

(Reference FSH 2509.13)

O. Vegetation Types: The fire burned northerly and southerly aspects along drainages oriented east-west (North Fork of Little Thompson River, Little Rock Creek, Bear Creek, Chippy Creek, Big Rock Creek) at elevations between 3400 and 7300 feet. The burned area is primarily Douglas-fir forest types with ponderosa pine at lower elevations and on southerly aspects; lodgepole pine on midslope and upper elevations; mixed

shade-tolerant species including alpine fir and spruce at the highest elevations along ridgetops and northerly aspects; and patches of non-forested grass or shrub cover types at low to mid-elevations on southerly slopes.

P. Dominant Soils: Soils throughout the burned area are derived from weakly weathered metasedimentary rocks of the Belt Supergroup. Textures are sandy loams and fine sandy loams and contain many hard rock fragments. Surface soils may also contain volcanic ash influenced loess up to several inches deep. Riparian areas of larger streams contain undifferentiated alluvium.

Q. Geologic Types: Landforms range from rocky stream breaklands to moderate relief (30% - 50%) and steep (>65%) mountain slopes. Watershed divides are broad convex ridges.

R. Miles of Stream Channels by Order or Class: 243 miles Intermittent 84 miles perennial

S. Transportation System

Trails: 59 miles Roads: 266 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 19,482 (low) 37,439 (moderate) 10,661 (high)

B. Water-Repellent Soil (acres): Because of extreme soil dryness most soils exhibited some degree of water repellency but there were no areas where this condition was severe.

C. Soil Erosion Hazard Rating (acres):
34,680 (low) 5,693 (moderate) 3,979 (high)

D. Erosion Potential: 2.5 tons/acre (Lolo Land Systems Inv. base rates with WATSED wildfire coefficients and delivery ratios for sediment)

E. Sediment Potential: 960 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 2-7 (depending on location)

B. Design Chance of Success, (percent): 85

C. Equivalent Design Recurrence Interval, (years): 2 an 10 yr (average)

D. Design Storm Duration, (hours): **6 hr 2 and 10 year** The Lolo NF culvert database contains measured information at each culvert including stream gradient, channel width, culvert dimensions and fill height to allow calculation of in-culvert flow depths and velocities from design flows (below). Where design flows exceed the capacity of the culvert ($H/D > 1.0$) the risk of failure is considered high.
high.

E. Design Storm Magnitude, (inches):

F. Design Flow, (cubic feet / second/ square mile): Varried, see below

G. Estimated Reduction in Infiltration, (percent): 33 ~ average, depends on location

H. Adjusted Design Flow, (cfs per square mile):

Dependent on watershed size and burn severity – predicted Increases ranged from 3 to 206%. Flow bulking may add an additional 50% to the 206% ~300% increase...

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

On Forest Service lands, the Chippy Creek Fire produced a mosaic pattern of canopy burn and surface burn. Soil burn severity was mixed and judged to be predominantly low and moderate. Because of extremely low pre-existing soil moisture conditions (2 to 5 percent), conclusive determination of fire induced hydrophobic conditions was limited. Most of the road system is not at high risk for stormflow damage. However, areas on south-facing slopes in upper Chippy, Big Rock and Bear Creeks burned at high intensity and are at risk for increased flows related to both both snowmelt runoff and storm runoff. Ditch relief culverts have accumulated woody debris and sediment increasing failure potential. These roads are part of the Forest's permanent transportation system and will be needed for immediate and near-term access to accomplish re-forestation and other long-term restoration activities. Crossing structures on primary access National Forest System and county roads at the mouths of these drainages are undersized and subject to failure from fire induced runoff increases. Additional culverts on interior NFS roads below localized high intensity burned patches are also vulnerable to increased flows.

South-facing slopes in the burned area are at risk for rapid invasion of noxious weeds.

B. Emergency Treatment Objectives:

The following is a summary of treatments recommended for the immediate emergency. Treatment areas were prescribed based on the potential for damaging flood flows, loss of forest productivity, and for the mitigation of loss of life and property.

These treatments are designed to:

- Protect the National Forest road system from fire related runoff increases in high burn intensity areas.
- Mitigate effects of fire induced runoff increases in Chippy, Big Rock, Bear and Little Thompson River at major stream crossings.
- Reduce loss of productivity on critical winter ranges and other vulnerable ecosystems due to noxious weed invasion along burned over roads.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:

Land ___ % Channel ___ % Roads/Trails 95 % Protection/Safety ___ %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land			
Channel			
Roads/Trails	85	90	95

Protection/Safety			

E. Cost of No-Action (Including Loss):_ A Values-at-Risk spreadsheet is attached. Of the treatments proposed, the interior roads stormproofing and the weed spraying are both economically justified with an expected benefit/cost ratio ranging from 1.4 and 1.1. The Big Rock Creek culvert replacement has an expected benefit/cost ratio of 0.4 and is not economically justified. However the non-market resource values of water quality and TES habitat protection and continuation of service on a primary access road with an implied minimum value of \$35,556 suggest the action would be appropriate.

F. Cost of Selected Alternative (Including Loss):_

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input type="checkbox"/> Range	<input type="checkbox"/>
<input type="checkbox"/> Forestry	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input type="checkbox"/>
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Botany	<input type="checkbox"/> Archaeology	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	<input checked="" type="checkbox"/> Economics

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H. Treatment Narrative:

(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

Land Treatments: None Proposed

Channel Treatments: None Proposed

Roads and Trail Treatments:

While much of the Chippy Creek fire was of low to moderate severity, some areas did burn with high severity. Most of the high severity areas occurred in the higher elevation, south-aspect portions of Chippy, Big Rock and Bear Creeks where a total of 133 mile of National Forest System Roads are effected. Road treatments, then, are designed to address higher runoff and debris accumulation in existing drainage features and install additional water bars as needed. The fire induced runoff increases in these and other drainages were modeled and routed through the main crossing structures at the mouths of the watersheds. The Lolo NF Culvert Database contains sufficient quantitative data to calculate whether existing structures have the capacity to accommodate the increased runoff. Our calculations revealed that for several structures, the post-fire "headwater-to-depth ratio exceeded '1'; meaning in an average runoff year the culvert would be over topped with a high likelihood of failing.

Because there is a high risk of introducing invasive weeds from the perimeter of the fire into vulnerable areas within the fire, ground-based herbicide treatments are proposed on roads leading into previously weed-free areas within the burn. There will be approved NEPA before any treatments occur. Finally, to also discourage the invasion of weeds, areas receiving mechanical treatment will be seeded and fertilized.

Road treatments designed for the Chippy Creek fire area include:

Preventive maintenance-type activities to ensure proper drainage. These activities include cleaning existing culverts, re-shaping drainage ditches, cleaning and reshaping drivable dips, and constructing new drivable type dips where needed. Clearing of burned over small trees and brush will be required for access in some areas.

Replacement of undersized culverts on Road 56 at Big Rock Creek. On Big Rock Creek the post-fire flow increase is 44 percent producing a 30 percent increase in headwater-to-depth ratio. The Big Rock Creek crossing however encroaches on the active channel and consists of twin culverts with an “at risk” fill volume of 225 cubic yards about one-half mile upstream from the confluence with the Thompson River, a Priority Bull Trout Conservation Watershed. The Thompson River is a critical watershed to the Lower Clark Fork for the recovery of this listed species. The Thompson River and its tributaries also provide important habitat to the native West Slope Cuthroat Trout. The twin culverts have over-topped twice in the past ten years. **The cost of this replacement will be shared 50/50 with Saunders County using non BAER emergency funds.**



The above photo of the Big Rock Creek crossing illustrates the fill encroaching on the floodplain and the damage to the culvert inlets sustained by previous encounters with bedload and floatable debris.

Protection/Safety Treatments: None Proposed

I. **Monitoring Narrative:**

(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Monitor effectiveness of noxious weed treatment by standard vegetation plot transect methodology and road surveys. Survey would be conducted mid-to-late summer 2008. Monitor high potential infestation sites for noxious weed species in the burned area; determine need and extent of follow-up control treatment to be implemented. Data gathered will be used to facilitate prompt re-treatment to control weed populations for the purpose of protecting native plant diversity and ecological integrity of the plant communities in the burned area. Estimated cost of monitoring is ten work-days (\$3,000).

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #

				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treat.				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
Road Clearing & Brush	Miles	520	133	\$69,160	\$0		\$0		\$0	\$69,160
Culvert Cleaning (\$100	Miles	600	133	\$79,800	\$0		\$0		\$0	\$79,800
Construct Additional D	Miles	1,500	133	\$199,500	\$0		\$0		\$0	\$199,500
Enlarge Ditches to Acc	Miles	520	133	\$69,160	\$0		\$0		\$0	\$69,160
Hazard Tree Removal	Miles	200	133	\$26,600	\$0		\$0		\$0	\$26,600
Seeding & Fertilizing	Miles	750	133	\$99,750	\$0		\$0		\$0	\$99,750
Roadside Weed Treatr	Miles	141	180	\$25,380	\$0		\$0		\$0	\$25,380
Spot Spray Weeds	Acres	25	10	\$250	\$0		\$0		\$0	\$250
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Road & Trails				\$569,600	\$0		\$0		\$0	\$569,600
D. Protection/Safety										
				\$0	\$0		\$0		\$0	\$0
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Structures				\$0	\$0		\$0		\$0	\$0
E. BAER Evaluation										
Team	Each	4,895	1	---	\$4,895		\$0		\$0	\$4,895
Insert new items above this line!				---	\$0		\$0		\$0	\$0
Subtotal Evaluation				---	\$4,895		\$0		\$0	\$4,895
F. Monitoring										
Weed Treatment	Days	300	10	\$3,000	\$0		\$0		\$0	\$3,000
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$3,000	\$0		\$0		\$0	\$3,000
G. Totals				\$572,600	\$4,895		\$0		\$0	\$577,495
Previously approved										
Total for this request				\$572,600						

XXXXXX

*Culvert cleaning, construction of additional dips, and enlarging ditch costs from the R-1 Cost Estimating Guide for Road Construction.

PART VII - APPROVALS

1. _____
Forest Supervisor (signature) _____
Date
2. _____
Regional Forester (signature) _____
Date