Kaniksu Complex Fire BAER Report

Resource Specialty: Engineering
Fire Name: Tower Fire, Baldy Fire, and Grease Fire
Month and Year: October 2015
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I. Potential Values at Risk (identified prior to the on-the-ground survey)

A. Critical Values

Risk to Life and Safety of Road Users on routes within the perimeter of the fire.

Property damage to Forest Service Road Values loss of access to private land owners, Forest Service Admin personnel, Recreation Opportunities, and other Road users.

B. Resource Condition Assessment

(a) Resource Setting

Appendix A shows an overview of the burn severity with the roads for the Tower Fire. The Baldy Fire is in an Inventoried Roadless Area, and no roads are within the fire perimeter. Appendix B shows an overview of the burn severity with road locations for the Grease Creek Fire.

For the Tower Fire, the National Forest Service System Roads (NFSR) within the burn perimeter are listed in INFRA as Maintenance Level (ML) 1, 2, 3, and 4, single lane with native and aggregate surfacing. ML 1 roads are closed. ML 2 roads are maintained for high clearance vehicles. ML 3 roads are maintained for passenger cars. ML 4 roads are maintained to provide moderate degree of user comfort and convenience at moderate travel speeds for passenger cars. Road designs are both in-slope and out-slope with road way ditch lines, rolling dips with associated lead off ditches. Most road segments are constructed with culvert cross drains and culverts at perineal drainages varying in size from 12” to 48” in diameter.

For the Tower Fire there are approximately 159 miles of road within the burn perimeter. Of this mileage, 48.4 miles of NFSR were accessible and surveyed for purposes of this report. Of those 159 miles of road, 32.2 miles of roads are proposed for BAER road treatments.

Trails, both motorized and un-motorized, are covered under the recreation report.

The following tables show road mileages, and the roads proposed for stabilization, under the Tower Fire BAER assessment.

Table 1 Transportation System inside the Tower Fire Burned Perimeter

Maintenance Level	Definition	Miles
Colville NF		
1	Basic Custodial Care (Closed)	28.7
2	High Clearance Vehicles	45.9
3	Suitable for Passenger Cars	5.4
4	Moderate Degree of User Comfort	0
5	High Degree of User Comfort	0
	SUBTOTAL	**80**
Idaho Pandhandle NF		
1	Basic Custodial Care (Closed)	23.8
2	High Clearance Vehicles	36.3
3	Suitable for Passenger Cars	6.7
4	Moderate Degree of User Comfort	12.1
5	High Degree of User Comfort	0
	SUBTOTAL	**78.9**
	TOTAL	**158.9**

Table 2-See Appendix C For Roads and Trails inside the Tower Fired Burned Perimeter and Associated Mileage

Table 3 Roads and Trails Surveyed

Road #	Name	Miles
Colville NF		
1200000	MILL CREEK	6.06
1920000	CCA CREEK	5.39
1920306	NORTH BALDY L.O.	7.15
5080000	SHEEPHERDER	10.34
	SUBTOTAL	**28.9**
Idaho Panhandle NF		
305	BOSWELL KINGS LAKE	2.60
312	SQUAW VALLEY MILL CREEK	6.77
659	SOLO CREEK	2.68
1090	SOUTH BALDY CONNECTION	1.64
1137	IPS	5.82
	SUBTOTAL	**19.5**
	TOTAL	**48.4**

Table 4 Roads and Trails for Proposed for Treatment

Road #	Name	Miles Proposed for Treatment
Colville NF		
305	BOSWELL KINGS LAKE	0.85
312	SQUAW VALLEY MILL CREEK	1.12
460	BLUE GROUSE	0.7
659	SOLO CREEK	0.7
1090	SOUTH BALDY CONNECTION	0.8
1137	IPS	2.86
1090A	SOUTH BALDY SPUR	0.22
460D	BLUE GROUSE D	0.24
460B	BLUE GROUSE B	1
460E	BLUE GROUSE E	0.46
659A	SOLO CREEK A	0.87
659B	SOLO CREEK B	3.06
	SUBTOTAL	**12.9**
Idaho Panhandle NF		
1200000	MILL CREEK	2.87
1920000	CCA CREEK	0.43
1920050	CCA SADDLE	0.61
1920306	NORTH BALDY L.O.	4.21
5080000	SHEEPHERDER	7.82
5080306	SOUTH BALDY	3.08
	SUBTOTAL	**19.3**
	TOTAL	**32.2**

The following tables show the road mileages associated with the Grease Fire. No roads on the Grease Fire were surveyed. The roads associated with the Grease Fire are both within the burn perimeter, and in the watershed below the fire, so the roads may be affected by the fire. All of the roads associated with the Grease Fire are closed roads, Maintenance Level 1.

Table 5 Transportation System affected by the Grease Fire

Road #	Maintenance Level	Miles
Colville NF		
526	1	0.80
528	1	0.40
401	1	0.60
512	1	0.60
508	1	1.30
400	1	1.00
405	1	0.60
402	1	0.30
	TOTAL	**5.6**

(b) Findings of the On-The-Ground Survey

The Kaniksu Complex burned approximately 25,933 Acres. The tables below show the acres associated with each fire in the Kaniksu Complex.

Table 5 Tower Fire

Tower Fire:	**Ownership**	**Acres**
	Colville NF	5,473
	Idaho Panhandle NFs	12,128
	State of Washington	2,203
	Private	4,898
	Total	**24,702**

Table 6 Bald Fire

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

Table 8 Grease Creek Fire

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

The acres burned are as follows: Colville NF (5,473), Idaho Panhandle NF (12,128), Other Federal (0), State of Washington (2,203), and Private (4,898).

The complex was lightning-caused on August 11th. The fire was reported on August 12, 2015 and is located, located 12 miles southwest of Priest Lake, Idaho and 17 miles north of Newport, WA.

On the ground vehicle reconnaissance of roads within and adjacent to the fire perimeter were assessed by BEAR Team road engineer to determine if there were any VARs related to Life and safety, property and other resource values, and which roads had the highest potential for water diversion and fire related flood damage.

Following is a brief description resulting from on the ground surveys of the system roads with resource condition resulting from the fire:

a. Road 305: Portions of this road are located below moderate and high burn severity, and there are several 18” culverts that need maintenance, and that have some risk of failing due to increased flows.
b. Road 312: Portions of this road are located below moderate burn severity, and there are several culverts that need maintenance, and that have some risk of failing due to increased flows. This road already

contains some rolling drain dips, but these need armored in anticipation of the higher flows that the road will experience. This route is a major access route on the Northern end of the fire, and also serves as a snowmobile route in the winter.

c. Road 659: Portions of this road are located through drainages that have large areas falling under high and moderate burn severities. There are 18” and 24” culverts that will be affected. This road needs rolling dips installed in anticipation that these culverts become blocked and overtop the structure. This is a main access route for the southern part of the fire area, and is also a maintenance level 4 road. It is also a snowmobile route.

e. Road 659A: This closed road has two drainage crossing. Both of these drainages have much of their tributary area either classified as high or moderate burn severity. These drainage crossing are likely to see failure if not treated.

f. Road 1200000: Portions of this road are located below moderate burn severity. The drainage structures on this road were recently worked on under fire rehabilitation. The road could use some more surface drainage, and the culvert crossing areas need to be stabilized. This road is a main route through the northern area of the fire, as well as a snowmobile route.

g. Road 1920000: This route has a drainage crossing on Mill creek, with a 36” culvert. After consulting with the BAER hydrologist, it was determined that flow out of this drainage may increase dramatically, and this culvert should be removed in anticipation of these flows. This road will be closed after the fire because of the culvert removal, but also because of a fill slope failure farther north along the route.

h. Road 5080000: Portions of this road are located below moderate burn severity. One drainage in particular by Browns lake is severely impacted, as the whole drainage is classified as high burn severity and high slopes. This crossing will be stabilized in anticipation of high runoff potential. Several other crossing along this route will be stabilized as well.

(c) Consequences of the fire on values at risk

Tower Fire

Life and Safety: As a result of the burned watersheds it was determined through the BAER Risk Assessment process that it’s possible that some drainage feature at road crossing along the roads will be inadequate to handle post burn increased water flows and additional movement of sediment down slope and into these drainage features, causing water to divert over and down the roadways. The magnitude of this occurrence has Major Consequences and is considered a high risk to life and safety of residences and other road users accessing National Forest lands. There is the risk of flash flooding, debris flows, and potential for the loss of road function, denial of access and entrapment.

Property: It has been determined through the BAER Risk Assessment process that it is likely that post burn conditions will increase runoff and the movement of sediment into road drainage features, such as culvert inlets, over side drains, roadway dips and runouts along roads 305, 312, 460, 659, 1090, 1137, 1090A, 460D, 460B, 460E, 659A, , 659B, , 1200000, 1920000, 1920042, 1920050, 1920306, 5080000, and 5080306. The magnitude of this occurrence is considered Moderate and puts road drainage features at high risk for blockage and uncontrolled water to divert, resulting in the likelihood of damage to the invested road improvements , and a risk to road users.

Private and State Owned Facilities: Private and state (Washington Department of Natural Resources) owned roads are also located within the fire perimeter and are affected by the fire. These roads pose a life and safety hazard, and also could experience property damage as described above. The closure of the burned area by the Forest Service will limit access to these private and state roads. However, it is the responsibility of the state and the private landowners to manage the roads affected by the fire as they see fit. The state and the private landowners should contact the NRCS for further assistance.

Some roads that are located within the fire perimeter on private/state owned land are under cost share agreements. These roads may require stabilization work. This work should be coordinated appropriately under the cost share agreement.

Baldy Fire

Life and Safety: It was determined through the BAER Risk Assessment process that there are no roads within the vicinity of the fire that will be affected. There are still hazard tree safety issues, but no mitigation is recommended for roads at this point, as no roads are located in the area. Hazard tree mitigation for trails is addressed under the recreation report.

Property: As a result of the burned watersheds it was determined through the BAER Risk Assessment process that there are no roads within the vicinity of the fire that will be affected.

The Baldy Fire will not be discussed further in this report.

Grease Creek Fire

Life and Safety: As a result of the burned watersheds it was determined through the BAER Risk Assessment process that it's possible that some drainage feature at closed roads to experience increased water flows. The magnitude of this occurrence has moderate consequences on life and safety, because of potential hazard trees, floods, and debri flows. However, it was determined that these hazards are unlikely, and therefore the final risk is considered low. All the roads affected by the fire are closed, so Forest users should generally not be utilizing these facilities. However, Forest Users sometimes utilize these closed

routes to access the forest, and therefore may access the fire area over these routes. See the recreation report for hazard mitigations on trails in the area.

Property: It has been determined through the BAER Risk Assessment process that it is possibly for roads property to be damaged because of the fire, but the consequence is minor, as these roads are closed currently. Also, the damage that may happen to the roads is minimal, as the severity of the burn above the roads is generally low in nature.

II. Risk Assessment:

Summary:

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 (Appendix A) 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. 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.

Probability of Damage or Loss	**Magnitude of Consequences**		
	Major	Moderate	Minor
	RISK		
Very Likely	**Very High**	**Very High**	**Low**
Likely	**Very High**	**High**	**Low**
Possible	**High**	**Intermediate**	**Low**
Unlikely	**Intermediate**	**Low**	**Very Low**

C. Emergency Determination –

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 risk is 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 Forest and employees of the Ranger Districts to manage hazard trees near and around their facilities.

d. Very low, low, and 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.

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 to improve road drainage features, install temporary closure, install warning signage, and implement storm patrol monitoring to ensure treatments are functioning as intended.

b. Very low, low, and intermediate 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.

D. Treatments to Mitigate the Emergency

Tower Fire

Life and Safety: Area Road Closure Gates, Road Warning Signs, Hazard Tree Removal

(a) Treatment Type

Area Road Closure Gates, Road Warning Signs, Hazard Tree Removal

(b) Treatment Objective

The area closure and road warning signs will prevent Forest users from accessing the fire area, and also warn Forest users about the hazards in the burned area.

The hazard tree removal will target certain trees along maintenance level 3, 4 and 5 roads that pose a risk to Forest users, Forest Service employees, and contractors working in the area, and remove those hazard trees.

(c) Treatment Description

Closure gates will be constructed at 7 locations around the fire perimeter. See appendix A for a 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.

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.

(d) Treatment Cost

Appendix D of this report includes the detailed cost break down of proposed BAER life and safety road treatments.

(e) Probability of completing treatment in first year prior to damaging storms or events:

The proposed BAER gate and sign installations are suitable for either force account road crews or private contractors. The hazard tree removal is suitable for agency qualified sawyer crews or contracting sawyer crews. The probability of completing treatment is 90% likely.

(f) Probability of treatment success:

The probability of motorist accessing routes or hitting objects not identified within the roadway is about 95%. The loss is difficult to estimate since this is a safety issue. One could conclude damages to a vehicle would occur but there is a greater risk of someone getting injured if their vehicle strikes something. If the treatments are implemented the probability of someone damaging their vehicle is greatly reduced.

The probability of the hazard tree treatment success is unknown since it is a safety issue, but the hazard tree removal is an action that the BAER team feels is necessary since Forest employees and contractors are expected to be working in the burned area.

Life and Safety: Storm Patrol

(a) Treatment Type

Storm Patrol

(b) Treatment Objective

The storm patrols are used to identify road problems such as plugged culverts and washed out roads, and to clear, clean, and/or close roads that are or have received damage for 30 days. Those conducting storm patrols shall have rapid access to a backhoe and dump truck that can be used when a drainage culvert is plugged or soon to be plugged, to repair any road having severe surface erosion, or to clean debris from roadside drainage ditches. Due to the multiple crossing structures in the fire area drainages and the potential for debris to cause damage to those structures, the patrols will also monitor the movement of large woody debris and make a determination of whether or not the material should be removed before it contacts the structures. Patrols are based on the areas expected to have or that did have localized precipitation events. Secondly, patrols should then focus on those roads that receive the most traffic and are of more value to the transportation system.

(c) Treatment Description

Immediately upon receiving heavy rain and spring snowmelt the FS will send out patrols to identify road hazard conditions. Observations of rocks and sediment causing washouts and plugged culverts are identified and corrected before they worsen or jeopardize motor vehicle users. 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 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 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.

(d) Treatment Cost

Appendix D of this report includes the detailed cost break down of proposed BAER road storm patrol treatments.

(e) Probability of completing treatment in first year prior to damaging storms or events:

The proposed BAER road treatments are suitable for either force account road crews or private contractors. The probability of completing treatment is 90% likely.

(f) Probability of treatment success:

This treatment has a high probability of being successful. Further damage to roads can be prevented if the road storm patrol is used quickly after a storm event. For this treatment to be successful, it is imperative that Colville NF and Idaho Panhandle NF employees monitor road conditions within the Tower Fire as described in the treatment description section.

Property: Road Stabilization

(a) Treatment Type

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 and reinstall after high flows

(b) Treatment Objective

The objective of road stabilization treatments is to lower the risk of damage to property (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.

(c) Treatment Description

Roads shown on the map in Appendix A will receive the road work as described in the treatment types.

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. 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. An analysis was performed on the Brown Lake culvert site. It was found the post fire the culvert would fail at a 10 year event. It is believed the culvert will fail in a 5 year event, but that data was not calculated for this particular site. Therefore, the culvert will have an overside drain installed on the road surface to conduct these overtopping flows down the embankment safely. See the hydrologists report for more information on peak flows. The option of removing this culvert was discussed because of the probability of loss, but this road serves as an alternative egress to private and state landowners inside the fire, so removing the culvert and blocking access to those lands was not considered as a feasible option.

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. An analysis was performed on the culvert at Mill Creek. The Mill Creek culvert was found to fail during a 5 year event in the post fire conditions. See the hydrology report for more information on peak flows. 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 stable.

(d) Treatment Cost

Appendix D of this report includes the detailed cost break down of proposed BAER road treatments.

(e) Probability of completing treatment in first year prior to damaging storms or events:

The proposed BAER road treatments are suitable for private contractors. The probability of completing treatment in first year prior to damaging storms or events is considered to be 75% likely. If there is a construction season ending storm event, the road treatments may not be implemented and serious damage to the road system may occur. Expediting the implementation of the road treatments is critical.

(f) Probability of treatment success:

The proposed BAER road treatments will restore drainage features to full capacity, storm inspection and response (storm patrol) will inspect and respond as needed before during and after major storm events to assure invested BAER road treatments continue to function and roads remain accessible and passible. The probability of the proposed road treatments is considered to be at the 80 to 100 percent success rate.

Grease Creek Fire

Life and Safety: Area Closure Warning Signs

(a) Treatment Type

Area Closure Warning Signs

(b) Treatment Objective

The area closure warning signs will prevent Forest users from accessing the fire area, and also warn Forest users about the hazards in the burned area.

(c) Treatment Description

Closure signs will be placed at 2 locations around the fire perimeter. See appendix B for a map showing the proposed locations of the signs. These signs 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. 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.

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 gate and sign will be integral to the enforcement of a legal order identified in the Temporary Area 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.

(d) Treatment Cost

Appendix D of this report includes the detailed cost break down of proposed BAER life and safety road treatments.

(e) Probability of completing treatment in first year prior to damaging storms or events:

The proposed BAER gate and sign installations are suitable for force account installation. The probability of completing treatment is 90% likely.

(f) Probability of treatment success:

The probability of motorist accessing routes or hitting objects not identified within the roadway is about 95%. The loss is difficult to estimate since this is a safety issue. One could conclude damages to a vehicle would occur but there is a greater risk of someone getting injured if their vehicle strikes something. If the treatments are implemented the probability of someone damaging their vehicle is greatly reduced.

The probability of the hazard tree treatment success is unknown since it is a safety issue, but the hazard tree removal is an action that the BAER team feels is necessary since Forest employees and contractors are expected to be working in the burned area.

III. Discussion/Summary/Recommendations

Tower Fire

A. Implement BAER road treatments before the first damaging storm events of the of the season.

B. Colville National Forest and Idaho Panhandle National Forest, coordinate BAER warning signs a, size, wording, and exact locations on the ground. Coordinate the exact location of the closure gates on the ground.

IV. References

A. INFRA Travel Routes Inventory, and Quad Maps.
B. Federal standards for the construction of Roads and Bridges.
C. BAER Catalog (chapter 4)

D. BAER Team meetings and discussions.
E. Rob Lawler, BAER Hydrologist.
F. Mark Casillas, BAER Soil Scientist

V. Appendices

A. Burn Severity Tower Fire Map With Proposed Road Work
B. Burn Severity Grease Creek Fire Map With Roads
C. Tower Fire Road List
D. Road Life and Safety and Road Property Detailed Cost