USDA-FOREST SERVICE FS-2500-8 (7/00)

Date of Report: 08/14/02

**BURNED-AREA REPORT**
(Reference FSH 2509.13)

## PART I - TYPE OF REQUEST

A. Type of Report

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

B. Type of Action

[x] 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 DESCRIPTION

A. Fire Name: Tool Box Complex

B. Fire Number: ODF-009

C. State: OR

D. County: Lake

E. Region: Pacific Northwest

F. Forest: Fremont

G. District: Silver Lake

H. Date Fire Started: 7/12/2002 1800

I. Date Fire Contained: 08/05/2002 1800

J. Suppression Cost: $6,863,521 as of 8/052002, which excudes Winter Rim's cost of $10,285,111 that became part of the complex)

K. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 70 of 145 miles as of 8/12002, and water bars will be completed as the fire is controled.
2. Fireline seeded (miles): 0
3. Other (identify): .

L. Watershed Number: Duncan Creek 1712000503; Silver Creek 1712000502; and Summer Lake 1712000510

M. Total Acres Burned: 86,794 acres, which excudes Winter Rim's 33,894 acres that became part of the complex)

NFS Acres(51,284) Other Federal (8,015 BLM ) State (52 ) Private ( 27,443)

N. Vegetation Types:

Ponderosa pine/bitterbrush/sagebrush dominate the Silver fire area. Areas of lodgepole pine/sedge/bitterbrush are scattered throughout, mostly in the ridges above creek canyons and bordering meadows where frost pockets are common. The northeastern area of the fire bordering the public land is a ponderosa pine/juniper/ bitterbrush intermixed with a juniper/bitterbrush/ bunchgrass plant association. In these plant drier plant associations, these areas are erosion concern with naturally sparse ground cover and the potential for noxious weed invasion.

The Tool Box fire area consists of ponderosa pine, ponderosa pine/white fir, or ponderosa pine / aspen plant associations. Where aspen occurs, the ponderosa pine intermixed and encroaching on it. There are several areas of sage/juniper within the fire perimeter. In addition a great deal of the land base within the fire is private land ownership consisting mostly of ponderosa pine plantations.

Grassy understory plants such as fescue are parts of the forestland and rangeland plant associations.

O. Dominant Soils:

The Tool Box rim is dominated by landtype 37A of weathered basalt and andesite soil material and it is similar to Woodchopper and Rogger soil series. The soil series are characterized by dry summer, loam over clay loam textures with shrink swell weathered profiles, and grass savanna nutrient flows.

In Silver, volcanic ash deposits from the Cascades are visible in the soils. The Silver rim is dominated by landtypes 37A and 88A of weathered basalt and andesite soil material and it is similar to Woodchopper and Rogger and Mound soil series. The Mound soil series is characterized by dry summer, ashy sandy loam deposits over stony clay loam weathered profiles, and grass savanna nutrient flows.

The rim is cut by rocky canyons, which are dominated by landtypes 2. The soils are similar to the Booth soil series, yet it they have extensive surface stones.

P. Geologic Types:

This area geologically is on the edge of the Great Basin Physiographic Province, and both fires occurred almost exclusively in closed basins that drain to the north. The Tool Box Fire area dips to the northwest, with several northwest/southeast trending faults dominating the north part of the fire area. Several drainages follow these fault trends. The Silver Fire generally dips to the northeast. Volcanic deposits including dominantly Tertiary age basalts, andesite, and rhyolite, with minor quaternary alluvium and sedimentary rocks, characterize the exposed geology. The Silver fire geology includes a large deposit of ash-fall tuff. Foster Butte and Dead Indian Mountain on the Tool Box Fire are cinder cones that probably went through several eruptive periods beginning in the Tertiary. Widespread mass slope failures appear to be unlikely following these wildfires, however tuffaceous deposits exposed within the inner gorge of West and North Forks of Silver Creek should be investigated for potential post-fire problems with slope stability.

Q. Miles of Stream Channels by Order or Class: Perrenial – 29 miles; Intermittent – 121 miles; ephemeral 42 miles; marsh 1.3 acre.

R. Transportation System

Trails: miles Roads:197 miles – Level 1: 44 miles; Level 2: 119 miles; Level 3: 34 miles; Private: mile

## PART III - WATERSHED CONDITION

A. Burn Severity (acres): 74,673 (low) 11,311 (moderate) 810 (high)

B. Water-Repellent Soil (acres): 800

Moderate water-repellant soil occurs in most high severity burn areas and in scattered spots of moderate severity burn. Ponderosa pine sites, in high burn severity had both water-absorbent and water-repellant areas. While Lodgepole pine thickets on meadow edges often have high water-repellant spots. Where grassy or sagebrush grass understories occur water-repellence layers were rare.

C. Soil Erosion Hazard Rating (acres):

65,383 (low) 14,003 (moderate) 7,408 (high)

The hazard is based on the Soil Resource Inventory rating by David Wenzel in 1979, when all vegetation cover is removed as in road building.

D. Erosion Potential: 0.09 tons/acre

E. Sediment Potential: 0.04 tons/acre; rather than in cubic yards / square mile

Likely erosion, sediment transport and rainfall runoff was estimated with the Water Erosion Prediction Project technology for the landtypes, grouped by capability areas. Back ground erosion is 0.01 to 0.05 ton/acre and runoff is 0.00 to 0.02. Post fire erosion is 0.09 ton/acre and runoff is 0.04 inches overall in Tool Box and in Silver post fire erosion is 0.06 ton/acre and runoff is 0.03 inches overall yet select areas have anticipated erosion rates of 1.72 ton/acre and runoff is 0.31 inches.

## PART IV - HYDROLOGIC DESIGN FACTORS

**Note:** Foster Creek watershed was used as a model to predict hydrogic factors for all watersheds coming off the face of Winter Rim.

A. Estimated Vegetative Recovery Period, (years): 5 years for low burned areas which is 86 percent of the burned area. And 10 years for the 13 percent moderate burn; and greater than 15 years for high burn intensity.

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

C. Equivalent Design Recurrence Interval, (years): 25

D. Design Storm Duration, (hours): 6

E. Design Storm Magnitude, (inches): 1.5

F. Design Flow, (cubic feet / second/ square mile): 14.0 csm with flow of 392 cfs

The example flow is from Upper Duncan Creek, 6th Field HUC 171200050301

G. Estimated Reduction in Infiltration, (percent): 15%

H. Adjusted Design Flow, (cfs per square mile): 16.1 csm with flow of 451 cfs

## PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

The fire complex of Tool Box and Silver burns poses a combination of threats to property, wildland habitats, and site productivity. The largest risk is the spread of noxious weed. Along the dozer and hand line there are currently patches of the noxious grass medusa head. Several pieces of equipment contracted for fire

suppression work on these fires came from Northern California where Yellow Star Thistle is know to be a problem. There are about 145 miles dozer lines, which are susceptible to weed infestation.

Considering burn intensity, soil erosion potential, expected post-fire hydrologic response, an emergency situation exists in several areas. For example several stream segments along West Fork Silver Creek have anticipated erosion rates of 1.72 ton/acre from hill slopes in high burn intensity areas. So erosion log barriers are needed to slow sediment transport in these select areas. There is the possibility of increased runoff in several areas that could directly impact roads and private property.

Overall site productivity is fairly intact in the extensive low intensity burn areas, that is a combination of understory burn and un-burn areas. So overall erosion rates are similar to background rates. In the adjacent 1996 Alder Ridge burn, the natural recover of understory grasses such as Idaho fescue provide effective ground cover to limit erosion, sediment transport and absorb surface runoff. Still in spot areas intense burn in pine thickets heated the soil and produced water repellant conditions.

BAER specialist's reports are available upon request.

B. Emergency Treatment Objectives:

Harm to property, habitats and site integrity is apt to be moderated by select treatments. Noxious weed patches monitored will be treated with herbicides. In addition, it is recommended that these specific areas be spot seeded with sterile hybrid wheat. This will provide temporary competition immediately following the herbicide treatment, but will allow native vegetation to re-establish in the long term. These areas should be monitored.

As on the Forest, the public land administered by the Bureau of Land Management is slated for treatment. Seeding in about 600 of the 8,015 acres within the burns is planned. The seeding will focus on recovery of moderate and high intensity burn areas, dozer lines, noxious weeds areas and sagebrush cheetgrass areas.

Natural barriers to off site enhanced sediment transport and runoff, have been considered to focus treatments. Select log erosion barriers/contour log terraces are planed in canyon reaches, which burned hot and lack surface rock fragment to slow sediment transport. And with enhanced flows, road ditches need to be cleared and select culverts protected to accommodate the elevated storm flows.

Across the burned landscape erosion is apt to be limited by effective ground cover. Again, we considered natural recovery, visible in the 1996 Alder Ridge fire area of grasses such as Idaho fescue and shrubs, such as snowbrush, *Ceonothus velutinus* that forms and effective post fire ground cover within Ponderosa pine plant associations on the rims. Snowbrush also fixes and stores nitrogen for forest recovery. So seeding for effective ground cover can be limited to weedy location where native recovery has been compromised.

The scattered water-repellant soil layers which compromise infiltration rates are apt to recover with sedge and grass growth and subsequent humus forming grassy root decay. The digestible grassy decay is apt to form the stable soil aggregates and macro-pores needed to recover soil infiltration rates.

Watershed treatments have been identified on adjacent public (BLM) and private land and are being submitted to the Bureau of Land Management and Natural Resource Conservation Service (NRCS) for their consideration and possible funding.

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

Land **90** % Channel **100** % Roads **60** % Other **15** %

Land: Log erosion barriers/contour log terraces should be completed.

Road: Culvert work which pose the greatest risk, will be completed this fall, 2002.

Other: A noxious weed treatment will be completed in phases, the first phase is this fall.

D. Probability of Treatment Success

| | Years after Treatment | | |
|---|---|---|---|
| | 1 | 3 | 5 |
| Land | 80 | 90 | 100 |
| | | | |
| | | | |
| Channel | | | |
| | | | |
| | | | |
| Roads | 60 | 100 | 100 |
| | | | |
| Other | 15 | 80 | 100 |
| | | | |

E. Cost of No-Action (Including Loss):

| Evaluation Criteria | Alternatives | |
|---|---|---|
| | No Treatment | Treatments |
| Protect Life and Property | - | + |
| Product Site Productivity | - | + |
| Protect Water Quality | - | + |
| Protect Habitat | - | + |
| Noxious Weed Control | - | + |

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

[x ] Hydrology [x ] Soils [ x] Geology [ x] Range [ ]
[x ] Forestry [x ] Wildlife [ ] Fire Mgmt. [x ] Engineering [ ]
[ ] Contracting [ ] Ecology [x ] Botany [ ] Archaeology [ ]
[x ] Fisheries [ ] Research [ ] Landscape Arch [ x] GIS

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H. **Treatment Narrative:**

The emergency treatments are described in attached in **Appendix A**.

H. **Monitoring Narrative:**

The recovery and treatments will be monitored for effective ground cover, diminished water-repellant soils, and infiltration recovery on plot along 20 meter transects. And 50 transects should be sufficient to provide a preliminary assessment of implementation.

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

| | | | NFS Lands | | | | Other Lands | | | All |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Unit | # of | WFSU | Other | # of | Fed | # of | Non Fed | Total |
| Line Items | Units | Cost | Units | SULT $ | $ | units | $ | Units | $ | $ |
| | | | | | | | | | | |
| **A. Land Treatments** | | | | | | | | | | |
| Seeding | ac | $150 | 0 | $0 | | 600 | $90,000 | 0 | $0 | $90,000 |
| Log erosion barriers | ac | $410 | 38 | $15,580 | | 0 | $0 | 0 | $0 | $15,580 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| *Subtotal Land Treatments* | | | | $15,580 | | | $90,000 | | $0 | $105,580 |
| **B. Channel Treatments** | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | $0 | | | $0 | | $0 | $0 |
| | | | | $0 | | | $0 | | $0 | $0 |
| | | | | $0 | | | $0 | | $0 | $0 |
| *Subtotal Channel Treat.* | | | | $0 | | | $0 | | $0 | $0 |
| **C. Road and Trails** | | | | | | | | | | |
| Ditch/inlet cleaning | mi | $500 | 15.1 | $7,550 | | | $0 | 8.1 | $500 | $8,050 |
| Drainage dip | str. | $8,750 | 1 | $8,750 | | | | | | |
| Relief culvert | str. | $5,000 | 2 | $10,000 | | | $0 | | $0 | $10,000 |
| Storm patrol | days | $125 | 30 | $3,750 | | | $0 | | $0 | $3,750 |
| *Subtotal Road & Trails* | | | | $30,050 | | | $0 | | $500 | $21,800 |
| **D. Noxious Weeds** | | | | | | | | | | |
| | | | | | | | | | | |
| Monitor weeds | days | $100 | 120 | $12,000 | | | $0 | | $0 | $12,000 |
| Teat weeds | ac. | $200 | 120 | $24,000 | | | $0 | | $0 | $24,000 |
| Sopt seed | ac. | $60 | 120 | $7,200 | | | $0 | | $0 | $7,200 |
| *Subtotal Structures* | | | | $43,200 | | | $0 | | $0 | $43,200 |
| **E. BAER Evaluation** | | | | | | | | | | |
| Team Costs | day | $500 | 20 | $10,000 | | | $0 | | $0 | $10,000 |
| | | | | $0 | | | $0 | | $0 | $0 |
| | | | | | | | | | | |
| **G. Monitoring Cost** | day | $500 | 30 | $15,000 | | | $0 | | $0 | $15,000 |
| | | | | | | | | | | |
| **H. Totals** | | | | **$113,830** | | | **$90,000** | | **$500** | **$180,580** |
| | | | | | | | | | | |

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## PART VII - APPROVALS

1. _____ _____
Forest Supervisor (signature) Date

2. _____ _____
Regional Forester (signature) Date

Appendix A

# Tool Box and Silver Burn Area Emergency Rehabilitation Treatments for federal lands administered by the Fremont National Forest

August 14, 2002

Compiled by
Desi Zamudio, Team Leader, Mike McNamara and Michele Reba, Hydrologists

## Introduction

The following treatments were developed by an Interdisciplinary BAER Team for rehabilitation of areas burned in the Tool Box and Silver Fires that started on July 12, 2002 and was contained on August 5, 2002. A detailed description from each of the specialists on the Team is available in the project file.

## *Log erosion barriers/contour log terraces*

**Purpose:** To reduce water velocity, break up concentrated flows, and induce hydraulic roughness to burned watersheds. Sediment storage is a secondary objective.

**Location:** See treatment maps.

**Treatment success:** Eighty percent excellent to fair.

| | | |
|---|---|---|
| **Acres by ownership:** Fremont National Forest | | 38 acres |
| Cost Estimates | | |
| **Contour cost @ 410/acre:** | | $15,580 |
| | Total | $15,580 |

**Installation Guidelines:** Work includes selecting only those trees that meet the criteria, then felling, limbing, and positioning the log and backfilling above each log. Trees should not be felled in excess of the need, or too far ahead of the backfilling team.

1. Locating – Log terraces are implemented only on hill slopes designated by the project leader and approved in the treatment plan. The perimeter of each area is clearly flagged with a discrete color code, marked on the ground with a wooden stake and indexed both on the stake and on the project map. The size may be noted both on the ground and on the map.

2. Spacing – The preferred density is 400 to 600 linear feet of logs per acre, but can go as low as 300 linear feet of logs per acre if slopes are less than 35%, or trees are scarce. To judge when the target density has been achieved, inventory a 1/5-Acre plot. (+\- 53’ radius)

3. Tree Size – Trees should be approximately 6" to 8" DBH, but slightly smaller or larger may be used. Where larger trees are not available, trees as small as 4" DBH can be selected. In stands of smaller trees, the small stems can be felled in groups of 3 to 6 stems per group. The best, and most durable trees are those that are suppressed and growing in the under story. Down logs may also be used if they are solid enough to act as and erosion barrier.

4. Species – Linear conifer trees are preferred over oak trees. Suitable hard wood trees are larger alder, birch and aspen. Only dead trees of any species will be cut for logs. No trees with green leaves/needles will be cut.

5. Stumps – Stumps should be at least 12" high, but on steeper slopes can go 18" high. Stumps make a good place to secure the logs.

6. Logs – Should be approximately 10 to 30 feet long. Longer logs are difficult to handle and not easily bedded into the soil. The entire length must be in contact with the soil, and positioned on the contour, perpendicular to the slope.

7. Positioning – Logs must be level, secure on the slope to prevent rolling, and perpendicular to the overland flow path of water. The log may be secured against stumps or natural features, or a short stake may be driven into the soil to keep it from rolling. The secure log must then be backfilled with soil to prevent water flow beneath the log. The back fill must be tamped down to seal the log to the soil.

8. Progress – It is best to begin at the top of the unit and work down. That way the people bedding the logs can stay out the way of falling trees. It is also easier to determine how the water would flow looking down on an area and easier to determine the staggered spacing of logs.

9. Teams – The most efficient team is one person sawing and trimming trees followed at a safe distance by two people positioning and backfilling the logs.

10. Equipment – Chain saw with safety equipment; Hazel Hoe or mattock for back-filling logs; a single bit ax is sometimes used to cut and pound stakes; small (8") carpenter level to periodically check logs.

11. Protection Of Cultural Resources – There are typically can dumps, old metal parts and bottles scattered throughout most work areas. The workers must protect all cultural resources by not dropping trees or bedding logs on these sites. Each site must be reported to the team leader.

12. Bypass Areas – There will be islands within most designated treatment blocks that are low priority for log terraces. Following are examples.

    - Trees have been dilled by the fire, but still retain their needles. These areas can be bypassed if needle cast will stabilize the site.

    - Slopes are greater than approximately 60% are usually poor footing and can be bypassed.

- Where surface rock, 4” diameter and larger cover over 60% of the soil surface, a partial treatment can be achieved by felling the required number of trees, but without cutting it into logs, or bedding it.

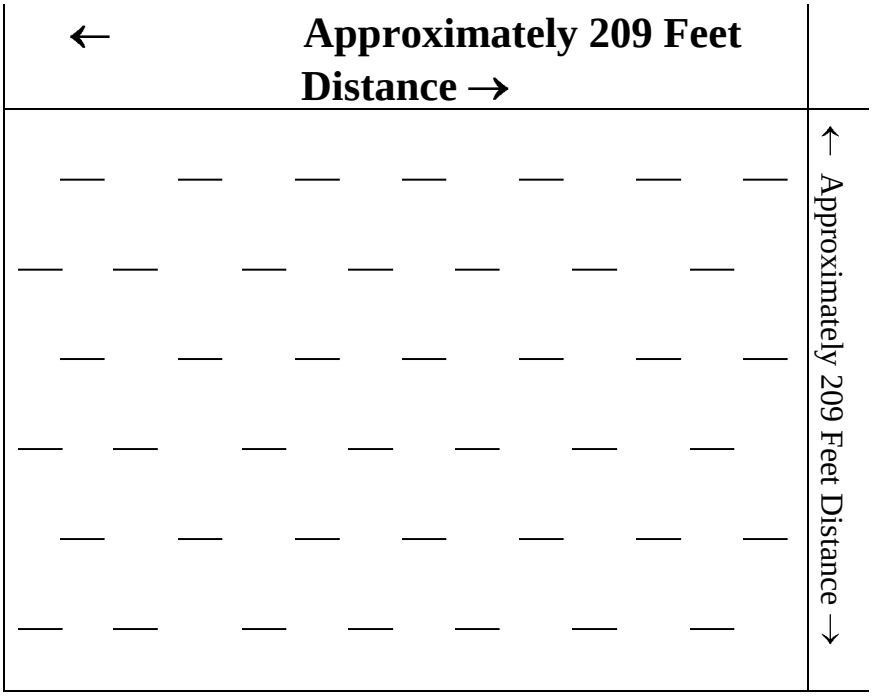
- Where trees are 12” diameter or greater, then there are no candidate trees, and the area should be bypassed.

- Openings where trees do not grow should be bypassed.

- If not enough suitable trees are available, only those that meet the selection criteria are felled.

Production – A well-trained crew can achieve 1+ acre of log terraces per person day. Experienced crews can treat 3+ acres per person day.

**TYPICAL LOG TERRACE INSTALLATION**
(40 Logs Per Acre)




A typical, square, acre of land is approximately 209 feet on each side, as shown above. The installation usually begins at the upper elevation of a designated land unit, and works down slope.

**Step 1.** Pacing 209 feet around the contour of the land, and tying a flag to mark the beginning and ending points can lay out the first acre.

**Step 2.** Log terraces are then positioned, approximately on the flagged line, as the initial installation.

**Step 3.** The first acre of log terraces can then be installed by locating **6 rows** of logs, with approximately **7 logs in each row** (each log approximately 20 to 30 feet long), that are approximately parallel to the original, flagged line.

Step 4. A second, square acre can be flagged, beginning at the end of line #1, and continuing around the contour of the hill.
The felling/bedding team can then establish additional square acres, by continuing to install additional log terraces down slope from the original starting point.

Seldom can log terraces be positioned exactly as shown in the above diagram. The objective is to approximate the prescribed number of logs by offsetting each lower log to line up below a space between logs on the upper row. This breaks the straight path of overland runoff down the slope. At each log, the runoff can infiltrate into the soil, and then any excess run off is directed at the next lower log.

## *Road treatments*

**Purpose**: Road treatments are needed to increase the water and sediment processing capabilities of roads and road structures.

**Location:** See treatment maps

**Treatment success:** Little information exists to evaluate the effectives of road treatments as they relate to BAER projects. However, keeping roads, culverts and in slope ditches well maintained are effective measures to minimize sedimentation to nearby streams and prevents catastrophic failure of road fills.

**Treatment:** A decrease in infiltration of 15 % is project for the burned area as a result of the loss of vegetation and increase water-repellant areas in the burn. High and moderate burn intensity coupled with a decrease in infiltration prompted the BAER team to review the drainage design of several roads in the burn area. The roads of particular interest were those located down slope of moderate and high burn intensity.

Several mitigation measures were developed from the field review and include cleaning the drainage ditches, cleaning of the inlet and outlet of culverts, constructing a drainage dip, implementing storm patrol in sensitive areas, and constructing a relief culverts.

The recommendation to **clean the drainage ditches** of several roads and **clean the inlet** and **outlet** of currently blocked or partially blocked inlets and outlets will allow for proper drainage of the increased water yield and move water off of the road prism effectively and efficiently. The movement of water off of the road will allow for decreased probability of road failure. More specifically, there will be 23.2 miles of roads where the drainage ditches will be cleaned and the inlet and outlet will be cleared of material. The road segments that call for this treatment are on the roads treatment maps.

An increase of 50 cfs was calculated for the 25-year event at Duncan Creek. Currently there are two culverts (both 5 ft. wide and 4 ft. tall squashed pipes) at the road crossing of Duncan Creek

and the 2914 road. The BAER team proposes the construction of a **large drainage dip** to alleviate the increased flow calculated at this crossing.

Several areas upstream of the road crossing at the 27 road and West Fork Silver Creek burned at a high intensity and will generate debris and high flows. In an effort to alleviate the increased flow capacity necessary two **relief culverts** would be installed at the crossing. The culverts would be 30" diameter, placed at the high flow elevation of the existing culvert, and utilize trench-less technology for installation.

Several areas of concern were identified for **storm patrol**. Storm patrol includes having an employee gain access to these concern areas and clear them of debris. These areas of concern are located on the 2914 road at Duncan Creek, East Duncan Creek, and Murdock Creek, on the 28 road at Benny Creek, and on the 2917 road at Silver Creek and West Fork Silver Creek. Furthermore, there are roads that should be patrolled because of their proximity to moderate or high intensity burn areas. On the Silver Fire section these roads include: 0027 2917 road, 0027 000 road, 0027 041 road, 0027 021 road, 0027 3038 road, 3038 024 road. On the Toolbox Fire these roads include: 2914 000 road, 2901 000 road, 2916 000 road, and 2916 018 road.

| Location | Activity | Quantity | Cost | Total Cost |
|---|---|---|---|---|
| Fire Area on Forest | Clean drainage ditches, inlet, and outlet of drainage culverts | 15.1 miles | 500/mile | 7,555 |
| Duncan Creek & 2914 Road | Drainage Dip | 1 | 8,750 | 8,750 |
| West Fork Silver Creek & 27 Road | Relief Culverts (30" diameter) | 2 | 5000 | 10,000 |
| Fire Area | Storm Patrol | 30 days | 125/day | 3,750 |
| | | | Total Cost= | 30,055 |

**Installation Guidelines:**

Follow standard Forest Service Engineering Guidelines. An interdisciplinary team consisting of an engineer, hydrologist, wildlife biologist and archeologist should be assembled to evaluate each treatment site. There are no planned treatments on perennial fish bearing streams so considerations related to passage should not be a factor.

## *Noxious weed control*

**Purpose:** To prevent the spread of or density of pre-fire infestations within the fire perimeter. A secondary objective is to prevent the spread of infestations along roads that may have been introduced during suppression efforts. There were approximately 145 miles of control lines constructed on the Forest and private lands with heavy equipment during the suppression effort. Several pieces of equipment contracted for fire suppression work on these fires came from Northern California where Yellow Star Thistle is know to be a problem. There was limited inspection exercised during the mobilization as far as cleaning these pieces equipment therefore there is a concern of fire lines contaminated with Yellow Star Thistle.

The BAER request includes $12,000 for monitoring of the control lines for the 2003 and 2004 growing season for the presence of Yellow Star Thistle. The $12,000 will be applied to salary for a GS-5 biological technician for 60 days per growing season. The biotech will survey and monitor approximately 3 miles of rehabilitated fire line per day during the growing season.

In addition, it is recommended that these specific areas be spot seeded with sterile hybrid wheat. This will provide temporary competition immediately following the herbicide treatment, but will allow native vegetation to re-establish in the long term. The spot seeding conforms to the Forest native seed policy and there are no known conflicts with TES listed plants. These weed and spot seed areas should be monitored. Currently there are 49 acres of noxious weeds in the Tool Box and Silver fire areas.

**Treatment success:** Good to excellent.

Cost Estimates

| | Cost | Year |
|---|---|---|
| Monitor by biotech | $6,000 | 2003 |
| Monitor by biotech | $6,000 | 2004 |
| Likely Weeds | | |
| 60 acres treatment @ 200/acre | $12,000 | 2003 |
| 60 acres treatment @ 200/acre | $12,000 | 2004 |
| Likely Spot Seed | | |
| 60 acres treatment @ 60/acre | $3,600 | 2003 |
| 60 acres treatment @ 60/acre | $3,600 | 2004 |
| Total Cost | $43,200 | |

## References


Mankins, Annetta. 1998. A presentation given at the BAER Rehabilitation Techniques Course in Reno Nevada.

Robichaud, P.R.; J.L. Beyers, and D. Neary. 2000. Evaluating the Effectiveness of Postfire Revalidation Treatments. Rocky Mountain Station General Technical Report RMRS-GTR-63.

Tracy, R. and E. Ruby. 1994. Energy Burn Area Rehabilitation – Structural Treatments, Site selection and project requirements. Presented at BAER Techniques Course, Reno Nevada, 1998.


**Cost estimates provided on the BAER webpage were used to determine treatment costs.**