

Date of Report: 12/13/2004 Final Report

BURNED-AREA REPORT
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST**

A. Type of Report

- ☐ 1. Funding request for estimated WFSU-SULT funds
- ☐ 2. Accomplishment Report
- ☐ 3. No Treatment Recommendation

B. Type of Action

- ☐ 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)
- ☐ 2. Interim Report
 - ☐ Updating the initial funding request based on more accurate site data or design analysis
 - ☐ Status of accomplishments to date
- ☒ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTIONA. Fire Name: Purdy CreekB. Fire Number: MT-GNF-01-070C. State: MTD. County: GallatinE. Region: 01F. Forest: GallatinG. District: BozemanH. Date Fire Started: 09-26-2001I. Date Fire Contained: 10-04-2001J. Suppression Cost: \$5,000,000

K. Fire Suppression Damages Repaired with Suppression Funds

- 1. Fireline waterbarred (miles):
- 2. Fireline seeded (miles):
- 3. Other (identify):

L. Watershed Number: 100200080705 (Gallatin River Gateway); 100200080702 (Bear Cr); 100200080701 (West Fork Wilson); 100200080701 (Middle Fork Wilson); 100200080607 (Gallatin River Storm Castle); 100200080604 (Native Woman Cr)M. Total Acres Burned: 5,023

NFS Acres(3,621) Other Federal (0) State (309) Private (1,093)

N. Vegetation Types: Primarily lodgepole pine, with some grassland, douglas fir, subalpine fir, whitebark pine, meadow, riparian, aspen

O. Dominant Soils: The landscape on the southern two-thirds of the wildfire area is dominated by Typic Cryochrepts, loamy-skeletal soils (moderately coarse textured soils with light colored surface layers and many rock fragments) which occur on steep slopes. These soils also occur on gentle slopes at the southern end of the fire perimeter. The northern one-third of the wildfire area is dominated by Cryoboralfs, loamy-skeletal soils (moderately coarse to medium textured, rocky soils with light colored surface layers and clayey subsurface layers) which occur on all slopes. The latter is primarily on private land within the National Forest boundary.

P. Geologic Types: The southern two-thirds of the wildfire area is dominated by coarsely-crystalline rocks such as granite and gneiss, with some schist. The northern one-third is dominated by interbedded sandstone and shale, with some limestone. The latter is primarily on private land within the National Forest boundary.

Q. Miles of Stream Channels by Order or Class:

1st order: 6.5 mi 2nd order: 2.5 mi 3rd order: 2.3 mi

R. Transportation System

Trails: 0 miles Roads: 46 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): (low) 2098 (moderate) 2863 (high) 62

B. Water-Repellent Soil (acres): 2913

C. Soil Erosion Hazard Rating (acres):
1,633 (low) 1633 (moderate) 1,758 (high)

D. Erosion Potential: 9.8 tons/acre (high severity area)
5.2 tons/acre (low severity area)

E. Sediment Potential: 8,260 cubic yards/square mile (high severity)
4,130 cubic yards/square mile (low severity)

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):
3 years understory forest
25 years forest

B. Design Chance of Success, (percent): 80

C. Equivalent Design Recurrence Interval, (years): 10

D. Design Storm Duration, (hours): 24

E. Design Storm Magnitude, (inches): 2.6

F. Design Flow, (cubic feet / second/ square mile): 11.3

G. Estimated Reduction in Infiltration, (percent): 58%

H. Adjusted Design Flow, (cfs per square mile): 29.9

V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

The following is a short summary. Complete documentation is contained in the reports in Appendix A.

Threats to Life and Property

Field reviews within the burned area and downstream of the burned area confirm that threats to life are unlikely but that threats to property are somewhat likely. A constructed fish barrier/irrigation diversion structure on private land at the north end of the fire on WF Wilson Creek is at risk. This concrete/steel structure was completed about two weeks before the fire at a cost of approximately \$30,000 as a cooperative project between the Gallatin NF, Montana DFWP, private landowner, and the water right holder (who is not the landowner where the structure is located). The structure was not affected directly by the fire. The diversion structure could be covered by sediment as a result of the fire, causing the channel to divert around the structure. If this were to occur, the fish barrier could be breached, possibly allowing invasion of other fish into the 100% pure westslope cutthroat trout population up West Fork Wilson Creek and possibly clogging the irrigation ditch with sediment as well as adding sediment to the lower reaches of WF Wilson.

A private land assessment by Natural Resources Conservation Service (NRCS) is on-going but is not expected to be completed until later this month.

Threats to Long-Term Soil Productivity and Ecosystem Integrity

Field reviews indicate potential threats to long-term soil productivity and ecosystem integrity. Observations from this and other fires suggest that there will likely be an increase in noxious weed infestation, primarily from spotted knapweed (*Centaurea maculosa*). All burned area and especially those with moderate and high burn severity that are invaded by noxious weeds will cause a decline in soil quality and productivity.** Degradation of soil quality generally leads to increased erosion rates and sediment yield, causing further impacts to soil productivity and water quality/fisheries.

Portions of valley bottoms and timber harvest areas that had large woody debris loads have the most extensive high severity burn area (approximately 5% of their area). These are a high erosion hazard threat and there is a concern about soil productivity and quality in portions of the West Fork Wilson Creek watershed.

**Maintaining soil quality is necessary for long-term soil productivity and ecosystem integrity. Key soil quality factors include infiltration, sorptivity, water holding capacity, structure, ion exchange characteristics, carbon and nitrogen cycling, and soil food web status.

Threats to Water Quality

Westslope cutthroat trout occur in West Fork Wilson creek. This species has been petitioned for listing and is a sensitive species for the Forest Service and a species of special concern for the state of Montana. The population in WF Wilson is considered to be the best population in the Gallatin basin. Even so, the population is small and isolated and cannot migrate out of the watershed. There is concern that sediment will fill pools and cover spawning gravel. Sediment modeling indicates that WF Wilson sediment yields will increase from 64% over natural to about 190% over natural and that Wilson Creek sediment could increase from 37% over natural to 64% over natural. WF Wilson already is over % over natural guidelines for sediment and % fines in spawning gravel guidelines as established by the Gallatin NF Forest Plan (approx. 35% fines by weight). This drainage has the most extensive burn area in the fire and additional sediment could come from the steep adjacent slopes and from roads and failed culverts. If this occurs, the percent fines is expected to be as much as 400% over guidelines. Numerous westslope cutthroat have died as a direct effect of the fire. On October 10, 2001, the Montana Dept. of Fish, Wildlife and Parks, with assistance from the Gallatin NF, will remove approximately half of the remaining westslope population in

WF Wilson and move them to isolated waters off-site. This is a risk reduction move designed to limit the potential negative effects of the fire on this important population

B. Emergency Treatment Objectives:

- Temper fire effects on westslope cutthroat trout and habitat by reducing erosion and potential sediment input to WF Wilson creek and its tributaries.
- Lessen fire effects from roads by recontouring 9 miles of roads in West Fork Wilson which are likely to be direct sediment contributors, and removing culverts and restoring drainage in 16 miles of other roads in WF Wilson that are likely sediment contributors.
- Reduce and mitigate effects on soil productivity and ecosystem function by limiting erosion, containing weed colonization and spread, and by initiating revegetation on the most problematic areas (steep slopes and high intensity/severity burn).

C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:

Land 90 % Channel -- % Roads 90 % Other 90 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land			
seeding	70	70	70
weed spraying	80	90	90
Channel			
Roads			
culverts	90	90	90
recontouring	80	90	100
Other			

E. Cost of No-Action (Including Loss): \$721,921

F. Cost of Selected Alternative (Including Loss): \$449,921

G. Skills Represented on Burned-Area Survey Team:

☒ Soils ☒ Hydrology ☐ Geology ☒ Range ☐
☒ Forestry ☐ Wildlife ☐ Fire Mgmt. ☒ Engineering ☐
☐ Contracting ☐ Ecology ☐ Botany ☐ Archaeology ☐
☒ Fisheries ☐ Research ☐ Landscape Arch ☒ GIS

Team Leader: Dan Svoboda

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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:

Seeding

Aerial seed 385 acres of steep slopes adjacent to westslope cutthroat (sensitive species) stream (slopes range from 20 to 100%) with non-invasive, non-competitive winter wheat (*Triticum aestivum*) to stabilize soil, reduce erosion and sediment (it is likely too late in the year to sow winter wheat). Apply seed this fall to start a stand as soon as possible after snowmelt in the spring. Areas to be seeded include terraces and adjacent slopes in West Fork Wilson Creek (see map, appendix).

Species	Seeding rate (lb pls/ac)	PLS/ lb	Cost/ lb	PLS/sq. ft.	Seed/Application Cost \$	Total Cost \$
<i>Triticum aestivum</i>	120	11,133	\$0.09	30	4,389 / 18,480	22,869 or 60/ac

Weed Spraying

Treat and monitor 1,212 acres across the burn that are mostly within a few hundred feet of road corridors. and other areas that occur mostly adjacent to landings and clear-cuts. Treatment will be done in accordance with the Gallatin Forest weed treatment environmental impact statement. Treatment will begin as soon as possible in spring/early summer. Treatment will be by vehicle and backpack sprayers.

Planting – Recognized need not covered by BAER authorization

Several large clearcuts which were done before the land became National Forest through the BSL land exchange were in the process of regeneration (see timber spec. report, Appendix A). Some of these plantations have burned and are now isolated from tree-seed sources. The team recommends planting strategic areas within burned plantations to reintroduce tree seed so that these plantations can eventually be reforested.

Invasive species seeding

Seeding to reduce the risk of spread of knapweed and invasive weed species is proposed. After consultation with the Regional Botanist, *Lolium multiflorum* (ryegrass) was selected as an appropriate species to be seeded for this purpose

Channel Treatments:

No emergency channel treatments proposed.

Road Treatments:

Three land sections that are entirely or mostly within the burn were formerly private (BSL), but have since been acquired by the Forest through land exchange. Each of these sections were extensively roaded and logged. Drainage structures are not adequate to carry post fire runoff and many road were constructed by pushing the excavated material over the down slope side of the road. Much of this sidecast material is now burned and unprotected from erosion. Many of these roads are in excess of the Forest transportation system needs and will result in adverse impacts to fisheries, water quality, and/or soil quality problems if not treated. The BAER team has identified two classes of recommended road treatments to meet emergency rehabilitation objectives: 1) Close and obliterate roads. This would remove culverts, recontour the road and fill, slash and seed for 9 miles (and see map appendix B, attached). 2) Close and stabilize roads (without obliteration). This would include removing culverts,

reshaping drainage, ripping the road surface with a winged subsoiler to reduce compaction and increase infiltration, and seed for miles.

The roads recommended for recontouring are poorly constructed on steep slopes and erodible soils immediately above the West Fork of Wilson Creek. The roads recommended for closing are those with erodible soils but higher on the slope from WF Wilson (see road map in appendix B).

Structures:

As this fire contains active grazing allotments, livestock control concerns have arisen due to the fire. Formerly, the timber stand on some key slopes prevented cattle use from crossing the ridges into the wrong pastures. Those timbered stands are now burned so fencing is proposed to control livestock movement.

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.)

This section contains a summary of monitoring work. See the monitoring sections in the full reports contained in appendix A.

Seeding implementation and effectiveness monitoring

Monitor seed application to ensure that the specified rate of :PLS/sq ft is applied. Establish random monitoring sites within areas to be seeded. Set up plots using cardboard sheets overlain with square foot pieces of sticky paper. Use belt transects to determine that seed application resulted in the specified stand density. Monitor growth over the season to ensure objectives are met. Establish photoplots for documentation.

Weed spraying implementation and effectiveness monitoring

Monitor spraying to ensure objectives and safe spraying practices are being met. Ensure that Forest weed EIS requirements and guidelines are met. During 2002-2004 monitor effectiveness of the treatment and establishment of any new weed populations. Locate and map existing and new populations with GPS. Establish photo plots for documentation.

Road treatment monitoring

Ensure that the contracting officer applies the appropriate contract language and specifications for road obliteration, drainage, and ripping with a winged subsoiler. The project administrator will visit the job sites daily to ensure the contract or force account is implemented correctly. Gallatin NF resource personnel including engineering, soils, hydrology, and fisheries will inspect the project early-on to insure that the work is progressing as planned. Roads will be inspected for two years following road obliteration or closure. Effectiveness of treatments and any need for additional work will be assessed.

Fish population/habitat monitoring

Fisheries monitoring will consist of checking the barrier on WF Wilson creek; electrofishing surveys for three years to determine population numbers and age classes; and core sampling to monitor Forest plan standards for sediment in spawning and rearing reaches. If standards are not obtained additional erosion control measures may be requested.

Stream cross-sectional monitoring

Stream reference sites will be established on West Fork Wilson and Wilson Creeks near the forest boundary. Reference measurements include channel cross-sections and gradients, Wolman pebble counts and RASI, and channel stability. These measurements will establish post-fire and pre-flood conditions in these streams. The cross sectional measurements will be repeated during the fall of 2002 and 2003 to determine trends.

Livestock movement monitoring

Fencing is proposed to replace the former timber barriers to manage livestock. The allotment administrator must make sure that this fence is effective. This would be within the normal allotment administration duties so no monitoring cost is being requested.

Invasive seeding for noxious weeds

There are currently some stands of noxious weeds within the burn (see range/weed report, appendix A). The District range person proposes to seed *Lolium multiflorum* (ryegrass) to compete with knapweed. District personnel will monitor this seeding by utilizing test plots and determine whether or not noxious weeds are colonizing these areas, and if so, at what rate and density. If noxious weeds colonize, they will be treated by spraying.

Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

**PART VI -- EMERGENCY
STABILIZATION AND REHABILITATION
TREATMENTS AND SOURCE OF FUNDS
BY LAND OWNERSHIP**

Purdy Fire

			Gallatin NF			
Line Items	Units	Unit Cost	# of Units	WFSU SULT \$		
A. Land Treatments						
seeding	acres	60	385	\$23,100		
weed spraying	acres	11	3600	\$30,192		
invasive species	acres	1000	5	\$5,000		
Subtotal Land Treatments				\$58,292		
B. Channel Treatments						
Subtotal Channel Treatments				\$0		
C. Road and Trails						
obliteration	mile	10166	3	\$30,500		
closure/drainage	mile	2475	16	\$39,600		
culvert replace/drain	mile	1580	10	\$15,800		
Subtotal Road & Trails				\$85,900		
D. Structures						
fence	mile	6000	1	\$6,000		
fence maint.	mile	500	3	\$1,500		
Subtotal Structures				\$7,500		
E. BAER Evaluation						
assessment team	each	20000	1	\$20,000		
implementation	each	20000	1	\$13,529		
Subtotal BAER Evaluation				\$33,529		
F. Monitoring						
fish pop/habitat	days	345	16	\$5,520		
weeds	days	275	62	\$13,317		
seeding	days	275	10	\$2,750		
stream reference	days	625	2	\$2,750		
roads	days	1100	10	\$11,000		
	days					
	days					
Subtotal Monitoring				\$35,337		
G. Totals				\$220,558		

\$265,014
\$44,456

authorized
excess

* note excess
was used to
balance Frider
BAER which
finalized with a
\$5,452.40
balance

PART VII - APPROVALS

1. /s/ James A. Devitt _____ 10-11-2001
for Forest Supervisor (signature) Date

2. /s/ Martin Prather for _____ 10-12-2001
Regional Forester (signature) Date