Fisheries Biological Evaluation Addendum (for Appendix F)

Forest Service

Easy Fire Recovery Project

August 27, 2004

This letter serves to document the reduction in planned salvage acres and the impact on the analysis and "Effects Determinations" on Threatened, Endangered, and Sensitive (TES) species from the Easy Fire Recovery Project.

The following table displays the change in planned harvest acres.

Alternative	DEIS Harvest Acres	FEIS Harvest Acres	% decrease
2	3,652	1,777	51%
3	2,820	1,298	54%
4	2,519	956	62%

The table shows that the planned harvest acres in each alternative have decreased by more than 50%. A decrease in harvested acres will not increase the effects on TES species. The result would be a decrease of impacts at best or no change in impacts.

The "Effects Determinations" for threatened or endangered species from project activities was "May affect but is not likely to adversely affect (NLAA)". The decrease in harvest acres will not change those determinations.

The "Effects Determinations" for sensitive species from project activities was "May Impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH)". Road closures and haul maintenance will have a beneficial impact (BI) with the Implementation of any action alternative. The decrease in harvest acres will not change those determinations.

The "Effects Determination" for the essential fish habitat (EFH) of the spring chinook (sensitive species) from project activities is "May affect but is not likely to adversely affect (NLAA)". The decrease in harvest acres will not change that determination.

/s/ Paul M. Bennett 27 August 2004
Paul M. Bennett
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Easy Fire Recovery Project

APPENDIX F - FISHERIES BIOLOGICAL EVALUATION

Easy Fire Recovery Project Area
Malheur National Forest
Prairie City Ranger District

May 2004

Prepared by: /s/ Paul Bennett Date: May 6, 2004
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Fishery Biologist

FISHERIES BIOLOGICAL EVALUATION

Easy Fire Recovery Project Area
Malheur National Forest
Prairie City Ranger District
April 2004

Alternatives considered in the Easy Fire Recovery Project FEIS require that a Biological Evaluation be completed (FSM 2672.4). The Biological Evaluation process is intended to analyze and document activities to ensure proposed management actions: 1) do not contribute to loss of viability of any native or desired non-native plant or animal species; 2) incorporate concerns for sensitive species throughout the planning process, reducing negative impacts to species and enhancing opportunities for mitgation; 3) ensure that activities will not cause a species to move toward federal listing; 4) comply with requirements of the Endangered Species Act that actions of Federal agencies not jeopardize or adversely modify critical habitat of Federally listed species; and 5) provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process (FSM 2672.41 ID and 2672.4).

Fish species evaluated in this Biological Evaluation are:

1. Species listed or proposed to be listed as endangered (E) or threatened (T) by the USDI Fish and Wildlife Service, or listed or proposed to be listed by the USDC National Marine Fisheries Service

2. Species listed as sensitive (S) by the USDA Forest Service Region 6.

I. INTRODUCTION

This Biological Evaluation (BE) determines the effects of the alternatives for the Easy Fire Recovery Project proposal on any threatened, endangered, or sensitive fish species and habitat that may occur within the analysis area. A biological evaluation of the potential effects to threatened, endangered, and sensitive flora is in a separate document prepared by a Botanist. A biological evaluation of the wildlife is in a separate document prepared by a Wildlife Biologist. This determination, required by the Interagency Cooperation Regulations (Federal Register, January 4, 1978), ensures compliance with the Endangered Species Act of 1973, P.L. 93-205 (87 Stat. 884) as amended.

The following sources of information have been reviewed to determine if PETS (proposed, endangered, threatened, or sensitive) species and their associated habitats may or may not occur within the project area:

1) Regional Forester's Sensitive Species List.
2) Forest sensitive species database and the current GIS mapping layers.
3) Project area maps, unique habitat databases, and any historical records.

4) Current regulatory agency status reports and listed species new releases.

The following information apply to all alternatives and are determined to be universally important to the analysis of Easy Fire Recovery project effects to all fish species discussed in this document and in determining appropriate conclusions :

1) No riparian harvest activities.
2) Foreseeable future projects include planting of appropriate riparian species within RHCAs of Category 2 and 4 streams that experienced high BAER burn severity.
3) No new permanent road construction.
4) Temporary road construction and the reopening of decommissioned roads (maximum 1.8 miles total) is expected to have minimal impact to the aquatic environment due to the distance to nearby streams and the generally flat topography on which the roads are to be built or reopened.
5) Temporary and reopened decommissioned roads to be hydrologically closed at the end of harvest activities.
6) All salvage units to be replanted.
7) Routine haul maintenance to be performed on all roads utilized for this project, thereby improving the local road system.
8) Only 0.30 miles of heavy road maintenance to be performed (Road 2600026). This maintenance is expected to have minimal impact to nearby streams, with regards to production of fine sediments, due to the nature of the work performed i.e., placement of grid-rolled rock.
9) No grazing to occur in the project area for a minimum of 2-3 years to allow riparian vegetation and hardwood shrubs to recover from the effects of fire.
10) Road 2600391 (4.6 miles inside the project area and 0.6 miles outside) is to be closed with this project.
11) All units located adjacent to streams that are on moderate slopes (31-60%) and that burned with high BAER burn intensity will be harvested by helicopter to minimize impacts to soils, hydrology, and nearby streams (fisheries).
12) Two streams (Lunch and Reynolds Creek) located outside the project area but within the affected area are on the state of Oregon DEQ 303d list of waterbodies not meeting water quality standards. Lunch Creek and Reynolds Creek were listed for water temperature concerns for salmonid rearing habitat and bull trout, respectively. The single fish bearing stream within the project area, Clear Creek, is also listed for temperature concerns for bull trout.
13) Haul during dry weather or frozen road conditions only.
14) No long-term measurable impacts to hydrology or fine sediment production predicted from project activities.
15) Under all action alternatives there will be no thinning of riparian reserves. No cut riparian buffers (RHCAs) will be 300-feet slope distance from each side of the stream channel on Category 1 (fish bearing perennial) streams, 150-feet on Category 2 (non-fish bearing) streams, and 100-feet on Category 4 (intermittent or seasonal flowing) streams. These no cut buffers will protect the stream bank stability and current stream temperature regimes and overall water quality.

Project Location and Description

The Easy Fire burned within two key watersheds, the Upper Middle Fork of the John Day River (UMFJDR), and the Upper John Day River (UJDR) watershed in July through September 2002 on the Malheur National Forest. The Easy Fire occurred within four subwatersheds – Bridge Creek, Clear Creek, Dry Fork and Reynolds Creek. Most of the fire occurred in the Clear Creek subwatershed, where 3,002 acres burned. Clear Creek subwatershed also had the most high burn severity acres, 800 acres. Only a small number of acres (30 acres) were burned within the Dry Fork subwatershed. In the Reynolds Creek subwatershed, most of the acres were of low burn severity, and only 35 acres were high burn severity. The table below lists the acres of the various BAER (Burned Area Emergency Rehabilitation) burn severities in the subwatersheds, HUC 6th field (Bright and others 2002).

Table of Burned Acres by Subwatershed.

Subwatershed (HUC 6th Field)	Total SWS Acres	Unburned Acres in Easy Fire Area	*BAER Burn Severity (acres)* Low	Moderate	High	Total Ac. Burned	% of subshed burned. (*)
Bridge Creek	12,149	256	311	158	172	641	5 (1)
Clear Creek	12,484	605	1,226	976	800	3,002	24 (6)
Dry Fork	11,219	6	24	5	1	30	<1 (<1)
Reynolds Creek	19,915	265	702	127	35	864	4 (<1)
Total	55,767	1,132	2,263	1,266	1,008	4,537	8 (2)

*Percent of subwatershed with high burn severity in ( ).
Figures revised April 2003 to reflect the new subwatershed boundaries.

The watershed and fisheries analysis is focused on the three subwatersheds: Bridge Creek, Clear Creek and Reynolds Creek - where most of the fire burned. Only 30 acres were burned in the Dry Fork subwatershed, and no activities are proposed for those acres.

The project area is 5,839 acres in size and is located approximately 11 miles northeast of Prairie City in Grant County, Oregon.

For the Upper Middle Fork John Day watershed, elevations range from a high of 6640 feet at the headwaters of Clear Creek, Dry Fork and Clear Creek subwatersheds, to a low of 4020 feet where the Middle Fork John Day River exits the watershed. Elevations in the Upper John Day Watershed range from a high of about 9038 feet at the top of Strawberry Mountain, to a low of 3080 feet where the John Day River exits the Upper John Day Watershed near John Day, Oregon.

The climate is a combination of maritime and continental influences. The average annual precipitation of the area is fairly low due to the rain shadow effect of the Cascade Range. Annual precipitation ranges from approximately 20 inches at the lower elevations to approximately 40-45 inches at higher elevations.

Five alternatives were analyzed by an interdisciplinary team for potential implementation within the Easy Fire Recovery Project area (See following Table):

1) Alternative 1 is the no action alternative. Under this alternative, no timber harvest or other projects are proposed.
2) Alternative 2 harvests the most timber volume at 36.5 MMBF. This alternative was specifically designed to address fuels reduction, economic recovery, and forest plan snag retention level issues and consists of 11 salvage regen units (3499 acres) and 13 post and pole units (153 acres), a total of 3652 acres. Alternative 2 would construct about 1.8 miles (about 1.7 miles within the project area and about 0.1 miles outside the project area) of temporary road to allow access to harvest. Of these temporary road miles, about 0.2 miles are existing rehabilitated temporary road, about 1.0 miles are decommissioned roads that would be re-opened as temporary roads, and 0.2 miles are existing dozer fire line (0.1 mile within project area and 0.1 mile outside project area). Temporary roads utilized under any action alternative will be decommissioned following harvest activities.
3) Alternative 3 was selected by both the interdisciplinary team and Malheur Forest Supervisor as the preferred alternative Alternative 3 was specifically designed to address water, soil, and fish habitat issues and consists of 13 salvage regen units (2667 acres) and 13 post and pole units (153 acres), a total of 2820 acres. Alternative 3 would construct about 1.5 miles (about 1.4 miles within the project area and about 0.1 miles outside the project area) of temporary road to allow access to harvest. Of these temporary road miles, about 1.0 miles are decommissioned roads that would be re-opened as temporary roads, and 0.2 miles are existing dozer fire line (0.1 mile within project area and 0.1 mile outside project area).
4) Alternative 4, addresses DECAID snag retention levels and consist of 13 salvage regen units (2366 acres) and 13 post and pole units (153 acres), a total of 2519 acres. Alternative 4 would construct about 1.8 miles (about 1.7 miles within the project area and about 0.1 miles outside the project area) of temporary road to allow access to harvest. Of these temporary road miles, about 0.2 miles are existing rehabilitated temporary road, about 1.0 miles are decommissioned roads that would be re-opened as temporary roads, and 0.2 miles are existing dozer fire line (0.1 mile within project area and 0.1 mile outside project area).
5) Alternative 5 is the restoration alternative. Commercial harvest of fire-damaged or killed trees will not occur with implementation of this alternative. However, dead and dying fuels less than 7-inches in diameter will be removed to reduce fuel loadings in all units identified in Alternative 2. These fuels will be grapple piled and burned on slopes less than 35%. On steeper slopes these fuels will be hand-fell and hand-piled prior to burning. Temporary roads would not be constructed and decommissioned roads would not be reopened as in Alternatives 2-4. Although there will be no commercial haul with Alternative 5, those roads proposed for haul activities in Alternative 2 will receive maintenance as needed for properly functioning condition, including the 0.30 miles of grid-rolled rock placement on Road 26000026. There would be no change in permanent road miles and no change in road densities as no new system roads would be constructed. Closure activities will be the same as Alternatives 2-4, including the 5.2 mile closure of Road 2600391 and those roads opened for fire suppression efforts.

In addition to the temporary road construction and decommissioned roads to be reopened with each action alternative, 0.30 miles of Road 2600026 would receive heavy maintenance with

implementation of these alternatives. Following harvest activities, temporary and decommissioned roads will be prepared for closure and then closed. Also, approximately 5.2 miles of existing Road 2600391 would be closed for soils, hydrology, and fisheries concerns with each action alternative.

Table of Types of Treatment Prescribed by Alternative.

Treatment	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Total Volume (MMBF)	0	15.7	12.9	11.4	0
Total harvest acres Salvage (Salv.) 1/ Post and Poles (P and P) 2/	0 (Salv.) 0 (Pand P)	3499 (Salv.) 153 (Pand P)	2667 (Salv.) 153 (Pand P)	2366 (Salv.) 153 (Pand P)	0 (Salv.) 0 (Pand P)
Number of harvest units	0 (Salv.) 0 (Pand P)	11 Salv.) 13 (Pand P)	13 (Salv.) 13 (Pand P)	13 (Salv.) 13 (Pand P)	0 (Salv.) 0 (Pand P)
Average acres/unit	0 (Salv.) 0 (Pand P)	14.6 (Salv.) 46.5 (Pand P)	15.9 (Salv.) 46.5 (Pand P)	14.3 (Salv.) 46.5 (Pand P)	0 (Salv.) 0 (Pand P)
Logging System Acres (% by acres)					
Skyline	0	504 (14)	302 (11)	151 (6)	0
Helicopter	0	1,398 (38)	910 (32)	1,063 (42)	0
Tractor	0	1,750 (48)	1,608 (57)	1,305 (52)	0

1/ Salvage = Unit acreage to be replanted
2/ Post and Poles = Unit acreage with natural regeneration

Easy Fire Area Project Area TES Species

The Upper Middle Fork John Day River (UMFJDR) watershed and the Upper John Day River (UJDR) watershed both contain habitat for two federally listed (threatened) species under the Endangered Species Act (ESA) and three Region 6 sensitive species. The following table shows the known distribution of these species in the affected environment in and within two miles of the Easy Fire Recover project Boundary.

Table of distribution and miles of habitat of Federally Listed and Region 6 Sensitive species in the Upper Middle Middle Fork John Day River Watershed and the Upper John Day River (UJDR) Watershed.

Watershed	Subwatershed	Stream	Bull Trout	Steelhead	Chinook Salmon	Redband Trout	Cutthroat Trout
Upper Middle Fork John Day	Clear Creek	Clear Creek	2.88	3.64	0.57	6.45	
	Bridge Creek	Lunch Creek	3.64 P	3.51		3.64	
Upper John Day River	Reynolds Creek	Mossy Gulch Creek	1.06	1.06		1.06	
		North Reynolds Creek	7.37	3.57		8.00	7.37

P = Potential Habitat

Summer steelhead (*Oncorhynchus mykiss*), an anadromous salmonid, of the Middle Columbia Evolutionary Significant Unit (ESU) was listed as threatened on 03/25/25/99 and bull trout (*Salvelinus confluentus*) of the Columbia River distinct population segment (DPS) was listed as threatened on 06/10/98. Both resident and fluvial forms of bull trout are present in the watershed, although fluvial forms are rare. Access to historic habitat for bull trout and steelhead into Lunch Creek and upper Bridge Creek only became possible two years ago when a fish ladder was built around the dam at Bates pond. These streams are capable of providing spawning and juvenile rearing habitat in their present condition (UMFJDR WA 1998).

The Region six sensitive species include: (1) the mid-Columbia River spring run chinook salmon (*Oncorhynchus tshawytscha*), listed in1997, (2) interior redband trout (*Oncorhynchus mykiss ssp.*), listed in 1986, and (3) westslope cutthroat trout (*Oncorhynchus clarki lewisi*), listed in 2000. Both resident and anadromous forms of redband trout are found in the watersheds. Chinook salmon are anadromous as well. Additionally, the Columbia spotted frog is thought to be present in the two watersheds, however, their presence has not been confirmed. This species is discussed in the wildlife BE.

In addition to the federal and regional listing for these fish species, the summer steelhead, bull trout, redband trout, and westslope cutthroat trout are all designated as management indicator species (Malheur National Forest Plan 1990) for assessing changes to fish habitat. Management Indicator Species (MIS) are species of vertebrates and invertebrates whose population changes are believed to best indicate the effects of land management activities. Through the MIS concept, the total number of species found within a project area is reduced to a subset of species that collectively represent habitats, species and associated management concerns. The MIS are used to assess the maintenance of populations (the ability of a population to sustain itself naturally) and biological diversity (which includes genetic

diversity, species diversity, and habitat diversity), and to assess effects on species in public demand. The Malheur Forest Plan directs analyses to focus on MIS species.

The bull trout has more specified habitat requirements than other salmonids and is more sensitive to environmental disturbances at all life stages (Rieman and McIntyre 1993) and consequently is the key indicator species for analyzing effects. While the other management indicator species have similar but less restrictive habitat needs than bull trout they will benefit by activities that preserve and protect bull trout habitat.

The summer steelhead and spring chinook runs in the John Day River Basin are composed entirely of native stocks. The number of anadromous adults returning to the entire John Day Basin range on a yearly basis is from 4,000 to 25,000 steelhead and 400 to 3,000 chinook salmon. The Middle Fork John Day River (MFJDR) subbasin produces 24 percent of the wild spring chinook and 30 percent of the wild steelhead of the John Day River Basin (Oregon Water Resources 1986). In particular, the MFJDR has historically contributed approximately 23% of the total run of steelhead and 12% of the total run of chinook salmon for the John Day River Basin (USFWS and NMFS 1981). The estimated escapement to the John Day basin is shown in table below and has averaged 13,998 and 2,670 adults since 1987 for steelhead and chinook, respectively.

Table of estimated spawning escapement of spring chinook salmon and steelhead to the John Day Basin.

Year	Spring Chinook Salmon	Summer Steelhead Trout
1997	2,700	5,711
1996	3,300	5,658
1995	369	3,900
1994	2,400	9,300
1993	4,000	7,200
1992	3,100	17,100
1991	1,100	7,200
1990	2,200	12,000
1989	2,600	9,600
1988	3,000	36,400
1987	4,600	34,300
Mean	**2,670**	**13,988**

Note: Data from Unterwegner pers. Comm., Unterwegner and Gray (1995, 1996, 1997)

Stream Channel Habitat Condition

Current habitat conditions in the watersheds reflect almost 140 years of human activities. Where past impacts to riparian and aquatic habitat exist in the two watersheds, four dominant factors have resulted in the degraded conditions: 1) An extensive road system that imposes on most of the riparian areas within the watershed; 2) Past logging practices, which have both directly and indirectly influenced channel morphology; 3) Livestock, which have impacted stream bank stability and changed vegetative species composition; and 4) The significant reduction of beaver populations within the watershed. Water withdrawals and projects that artificially restrict stream channels have also impacted stream channels.

Each of these four factors have led to a simplification of channel structure by reducing the influence of large wood, straightening of the channel, destabilizing stream banks and reducing the amount of bank undercuts, widening channels (increasing width to depth ratios), and by causing streams to downcut their channels, thereby reducing their contact with the floodplains.

Large woody debris levels have been reduced along many reaches of streams located in the two watersheds by past harvest activities, stream-side railroad grades, road building, and stream management activities. This reduction in large wood has resulted in reduced numbers of pools, channel diversity and sinuosity, bank stability, as well as increased stream velocities and water temperatures. Also the reduction of wood in channels has resulted in a reduced ability for streams to trap sediments and organic debris and interact with floodplains. The reduced wood levels has also meant a loss of high quality summer and winter rearing habitat for salmonids and other fish species. Bull trout, in particular, prefer complex habitat formed by the accumulation of large wood (Rieman and McIntyre 1993).

However, exceptions to this condition of reduced stream channel large woody debris levels are found in Lunch Creek and Clear Creek, in the Bridge Creek and Clear Creek subwatersheds, respectively, of the UMFJDR watershed (see table below). These subwatersheds contain high levels of woody debris and good channel complexity reflecting the largely unaltered condition of the riparian vegetation along these streams. Past log weir structures have been constructed in the lower portions of Clear Creek in an attempt to increase pool habitat and emulate large woody debris structure.

Table of Summary of Channel habitat Conditions in Lunch Creek and Clear Creek.

Stream	Average Gradient % *	Average Sinuosity *	Bankfull Width to Depth Ratio **	Woody Debris per Mile (#large pieces) **
Clear Creek	3.3	1.2	6-13.7	329 (36)
Lunch Creek	2.7	1.4	15.7	197 (5)

Sources: * Derived from USGS topographic maps.
** Hankin and Reeves stream survey data.

The riparian condition of those streams adjacent to the project area in the UJDR watershed is much different. In Reynolds Creek, to the confluence of North Reynolds Creek, and in North

Reynolds Creek, to the confluence with Mossy Gulch Creek, the overstory conifers are rated at fair and the understory does not meet forest plan standards (Mossy Analysis Area EA 1994). The upper reaches of North Reynolds Creek, from its confluence with Mossy Gulch Creek to its headwaters, also have overstory conifers in fair condition, but at risk of declining due to insect infestation. Most of the understory vegetation is in satisfactory condition.

Mossy Gulch Creek, from its mouth to its headwaters has a conifer overstory condition in decline from insect infestation. However, the understory vegetation meets forest plan standards (Mossy Analysis Area EA 1994). Mossy Gulch Creek, Reynolds Creek, and the Upper North Reynolds Creek were found to have stable banks. In other parts of the watershed where the streams had unstable banks, surveys indicated these conditions had been primarily caused by the impact of recreational activities (dispersed camping) and the trampling and heavy grazing by cattle, not past harvest activities. Riparian shrubs were few and heavily browsed. Mature deciduous trees were present, although heavy browsing of seedlings was restricting or eliminating future populations.

Stream Inventories

Using Region 6 Level II stream methodology, pre-fire stream inventories were conducted on streams within the project area (Clear Creek, 1992, UMFJDR watershed) and within the potential effected environment immediately adjacent to the project area (Reynolds Creek, North Reynolds Creek, 1991, UJDR watershed). Clear Creek is the only perennial fish bearing stream (Category 1) present in the Easy Fire project area. Post-fire stream inventories were also conducted in 2002 to assess conditions on all Category 1, 2, and 4 streams in the project area. However, the intent of these surveys was to acquire data for only four specific types of habitat data, not a full Level II stream inventory. These data were: 1) large woody debris per mile, 2) replacement large wood per mile, 3) pools per mile, and 4) Wolman pebble counts.

Reaches 1 through 4 of the 1992 Clear Creek stream survey and the first 0.30 miles of Reach 5 inventoried channel and riparian conditions below the fire between Highway 26 and the project area boundary, whereas only Reach 1 of the 2002 survey covered the same area. The last mile of Reach 5 and the first 1.85 miles of Reach 6 of the 1992 survey inventoried conditions within the fire boundary, which corresponds to Reach 2 of the 2002 stream survey. The last 0.25 miles of Reach 6 of the 1992 survey and Reach 3 of the 2002 survey were completed above the fire project area boundary.

Large Wood

Twenty pieces of wood per mile (at least 35-feet long and greater than 12-inches in diameter) is considered to be functioning appropriately according to PACFISH (1995). Results of stream surveys are shown in table below. Large wood counts include both large and medium woody debris which is effective in smaller streams. Low LWD component reduces availability of high quality pools, sorting of gravel to create spawning habitat, and increases channel instability and sediment transport, all of which impact fish habitat and populations. Reach one of Reynolds Creek spans the area between the end of private land to the confluence with North Reynolds Creek (about 1 1/2 miles).

Table of Large wood/mile for surveyed streams in Easy Fire Recovery Project Area.

Stream Name	Reach	Total pieces of large wood/mile 35-feet long and >12-inches diameter
Upper Middle Fork John Day River Watershed		
Clear Creek 1992	1	94
	2	184
	3	130
	4	144
	5	206
	6	307
Clear Creek 2002	1	42
	2	63
	3	74
Upper John Day River Watershed		
Reynolds Creek	1	No data available
North Reynolds Creek	1	33
	2	103
	3	80
	4	25
	5	177
	6	124

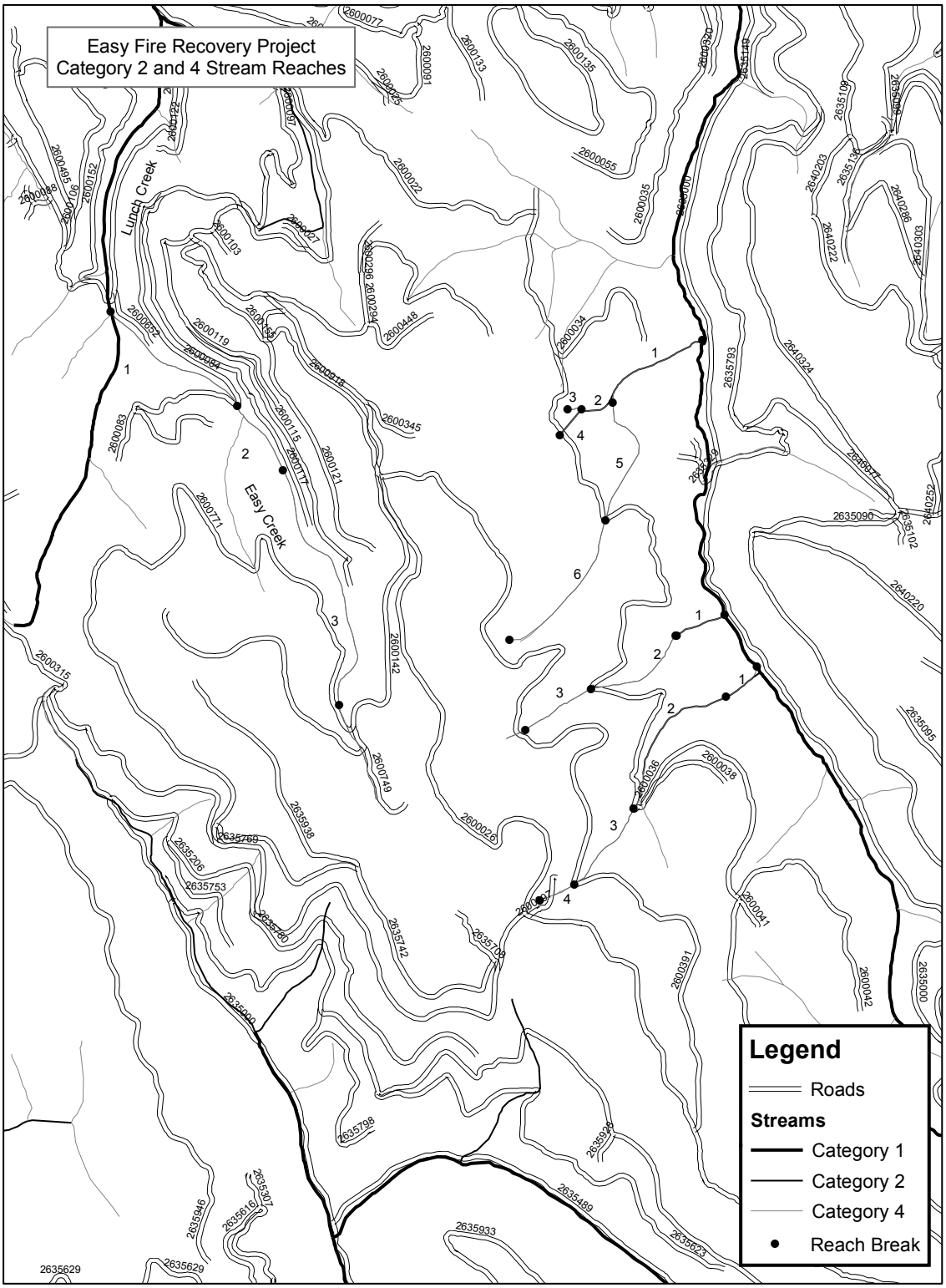
While wood counts in Clear Creek are much lower in 2002 as compared to the 1992 survey, the large wood counts are well above PACFISH (1995) objectives at two to three times PACFISH (1995) levels. Results for the North Reynolds Creek stream survey (1991) also show wood counts to be above PACFISH (1995) levels. However, data collected for Clear Creek in 2002 and North Reynolds Creek are below the minimum desired future condition (DFC) values of 80 pieces per mile specified in Amendment 29 of the Malheur Forest Plan (1990).

Post–fire wood count data was also collected for Category 2 and 4 streams in 2002 within the Easy Fire Recovery project area and is shown in the table below. While specific wood count recommendations are not specified in PACFISH (1995) or Amendment 29 of the Malheur Forest Plan (1990) for these stream categories, the plan does specify the following as resource element standard under Fish and Wildlife (Resource Element 12, IV-56): Provide for the input of large, woody debris into all classes of streams and eveluate to determine if objectives are being met. Wood count data was collected in accordance with Region 6 Level II Stream Survey protocol.

Table of large wood/mile for Category 2 and 4 streams within the Easy Fire Recovery Project Area.

Stream	Category	Total pieces of large wood/mile >35-feet long and >12-inches diameter
Easy Creek	4	40
Tributaries to Clear Creek within Project Area	2	59
Tributaries to Clear Creek within Project Area	4	20

The surveyed reach breaks for these Category 2 and 4 streams are shown in the following figure.



Large Pools

Large pools function as holding areas for migrating adult salmonids; summer and rearing habitat for juvenile salmonids, adult bull trout and redband trout; and as refugia during low flows and extreme temperatures.

All surveyed streams were found to be below PACFISH (1995) objectives of 96 pools per mile and Amendment 29 of the Malheur Forest Plan (1990) DFC minimum number of 75 per mile. See table below.

Table of Pools per Mile for surveyed streams in the Easy Fire Recovery Project area.

Stream Name	Reach	Pools per Mile
Upper Middle Fork John Day River Watershed		
Clear Creek 1992	1	15
	2	4
	3	9
	4	5
	5	7
	6	8
Clear Creek 2002	1	12
	2	11
	3	0
Upper John Day River Watershed		
Reynolds Creek	1	50
North Reynolds Creek	1	0
	2	2
	3	8
	4	50
	5	3
	6	2

Stream Substrate

Clear Creek and North Reynolds Creek were found to have a high percentage of embedded units (>35% embedded). No data was available for Reynolds Creek (See table below). Gravel for trout spawning is found in every fish bearing stream reach surveyed in the project analysis area. See following table.

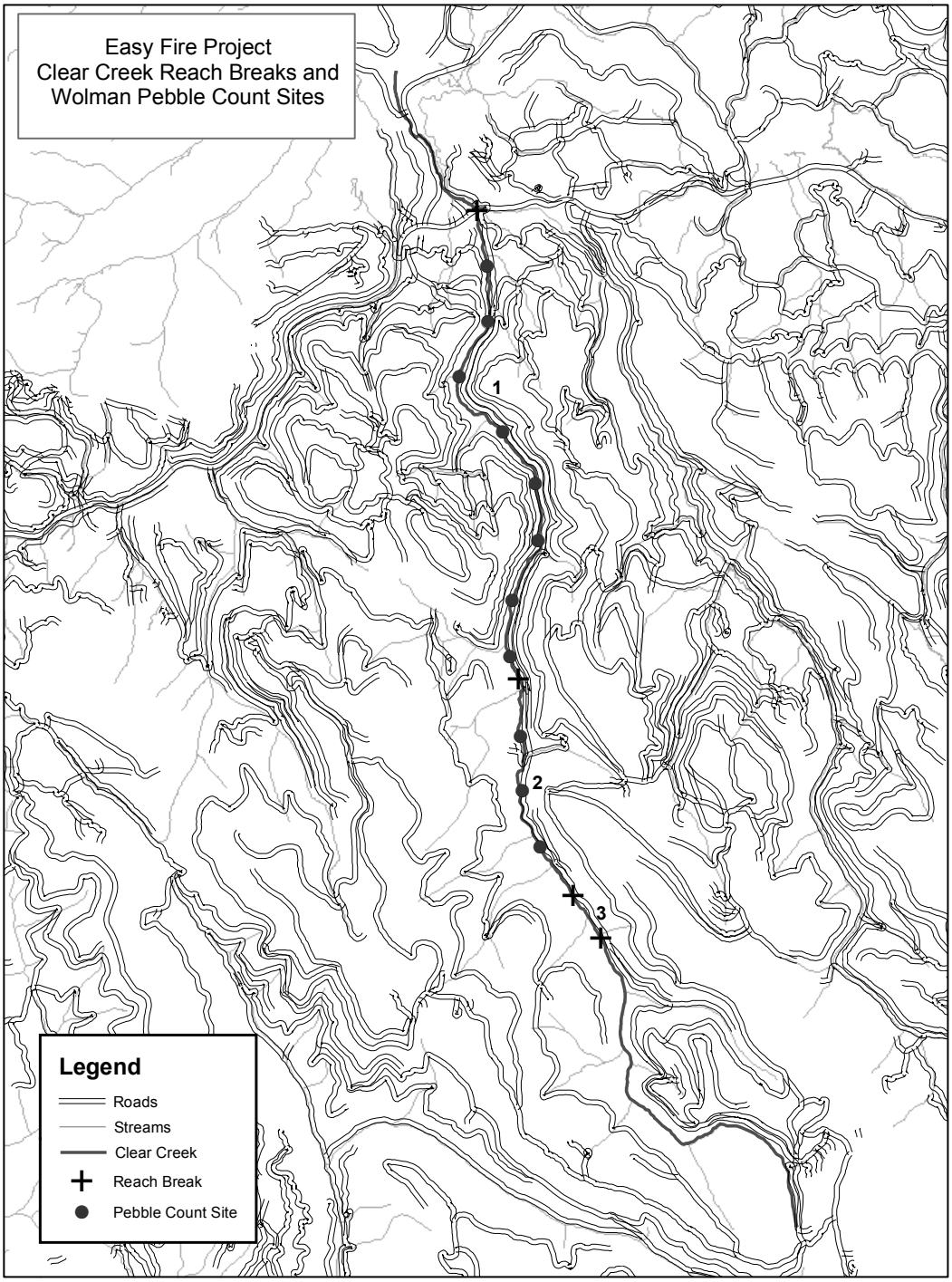
Table of substrate of surveyed streams in Easy Fire Recovery Project area.

Stream Name	Reach / %units embedded >35%	Dominant Substrate	Subdominant Substrate
Upper Middle Fork John Day River Watershed			
Clear Creek 1992	1/ 75%	Cobble	Gravel
	2/ 0-	Gravel	Cobble
	3 /0-	Gravel	Cobble
	4/56%	Cobble	Gravel
	5/86%	Gravel	Sand
	6/44%	Cobble	Gravel
Clear Creek 2002	1/No Data	No Data	No Data
	2/No Data	No Data	No Data
	3/No Data	No Data	No Data
Upper John Day River Watershed			
Reynolds Creek	1/ No data available	Cobble	Gravel
North Reynolds Creek	1/ 0	Cobble	Gravel
	2/ 0	Cobble	Gravel
	3/ 25	Cobble	Gravel
	4/ -	Cobble	Gravel
	5/ 100	Cobble	Gravel
	6/ 100	Cobble	Gravel

Wolman Pebble Count Data

While dominant and subdominant substrate and embeddedness data were not collected during the post-fire 2002 Clear Creek survey, Wolman Pebble Count data was collected. The Wolman Pebble count technique (Wolman 1954) has recently been recognized (since 1996) as a better alternative to characterize substrate than visual estimation techniques such as embeddedness. Pebble counts are also used as monitoring tools to evaluate the entry of fine sediments (i.e., sand, silt, or clay) into streams resulting from management activities such as timber harvest, fire, or road construction.

The following figure depicts reach breaks for this survey as well as the Wolman Pebble Count sites in Reaches 1 and 2.



Wolman pebble count transects were completed downstream (Reach 1) and within (Reach 2) the fire area, according to Region 6 Stream Survey Protocol (Version 2.3). Data was compiled in table below. A pebble count generally consists of a random selection of at least 100 particles from the streambed. Sand, silt, and clay particles are tallied as "less than 2 mm" or what may be regarded generally as potentially harmful to fish. Because the methodology used in collecting data is inherently biased against fines, this data can not be compared to embeddedness data from the 1992 survey, but will better serve as a monitoring tool to assess post-fire changes in stream channel particle size distributions.

The number of pebbles in size classes are tabulated and converted into percentages. The resulting frequency distribution represents a representation of the streambed covered by particles of a certain size since each pebble represents a portion of the bed surface.

The entire width of the bankful channel is investigated, and the rocky particles of the streambed are grouped by their size. A frequency distribution by size class is graphed, and the resultant curve is used to make inferences about channel dynamics. During bankful flows, it is expected that all particles smaller than the median value (D50) displayed on the curve will be mobile, and this same value further refines the Rosgen channel type for that reach. In a similar sense, particles larger than the 84th percentile (D84) will comprise the immobile portion of the streambed during bankful discharge.

Table of Wolman Pebble Count Data- Clear Creek Survey 2002.

Reach	Site	Distance Between Sites (Feet)	Total Distance from Reach Start (Feet)	Percent Finer than 2 mm	D50 (mm)	D84 (mm)
1	1	2752		5	22.7	37.8
1	2	2668	5420	0	27.1	46.5
1	3	3044	8464	0	30.4	65.2
1	4	3951	12415	0	30.3	50.4
1	5	3107	15522	3	10.7	19.6
1	6	2756	18278	0	24.0	63.3
1	7	3248	21526	0	18.1	35.4
1	8	2734	24260	0	15.4	40.0
1	End of Reach	1241	25501			
2	1	2890		11	53.1	105.4
2	2	2837	5727	8	17.3	35.7
2	3	3042	8769	0	25.2	87.2
2	End of Reach	2875	11644			

Percent Bank Stability

Results show Reynolds Creek and Clear Creek to have highly stable banks, exceeding PACFISH (1995) objective levels of >80% and the Malheur National Forest Plan Amendment 29 (1994) DFC value of 90% in the table below. Whereas, only Reach 5 of North Reynolds Creek showed bank stability in excess of 80%.

Table of Bank Stability for surveyed streams in the Easy Fire Recovery Project area.

Stream Name	Reach	Streambank Stability (%)
Upper Middle Fork John Day River Watershed		
Clear Creek 1992	1	100
	2	100
	3	100
	4	100
	5	100
	6	100
Clear Creek 2002	1	-
	2	-
	3	-
Upper John Day River Watershed		
Reynolds Creek	1	100
North Reynolds Creek	1	58
	2	55
	3	56
	4	-
	5	86
	6	-

Wetted Width/ Maximum Depth Ratio

High width to depth ratios without shade or undercut banks commonly allow the sun to elevate stream temperatures above the optimum for salmonid summer rearing. High width to depth ratios can also limit winter rearing by allowing streams to freeze. High width to depth ratios in smaller streams can severely limit habitat available for fish at base flows due to inadequate depth as well as high water temperatures.

Wetted width to maximum depth ratios for all surveyed streams met or exceeded the PACFISH (1995) and the Malheur National Forest Plan Amendment 29 (1994) DFC objective level of <10. All reaches of Clear Creek were less than or equal to 10, Reynolds Creek reaches ranged from 4.6 to 8.7 and North Reynolds Creek reaches ranged from 6.0 to 7.4.

Summary of Effects to TES Species

The following tables display pertinent information and effects determinations to threatened, endangered, and Region 6 sensitive (TES) fish species present on the Malheur Forest. Only species with a documented occurrence within the Easy Fire Recovery project area boundary or inside the estimated zone of influence from project activties, were considered in the analysis of the effects of the alternatives.

Fish Species	Scientific Name	Status	Occurrence
Columbia River Bull Trout	Salvelinus confluentus	T	D
Columbia River Bull Trout	Salvelinus confluentus	CH	D
Mid-Columbia River Summer Steelhead	Oncorhynchus mykiss ssp.	T	D
Mid-Columbia River Spring Chinook Salmon	Oncorhynchus tshawytschaw	S	D
Mid-Columbia River Spring Chinook Salmon	Oncorhynchus tshawytschaw	MS	D
Interior Redband Trout	Oncorhynchus mykiss ssp.	S	D
West Slope Cutthroat Trout	Oncorhynchus clarki lewisi	S	D
Malheur Mottled Sculpin	Cottus bendirei	S	N

Status

T	Federally Threatened
S	Sensitive species from Regional Forester's (R6) list
MS	Magnuson-Stevens Act designated Essential Fish habitat
CH	Proposed Critical Habitat
E	Federally Endangered
C	Candidate species under Endangered Species Act

Occurence

D	Species documented in general vicinity of project activities
N	Species not documented and not suspected in general vicinity of project activities
S	Species suspected in general vicinity of project activties
HD	Habitat documented or suspected within the project area or near enough to be impacted by project activites
HN	Habitat not within the project area or affected by its activties
NLAA	May affect, but is not likely to adversely affect individuals or habitat
NI	No impact
MIIH	May impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species
WIFV	Will impact individuals or habitat with a consequence that the action may contribute to a trend towards federal listing or cause a loss of viability to the population or species
BI	Beneficial impact.

The following Table of Federally Listed and Sensitive Species Biological Evaluation Summary lists determinations for all alternatives. Effects determinations shown for Alternatives 2, 3, 4, and 5 are based on long term effects (effects greater than two years).

Fish Species	Effects Determinations Alternative 1 No Action	Effects Determinations Alternative 2	Effects Determinations Alternative 3	Effects Determinations Alternative 4	Effects Determinations Alternative 5
Columbia River Bull Trout	NLAA	NLAA	NLAA	NLAA	NLAA
Columbia River Bull Trout (CH)	NLAA	NLAA	NLAA	NLAA	NLAA
Mid-Columbia River Summer Steelhead	NLAA	NLAA	NLAA	NLAA	NLAA
Interior Redband Trout	MIIH	MIIH(BI)	MIIH(BI)	MIIH(BI)	MIIH(BI)
Westslope Cutthroat Trout	MIIH	MIIH(BI)	MIIH(BI)	MIIH(BI)	MIIH(BI)
Mid-Columbia River Spring Chinook Salmon	MIIH	MIIH(BI)	MIIH(BI)	MIIH(BI)	MIIH(BI)
Mid-Columbia River Spring Chinook Salmon (MS)	MIIH	MIIH(BI)	MIIH(BI)	MIIH(BI)	MIIH(BI)

The following is a summary of effects determinations for alternatives documented in the Biological Evaluation of the Easy Fire Recovery project.

Discussion

Analysis of Effects

Since Malheur mottled sculpin are not present in the project area or downstream, harvest or other activities within the planning area will have no direct, indirect, or cumulative effect on this species with any Easy Fire Recovery Project area alternative. Consequently, this species will not be discussed further in this BE.

Determination

Direct and indirect impacts to Malheur mottled sculpin and their habitat will not occur with the implementation of the No Action or any Action Alternative.

Columbia River Bull Trout (*Salvelinus confluentus*)

Status

Federal: Threatened (06/10/98)
State: Critical
R-6 : Not Listed
Global Heritage Rank: G3T2Q (27Oct1999)
National Heritage Rank: N?
Oregon Heritage: S2

A. Life History

Bull trout

Bull trout are a member of the char family. Bull trout exhibit three life history forms in Oregon: resident, fluvial and adfluvial (Buchanan et al 1997). Resident life history forms spawn and rear in their natal streams. Fluvial life history forms migrate and rear to maturity in larger rivers. Adfluvial life history forms migrate and rear to maturity in lakes. Resident and fluvial life history forms are present in the MFJD metapopulation (T. Unterwegner, ODFW, personal communication 1997). By rearing in larger rivers and lakes migratory forms typically grow to larger sizes compared to resident forms. Increased size results in an increase in fertility (Goetz 1989).

Bull trout spawn from August through November when water temperatures drop to 5 to 9 C (Fraley and Shepard 1989). Bull trout require clean gravel with little silt for spawning (Weaver and White 1985, Rieman and McIntyre 1993) and are strongly associated with the stream bottom (Rieman and McIntyre 1993). Increases in fine sediment can reduce embryo survival and fry emergence. Embryos incubate over winter and hatching occurs in January. Successful incubation requires upwelling groundwater. Fry emerge from the gravel in early spring. The extended incubation period suggests that embryos and fry are susceptible to highly variable streamflows, bedload movement and channel instability (Rieman and McIntyre 1993).

Bull trout fry utilize side channels, stream margins and other low velocity areas (Rieman and McIntyre 1993). As juveniles increase in size they utilize pools, undercut banks, areas with large wood and other highly complex habitat. Juveniles require cold water trib rearing habitat with an abundance of rocks and woody debris for cover (Fraley et al. 1989). Optimum juvenile growth occurs in water temperatures from 4 to 10 C (Buchanan and Gregory 1997). Feeding habits of juveniles change as size increases (Shepard et al. 1984). Juveniles less than

110 millimeters (mm) feed almost exclusively on aquatic insects. Juveniles from 110 to 140 mm begin to feed on fish. Resident fish rear to maturity in natal or nearby streams. Migratory life history forms generally migrate from natal streams to larger rivers or lakes at 2 to 3 years of age. Migration can occur in spring, summer or fall (Shepard et al. 1984).

Bull trout mature between 5 and 7 years of age (Rieman and McIntyre 1993). Fluvial adults require large pools with abundant cover in rivers. Adfluvial adults utilize all areas of lakes for rearing habitat (Hanzel 1986). Adults are found in water temperatures from 4 to 20 C with optimum temperatures of 12 C (Buchanan and Gregory 1997). Feeding habits of adults vary according to life history form and food availability (Shepard et al. 1984). Resident adults feed on both insects and fish. Fluvial and adfluvial adults are predominantly piscivorous. Adults begin migrating to spawning areas in late spring through early fall (Martin 1985). Adults generally return to rearing areas within a month of spawning (Thiesfield et al. 1996).

B. CONDITION AND DISTRIBUTION OF BULL TROUT

Upper Middle Fork John Day River Watershed

Bull trout

Bull trout are reduced in both numbers and distribution within the MFJD River subbasin. Bull trout were found prior to 1990 in Indian Creek, Big Boulder Creek, Butte Cr, Davis Creek, and Vinegar Creek. Bull trout were also found in the mainstem MFJD below Indian Creek and from Clear Creek upstream to Phipps Meadow. It is assumed that interchange between all John Day River metapopulations occurred in the past. Fluvial life history forms once had access to the Columbia and Snake Rivers and may have used these rivers for rearing habitat (Buchanan et al. 1997).

Currently, bull trout are found in the Big Creek, Granite Boulder Creek, and Clear Creek drainages. These subpopulatiobns constitute the MFJD metapopulation (Buchanan et al. 1997). The mainstem MFJD serves as a seasonal migration corridor for the three subpopulations. It is likely that some members of these populations move into the main MFJD River and possibly other tributaries when water temperatures are cooler, but currently it is unknown as to the extent of connectivity between the three populations of the MFJD.

Clear Creek is the only stream in the UMFJDR watershed with documented Bull trout presence. However, it is assumed that use has occurred or will soon in Lunch Creek with access provided two years ago around Bates mill on Bridge Creek.

Status of the upper MFJD subpopulation was classified as ``probably extinct'' in 1992 (Ratliff and Howell 1992). Status for the Granite Boulder and Big Creek subpopulations was classified as at ``high risk of extinction'' in 1992 (Ratliff and Howell 1992). These classifications remain unchanged in 1997 (Buchanan et al. 1997). The Clear Creek subpopulation was classified as at ``high risk of extinction'' in 1997 (Buchanan et al. 1997).

Outside influences have effected the viability of bull trout in the UMFJDR watershed. These include: 1) isolation from other Columbia River metapopulations by dams. 2) fragmentation of the John Day bull trout metapopulation into three isolated populations, and 3) isolation of subpopulations in the Middle Fork subbasin due to poor habitat in the Middle Fork John Day River.

Very little data is available to determine the size of the bull trout subpopulation in Clear Creek. In 1992 surveys were conducted by Oregon Department of Fish and Wildlife (ODFW) which included the sampling of bull trout in two locations on Clear Creek. Results of the survey estimated a spawning density of 17 bull trout per mile. Estimating a minimum of three miles of habitat the estimated population would be 51 spawners. This estimate is rough, as the sampling was not randomized nor conducted without block nets (Claire and Gray 1993).

Density surveys of bull trout conducted in Big Creek and Granite Boulder Creek estimated 625 spawning age bull trout per 5 miles and 375 spawning age bull trout per 0.75 miles of habitat in Big creek and Granite Boulder Creek, respectively, in 1992. Given these density estimates and estimated miles of habitat, an additional 1,000 spawning age bull trout are estimated to be a part of the meta-population. These surveys were not conducted with the intention of estimating population size. The estimates presented are merely extrapolations based on available surveys and do not have statistical validity to be expected if the original sampling objectives were to estimate actual population size.

Migratory habitat in the upper Middle Fork of the John Day River is poor due to seasonal thermal barriers and lack of complex pool habitat (Claire and Gray 1993) and may limit movement between subpopulations in the subbasin.

Upper John Day River Watershed

Bull trout

Historical information prior to 1990 reveals that isolated sightings of bull trout were recorded only in Dads Creek, Dixie Creek, and Pine Creek of the UJDR watershed.
The John Day River metapopulation is composed of bull trout in the Prairie City and Upper John Day River watersheds. A determination was made that the bull trout populations in the two watersheds have little chance for connection to other bull trout populations in the John Day River system, thus constituting a separate metapopulation. The Reynolds Creek subwatershed of the UJDR encompasses the southwest edge of the Easy Fire Recovery Project area. Bull trout are found in two streams within this subwatershed that parallel the southwest project area boundary and are potentially effected by project activities; North Reynolds Creek and Mossy Gulch. Mossy gulch flows along the west side of the project boundary while North Reynolds Creek flows along the south side.

The John Day River metapopulation is rated at low risk of extinction (Buchanan et al. 1997). Oregon Department of Fish and Wildlife research is currently implementing a life history study on bull trout in this watershed. Spawner density was recorded as 0 by ODFW in 1991. Size ranges of bull trout sampled at that time ranged between 30 and 140 mm indicating resident adults were not present or present at very low numbers. In the same year spawner density in North Fork Reynolds Creek, where at least one redd has been found, was recorded

at 15. During this survey bull trout sizes ranged from 90 to 230 mm indicating multiple age classes were present. ODFW estimated the total spawner density in the Upper John Day River to be a minimum of 304 in 1990 (ODFW 1991). Size ranges of bull trout with that survey ranged from 60 to 300 mm indicating all life history stages were present.

Analysis of Effects Effects on fish from the Easy Fire include indirect effects from short-term changes in habitat initiated by the fire. Increases in large woody debris to Clear Creek, within the project area, are expected as snags fall into streams but these numbers are expected to be low due to the minimal impacts of the fire to the Clear Creek RHCA overstory. Long term benefits of the fire rejuvenating riparian hardwoods and other vegetation will likely result. The stream temperature of Clear Creek is not expected to rise due to effects from the fire or incoming tributaries. Effects to fish and habitat outside the Easy Fire Recovery Project area, but with the potential area of effects from the fire, are not expected to be significant.

The Malheur Forest Plan, Amendment 29 to the Malheur Forest Plan, the Regional Foresters Amendment #2 to east side forest plans, and PACFISH (1995) sets objectives for management activities that should result in the recovery and protection of habitat of sufficient quality and quantity to avoid impacts to bull trout near and within the Easy Fire Recovery Project area. Actions which do not prevent attainment of the specified objectives should result in no adverse impacts to bull trout or their habitat. There are no long-term adverse effects expected on fish habitat complexity or quality from action alternative project activities, both within the project area and downstream. Water yield, water temperature, and sediment delivery to streams are not predicted to increase above baseline levels. However, there is an increased risk of short-term sediment into local perennial streams with haul road maintenance activities associated with implementation of action alternatives. While these short-term impacts are not expected to be measurable, long-term benefits to fish habitat and populations will result from haul road maintenance and road closure activities. Chemical contamination to streams is possible from project activities but unlikely due to design criteria.

With the no action alternative, a failure to perform needed road maintenance will result in a further degraded road drainage system in the area in the long-term. However, currently road conditons in the project area are good due to recent sale reconstruction activities.

Determination
The Easy Fire Recovery project, including road maintenance, temporary road work, and harvest activities may affect but is not likely to adversely affect (NLAA) Columbia River bull trout or their habitat (proposed critical) with the implementation of the No Action or any Action Alternative.

Middle Columbia River Spring chinook (*Oncorhynchus tshawytscha*)

Status

Federal: Not listed
State: Not listed
R-6 : Sensitive (1997)

Global Heritage Rank: G5T?Q
National Heritage Rank: N?
Oregon Heritage: S?

A. Life History

Spring chinook salmon

Adult spring chinook salmon return to the John Day River Basin during the spring; generally in May. Adults hold in deep pools during the summer while sexually maturing. Spawning occurs during the fall from late August through September. Embryos incubate over the winter and emergence occurs in the spring. Juveniles generally rear for one year in freshwater. Both adult and juvenile chinook salmon seek out the cooler waters of the tributaries when temperatures become high in the MFJDR. Juveniles use habitats with slower water velocities (pools, glides, and side channels). Juveniles overwinter in deep pools with abundant cover. Smoltification and emigration to the ocean occurs in the spring of their second year. The ocean rearing phase lasts for one to three years.

The lower portions of Clear Creek has suitable water quality and habitat for successful spawning and rearing, and it is believed that if more fish were available in the system, then more spawning chinook salmon would be observed in Clear Creek.

B. Condition and Distribution

Spring Chinook Salmon

Spring Chinook in the John Day River Basin are composed entirely of native stocks. Spring chinook salmon are present in three streams in the upper UMFJDR watershed. The MFJDR has historically contributed approximately 12% of the total run for the basin (USFWS and NMFS 1981). Estimated escapement to the John Day Basin has averaged 2,670 adults since 1987 (see table of estimated spawning escapement of spring chinook salmon and steelhead to the John Day Basin).

Analysis of Effects Effects to spring chinook downstream from the Easy Fire include indirect effects from short-term changes in habitat initiated by the fire. Within the project area, increases in large woody debris to Clear Creek are expected as snags fall into streams but these numbers are expected to be low due to the minimal impacts of the fire to the Clear Creek RHCA overstory. Long-term benefits of the fire rejuvenating riparian hardwoods and other vegetation will likely result. The stream temperature of Clear Creek is not expected to rise due to effects from the fire or incoming tributaries.

When the Magnuson-Stevens Act of 1976 was re-authorized in 1996, it directed Regional Fishery Management Councils to identify Essential Fish Habitat (EFH) for commercial fish species of concern. This act requires federal agencies to consult with the Secretary of Commerce (NMFS) regarding any action authorized, funded, undertaken by such agency which may adversely affect EFH. Minimal risk of impact to spring chinook EFH will result from project activities.

The Malheur Forest Plan, Amendment 29 to the Malheur Forest Plan, the Regional Foresters Amendment #2 to east side forest plans, and PACFISH (1995) sets objectives for management activities that should result in the recovery and protection of habitat of sufficient quality and quantity to avoid impacts to spring chinook near the Easy Fire Recovery Project area. Actions which do not prevent attainment of the specified objectives should result in no adverse impacts to spring chinook or their habitat. There are no long-term adverse effects expected on fish habitat complexity or quality from action alternative project activities. Water yield, water temperature, and sediment delivery to streams are not predicted to increase above baseline levels. However, there is an increased risk of short-term sediment into local perennial streams with haul road maintenance activities associated with implementation of action alternatives. While these short-term adverse impacts are not expected to be measurable, long-term benefits to fish habitat and populations will result from haul road maintenance and road closure activities. Chemical contamination to streams is possible from project activities but unlikely due to design criteria.

With the no action alternative, a failure to perform needed road maintenance will result in a further degraded road drainage system in the area in the long-term. However, currently road conditions in the project area are good due to recent sale reconstruction activities.

Determination

The Easy Fire Recovery project, including road maintenance, temporary road work, and harvest activites may impact Middle Columbia River spring chinook individuals or their habitat (MIIH), but will not likely contribute to a trend towards federal listing or cause a loss of viability to spring chinook, or adversely affect their habitat (EFH) with the implementation of the No Action or Any Action alternative. Road closures and haul maintenance will have a beneficial impact (BI) with the implementation of any action alternative.

Middle Columbia River Summer Steelhead (*Oncorhynchus mykiss gairdneri*)

Status

Federal: Threatened(03/25/99)
State: Vulnerable
R-6 : Not listed
Global Heritage Rank: G5T2Q (10May2001)
National Heritage Rank: N2 (19Oct2000)
Oregon Heritage: S2

A. Life History

Summer steelhead

Summer steelhead are the anadromous form of *O. mykiss*. Adult summer steelhead return to freshwater from June through September. Adults overwinter in large rivers while sexually

maturing. Adults resume migration to spawning streams in early spring. Spawning takes place in the John Day River Basin from March through mid-June. Eggs incubate during the spring and emergence occurs from April through July depending on water temperatures. Juveniles typically spend two to three years in freshwater. They use mostly moderately sized tribs to the MFJDR for both spawning and rearing, whereas, chinook salmon generally spawn in the main river. Juvenile steelhead generally utilizes habitats with higher water velocities than juvenile chinook salmon. In winter, juveniles utilize deep pools with abundant cover. Juveniles may reside in their natal stream for their entire rearing freshwater phase or may migrate to other streams within a watershed. Smoltification occurs during late winter and emigration to the ocean occurs during the spring. Summer steelhead adults normally rear for 1 or 2 years in the ocean.

B. Condition and Distribution

Summer Steelhead

Summer steelhead runs in the John Day River Basin are composed entirely of native stocks. However, hatchery fish stray into the John Day Basin from the Columbia River (Unterwegner and Gray 1997). Steelhead are present in eight streams of the UMFJDR watershed. The Middle Fork John Day has historically contributed approximately 23% of the total run for the Basin (USFWS and NNFS 1981). Estimated escapement to the John Day Basin has averaged 13,988 adults since 1987 (see table of estimated spawning escapement of spring chinook salmon and steelhead to the John Day Basin).

Analysis of Effects Effects on fish from the Easy Fire include indirect effects from short-term changes in habitat initiated by the fire. Increases in large woody debris to Clear Creek, within the project area, are expected as snags fall into streams but these numbers are expected to be low due to the minimal impacts of the fire to the Clear Creek RHCA overstory. Long-term benefits of the fire rejuvenating riparian hardwoods and other vegetation will likely result. The stream temperature of Clear Creek is not expected to rise due to effects from the fire or incoming tributaries. Effects to fish and habitat outside the Easy Fire Recovery Project area, but with the potential area of effects from the fire, are not expected to be significant.

The Malheur Forest Plan, Amendment 29 to the Malheur Forest Plan, the Regional Foresters Amendment #2 to east side forest plans, and PACFISH (1995) sets objectives for management activities that should result in the recovery and protection of habitat of sufficient quality and quantity to avoid impacts to summer steelhead near and within the Easy Fire Recovery Project area. Actions which do not prevent attainment of the specified objectives should result in no adverse impacts to summer steelhead or their habitat. There are no long-term adverse effects expected on fish habitat complexity or quality from action alternative project activities, both within the project area and downstream. Water yield, water temperature, and sediment delivery to streams are not predicted to increase above baseline levels. However, there is an increased risk of short-term sediment into local perennial streams with haul road maintenance activities associated with implementation of action alternatives. While these short-term adverse impacts are not expected to be measurable, long-term benefits to fish habitat and populations will result from haul road maintenance and road closure activities. Chemical contamination to streams is possible from project activities but unlikely due to design criteria.

With the no action alternative, a failure to perform needed road maintenance will result in a further degraded road drainage system in the area in the long-term. However, currently road conditions in the project area are good due to recent sale reconstruction activities.

Determination

The Easy Fire Recovery project, including road maintenance, temporary road work, and harvest activities may affect but is not likely to adversely affect (NLAA) Middle Columbia River steelhead or their habitat with the implementation of the No Action or any Action Alternative.

Redband Trout (Oncorhynchus mykis ssp.)

Status

Federal: Not Listed
State: Vulnerable
R-6 : Sensitive (Listed 1986)
Global Heritage Rank: G5T4 (10May2001)
National Heritage Rank: N4 (05Dec1996)
Oregon Heritage: S3

A. Life History

Redband Trout

Native trout found in the internal basins of Oregon are redband trout derived from the Columbia River system. Malheur redband are a genotypic sub-species adapted to unstable, harsh, environments and because they are more adapted to variable water conditions, they probably have resisted hybridization with hatchery fish. Observations have verified this adaptive nature by finding redband in some very marginal waters with high temperatures late in the summer. Redband trout move into smaller tributary streams during the summer to access cooler water during base flow periods. They tend to be small in size and are better suited for the microhabitats being maintained by base flows of less the 0.3 cfs. Hatchery rainbows would not be able to tolerate the such harsh water conditions.

Redband trout are the resident form of *O. mykiss*. Redband trout may or may not be reproductively isolated from steelhead. Redband and steelhead trout from the same geographic area may share a common gene pool. Spawning takes place in the spring from March through May. Eggs incubate during the spring and emergence occurs from April through July depending on water temperatures. Redband trout may reside in their natal stream or may migrate to other streams within a watershed. Habitat requirements are similar for redband trout and juvenile steelhead.

B. Condition and Distribution

Redband Trout

Redband trout are present in all streams in the UMFJDR watershed. However, no information is available to estimate the population size of redband trout in this watershed or the UJDR watershed.

Analysis of Effects Effects on fish from the Easy Fire include indirect effects from short-term changes in habitat initiated by the fire. Increases in large woody debris to Clear Creek, within the project area, are expected as snags fall into streams but these numbers are expected to be low due to the minimal impacts of the fire to the Clear Creek RHCA overstory. Long-term benefits of the fire rejuvenating riparian hardwoods and other vegetation will likely result. The stream temperature of Clear Creek is not expected to rise due to effects from the fire or incoming tributaries. Effects to fish and habitat outside the Easy Fire Recovery Project area, but within the potential area of effects from the fire, are not expected to be significant.

The Malheur Forest Plan, Amendment 29 to the Malheur Forest Plan, the Regional Foresters Amendment #2 to east side forest plans, and PACFISH (1995) sets objectives for management activities that should result in the recovery and protection of habitat of sufficient quality and quantity to avoid impacts to redband trout near and within the Easy Fire Recovery Project area. Actions which do not prevent attainment of the specified objectives should result in no adverse impacts to redband trout or their habitat. There are no long-term adverse effects expected on fish habitat complexity or quality from action alternative project activities, both within the project area and downstream. Water yield, water temperature, and sediment delivery to streams are not predicted to increase above baseline levels. However, there is an increased risk of short-term sediment into local perennial streams with haul road maintenance activities associated with implementation of action alternatives. While these short-term impacts are not expected to be measurable, long-term benefits to fish habitat and populations will result from haul road maintenance and road closure activities. Chemical contamination to streams is possible from project activities but unlikely due to design criteria.

With the no action alternative, a failure to perform needed road maintenance will result in a further degraded road drainage system in the area in the long-term. However, currently road conditions in the project area are good due to recent sale reconstruction activities.

Determination

The Easy Fire Recovery project, including road maintenance, temporary road work, and harvest activities may impact inland redband trout individuals or their habitat (MIIH), but will not likely contribute to a trend towards federal listing or cause a loss of viability to inland redband trout with the implementation of the No Action or Any Action alternative. Road closures and haul maintenance will have a beneficial impact (BI) with the implementation of any action alternative.

Westslope Cutthroat Trout (*Oncorhynchus clark lewisi*)

Status

Federal: Not listed
State: Vulnerable
R-6 : Sensitive (2000)
Global Heritage Rank: G4T3 (25Oct1999)
National Heritage Rank: N2 (05Sep1996)
Oregon Heritage: T3 N2

A. Life History

Westslope cutthroat trout

Resident westslope cutthroat trout (WCT) are the dominant life-history form present in the John Day River system; however, recent research has indicated larger, possibly fluvial life forms are present in the mainstem John Day River (Unterwegner 2002). Resident WCT are the one known life-history form found in the upper John Day River watershed. Resident forms are often isolated in single streams, separated from other stocks by distance and habitat conditions. However, numerous stocks in the Upper John Day River exhibit occupation of multiple, connected tributary streams that are, as a group, isolated from other, single stream stocks by geographic distance and habitat conditions (Unterwegner 2002). This connectivity is important to avoid isolation and protect the interconnected stocks from cumulative watershed effects (Unterwegner 2002).

Westslope cutthroat trout habitat includes small mountain streams, main rivers, and large natural lakes. WCT require cool, clean, well-oxygenated water. In large rivers, adults prefer large pools and areas of slow water velocity; those reaches with many pools and some form of cover generally have the highest fish densities. In lakes, WCT often occur near shore (Spahr et al. 1991). Juveniles of migratory populations may spend 1-4 years in their natal streams, then move (usually in spring or early summer, and/or fall in some systems) to a main river or lake where they remain until they spawn (Spahr et al. 1991), McIntyre and Reiman 1995). Many fry disperse downstream after emergence (McIntyre and Reiman 1995). These fry tend to overwinter in interstitial spaces in the substrate. Larger individuals congregate in pools in the winter.

No information is available regarding WCT spawning locations in the upper mainstem John Day River or its tributaries. However, WCT spawn in small tributary streams on clean gravel substrate at a mean water depth of 17-20 cm and a mean water velocity of 0.3-0.4 m/sec. They tend to spawn in their natal stream (McIntyre and Reiman 1995). Adfluvial populations live in large lakes in the upper Columbia drainage and spawn in lake tributaries. Fluvial populations live and grow in rivers and spawn in tributaries. Resident populations complete their entire life history in tributaries. All three life-history patterns can occur in a single basin (McIntyre and Reiman 1995). Migrants may spawn in the lower reaches of the same streams used by resident fish. Maturing adfluvial fish move into the vicinity of tributaries in fall and winter and remain there until they begin to migrate upstream in spring. Some migratory

spawners remain in tributaries during summer months but most return to the main river or lake soon after spawning (Behnke 1992).

B. Condition and Distribution

Westslope cutthroat trout

The largest concentrations of westslope cutthroat trout (WCT) in Oregon are found on the Malheur National Forest in the upper John Day River and tributaries.

Two branches of the John Day River, the North Fork and mainstem, contain WCT. Historic WCT distribution is sketchy; no tributaries currently absent of WCT are known to have supported these fish in the past (Unterwegner 2002). However, it is reported that "suspected" historical WCT habitat has been reduced 59 %, based on assumptions (no substantive evidence) that WCT had a wider historical distribution in the North Fork (Unterwegner 2002). The distribution of WCT in the mainstem of the John Day River system may have been much further downstream than at present; descriptions of the mainstem river valley by explorers and trappers such as Peter Skene Ogden indicate conditions suitable to these fish prior to European settlement of the West. However, distribution of year-round resident fish in the valley and foothill reaches of tributaries may have been reduced from the historic distribution due to habitat alteration (Unterwegner 2002).

Westslope cutthroat trout distribution overlaps with resident redband trout, with WCT generally being found in reaches with higher gradient, cooler temperatures, and more numerous large woody debris (Unterwegner 2002). WCT co-evolved with with native redband trout throughout the upper John Day River and tributaries. Westslope cutthroat trout distribution in the John Day drainage also overlaps with bull trout, steelhead trout, and chinook salmon but is much wider in distribution. Hybridization and introgression between WCT and redband trout has been noted in areas where overlapping distribution occurs (Unterwegner 2002) and has been occurring naturally for as long as both species have been present in the same stream.

Unterwegner (2002) reported WCT distribution upstream from the mainstem John Day River. All occupied subwatersheds in the mainstem John Day are predicted or known to have "depressed" WCT populations. Malheur National Forest (Unterwegner 2002) provided an updated WCT distribution map that contains additional WCT records, including presumed seasonal habitat distribution. In the Upper John Day River, tributaries with WCT include: Graham, Call, Roberts, Reynolds, Deardorff, and Rail Creeks. WCT in the these mainstem headwaters area exist within a "checkerboard" of public (Malheur National Forest) and private (mostly commercial timberlands, with some stream-bottom pasture lands) land ownership. Due to this land-ownership pattern, harvest on private timberlands is believed to threaten WCT in this area of the watershed; however, the highly connected streams of this portion of the watershed would allow for rapid WCT recolonization (Unterwegner 2002).

Seasonal WCT habitat includes the lower portions of most of these occupied tributaries, an additional tributary without resident WCT (Widows Creek) and the mainstem John Day River

downstream to Widows Creek (between the towns of Dayville and Mount Vernon). These "seasonal" zones appear to be habitat for wandering or migratory WCT (Unterwegner 2002).

Analysis of Effects Effects on WCT in North Reynolds Creek and Mossy Gulch Creek from the Easy Fire include indirect effects from short-term changes in habitat initiated by the fire. The stream temperature of North Reynolds Creek and Mossy Gulch Creek are not expected to rise due to effects from the fire or incoming tributaries. Effects to WCT and their habitat outside the Easy Fire Recovery Project area, but within the potential area of effects from the fire, are not expected to be significant.

The Malheur Forest Plan, Amendment 29 to the Malheur Forest Plan, the Regional Foresters Amendment #2 to east side forest plans, and PACFISH (1995) sets objectives for management activities that should result in the recovery and protection of habitat of sufficient quality and quantity to avoid impacts to westslope cutthroat trout near the Easy Fire Recovery Project area. Actions which do not prevent attainment of the specified objectives should result in no adverse impacts to westslope cutthroat trout or their habitat. There are no long-term adverse effects expected on fish habitat complexity or quality from action alternative project activities, both within the project area and downstream. Water yield, water temperature, and sediment delivery to streams are not predicted to increase above baseline levels. However, there is an increased risk of short-term sediment into local perennial streams with haul road maintenance activities associated with implementation of action alternatives. While these short-term adverse impacts are not expected to be measurable, long-term benefits to fish habitat and populations will result from road maintenance and road closure activities. Chemical contamination to streams is possible from project activities but unlikely due to design criteria.

With the no action alternative, a failure to perform needed road maintenance will result in a further degraded road drainage system in the area in the long-term. However, currently road conditions in the project area are good due to recent sale reconstruction activities.

Determination

The Easy Fire Recovery project, including road maintenance, temporary road work, and harvest activities may impact westslope cutthroat trout individuals or their habitat (MIIH), but will not likely contribute to a trend towards federal listing or cause a loss of viability to westslope cutthroat trout with the implementation of the No Action or Any Action alternative. Road closures and haul maintenance will have a beneficial impact (BI) with the implementation of any action alternative.

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