File Code: 6520/2520-3 **Date:** September 28, 2000
Route To:

Subject: Landowner Portion of the Thompson-Flat Complex Fire, Burned Area Emergency Rehabilitation Request

To: Chief

Enclosed is the Initial Burned Area Rehabilitation (BAER) request for the Landowner Fire on the Lolo National Forest. This request is for $140,044.

This fire burned 2425 acres of which 2,372 was on National Forest lands. Issues include: noxious weeds, bull trout, increased flood flows, increased erosion and sediment yield. Treatments include: Fill removal, grass seeding, tree planting, control of noxious weeds, placement of straw-wattles, hazard tree removal, culvert replacement, culvert cleaning and armoring with rock.

Contact Bruce Sims (406-329-3447) if you have any questions.

/s/Kathleen A. McAllister (for)

DALE N. BOSWORTH
Regional Forester

Enclosure

cc:
Max Copenhagen, WO

Date of Report: 9/27/2000

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: Landowner portion of Thompson-Flat Complex B. Fire Number: MT-LNF-092

C. State: Montana D. County: Mineral

E. Region: R1 F. Forest: Lolo

G. District: Superior

H. Date Fire Started: 08/04/00 I. Date Fire Contained: 09/12/00

J. Suppression Cost: $11,800,000.

K. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): N/A
2. Fireline seeded (miles): N/A
3. Other (identify): N/A

L. Watershed Number: 17 01 02 04 06 07 and 17 01 02 04 06 08

M. Total Acres Burned: 2425
NFS Acres (2372) Other Federal (0) State (0) Private (53)

N. Vegetation Types:
High severity burn, approximately 118 acres, occurred in Subalpine Fir/beargrass (SAF/XETE) habitat types. Moderate and mod/low severity, approximately 922 acres, 38 percent occurred in dry Douglas-fir (DF) habitat types, 46 percent in Grand fir and moist DF habitat types, and 15 percent in SAF/XETE.

O. Dominant Soils: Deep, medium textured Inceptisols and Alfisols on moderately steep to steep mountain slopes.

P. Geologic Types: Pre-cambrian meta-sedimentary argellites, siltites and limestones

Q. Miles of Stream Channels by Order or Class: 4^{th}= 2, 3^{rd}= 2, 2^{nd}= 3, 1^{st}= 15

R. Transportation System

Trails: 1.3 miles Roads: 22 miles FDR system, 8 miles non-system road

Jammer terraces: 5 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 1334 fs, 42 pvt (low); 922 fs, 11 pvt (moderate); 118 fs (high)

B. Water-Repellent Soil (acres): 64

C. Soil Erosion Hazard Rating (acres):
1,143.8 (low) 575.6 (moderate) 706.6 (high)

D. Erosion Potential: 13.6 tons/acre

E. Sediment Potential: 1036 cubic yards / square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):	6 yrs. for erosion, 60 yrs. for runoff
B. Design Chance of Success, (percent):	80
C. Equivalent Design Recurrence Interval, (years):	10
D. Design Storm Duration, (hours):	6
E. Design Storm Magnitude, (inches):	1.4
F. Design Flow, (cubic feet / second/ square mile):	10
G. Estimated Reduction in Infiltration, (percent):	20
H. Adjusted Design Flow, (cfs per square mile):	13

PART V - SUMMARY OF ANALYSIS

A. Description of Resource Emergencies:

Watershed Emergency The Landowner Fire perimeter is about 5793 acres on both sides of Trout Creek, a tributary to the Clark Fork River near Superior, Montana. The acreage burned within the perimeter is 2425 acres. Trout creek is both a “Priority Watershed” for bull trout recovery as well as being described as Water

Quality Limited (303(d) listed) by the state of Montana primarily because of increased sediment, flow alteration and alteration of aquatic habitat. Trout Creek (although impaired) provides important fish habitat because it is one of only four large, perennial, refuge tributaries to the Clark Fork River in the 60 mile reach between the Bitterroot and St. Regis Rivers.

The area is mineralized and was heavily mined from the late 1880's until near the mid 1900's; small to medium sized placer mining operations continue in many streams. The mainstem of Trout Creek itself and most of its tributaries within the fire were extensively placer mined over the last century resulting in re-located stream channels, unstable banks, disrupted streambeds, and highly mobile placer tailing deposits leaving the watershed in a vulnerable state with respect to potential increased post-fire runnoff.

Side slopes within the fire perimeter are moderate to steep, ranging from 35 to 80 percent. While the average slope in the watershed is 40 percent, the higher slopes are found in the areas that were severely burned. The relatively low proportion of severely burned soils are concentrated in steep (65 – 80 percent) ephemeral and intermittent drainages with high soil erosion hazard. Road densities range from 2 to 3 miles per square mile across both HUC's (watersheds) noted in part II, but in the 20 to 40 acre severely burned drainages the areal equivalent density is over 20. Flow concentration will happen!

Severe erosion, stream crossing failures, and subsequent sedimentation from roads, trails and jammer terraces will occur due to increased run-off resulting from the burn; water quality and fisheries resources will be acutely degraded. Anticipated post-fire storm runoff increases will result in excessive erosion caused by flow concentration along system and non-system road surfaces and by roads directing large portions of runoff into drainage ways. Based on observations in the nearby Flat Creek Fire area on this district (Superior Ranger District) following a 0.5 to 1 inch rainfall event, portions of system and non-system roads can be expected to lose 2 to 4 inches of native surface material from potential post-fire runoff flowing down and along road prisms, and stream channels intersected by road crossings will suffer likely increased debris flows and scouring because of the fire.

Steep slopes, extensive road, trail and jammer corridor networks (logging access-features that function hydrologically similar to constructed terraces), soil temporarily covered by water-repellent fine ash, and loss of canopy due to the fire seriously increases the risk of runoff concentrating in ephemeral draws with subsequent scouring mud flows. High road densities in severely burned, sensitive sub-drainages, coupled with a jammer corridor network multiply sedimentation and culvert failure probabilities. Natural re-vegetation on these sites will be too slow to prevent increased runoff, soil erosion and their associated impacts.

Vegetation Emergency The largest, contiguous area of high and moderate burn severity and stand replacement fire intensity occurs in the Russian Bill Creek drainage. Of these, 280 acres is classified as Fire Groups 4 and 6, FG 4/6, (Fischer and Bradley, 1987). Historically, fires of low intensity and a frequency of 5 to 25 years would have occurred instead of stand replacement. These are Douglas-fir Habitat types (Pfister, 1978 and Hansen, 1995).

The length of time for natural revegetation on dry Douglas fir types is expected to be slow and spatially discontinuous. Based on research (Stickney, 1986) (Noste and Bushey, 1987) and professional experience, some native grasses and shrubs will colonize the burned areas. Ceanothus was present in many stands before the fire. Stickney (1986) found Ceanothus covered 41 percent of the area on a severe fire on south slopes. Arno and others (1985) state that a medium to severe wildfire on a Douglas-fir/ninebark habitat type with evergreen Ceanothus seed in the soil will result in an evergreen Ceanothus community. This results in a high probability that Ponderosa pine and Western larch would be lost as a component on these habitat types in the high and moderate burn areas. Establishing seral species of trees is a priority to maintain ecosystem stability and prevent type conversion.

The Northern Region Assessment, Focus on Ecosystem Health and Recreation (USDA, 1998) identified the following plant communities at most risk in the Northwest zone due to: past and potential future loss in the areal extent of the cover type; significant changes in landscape level heterogeneity (fragmentation); significant

changes in structure (both density and change in distribution of structural stages); and susceptibility to spread of identified exotic plants.

Upland grass/shrub	Ponderosa pine
Riparian	Larch
White pine	Whitebark pine

There is a low probability for natural regeneration of Ponderosa pine and Western larch due to the size of the burned area, the severity of the burn, and the topography. The drainages have 100% mortality of the overstory and no surviving cones were observed during field reconnaissance. The ridge presents a barrier for seed from live trees to initiate regeneration. Because of this there is significant risk to increased runoff and soil erosion in addition to the ecological instability and risk of type conversion discussed above.

Noxious Weed and Wildlife Winter Range Emergency

Noxious weeds, including spotted knapweed (*Centaurea maculosa*) and leafy spurge (*Euphorbia esala*), are rapidly invading and replacing native vegetation communities across the west. Such invasions can have devastating impacts on wildlife. Invasion of ungulate winter ranges can reduce forage production by >90. In western Montana, droughty timber/bunchgrass or timber/shrub communities are most at risk from noxious weed invasions. Disturbance from logging, road construction, mining, or wildfire significantly increases both the rate of spread of these weeds, and the degree to which these weeds can permanently displace native vegetation.

While weeds were a minor problem prior to the fire, based on local research by Jack Losensky, we expect noxious weeds to increase by another 3-4 fold due to the reduction in canopy closure and increased ground disturbance. This fire has approximately 375 acres that are (A) close to a weed source such as a road, logged area, or mining site, and (B) composed of landtypes that are highly vulnerable to noxious weed invasions because of the combination of: 1) droughty sites and 2) burned over conditions. Based on local monitoring and research, we expect these sites to be fully occupied by noxious weeds within 3-5 years without treatment. The consequences of this shift from the natural timber/shrub/bunchgrass vegetation to weeds will be: increased soil erosion caused by a decrease in surface cover, decline in soil productivity because of lower organic matter availability and long term increases in overland flow as infiltration is inhibited. As an added risk, the use of crews and equipment from other locales raises a high risk of new invaders becoming established (including yellow star thistle and Dyer's woad).

Elk and mule deer are abundant in the area in the spring, summer, and fall. Most of these animals winter at lower elevation. Without treatment, ungulate range forage productivity will decline by at least 90-100%. These reductions of forage in spring and fall may increase over winter mortality, especially in young animals.

Additionally, there is a pack of federally endangered wolves in the area, part of an experimental population. Loss of this winter range carrying capacity resulting from noxious weeds will force this pack to relocate to other adjacent areas. While wolves are fully capable of relocating to exploit ungulate prey availability, such relocation would increase the risk of wolves killing domestic livestock in the area. This would likely result in federal control actions or illegal human-caused wolf mortality, outcomes incompatible with the Endangered Species Act (ESA).

By displacing native grasses and forbs, weeds will have adverse effects on animals that use early successional or grass/shrub habitats, including native birds, small mammals, and insects like butterflies.

Fisheries Emergency:

Trout Creek and its tributaries are priority watersheds for bull trout on the Lolo National Forest, and are Bull Trout core areas for Montana Fish, Wildlife and Parks. Trout Creek and Cement Gulch are documented to contain bull trout, which are federally listed under the Endangered Species Act (ESA) as threatened. They

also contain the Regionally sensitive westslope cutthroat trout. In addition, Trout Creek supports other native coldwater species and several introduced coldwater game fish including brook trout, brown trout and rainbow trout.

Effects of the fire, which will impact fish, are:

1) Increased sediment, and ash, from surface run off from burned areas.
2) Impacts that result from increased stream flow, which may include sediment from increased channel scour and/or from any culvert failures resulting from clogging with burn debris or inability to handle increased flows.

Treatments for these potential effects are already proposed. See grass and tree planting treatments listed under Land Treatments, and culvert treatments under the Road and Trail Treatments section. Based on input from Fisheries Biologists that have been in the field as Resource Advisors on the fire, and/or working on suppression rehabilitation projects, and field review, it is determined that no additional treatments need to be proposed for fisheries resources.

Cultural Resources Emergency This fire burned over large portions of the Cedar-Quartz Historic Mining District (24MN245) and contributing sites in Deep Cr. (24MN54, 24MN119, and 24MN216), Cement Creek (24MN95), and Sunrise Creek (24MN32 and 24MN83). The fire also burned-over Landowner lookout (24MN147) and near the Van Ness lookout (24MN246), and the Trout Creek stock driveway (24MN251). The Historic District and the contributing sites have been determined eligible for the National Register of Historic Places. Further, we expect the fire has revealed undocumented sites within the Historic Mining District that are also subject to increased erosion and degradation. Finally, in keeping with Section 106 of the National Historic Preservation Act and 36CFR800, both the fire and proposed BAER rehab activities must be evaluated for their effects on significant and eligible cultural resources and consultation with the State Historic Preservation Office (SHPO) and the Confederated Salish and Kootenai Tribes (CSKT) on these effects must occur. The CSKT has concerns about other values that may be adversely effected by proposed rehab methods. The use of aerial seeding and its impact on tradional use plants would be one example.

B. Emergency Treatment Objectives: Dispersion of concentrated runoff away from severley burned sub-drainages is the primary objective! All treatment objectives are proposed to stablize watershed slopes; reduce the risk of post-fire flooding, channel degradation, water quality impacts, and affects to downstream watershed improvements, public health and safety, and loss of fish habitat; maintain native plant species diveristy, density, composition and vigor; avoid establishment of new noxious weeds; restore ecosystem composition and function; maintain winter range forage productivity; maintain wolf populations and avoid human-caused mortality; and mitigate affects to cultural resources. Emergency efforts will emphasize reducing the existing potential to concentrate runoff in intermittent and empheral draws through a combination of actions which will disperse water from old jammer terraces, promote infiltration, and remove through fills where no culverts are inplace. Culverts of insufficient capacity will be replaced where necessary to avoid stream crossing failures; where, existing failure potential is low, culverts will receive inlet efficiency improvements. A mix of grass seeding and tree planting in intensely burned areas will promote infiltration, add soil stability and increase surface cover. A combination of grass seeding and herbicide application are proposed to minimize the spread of weeds on dry, south facing slopes which are critical big game winter ranges.

Additional treatments focus on stream crossings and surface drainage patterns relating to roads and trails where a high potential for increased post-fire flow concentration exists --primarily within moderate to high burn severity areas. Consequences of not doing this work are significant as it relates to maintaining surface material on system roads, reducing erosion of road and trail templates, reducing concentrated flow patterns resulting from increased runoff interacting with roads and trails, maintaining soil productivity down slope of roads and trails, protecting water and fish resources, and providing for trail user safety. There will be no long-term changes in pre-fire access or road maintenance levels with BAER funding.

Treatment details are provided below.

Land and Slope Treatments

Treatment 1: **Restore stream capacity and disperse runoff from jammer terraces.**

Treatments involve removing stream fills and dispersing surface water from jammer terraces where an increased potential for flow concentration, excessive erosion, sedimentation, and stream crossing failures exists, primarily within moderate to high burn severity areas.

A substantial amount of moderate to high burn severity locations overlay with very high densities of "stacked" jammer terraces which typically have no drainage structures and were built with continuous grades that intercept overland flow and funnel runoff for thousands of feet into stream channels. (A large portion of the excessive erosion that occurred after the first storm event on the nearby Flat Creek Burn Area on the Superior Ranger District was caused by flow concentration on jammer terraces, which diverted increased amounts of runoff into stream channels because of the fire.)

Jammer terrace treatments to improve surface drainage largely depend on risk reduction, burn severity, and hydrologic recovery. Where applicable, the following measures will be employed: add drain dips and waterbars, outslope terrace surfaces, restore drainage channels, and, in some areas, recontour slopes.

Specifically (based on maps and initial post-burn field reconnaissance), jammer terrace fills will be removed at 3 draw crossings, 1 mile of jammer terrace drainage treatments (such as dips, waterbars, and outsloping) would be accomplished, and spot recontouring of jammer terraces (estimated at 0.5 miles total) would be performed where necessary to correct drainage or stability problems exacerbated by the fire and which could not be corrected through other means.

Consequences of not doing this work are significant – as it relates to protecting human life, maintaining downslope soil productivity, protecting downslope system road facilities, and protecting water and fish resources.

Probability of Completing Treatment: 100%

Probability of Treatment Success:

Year 1	Year 3	Year 5
90	100	100

Treatment 2: **Hillslope stabilization**

There is a high burn severity area located in very steep (65-70% slope) draw, in the SE1/4 of Section 23 and the SW1/4 of Section 24. This site has the potential for surface soil erosion to occur and deliver sediment directly to Trout Creek, which is at the base of the draw. Also the hill-slope in this draw has a road going through the draw. Because of the additional soil water in this draw following the fire there is an increased risk of the cut-slope of the road failing in the draw crossing. This failure would also deliver sediment into Trout Creek.

The treatments on this draw site to reduce the surface and/or mass soil erosion would include the following practices: 1) Grass seeding with a hand seeder on the hill-slope above the draw, that burned with high burn severity. 2) The placement of 4 rows of straw-wattles across the draw directly above the road. The spacing on the rows of straw–wattles would be approximately 25 feet apart and 3) Place an armoring of large rock (24"+) on the cut-slope of the road through the draw, to reduce the potential for the cut-slope to fail. The armoring is included as a stream crossing cost.

Probability of Completing Treatment: 100%

Probability of Treatment Success:

Year 1	Year 3	Year 5
90	100	100

Treatment 3: **Ecological Stabilization: Plant seral tree species.**

Approximately 280 acres of dry Douglas-fir habitat types burned moderate to high. Plant approximately 200 to 300 Ponderosa pine and/or Western larch per acre on areas where it occurred before the fire. There is a low probability for natural regeneration of Ponderosa pine and Western larch due to the size of the burned area, the severity of the burn, and the topography. The drainages have 100% mortality of the overstory and no surviving cones were observed during field reconnaissance. Use standing dead trees for shade. Netting protection is needed to protect Ponderosa pine seedlings from being browsed by animals. Cost is estimated at $325 per acre. Seventy-five acres are being proposed for BAER funding for a total cost of $25,000. (This is only the beginning of what is needed; delays in planting the remaining acres will increase costs to about $500. per acre.)

Probability of Completing Treatment: 100%

Probability of Treatment Success:

	Year 1	Year 3
% estab. of WL & PP	100	83

Treatment 4: **Apply herbicide to control noxious weeds.**

Controlling noxious weeds will not only minimize sediment production and improve long term soil productivity but will also help maintain winter range forage productivity, maintain native plant diversity, density, composition, and vigor, and avoid the establishment of new noxious weeds. The herbicide will be limited to picloram (brand name TORDON), applied @ 1pt/ac in 2 gal water. Application will be limited to licensed applicators and will follow all label restrictions. Where riparian zones or high water table situations are encountered, no herbicide will be applied. Treatment will be limited to areas with completed NEPA (Lolo National Forest has an approved weed treatment NEPA document). The costs below are 66% of the total treatment costs, those solely attributable to wildfire. One third of the costs will be provided by other funds to cover treatment of pre-existing conditions.

a. year 1 aerial spraying 375 ac @ $35/ac $13,125
b.. anticipated year 3 aerial spraying 150 ac @ $35/ac $ 5,250 (not requested)

Probability of Completing Treatment (before noxious weed invasion): 100 percent

Probability of Treatment Success:

	Year 1 (6/1/01)	Year 3 (6/1/03)
% Control of Weeds	90%	100%

Fisheries Treatments: Protection of fish and habitat will be accomplished through proposed Land, Channel and Road Treatments. No additional treatments are proposed.

Channel Treatments: No Channel Treatments proposed.

Road and Trail Treatments:

Treatment 1: **Restore stream crossings and surface drainage to roads.**

Treatments involve stream crossing and surface drainage modifications to Forest Development Roads and non-system roads where an increased potential of flow concentration, excessive erosion, sedimentation, and

stream crossing failures exists because of the fire, primarily within moderate to high burn severity areas. There will be no long-term changes in pre-fire access or road maintenance level with BAER funding.

Some of the moderate to high burn severity locations overlay with high road densities (Sections 18, 19, and 20 for example); these roads include non-system roads with no drainage structures and continuous grades that intercept overland flow and funnel runoff for thousands of feet into stream channels. (A large portion of excessive erosion that occurred after the first storm event on the nearby Flat Creek Fire on the Superior Ranger District was caused by flow concentration on roads, which diverted fire increased volumes of runoff into stream channels. Several Forest Service system and non-system roads in these areas lost 2- 4 inches of native road surface material, most of which contributed to debris flows in stream channels.)

Channel crossings on non-system roads -- typically absent of culverts -- will involve pulling the fills and restoring the channel to natural contours and alignments. In some locations, spot recontouring of non-system road prisms outside of stream crossings may be appropriate.

Culverts in this area are substantially undersized in most locations for expected post-fire runoff. Culvert treatments will primarily involve resizing the culverts on FDRs to accommodate flood and debris flows and to provide for fish migration where necessary. Culverts at the minimum will meet INFISH standards and will be sized to pass a 100-year peak flow from a vegetated watershed or the calculated flow from the burned watershed, whichever is larger. In some locations, where possible (headwater depths are not significantly over 1.0 for the 100-yr design flow and fish passage is not necessary), culvert capacity will be improved by installing flared-end sections on inlets with erosion protection provided at the outlets.

Road treatments to improve surface drainage largely depend on transportation planning, site specific road conditions, risk reduction, burn severity, and hydrologic recovery. On both system and non-system roads, road templates will be treated by installing drain dips and other types of cross-drains and providing road surface cross-slope.

Based on maps and initial post-burn field reconnaissance:

- fills would be removed at 8 draw crossings on non-system roads,
- 1 culvert (on an FDR road) would be upsized,
- 5 culvert inlets would be cleaned,
- 1 culvert inlet catch basin would be rock lined,
- road surface drainage treatments (such as dips, waterbars, ditching, and template cross-sloping) would be accomplished on 3 miles of FDR and non-system roads,
- spot recontouring of non-system roads would be performed where necessary (estimated at 0.5 miles) to correct drainage or stability problems exacerbated by the fire and which could not be corrected through other means.

Consequences of not doing this work are significant – as it relates to protecting human life, maintaining surface material on system roads, maintaining downslope soil productivity and protecting water and fish resources.

Probability of Completing Treatment: 80%

Probability of Treatment Success:

Year 1	Year 3	Year 5
100	100	100

Treatment 2: **Restore surface drainage to trails, post hazard warning signs, and remove obvious hazard trees.**

Trail treatments primarily involve waterbar installation and spot trailbed drainage work to eliminate fire induced concentrated runoff, and subsequent erosion, down steep grades in moderate to high burn severity areas. Relocation of short sections of trail in order to reduce erosion potential may be appropriate in specific areas. Trail signs describing potential fire-caused hazards (potential for snag windthrow and burned-out voids in the trailbed for example) will be installed at burn area entry points and at trail-road junctions within the burn area. Specific hazard trees (imminent danger of falling across the trail) that result from the fire will be removed.

The only trail within the burn area is the Landowner Mountain Trail #620. Within the burn area, this trail is primarily a ridgetop trail, and thus does not inhibit runoff dispersal to a large degree. Moreover, this trail is generally within low to unburned fire intensity areas. There are some areas of moderate to steep trail grades, particularly near the summit of Landowner Mountain, that are of concern.

On this trail within the fire area, 10 waterbars would be installed and spot tread work, totaling approximately 500 feet of trail length, will be performed to provide drainage. One sign warning of hazardous conditions would be installed and specific hazard trees that are a result of the fire will be felled along the 1.3 miles of trail that are in the burned area.

Consequences of not doing this work are significant – as it relates to maintaining surface material on trails, maintaining soil productivity downslope of trails, protecting water and fish resources, and providing for trail user safety.

Probability of Completing Treatment: 75% prior to December 1, 2000
100% prior to July 1, 2001

Probability of Treatment Success:

Year 1	Year 3	Year 5
100	100	100

Cultural Resource Treatments

Treatment 1: **Protect Cultural Resources.**

Land treatments prescribed to reduce erosion and disperse surface runoff are expected to reduce the risk of adverse effects to National Register-eligible properties caused by (1) the fire, (2) increased runoff and erosion resulting from the fire, and (3) post-fire BAER and suppression rehabilitation treatments.

Treatment 1a: **Document resource impacts in event of failure of watershed treatments to protect cultural properties.**

The Land Treatments identified above to reduce erosion and runoff concentration are expected to provide protection for the documented cultural sites. If these measures fail, then full-scale recordation and data recovery to the Secretary of the Interior's standards will be necessary (not fundable by BAER).

Treatment 1b: **Consult with SHPO and Confederated Salish and Kootenai Tribes.**

Consult with the State Historic Preservation Office and the Confederated Salish and Kootenai Tribes on the impact of the fire and the post-fire rehab efforts on the Historic Mining District, contributing sites within the District, the five prehistoric sites within the burn areas, and other as yet undocumented sites or other resources of concern to the CSKT. Consultation with the SHPO and the CSKT is required under the provisions of the National Historic Preservation Act and by other laws and treaties. These treatments to protect cultural resources will require eight days of fieldwork for two archaeologist, four days for analysis and write-up and and two days for consultation with SHPO and the CSKT.

Probability of Completing Treatment: 70%

Probability of Treatment Success:

Year 1	Year 3	Year 5
50	70	90

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

Land **90** % Channel **N/A** % Roads **100** % Other **70-75** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	90	100	100
Channel	-	-	-
Roads	100	100	100
Cultural	50	70	90

E. Cost of No-Action (Including Loss): Cost of No-Action (Including Loss): An accurate monetary cost of no-action is imprecise because of the unpredictable nature of climate from year to year. Predictions could be much less or much more than the design storm events. For the design climatic events, costs of no action would include damage to the road system which would have to be repaired at stream crossings from culvert replacement and surface erosion ($185,000), Debris cleaning from potential mudflows would be about $30,000 and replacing fills would be about $15,120. Wildlife impacts caused by noxious weed invasion of winter ranges would be $12,000. (see below).

Planting trees after grass has established would increase costs by $200 per acre or $525 /acre for a total of $39,375 and reduce success of artificial regeneration to less than 50%. Not planting 75 acres of western larch and ponderosa pine at this time would therefore cost an additional $14,000. Grass seeding for erosion control would limit success for natural regeneration of trees especially Ponderosa pine and Western larch which needs bare mineral soil.

By not treating noxious weeds to inhibit invasion of wildlife winter ranges, the following losses to wildlife are estimated:

a. 5 elk (assumes 50% winterkill, valued at $1,200/elk) $6,000
b. 10 deer (assumes 50% winterkill, valued at $600/deer) $6,000

The estimated on-forest cost of no action is about **$226,000**. The difference between this figure and the proposed restoration action is **$85,956**.

F. Cost of Selected Alternative (Including Loss): **$140,044**

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Arne Rosquist, Lolo National Forest

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H. **Treatment Narrative:**

NOTE: See part B, Emergency Treatment Objectives.

I. **Monitoring Narrative:**

Landowner Fire - Post-fire Burn Area Emergency Rehabilitation Monitoring Plan

Background: The impacts of the fire on the aquatic resources are expected to be low to moderate in Trout Creek. The BAER team conducted onsite reviews of streams within the fire area during the latter half of September, after the majority of the burning occurred within the fire perimeter. Observations from numerous vantage points indicated that the fire burned within the riparian area (300 feet either side) of Trout Creek only a short distance in the reach between Dunn Creek and Windfall Creek. The majority of the burned areas within the riparian zone was of low intensity and appears to have had minimal effect on riparian shade or vegetative bank stability. Immediate and long-term increases in large woody debris levels, derived from high burn severity areas further upstream, are expected in these streams. Because of high burn severities in headwater basins of several tributary watersheds, higher volumes of fire-induced runoff and sediment are expected during the next few years' spring runoff (and possibly this fall dependent upon rainfall intensity). A moderate precipitation event on September 2 generated a mudflow in an ephemeral draw just across the Clark Fork River a few miles to the north demonstrating the vulnerability of these basins and their potential to produce increased volumes of both runoff and sediment.

Proposed Activities:

1) **Monitor effectiveness of recommended mitigation measures to protect cultural properties and identify any necessary additional measures** at nine cultural sites and the historic district, 24MN245. Approximately 1000 acres and 10 miles of stream need to be monitored or evaluated for cultural sites adversely effected by either the fire or the BAER rehab efforts. Estimated cost is $2,000 for monitoring.

2) **Monitor effectiveness of runoff dispersion treatments of jammer terraces** at selected indicator sites by establishing photo points. Photo points would be established this fall and observations and photo documentation of site condition would be completed. These observations and photography would be repeated after snowmelt runoff and again late in the fall of 2001 after the summer thunderstorm season. Effectiveness would be determined by the degree of rilling or gullying observed (photographed), amount of off-site sediment movement and the the degree of re-vegetation of the treatment. The cost is estimated at five work-days plus photography costs for $1,100.

3) **Monitor results of grass seeding** by standard vegetation plot transect methodology. Each seeded area would be surveyed once during mid-to-late summer 2001. Estimated cost for two work days is $400.

4) **Monitor success of seral tree planting** using standard re-forestation survey methods. Estimated cost is one work day for $200.

5) **Monitor effectiveness of noxious weed treatment** by standard vegetation plot transect methodology. Survey would be conducted mid-to-late summer 2001. Estimated cost is three work days for $600.

6) **Monitor effectiveness of hillslope treatments** at selected indicator sites by establishing photo points. Photo points would be established this fall and observations and photo documentation of site condition and straw wattle installation would be completed. The site observations and photography would be repeated after snowmelt runoff and again late in the fall of 2001 after the summer thunderstorm season. Effectiveness would be determined by the degree of rilling or gullying observed (photographed), amount of off-site sediment movement and the the degree of re-vegetation of the treatment. The cost is estimated at five work-days plus photography costs for $1,100.

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

Line Items	Units	Unit Cost	# of Units	WFSU SULT $	Other $	# of units	Fed $	# of Units	Non Fed $	Total $
A. Land Treatments										
Jammer Fill Removal	ea	$2,000	3	$6,000			$0		$0	$6,000
Jammer Surface Treatment	miles	$2,000	1	$2,000			$0		$0	$2,000
Jammer Recontoring	miles	$5,000	0.5	$2,500			$0		$0	$2,500
Erosion control seeding	acres	$100	5	$500						
Erosion control -straw wattles	foot	$5	400	$2,000						
Tree Planting	acres	$325	75	$24,375			$0		$0	$24,375
Weed Spray, Aerial - year 1	acres	$35	375	$13,125			$0		$0	$13,125
Subtotal Land Treatments				**$50,500**			$0		$0	$50,500
B. Channel Treatments										
Subtotal Channel Treat.	0	$0	0	$0			#REF!		#REF!	#REF!
C. Road and Trails										
Rd Fill Removal	ea	$2,000	8	$16,000			$0		$0	$16,000
Rd Surface Drainage	miles	$2,000	3	$6,000			$0		$0	$6,000
Rd Recontouring	miles	$5,000	0.5	$2,500			$0		$0	$2,500
Rd Culvert Replace	ea	$8,100	1	$8,100			$0		$0	$8,100
Rd. Culvert cleaning	ea	$500	5	$2,500			$0		$0	$2,500
Rd. Armoring with rock	ea	$4,000	1	$4,000			$0		$0	$4,000
Trail Water Bars	ea	$50	10	$500			$0		$0	$500
Trailbed Drainage	ft	$1.25	500	$625			$0		$0	$625
Trail Hazard Signs	ea	$100.00	1	$100			$0		$0	$100
Tr Hazard Tree Remove	miles	$500.00	1.3	$650			$0		$0	$650
Subtotal Road & Trails				**$40,975**			$0		$0	$40,975
D. Other										
Cultural resource - CSKT/SHPO	ea	$12,000.00	1	$12,000			$0		$0	$12,000
Subtotal Structures				**$12,000**			$0		$0	$12,000
E. BAER Evaluation										
Survey/assessment Form	Days	$250.00	75	$18,750			$0		$0	$18,750
BAER Cont. Suppport	Days	$250.00	15	$3,750			$0		$0	$3,750
Team Travel & PD	Days	$120.00	25	$3,000						$3,000
Subtotals BAER Eval				**$25,500**						$25,500
F. Monitoring										
Cultural Properties	survey	$1,000.00	1	$1,000						$1,000
Runoff Dispersion Treatments	survey	$1,100.00	1	$1,100						$1,100
Grass Seeding Effectiveness	survey	$400.00	1	$400						$400
Seral Tree Planting Effectiveess	survey	$200.00	1	$200						$200
Hillslope Treatment Effectiveness	survey	$1,100.00	1	$1,100						$1,100
Herbicide Trtmt Effectiveness	survey	$600.00	1	$600						$600
Subtotals Monitoring				**$4,400**						$4,400
Subtotal				**$133,375**						$138,625
G. Overhead (5%)				$6,669						$6,931
H.Totals				**$140,044**						$145,556

PART VII - APPROVALS

1. /s/ Barbara K. Beckes (for) — 9/27/00
   Deborah L. R. Austin, Forest Superviosr — Date

2. _____ — _____
   Dale N. Bosworth, Regional Forester — Date