.67	1	1	1	1	4	1	0	5	5

Jocko Lakes Fire Salvage Roads Analysis
Recommended Road Management Appendix A-4

Route No.	Segment No.	Length Miles	Map Code	Recommended Management
349	113	1.70	K	Existing Management
349	116A	1.78	OPEN	Existing Management
349	116B	1.53	K	Existing Management
2190	107	0.97	K	Existing Management
2191	53A	0.94	K	Existing Management
2191	53B	1.86	K	Existing Management
2192	54	5.30	K	Existing Management
2192	55	1.79	K	Existing Management
2192	56	0.11	K	Existing Management
4339	87	1.35	OPEN	Cls Lvl 3S
4342	88	0.18	OPEN	Existing Management
4342	89	0.73	OPEN	Existing Management
4342	90	0.41	OPEN	Existing Management
4342	91	1.26	OPEN	Existing Management
4342	92A	0.44	OPEN	Existing Management
4342	92B	0.55	OPEN	Cls Lvl 5
4342	93	0.60	OPEN	Cls Lvl 5
4342	94	1.04	OPEN	Cls Lvl 5
4345	95	0.33	OPEN	Existing Management
4345	96	0.34	OPEN	Existing Management
4347	97	1.33	OPEN	Existing Management
4347	98A	0.29	OPEN	Existing Management
4347	98B	1.29	B	Existing Management
4347	98C	1.29	B	Cls Lvl 3S
4367	99	2.02	OPEN	Existing Management
9975	105	1.08	OPEN	Existing Management
9975	106	0.01	OPEN	Existing Management
16001	1	0.25	OPEN	Existing Management
16001	2	0.02	OPEN	Existing Management
16001	3A	0.21	B	Existing Management
16001	3B	0.83	B	Cls Lvl 3S
16002	4	0.46	OPEN	Cls Lvl 3S
16003	5	1.39	OPEN	Existing Management
16655	6	0.22	B	Existing Management
16655	7	0.02	B	Existing Management
16655	8	0.09	B	Existing Management
16655	9	0.26	B	Existing Management
16655	10	0.11	B	Existing Management
16687	11	0.09	B	Existing Management
16687	12	0.45	B	Existing Management
16688	13	0.63	B	Existing Management
16689	14	0.32	B	Existing Management
16691	15A	0.50	B	Existing Management
16691	15B	0.09	B	Cls Lvl 3D

Route No.	Segment No.	Length Miles	Map Code	Recommended Management
16691	16	0.11	B	Cls Lvl 3D
16727	17	1.45	B	Cls Lvl 3S
16729	18	0.46	B	Existing Management
16870	19	0.46	B	Existing Management
16887	20	0.82	OPEN	Cls Lvl 3S
16892	21	1.22	OPEN	Existing Management
16898	22	0.99	B	Cls Lvl 3D
16899	23	0.31	OPEN	Existing Management
16899	24A	0.19	OPEN	Existing Management
16899	24B	0.25	B	Existing Management
16899	25	0.22	B	Existing Management
16899	26	0.38	B	Existing Management
16899	27	0.03	B	Existing Management
17455	28	0.41	OPEN	Existing Management
17455	29	0.61	OPEN	Existing Management
17455	30	0.18	B	Cls Lvl 3S
17455	31	0.71	B	Cls Lvl 3S
17457	32	0.23	OPEN	Existing Management
17457	33	0.10	OPEN	Existing Management
17457	34	1.15	B	Existing Management
17457	35	0.02	B	Existing Management
17457	36	0.58	B	Cls Lvl 3D
17457	37	0.04	B	Cls Lvl 3D
17458	38	0.66	OPEN	Existing Management
17458	39	0.30	OPEN	Existing Management
17527	40A	0.90	B	Existing Management
17527	40B	0.31	B	Cls Lvl 3S
17544	41	1.08	B	Cls Lvl 3S
17546	42	0.24	OPEN	Cls Lvl 3D
17547	43A	0.76	B	Existing Management
17547	43B	0.37	B	Cls Lvl 3S
17620	118	0.23	OPEN	Existing Management
17643	44A	0.41	OPEN	Existing Management
17643	44B	0.94	OPEN	Cls Lvl 3S
17644	45	1.26	OPEN	Existing Management
17668	46	0.35	E	Existing Management
17669	47	0.63	E	Existing Management
17682	48	0.01	E	Existing Management
17682	49	0.36	E	Existing Management
17698	50	0.40	B	Existing Management
46372	114A	0.17	OPEN	Existing Management
46372	114B	0.32	OPEN	Existing Management
9974-2	102	5.12	K	Existing Management
9974-2	103	0.48	OPEN	Existing Management
9974-2	104	1.78	OPEN	Existing Management
36022	57	0.14		Cls Lvl 5
36023	58	0.45		Cls Lvl 5
36206	59	0.35		Cls Lvl 5
36207	60	0.57		Existing Management

Route No.	Segment No.	Length Miles	Map Code	Recommended Management
36208	61	0.33		Cls Lvl 3D
36209	62	0.19		Existing Management
36210	63	0.22		Cls Lvl 5
36212	64	0.61		Cls Lvl 3D
36213	65	0.66		Cls Lvl 5
36214	66	0.37		Cls Lvl 5
36232	67	0.28		Cls Lvl 3D
36234	68	0.84		Cls Lvl 5
36239	69	0.56		Cls Lvl 5
36246	70	0.32		Cls Lvl 3S
36247	71	0.33		Existing Management
36256	72	0.41		Cls Lvl 3D
36257	73	0.09		Cls Lvl 3D
36258	74	0.41		Cls Lvl 5
36265	75	0.28		Cls Lvl 3D
36279	76	0.20		Cls Lvl 3D
36282	77	0.15		Existing Management
36290	78	0.70		Cls Lvl 3D
36295	121	0.64		Cls Lvl 3D
36297	79	0.42		Cls Lvl 5
36298	80	0.33		Cls Lvl 5
36299	81	0.23		Cls Lvl 5
36300	82	0.30		Cls Lvl 5
36301	83	0.17		Cls Lvl 5
36408	84	0.03		Existing Management
36409	85	0.81		Cls Lvl 3D
36410	86	0.38		Cls Lvl 3D
46521	100	0.09		Cls Lvl 3D
46527	110A	0.22		Cls Lvl 3D
46527	110B	0.05		Cls Lvl 3D
46557	117	0.15		Cls Lvl 3D
46560	119B	0.22		Cls Lvl 1
46617	111	0.22		Existing Management
46618	108	0.36		Cls Lvl 5
46622	101	0.10		Cls Lvl 3D