

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

A. Type of Report

- ☒ 1. Funding request for estimated emergency stabilization funds
☐ 2. Accomplishment Report
☐ 3. No Treatment Recommendation

B. Type of Action

- ☐ 1. Initial Request (estimate of funds needed to complete eligible stabilization measures)
☒ 2. Interim Report (**#1**)
 ☒ Updating the initial funding request based on more accurate site data or design analysis. **Subsequent analysis for unassessed area of fire.**
 ☐ Status of accomplishments to date
☐ 3. Final Report (following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Pioneer

B. Fire Number: ID-BOF-000539

C. State: Idaho

D. County: Boise & Valley

E. Region: 04 - Intermountain

F. Forest: 02 - Boise

G. Districts: Idaho City, Lowman, Emmett

H. Fire Incident Job Code: P4KGG1 (0402)

I. Date Fire Started: 7/18/2016

J. Date Fire Contained: Est 10/15/2016

K. Suppression Cost: \$96M (as of 10/3/2016)

L. Fire Suppression Damages Repaired with Suppression Funds:

1. Fireline water barred (miles): Approximately 34 miles of dozer line, 23 miles of masticator line, and 15 miles of hand line. Equipment lines were repaired using excavators and handcrews. Water bars will be constructed, where appropriate on any of the firelines.
2. Fireline seeded (miles): Approximately 34 miles of dozer line, 23 miles of masticator line, and 15 miles of hand line. Seeding is planned prior to snowfall. All lines, except for those with rare plant concerns, will be seeded with a stabilizing seed mix.
3. Other (identify): Incident base camps, spike camps, staging areas, drop points, and helispots will undergo suppression repair activities, including seeding, planting, ripping or scarification, and access blockage where needed. See Pioneer Fire suppression rehabilitation plan for more information.

M. Watershed Number:

Pioneer North - HU Name (HUC)	Total Acres Burned	Percent Watershed Burned
Boise River (Upper Grimes Creek)		
Headwaters Grimes Creek (170501120101)	6,502	33
Smith Creek-Clear Creek (170501120102)	3,942	34
SF Payette River (mainstem)		
Upper Warm Springs Creek (170501200204)	119	1
Upper Clear Creek (170501200301)	13,304	79
Lower Clear Creek (170501200302)	14,356	73
Eightmile Creek (170501200303)	65	<1
Fivemile Creek-SF Payette River (170501200304)	1,827	8
Rock Creek (170501200305)	12	<1
Kirkham Creek-SF Payette River (170501200306)	1,270	5
Big Pine Creek (170501200601)	1	<1
Hole in the Wall Creek-SF Payette River (170501200602)	10,914	62
Danskin Creek-SF Payette River (170501200604)	28	<1
SF Payette River (Deadwood River)		
Warm Springs Creek (170501200501)	1,233	7
Whitehawk Creek (170501200502)	7,860	72
No Man Creek-Deadwood River (170501200503)	6,437	53
Scott Creek (170501200504)	3,809	35
Lorenzo Creek-Deadwood River (170501200505)	10,670	64
Stevens Creek-Deadwood River (170501200506)	8,771	66
Bear Valley – Elk Creek (Upr MF Salmon Basin)		
Bearskin Creek (170602050102)	2,227	20
Headwaters Bear Valley Creek (170602050201)	10,172	59
Cache Creek-Bear Valley Creek (170602050202)	4,997	20
Wyoming-Bear Valley Creek (170602050203)	4	<1
Upper Elk Creek (170501120303)	380	4

N. Total Acres Burned:

	NFS	State	Private	Total
Pioneer North	130,375	41	481	130,897
Pioneer South	57,593	0	335	58,128
Total	187,968	41	816	189,025

- O. Vegetation Types: The dominant vegetation community is Douglas-fir and ponderosa pine at lower elevations, transitioning to lodgepole pine, subalpine fir, and whitebark pine at higher elevations, with aspen interspersed throughout. Sacajawea's bitterroot (*Lewisia sacajawean*) is an endemic FS Sensitive species to central Idaho and exists within the fire area with whitebark pine, which is an ESA candidate species and a FS Sensitive species. Rare high elevation riparian native plant communities of concern occur in mountain sedge-dominated wet meadows in glaciated basins. The subalpine fir/bluejoint grass habitat type occurs adjacent to these meadows with an overstory of subalpine fir, Englemann spruce, and lodgepole pine. These riparian communities also occur along moderate-size creeks in the subalpine fir/feathery false lily of the valley association, which is restricted to stream margins. These areas provide suitable habitat for FS Watch list species tall swamp onion (*Allium validum*) and sweetgrass (*Hierocloe odorata*), which is a species of cultural importance. Additional associated vegetation communities include shrublands and grasslands.

- P. Dominant Soils: gravelly sandy loam with 15-50% fine gravels

- Q. Geologic Types: Primarily granitics of the Idaho batholith, an intrusive mass in the central Idaho region with an area exceeding 20,000 square miles. The burned area also includes inclusions of intrusive porphyritic rocks, lamprophyres and pegmatites, small areas of lavas and lake beds, and bench and stream gravels.

R. Miles of Stream Channels by Class:

Perennial: 404

Intermittent: 73

S. Transportation System (miles)

All System Roads: 177

Trails: 124

PART III - WATERSHED CONDITION

A. Burn Severity:

Pioneer North	Acres	Percent	NFS	State	Private
High	4,381	3	4,381	0	0
Moderate	48,741	37	48,645	0	96
Low	55,775	43	55,520	32	223
Unburned/Very Low	22,000	17	21,829	9	162
Total	130,897		130,375	41	481

Pioneer South	Acres	Percent	NFS	State	Private
High	3,325	6	3,314	0	11
Moderate	19,389	33	19,309	0	80
Low	25,397	44	25,237	0	161
Unburned/Very Low	10,016	17	9,933	0	83
Total	58,128		57,793	0	335

B. Water-Repellent Soil (acres): 39,841

Some degree of water repellency was observed across the range of soil burn severity classes throughout the fire area. Unburned sites exhibited weak repellency near the surface or lack of it. But there were exceptions as some unburned sites displayed medium repellency in the upper portion of the A-horizon, particularly dry pine sites or where the understory was dominated by grasses. Where soil burn severity was moderate to severe, repellency was typically strong within the first inch and trended from medium-strong to weak at the 2 to 4 inch depth. Below 4 inches (or below the A-horizon) repellency was usually absent. There were some areas in the moderate and severe burn areas where repellency was absent.

It is expected that roughly 75 percent (39,841 acres) of areas mapped as moderate to severe soil burn severity will experience heightened runoff potential and increased risk for accelerated surface erosion. These are areas exhibiting moderate to strong repellency and its projected the water repellent conditions will persist until the topsoil becomes thoroughly wetted, and possibly longer until roots, rhizomes, and soil microorganisms begin to re-aerate pore spaces and breakdown organic residues.

C. Soil Erosion Hazard Rating (acres):

Erosion Hazard Index	Acres	Percent
Very High	11,816	9
High	32,608	25
Moderate	8,678	7
Unburned or Low	77,795	59
Total	130,897	100

- D. Erosion Potential: ERMiT predictions indicate post fire soil loss ranges between 1 to 22 tons/acre for a 10-year storm event, depending on slope length, shape, soil depth, and steepness. This is greater than a ten-fold increase above background pre-fire erosion rates. Given the 45 years of climate records from the Deadwood weather station, the greatest propensity for a precipitation event of that magnitude to occur would be as a spring rain-on-snow event or high-intensity summer thunderstorm.

ERMiT was also used to evaluate the efficacy of hillslope treatments to potentially reduce post fire accelerated erosion from heavily burned over areas. A mulch treatment provide effective ground cover (~1-2 tons/ac application rate) is estimated to reduce post fire erosion rates by about 85 percent on a per acre basis. However, accelerated surface erosion across a subwatershed or at a landscape scale would necessitate a mulch treatment over more than 60 percent of heavily burned over areas. Many of these areas are comprised of slopes greater than 50%, with the over-steepened slopes decreasing effectiveness of mulch treatments. Additionally, treating that amount of area is likely infeasible due to cost, time, and material availability constraints. Mulching treatments in this circumstance are best suited for strategic protection at the site-level scale, not large-scale applications.

- E. Sediment Potential: 12,400 yd³/mi² (cumulative sediment delivery for first 2 years post fire). At least 50 percent of eroded soil would be available for delivery as sediment to streams with a 10-year runoff event.

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period, (years): 2-5 grass (achieve 75% effective ground cover), 20-25 shrubs, 20-50 conifers
- B. Design Chance of Success, (percent): 85
- C. Equivalent Design Recurrence Interval, (years): 5
- D. Design Storm Duration, (hours): 6 and 24
- E. Design Storm Magnitude, (inches): 1.5 in and 2.7
- F. Design Flow, (cubic feet/second/square mile): 67 (varies by site)
Design storm incorporated into SCS Type I rainfall distribution.
- G. Estimated Reduction in Infiltration, (percent): 83
All burned acres within the analyzed burn perimeter are expected to experience at least a partial reduction in infiltration.
- H. Adjusted Design Flow, (cfs per square mile): 24-299 (varies by site)
Design storm incorporated into SCS Type I rainfall distribution.

PART V - SUMMARY OF ANALYSIS

Background: The Pioneer Fire started on July 18, 2016 and is 71% contained as of October 3. The initial Pioneer South assessment on 58,130 acres of the fire was completed with emergency treatments authorized on September 8. An second BAER assessment team began field reconnaissance of the remaining 130,000 acres of the burned area on September 17. This analysis area is named Pioneer North, and is described using four zones: Grimes Creek (Boise River basin), Deadwood (S.F. Payette River basin), Bear Valley (M.F. Salmon River basin), and Clear Creek (S.F. Payette River basin).

A. Describe Critical Values/Resources and Threats (narrative):
(formatted to incorporate "Critical Values and Risk Assessment" from WO ID 2520-2015-1)

1. Human Life and Safety:

Potential threats to visitors/recreating public, residents of private lands, & agency personnel include flooding and debris flows, hazard trees, loss of ingress and egress, and rock fall along/at roads, trails, developed and improved dispersed recreation areas, and permitted uses downstream or downslope of burned slopes, especially those with a moderate-high burn severity. The threats to human life and safety are repetitive throughout the four analysis zones. Risk is increased with higher probability in places having greater, more frequent concentrations of people. Locations with increased risk include: the S.F. Payette River corridor because popular white-water rafting opportunities; and developed and improved recreation uses in the Deadwood and Clear Creek drainages because the NFS road and trail infrastructure provide easy access for Forest visitors.

Very High Risk (likely, major) to **forest visitors and Forest Service employees** within and adjacent to the burn area along County Road 17, NFS roads and trails, and at developed recreation sites due to the increased threat of **falling trees, rocks, flash floods and debris flows** within the burned area. High risk to motorists and trail users from lack of directional and object marker signage in the burned area. (*Treatments PS-01 Warning Signs, PS-02 Recreation Site Warning Signs, PS-03 Recreation Site Hazard Mitigation, PS-06 Temporary Administrative Closure*)

Very High Risk (likely, major) to recreating **forest visitors and Forest Service employees** working in the S.F. Payette River canyon between the Deadwood and Danskin boat launches due to the increased threat of **flash floods, debris flows, falling rocks and trees**. (*Treatment PS-02 Recreation Site Warning Signs, PS-06 Temporary Administrative Closure*)

Very High Risk (likely, major) to **forest visitors and Forest Service employees** utilizing NFS roads within the Clear Creek drainage (NFS Road 582) due to the increased threat of **flash floods, debris flows, falling rocks and trees** and the potential for loss of ingress and egress. (*Treatment PS-01 Warning Signs*)

There may be an increased threat to private residents within and adjacent to the fire perimeter including residents in Long Creek recreation residences (Clear Creek drainage) and in Lowman near the mouth of Clear Creek including Lowman recreation residences. The potential for flash flooding, debris flows, falling rocks and trees poses a threat as well as loss of ingress and egress to landowners if road systems are impacted. Several private residences exist within and downstream from the fire area. Coordination and information sharing with landowners and emergency services is recommended.

2. Property:

Very High (likely, major) and **High Risk** (possible, major) to **NFS road prisms** at intermittent and perennial drainages from **increased runoff, erosion, and debris flows**. Undersized culverts and inadequate drainage structures are not expected to convey the expected increase in post fire runoff and erosion and may severely damage Forest Service road infrastructure and will likely result in **threats to water quality and designated critical habitat or suitable occupied habitat for ESA-listed species (bull trout)**. Locations include maintenance level 2 and 3 roads within and adjacent to the burned area. (*Treatments: RT-01 Storm Patrols Roads and RT-02 Road Drainage Reconstruction*)

High Risk (likely, moderate) to **NFS trail prisms** from **increased overland flow and accelerated erosion** concentrating on route segments downslope from areas burned at moderate and high severity. Failure of these trail segments constitute a loss of Forest Service infrastructure and are expected to deliver sediment to streams downslope and adjacent to the trail resulting in **threats to water quality and designated critical habitat or suitable occupied habitat for ESA-listed species (bull trout)**. (*Treatments RT-05 Trail Drainage Reconstruction, RT-06 Storm Patrols Trails*)

High Risk (possible, major) to stationary **developed recreation site infrastructure** from **hazard trees** at Pine Flats C.G., Deadwood C.G., Red Mountain trailhead, Julie Creek camp and trailhead, and designated camping areas along NFSR 582. Fire weakened trees pose a **threat to buildings and infrastructure** at these developed recreation sites. (*Treatment PS-03 Recreation Site Hazard Mitigation*)

Several private residences exist within and downstream from the fire area. There may be increased threats to non-NFS properties within and adjacent to the fire perimeter including Long Creek recreation residences (Clear Creek drainage) and in Lowman near the mouth of Clear Creek, including Lowman recreation residences. The potential for flash flooding, debris flows, falling rocks and trees pose threats to privately-owned dwellings. Coordination and information sharing with landowners and emergency services is recommended.

3. Natural Resources:

Very High (very likely, moderate) and **High Risk** (likely, moderate) to **designated critical habitat or suitable occupied habitat** throughout the fire area for three ESA-listed fish species (Columbia River DPS bull trout (*Salvelinus confluentus*), Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*). Potential threats include short- and long-term modification of suitable occupied or designated critical habitat due to **channel scouring from increased stream flows, accelerated erosion, increased sediment delivery, debris flows, and potential stream channel diversion down road prisms**, below moderate and high burn severity areas. (*Treatments: L-01 EDRR, L-02 Aerial Mulch, L-03 Ground-based Hydro Seeding, L-04 Ground-based Mulch/Seed, L-05 Riparian Planting, L-06 Unauthorized Route Erosion Control, RT-01 Storm Patrol-Roads, RT-02 Road Drainage Reconstruction, RT-03 Culvert Removals, RT-04 Culvert Upgrades, RT-05 Trail Drainage Reconstruction, RT-06 Storm Patrols-Trails*)

Very High Risk (likely, major) to ESA-listed **bull trout (*Salvelinus confluentus*) designated critical habitat** in the **Clear Creek drainage** because of greater amounts of high and moderate soil burn severity throughout the entire watershed. In addition to considerable direct impacts to

core spawning and rearing habitat, recently hatched and juvenile fish are likely at risk from damaged or impaired habitat. More than 60% of the Upper and Lower Clear Creek watersheds (HU12) burned leaving minimal available habitat; refugia habitat exists in other S.F. Payette River watersheds upstream of Clear Creek, however the juvenile fish do not have the migration capability. *(Treatments: L-02 Aerial Mulch, L-03 Ground-based Hydro Seeding, L-04 Ground-based Mulch/Seed, L-05 Riparian Planting, L-06 Unauthorized Route Erosion Control, RT-01 Storm Patrol-Roads, RT-02 Road Drainage Reconstruction, RT-03 Culvert Removals, RT-04 Culvert Upgrades, RT-05 Trail Drainage Reconstruction, RT-06 Storm Patrols-Trails)*

Very High Risk (very likely, major) to **native and naturalized plant communities** including: Sacajawea's bitterroot, rare high elevation riparian native plant communities of concern, and tall swamp onion due to the threat from the **spread of noxious weeds and invasive plant species**. Invasive weed species that exist within and adjacent to the fire area that may impact native plant communities include: Spotted knapweed, Diffuse knapweed, Rush skeleton weed, Canada thistle, Houndstongue, Dalmation toadflax and Oxeye daisy. *(Treatment L-01 EDRR)*

Very High Risk (likely, major) to Whitebark Pine from alterations in native communities from post fire subalpine fir regeneration, loss of mature seed source trees. Whitebark pine is not a BAER critical value because it is not listed under the Endangered Species Act. No treatments proposed.

High Risk (likely, moderate) to **soil productivity** and **hydrologic function** as **accelerated hillslope and sheet erosion, rilling, gully**ing with **increased overland flows** from moderate and high burn severity areas is expected. The loss of effective ground cover and above ground organic matter will leave the soil resource susceptible to erosive forces for 8 to 10 years. Over the long term loss of surface soils can lead to decreased site productivity and increased potential for the spread of invasive plant species and noxious weeds from known populations within and adjacent to the burned area. Additional threats to soil quality from accelerated erosion and introduction of non-native and invasive plant species exist from unauthorized OHV intrusions due to the loss of physical and vegetative barriers. No soil and hydrology specific treatments recommended however, other treatments will result in benefits to this value. *(Treatments: L-01 EDRR, L-02 Aerial Mulch, L-03 Ground-based Hydro Seeding, L-04 Ground-based Mulch/Seed, L-06 Unauthorized Route Erosion Control, RT-01 Storm Patrol-Roads, RT-02 Road Drainage Reconstruction, RT-03 Culvert Removals, RT-05 Trail Drainage Reconstruction, RT-06 Storm Patrols-Trails)*

4. Cultural and Heritage Resources:

High Risk (likely, moderate) to **critical Cultural and Heritage Resources** within the burn perimeter as a result of **increased potential for looting** resulting from increased public access to sites and exposure of previously concealed artifacts and features, and **loss of sites and/or site integrity as a result of erosion, runoff, and flash flooding** from post wildfire storm events. *(Treatments PS-04 Cultural Resource Protection Patrols and PS-05 Resource Protection Barriers)*

5. Other non-BAER Values:

There are numerous NFS values that are not BAER Critical Values in addition to non-NFS values potentially at risk from post fire threats originating primarily on NFS lands. These are summarized in a "Values at Risk" (VAR) table in the assessment record. Treatments for these other values have not been identified. Activities to address the non-BAER Critical Values on

NFS lands can be considered for discretionary program funding. It is recommended the non-NFS values potentially threatened by post fire conditions be communicated to the appropriate parties through interagency coordination procedures.

B. Emergency Treatment Objectives:

Mitigate and protect, to the extent possible, threats to personal injury or human life of forest visitors and Forest Service employees by raising awareness through posting hazard warning signs on roads and trails, reinforcing trail tread, improving trail drainage and stream crossings, and communicate hazard of flooding, debris flows, and rock fall. Communicate to cooperating agencies and community groups. Consider temporary closures to protect public users of NFS lands and recreation facilities.

Protect or minimize damage to NFS investments in roads and trail infrastructure by installing drainage features capable of withstanding potential increased stream flows and/or debris flows. Minimize damage to key NFS travel routes.

Protect or mitigate potential post fire impacts to critical natural and cultural resources within the burned area. A core area is the Clear Creek drainage having designated critical habitat for ESA-listed bull trout, specifically spawning and rearing habitat that is at very high risk from post fire increases in sediment delivery.

Treat invasive plants that are a threat to naturalized ecosystems by minimizing the expansion of existing populations in the burned area and control of expected invasion of noxious weeds within and adjacent to the area where soils/vegetation was disturbed as a result of fire suppression activities.

Assist cooperators, other local, State, and Federal agencies with the interpretation of the assessment findings to identify potential post fire impacts to communities and residences, domestic water supplies, public utilities (including hydropower facilities, power lines, roads, and other infrastructure).

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

Land - 80% Channel - NA Roads/Trails - 80% Protection/Safety - 90%

D. Probability of Treatment Success

Treatment	Years after Treatment		
	1	3	5
Land	80	80	90
Channel	NA	NA	NA
Roads/Trails	80	90	90
Protection/Safety	90	80	70
Initially, visitors will heed the warning signs. Complacency is expected after the initial year unless there is a damaging event.			

E. Cost of No-Action (Including Loss): Expected benefit of treatment for market values is estimated to be \$1,033,131. This is a direct analysis for market value resources and does not

include tangible benefits to accumulated non-market ecological values. See Pioneer North VAR tool spreadsheet in the project record for calculations.

F. Cost of Selected Alternative (Including Loss):\$ 3,640,741 is the cost of treatment to address emergency conditions for market and non-market critical values. While \$832,034 is the treatment cost to address emergency conditions for critical values with market values only, land treatments L-02 Aerial Mulch and L-04 Ground-based Mulch/Seed recommended for mitigating impacts to ESA-listed bull trout designated critical habitat (DCH) also decrease the probability of damage or loss to the road infrastructure.

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Terry Hardy / Brian Anderson

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H. Treatment Narrative:

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

Land Treatments:

L-01 EDRR (Early Detection and Rapid Response): EDRR is necessary to prevent the establishment and spread of noxious weeds and non-native invasive species into the burned area. EDRR will be used to prevent new noxious weed infestations and ensure the natural recovery of native perennial grasses and forbs is not affected by the establishment of noxious weeds or invasive species. This treatment will also ensure the ecological indicators (soil stability, hydrologic function, and biotic integrity) are functioning properly during the natural recovery period on lands administered by the FS. Chemical treatment of new and existing noxious weed infestations will reduce the likelihood of their spread to disturbed areas and help to re-establish high quality wildlife habitat within the burn.

The Pioneer Fire includes designated critical habitat and suitable occupied habitat for bull trout and occupied habitat for chinook and steelhead. It also includes habitat for whitebark pine, Sacajawea bitterroot, dwarf primrose, sweetgrass and tall swamp onion. EDRR is necessary to protect the integrity of these habitats from the expansion of noxious weeds.

The fire is a disturbance that provides a receptive avenue for the spread of noxious weeds and/or invasive species. Noxious weeds and non-native invasive species are a concern for biodiversity. Weed invasion is a potentially threatening process leading to competition and habitat modification. Plant communities and native species likely to be at greatest risk from weed invasion are those which occupy weed-prone habitats, such as riparian zones, rangelands with naturally low vegetation cover, and disturbed areas adjacent to and near existing weed infestations. On the Pioneer Fire disturbances caused by suppression forces (dozer lines, drop points, etc.) and transportation routes (roads and trails) are the main vectors for noxious weed

invasion. This treatment mitigates this risk by allowing for an early means of detecting new noxious weed occurrences and a quick response for control.

Critical areas for this treatment include riparian habitat, roads, dozer lines, pit reservoirs, ephemeral drainages and burned areas where suppression vehicles and equipment traveled through known noxious weed/non-native invasive plant species populations. Disturbed areas within and along the fire perimeter, such as dozer lines, hand lines, staging areas and safety zones will also be prioritized for monitoring. The 6,373 priority acres for EDRR are as follows:

fire points @ 306 acres; constructed firelines @ 554 acres; roads/trails used as firelines @ 5,513 acres; 6,427 acres of highly susceptible burned area where noxious weeds are absent or in low abundance.

EDRR Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
EDRR	Acres	\$6.13	12,800	\$78,464

L-02 Hillslope stabilization and erosion control (aerial): An application of wood straw or straw mulch would promote faster vegetation regrowth and reduce sediment delivery to designated bull trout critical habitat and known bull trout spawning and rearing areas. Bull trout are fall spawners and their eggs are now in redds in these areas. Increases in fine sediment delivery to spawning areas can entomb and suffocate egg masses deposited in the stream gravels, potentially extirpating the majority of a year class. Degradation of water quality could also force bull trout to relocate to another area and abandon these streams until they have recovered. Re-establishing vegetation and providing soil roughness, as quickly as possible, would decrease erosion by slowing surface water runoff and allowing the fine sediments to be captured before reaching the stream. Application of wood straw, wood chips, and/or straw mulch provides immediate ground coverage, reduces erosion, secures native seeds stored in the soil, helps maintain a favorable moisture and temperature regime for seed germination and growth, and retards noxious weed infestation. As the vegetation grows, it would retain these sediments, as well as the roots providing soil stability, thus reducing sediment delivery to Clear Creek in the short- and long-term timeframes, as well as outcompete noxious weeds.

This treatment is expected to be effective within year one especially if fall treatments are followed by spring supplemental treatments in addition to hydro mulching and willow planting/sod mat treatments overlapping these strategic locations. Although sedimentation is expected in some locations along Clear Creek, the combination of the hydro mulch treatment in addition to the willow and live sod treatments within the RCAs will help minimize this potential and allow willows which are locally adapted to such conditions become readily established further repairing this critical habitat.

The locations of this treatment will be in High to Very High Erosion Hazard Indexed portions of Clear Creek (SFPR), SF Scott Creek, Grimes Creek, and Clear Creek (Grimes).

Hillslope Stabilization and Erosion Control (aerial) Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Hillslope Stabilization and Erosion Control (aerial) Cost Estimate	Each	\$740	2,750	\$2,035,000

L-03 Hydro Seeding (ground based): Hydro seeding the more severely burned portions of the RCA would provide immediate ground cover and promote faster vegetation regrowth, therefore reducing sediment delivery to Clear Creek, which is designated bull trout critical habitat and a known bull trout spawning and rearing area. The threat of invasive weeds would also be diminished by getting native vegetation established as soon as possible. Bull trout, listed as a “threatened” species under the Endangered Species Act, are fall spawners and their eggs are in the redds within this area of Clear Creek. Increases in fine sediment delivery to spawning areas can entomb and suffocate egg masses deposited in the stream gravels, potentially extirpating the entire year class. Degradation of water quality could also force bull trout to relocate to another area and abandon Clear Creek until it has recovered. Re-establishing vegetation and providing soil roughness, as quickly as possible, would decrease erosion by slowing surface water runoff and allowing the fine sediments to be captured before reaching the stream. Application of hydro mulch provides immediate ground coverage, reduces erosion, secures native seeds stored in the soil (if viable), helps maintain a favorable moisture and temperature regime for seed germination and growth, and retards noxious weed infestation. As the vegetation grows, it would retain these sediments, as well as establishing root structure providing soil stability, thus reducing sediment delivery to Clear Creek in the short- and long-term timeframes.

This treatment is expected to be effective within year one. In addition to hydro mulching, willow planting/sod mat treatments overlap these strategic locations. Although sedimentation is expected in some locations along Clear Creek, the combination of the hydro mulch treatment, coupled with the willow and live sod treatments, within the RCAs will help minimize sediment delivery potential, re-establish ground covering vegetation, and allow willows, which are locally adapted to such conditions, become readily established further repairing this critical habitat.

The location of these treatments will be in Moderate/High Soil Burn Severity areas mapped within the Clear Creek RCA adjacent to:

- NFSR 582 from Pole Creek upriver to NFSR 515
- NFSR 515 at NFSR 582 junction to Red Mountain Trailhead.

The treatments will occur from the road edge, downhill as far as possible, including the far side stream bank where feasible. Acreage estimate is based on a 300’ distance from the road, as that is the effective range for hydro mulchers.

Hydro Seeding (ground based) Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Hydro Seeding (ground based)	Each	\$2,005	180	\$360,900

L-04 Hillslope stabilization and erosion control (ground based): Seeding followed by an application of wood straw or straw mulch, would promote faster vegetation regrowth, as well as reducing sediment delivery to Clear Creek, which is designated bull trout critical habitat and a known bull trout spawning and rearing area. Bull trout are fall spawners and it is highly likely their eggs are in the redds within this area of Clear Creek. Increases in fine sediment delivery to spawning areas can entomb and suffocate egg masses deposited in the stream gravels, potentially extirpating the entire year class. Degradation of water quality could also force bull trout to relocate to another area and abandon Clear Creek until it has recovered. Re-establishing vegetation and providing soil roughness, as quickly as possible, would decrease erosion by slowing surface water runoff and allowing the fine sediments to be captured before reaching the stream. Application of wood straw or straw mulch provides immediate ground

coverage, reduces erosion, secures seeds, helps maintain a favorable moisture and temperature regime for seed germination and growth, and retards noxious weed infestation. As the vegetation grows, it would retain these sediments, as well as the roots providing soil stability, thus reducing sediment delivery to Clear Creek in the short- and long-term timeframes, as well as outcompete noxious weeds.

This treatment is expected to be effective within year one especially if fall treatments are followed by spring supplemental treatments in addition to hydro mulching and willow planting/sod mat treatments overlapping these strategic locations. Although sedimentation is expected in some locations along Clear Creek, the combination of this treatment above the road, with hydro mulch treatment within the RCA, and also to the willow and live sod treatments on the streambanks will help minimize this potential and allow willows which are locally adapted to such conditions become readily established further repairing this critical habitat.

Locations proposed for this treatment:

- NFSR 582 from Pole Creek upriver to NFSR 515
- NFSR 515 from the junction with NFSR 582 to Red Mountain Trailhead.

The treatments will occur from the road edge, uphill as far as possible. Acreage estimate is based on a 200' distance from the road, as that is the effective range for straw/wood blowers.

Hillslope Stabilization and Erosion control (ground based) Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Hillslope stabilization and erosion control (ground based)	Each	\$1,600	120	\$192,000

L-05 Riparian Planting: The overall purpose of this treatment is expected to reduce the risks to Critical Occupied Habitat (COH) for federally listed fish species (bull trout). Transplanting live willow poles and sod in strategic moderate to high SBS areas where vegetation removal was high is proposed at toe slopes and areas within the flood plain where veg recovery potential is expected to be low. Threats to this CH include noxious and invasive weed introduction and establishment from adjacent unburned areas; native vegetation recovery was considered a VAR with a risk rating of very high in this area. Noxious weed populations in unburned areas along the access road to Clear Creek are likely to become established in the burned area within COH with the absence of native vegetation to outcompete weeds. Moderate to high SBS areas have likely killed most seeds scattered within the top soil surface layer where litter and organic matter (including surface fuels and understory vegetation) were consumed. These areas are not likely to revegetate with native species and no re-sprouting was observed during rapid assessments. Soil structure is weakened due to consumption of fine roots and organics and canopy foliage do not exist for needle-cast potential in these areas. \

This treatment is expected to be effective within year one especially if fall treatments are followed by spring supplemental treatments in addition to hydro mulch treatments overlapping these strategic locations. Although sedimentation is expected in some locations along Clear Creek, the combination of the hydro mulch treatment in addition to the willow and live sod treatments will help minimize this potential and allow willows which are locally adapted to such conditions become readily established further repairing this COH.

This treatment will be conducted in moderate to high SBS locations (approximately 250 ac.) along approximately 5 stream miles of Clear Creek from the Red Mountain trailhead south to Pole Creek.

Riparian Planting Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Riparian Planting Cost Estimate	acre	\$283.13	79	\$22,367

L-06 Unauthorized Route Access Restriction and Erosion Control: The objective is to decrease sediment transport and delivery, and reduce flooding and debris flow potential into Clear Creek which is designated critical habitat for ESA-listed bull trout. Multiple decommissioned roads had 20-30 year-old conifer trees and intact forest floor providing stabilizing roots and canopy/ground cover interception of rainfall. The purpose of this treatment is to stabilize segments of unclassified routes that are now a threat to downslope values due to loss of vegetation and water control. The work is intended to minimize accelerated erosion from de-stabilized cut- and fill slopes and improve infiltration with outcropping and drainage.

Stabilizing unclassified routes improves water infiltration, restores hillslope hydrology, stabilizes soil, and reduces erosion of side-cast material. Removing points of access to these features reduces unauthorized motorized vehicle use, decreasing the potential for spread of invasive plants and noxious weeds.

Increased runoff from burned slopes adjacent to stream channels increases the probability and magnitude of damage from de-stabilized unauthorized route templates. Increased sediment delivery, mud, and debris flows can impact bull trout designated critical or suitable occupied habitat if stabilizing measures are not implemented. Additional impacts from eroded material being delivered to downslope open roads at crossings with intermittent and ephemeral drainages are likely.

The unclassified routes listed below were identified to have post fire stability and drainage threats. The 6 miles of unclassified segments are located within estimated sediment delivery distances of bull trout designated critical habitat and will require all or part of the treatments.

UR #X545L (1.0 miles to be treated)

Located off of Road 545, beginning at UTM NAD 83 Zone 11 4895680N, 618960E

UR #X545L-1 (0.5 miles to be treated)

Located off of UR #X545L, beginning at UTM NAD 83 Zone 11 4895192N, 619276E

UR #X545L-2 (0.4 miles to be treated)

Located off of UR #X545L, beginning at UTM NAD 83 Zone 11 4895506N, 619384E

UR #X545M (1.3 miles to be treated)

Located off of Road 545 beginning at UTM NAD 83 Zone 11 4895780N, 619046E

UR #X545M-1 (0.1 miles to be treated)

Located off of UR #X545M, beginning at UTM NAD 83 Zone 11 4895780N, 619531E

UR #X545M-2 (0.7 miles to be treated)

Located off of UR #X545M, beginning at UTM NAD 83 Zone 11 4895828N, 619770E

UR #X545M-3 (0.1 miles to be treated)

Located off of UR #X545M-2, beginning at UTM NAD 83 Zone 11 4895995N, 619857E

UR #X545M-4 (0.1 miles to be treated)

Located off of UR #X545M-2, beginning at UTM NAD 83 Zone 11 4896227N, 620257E

UR #X545M-5 (0.1 miles to be treated)

Located off of UR #X545M, beginning at UTM NAD 83 Zone 11 4896068N, 620168E

UR #X545M-6 (0.5 miles to be treated)

Located off of UR #X545M, beginning at UTM NAD 83 Zone 11 4896068N, 620168E

UR #X582C (0.9 miles to be treated)

Located off of Road Number 582 beginning at UTM NAD 83 Zone 11 4890620N, 614445E

Unauthorized Route Access Restriction and Erosion Control Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Unauthorized Route Erosion Control	mile	\$6,686	5.7	\$38,110

Channel Treatments: none proposed

Road and Trail Treatments:

RT-01 Storm Patrols-Roads: The overall purpose of this treatment is to reduce risks to human life and safety and loss of property (Forest Roads and Bridges). In addition, the treatment reduces risks to bull trout Designated Critical Habitat by mitigating potential damage that would occur through loss of infrastructure and associated sediment/debris substantially impacting water quality and riparian areas.

Roads within the fire perimeter contain drainage structures that cross intermittent and perennial streams located in watersheds that have burned at moderate to high severity. These streams now have the potential for increased runoff and debris flows. These increases in flows pose a threat to the existing crossings which may result in plugging culverts or exceeding their maximum flow capacity. If these flows plug drainage structures, the result will likely be additional erosion and debris further down the drainage due to failures of the fill slopes of the roads.

There is an immediate and future threat to travelers along these roads within the burned area due to the increased potential for rolling and falling rock from burned slopes and increased potential for falling trees, flash floods and mudflows. The post fire flooding will threaten to interrupt access to visitors, local residents, and Forest Service personnel who are implementing treatments. With the loss of vegetation, normal storm frequencies and magnitudes can more easily initiate rill and gully erosion on the slopes and it is likely that this runoff will cover the roads or cause washouts. These events make for hazardous access along steep slopes and put the safety of Forest visitors and administrative personnel at risk.

The purpose of the treatment is to evaluate the condition of roads and bridges for motorized access and to identify and implement additional work needed to maintain and/or repair damage to road surfaces and flow conveyance structures (culverts, bridges) across roads in order to provide safe access across FS lands. Engineering and District personnel, including engineering

equipment operators, will survey the roads within the fire perimeter during or after high-intensity summer thunderstorms and spring snow-melt. Patrols will inspect road surface condition, ditch erosion, and culverts/inlet basins for capacity to accommodate runoff flows. As required, the patrols will take action with the heavy construction equipment to minimize the damage to the infrastructure and threat to Forest travelers and administrative personnel.

See Road Storm Patrols treatment specification for the complete list of roads to be visited for storm patrols.

Storm Patrols-Roads Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Road Storm Patrols	days	\$1,807	22	\$39,755

RT-02 Road Drainage Reconstruction: Increased runoff resulting from burned slopes and stream channels which are adjacent to roads will cause damage to roadway surfaces, drainage structures, and debris flows and threats to Human Life and Safety unless treatments are implemented to handle or minimize the effects from the post fire flows.

The purpose of this treatment is to mitigate additional risk to Human Life and Safety, property, emergency ingress/egress, loss of access to visitors and local residents, and impacts to water quality, riparian, and bull trout (listed species). Approx. 177 miles of Forest Roads and eight (8) major bridge crossings are located within or directly adjacent to the fire perimeter, representing a significant financial property investment. Adjacent communities such as Lowman are located within or adjacent to the fire perimeter, the roads and bridges provide critical access needs and emergency ingress/egress to the public and administrative personnel. Protect road infrastructure and minimize sediment delivery into the watersheds that run into the Clear Creek and Bear Valley Creek which contain listed fish species (bull trout and chinook salmon/steelhead).

Of the 177 miles within the perimeter, approx. 137 miles were surveyed or had reconnaissance performed. Treatments are proposed on 98 of the 137 miles surveyed.

The roads listed in section 'B' below were found to have issues with their drainage system due to the expected increase in flows. The minimal treatments required to remedy these issues are:

Out Sloping – Out sloped road templates disperse water and reduce erosion. Out sloping is useful in most locations, particularly for dispersing surface drainage on flat road grades. Outsloping is often combined with other road treatments, including rolling dips and armored crossings to control water.

Drain Dips (with or without armor) – Roadway dips modify the road drainage by altering the template and allowing surface flows to run off the road to prevent any excessive erosion of the surface. The armor consisting of rip rap is placed where runoff could possibly cause erosion to the road surface and fillslope.

Waterbars – Purpose and function is similar to rolling drain dips except the length of the structure is more abrupt and is recommended for roads that do not receive any or very little traffic.

Culvert Installations – New culverts will be installed in ditchlines on insloped roads that have insufficient relief culverts to prevent scouring of the ditch bottoms and resultant sediment

delivery to streams. Where feasible and cost effective, replacement culverts will be installed in small perennial streams to handle post fire flows.

Debris Racks – The debris rack is a barrier in front of the culvert inlet or across the stream channel prior to the culvert which is used to prevent debris from plugging the culvert.

Culvert Cleaning – Culvert cleaning includes the cleanout of catchment basins, inlets and outlets. The cleanout of catchment-basins below the inlet of the culvert is done to capture the sediment transported from the channel or ditch. Capturing the sediment will help in preventing the culvert inlet from being partially plugged or completely buried. Culvert outlet cleanout is done to remove any material that would impede the flow of water through the outlet of the culvert.

Ditch Cleaning – The cleanout of drainage ditches is required to remove any debris that may deflect the flow out of the ditch and also to ensure the flow reaches the outflow structure.

Road Template Reshaping – Road surfaces that channel water down the roadway need to be reshaped to shed the increased flows quickly before additional road surface erosion occurs. This will be accomplished by a combination of insloping and removal of berm where water will drain off the road surface.

The roads listed below were found to have or will have road drainage issues and at a minimum will require all or part of the treatments listed in section 'A'. The roads are listed individually and represent approximately 98 miles of treatments on the 137 miles within the fire perimeter (north project area).

NFSR 380 (8.8 miles to be treated)

Culvert Installations (drainage culverts): 18"x28', 24"x26', 36"x66'

Culvert Cleaning: 10 Each

Construct/Reconstruct Drain Dips: 2 Each

Road Template Reshaping/Ditch Cleaning: 8.8 Miles

NFSR 380F (2.0 miles to be treated)

Construct Waterbars: 15

Road Template Reshaping/Ditch Cleaning: 2.0 Miles

NFSR 380G (3.7 miles to be treated)

Culvert Cleaning: 6 Each

Construct/Reconstruct Drain Dips: 3 Each

Construct Waterbars: 3

Road Template Reshaping/Ditch Cleaning: 3.7 Miles

NFSR 380H (1.3 miles to be treated)

Culvert Cleaning: 12 Each

Construct Waterbars: 12 Each

Road Template Reshaping/Ditch Cleaning: 1.3 Miles

NFSR 397 (7.4 miles to be treated)

Culvert Cleaning: 42 Each

Construct/Reconstruct Drain Dips: 15 Each

Road Template Reshaping/Ditch Cleaning: 7.4 Miles

NFSR 397G (2.1 miles to be treated)

Outsloping: 2.1 miles
Road Template Reshaping/Ditch Cleaning: 2.1 Miles
Construct water bars: 54 each

NFSR 500 (1.2 miles to be treated)

Culvert Cleaning: 4 Each
Road Template Reshaping/Ditch Cleaning: 1.2 Miles

NFSR 502 (7.3 miles to be treated)

Culvert Cleaning: 69 Each
Road Template Reshaping/Ditch Cleaning: 7.3 Miles

NFSR 502A (1.8 miles to be treated)

Culvert Cleaning: 15 Each
Construct/Reconstruct Drain Dip: 2 Each
Culvert Installations (drainage culverts): 18"x60'
Road Template Reshaping/Ditch Cleaning: 1.8 Miles

NFSR 510 (6.5 miles to be treated)

Culvert Cleaning: 72 Each
Debris Racks: 15 Each
Construct/Reconstruct Drain Dip: 2 Each
Culvert Installations (small perennial): 30"x54'
Road Template Reshaping/Ditch Cleaning: 6.5 Miles

NFSR 515 (4.5 miles to be treated)

Culvert Cleaning: 27 Each
Construct/Reconstruct Drain Dip: 3 Each
Culvert Installations (small perennial): 24"x60'
Road Template Reshaping/Ditch Cleaning: 4.5 Miles

NFSR 545 (10.1 miles to be treated)

Culvert Cleaning: 49 Each
Debris Racks: 2
Culvert Installations (small perennial): 18"x48', 24"x34'
Road Template Reshaping/Ditch Cleaning: 10.1 Miles

NFSR 546 (7.1 miles to be treated)

Culvert Cleaning: 36 Each
Construct/Reconstruct Drain Dip: 2 Each
Debris Racks: 12 Each
Culvert Installations (drainage culverts): 24"x120'
Road Template Reshaping/Ditch Cleaning: 7.1 Miles

NFSR 546E (0.6 miles to be treated)

Construct Waterbars: 16 Each
Outsloping: 0.6 miles
Road Template Reshaping: 0.6 Miles

NFSR 550 (1.6 miles to be treated)

Culvert Cleaning: 3 Each
Construct Waterbars: 12 Each
Culvert Installation (small perennial): 18"x30'
Road Template Reshaping/Ditch Cleaning: 1.6 Miles

NFSR 555 (2.7 miles to be treated)

Culvert Cleaning: 50 Each
Construct/Reconstruct Drain Dip: 1 Each
Road Template Reshaping/Ditch Cleaning: 2.7 Miles

NFSR 555B (2.4 miles to be treated)

Culvert Cleaning: 45 Each
Road Template Reshaping/Ditch Cleaning: 2.4 Miles

NFSR 563C (1.5 miles to be treated)

Outsloping: 1.5 miles
Construct Waterbars: 20
Culvert Installations (drainage culverts): 24"x40'
Road Template Reshaping: 1.5 Miles

NFSR 569 (2.8 miles to be treated)

Culvert Cleaning: 17 Each
Debris Rack: 1 Each
Culvert Installations (drainage culverts): 18"x60'
Road Template Reshaping/Ditch Cleaning: 2.8 Miles

NFSR 569A (3.8 miles to be treated)

Outsloping: 1.0 miles
Construct/Reconstruct Drain Dip: 1 Each
Construct Waterbars: 30
Road Template Reshaping/Ditch Cleaning: 3.8 Miles

NFSR 569B (0.9 miles to be treated)

Outsloping: 0.9 miles
Construct Waterbars: 14
Road Template Reshaping/Ditch Cleaning: 0.9 Miles

NFSR 582 (15.2 miles to be treated)

Culvert Cleaning: 199 Each
Construct/Reconstruct Drain Dip: 2 Each
Culvert Installations (drainage or small perennials): 18"x50', 24"x34', 36"x84'
Road Template Reshaping/Ditch Cleaning: 15.2 Miles

NFSR 582B (2.4 miles to be treated)

Construct/Reconstruct Drain Dip: 1 Each
Construct Waterbars: 41
Road Template Reshaping/Ditch Cleaning: 2.4 Miles

NFSR 582E (0.5 miles to be treated)

Outsloping: 0.5 miles

Construct Waterbars: 10 Each

Culvert Installations (drainage or small perennials): 24"x40'

Road Template Reshaping/Ditch Cleaning: 0.5 Miles

Road Drainage Reconstruction Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Road Drainage Reconstruction	miles	\$2,838	98	\$278,124

RT-03 Culvert Removals: The purpose is to reduce the risk of pipe failure and associated sediment delivery to critical resources, such as occupied bull trout streams and/or designated bull trout critical habitat. Roads within the Pioneer Fire contain drainage structures that cross streams located in watersheds that have a moderate to high burn severity. These streams now have the potential for increased runoff and debris flows. These increases in flows pose a threat to the existing crossings which may result in plugging culverts or exceeding their maximum flow capacity. If these flows plug drainage structures the result could be additional erosion and debris further down the drainage due to the failures of the road fill slopes, thereby impacting water quality and the riparian areas. Additionally, increased sediment delivery and/or debris torrents, would likely entomb and suffocate bull trout egg masses present in stream gravels.

The following sites locations are where the pipes will be removed:

- NFSR 546E – O’Keefe Creek (36” diameter pipe).
- NFSR 563C – Bearskin Creek (48” diameter pipe).
- NFSR 569A – Bear Valley Creek tributary (36” diameter pipe).

Culvert Removal Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Culvert Removals	Each	\$1,675	3	\$5,025

RT-04 Culvert Upgrades: The purpose of this treatment is to reduce the risk of pipe failure and road infrastructure loss and associated sediment delivery to downstream critical resources, such as designated bull trout critical habitat. The locations selected for this treatment contain drainage structures that cross streams located in watersheds that have a moderate to high burn severity and have the potential for increased runoff and debris flows. These increases in flows pose a threat to the existing crossings which may result in plugging culverts or exceeding their maximum flow capacity. If these flows plug drainage structures the result would be additional erosion and debris further down the drainage due to the failures of the road fill slopes, thereby impacting water quality and bull trout critical habitat. As these crossings are immediately adjacent to known bull trout spawning and rearing areas, the additional fine sediment would likely result in entombing and suffocating bull trout egg masses, which are currently present, downstream in Clear Creek.

Additionally, these culverts are barriers to migration for bull trout and upgrading would provide access to quality stream habitat to increase bull trout survival in the Clear Creek drainage. More than 60% of the Upper and Lower Clear Creek watersheds (HU12) burned, with considerable direct impacts to core spawning and rearing habitat and minimal available habitat. Refugia habitat exists in other S.F. Payette River watersheds upstream of Clear Creek, however recently hatched and juvenile fish are likely to experience high mortality when migrating extended distances. The Forest Plan requires all culverts installed in existing or potential fish bearing streams must provide for aquatic species passage, the cost of infrastructure repair or

replacement if crossings are damaged or lost following a flood event is equal to the proposed treatment cost.

The following sites locations are where the pipes will be removed:

- NFSR 582 – Pole Creek crossing (existing 36" diameter pipe). Remove and replace with a bottomless precast concrete box culvert.
- NFSR 582 – Big Spruce Creek (2 – 36" diameter pipes). Remove and replace with a bottomless structural multi-plate arch set on precast concrete footings.

Culvert Upgrade Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Culvert Upgrade	Each	\$188,800	2	\$377,600

RT-05 Trail Drainage Improvement: Over 120 miles of NFS trails are located within the Pioneer North assessment area. Roughly 70 miles are in areas threatened by moderate to high soil burn severity. Trails within burn perimeter are excellent conveyors for routing considerable volumes of sediment to nearby streams if drainage facilities are not adequate to process increased runoff. Streams within the burned area are designated as critical habitat for ESA-listed bull trout. Maintaining appropriate water bars & drainage dips and installation of new drainage structures is needed to effectively route expected post fire increases in surface water from the trail surface. This response action will reduce/prevent erosion from damaging the trail surface and decrease direct sediment delivery into critical stream habitat, decreasing the potential threat of trail failures from impacting water quality. Predicted increases in surface runoff/overland flow are expected to erode soils from the burned area and deliver sediment to adjacent streams. Additionally, voids in the trail tread created by burned out stump holes may act to channel runoff underneath existing trail tread eroding trail tread, resulting in delivery of greater amounts of sediment to nearby streams. Installing additional drainage features, maintaining existing features, and filling voids in the trail tread should ensure increased runoff and over surface flows will not destroy trail tread, compromise human health and safety, and contribute sediment to streams impacting water quality and critical habitat for listed bull trout and sensitive fish species

This treatment includes cleaning existing trail drainage structures and installing additional water bars and rolling grade dips on the 61 miles within the areas that burned at high or moderate intensity or are located downslope of areas within the drainage that burned at high or moderate burn intensity. This treatment also includes filling voids within the trail tread created by burned out stumps in or adjacent to the trails that could channel flows under the existing trail. The treatment will prevent erosion and further failure of the trail tread and provide for safety of trail users and employees working in the burned area.

Hazard tree identification and falling in the vicinity of forested work sites is required prior to beginning drainage structure work and is included in this treatment to provide for worker safety.

Trails requiring drainage improvement are depicted on the BAER Treatment map and listed below:

Kirkham Ridge Trail, Long Creek Trail, Miller Mountain Trail, Logging Gulch Trail, Deadwood Ridge Trail, Julie Creek Trail, Lost Lake Trail, Clear Creek Trail, Nellies Basin Trail, Cat Paw Trail, Stevens Point Trail, Red Mountain Trail, White Hawk Basin Trail, Coulter Summit Trail, Wet Gulch Trail, Grimes Elk Divide Trail, Grimes Creek Trail.

Trail Drainage Improvement Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Trail Drainage Improvement	Mile	\$1,569	70	\$109,830

RT-06 Storm Patrols-Trails: The overall purpose of this treatment is to reduce the risks to human life and safety and loss of or damage to NFS trails. This treatment also reduces the risk to bull trout designated critical habitat by mitigating the potential loss of infrastructure and subsequent sediment/debris that would impact water quality and riparian areas.

Trail tread and drainage crossings of travel routes with the fire perimeter are located in watersheds that burned at moderate to high soil burn severity. The burned area has elevated potential for post fire increases in overland flow, stream discharge, and debris flows which are threats to the existing trail infrastructure and crossings. Trail tread erosion and plugged drainage structures will result in trail damage with accelerated erosion and sediment and debris delivered downslope to adjacent streams.

There is an immediate and future threat to travelers along the trails within the burned area due to the increased potential for rolling and falling rock from burned slopes and increased potential for falling trees, flash floods and mudflows. The post fire flooding threatens to interrupt access to visitors, local residents, and Forest Service personnel who are implementing treatments. With the loss of vegetation, normal storm frequencies and magnitudes can more easily initiate rill and gully erosion on adjacent slopes that will likely cover trails with hillslope sediment or cause washouts. These events make for hazardous access along steep slopes and put the safety of Forest visitors and administrative personnel at risk.

The purpose of the treatment is to evaluate the condition of trails after storm events, primarily for motorized access, and to identify and implement additional work needed to maintain and/or repair damage to trail tread and stream crossings in order to protect the trail prism from further loss. Recreation personnel will survey trails potentially affected by rapid spring snow-melt and during or after high-intensity summer thunderstorms. Patrols will inspect trail surface condition for unacceptable erosion and sediment/debris delivery to stream crossings. As required, personnel will take action to minimize further damage to the infrastructure and risks to Forest travelers and administrative personnel.

Storm Patrols-Trails Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Trail Storm Patrols	days	\$536	13	\$6,968

Protection/Safety Treatments:

PS-01 Hazard Warning Signs: The overall purpose of this treatment is expected to reduce the risks to human life and safety (HLS) by warning motorists of existing threats while traveling the authorized routes within and downstream of the burned area.

“Entering Burned Area” signs are needed to alert the public of possible threats to their life and safety that exist within or downstream of a burned area. The signs contain language specifying items to be aware of when entering a burn area such as falling trees and limbs, rolling rocks, and flash floods.

The highway warning signs are needed in site-specific locations to alert those traveling the roads through and downstream of the burned area of upcoming dangers such as sharp curves, falling rocks, "Flood Risk - No Parking or Standing", etc.

The directional signs are needed to safely direct motorists to their destination without taking a wrong turn, especially during emergency or severe weather conditions. Signs will be located at strategic intersections to inform the traveler of their current location corresponding to the Forest Visitor Map and Motor Use Vehicle Map (MVUM.) and their intended destination with corresponding distances that can be reached from that junction.

Barricade and object markers are retroreflective and delineate the obstruction and/or hazard to ensure the motorist safety.

Resource protection warning signs are needed to prevent motorists from traveling through and within sensitive vegetation and plants now exposed in the burn area.

Road/trail route markers are located at the beginning of the road/trail and major intersections. The route markers identify the road/trail or route number corresponding to the Forest Visitor Map and Motor Use Vehicle Map (MVUM.) Maintenance Level (ML) 3 roads or higher are identified with horizontal route markers and Level 2 roads are identified with vertical route markers (Carsonites.) These signs inform the traveler of their current location and assist in navigating to safety during times of severe weather and flooding/debris flows.

Locations for "Entering Burned Area" warning signs on NFS lands (8 total):

- NFSR 380 (Upon entering burned area; UTM 11N 4871515, 0595643)
- NFSR 382AA (Upon entering burned area; UTM 11N 4878551, 0594400)
- NFSR 397 (Intersection of NFSR 397-NFSR 397B; UTM 11N 4877514, 0596658)
- NFSR 510 (Intersection of NFSR 510-NFSR 510A; UTM 11N 4907971, 0612581)
- NFSR 542 (Upon entering burned area; UTM 11N 4877553, 0617216)
- NFSR 555 (Intersection of NFSR 555-NFSR 555B; UTM 11N 4891711, 601716)
- NFSR 582 (Intersection of NFSR 582-NFSR 563; UTM 11N 4908768, 0621490)
- NFSR 582 (Intersection of NFSR 582-FH25; UTM 11N 4882002, 0611042)

Locations of small burned area warnings signs or safety placards at developed recreation sites and/or trailheads (16 total):

- Logging Gulch (South entrance near Graney Creek; UTM 11N 488337, 0610840)
- Logging Gulch (North entrance near Clear Creek; UTM 11N 4885255, 0612372)
- Miller Mountain Trailhead (Near end of NFSR 592; UTM 11N 4885000, 0614235)
- Cozy Cove Trailhead (Near Cozy Cove Campground; UTM 11N 4905226, 0608335)
- Kirkham Ridge Trailhead (Near Bulltrout Lake; UTM 11N 4907728, 0638413)
- Warm Spring Trailhead (Near Bonneville Campground; UTM 11N 4889396, 635122)
- Kirkham Ridge Trailhead (Off SH 21; UTM 11N 4880913, 0617634)
- Red Mountain Trailhead (At the end of NFSR 515; UTM 11N 4898914, 0624468)
- Deadwood Ridge (Intersection of NFSR 510-NFSR 510C; UTM 11N 4906860, 0614010)
- Deadwood River Trailhead (Near Deadwood River CG; UTM 11N 4881748, 0607364)
- Julie Creek Trailhead (Near Deadwood River CG; UTM 11N 4882876, 0607117)
- Danskin Boat Launch (Off CR17; UTM 11N 4879495, 0595038)
- Pine Flats CG (Off CR 17; UTM 11N 4879798, 0605560)
- Deadwood Boat Launch (Near Deadwood River CG; UTM 11N 4881790, 0607472)
- Deadwood CG (Off CR 17; UTM 11N 4881890, 0607500)

- Park Creek CG (Off NFSR 582; UTM 11N 4885860, 0613554)

Locations for barricade and object markers:

- Replacement of NFSR 582 Gate (MP 12.2): Barricade Markers (4 total) and Type 2 Object Markers (6 total).
- Replacement of NFSR 546-7.0 Bridge: Type 3 Object Markers (4 total) and Posts (4 total).
- Replacement of NFSR 569 Gate (MP 3.6): Barricade Markers (4 total) and Type 2 Object Markers (6 total).
- Replacement of NFSR 569-0.3 Bridge: Type 3 Object Markers (4 total).
- Replacement of NFSR 594B Gate (MP 0.1): Barricade Markers (4 total), Type 2 Object Markers (6 total), and 2 metal gate posts (2 total).
- Replacement of NFSR 555B Gate (MP 0.1): Barricade Markers (4 total) and Type 2 Object Markers (6 total).
- Replacement of NFSR 510 (MP 0.1): sign post (1 total).

Locations for directional signs (4 total):

- Replacement of Forest Road Destination signs (directional) is required near the junction of NFSRs 510 and 582 (2 total).
- Replacement of Forest Road Destination signs (directional) is required on NFSR 582, MP 8.4 (2 total).

Locations for resource protection signs (10 total):

- Bear Valley Area - Meadows (qty 2)
- Coulter Summit (qty 2)
- Areas where Sacajawea Bitterroot and Tall Onion (Sensitive plants) are present (Grimes Creek Area) (qty 6)

Hazard Warning Signs Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Hazard Warning Signs	Each	\$181.65	101	\$18,347

PS-02 Recreation Site Warning and Safety Signs: The purpose of the informational warning signs is to inform the public to be aware of new hazards in the area due to the burned conditions.

Recreation Site Warning and Safety Signs Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Recreation Site Warning and Safety Signs	Site	\$65.19	80	\$5,215

PS-03 Recreation Site Hazard Removal: To prevent damage to recreation infrastructure from fire damaged trees. The fire burned in the surrounding areas of the campgrounds, cabin and trailheads resulting in the mortality to pockets of trees in and around the developed sites. A dead tree is considered a hazard tree in a developed area setting. Falling and removal of these trees will prevent further damage to campground structures (undamaged by the fire) and also prevent unnecessary injury to the public or their property. This will limit threats to human life and property.

Recreation sites included for this treatment are Pine Flats Campground, Deadwood Campground, Pine Flats Campground Hot springs Day use, Red Mountain Trailhead, Julie

Creek Designated Camping Area ATV Trail Camp, Designated Camping Areas FS-582, Designated Camping Areas FS-546

Recreation Site Hazard Removal Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Recreation Site Hazard Removal	Days	\$1,445.50	10	\$14,455

PS-04 Resource Protection: Cultural Heritage Patrols: The primary purpose of resource protection patrols is to reduce or mitigate the risk of archeological looting during a time (now through Summer 2017) when hunters and post fire “sightseers” are expected to be in the area. These sites are most vulnerable to looting immediately after a fire when there is no vegetation to help obscure artifact visibility. Exposure of previously hidden artifacts and features due to vegetation loss and increased ground surface visibility increase the potential for looting that affects site integrity. During the 2000 Trail Creek Fire on the Boise NF, FS archeologists observed and photographed looters on cultural resources sites in the Atlanta Historic Mining District during the BAER response to that fire. Unauthorized artifact collection (i.e. looting) is a pervasive, persistent, and well-documented activity in this area of Idaho. Like the Trail Creek Fire, this area of the Pioneer Fire occurred in the location of historic mining (Deadwood River) and logging (Clear Creek). There are also numerous Native American sites in the areas identified above. Since 2006, FS archeologists and law enforcement have documented what appears to be an increase in site vandalism on the Boise NF. In the last month alone, two instances of digging and collecting has been identified by or reported to BNF law enforcement on the Idaho City Ranger District. These sites fall within the range of low to high SBS, and several are also at risk for erosion.

Locations for the Cultural Resource Protection Patrols in the Pioneer North Analysis area annotated on the BAER treatment map and listed below:

- Grimes Creek headwaters, vicinity of NFSR 397BT (T8N, R6E, sections 16-17)
- Clear Creek (ICRD) adjacent to NFSR 380H (T8N, R6E, sections 30-31)
- Clear Creek (Lowman RD) and Deadwood River (south of reservoir) (T9N, R7E, sections 5, 17, 20, 22)
- SFPR along State Highway 17 (T9N, R5-7E)

Resource Protection: Cultural Heritage Patrols Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Resource Protection: Cultural Heritage Patrols	Sites	\$180	77	\$13,863

PS-05 Resource Protection: Cultural and Natural Resource Site Barriers: The purpose of this treatment is to protect a Native American site that is important to potentially affected Indian Tribes while vegetation reestablishes on site and allow an herbaceous meadow to naturally recover. The fire denuded vegetation in these two areas, increasing the vulnerability of resources to damage from off-road motor vehicle use, compaction, and erosion. The barriers will help deter motorized vehicles in these areas, and along with the application of mulching (proposed BAER treatment, separate specification) at the cultural site, help facilitate revegetation.

Locations requiring this treatment are annotated on the BAER Treatment Map and listed below:

- Clear Creek: approximately 4 acres (T10N, R8E, section 16).

- North of Summit Flat Area along FS Rd 380 (T8N, R6E, section 25).

Resource Protection: Cultural and Natural Resource Site Barriers Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Resource Protection: Cultural and Natural Resource Site Barriers	feet	\$19	1100	\$20,900

PS-06 Temporary Trail Closure: The designated routes have not been fully assessed for hazards within the fire area. Until the routes have been inventoried a temporary trail closure to limit public access in order limit threat to human life and property. A condition inventory for hazards prior the next operating season.

The following trails are within the burn area and recommended for closure: 019 Deadwood Ridge, 020 Julie Creek, 017 Lost Lake, 022 Nellies Basin, 013 Stevens Point, 021 White hawk Basin, 144 Kirkham Ridge, 142 Cat Paw Lakes, 145 Clear Creek, 650 Logging Gulch, 018 Long Creek, 159 Miller Mountain, 143 Red Mountain, 163 Coul33r Summit, 169 Grimes Creek, 690 Grimes Elk Divide, 170 Wet Gulch, SNO 582 Clear Creek/Bear Valley, SNO 281 Summit Flats, 021 White hawk Basin open till 510C, 650 Logging Gulch, 144 Kirkham Ridge Closed from Miller Mountain Junction to Bull Trout.

Temporary Trail Closure Cost Estimate

Item	UOM	Unit Cost	# of Units	Total Cost
Temporary Trail Closure	Days	\$434	20	\$8,680

BAER Assessment & Implementation Consultation and Coordination:

Associated activities obligated under ID-FSM2520-2015-1 need to be considered in the BAER funding request when emergency response actions are authorized. These are accumulated tasks above the normal program of work and generally not accounted for in out-year program planning. Because implementation of approved BAER response actions trigger these required tasks and the unit's allocated budget does not account for these obligations, BAER funding is the appropriate authorization to ensure this coordination and consultation is completed.

Interagency Coordination

	Rate	Days	Cost
Staff Officer (GS-13)	\$475	5	\$2,375
Forest BAER Coordinator (GS-12)	\$400	5	\$2,000
BAER Implementation Specialist (GS-11)	\$360	10	\$3,600
Total Cost			\$7,975

Implementation Tracking & Required Reporting of Authorized Emergency Response Actions

	Rate	Days	Cost
Forest BAER Coordinator (GS-12)	\$400	5	\$2,000
PIO (GS-11)	\$360	2	\$720
Total Cost			\$2,720

Emergency Consultation on Implementation of Authorized Emergency Response Actions

	Rate	Days	Cost
Forest Fish Biologist (GS-12)	\$400	5	\$2,000
Total Cost			\$2,000

NHPA Compliance for Implementation of Authorized Emergency Response Actions

	Rate	Days	Cost
Forest Archeologist (GS-12)	\$400	5	\$2,000
Total Cost			\$2,000

I. Monitoring Narrative:

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

LT-01 Treatment sites will be evaluated annually for the next three years to ensure control methods are meeting resource objectives and to inventory for new invaders. Weed specialist/technicians will visit chemically treated sites after treatment; this is especially important for weed populations that are sprayed to ensure efficacy of herbicide application. Initiate follow-up treatments if additional non-native species or new infestations are discovered. Control will be considered successful upon determination that all noxious weeds have been controlled and non-native invasive plants have not spread beyond their pre-fire locations.

Implemented road drainage reconstruction (RT-02) will be monitored to ensure stabilization objectives are being met after storm events (RT-01 Road Storm Patrols).

Implemented trail drainage reconstruction (RT-05) will be monitored to ensure stabilization objectives are being met after storm events (RT-06 Trail Storm Patrols).

Part VI – Emergency Stabilization Treatments and Source of Funds

Interim #1

			NFS Lands			Other Lands		All		
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER \$	\$	units	\$	Units	\$	\$
A. Land Treatments										
L-01 EDRR	acres	6	12,800	\$78,464	\$0		\$0		\$0	\$78,464
L-02 Aerial Mulch	acres	740	2,750	\$2,035,000	\$0		\$0		\$0	\$2,035,000
L-03 Ground-based Hydro Mulch	acres	2,005	180	\$360,900	\$0		\$0		\$0	\$360,900
L-04 Ground-based Mulch/Seed	acres	1,600	120	\$192,000	\$0		\$0		\$0	\$192,000
L-05 Riparian Planting	acres	90	250	\$22,500	\$0		\$0		\$0	\$22,500
L-06 UA Route Access Restriction	miles	6,690	6	\$38,133	\$0		\$0		\$0	\$38,133
Subtotal Land Treatments				\$2,726,997	\$0		\$0		\$0	\$2,726,997
B. Channel Treatments										
None				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treatments				\$0	\$0		\$0		\$0	\$0
C. Road and Trails										
RT-01 Storm Patrol-Roads	days	1,810	22	\$39,820	\$0		\$0		\$0	\$39,820
RT-02 Road Drainage Reconstruction	miles	2,840	98	\$278,320	\$0		\$0		\$0	\$278,320
RT-03 Culvert Removals	each	1,675	3	\$5,025	\$0		\$0		\$0	\$5,025
RT-04 Culvert Upgrades (AOP)	each	188,800	2	\$377,600	\$0		\$0		\$0	\$377,600
RT-05 Trail Drainage Reconstruction	miles	1,800	61	\$109,800	\$0		\$0		\$0	\$109,800
RT-06 Storm Patrols-Trails	days	536	13	\$6,968	\$0		\$0		\$0	\$6,968
Subtotal Road and Trails				\$817,533	\$0		\$0		\$0	\$817,533
D. Protection/Safety										
PS-01 Hazard Warning Signs	sign	182	101	\$18,382	\$0		\$0		\$0	\$18,382
PS-02 Recreation Site Warning Signs	sign	65	80	\$5,200	\$0		\$0		\$0	\$5,200
PS-03 Recreation Facility Hazard Res	site	1,450	10	\$14,500	\$0		\$0		\$0	\$14,500
PS-04 Resource Protection Patrol-Ch	site	180	77	\$13,860	\$0		\$0		\$0	\$13,860
PS-05 Resource Protection Barriers	feet	19	1100	\$20,900	\$0		\$0		\$0	\$20,900
PS-06 Temporary Administrative Clos	order	4,337	2	\$8,674	\$0		\$0		\$0	\$8,674
Subtotal Protection/Safety				\$81,516	\$0		\$0		\$0	\$81,516
E. BAER Evaluation										
Initial Assessment	Report			\$100,000	\$0		\$0		\$0	\$100,000
Interim Assessment #1	Report			\$138,000	\$0		\$0		\$0	\$138,000
Coordination & Consultation	lump sum			\$14,695	\$0		\$0		\$0	\$14,695
Subtotal Evaluation				\$252,695	\$0		\$0		\$0	\$252,695
F. Monitoring										
Insert new items above this line!				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals										
Total - This Request				\$3,640,741	\$0		\$0		\$0	\$3,640,741
Previously Approved				\$639,071	\$0		\$0		\$0	\$639,071
Total to Date				\$4,279,812						\$4,279,812

PART VII - APPROVALS

1.

/s/ Jeffery Alexander for
 CECILIA R. SEESHOLTZ
 Forest Supervisor

Oct 4, 2016

Forest Supervisor (signature)

Date

2.

Regional Forester (signature)

Date