Date of Report: October 26, 2015

Kaniksu Complex – Tower Fire

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[x] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[x] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization 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: Kaniksu Complex – Tower Fire (Tower, Baldy, and Grease Creek Fires)

B. Fire Number: WA-COF-001302

C. State: Washington

D. County: Pend Oreille

E. Region:

Tower	06 – Pacific Northwest/01 – Northern
Baldy	06 – Pacific Northwest
Grease	06 – Pacific Northwest

F. Forest:

Tower	Colville NF/Idaho Panhandle NFs
Baldy	Colville NF
Grease	Colville NF

G. District:

Tower	Newport RD/Priest Lake RD
Baldy	Sullivan Lake RD
Grease	Sullivan Lake RD

H. Fire Incident Job Code:

Tower	P6J1E8 (0621/0104)
Baldy	P6J0NJ (0621)
Grease	P6J28X (0621)

I. Date Fire Started:

Tower	08/12/2015
Baldy	08/01/2015
Grease	08/14/2015

J. Date Fire Contained:

Tower	10/31/2015
Baldy	10/31/2015
Grease	10/31/2015

K. Suppression Cost: $28,000,000 (est. by 10/31/2015)

L. Fire Suppression Damages Repaired with Suppression Funds

Tower Fire	#	Unit	
Hand Line	4.29	Miles	(4.29 miles waterbarred)
Dozer Line	54.63	Miles	(exact # of miles waterbarred unknown; only 0.15 miles were seeded)
Helibase	1	Each	
Helispots	4	Each	
Drop Point	23	Each	
Spike Camp	2	Each	
Staging Area	6	Each	
Safety Zone	3	Each	
Closed Roads Reopened	241.21	Miles	
CNF Closed Roads Reopened	107.02	Miles	
IPNF Closed Roads Reopened	91.47	Miles	
Private Closed Roads Reopened	42.72	Miles	

Baldy Fire	#	Unit	
Hand Line	5.57	Miles	(exact # of miles waterbarred unknown)
Dozer Line	10.88	Miles	(exact # of miles waterbarred unknown)
Helispots	5	Each	
Drop Point	10	Each	
Spike Camp	1	Each	
Helibase	1	Each	
CNF Closed Roads Reopened	6.01	Miles	

Grease Creek	#	Unit	
Hand Line	0.05	Miles	(exact # of miles waterbarred unknown)
Dozer Line	1.78	Miles	(exact # of miles waterbarred unknown)
Safety Zone	1	Each	
Drop Point	3	Each	
Spike Camp	1	Each	
CNF Closed Roads Reopened	63.71	Miles	

M. Watershed Number: (6th level hydrolgic units, percent of watershed acres within the fire perimeter)

Tower Fire:

HUC12 (6th Field) Name	HUC12 #	% of Watershed in Fire Perimeter
Cee Cee Ah Creek	170102160204	29%
East Branch Le Clerc Creek	170102160303	<1%
Flat Creek-Lower West Branch Priest River	170102150602	4%
Goose Creek	170102150402	13%
Headwaters Upper West Branch Priest River	170102150401	46%
Middle Creek-Pend Oreille River	170102160301	35%
Mission Falls-Upper West Branch Priest River	170102150403	1%
Skookum Creek	170102160202	2%

*Subwatersheds having less than 5% burned area are listed but were not analyzed in detail.

Baldy Fire:

HUC12 (6th Field) Name	HUC12 #	% of Watershed in Fire Perimeter
North Fork Deep Creek	170200011004	<1%
Sweet Creek-Pend Oreille River	170102160902	1%

Grease Creek Fire:

HUC12 (6th Field) Name	HUC12 #	% of Watershed in Fire Perimeter
Harvey Creek	170102160401	1%
Headwaters Sullivan Creek	170102160402	1%

N. Total Acres Burned: 25,933

Tower Fire:	**Ownership**	**Acres**
	Colville NF	5,473
	Idaho Panhandle NFs	12,128
	Washington Department of Natural Resources (WA DNR)	2,203
	Private	4,898
	Total	**24,702**

Baldy Fire:	**Ownership**	**Acres**
	Colville NF	514
	Total	**514**

Grease Creek Fire:	**Ownership**	**Acres**
	Colville NF	717
	Total	**717**

O. Vegetation Types: Tower, Baldy, and Grease fires include mixed conifer, montane mixed conifer, montane grassland/shrublands, and riparian areas.

P. Dominant Soils:

Tower Fire: Dominate soil series mapped in the tower fire area include Brickel, Hartil, Huckleberry, Manley, and Newbell.

Baldy Fire: Dominate soil series mapped in the Baldy fire area include Manley, and Buhrig.

Grease Creek: Dominate soil series mapped in the Baldy fire area include Huckleberry, Cryands, Manley, and Buhrig.

Q. Geologic Types:
Tower Fire: Bedrock within the boundaries of the Tower Fire includes intrusive and extrusive volcanic, Metasedimentary rock, and unconsolidated material of alluvial and glacial origin.

Baldy Fire: Bedrock within the boundaries of the Baldy Fire Maitlen Phyllite, and continental glacial drift, Fraser-age.

Grease Creek: Bedrock within the boundaries of the Grease Creek Fire includes Carbonatic sedimentary rock, Shedroof Conglomerate and continental glacial drift, Fraser-age.

R. Miles of Stream Channels by Order or Class: (miles)

Tower Fire	
Intermittent	134.9
Perennial	35.6
Total	**170.5**

Baldy Fire	
Intermittent	0.5
Perennial	0.2
Total	**0.7**

Grease Creek Fire	
Intermittent	0.7
Perennial	0.2
Total	**0.9**

S. Transportation System: (in the various fire perimeters)

Tower Fire:

NFS Roads	Miles
Total	**155**
Colville NF	76
Idaho Panhandle NFs	79
NFS Trails (Motorized and Nonmotorized)	Miles
Total	**12**
Idaho Panhandle NFs	12
NFS Groomed Snowmobile Trails	Miles
Total	**56**
Colville NF	38
Idaho Panhandle NFs	18

Baldy Fire:

NFS Roads	Miles
Total	0
NFS Trails	Miles
Total	0
NFS Groomed Snowmobile Trails	Miles
Total	0

Grease Creek Fire:

NFS Roads	Miles
Total	0
NFS Trails (Nonmotorized)	Miles
Total	**2**
Colville NF	2
NFS Groomed Snowmobile Trails	Miles
Total	0

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

Tower Fire:

Soil Burn Severity	Colville NF (acres)	Idaho Panhandle NFs (acres)	WA DNR (acres)	Private (acres)	Grand Total (acres and %)	
High	677	654	355	416	2,102	**9%**
Moderate	2,248	2,615	1,080	2,430	8,373	**34%**
Low	1,723	6,268	644	1,366	10,001	**40%**
Unburned/Very Low	825	2,591	124	686	4,226	**17%**
Grand Total	**5,473**	**12,128**	**2,203**	**4,898**	**24,702**	

Baldy Fire:

Soil Burn Severity	Colville NF (acres)	Grand Total (acres and %)	
High	36	36	**7%**
Moderate	35	35	**7%**
Low	299	299	**58%**
Unburned/Very Low	144	144	**28%**
Grand Total	**514**	**514**	

Grease Creek Fire:

Soil Burn Severity	Colville NF (acres)	Grand Total (acres and %)	
High	46	46	**6%**
Moderate	43	43	**6%**
Unburned/Very Low	628	628	**88%**
Grand Total	**717**	**717**	

B. Water-Repellent Soil (acres):

Tower Fire:

Hydrophobic	10,475 acres	42%
Not Hydrophobic	14,227 acres	58%

Baldy Fire:

Hydrophobic	71 acres	14%
Not Hydrophobic	443 acres	86%

Grease Creek Fire:

Hydrophobic	89 acres	12%
Not Hydrophobic	628 acres	88%

C. Soil Erosion Hazard Rating (acres):

Tower Fire:

Erosion Hazard	Acres	Percent
High	10,475	42%
Moderate	10,001	41%
Low	4,226	17%
Total		100%

Baldy Fire:

Erosion Hazard	Acres	Percent
High	71	14%
Moderate	299	58%
Low	144	28%
Total		100%

Grease Creek Fire:

Erosion Hazard	Acres	Percent
High	46	6%
Moderate	43	6%
Low	628	88%
Total		100%

D. Erosion Potential: 2.6 tons/acre (Tower Fire), 1.49 tons/acre (Baldy Fire), and 9.71 tons/acre (Grease Creek Fire)

E. Sediment Potential: 1,118 cubic yards / square mile (Tower Fire), 667 cubic yards / square mile (Baldy Fire), and 4,438 cubic yards / square mile (Grease Creek Fire)

PART IV - HYDROLOGIC DESIGN FACTORS

Tower Fire:

A. Estimated Vegetative Recovery Period	**3-7 years**
B. Design Chance of Success	80 %
C. Equivalent Design Recurrence Interval	10 years
D. Design Storm Duration	1 hours
E. Design Storm Magnitude	0.76 inches
F. Design Flow	23.73 cfs / mi^2
G. Estimated Reduction in Infiltration	43 %
H. Adjusted Design Flow	292 cfs / mi^2

Baldy Fire:

A. Estimated Vegetative Recovery Period	**3-7 years**
B. Design Chance of Success	90 %
C. Equivalent Design Recurrence Interval	10 years
D. Design Storm Duration	1 hours
E. Design Storm Magnitude	0.66 inches
F. Design Flow	15.8 cfs / mi^2
G. Estimated Reduction in Infiltration	15 %
H. Adjusted Design Flow	31 cfs / mi^2

Grease Creek Fire:

No analysis was performed due to the amount of low severity fire and minimal connectivity of the fire to the stream network.

A. Estimated Vegetative Recovery Period	**3-7 years**
B. Design Chance of Success	90 %
C. Equivalent Design Recurrence Interval	10 years
D. Design Storm Duration	1 hours
E. Design Storm Magnitude	0.66 inches
F. Design Flow	----------
G. Estimated Reduction in Infiltration	12 %
H. Adjusted Design Flow	----------

PART V - SUMMARY OF ANALYSIS

Overview

The Tower Fire, along with six smaller fires, comprises the Kaniksu Complex. The other fires are Onata, Baldy, Grease Creek, Hall Mountain, Slate Creek, and South Fork Creek Trail. The total acreage of all fires in the complex is 26,670 acres with 85 percent containment as of October 15, 2015. Tower Fire is 8 miles northeast of Usk, WA and 6 miles west of Priest Lake, Idaho. Baldy is 6 miles northwest of Ione, WA. Grease Creek is 4 miles northeast of Ione, WA and east of Sullivan Lake. All of the fires in this complex were lightning caused.

Watershed Response

Hydrologic Response: Watershed conditions in the burned watersheds of the Colville National Forest (CNF) and the Idaho panhandle National Forest (IPNF) have changed significantly as a result of the Tower Fire, but not in the Baldy and Grease Creek Fires. Vegetation and underlying organic matter slows runoff and protects soils from direct raindrop impact, assists with water infiltration to soil and releases runoff at slower rates. Consumption of organic material and high soil heating can promote the formation of water repellent layers, at or near the soil surface, which can result in significant amounts of soil loss.

Due to the steepness of some of these drainages, the amount of moderate and high burn severity in the Tower Fire (20%), and the large areas now devoid of vegetation and groundcover after the fire, large runoff producing storms will likely create increased surface flow volumes and velocities that can transport available sediment from the slopes and along the channel bottoms particularly in the Mill Creek (CNF), Browns Lake (CNF), and Solo Creek (IPNF) drainages. These responses are expected to be greatest in initial storm events, and will become less evident as vegetation is reestablished, providing ground cover, increasing surface roughness, and stabilizing and improving the infiltration capacity of the soils. As a result, values at risk are expected to be at an increased risk from post fire flooding. High and moderate burn severity in Baldy (15%)

and Grease Creek (12%) Fires was almost entirely limited to ridge top areas and hydrologic concerns are very limited in nature on these fires.

A pour point is the outlet of a catchment through which all runoff in the catchment pass through. Several pour points (catchments smaller than the HUC12) were established across the burned area to capture the estimated increase in hydrologic response the fire might produce. Response across the burn area varies based on terrain, pattern of burn, and amount of moderate and high Soil Burn Severity (SBS) acres, with the increase of estimated post-fire runoff in a 10 year storm ranging from 3 to 27 times increase in runoff increase. Flows are expected to be even greater when considering bulking.

Potential post-fire peak flow increases were estimated using a modeling technique utilizing regional regression equations to evaluate watershed response in three of the eight 6th field watersheds (HUC12 in the Tower Fire and in Cedar Creek of the Baldy Fire. No creeks were in the Grease Creek Fire area). Modeling estimates of post-fire peak flow showed water runoff increases from 3 to 27 times normal runoff in the Mill Creek, Browns Lake, and Solo Creek Drainages in the Tower Fire and 2 times normal runoff in the Cedar Creek drainage of the Baldy Fire.

Field evaluations were conducted to identify potential values at risk. The effects to the water quality of the Mill Creek, Browns Lake, and Solo Creek Drainages include potential loss of roads at undersized crossing structures due to flooding and debris torrents associated with road failure. Mill Creek is a designated Bull Trout critical habitat stream, and Browns Lake and Solo Creek drainages are popular recreation areas in both the winter and summer.

Erosion Response: Primary effects of fire on soils are removal of soil cover and soil heating effects, as affected by peak temperatures during the fire front and subsequent smoldering consumption of duff and woody debris. Soil heating effects are below ground, which may compromise soil structure stability and infiltration characteristics, which changes the ability of soils to accept rain events and/or produce runoff. Soil cover is crucial in physically protecting soil from erosion by absorbing raindrop impact, and dissipating energy of surface runoff at the duff/soil interface; in unburned condition this normally limits erosion to small-scale effects, and fines re-deposited on hillslopes prior to reaching a channel. With cover removal by this fire, large contiguous areas are vulnerable to rain and runoff impacts and mobilized sediments will frequently be delivered to streams. Soil Burn Severity mapped for this fire reflects the relative degrees of soil heating effects and cover reduction as a result of this fire. This mapping may be further used to quantify erosion risk and sediment production through various WEPP models.

Multiple representative hillslopes were modeled in ERMiT for this fire and results extrapolated to cover all water sheds affected by the fires. Soil erosion estimates are based upon watershed areas within the fire areas only. Unburned watershed areas outside the fire areas were not modeled. A 5-Year storm was modeled in ERMiT to determine if the estimated soil erosion for the fire areas would affect soil productivity. For the 5-year event (20% probability); an estimated 2.6 tons/acre and 1,118 cubic yards per square mile of sediment for the Tower Fire, 9.7 tons/acre erosion and 4,438 cubic yards per square mile of sediment for the Grease Creek Fire, and 1.49 tons/acre erosion and 667 cubic yards per square mile for the Baldy Fire. Increased hillslope erosion is expected to occur throughout the fire area especially within those areas in the high burn severity. Unburned, pre-fire conditions estimated 0 tons of sediment could be produced (0 tons/acre) for a 5-year event (20% probability).

Geologic Response: Within the Tower and Grease Creek Fire burned area, some watersheds, showed a great deal of past debris slide/debris flows/rock fall activity that will be increased during future storms. Other areas have little evidence of recent past slope instability. But conditions have changed due to the Tower and Grease Fire.

As a result of the removal of vegetation by the fire, excessive sediment on the hillslope and readily available material in channels maybe transported through the ecosystem during moderate to high rain events. High runoff response on the landscape has the potential to increase debris-flow in the steep to moderate canyons. Soils are exposed and have become weakened, and rocks on slopes have lost their supporting vegetation. Roads are at risk from rolling rock, plugged culverts, debris slides and debris flows. Stream channels and

mountainside ephemeral channels will be flushed of the sediment that in some places is loose and deep, in other places shallow. That sediment will deposit in some channels, choking flow, raising flood levels, and covering roads or eroding road prisms. Risks to human life, roads, trails and natural resources are high to very high. There is a high potential for small to large debris flows within the steep area of the Tower and Grease Creek Fires.

Field and aerial observations of the Tower and Grease Creek Fires showed numerous debris flows, colluvium slopes and mass wasting slumps. Many of these occur on slopes burned at moderate and high soil burn severity and are at risk for increased activity resulting in large quantities of soil, rock and organic debris moving down slope. When debris flows occur, infrastructure such as roads and trails may be lost and increase quantities of sediment, rock, and vegetation may enter into drainages.

Native Vegetation Recovery Response: The effects of fire on native vegetation and recovery of native vegetation following fire depends upon many variables, including soil burn severity (both maximum soil temperature/heating during fire and loss of organic and soil horizons), pre-fire vegetation composition, proximity of unburned native seed sources, aspect, elevation, and presence of non-native invasive species.

Most of the fire areas with low soil burn severity (see Soils Report) should revegetate or recover with native plants fairly rapidly, likely to acceptable levels within 1-3 years. In moderate soil burn severity areas, scattered duff layers are still present, as are isolated patches of surviving native plants, resulting in the ability to re-establish forbs and graminoids via natural seeding/succession over much of the burn area fairly readily, likely within 3-5 years, except in high elevation zones, harsh sites (southwest aspects or thin soils) or where soil mass failures in the area. In high soil burn severity areas, especially those that are extensive (i.e. within the Tower Fire: the basin near the northwest side of Browns Lake, the upper basin of the head of Mill Creek, and the east side of the ridgeline north of South Baldy) or in high elevation areas, native recovery will likely take some time to successfully re-establish (potentially 3-8 years for forbs or graminoids, but up to 8-15 years for shrubs or on harsh sites, such as high elevations, thin-soils, or low elevation southwest aspects.)

Additionally, some of the higher soil burn severity areas also tend to occur where existing non-native invasive plants already are present. As a result, many of these sites will not only be slower to recover, but will also have a high likelihood of non-native invasive plant encroachment within the burned area.

A. Describe Critical Values/Resources and Threats:
A comprehensive list of potential values at risk within or directly downstream of the Kaniksu Complex burned area was compiled through consultation with local management and resource specialists and through BAER Team on the ground assessment. Following guidance in Interim Directive 2520- 2013-1, the BAER assessment team evaluated this list of values through field assessment and subsequent analysis to identify the critical values (FSM 2523.1 – Exhibit 01) that may be treated under the BAER program (See project file for VAR Risk Assessment for BAER Critical Values). The critical values were then assigned a level of risk defined by the probability of damage or loss coupled with the magnitude of consequences using the risk assessment matrix (FSM 2523.1 – Exhibit 02). The critical values with unacceptable risks signify a burned-area emergency exists. The characterization of the probability of damage or loss is based on the watershed response analysis completed by the BAER Assessment. Critical values having a “Very High” or “High” risk rating include recommended emergency stabilization actions known to mitigate potential threats or minimize expected damage, which are described below. “Intermediate” risk areas were identified and discussed with the recommended treatment consisting of coordination with local, state, and other federal cooperators. Additionally critical warning signs are recommended in some areas with an intermediate risk. No treatments were identified for values when the analysis resulted in a “low” or “very low” risk rating.

Tower Fire

1.Human Life and Safety (HLS)

a. **Very High to High** risk to travelers along routes (roads and trails) within and downslope from hillslopes burned at a moderate to high severity due to an increased threat of falling trees/snags, rocks, excessive erosion, flooding, and other debris. The highest identified risks are the following roads: 312, 659, 1200000, 1920000, and 5080000. Treatment recommendations are temporary closure, install warning

signage, and monitoring to ensure treatments are functioning as intended.

b. **Very High, High, to Intermediate** risk to the life and safety of the public, cooperator, and FS workers and contracted personnel implementing BAER treatments due to the presence of excess sedimentation, flooding, debris flow, rockfall in the burn area have been identified. Treatment recommendations are temporary closure, install warning signage, and storm patrol monitoring to ensure treatments are functioning as intended.
c. **Very High, High, to Intermediate** risk to the life and safety of the public, cooperator, and FS workers and contracted personnel implementing BAER treatments due to the presence of hazard trees throughout the entire burn area. In areas of high or very high risk closure is the most certain way of reducing public safety risks, but in those unusual situations where public closure cannot be implemented, the appropriate treatment may involve removal of the hazard trees. Hazard tree removal would be limited to managing the hazard (dropping the tree) and must be focused on the trees posing the greatest risk. Mitigation of hazard trees that pose a significant risk to FS or contract workers working on implementing BAER treatments will occur as needed. Cooperators and employees at the District Offices will need to monitor their facilities and infrastructure. It will be up to the cooperators coordinating with the Colville and Idaho Panhandle National Forests and employees of the Ranger Districts to manage hazard trees near and
d. **Very High** risk to public, cooperator, FS workers and contracted personnel implementing BAER work exists in all the dispersed recreation (Both IPNF and CNF) sites due to fire weakened trees and an increased potential for avalanches. Treatments include: FS area closure and the installation of closure and warning signs at major points of entry until hazards can be mitigated.
e. **High to low** risk to public, cooperator, FS workers and contracted personnel implementing BAER work exists on all Groomed Snowmobile Trails (38 miles CNF & 17.9 miles IPNF) due to geologic failures, increased avalanche potential, debris torrents, and/or hazardous trees. Treatments include: FS area closure and installation of closure and warning signs at trailheads and connector points until hazards can be mitigated.
f. **Very High** risk to the public exists due to hazardous materials introduced to water sources in the burn area due to chemicals leaching from a burnt foot bridge. Recommended treatment is the removal of the remnants of the burnt foot bridge located on the Icy Springs Motorized Trail (IPNF).
g. **Very High** risk to the life and safety of the public, cooperator, and FS workers and/or contracted personnel implementing BAER treatments due to the presence of hazard trees located at the following IPNF trailheads: Icy Spring TH, Kalispell Rock TH & South Baldy TH. Hazard tree removal would be limited to managing the hazard (dropping the tree) and must be focused on the trees posing the greatest risk. Mitigation of hazard trees that pose a significant risk to FS or contract workers working on implementing BAER treatments will occur as needed.
h. **Intermediate** risk to the life and safety of the public, cooperator, and FS workers and contracted personnel implementing BAER treatments due to the presence of hazard trees, and the increased threat of falling rocks, erosion, flooding and other debri is expected in areas with low burn severity or unburned areas. Treatment recommendations are temporary closure, install warning signage, and storm patrol monitoring to ensure treatments are functioning as intended.
i. **Intermediate** risk exists to public and administrative personnel on the South Baldy Trail (#104-IPNF), Kalispell Rock Trail (#103-IPNF), due to a Loss of ingress/egress, rolling rocks, flooding and debris flow, fire weakened trees. Treatments include area closures and installation of closure and warning signs at trailheads and connector points until hazards can be mitigated.
j. **Low** risk to the public, cooperators, and FS workers on all Level 1 (Closed) Roads due to an increased threat of falling trees/snags, rocks, excessive erosion, flooding, and other debris. These routes are currently closed. No treatments are recommended.
k. **Low** risk exist to visitors to the Grouse Knob (#198-IPNF), Squaw Valley (#164-IPNF) and Mill Point (#199-IPNF) trails due to the loss of ingress/egress, rolling rocks, flooding and debris flow, and fire weakened trees. No treatment is recommended due to the lack of trail tread and visitation.
l. **Low** risk to visiting publics and FS personnel exists due to the presence of fire weakened trees located at the Grouse Knob (#198-IPNF), Squaw Valley (#164-IPNF) and Mill Point (#199-IPNF) Trailhead. No treatment is proposed at this time because no restoration is currently planned for the trails and they currently receive no use due to deteriorated trail conditions.
m. **Very low** risk to Browns Lake CG (CNF) and the Pelke Warming Hut (CNF) due to similarly fire weakened tree. No treatments are proposed for these sites because the fire weakened tree are located

at least two tree lengths away.

2. Property (P)
   a. **Very High to High** risk to road and associated infrastructure with substantial damage expected because flooding, debris flows, and erosion is imminent. The highest risk is associated with roads 312, 460, 659, 1090, 1137, 1090A, 460D, 460B, 460E, 659A, , 659B, , 1200000, 1920000, 1920042, 1920050, 1920306, 5080000, and 5080306. Post fire conditions and predicted watershed response indicate increased runoff, excessive sedimentation, debris flows, and rockfall will occur into roadway drainage features, such as such as roadside ditches, culvert inlets, over side drains, roadway dips and run outs. Once these drainage features become impacted and overwhelmed, their function fails, allowing uncontrolled water to divert, resulting in major damage to the road and invested road improvements, loss of road function, and the denial of access along some road segments. Treatment recommendations are improve road drainage features, temporary closure, install warning signage, and storm patrol monitoring to ensure treatments are functioning as intended.
   b. **Very High** risk to FS property along the Icy Springs Trail (#197-IPNF), Squaw Valley Trail (#164-IPNF), Kalispell Rock Trail (#103-IPNF), South Baldy –Solo (#104-IPNF) within and downslope from hillslopes burned at a moderate to high severity due to an increased threat erosion of trail tread, impacts to trail at crossings, trail blockage by eroded soil, dry ravel and or falling burned trees. Treatments include trail crossing armoring, trail storm proofing treatments, and storm inspection and response.
   c. **Intermediate** risks to property exists on the groomed snowmobile trails on both the IPNF (17.9 miles) and CNF (38 miles). Increased flooding (snow-on-rain event) and avalanche potential could cause property damage to FS or public properties. Trail closures would eliminate the need for further treatments other than natural recovery
   d. **Intermediate, low, and very low** risk to road and associated infrastructure with minimal damage expected due to slight increase in runoff is expected in low burn severity and unburned areas. Treatment recommendations are to let native recovery occur.
   e. **Low to very low** risk exists to the property at Browns Lake Campground (CNF), Grouse Knob TH (IPNF), Icy Springs TH (IPNF), Kalispell Rock TH (IPNF), Mill Point TH (IPNF), South Baldy TH (IPNF), Squaw Valley TH (IPNF) and all other level 1 dispersed site found in the burn area due to increased flooding, sedimentation, and hazardous trees impacting the features at these locations. No treatments were prescribed at Browns Lake CG because the hazard trees were located at a safe distance from the any parking or infrastructure. No treatments were proposed at the trailheads and dispersed sites due to the lack of infrastructure to damage.
   f. **Low** risk to the property at Grouse Knob (IPNF) and Mill Point (IPNF) trails exists due to erosion of trail tread, impacts to trail at crossings, trail blockage by eroded soil, dry ravel and or falling burned trees. No treatment was proposed given the minimal development level of these (class 1) trails.
   g. **Very low** risk exists to the Pelke Warming Hut (CNF) due to the fire weakened tree in the area. No treatment was proposed given the safe distance the trees were cleared from the structure.
   h. **Low** risk to the South Baldy lookout is the only historic standing structure within the APE but it is far removed from the fire effects, is not in danger from any post fire effects, and should be considered stable. No treatments are recommended.
   i. **Low** risk to the North Baldy repeater because it is far removed from the fire effects, is not in danger from any post fire effects, and should be considered stable. No treatments are recommended.

3. Natural Resources (NR)
   a. **Very High, High, and Intermediate** risk to hydrologic function from loss of ground cover and coarse woody debris, mass erosion, flooding and debris flows that scour channels below the root structure of the surviving plant communities. Approximately 20% of the fire burned at moderate to high severity, the threat to hydrologic function exists to varying degrees in all subwatersheds with significant moderate to high severity. The highest threat is within the Mill Creek drainage. Impacts to hydrologic functions will be mitigated by the proposed roads, trails and land treatments.
   b. **Very High** risk to water quality in the Mill Creek and Browns lake areas from ash and sediment input. Treatment recommendations are natural recovery along with associated benefits derived from treatments to protect life, safety and property, including road treatments (culvert pull on 1920000 road and stormproofing on 5080000, 659 roads).
   c. **High** risk for water quality concerns and loss of designated critical habitat for bull trout (T&E) and

westslope cutthroat trout (culturally significant) in the Browns Lake and Mill Creek watersheds exists due to the probability of increase flows resulting in flooding and excess sedimentation input. For aquatic species, post-fire impacts will include compromised water quality and changes in water chemistry due to ash delivery and hazardous materials, changes in water temperature from loss of canopy shading and increased sedimentation, scouring of riparian/aquatic vegetation, and changes in streambed/pool habitat due to geomorphic movement (debris flows), and flushing of individual fish downstream during flood events. These combined impacts may lead to a long term loss or reduction of suitable stream habitat for bull trout. For all fish species, there is a concern that until enough vegetative recovery has occurred habitat degradation will continue. Specific fisheries treatments to reduce potential impacts to habitat will rely on the trail and road treatment packages.

d. **Very High to High** risk for of increased debris flow potential, rock fall and landslide potential in to areas that burned at moderate to high severity. It is likely that debris flows, rock falls, and landslide will occur in high and moderate burn severity areas and the magnitude of consequence associated with debris flows, rock falls, and landslide is moderate to high. Debris flows, rock falls, and landslide occurring in the high and moderate burn severity areas can result in further loss of infrastructure, loss or soil productivity, and deposition of sediment, rocks, and material in to drainages.
e. **Low** risk for water quality concerns exists due to flooding or excess sedimentation for Westslope Cutthroat Trout (Culturally Significant and FS Sensitive) in Cee Cee Ah Creek. Much of the Cee Cee Ah Creek watershed was impacted by low to unburned fire severity leaving vegetation to buffer and filter potential sediment between the creek and the fire. Fire effects are minimal to the fisheries resource will not cause harm to the westslope cutthroat trout populations.
f. **Intermediate** risk to soil productivity from Off-highway vehicle (OHV) into areas that burned at moderate to high severity. There is possible (10-49%) that OHV intrusion will occur in high and moderate bur severity areas and the Magnitude of consequence associated with this intrusion is moderate. OHV intrusion into high and moderate burn severity areas can result in further loss of organic material, destruction of soil structure, sub-surface compaction and creation of artificial rills and/or gullies. Site specific locations of greatest concern have been identified in the botany specialist report. The most effective methods to reduce this potential risk are area closures, closure patrols/citations, and interpretive signage describing the importance of protecting fragile ecosystems and natural recovery following fire disturbance.
g. **Low** risk to soil productivity from increased soil erosion within areas that burned at moderate to high severity. There is a high probability for erosion, hillslope erosion, and mud flows. Result from the erosion and sedimentation models indicate low levels of soil erosion and sedimentation. Despite there being a high probability, results from the model indicate a low magnitude of consequences. The mosaic nature of the fire and naturally occurring slope break will reduce the amount of soil transported out of the burn area. The fire is expected to impact soil quality by eroding exposed soil and nutrient-rich ash off-site, as well as by increasing the potential for spread of noxious weeds and invasive plant species. Site specific locations of greatest concern have been identified in the soil specialist report. No treatments were recommended.
h. **Very High** risk to native vegetation due to lack of recovery of native vegetation, establishment/spread of invasive plants, and potential loss of native seed sources is very likely in high soil burn severity areas. In high soil burn severity areas, seed banks in the soil profile have likely been destroyed due to fire consumption or heat. High percentages of native plant rhizomes and crowns also were likely destroyed due to heat. Therefore, in some areas, native plant recovery could take many years to attain acceptable levels. Unfortunately, most of those same areas were deemed too steep to accommodate seeding/mulching treatments, so seeding or propagule augmentation is not feasible for landscape treatments. However, limited areas which were highly-disturbed are recommended for seeding treatments to try to prevent non-native invasive plant establishment. Furthermore, early detection/rapid response (EDRR) weed treatments (described below), particularly along weed conduits (like roads, firelines,etc.) that are adjacent to or lead into the fire area are imperative in helping to reduce potential for non-native invasive plant establishment.
i. **Very High** risk of non-native invasives due to the establishment or spread of invasive weeds along access roads is likely in the Tower Fire, as is weed movement away from conduits (such as roads, dozer lines, etc.) into the moderate and high soil burn severity areas. Known infestations of spotted knapweed, St. Johnswort, yellow hawkweed, orange hawkweed, dalmation toadflax, oxeye daisy, common tansy, bull thistle, and Canada thistle occur within and adjacent to the burned areas.

Infestations on NFS lands have been treated in the past. However, these infestations may expand following fire due to seed bank stimulation and lack of competition and may also expand from adjacent lands in the Tower Fire area (where weed control efforts have not previously been implemented.) In addition, the fire suppression activities have the potential to introduce or establish new weed infestations. Treatment recommendations include treating infestations to limit fire-induced population growth and geographic expansion, as well as surveying for and treating newly introduced infestations before they become a serious threat to the integrity of native plant communities.

j. **Very High** risk of Whitebark Pine habitat due to loss of a self-sustaining population of whitebark pine (Pinus albicaulis), a candidate T&E species is very likely to occur as a result of the Tower Fire. All known occurrences of whitebark pine within the fire area were destroyed by the fire. Furthermore, although the soil burn severity map indicated fairly low severity in the general area where trees were known to occur, on-the-ground assessments revealed moderate to high severity in proximity to occurrence areas. As a result, organic soil horizons were destroyed in much of the occurrence areas and it is unlikely that cached whitebark pine seeds (cached by Clark's nutcrackers or chipmunks/squirrels) would have survived the fire. As a result, restoration efforts to re-establish whitebark pine in suitable habitat areas (including planting whitebark pine seedlings or seeding efforts) should strongly be considered/pursued by each respective Forest (perhaps even as a joint effort.) Because this species is not technically a T&E species, this restoration endeavor should be pursued at the Forest level.

k. **Intermediate** risk to native vegetation due to OHV intrusions in high and moderate soil burn severity areas on the Tower Fire could result in reduced native vegetation recovery. Areas where organic soil horizons or cryptogrammic soil/lichen crusts are present are especially sensitive to potential impacts (of soil compaction, displacement, and rutting) often caused by off-road tracked/tired vehicles. Although these impacts are possible, fire-killed snags and downed wood throughout much of the fire area will continue to serve as natural barriers. The primary area of concern (lacking natural barriers) would be the natural "balds", such as North Baldy and South Baldy, where adjacent recreation is already occurring and the sites are naturally-maintained grasslands. However, it would be difficult, if not impossible, to effectively prevent all OHV incursions through areas that large. The most effective methods to reduce this potential risk are area closures, closure patrols/citations, and interpretive signage describing the importance of protecting fragile ecosystems and natural recovery following fire disturbance.

l. **Low** risk to immediate adverse effects to suitable habitats for Threatened and Endangered terrestrial wildlife species grizzly bear and Canada lynx. Over the short to mid-term, these fires are also likely to have beneficial effects to grizzly bears through the promotion of nutritious, palatable forage. In the case of lynx, the fires should set the stage for the development of potential lynx den sites and suitable habitats for snowshoe hares, over the course of a few decades. There is potential for a prolonged delay in the re-vegetation of severely burned areas, due to mass soil movement initiated by rain-on-snow events. This could delay the restoration of suitable forest habitats for the lynx on local sites.

4.Cultural and Heritage Resources (CHR)

a. **High** risk to eligible cultural and historic sites from looting, due to the burned area exposing previously obscured features and artifacts. Approximately none of the federal lands burned have been surveyed within the fire perimeter. Continued monitoring will occur for this concern under the normal program of work. No treatments are recommended.

b. **High** risk to eligible cultural and historic sites due to an increased threat from increased runoff, erosion, flooding, or debris flow causing irreversible damage. There are 15 cultural sites within the burned area, of which, 12 were visited as part of the BAER assessment. Three of the sites will benefit from erosion control mitigation. Cultural resources will benefit from the proposed roads, trails and land treatments.

Baldy Fire:

1.Human Life and Safety (HLS) – No critical BAER values were identified.

2. Property (P) – No critical BAER values were identifed.

3. Natural Resources (NR)

a. **Intermediate** risk exists to the natural resources found within the Baldy fire perimeter. Potential threats exist to the Abercrombie - Hooknose (CNF) Inventoried Road Area (IRA). Values at risk include Soil, Water, and Air; Diversity of Plant and Animal Communities; Scenic; Heritage; Solitude and Primitive Recreation; Manageability; and Special Features. Natural recovery is the only treatment being proposed.

a. **Intermediate** risk to native vegetation in Baldy fire due to lack of recovery of native vegetation, establishment/spread of invasive plants, and the potential loss of native seed sources is possible in the Baldy high soil burn severity areas. In high soil burn severity areas, seed banks in the soil profile have likely been destroyed due to fire consumption or heat. High percentages of native plant rhizomes and crowns also were likely destroyed due to heat. Therefore, in some high soil burn severity areas, native plant recovery could take many years to attain acceptable levels. Unfortunately, most of those same areas were deemed too steep to accommodate seeding/mulching treatments, so seeding or propagule augmentation is not feasible for landscape treatments. However, limited areas which were highly-disturbed are recommended for seeding treatments to try to prevent non-native invasive plant establishment. Furthermore, early detection/rapid response (EDRR) weed treatments (described below), particularly along weed conduits (like roads, firelines,etc.) that are adjacent to or lead into the fire area are imperative in helping to reduce potential for non-native invasive plant establishment.

b. **Intermediate** risk in Baldy Fire due to the establishment or spread of invasive weeds along access roads is likely in the Baldy Fire, as is weed movement away from conduits (such as roads, dozer lines, etc.) into the moderate and high soil burn severity areas. Known infestations of spotted knapweed, St. Johnswort, yellow hawkweed, orange hawkweed, dalmation toadflax, oxeye daisy, common tansy, bull thistle, and Canada thistle occur within and adjacent to the burned areas. Infestations on NFS lands have been treated in the past. However, these infestations may expand following fire due to seed bank stimulation and lack of competition and may also expand from adjacent lands (where weed control efforts have not previously been implemented.) In addition, the fire suppression activities have the potential to introduce or establish new weed infestations. Treatment recommendations include treating infestations to limit fire-induced population growth and geographic expansion, as well as surveying for and treating newly introduced infestations before they become a serious threat to the integrity of native plant communities.

c. **Low** risk to Water Quality concerns due to excessive sedimentation for Bull Trout and downstream domestic use. No treatment recommendations are recommended.

d. **Low** risk to hydrologic function from loss of ground cover and coarse woody debris, mass erosion, flooding and debris flows that scour channels below the root structure of the surviving plant communities. No treatments are recommended.

e. **Low** risk to soil productivity from increased soil erosion within areas that burned at moderate to high severity. There is a high probability for erosion, hillslope erosion, and mud flows. Result from the erosion and sedimentation models indicate low levels of soil erosion and sedimentation. Despite there being a high probability, results from the model indicate a low magnitude of consequences. The mosaic nature of the fire and naturally occurring slope break will reduce the amount of soil transported out of the burn area. The fire is expected to impact soil quality by eroding exposed soil and nutrient-rich ash off-site, as well as by increasing the potential for spread of noxious weeds and invasive plant species. Site specific locations of greatest concern have been identified in the soil specialist report. No treatments are recommended.

f. **Low** risk for the loss of designated critical habitat exists due to flooding and excess sedimentation for bull trout (Threatened and Endangered) in Cedar Creek. Much of the Cedar Creek watershed was impacted by unburned to low fire severity leaving a large vegetation buffer and sediment filter potential between the creek and the fire. Fire effects are minimal to the fisheries resource and will not cause harm to the designated critical habitat for bull trout. No treatments are recommended.

g. **Low** risk to immediate adverse effects to suitable habitats for Threatened and Endangered terrestrial wildlife species grizzly bear and Canada lynx. Over the short to mid-term, these fires are also likely to have beneficial effects to grizzly bears through the promotion of nutritious, palatable forage. In the case of lynx, the fires should set the stage for the development of potential lynx den sites and suitable habitats for snowshoe hares, over the course of a few decades. There is potential for a prolonged delay in the re-vegetation of severely burned areas, due to mass soil movement initiated by rain-on-snow events. This could delay the restoration of suitable forest habitats for the lynx on local sites. No treatments are recommended.

4.Cultural and Heritage Resources (CHR) – No critical BAER values were identifed.

Grease Creek Fire:

1.Human Life and Safety (HLS)

a. **High** risk exists to public, cooperator, FS workers and contracted personnel implementing BAER work due to flooding, sedimentation, rock fall and/or hazardous trees on 1.9 miles of the Hall Mountain - Grassy Top Hiking Trail (#533-CNF). This trail is also a feeder trail for the congressionally designated Pacific Northwest Trail (PNT). Treatments include FS area closure and installation of closure and warning signs at trailheads and connector points until hazards can be mitigated.
b. **Low** risk to the public, cooperators, and FS workers on all Level 1 (Closed) Roads due to an increased threat of falling trees/snags, rocks, excessive erosion, flooding, and other debris. These routes are currently closed. No treatments are recommended.

2. Property (P)

a. **High** risk exists to trail infrastructure located on the Hall Mountain - Grassy Top Hiking Trail (#533-CNF) due to due to increased flooding and sedimentation caused by the fire. Treatments include trail crossing armoring, trail storm proofing treatments, and storm inspection and response.
b. Low risk to Level 1 (Closed) road and associated infrastructure with minimal damage expected due to slight increase in runoff is expected in low burn severity and unburned areas. Treatment recommendations are to let native recovery occur.

3. Natural Resources (NR)

a. Intermediate risk exists to the natural resources found within the Grease fire perimeter. Potential threats exist to the Grassy Top (CNF) Inventoried Road Area (IRA). Values at risk include Soil, Water, and Air; Diversity of Plant and Animal Communities; Scenic; Heritage; Solitude and Primitive Recreation; Manageability; and Special Features. Natural recovery is only treatment being proposed.
b. **High** risk in Grease Creek Fire due to the establishment or spread of invasive weeds along access roads is very likely in the Grease Creek, as is weed movement away from conduits (such as roads, dozer lines, etc.) into the moderate and high soil burn severity areas. Known infestations of spotted knapweed, St. Johnswort, yellow hawkweed, orange hawkweed, dalmation toadflax, oxeye daisy, common tansy, bull thistle, and Canada thistle occur within and adjacent to the burned areas. Infestations on NFS lands have been treated in the past. However, these infestations may expand following fire due to seed bank stimulation and lack of competition and may also expand from adjacent lands (where weed control efforts have not previously been implemented.) In addition, the fire suppression activities have the potential to introduce or establish new weed infestations. Treatment recommendations include treating infestations to limit fire-induced population growth and geographic expansion, as well as surveying for and treating newly introduced infestations before they become a serious threat to the integrity of native plant communities.
c. **Intermediate** risk to native vegetation in the Grease Creek Fire due to lack of recovery of native vegetation, establishment/spread of invasive plants, and potential loss of native seed sources is possible in the Grease Creek high soil burn severity areas. In high soil burn severity areas, seed banks in the soil profile have likely been destroyed due to fire consumption or heat. High percentages of native plant rhizomes and crowns also were likely destroyed due to heat. Therefore, in some high soil burn severity areas, native plant recovery could take many years to attain acceptable levels. Unfortunately, most of those same areas were deemed too steep to accommodate seeding/mulching treatments, so seeding or propagule augmentation is not feasible for landscape treatments. However, limited areas which were highly-disturbed are recommended for seeding treatments to try to prevent non-native invasive plant establishment. Furthermore, early detection/rapid response (EDRR) weed treatments (described below), particularly along weed conduits (like roads, firelines,etc.) that are adjacent to or lead into the fire area are imperative in helping to reduce potential for non-native invasive plant establishment.
d. **Low** risk to water quality concerns due to excessive sedimentation for Bull Trout and downstream

domestic use. No treatment are recommended.

e. **Low** risk to hydrologic function from loss of ground cover and coarse woody debris, mass erosion, flooding and debris flows that scour channels below the root structure of the surviving plant communities. No treatments are recommended.
f. **Low** risk to soil productivity from increased soil erosion within areas that burned at moderate to high severity. There is a high probability for erosion, hillslope erosion, and mud flows. Result from the erosion and sedimentation models indicate low levels of soil erosion and sedimentation. Despite there being a high probability, results from the model indicate a low magnitude of consequences. The mosaic nature of the fire and naturally occurring slope break will reduce the amount of soil transported out of the burn area. The fire is expected to impact soil quality by eroding exposed soil and nutrient-rich ash off-site, as well as by increasing the potential for spread of noxious weeds and invasive plant species. Site specific locations of greatest concern have been identified in the soil specialist report.
g. **Low** risk for the loss of designated critical habitat exists due to flooding and excess sedimentation for bull trout (Threatened and Endangered) in Sullivan Creek. Sullivan Creek is over 5 stream miles from the fire. Due to the long distance and unburned to low fire severity along tributaries within the fire there is a large vegetation buffer and sediment filter potential between Sullivan Creek and the fire. Fire effects are minimal to the fisheries resource and will not cause harm to the designated critical habitat for bull trout in Sullivan Creek.
h. **Low** risk to immediate adverse effects to suitable habitats for Threatened and Endangered terrestrial wildlife species woodland caribou, grizzly bear, and Canada lynx. Over the short to mid-term, these fires are also likely to have beneficial effects to woodland caribou and grizzly bears through the promotion of nutritious, palatable forage. In the case of lynx, the fires should set the stage for the development of potential lynx den sites and suitable habitats for snowshoe hares, over the course of a few decades. There is potential for a prolonged delay in the re-vegetation of severely burned areas, due to mass soil movement initiated by rain-on-snow events. This could delay the restoration of suitable forest habitats for caribou and lynx on local sites.

4.Cultural and Heritage Resources (CHR) – No critical BAER values were identifed.

B. Emergency Treatment Objectives:

<u>Land Treatments (Tower Fire)</u>

The objective of *roadside invasive* treatments is to provide for recovery of native vegetation by preventing the establishment and spread of noxious weeds in the high and moderate soil burn severity area.

<u>Road and Trail Treatments (Tower and Grease Creek Fires)</u>

The objective of road (CNF) and trail stabilization (IPNF) treatments is to lower the risk of damage to property (system roads and trails) by lowering erosion of the road and trail surface in severely burned and steep areas within the burned area and to provide for public safety. The objective of temporary closure of roads and trails is to reduce risk to human life and safety.

The Idahoe Panhandle National Forests choose to complete storm inspection and response in lieu of costly treatments with the exception of 3 critical areas that will require road stabilization treatments. The objective of post storm inspection and response is to survey impacts to the transportation infrastructure after a wildfire. This treatment will be used in lieu of more costly upgrades that may not feasible due to time constraints of installing these treatments before the first damaging event or before winter occurs.

<u>Recreation Treatment (Tower and Grease Creek Fires)</u>

Recreation treatments are needed to protect health and safety of public users of developed and dispersed sites, as well as the General Forest Areas. Treatments are also necessary to protect Forest Service infrastructure.

<u>Protection/Safety Treatments (Tower, Baldy, and Grease Creek Fires)</u>

The objective of installing warning signs is to reduce threats to life/safety of Forest users by warning that they are entering a burned area and warning against access into hazardous areas. These signs also serve to accelerate natural recovery by preventing travel off trails.

The objective of temporary Forest closure of the Kaniksu Complex – Tower, Baldy, and Grease Creek Fires is to reduce risk to human life and safety.

The objective of hazard tree removal is to reduce the risk to Forest users, Forest employees and contractors who may be working in the burned area.

Facilitating and coordinating with the National Weather Service and Northwest Avalanche Center or like agency for warning and or watch advisories for flooding and avalanche forecasting will reduce the threat to life and safety. Interagency coordination with the NRCS and Washington Department of Natural Resources to inform these entities of anticipated post wildfire watershed response and associated threats to public safety on private and state lands. This information could be utilized in the development of early warning systems or emergency response plans.

Cultural Resources (Tower Fire)

The objective of cultural resource treatments is to prevent irretrievable loss of archeological information, to prevent looting by informing recreational users of the importance of archaeology and federal laws that prohibit theft of artifacts and damage to historic or prehistoric sites, and to prevent erosion on disturbance of archaeological materials.

Treatments considered, but not carried forward (Tower Fire)

Opportunities exist to reduce sediment delivery and loss of hydrologic function through mulching and seeding. The team considered this treatment to protect the Bull Trout critical habitat in Mill Creek and the Culturally Significant Westslope Cutthroat Trout in Browns Lake from the risk of post-fire turbidity, ash, and sediment delivery. Mulching and seeding would not only help to protect the habitat, but also reduce hydrological response to critical crossings along FS System Road 1920000 and 5080000. The team determined the acres available for mulching and seeding in the high and moderate burn severity in these two subwatersheds. ErMIT and Wildcat modelling was used to estimate the reduction in sediment delivery and flow with mulching versus no treatment. The VAR tool was used to determine a minimum implied value. The value of the road system and a qualitative assessment of TES fish habitat was compared to this implied minimum value. This comparison found that the mulching treatment was not warranted.

Treatments considered, but not carried forward (Tower, Baldy and Grease Creek Fires)

Early Detection Rapid Response (EDRR) Surveys on dozerlines, handlines, drop points, etc. are utilized to determine if native or naturalized communities are at risk to the introduction of invasive species or noxious weeds particularly in areas where they previously *were absent or present in only minor amounts.* Invasive plants pose a serious threat to the stability and function of ecosystems. Often these plants rapidly colonize a burned area especially in moderate and high soil burn severity areas, reducing other plant abundance and diversity. Utilizing GIS the dozer lines, hand lines, and other fire suppression roads work was overlaid on the Final Soil Burn Severity map for each Fire. On the Tower Fire 0.6 miles were located in moderate soil burn severity. Only 2.5 miles were located within 1/8th of a mile of high and moderate soil burn severity. On the Baldy and Grease Creek Fires zero miles were located within the high and moderate soil burn severity. Only 0.25 miles were located within 1/8th of a mile of high and moderate soil burn severity. The need for EDRR surveys *on dozerlines, handlines, drop points, etc*. was discussed but determined to not be warranted.

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

Land **75** % Channel **0** % Roads/Trails **75** % Protection/Safety **75** %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	75	85	95
Channel	--	--	--
Roads/Trails	75	85	95
Protection/Safety	80	70*	60*

*Initially, visitors will heed the warning signs. Complacency is expected after the initial year unless there are continued damaging events.

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

Tower Fire	$10,079,070 (Market Resource Value from the VAR Worksheet)
Baldy Fire	$25,000 (Market Resource Value from the VAR Worksheet)
Grease Creek Fire	$85,000 (Market Resource Value from the VAR Worksheet)

F. Cost of Selected Alternative (Including Loss):

Tower Fire	$238,578 (Total Treatment Cost from the VAR Worksheet)
Baldy Fire	$0 (Total Treatment Cost from the VAR Worksheet)
Grease Creek Fire	$11,795 (Total Treatment Cost from the VAR Worksheet)

Implementation of recommended response actions is based on market resources only and is economically justified with the following benefit:cost ratio below:

Tower Fire	25.3
Baldy Fire	----
Grease Creek Fire	4.3

The likely probability of loss if treatments were not applied is based on field observations and estimate of damage or loss with the longer duration precipitation event. For the recommended treatments there is a reduced probability of damage or loss with implementation. The expected loss would not be as costly when implementing the recommended treatments. The VAR analysis focused primarily on market values so potential benefits such as lowering level of risk to human life and safety, natural resources, and cultural resources were recognized in this BAER assessment, but not included in the cost basis for Values at Risk analysis. Natural resources are the primary concern in the Baldy and Grease Creek Fires.

G. Skills Represented on Burned-Area Survey Team:

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

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Name	Home Unit	BAER Specialty

Mary Moore	SO, Stanislaus NF, R5	*Team Leader*
Rob Lawler	Newport/Sullivan Lake RDs, Colville NF	*Team Leader Trainee/Hydrologist Trainee*
Andy Casillas	Regional Office, R3	*Soils Trainee*
Dan Gilfillan	Priest Lake RD, Idaho-Panhandle NF	*Recreation Trainee*
Kyle Lee	Priest Lake RD, Idaho-Panhandle NF	*Recreation Trainee*
Jacob Noland	SO, Lewis and Clark NF, R1	*Engineering Trainee*
Stuart Chilvers	Republic RD, Colville NF	*Cultural Resources Trainee*
Mike Borysewicz	Newport/Sullivan Lake RDs, Colville NF	*Wildlife Trainee*
JD Jones	Newport/Sullivan Lake RDs, Colville NF	*Fisheries Trainee*
Jennifer Costich-Thompson	Sandpoint RD, Idaho-Panhandle NF	*Botany Trainee*
Paul Haas	Newport/Sullivan Lake RDs, Colville NF	*Range/Invasive Trainee*
Terri Contreras	Newport/Sullivan Lake RDs, Colville NF	*GIS Trainee*

H. **Treatment Narrative:**

Land Treatments:

Cultural Treatment (Tower Fire)

The objective for the treatment of the sites is to stabilize the soils to preserve the existing stratigraphy, integrity of the artifacts and features, context of artifacts and features, and the prevention of looting and disturbance of the site. Seeding, mulching or a combination thereof combined with annual monitoring of the treated sites can be applied to reduce the possibility of the loss of the resource. The effectiveness of revegetation and mulching is dependent on the types of soils, slope of the site and other limiting factors, since the revegetation of the sites is in partnership with botany and soils please refer to their reports for the effectiveness of these treatments. Revegetation of the indicated sites should be in consultation of the Forest Archaeologists on both the Idaho Panhandle and the Colville National Forests.

Tower Fire – CNF:

Item	Unit Cost	Unit	Total # of Units	Total Item Cost
Archaeologist GS-12	$ 382.00	day	2	$ 764.00
Archaeologist GS-09 (Treatment Monitor)	$ 281.00	day	4	$ 1,124.00
Sawyer GS-9	$ 281.00	day	4	$ 1,124.00
Swamper GS-07	$ 156.00	day	4	$ 624.00
GS-04	$ 105.00	day	4	$ 420.00
Transportation	$ 5,000.00	day	1	$ 5,000.00
Miscellaneous costs	$ 200.00	project	1	$ 200.00
Mulching (wood straw)	$ 1,000.00	acre	1	$ 1,000.00
Replanting/Seeding	$ 120.00	acre	1	$ 120.00
Vehicle Mileage	$ 0.55	mile	1000	$ 550.00
Total Cost of Treatment				$ **10,926.00**

Tower Fire – IPNF:

Item	Unit Cost	Unit	Total # of Units	Total Item Cost
Archaeologist GS-12	$ 382.00	day	2	$ 764.00

Archaeologist GS-09 (Treatment Monitor)	$ 281.00	day	4	$ 1,124.00
Sawyer GS-9	$ 281.00	day	4	$ 1,124.00
Swamper GS-07	$ 156.00	day	4	$ 624.00
GS-04	$ 105.00	day	4	$ 420.00
Transportation	$ 500.00	day	1	$ 500.00
Miscellaneous costs	$ 200.00	project	1	$ 200.00
Mulching (wood straw)	$ 1,000.00	acre	1.5	$ 1,500.00
Replanting/Seeding	$ 120.00	acre	1.5	$ 180.00
Vehicle Mileage	$ 0.55	mile	1000	$ 550.00
Total Cost of Treatment				$ **6,986.00**

Roadside Invasive Treatment (Tower Fire)

Tower Fire – CNF:

The following non-native invasive plant (noxious weed) treatment is proposed on those segments of road that were used for fire suppression activities or that would serve as a conduit for weed spread and establishment on the Colville NF portion of the Tower Fire. Due to the fire disturbance and disturbance from suppression activities treatment of existing and transported weed populations is essential to reduce spread across the affected landscape. Invasive plants are a serious threat to the stability and function of the ecosystem. Often these plants rapidly colonize a burned area reducing other plant abundance and diversity. Introduction of these invasive plants are of particular concern in high to moderate soil burn severity.

Contract costs are based on an average of four bid from vendors on the 2015 weed spraying contract on the Newport and Sullivan Lake Ranger Districts. All areas identified on the Colville portion of the Tower Fire can be treated as road side treatment by truck. The total proposed treatment area is 37.8 acres. Acres are based on an average treatment width of 25' ft. for 1 mile equaling 3 acres per mile.

Contract Application Costs						
Route #	**Miles To Treat**	**Application Method**	**Acres**	**Est. Cost per Acre**	**Cost per Segment**	
See Land Treatment Map for Locations	12.6	Truck	37.8	$ 70.00	$ 2,646	
	12.6		37.8	Subtotal	$ 2,646	
	(based on average of 3 ac./mile)					
Personnel, Vehicle, Reporting, & Contract Administration Costs						
			Daily Rate	Days	Cost	
GS-9 Range Weeds Specialist/COR			$ 331	9	$ 2,979	
Vehicle Use - FOR			$ 15	4	$ 60	
Vehicle Mileage (90 mi/day x 4 days)			$ 0.50	360	$ 180	
Misc. Supplies: Safety equipment, flagging, signs			$ 500	1	$ 500	
				Subtotal	$ 3,719	
				Total	**$ 6,365**	

Tower Fire – IPNF:

The following non-native invasives (noxious weed) roadside treatment is proposed on those segments of road that were used for fire suppression activities or that would serve as a conduit for weed spread and establishment on the Idaho Panhandle NF portion of the Tower Fire in high to moderate soil burn severity. All

areas identified on the Idaho Panhandle portion of the Tower Fire can be treated as road side treatment by truck. The total proposed treatment area is 19.2 acres. Acres are based on an average treatment width of 25' ft. for 1 mile equaling 3 acres per mile.

Contract Application Costs					
Route #	**Miles To Treat**	**Application Method**	**Acres**	**Est. Cost per Acre**	**Cost per Segment**
See Land Treatment Map for Locations	6.4	Truck	19.2	$ 70.00	$ 1,344
	6.4		19.2	Subtotal	$ 1,344
	(based on average of 3 ac./mile)				
Personnel, Vehicle, Reporting, & Contract Administration Costs					
			Daily Rate	Days	Cost
GS-9 Range Weeds Specialist/COR			$ 331.00	5	$ 1,655
Vehicle Use - FOR			$ 15.00	4	$ 60
Vehicle Mileage (140 mi/day x 6 days)			$ 0.50	840	$ 420
Misc. Supplies: Safety equipment, flagging, signs			$ 500.00	1	$ 500
				Subtotal	$ 2,635
				Total	**$ 3,979**

Channel Treatments:

None recommended.

Roads and Trail Treatments:

Road Stabilization – (Tower Fire)

Accepted BAER road treatments along these road segments include:
- Install culvert inlet modifications (vertical risers pipes and metal end sections).
- Restore drainage function to culvert inlet and outlets, and along roadway ditch lines.
- Install critical dips on roadway down grade of culvert crossings.
- Install drainage armor (rock) on fill slopes at critical dip locations, and spillways.
- Install metal over side drains with flume.
- Storm inspection and response.
- Remove culvert until high flows have passed.

The objective of road stabilization treatments is to lower the risk of damage to property (FS system roads) by lowering erosion of the road surface in severely burned and steep areas within the burned area and to provide for public safety. 19 miles on the Colville NF and 3 critical locations on the Idaho Panhandle NFs located in or directly below moderate to high soil burn severity. Roads will receive the road work as described in the treatment types. (See Roads and Trails Treatment map for specific locations.)

This treatment is designed to protect road infrastructure by minimizing erosion of the road surface, provide water control, and reducing excessive flooding and sediment delivery into the watersheds. No road stabilization work should be conducted along portions of each road located in low to unburned soil burn severity unless the road segment(s) will be significantly influenced by high to moderate soil burn severity above it. Before work is done on the road system, a forest archeologist shall be consulted.

Vertical riser placed on culverts and armoring of culvert inlets is to increase the culvert's water carrying

capacity, and reduce the chance for culvert failure. This treatment will be used in select locations. The road will be maintained at select locations, to connect ditch lines, clean culverts, and restore the function of water control features on the road. This will reduce surface and fill slope erosion potential. Critical dips will be placed at select locations. The purpose of a critical dip is to protect the road surface should a culvert immediately upslope from the rolling dip become nonfunctioning. Critical dips will be designed to be drivable.

Culverts will be removed in 3 different locations. The culvert on road 1920000 in the Mill Creek drainage will be removed before the storm events during the fall of 2015 and the spring of 2016. Two culverts on road 659A will be removed also. The culverts are both located in drainages that have extensive high and moderate burn severity in the tributary areas to those drainage crossings. This will eliminate the chance for culvert and road failure at that drainage crossing, and also decrease the chance for sediment introduction to the stream. See the hydrology report. A hydrologist or fish biologist shall be present while these culverts are being removed to make sure hydraulic conductivity is maintained, and to make sure the newly constructed channel is suitable for T&E fish passage.

Tower Fire – CNF:

Property: Road Stabilization-Cost Estimate					
Colville NF					
Road Number	Line Item	Unit	Unit Cost	Quantity	Total Item Cost
1200000					
	Culvert Cleaning	EA	$ 137.50	1	$ 137.50
	Armored Rolling Drain Dip (Critical and Normal)	EA	$ 2,062.50	3	$ 6,187.50
	Riprap Armoring	EA	$ 550.00	5	$ 2,750.00
	Culvert Cleaning	EA	$ 137.50	3	$ 412.50
	Slope Erosion Control at Culvert Inlet	EA	$ 550.00	1	$ 550.00
1920000					
	Culvert Removal	EA	$ 5,912.50	1	$ 5,912.50
1920050					
	Rolling Drain Dip	EA	$ 1,031.25	4	$ 4,125.00
1920306					
	Armored Rolling Drain Dip (Critical and Normal)	EA	$ 2,062.50	3	$ 6,187.50
	Riprap Armoring	EA	$ 550.00	3	$ 1,650.00
	Rolling Drain Dip With Overside Drain	EA	$ 2,750.00	4	$ 11,000.00
	Culvert Cleaning	EA	$ 137.50	2	$ 275.00
	Slope Erosion Control at Culvert Inlet	EA	$ 550.00	4	$ 2,200.00
5080000					
	Culvert Cleaning	EA	$ 137.50	6	$ 825.00
	Rolling Drain Dip With Overside Drain	EA	$ 2,750.00	6	$ 16,500.00
	Culvert Riser	EA	$ 1,375.00	1	$ 1,375.00
5080306					
	Rolling Drain Dip	EA	$ 1,031.25	3	$ 3,093.75
All Roads	2 Hydrologist (For Culvert Removals)	Day	$ 350.00	10	$ 3,500.00
All Roads	2 Archeologist (For Road Work Consultation)	Day	$ 350.00	4	$ 1,400.00
All Roads	Engineer (Design and Contract	Day	$ 350.00	30	$ 10,500.00

	Administration)				
All Roads	Per Diem	Day	$ 150.00	30	$ 4,500.00
All Roads	Rental Vehicle	Day	$ 70.00	30	$ 2,100.00
All Roads	Vehicle	Mile	$ 0.55	1000	$ 550.00
				CNF Subtotal	$ 85,731.25

Tower Fire – IPNF:

Property: Road Stabilization-Cost Estimate					
Idaho Panhandle NF					
Road Number	Line Item	Unit	Unit Cost	Quantity	Total Item Cost
659					
	Armored Rolling Drain Dip (Critical and Normal), Aggregate Surfacing	EA	$ 3,025.00	1	$ 3,025.00
659A					
	Culvert Removal	EA	$ 4,000.00	1	$ 4,000.00
659B					
	Armored Rolling Drain Dip (Critical and Normal), Aggregate Surfacing	EA	$ 3,025.00	1	$ 3,025.00
All Roads	2 Hydrologist (For Culvert Removals)	Day	$ 350.00	1	$ 350.00
All Roads	2 Archeologist (For Road Work Consultation)	Day	$ 350.00	1	$ 350.00
All Roads	Engineer (Design and Contract Administration)	Day	$ 350.00	5	$ 1,750.00
All Roads	Per Diem	Day	$ 150.00	5	$ 750.00
All Roads	Rental Vehicle	Day	$ 70.00	5	$ 350.00
All Roads	Vehicle	Mile	$ 0.55	400	$ 220.00
				IPNF Subtotal	$ 13,820.00

Trails Stabilization – (Tower Fire and Grease Creek Fires)

Many of the trails in the burned area are at high risk due to the burning of stabilizing brush, roots and logs. Current trail drainage features are not adequate to address the anticipated increased runoff. Treatments include the installation of rolling grade dips, non-structure water bars, berm removal, bank stabilization and non-structure stream crossing. Treatments are needed to provide sustainability of the trails and to prevent off-site impacts, should the trails erode or fail for the 5.5 miles on the Tower and 1.43 miles on the Grease Creek.

A rapid assessment was completed that did not provide a complete on-the ground condition assessment on every trail. The cost estimates are largely based on critical information gathered on trail conditions and potential hazardous as they relate to the varying burn severities found within the Kaniksu Complex Fire. Trail features will be constructed to standard as defined by USFS Trails Handbook 2309.18. Installation should be designed to last no more than 3 years. Permanent structures are not part of this treatment. If safety risks (e.g. hazard trees) cannot be mitigated for work crews, work will be delayed until threat is reduced or stabilized. Install drainage feature depending on steepness of trail in areas of

moderate or high severity or those areas directly below moderate or high soil burn severity. Focus on sections of trail that have continuous gradient for a length of greater than 50 feet and are either insloped (cupped) or show evidence of routing water (rills, gullies). Hazards within or along the trail route that restrict efficient and safe access to work sites will be mitigated (rocks, trees). Clean existing drainage features to ensure proper function and protect existing investments to infrastructure.

This treatment is designed to stabilize trails for anticipated increases in runoff. The stabilization methods may vary by site but are designed to reduce trail erosion or damage. The BAER Team considers this treatment to be the minimum necessary to achieve a reduction in risk to the accumulated critical values: trail infrastructure, soil productivity, hydrologic function, and public and administrative use. The sections of trail improved during this treatment will be inspected after implementation, during storm patrols and in 2015 to ensure that drainage features are functioning.

Tower Fire – IPNF

Cost Estimate for Trail Stabilization for Tower Fire (IPNF)				
Item	unit cost	unit	total units	Total item cost
Recreation Specialist	$350.00	Recreation Personnel GS-11	6	$2,100.00
Conservation Corp	$5,000.00	week	2	$10,000.00
Misc. Motorized Equipment	$50.00	Hours	16	$800.00
Vehicle mileage	$0.55	/mile	1000	$550.00
			Total Cost of Treatment	**$13,450.00**

Grease Creek Fire

Cost Estimate for Trail Stabilization for Grease Fire (CNF)				
Item	unit cost	unit	total units	Total item cost
Recreation Specialist	$350.00	Recreation Personnel GS-11	3	$1,050.00
Conservation Corp	$5,000.00	week	1	$5,000.00
Misc. Motorized Equipment	$50.00	Hours	8	$400.00
Vehicle mileage	$0.55	/mile	500	$275.00
			Total Cost of Treatment	**$6,725.00**

Protection/Safety Treatments:

Administrative Closure (Tower and Grease Creek Fires)

Roads:

Closure gates will be constructed at 7 locations around the fire perimeter. See Roads and Trails Treatment map showing the proposed locations of the gates. These gates will be placed to control access to the fire area. A recreational specialist shall be present during implementation to finalize the location of the closures points.

This treatment will design and install burned area warning signs to caution forest visitors recreating within the burned area. The closure signs will be placed at the gate locations. It is consistent with the language provided in the BAER Treatments Catalog. The treatment is a component of the overall travel control devices for the burned area (USDA Forest Service-EM7100-15, 2005). The warning signs will identify the types of hazards to watch for roads.

This treatment must be combined with the closure order to ensure that it is posted consistent with both the identified hazards as well as the language of the order. 7 gates have been identified as necessary to enforce a closure order. The gate and sign will be integral to the enforcement of a legal order identified in the Temporary Road Closure Treatment and citing the appropriate CFR. Purchase and install signs and gates at each of the identified locations consistent with Forest Engineering Standards at these locations. A Forest Service employee will inspect the signs and gates for visibility, damage, or loss and replace as needed. A Forest Service employee shall also monitor the closure to make sure it is effective, and see if any deficiencies in the closure need to be corrected.

This treatment will keep Forest users out of the burn area during major storm events and inform users of the dangers associated with entering/driving within a burned area.

Tower Fire – CNF:

Colville NF					
All Roads	Closure Gate	EA	$ 3,500.00	4	$ 14,000.00
All Roads	Closure Signs	EA	$ 550.00	4	$ 2,200.00
All Roads	2 Recreational Specialist (Administrating the Closure and Sign Installation)	Day	$ 700.00	10	$ 7,000.00
All Roads	Vehicle	Mile	$ 0.55	1000	$ 550.00
				CNF Subtotal	$ 23,750.00

Tower Fire – IPNF:

Idaho Panhandle NF					
All Roads	Closure Gate	EA	$ 3,500.00	3	$ 10,500.00
All Roads	Closure Signs	EA	$ 550.00	3	$ 1,650.00
All Roads	2 Recreational Specialist (Administrating the Closure and Sign Installation)	Day	$ 700.00	10	$ 7,000.00
All Roads	Vehicle	Mile	$ 0.55	1000	$ 350.00
				IPNF Subtotal	$ 19,500.00

Grease Creek Fire:

Colville NF					
Road Number	Line Item	Unit	Unit Cost	Quantity	Total Item Cost
1935000 and 22					
	Harvey Creek Road-Fire Closure Area Warning Sign	EA	$ 200.00	2	$ 400.00
All Roads	2 Recreational Specialist (Administrating the Closure and Sign Installation)	Day	$ 700.00	2	$ 1,400.00
All Roads	Vehicle	Mile	$ 0.55	500	$ 275.00
				CNF Subtotal	$ 2,075.00

Trails:

This treatment is to design and install burned area warning signs to caution public and administrative

users about the potential hazards that exist within the burned area. Consistent with the language provided in the BAER Treatments Catalog (USDA Forest Service-EM7100-15, 2005), the treatment is a component of the overall traffic control devices for the burned area. The warning signs will identify the types of hazards to watch for at the recreation site or trail. This treatment will place hazard warning signs and information signs at 1 developed campgrounds, key entry points or trail junctions, and numerous recreation trailheads.

The Forest's travel management strategy identifies the type of signing necessary. Use may be discouraged at certain times of the year when the risk is higher or damage to facilities may result from use. This treatment must be combined with the closure order to ensure that it is posted consistent with both the identified hazards as well as the language of the order. The signs will be integral to the enforcement of a legal order identified in the Temporary Trail Closure Treatment and citing the appropriate CFR. Purchase and install signs at each of the identified locations consistent with Forest Recreation Standards and the Trail Management Handbook at these locations.

Inform users of the dangers associated with entering/recreating within a burned area as well as inform them of closures to help ensure that users are able to access available routes in a safe manner.

Tower Fire – CNF:

Cost Estimate for Trailhead Work and Signage for Tower Fire (CNF)				
Item	unit cost	unit	total units	total item cost
Trail Closure Signage	$45.00	per sign	5	$225.00
Avalanche Info Sign	$45.00	per sign	5	$225.00
Sign Installation	$150.00	Per Person (GS-5)	4	$600.00
Vehicle mileage	$0.55	mile	200	$110.00
			Total Cost of Treatment	**$1,160.00**

Tower Fire – IPNF:

Cost Estimate for Trailhead Work and Signage for Tower Fire (IPNF)				
Item	unit cost	unit	total units	total item cost
Trail Closure Signage	$45.00	per sign	20	$900.00
Burned Area - Hazard Tree Sign	$45.00	per sign	20	$900.00
Avalanche Info Sign	$45.00	per sign	20	$900.00
Sign Installation	$150.00	Per Person (GS-5)	8	$1,200.00
Vehicle mileage	$0.55	/mile	200	$110.00
			Total Cost of Treatment	**$4,010.00**

Grease Creek Fire:

Cost Estimate for Trailhead Work and Signage for Grease Fire (CNF)				
Item	unit cost	unit	total units	Total item cost
Trail Closure Signage	$45.00	per sign	5	$225.00
Burned Area - Hazard Tree Sign	$45.00	per sign	5	$225.00
Avalanche Info Sign	$45.00	per sign	5	$225.00
Sign Installation	$150.00	Per Person (GS-5)	4	$600.00

Vehicle mileage	$0.55	/mile	200	$110.00
			Total Cost of Treatment	**$1,385.00**

Imminent Hazard Tree Removal on Level 3-5 Roads, Trails, and Trailheads (Tower and Grease Creek Fires)

Imminent Hazard trees will be mitigated in order to protect human life during implementation and prevent damage to infrastructure. The BAER Assessment Team considered this treatment to be the minimum necessary to achieve a reduction in risk to the human lives and safety of Forest visitors and Forest Service employees. Hazard tress will be removed by a sawyer team on routes before Forest employees and contractors work on the route or in the area. Also, hazard trees around property shall be identified by a Forest Service employee, and those hazard trees shall be removed. The property for roads consists of closure gates that currently exist in the burned area. The property of trails consists of trailheads that currently exist in the burned area. This type of hazard removal is not directed at "public" safety. Additionally hazard trees removal along the entire route (road or trail) will not occur. This treatment will occur in focused areas where crews (FS or contractor) are doing work, such as at the location where a low-water crossing or drainage dip are being constructed.

Tower Fire – CNF: (Roads)

Colville NF					
Road Number	Line Item	Unit	Unit Cost	Quantity	Total Item Cost
L3-5 Roads	Imminent Hazard Tree Removal on Level 3-5 Roads (4 Forest Service C Fallers)	Day	$ 2,000.00	5	$ 10,000.00
L3-5 Roads	Vehicle	mile	$ 0.55	1000	$ 550.00
				CNF Subtotal	$ 10,550.00

Tower Fire – IPNF: (Roads)

Idaho Panhandle NF					
Road Number	Line Item	Unit	Unit Cost	Quantity	Total Item Cost
L3-5 Roads	Imminent Hazard Tree Removal on Level 3-5 Roads (4 Forest Service C Fallers)	Day	$ 2,000.00	2.5	$ 5,000.00
L3-5 Roads	Vehicle	mile	$ 0.55	1000	$ 550.00
				IPNF Subtotal	$ 5,550.00

Trails:

Tower Fire – IPNF (Trails and Trailheads)

Cost Estimate for Imminent Trail Hazards and TH Hazard Tree Tower Fire				
Item	unit cost	unit	total units	Total item cost
2 Sawyers	$150.00	GS-5 Trails Crew per Day	20	$3,000.00
Vehicle mileage	$0.55	/mile	200	$110.00

Total Cost of Treatment	**$3,110.00**

Grease Creek (Trails)

Cost Estimate for Imminent Trail Hazards and TH Hazard Tree Grease Creek Fire (CNF)				
Item	unit cost	unit	total units	Total item cost
2 Sawyers	$150.00	GS-5 Trails Crew per Day	10	$1,500.00
Vehicle mileage	$0.55	/mile	200	$110.00
		Total Cost of Treatment		**$1,610.00**

Storm Inspection and Response for Roads (Tower Fire)

Immediately upon receiving heavy rain and spring snowmelt the FS will send out patrols to identify road hazardous conditions. Observations of rocks and sediment plugged culverts or risers are identified and corrected before they worsen or jeopardize motor vehicle users and/or road tread. The road patrol personnel bring heavy equipment necessary to mechanically remove any obstructions from the roads and culvert inlets and catch basins where necessary. All excess material and debris removed from the drainage system shall adhere to the sidecasting as reviewed by the archeologist and hydrologist.

Roads within the Tower Fire contain drainage structures that cross streams located in watersheds having areas of high to moderate soil burn severity. These flood source areas have a greater 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 unacceptable erosion and debris torrents further down the drainage from the failure of the fill slope of the road. 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. With the loss of stabilizing vegetation, normal storm frequencies and magnitudes can more easily initiate rill and gully erosion on the slopes and it is likely this runoff will cover the roads or cause washouts. These events make for hazardous access along steep slopes and put the safety of users at risk.

Engineering, Recreation, and District personnel will survey the roads within the fire perimeter after high-intensity winter storms in 2015 before they are snowed out of the area and spring 2016 runoff. Survey will inspect road, surface condition, ditch erosion, and culverts/inlet basins for capacity to accommodate runoff flows. The purpose of the monitoring is to evaluate the condition of roads, and bridges for motorized and foot traffic access and to identify and implement additional work needed to maintain and/or repair damage to flow conveyance structures (culverts, bridges) across roads in order to provide safe access across FS lands. BAER funding will not beused for permanent repair of fire or storm-caused damage to the road, but minor or short-term repairs needed to provide for equipment access to the treatment area may occur.

Tower Fire – CNF: (Roads)

Colville NF					
Road Number	Line Item	Unit	Unit Cost	Quantity	Total Item Cost
All Roads	Storm Patrol	Day	$ 3,000.00	2	$ 6,000.00
All Roads	2 Forest Service Employee (Storm Patrol Surveys)	Day	$ 350.00	10	$ 3,500.00
All Roads	Vehicle	Mile	$ 0.55	500	$ 275.00

	CNF Subtotal	$ 9,775.00

Tower Fire – IPNF: (Roads)

Idaho Panhandle NF					
Road Number	Line Item	Unit	Unit Cost	Quantity	Total Item Cost
All Roads	Storm Patrol	Day	$ 3,000.00	5	$ 15,000.00
All Roads	2 Forest Service Employee (Storm Patrol Surveys)	Day	$ 350.00	10	$ 3,500.00
All Roads	Vehicle	mile	$ 0.55	500	$ 275.00
				IPNF Subtotal	$ 18,775.00

Hazardous Materials and Water Quality (Tower Fire)

This treatment is designed to remove the Icy Springs Trail foot bridge from the creek to reduce the potential for hazardous material to be introduced into the water. The fire burned the Icy Springs Trail foot bridge. The burnt infrastructure (treated lumber) has now fallen into and remains in the channel. This system is an intermittent system that flows for a period of the year. Removal and proper dispose of the burned bridge material from creek will be necessary to keep hazardous material from entering into the water. Using a Force Account Trail Crew the burnt material will be extracted from the channel, hauled out, loaded onto a truck, and hauled to disposal site.

Tower Fire - IPNF:

Cost Estimate for Burnt Bridge Removal - Tower Fire (IPNF)				
Item	unit cost	unit	total units	Total item cost
Recreation Specialist	$150.00	Recreation Personnel GS-9	2	$300.00
Recreation Specialist	$350.00	Recreation Personnel GS-11	2	$700.00
Vehicle mileage	$0.35	/mile	400	$140.00
			Total Cost of Treatment	$1,140.00

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.)

Forest personnel will conduct implementation monitoring of the BAER treatments to check that treatments are present and functioning properly.

This report is an initial funding request based on a rapid assessment. If additional treatment needs are identified through more site specific on the ground investigation in cooperation with interested agencies, or through further field analysis location or noxious weed detection surveys, interim requests for additional funding will be filed. These funding requests will identify the purpose for each treatment, and specific treatment specifications, locations, and number of each treatment. A detailed implementation and treatment effectiveness monitoring plan will be submitted as a separate document to the Regional BAER coordinator.

Part VI – Emergency Stabilization Treatments and Source of Funds
Colville National Forest, Region 6

Interim #:_____

			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										
Cultural - (T)	Each	$ 10,926	1	$10,926	$0		$0		$0	$10,926
Roadside Invasive - (T)	Acres	$ 38	168.39	$6,365	$0		$0		$0	$6,365
				$0	$0		$0		$0	$0
				$0	$0					
Subtotal Land Treatments				$17,291	$0		$0		$0	$17,291
B. Channel Treatments										
None	-----			$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
Road Stabilization - (T)	Miles	$ 4,512	19	$85,731	$0		$0		$0	$85,731
Trail Stabilization - (G)	Miles	$4,513	1.49	$6,725	$0		$0		$0	$6,725
				$6,725	$0					
Subtotal Road & Trails				$92,456	$0		$0		$0	$92,456
D. Protection/Safety										
Road Gates/Signs - (T)	Each	$5,938	4	$23,750	$0		$0		$0	$23,750
Road Warning Signs - (G)	Each	$1,038	2	$2,075	$0		$0		$0	$2,075
Trail Warning&Closure Signs - (T)	Each	$58	20	$1,160	$0		$0		$0	$1,160
Trail Warning&Closure Signs - (G)	Each	$46	30	$1,385	$0		$0		$0	$1,385
Roads Haz. Trees - (T)	Lump	10550	1	$10,550	$0		$0		$0	$10,550
Trail/TH Haz. Trees - (G)	Lump	1610	1	$1,610	$0		$0		$0	$1,610
Roads Storm Patrol - (T)	Lump	9775	1	$9,775	$0		$0		$0	$9,775
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Subtotal Structures				$50,305	$0		$0		$0	$50,305
E. BAER Evaluation										
Assessment Team	Lump			$47,442			$0		$0	$0
Subtotal Evaluation				---	$0		$0		$0	$0
F. Monitoring										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$160,052	$0		**$0**		**$0**	**$160,052**
Previously approved										
Total for this request				**$160,052**						

T – Tower Fire and G – Grease Creek Fire

PART VII - APPROVALS

1. _____ _____
   Forest Supervisor (signature) Date

2. _____ _____
   Regional Forester (signature) Date

Part VI – Emergency Stabilization Treatments and Source of Funds
Idaho Panhandle National Forests, Region 1

Interim #:_____

			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										
Cultural	Each	6986	1	$6,986	$0		$0		$0	$6,986
Roadside Invasive	Acres	207.24	19.2	$3,979	$0		$0		$0	$3,979
				$0	$0					
Subtotal Land Treatments				$10,965	$0		$0		$0	$10,965
B. Channel Treatments										
None				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
Road Stabilization	Sites	4606.7	3	$13,820	$0		$0		$0	$13,820
Trail Stabilization	Miles	$2,445	5.5	$13,450	$0		$0		$0	$13,450
				$0	$0					
Subtotal Road & Trails				$27,270	$0		$0		$0	$27,270
D. Protection/Safety										
Road Gates/Signs	Each	$6,500	3	$19,500	$0		$0		$0	$19,500
Trail Warning&Closure Signs	Each	$66.83	60	$4,010	$0		$0		$0	$4,010
Roads Haz. Trees	Lump	5550	1	$5,550	$0		$0		$0	$5,550
Trail/TH Haz. Trees	Lump	3110	1	$3,110	$0		$0		$0	$3,110
Roads Storm Patrol	Lump	18775	1	$18,775	$0		$0		$0	$18,775
Burnt Bridge Removal	Lump	1140	1	$1,140	$0		$0		$0	$1,140
					$0		$0		$0	$0
					$0		$0		$0	$0
Subtotal Structures				$52,085	$0		$0		$0	$52,085
E. BAER Evaluation										
Assessment Team	Lump			$47,442			$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$0		$0		$0	$0
F. Monitoring										
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$90,320	$0		**$0**		**$0**	**$90,320**
Previously approved										
Total for this request				**$90,320**						

- All Requests are located in the Tower Fire

PART VII - APPROVALS

1. _____ _____
   Forest Supervisor (signature) Date

2. _____ _____
   Regional Forester (signature) Date