

*Kendall*  
*Final App*BURNED-AREA REPORT  
(Reference FSH 2509.13, Report FS-2500-8)PART I - TYPE OF REQUEST

## A. Type of Report

- ☐ 1. Funding request for estimated WFSU-FW22 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 and design analysis  
    ☒ Status of accomplishments to-date  
☐ 3. Final report - following completion of work

PART II - BURNED-AREA DESCRIPTION

- A. Fire Name: Tower B. Fire Number: OR-UMF-025  
C. State: Oregon D. County: Umatilla & Grant  
E. Region: 06 F. Forest: Umatilla  
G. District: North Fork John Day  
H. Date Fire Started: 8/14/96 I. Date Fire Controlled: 9/30/96 (est.)  
J. Suppression Cost: \$ est. 18,000,000  
K. Fire Suppression Damages Repaired with EFFS-PF12 Funds:  
    1. Fireline waterbarred (miles) 39 dozer, 32 hand\* (\*est. in progress)  
    2. Fireline seeded (miles) 2\*  
    3. Other (identify) dozer-line pull-back w/ excavator 11 mi, (in 1)  
L. Watershed Number: 17020233, 35, 95, 96  
M. NFS Acres Burned: 46,352 Total Acres Burned: 50,817  
    Ownership type:  
    ( 0 ) State ( 0 ) BLM ( 4,465 ) PVT ( ) \_\_\_\_\_  
N. Vegetation Types: 45% is lodgepole pine, 30% is mixed conifer,  
    15% is spruce/fir, and 10% is ponderosa pine  
O. Dominant Soils: Typic Udivitrands, deep, medial over clayey  
    Typic Vitricryands, mod. deep, medial over loamy  
P. Geologic Types: Tuffaceous sediments, pyroclastics; basalt and andesite;  
    granite and granodiorite  
Q. Miles of Stream Channels by Class:  
    I - 42 II - 11 III - 65 IV - 204  
R. Transportation System:  
    Trails: 71 (miles) Roads: 162 (miles)

### PART III - WATERSHED CONDITION

- A. Fire Intensity (Acres): 29,243 (low) 15,632 (moderate) 5,942\*(high)  
\* 1,820 acres of high intensity occurred in the Wilderness
- B. Water Repellant Soil (Acres): 0 \*  
\* Repellancy of the volcanic ash soil not significantly increased.
- C. Soil Erosion Hazard Rating (Acres):  
678 (low) 17,474 (moderate) 31,980 (high)
- D. Erosion Potential: 25 tons/acre
- E. Sediment Potential: 1600 cu. yds/sq. mile

### PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period: 3-5 years.
- B. Design Chance of Success: 80 percent.
- C. Equivalent Design Recurrence Interval: 25 years.
- D. Design Storm Duration: 6 hours.
- E. Design Storm Magnitude: 1.2 inches.
- F. Design Flow: 20.5 cfs.
- G. Estimated Reduction in Infiltration: 20 percent.
- H. Adjusted Design Flow: 24.6 cfs.

### PART V - SUMMARY OF ANALYSIS

#### A. Describe Emergency:

THE TOWER FIRE occurred over an elevation range of from around 3,000 feet at the North Fork John Day River (an important anadromous fishery) to over 6,000 feet elevation at Tower Mountain. Much of the moderate and high intensity areas are on steep slopes of relatively high productivity but highly erodable soils developed from pyroclastics and decomposed granites mantled by younger Mazama volcanic ash. These areas have experienced complete vegetative removal. The non-wilderness portions of the fire area selected for treatment are particularly at risk due to natural instability exacerbated by extensive roading and tractor skidding in the last few decades. Restoration projects have been initiated by are not completed in these drainages, leaving older closed roads at risk to failure. An extensive trail system has been developed in the burn area, including the majority of the Forest's OHV network which receives heavy use from throughout the region. The drainage improvements have been seriously impacted (including consumption of log deflectors leaving overhanging soil shelves) and are at high risk of significant gullyng without quick action to reestablish proper function of the trail erosion-protection system.

Much of the area drains either directly into or into primary tributaries of the North Fork John Day (NFJD) river, a Wild and Scenic river with one of the strongest remaining native runs of spring chinook and steelhead in the Columbia River Basin. Most of the area is designated in the Forest Plan as a Special Fish Management Area (all of the wilderness portions), now dedicated to high-quality water production to produce high levels of anadromous fish habitat. There is currently one of the better chinook runs in years spawning in the main stem of the NFJD, with redds that will be directly impacted by sedimentation. In addition to steelhead and chinook salmon, affected drainages contain Bull trout (Sensitive species and candidate for listing as Threatened and Endangered), brook trout, resident rainbow and redband trout. According to wilderness

objectives, the fire and sediment are considered natural processes. The limited treatment for the wilderness portion, as selected with native species harvested from the local area, is aimed at slowing accelerated erosion to benefit fish habitat while maintaining wilderness values.

B. Emergency Treatment Objectives:

Burned area emergency rehabilitation of the Tower Fire has three main objectives: 1) Maintain soil productivity and reduce the risk of soil erosion, 2) Reduce the risk of erosion-related damage to the road and trail networks, and 3) Protect rare and unique high value fisheries resources. Road and land treatments would reduce soil erosion and sedimentation onto private land and high value fish habitat.

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

Land 90 %      Channel        %      Roads 70 %      Trails 75 %

D. Probability of Treatment Success

	<----Years after treatment----->		
	1	3	5
Land	70%	80%	90%
Channel			
Roads	80%	85%	90%
Trails	75%	85%	95%

E. Cost of No-Action (Including Loss): \$ 17,633,062

F. Cost of Selected Alternative (Including Loss): \$ 4,836,800

G. Skills Represented on Burned-Area Survey Team:

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input checked="" type="checkbox"/> Range
<input checked="" type="checkbox"/> Timber	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Ecology	<input type="checkbox"/> Research	<input checked="" type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Fisheries	<input checked="" type="checkbox"/> Recreation	<input checked="" type="checkbox"/> Genetics	<input checked="" type="checkbox"/> Botany

Team Leader: Craig R. Busskohl (Coordinator: W. Murphy ext. 3762)

Phone: (541) 278-3817 DG Address: R06F14A

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

(See Appendix 1 for summary of seed mixes)

Existing Condition: "High Intensity" fire affected 5,942 acres of Wilderness and non-Wilderness acres on the North Fork John Day District, Umatilla National Forest portion of the Tower Mountain fire. The high intensity fire zone is characterized by the total absence of live tree crowns and total absence of ground vegetation, with little down woody debris remaining. Soils in the high intensity fire zone show no residual organic increment in the A horizon and are a mosaic of layers of white and grey ash and oxidized (red) patches on the soil surface. High intensity fire affected all of the coarse vegetative types in both upland and riparian habitats.

"Moderate intensity" fire affected 15,632 acres of the Tower Mountain fire. This zone is characterized by scorched tree crowns with a >50% dead crown, and >50% burned under story shrubs. Larger burned down woody debris remains. No litter is evident in the black and grey ash mosaic on the soil surface.

"Low intensity" fire affected 29,243 acres of the Tower Mountain fire. This zone is characterized by live tree crowns, minor crown scorching, and a black ash layer on the soil surface. Unburned woody material is present and litter is detectable in the ash layer. Although blackened, root crowns of perennial plants in this zone appear to be largely viable. Under story shrubs are >50% unburned.

Purpose: To minimize soil erosion by providing vegetative surface cover and sub-surface root mass. Late fall germination of both non-persistent (3-5 years) and persistent (12-15 years) seed mixes will help maintain site productivity, and reduce sediment delivery

to important fish-bearing streams. The non-persistent seed mixture will not interfere with long term reforestation efforts. The persistent seed mixture will be applied in areas with no present or future reforestation plans.

**Treatment (non-Wilderness):** Aerial seed specific high intensity burn areas with either a reforestation tiered nonpersistent seed mix (10% Soft White Winter Wheat, 75% Annual Ryegrass, 15% Sainfoin) @ 20PLS, or a combination nonpersistent/persistent seed mix (5% Soft Winter Wheat, 40% Annual Ryegrass, 15% Sainfoin, 40% Red Fescue) @ 20 PLS for areas unsuited for reforestation. Proposed contour felling will serve to partially anchor the combined seed mixtures in an area of extremely steep, highly erodible soils.

**Treatment (Wilderness):** Hand seed specific high intensity burn areas with a mix of suitable locally collected native seed, (15% Idaho Fescue, 15% Prairie Junegrass, 40% Blue Wild Rye, 30% Sandberg's Bluegrass) @ 10 PLS.

**Existing Condition:** Significant amounts of dead and down trees (though badly charred) remain throughout the moderate intensity and much of the high intensity burn areas. This has allowed the team to consider only those areas without adequate down wood in particularly sensitive areas for upland treatment.

**Purpose:** To reduce accelerated erosion of highly erodable soils where down woody material is insufficient for stabilization in Sheep Creek.

**Treatment:** cross-felling of standing dead trees and anchoring sufficient to trap and retain immobilized soil.

#### **CHANNEL Treatments**

**Existing Condition:** Stream bank stability remains high over most of the burned riparian areas. Even though many riparian areas burned at moderate and high intensity, most of the large woody material (which provides structural stability) was not consumed. Also, roots of riparian vegetation in water-saturated soils were not killed and many plants (such as rushes and sedges) are resprouting. Many riparian hardwood roots within the saturated soils have also survived the fire, but have not yet resprouted. Additional trees have fallen or will soon fall across the streams, providing a long-term source of large woody material. These factors indicate that bank stability should not be significantly different than pre-burn levels, therefore no channel treatments were proposed.

## **ROAD Treatments**

**Existing Condition:** There are 161.8 miles of system road within the perimeter of the Tower fire. Of these miles 12.4 fall within the areas of high intensity burn. Higher peak discharge rates and possible debris flows could cause extensive soil and road damage, especially within the drainages having highly erodible granitic geology. It is likely that the flow from an entire drainage could be diverted onto the road, if the culvert lacks adequate capacity or becomes plugged with debris. Because most of the roads are not outsloped, water would flow down the road for some distance until it reached a spot which would divert down the hillside and back into the stream channel. This type of failure, which occurred in nearby watersheds last winter, has the potential to heavily erode roads and adjacent hillslopes.

**Purpose:** The treatments would minimize the potential for flood damage to the transportation system, prevent excessive soil erosion, and reduce the influence of road crossings on channel hydraulics and sediment transport. The emergency treatments deal with the engineering concerns not only within these high intensity areas but also those areas downstream of those areas.

**Treatment:** Installing depressions in the road surface over streams (when not in the original design of the road), to allow the water to flow across the road if the culvert plugs (where no culvert treatment is proposed) in lieu of flowing down the road and ditchlines. Remove type III culvert installation (culverts installed on natural ground) on level II roads and replace with rock cross drains. Remove culverts and fill material on closed level I roads and reslope banks. Disturbed soil would be protected from erosion by seeding and placement of coconut cloth in some critical areas.

## **TRAIL Treatments**

**Existing Condition:** The fire burned a total of 71 miles of trails. Of this total 51 miles occurred in medium and high intensity areas. Portions of the OHV (Off Highway Vehicle) trails in the Winom-Frazier OHV Complex were burned, with approximately 42.5 miles in medium and high intensity. (This system is also open for other trail use, such as horseback riding and hiking.) Winom Creek OHV Campground received a low to medium intensity burn to approximately 50% of the campground area. The fire also burned portions of trails in the North Fork and Tower Units of the North Fork John Day Wilderness, with approximately 8.5 miles in medium and high intensity.

Trails in the medium and high intensity area have had drainage structures consumed by fire. In many areas, logs which supported the downhill side of the trailbed were totally consumed, as were

flexible (rubberized) diversions, and there is a very high risk (97%) of trailbed failure. Supporting vegetation has burned as well--in a number of areas the fire was so hot that the trail is no longer locatable. Even in the low intensity areas drainage and support structures were damaged, and generally these trails occurred on some of the steepest slopes in the trail system.

Purpose: Reestablish drainage network on affected trails to prevent/minimize accelerated erosion with high likelihood of occurrence due to loss of diversion structures and vegetative protection on steep slopes and compacted surfaces.

Treatment: Reconstruct diversions/drainage network appropriate to either OHV trails or wilderness trail standards. Replace or repair drainage structures consumed in the fire.

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

NOTE: Emergency rehabilitation is work done promptly following a wildfire and is not to solve watershed problems that existed prior to the wildfire.

Line Items	Units	Unit Cost \$	NFS Lands			Other Lands			All
			Number of Units	WFSU-FW22 \$	Other \$ ident.	Number of Units	Fed \$ ident.	Non-Fed \$ ident.	Total \$

**A. LAND TREATMENTS**

Non-Wild persist. seed*	ac.	34	524	17,816					17,816
Non-Wild non-pers. seed*	ac.	35	750	26,250					26,250
Wild. native, hand seed	ac.	36	480	17,280					17,280
Contour felling	ac.	65	78	5,070					5,070

\*Non-Wilderness, non-native aerial seeding

**B. CHANNEL TREATMENTS\* See narrative for explanation why there is no treatment proposed**


**C. ROADS AND TRAILS**

Install Larger Culvert	ea.	875	2	1,750					1,750
Culvert Removal	ea.	500	19	9,500					9,500
Cross Drain Installation	ea.	200	17	3,400					3,400
Reconstruct Drain Dips	ea.	50	78	3,900					3,900
Reconst OHV trail drain.	mi.	1300	41	53,500					53,300
Rec. Wilderness tr. dng.	mi.	1000	9	9,000					9,000

**D. STRUCTURES**


**E. BAER EVALUATION/ ADMINISTRATIVE SUPPORT**

Survey team, admin. sppt				37,800					37,800
incl. GIS									

<b>F. TOTALS</b>				185,066					185,066
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**PART VII - APPROVALS**

1. /s/ TOM K. REILLY 9/16/96  
Forest Supervisor (Signature) Date
2. /s/    
Regional Forester (Signature) Date





## APPENDIX 1

### Tower Mountain Burn Area Emergency Rehabilitation Report

#### Seeding Prescriptions

##### I. Non-Wilderness Forested and Non-forested Areas

###### A. Summary of Recommendation

1. Seeding is recommended for high fire intensity zones in dry forest, dry forest-grassland, and cool forest coarse vegetative types.
2. Seeding is not recommended in:
  - a. low and moderate intensity burn zones
  - or
  - b. vegetation types--rocky forest, scabland, escarpment, and meadow.

###### B. Recommended Seeding Prescription for High Intensity Fire Zones

1. Species composition (non-persistent):
  - a. Soft White Winter Wheat--10%
  - b. Annual Ryegrass--75%
  - c. Sainfoin('Remont')--15%
2. Species composition (persistent/non-persistent)
  - a. Red Fescue--40%
  - b. Soft White Winter Wheat--5%
  - c. Annual Ryegrass--40%
  - d. Sainfoin('Remont')--15%
3. Seeding Rate (non-persistent; 20 PLS)
  - a. Soft White Winter Wheat--7.6 lbs/acre
  - b. Annual Ryegrass--3.5 lbs/acre
  - c. Sainfoin('Remont')--10.6 lbs/acre
4. Seeding Rate (persistent/non-persistent; 20 PLS)
  - a. Red Fescue--.72 lbs/acre
  - b. Soft White Winter Wheat--3.8 lbs/acre
  - c. Annual Ryegrass--1.9 lbs/acre
  - d. Sainfoin('Remont')--10.6 lbs/acre

###### C. Rationale for Prescription

###### 1. Seeding vs. no seeding

The recommendation to seed high intensity fire zones falling within dry forest, dry forest-grassland, and cool forest coarse vegetative types is based on the potential for extreme erosion

of volcanic ash soils on 40-50% slopes and that of granitic soils on 50-60% slopes. Soil erosion adversely affects biological productivity and should be prevented before it becomes a long-term---and potentially irreversible---problem in portions of the Tower Mountain Burn rehabilitation area.

Non-persistent seeding mixes are recommended to meet the needs of existing and future reforestation objectives.

No seeding is recommended for low and moderate fire intensity zones to minimize competition with native species.

No seeding is recommended for the following coarse vegetative types: rocky forest, escarpment, scabland, and meadow. Because limited contact between seed and soil could be anticipated in these vegetative zones, the success rate was considered to be marginal in terms of a cost:benefit ratio.

## 2. Native species vs. non-native species

Sufficient supplies of native, provenance source seeds are not available. Consequently, non-persistent and persistent, non-native species were selected.

## 3. Species Selection Criteria

Soft White Winter Wheat Triticum aestivum 'Madsen' persists for up to three years (Bluewood Ski Area, Walla Walla Ranger District) with progressive decline in seed production. Its relatively large seed size insures excellent distribution when applied aerially. It is recommended that local source seed (eastern Oregon) be used to defuse any future claims regarding pathogen sources. This is particularly important since kernel bunt disease has recently caused quarantine measures to be invoked in Texas, Montana, and Washington.

Annual Ryegrass Lolium multiflorum is a long season grass that does not contribute significantly to ladder fuels. On harvest units of the Placer Timber Sale (North Fork John Day Ranger District) this species has demonstrated a persistence of two to four years.

Sainfoin Onobrychis viciaefolia is an attractive, non-persistent legume commonly grown for forage in Scotland. This species benefits soils through

nitrogen fixation. All traces of this species disappeared within five years of seeding (Interstate 84 construction in Pendleton and Baker City, Oregon, and on the Lane-Bear Timber Sale (North Fork John Day Ranger District)).

Red Fescue Festuca rubra is a non-sod-forming long lived perennial bunch grass. The rapid establishment and extensive root system will provide long term soil stabilization. The persistent green crown is highly fire resistant, greens early in the spring and remains until early winter. Areas of Red Fescue were found persisting on steep, highly erodible soils after the Tower Mountain fire.

## II. Wilderness Area

### Summary of Recommendation

1. Seeding is recommended in a portion of the high fire intensity zone of Winom Creek drainage (Figure 1). The area recommended for seeding is approximately 480 acres in size, occurring on steep, dissected sideslopes above Winom Creek. Method of seeding would include hand broadcasting or broadcasting with a hand-operated seeder.
2. Seeding is not recommended for any other portions of Wilderness, regardless of fire intensity zone.

### Recommended Seeding Prescription

#### Species composition:

- a. Idaho fescue - 15%
- b. Prairie junegrass - 15%
- c. Blue wild rye - 40%
- d. Sandberg s bluegrass - 30%

#### Seeding Rate: rate to achieve 10 PLS

- a. Idaho fescue - 0.73 lbs/acre
- b. Prairie junegrass - 0.20 lbs/acre
- c. Blue wild rye - 0.19 lbs/acre
- d. Sandberg s bluegrass - 0.24 lbs/acre

### Rationale for Prescription

#### Seeding vs. No seeding

Seeding of portions of the high intensity fire zone in Winom drainage is recommended to reduce erosion potential on steep unstable slopes, and to protect downstream resource

values, including steelhead and resident trout populations (Winom and Big Creeks, North Fork John Day River), as well as the last non-hatchery run of spring Chinook salmon in the Columbia River Basin (North Fork John Day River).

In the remaining portions of the North Fork John Day Wilderness, natural recovery is the preferred prescription for all fire intensity zones.

#### Seed Source

Supplies of suitable native sources of locally collected seed are available for use in the proposed seeding area. The seeds were collected by District personnel from areas adjoining the Wilderness boundary. The transfer of this germplasm across administrative boundaries will not compromise the genetic integrity of resident or post-fire colonizing plant populations. Because the quantity of appropriate seed stock is limited for the prescribed species, an application rate of 10 PLS is recommended.

Seedlots to be utilized include:

FEID-14-891-05-700-45-97F-93  
KOCR-14-891-05-700-45-97E-93  
POSA3-14-891-05-700-45-97F-93  
ELGL-14-891-05-100-35-35-96

#### Species Selection Criteria

a. Blue wild rye (*Elymus glaucus*) is a fast developing, short-lived, cool season, native perennial bunchgrass. Typical habitat includes prairies, open woods, thickets, and moist to dry hillsides at elevations in the Blue Mountains up to 6000 feet. It requires at least 16 inches annual precipitation for establishment. Blue wild rye provides soil protection rapidly after fires, and has high seedling vigor, high seed production, and a strong natural ability to reseed disturbed areas.

b. Idaho fescue (*Festuca idahoensis*) is a common and important native cool season perennial bunchgrass. It has a broad ecological amplitude, but does best in 14-24 inch precipitation zones on moderately deep to

deep silt loam to clay loam soils. The species has good herbage production, but low annual seed production. Although slow to establish from seed, it has high value as a persistent species in soil erosion control seed mixes.

c.       Prairie junegrass (*Koeleria macrantha*) is a long-lived, cool-season native tufted perennial grass. It has a broad ecological amplitude, often occurring with Idaho fescue on upper canyon slopes and grassy ridges on warm, dry sites. It occurs at higher montane elevations on well drained soils, growing best in areas of 12 to 20 inches annual precipitation. Prairie junegrass quickly reseeds bare areas after disturbance; seedling growth is slow to moderate. Plants have a shallow and fine, but well-developed root system.

d.       Sandberg's bluegrass (*Poa sandbergii*) is a long-lived, low-growing native perennial bunchgrass. It occurs in drier grassland and shrubland habitats across a wide variety of climatic, edaphic, and elevational extremes. A root system characterized by deeply penetrating fibrous roots make it a highly effective soil binder and a good persistent understory grass for erosion control and herbage on sites with 9-20 inches annual precipitation.

# Appendix 2

## Cost / Risk Worksheet

Fire Name: Tower Fire Acres: 50,200  
 Analysis Date: 16-Sep-96  
 Alternative: NO ACTION

TREATMENT	Unit	Number	Unit	Cost
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Seeding Non-wildrns Persistent ac		0		\$34
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Seeding Non-wildrns Non-persis ac		0		
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Seeding Wildrness Native Seed ac		0		
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Contour Felling (Non-wildrns) ac		0		
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Contour Felling (Wildrness) ac		0		
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Channel Log Structure	str	0		\$300
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Install Larger Culvert	str	0		\$875
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Culvert removal	str	0		\$500
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Cross Drain Installation	str	0		\$200
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Drainage Crossing Stabilization	ac	0		\$200
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Reconstruct Drain Dips	str	0		\$50
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Construct Inlet Structure	str	0		\$1,500
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Reconstruct Water Bars (ohv)	mi	0		\$1,300
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Reconst Water Bars (wildrness)	mi	0		\$1,000
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Total----->

\$0

Probability of Success

0.25

Resource Value Loss

Failure

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 Soil Productivity Loss \$8,157,500  
 Road Loss 981,700  
 Grazing Opportunity 13,900  
 Noxious Weed Infestation (Treatment Cost) 16,000  
 Trail Loss 61,650  
 Timber Productivity 12,000,000  
 Fish Productivity 280,000  
 Species Extirpation (Bull Trout, Chinook) 2,000,000  
 Total ----> \$23,510,750

Alternative Cost  
 Treatment Total \$0  
 Resources Loss \$17,633,062  
 Total \$17,633,062

Cost / Risk Worksheet

Fire Name: Tower Fire Acres: 50,200  
 Analysis Date: 16-Sep-96  
 Alternative: Initial Low Level: SELECTED

TREATMENT	Unit	Number	Unit	Cost
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Seeding Non-Wildrns Persistent ac	524		\$34
Seeding Non-Wildrns Non-persis ac	750		\$35
Seeding Wilderness Native Seed ac	480		\$36
Contour Felling (Non-wilderns) ac	78		\$65
Contour Felling (Wilderness) ac	0		\$75
Channel Log Structure	0	str	\$300
Install Larger Culvert	2	str	\$875
Culvert removal	19	str	\$500
Gross Drain Installation	17	str	\$200
Reconstruct Drain Dips	78	str	\$50



Construct Inlet Structure	str	0	\$1,500	\$0
Reconstruct Water Bars (ohv)	mi	45	\$1,300	\$58,500
Reconst Water Bars (wilderness)	mi	9	\$1,000	\$9,000
----->Total----->				

\$134,650

Probability of Success 0.8

Resource Value Loss	Failure	
-----		
Soil Productivity Loss		\$8,157,500
Road Loss		981,700
Grazing Opportunity		13,900
Noxious Weed Infestation (Treatment Cost)		16,000
Trail Loss		61,650
Timber Productivity		12,000,000
Fish Productivity		280,000
Species Extirpation (Bull Trout, Chinook)		2,000,000

Alternative Cost

Treatment Total	\$134,650
Resource Loss	\$4,702,150
Total	\$4,836,800

Cost / Risk Worksheet

Fire Name: Tower Fire Acres: 50,200  
 Analysis Date: 16-Sep-96  
 Alternative: Initial High Level of Treatment

TREATMENT	Unit	Number	Unit
Amount	type	Units	Cost
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Seeding Non-Wildrns Persistent ac		0	\$34
Seeding Non-Wildrns Non-persis ac		4,123	\$35
			\$144,305

Seeding Wilderness Native Seed ac	480		\$36
Contour Felling (Non-wilderns) ac	78		\$65
Contour Felling (wilderness) ac	480		\$75
Channel Log Structure	2	str	\$300
Install Larger Culvert	2	str	\$875
Culvert removal	22	str	\$500
Cross Drain Installation	20	str	\$200
Drainage Crossing Stabilization ac	45		\$200
Reconstruct Drain Dips	79	str	\$50
Construct Inlet Structure	1	str	\$1,500
Reconstruct Water Bars (ohv) mi	45		\$1,300
Reconst Water Bars (wilderness) mi	9		\$1,000
			\$9,000

Total----->  
\$301,955

Probability of Success 0.8

Resource Value Loss	Failure
Soil Productivity Loss	\$8,157,500
Road Loss	981,700
Grazing Opportunity	13,900
Noxious Weed Infestation (Treatment Cost)	16,000
Trail Loss	61,650
Timber Productivity	12,000,000
Fish Productivity	280,000
Species Extirpation (Bull Trout, Chinook)	2,000,000
Total ---->	\$23,510,750

Alternative Cost  
Treatment Total \$301,955  
Resources Loss \$4,702,150  
Total \$5,004,105