

# Kaniksu Fire Recreation BAER Report

Resource Specialty: Recreation & Trails

Fire Name: Kaniksu Complex Fire

Month and Year: October, 2015

Author(s) Name and Home Unit Name:

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## I. Potential Values at Risk (identified prior to on-the-ground surveys)

### Critical Values

Potential values at risk identified and addressed in this report include Forest Service recreation facilities and trails. Risks include threat to life and safety of BAER implementation team, USFS district trails & recreation crews, forest service partners including those authorized to operate snowmobile grooming equipment, and the visiting public recreating in the burned areas. Other threats include threats to facility infrastructure, threat of invasive weed spread, and threat to ecosystem recovery due to increased erosion lead to sedimentation in effected watersheds.

### A. Resource Condition Assessment

Recreation facilities impacted in the burned area include the following developed campgrounds and recreation related infrastructure.

#### (a) Resource Setting

Browns Lake Campground (CNF) includes 18 tent/RV sites (maximum length 21 feet), fire grills, picnic tables, and toilet facilities.

Pelke Warming Hut (CNF) is a rugged cabin structure providing and integral part of the Kings Lake Sno-Park groomed snowmobile trail system.

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

Fire activity did not reach the infrastructure on the ground at Browns Lake Campground (CNF). Fire related hazard trees are located at a safe distance from the developed campsites and related infrastructure (toilet, tables, etc....). Warning sign installation should be considered to reduce unnecessary risk to visiting publics recreating in burned area adjacent to the campground.

Pelke Warming Hut (CNF) was similarly unaffected by a wildfire activity in the vicinity of the site. Periodic hazard tree assessment should be completed

throughout the first season to ensure the effectiveness of hazard tree mitigation in the snowmobile staging area adjacent to the warming hut.

(c) Consequences of the fire on values at risk

Developed campgrounds within the affected area have highly developed infrastructure, including vault toilets, signage, barrier posts, interior roads, campfire rings, grills and picnic tables. These sites received no fire damage to infrastructure, and the threat is limited to hazard trees directly adjacent to public common areas. Hazard trees would represent a major threat to both life and property.

Pelke Warming Hut (CNF) is a structure that represents a substantial investment from Washington's snowmobile community.

B. Resource Condition Assessment - Trailheads

(a) Resource Setting

Multiple trailhead and/or staging areas exist within the burned area for both motorized and non-motorized trails. Parking areas vary in size depending on use. In general trailheads used to access motorized trails are large enough to accommodate trailer parking.

Trailhead Name	Trail Number	Burn Severity in the General Vicinity
Mill Point – Galena Point TH (IPNF)	#199	Moderate
Kalispell Rock – North Baldy (IPNF)	#103	Moderate
South Baldy –Solo TH (IPNF)	#104	Moderate
Icy Springs TH (IPNF)	#197	Moderate to High
Grouse Knob TH (IPNF)	#198	Low

**Table 1- Trailhead and Burn Severity**

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

The existing trailheads contained very little infrastructure other than signage. That being said they are well used parking areas and often have vehicles staged at them for extended periods of time. Numerous hazard trees were observed at the trailheads located within burned areas. They would present a threat to life and property of both administrative and public visitors. The fire-weakened trees in the area will need to be reevaluated periodically and felled by qualified sawyers using regional guidelines for hazard tree classification.



**Figure 1 - >6" dbh tree failures at the Icy Springs Trailhead**

(c) Consequences of the fire on values at risk

Trailheads (Day use areas) within the affected area have varying levels of developed infrastructure, typically including signage, vault toilets, picnic tables, campfire rings, grills, and interior roads and trails. All other sites are affected by the presence of hazard trees, which threaten life and property in those areas.

C. Resource Condition Assessment - Dispersed Recreation Use in the Area

(a) Resource Setting

The burned area is a mix of road modified, semi-primitive motorized and semi-primitive non-motorized recreational opportunities (ROS categories).

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

The primary dispersed recreation activities occurring within the burned area include: hunting, dispersed camping, snowmobiling, OHV use, horseback riding, hiking, backcountry skiing, viewing scenery, and wildlife. While the majority of visitors are respectful of Forest policy, several violations of forest area and trail closures were noted while working in the area. An administrative closure and appropriate monitoring of the area will help to reduce hazards in the burned area.

(c) Consequences of the fire on values at risk

Areas of high burn intensity could provide unwanted opportunities for forest visitor's to participate in off trail riding of OHV and snowmobiles. Cross country game retrieval could result in similarly damaging impacts. Increased erosion resulting from both trail and road damage (caused by users violating closure

orders) could result from these activities. Increased avalanche danger could result from the operation of over the snow vehicles in the burned area.

“Forests can affect the likelihood of avalanches starting and can thus protect large areas of human settlement and infrastructure. Forests generally reduce the likelihood of avalanche disturbances in mountain environments, but the degree to which forests serve this function varies with stand structure. Forest conditions that reduce likelihood of avalanche releases include a crown coverage of >30%, the absence of gaps >25 m in length, and an increased terrain roughness associated with lying or standing trees that exceed snow-depth.”

Post wildland fire the forest conditions and terrain roughness have changed to varying degrees. This change impacts snow avalanche disturbance areas. This will likely increase and alter the location of areas where avalanches typically occur. This could put winter recreators at an increased risk in the Tower Fire burn scar until the forest conditions and terrain roughness are restored.

#### D. Resource Condition Assessment - Inventoried Roadless Area Characteristics

##### (a) Resource Setting

Portions of the Grassy Top (CNF) Inventoried Roadless Area (IRA) are located within the burned area of the Grease Fire.

Portions of the Abercrombie – Hooknose (CNF) IRA are located within the burned area of the Baldy Fire.

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

Minimal impacts occurred to the IRA characteristics found within the burn area. Characteristics of concern included soils and rare plants. Please see the soils and hydrology report for additional info on the post fire impacts to the, “Soil, Water and Air” IRA characteristic. Please see the botany report for additional info on the post fire impacts to the, “Diversity of Plant and Animal Communities” IRA characteristic.

##### (c) Consequences of the fire on values at risk

Roadless characteristics used in the analysis of IRAs are from either the 2001 Roadless Rule (36 CFR 294 Subpart B) on the Coleville National Forest or the Idaho Roadless Rule (36 CFR 294 Subpart C).

#### E. Resource Condition Assessment - Developed Non-Motorized Trails

##### (a) Resource Setting

The systems of non-motorized trails within the burn perimeter are typically Trail Class 1 or 3 level developed and improved trails. Class 1 trails were not carried

forward for treatments. Infrastructure associated with these trails includes the trail tread, drainage features, constructed features such as trailheads, trailhead signage and kiosks, and directional signage. The following non-motorized trails exist within the burned area:

Trail Name	Trail Class	Trail Number	Managing Org	Designed Use	Mileage in Burned Area	Approx. % of High to Moderate
MILL POINT - GALENA POINT (IPNF)	TC1	199	010408	HIKER/ PEDESTRIAN	3.34	60%
KALISPELL ROCK - NORTH BALDY (IPNF)	TC3	103	010408	PACK - PACK AND SADDLE	1.85	100%
SOUTH BALDY-SOLO (IPNF)	TC3	104	010408	HIKER/ PEDESTRIAN	2.91	90%
TOTAL MILES					10	6.4

**Table 2 – Non-Motorized Trails Located Within the Burned Area of the Tower Fire**

Trail Name	Trail Class	Trail Number	Managing Org	Designed Use	Mileage in Burned Area	Approx. % of High to Moderate
HALL MTN - GRASSY TOP (CNF)	TC3	533	062105	HIKER/ PEDESTRIAN	1.90	75%
TOTAL MILES					1.9	1.4

**Table 3 – Non-Motorized Trails Located Within the Burned Area of the Grease Fire**

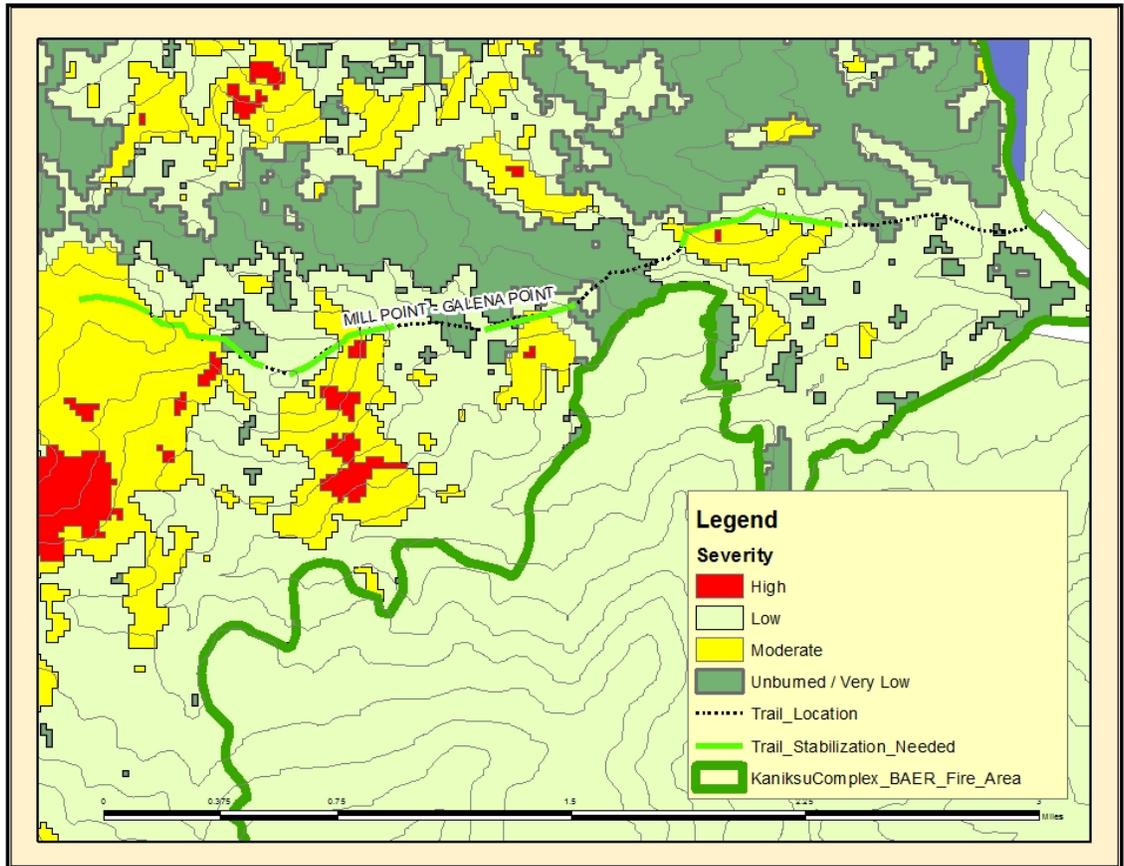
(b) Findings of the On-The-Ground Survey

Surveys indicate a potential for post-fire storm damage to the trail infrastructure on the Mill Point Trail (#199), Kalispell Rock – North Baldy (#103), South Baldy-Solo (#104) and Hall Mtn- Grassy Top (#533). Each of these trails contains segments that lie within and/or below areas that experienced moderate burn severity to varying degrees. Post fire stabilization efforts will vary based on the trail class and percentage of the trail located within areas of high and moderate burn severity.

Watershed response is expected to increase in these areas due to lack of vegetation and impacted soils, resulting in increased run-off of water and sediment during heavy precipitation events. Additionally there is potential for sedimentation, dry ravel, rock-fall, and loss of trail tread in these affected areas. The existence of fire-damaged hazard trees presents a life and safety risk to administrative and public users on all these trails.

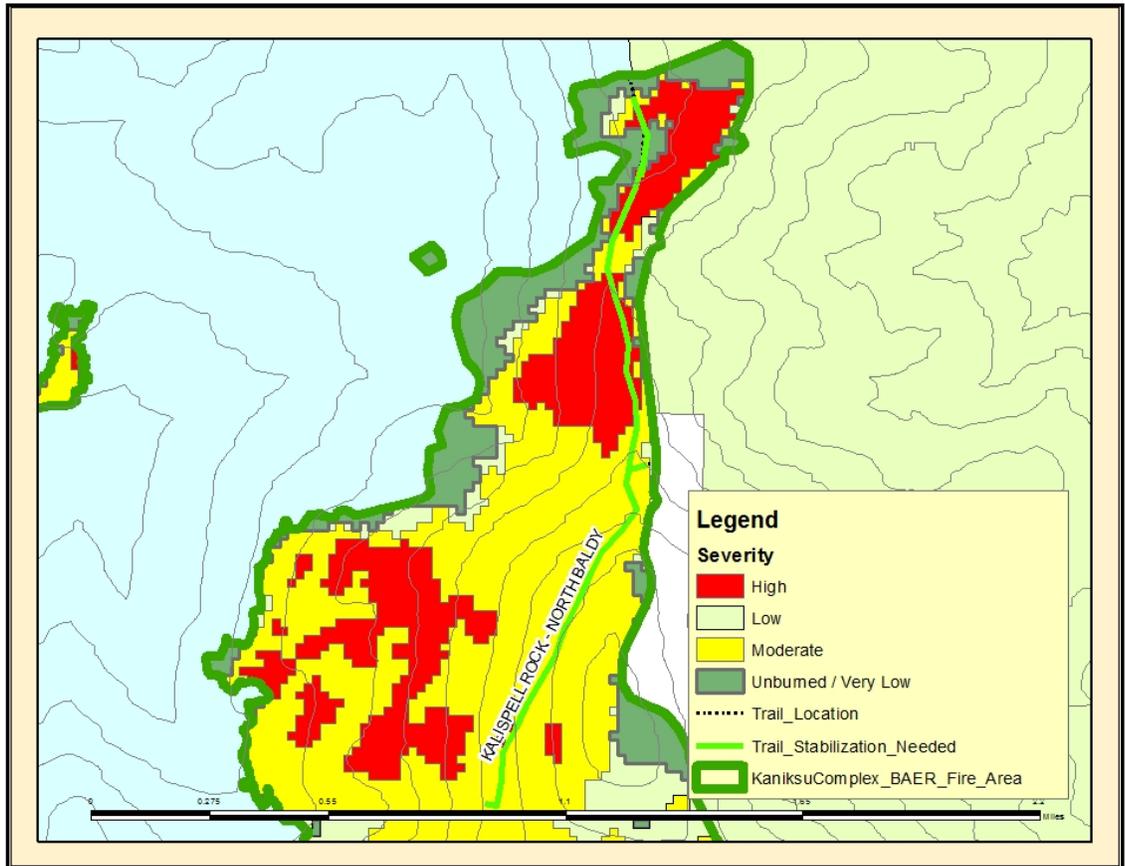
A property risk exists to the infrastructure of these trails. The anticipated increased runoff in the first year following the fire has the potential to cause erosion and associated trail incision along segments of these trails. If this trail incision was to occur, this would represent a loss to the forest investment in the construction and maintenance of the infrastructure of these recreation features.

**Mill Point – Galena Point Trail (#199)** – This trail is located on the IPNF. It is often faint and difficult to follow. High to moderate burn severity occurred on or above approximately 60% of the trail or around 2 miles. Given the low development level and lack of maintenance this trail should be considered low priority for stabilization efforts.



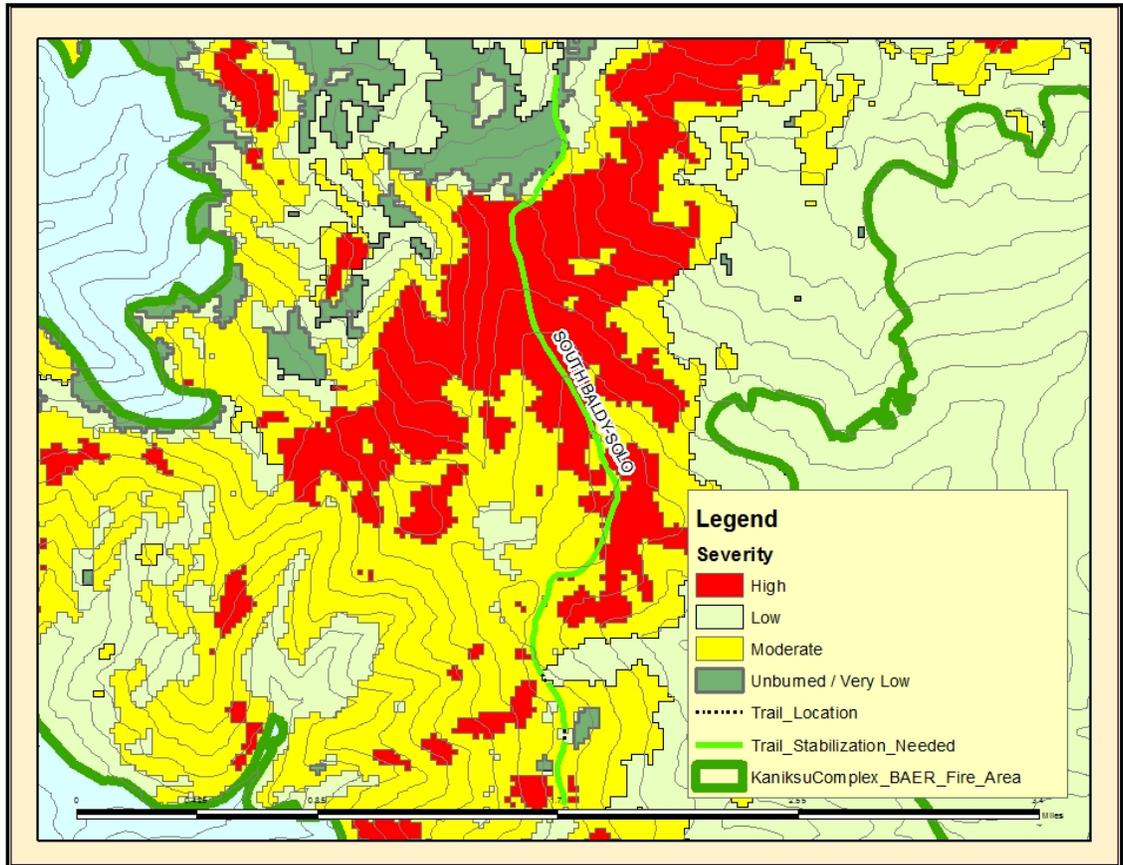
**Map 1 – Mill Point – Galena Trail (IPNF)**

**Kalispell Rock North Baldy (#103)** – This route is partially a road bed that is easily followed. High to moderate burn severity is present on the entire length of this trail. Trail stabilization will be required for the entire length of this trail. Stabilization efforts will include rolling grade dips and earth bound water bars. Hazard trees will need to be mitigated within two tree lengths of feature requiring extended periods of time for the trail crew to complete.



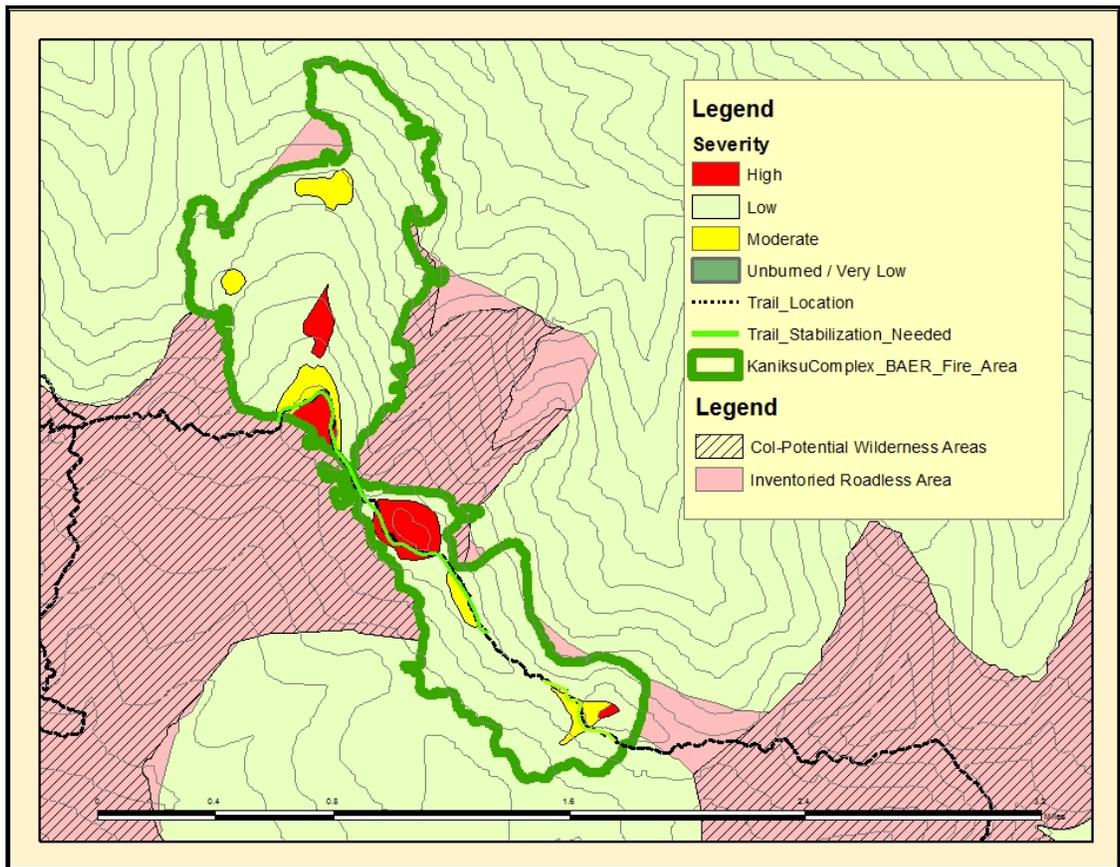
**Map 2 – Kalispell Rock – North Baldy Trail (IPNF)**

**South Baldy – Solo Trail (#104)** – This trail receives moderate level of use. The tread is present and has received frequent levels of maintenance. That being said this trail is listed as a TC-1 trail class and should be managed for minimal development levels. Stabilization efforts are still recommended for a 90% of the length.



**Map 3 – South Baldy – Solo Trails (IPNF)**

**Hall Mtn – Grassy Top Trail** –This trail is on the CNF, it is feeder trail for the National Designated Pacific Northwest Trail (PNT). Approximately 75% of this trail goes through high to moderate burn severity. The recommendation for trail stabilization is constructing rolling grade dips and earthbound water bars to help with watershed and sedimentation. Hazard tree removal is necessary to mitigate risk for crews working on trail stabilization efforts. According the Washington Office BAER Guidance Paper for Roads and Trails (April,2013), “There may be rare situations where the trail is part of a nationally significant network (e.g. Pacific Forest Trail) where closures are outside of FS administrative control. In that case, BAER may be used for limited hazard tree felling for the purpose of risk reduction, not user convenience.”



**Map 4 – Hall Mtn – Grassy Top Trail (CNF)**

(c) Consequences of the fire on values at risk

USFS owned trails are property and are considered critical values under BAER. Trail stabilization is needed to ensure that the risk to this property is minimized. If unacceptable risks are identified measures should be taken to minimize those risks. According the WO BAER Guidance Paper for Roads and Trails (April, 2013), “In the first year after the fire, post-storm inspection and response, combined with maintenance of certain high-value drainage features such as

culverts, drain dips, lead off ditches, water bars, etc., can be done under BAER..." Infrastructure associated with these trails includes the trail tread, drainage features, crib walls, bridges, puncheons, boardwalks, switchbacks and directional signage.

Risks to the health and safety of the personnel completing the trail stabilization work include standing hazardous snags within two tree lengths of the trail structures needing work. While hazard tree removal generally does not occur with BAER funding, certain situations allow for this use. According to the WO BAER Guidance Paper for Hazard Trees (April, 2013), "Mitigation of hazards that pose a significant risk to FS workers is appropriate and should be considered part of the cost of doing the BAER job... The risk reduction should occur in focused areas where crews are doing work, such as at the location where a low-water crossing or drainage dip are being constructed."

F. Resource Condition Assessment Developed Motorized Trails

(a) Resource Setting

The system motorized trails within the burn perimeter are all single track trails that have been designed for motorcycle use. A number of these trails access various points of interest such as scenic overlooks and hunting areas. Infrastructure associated with these trails includes the trail tread, drainage features, constructed features such as bridges, trailhead signage and kiosks, retaining walls, barriers, and directional signage. The following motorized trails exist within the burned area:

Trail Name	Trail Class	Trail Number	Managing Org	Designed Use	Mileage in Burned Area	Approx. % of High to Moderate
ICY SPRINGS (IPNF)	TC3	197	010408	MTRCYCL - MOTORCYCLE	1.53	60%
GROUSE KNOB (IPNF)	TC1	198	010408	MTRCYCL - MOTORCYCLE	2.64	80%
SQUAW VALLEY (IPNF)	TC3	164	010408	MTRCYCL - MOTORCYCLE	0.07	85%
TOTAL MILES					4.24	3.1

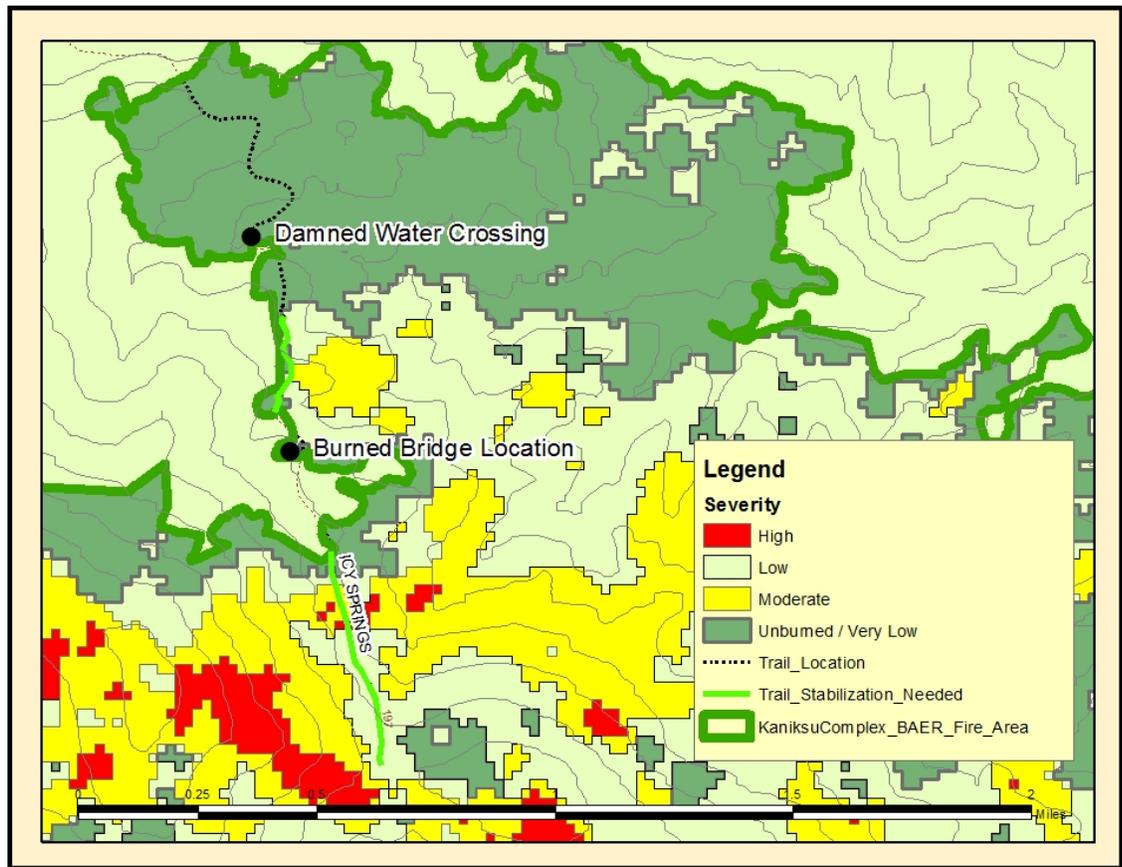
**Table 4 – Motorized Trail Found Within the Burned Area**

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

On the ground surveys were conducted for all of the above mentioned motorized trails. It was determined that all trails contain segments that lie within and/or below areas that experienced moderate to high burn severity. Watershed response is expected to increase within these areas and trail sections may experience increased water run-off and sedimentation during and after model storm events. These trails are anticipated to see higher levels of erosion and tread incision within affected segments. Additionally there is potential for sedimentation, dry ravel and debris-fall in these affected areas.

The increased runoff in the first year following the fire has the potential to cause infrastructure loss due to tread incision, increased runoff and erosion along segments of these trails. This would represent a loss to the forest investment in the construction and maintenance of these off highway vehicle trail features, as well as additional contribution of concentrated water runoff and sedimentation to burned hill slopes.

**Icy Springs Trail (#197)** – Icy Springs trail is located on the IPNF. It is the most used, developed and maintained trail located within the burned area of the Tower Fire. Although the GIS mapping exercise indicates that fire severity on the trail tread itself was for the most part less intense, on the ground surveys indicated that the fire followed the trail corridor and burned existing erosion control features more intensely.



**Map 5 – Icy Springs Trail (IPNF)**



**Figure 2 - Burned Trail Bridge on Icy Springs Trail (IPNF)**



**Figure 3 - Typical Fire Intensity**

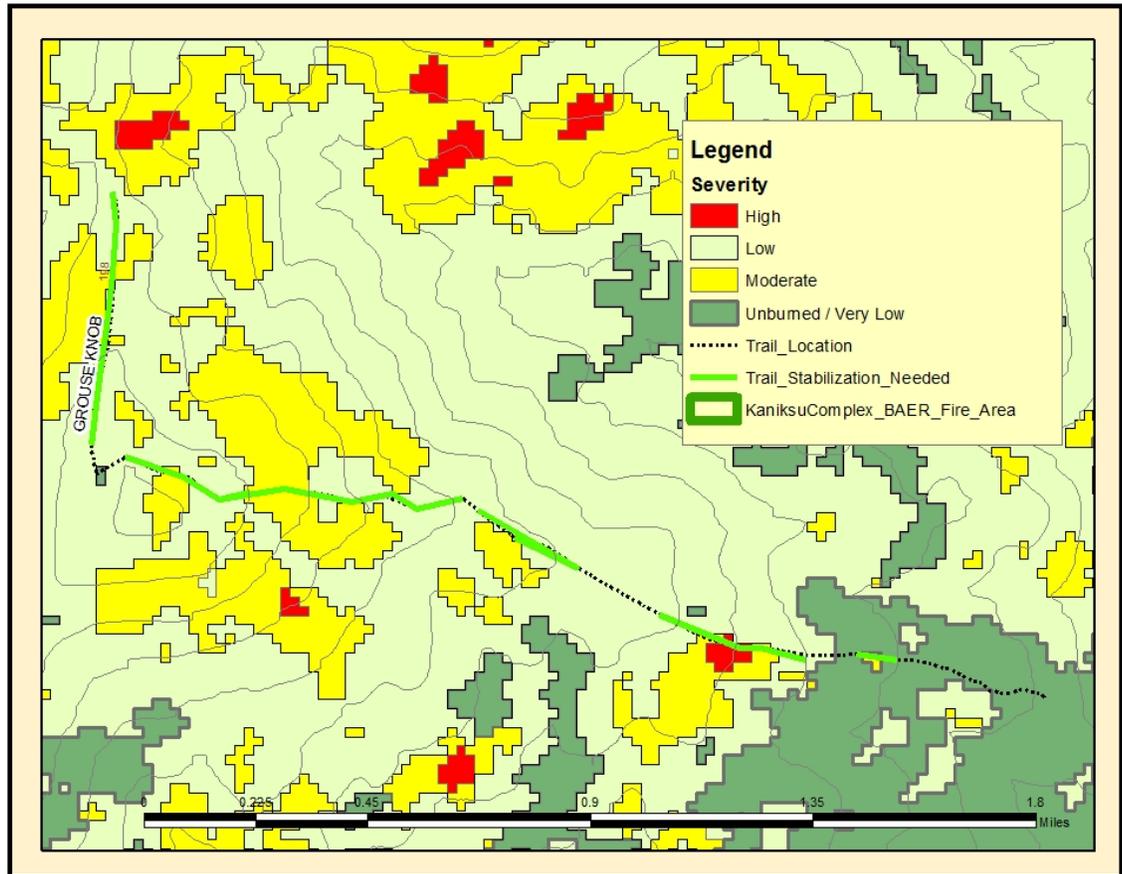


**Figure 4 - Water Crossing Dammed by Failing Fire Weakened Trees**



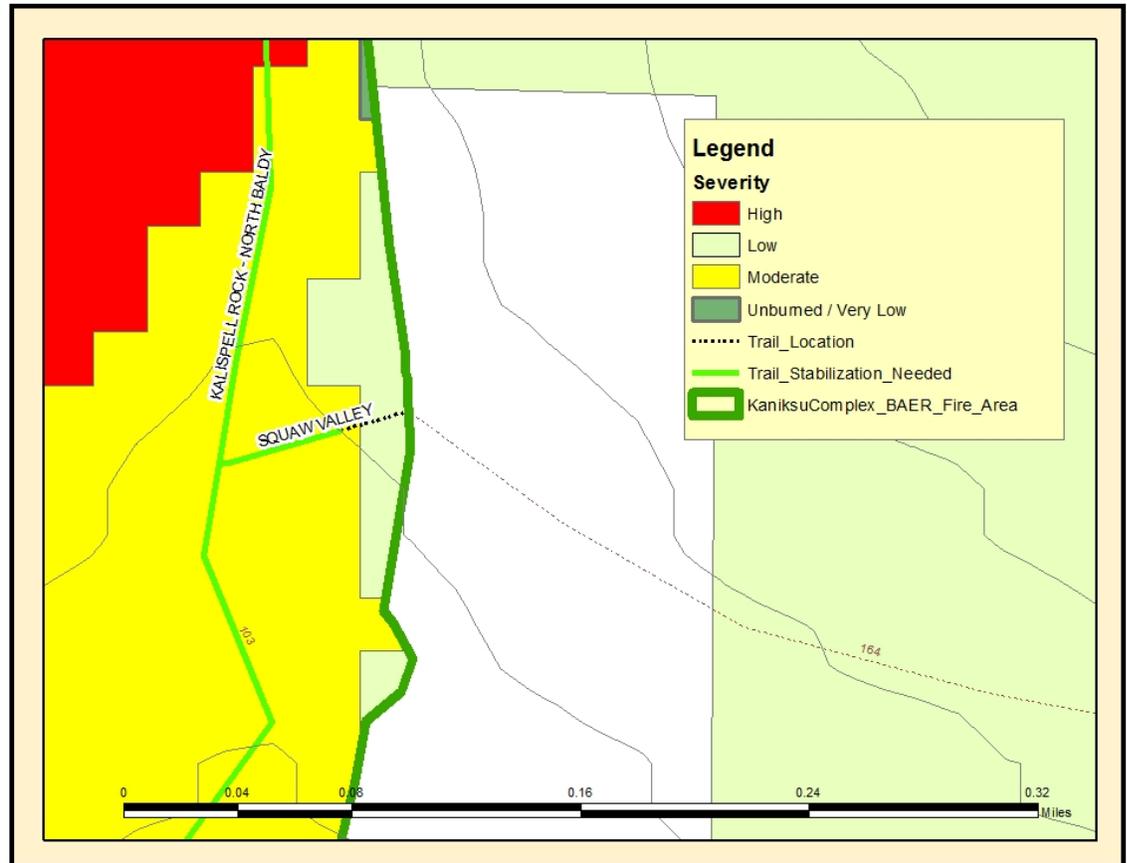
**Figure 5 - Trail Tread in need of Stabilization Work**

**Grouse Knob Trail #198** – Grouse Knob is TC1 motorcycle trail located on the IPNF. This trail receives very little use and has not been maintained in at least 10 years. The trail tread was very difficult to find and in historic monitoring reports the trail was said to have been heavily impacted by logging operations in the area. Although this trail is primarily located within high to moderate burn severity, the low development level and lack of maintenance lead us to recommend this trail to be low in priority for stabilization efforts.



**Map 6 – Grouse Knob Trail (IPNF)**

**Squaw Valley Trail #164** – The section of tread located within the burned area is very short. This trail was largely used as fire-line during suppression activities and has largely been rehabilitated by the division. They did a great job!!!



**Map 7 – Squaw Valley Trail (IPNF)**

(c) Consequences of the fire on values at risk

Tree mortality on both sides of the trail will pose a minimal threat to BAER implementation personal while conducting surveys to complete this report. Standing hazardous snags will need to be removed prior the district personnel or contract crews preforming erosion control work on the developed trail features (punchcons, retaining wall, bridges, etc....). Clearing of downed trees lying across the trail corridor, while routinely opening the trail in the spring, will also present potential hazards to the forest service and volunteer trail crews. Erosion control along fire damaged sections of the trail will be needed to minimize risk to trail investments.

G. Resource Condition Assessment - Snowmobile Routes

(a) Resource Setting

Approximately 55.9 miles of groomed snowmobile routes exist within the burned area of the tower fire. All trails that fall on the Washington state side of the fire are maintained through a cooperative agreement by the Winter Knights Snowmobile Club. The trails found on the Idaho side are maintained by the Priest Lake Snowmobile Association. The following Forest Service system snowmobile routes exist with the burned area:

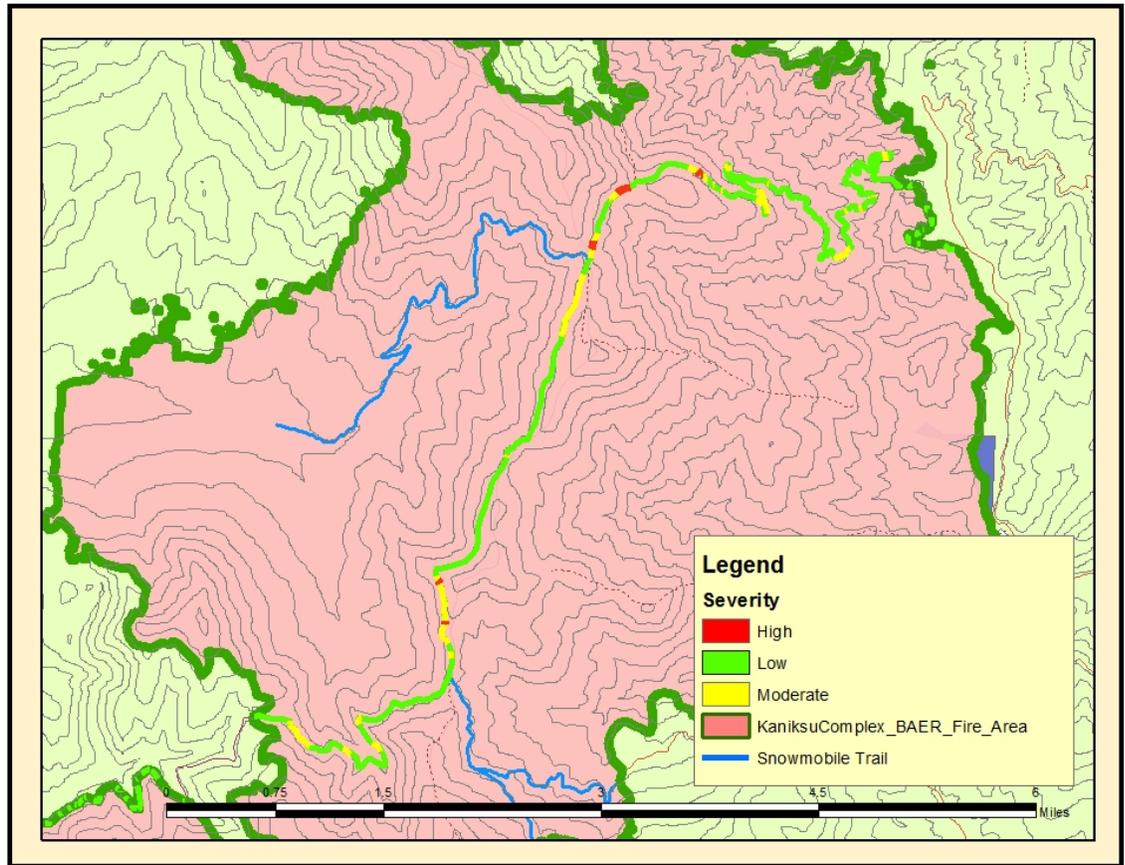
Trail Name	Maintenance	Trail Number	Managing Org	Corresponding USFS Roads	Mileage in Burned Area
LAMB CREEK - SOLO LOOP	GROOMED	SNO-8634	010408	659 & 659K IPNF	1.9
SOUTH BALDY LOOKOUT	GROOMED	SNO-8647	062105	5080306 CNF	4
SKOOKUM BROWNS LAKE LOOP	GROOMED	SNO-8646	062105	50000000 & 5080000 CNF	11.1
SOUTH BALDY	GROOMED	SNO-8667	062105	1090, 1090A, & 1137 IPNF 5080127 CNF	8.5
CEE CEE AH CREEK	GROOMED	SNO-8645	062105	1920000 CNF	5
GOOSE CREEK	GROOMED	SNO-8668	010408	305 IPNF	2.6
PYRAMID PASS	GROOMED	SNO-8644	062103	12000000, 1920041, 1920042 & 1920306 CNF 312 IPNF	22.8
TOTAL MILES					55.9

**Table 5 – Snowmobile Trails Found within the Burned Area**

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

Findings of the On-The-Ground Survey showed that many hazard trees are in the surrounding areas and snowmobile corridors. Within twenty four hours of our arrival several trees fell and multiple weakened trees were spotted. Lamb and solo creek had high intensity burns and with the steep slopes that could be at risk for avalanche hazards during the winter months. Trail closures would minimize hazards to the health and safety of visitor and fs staff in the burned area.

An additional alternative would be to maintain a single route through the burned area. A potential route could be maintained starting a Kings Lake Sno-Park traveling the 5030 and 5080 to the Pelke warming hut then on to 312 and 219 to Hill Resort. Approximately .25 of a mile of this route would occur within high burn severity. Approximately 2.43 miles would also occur within moderate burn severity. The risks to human health and safety could be reduced by completing hazard tree removal along burned section (high to moderate) of open snowmobile trails. Increased avalanche forecasting in burned areas would also help.



**Map 7 – Burn Severity on Potential Snowmobile Route within the Tower Fire**

(c) Consequences of the fire on values at risk

Standing snags could pose a threat to forest service partner organizations while grooming the developed network of snowmobile trails that exist on both the Idaho Panhandle and Colville National Forests. Forest visitors snowmobiling on our developed snowmobile trails could also be exposed to hazardous snags while recreating in the area. Hazards to both health and safety and property would exist. Snowmobiles have been known to travel in excess of 70 mph in the area. Conditions could change daily and signage would be essential.

II. Risk Assessment:

A. Summary:

The values at risk for the recreational resource located within the burned area include: campgrounds, a warming hut, trailheads, dispersed recreation opportunities, motorized and non-motorized trails, and snowmobile routes. These resources will be subject to an increased number of hazard trees, increased erosion, higher runoff and sediment flows caused by hydrologic response, retaining wall and barrier loss, and presence of potentially hazardous waste (bridge materials) in forest waterways:

1. Threat to life and safety
2. Threat to public health
3. Threat to infrastructure
4. Threat to ecosystem recovery

The following conditions describe in detail the consequences of the fire on Values at Risk:

There is an immediate risk of hazard trees within and adjacent to recreation facilities and trails posing life and safety threat to BAER implementation members and public visitors.

B. Emergency Determination –

The BAER team has concluded these risks pose an emergency due to:

1. Risk to life and safety
2. Risk to public health
3. Risk to infrastructure
4. Risk to noxious weed infestation
5. Risk to cultural resources
6. Risk to ecosystem recovery

The following conditions describe in detail the consequences of the fire on Values at Risk:

Fire activity minimally affected the Brown Lake Campground. Temporary trail closure may be necessary to reduce unnecessary risk to visiting publics in area adjacent to the campground.

Pelke Warming Hut (CNF) should be monitored to insure safe parking is available to visitors to the facility.

There is an immediate risk of hazard trees within and adjacent to recreation facilities and trails posing life and safety threat to BAER implementation members and public visitors.

An administrative closure or removal of hazard trees and increase avalanche forecasting will be needed to reduce hazards to forest visitors recreating in the burned area during the winter months.

Administrative monitoring of the closure area above Brown's Lake will also be needed.

Developed features damaged by moderate to severe fire activity located along the non-motorized trails will need to be restored to minimize the hazard to FS property and visitor safety. Hazard trees will need to be removed two tree lengths from the trail feature being repaired or replaced.

The developed features damaged by moderate to severe fire activity located along the motorized trail will similarly need to be repaired or replaced. Hazard trees will also need to be addressed that would pose a hazard to the health and safety of FS crew members accomplishing the restoration work.

C. Treatments to Mitigate the Emergency

Recreation Facility Treatment Descriptions: An emergency determination was made that the following BAER treatments are required for recreation facilities and trail treatments in the Kaniksu complex Fire burn area to protect infrastructure and reduce life/safety hazards:

- (a) Trail Stabilization
- (b) Trail Closure
- (c) Imminent Hazard Trees on Trails and Trailheads
- (d) Storm Patrol
- (e) Bridge Removal

D. Treatment Types:

- (a) Trail Stabilization

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 mile Grease Creek. The trail mileages reflect only those trails located within high to moderate burn severity and/or directly downslope of areas of high to moderate burn severity.

The following trails managed by the IPNF would require stabilization work:

Trail Name	Trail Class	Trail Number	Managing Org	Designed Use	Mileage in Burned Area	Approx. % of High to Moderate
KALISPELL ROCK - NORTH BALDY (IPNF)	TC3	#103	010408	PACK - PACK AND SADDLE	1.85	100%
SOUTH BALDY-SOLO (IPNF)	TC3	#104	010408	HIKER/ PEDESTRIAN	2.91	90%
ICY SPRINGS (IPNF)	TC3	#197	010408	MTRCYCL - MOTORCYCLE	1.53	60%
SQUAW VALLEY (IPNF)	TC3	#164	010408	MTRCYCL - MOTORCYCLE	0.07	85%
TOTAL MILES					6.36	5.5

**Table 6 –Trail Treatments on the Tower Fire (IPNF)**

The following trails managed by the CNF require stabilization work:

Trail Name	Trail Class	Trail Number	Managing Org	Designed Use	Mileage in Burned Area	Approx. % of High to Moderate
HALL MTN - GRASSY TOP	TC3 - DEVELOPED	533	062105	HIKER/ PEDESTRIAN	1.90	75%
TOTAL MILES					1.90	1.43

**Table 7 –Trail Treatments on the Grease Fire (CNF)**

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 Tower and Grease Creek Fires. If trees cannot be mitigated, work crews will be delayed until threat is reduced or stabilized. 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 an anticipated increase 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, hydrologic function, and public and administrative use. The sections of trail improvements during this treatment will be inspected after implementation, during storm patrols and in 2015 to ensure that drainage features are functioning.

**Total Cost of Trail Stabilization Treatment: \$REDACT**

Cost Estimate for Trail Stabilization for Tower Fire (IPNF)				
Item	unit cost	Unit	total units	Total item cost
Recreation Specialist	REDACT	Recreation Personnel GS-11	6	REDACT
Conservation Corp	REDACT	Week	2	REDACT
Misc. Motorized Equipment	REDACT	Hours	16	REDACT
Vehicle mileage	REDACT	/mile	1000	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 8 –Cost Estimates for Trail Stabilization for Tower Fire (IPNF)**

Cost Estimate for Trail Stabilization for Grease Fire (CNF)				
Item	unit cost	Unit	total units	Total item cost
Recreation Specialist	REDACT	Recreation Personnel GS-11	3	REDACT
Conservation Corp	REDACT	Week	1	REDACT

Misc. Motorized Equipment	REDACT	Hours	8	REDACT
Vehicle mileage	DEACT	/mile	500	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 9 –Cost Estimates for Trail Stabilization for Grease Fire (CNF)**

(b) Trails:

**Administrative Closure (Tower and Grease Creek Fires)**

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 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.

**Total Cost for Trailhead Work and Signage: \$REDACT**

Cost Estimate for Trailhead Work and Signage for Tower Fire (IPNF)				
Item	unit cost	Unit	total units	Total item cost
Trail Closure Signage	REDACT	per sign	20	REDACT
Burned Area - Haz Tree Sign	REDACT	per sign	20	REDACT
Avalanche Info Sign	REDACT	per sign	20	REDACT
Sign Installation	REDACT	Per Person (GS-5)	8	REDACT
Vehicle mileage	REDACT	/mile	200	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 10 –Cost Estimates for Trailhead Work and Signage for Tower Fire (IPNF)**

Cost Estimate for Trailhead Work and Signage for Tower Fire (CNF)				
Item	unit cost	Unit	total units	Total item cost
Trail Closure Signage	REDACT	per sign	10	REDACT
Avalanche Info Sign	REDACT	per sign	10	REDACT
Sign Installation	REDACT	Per Person (GS-5)	4	REDACT
Vehicle mileage	REDACT	/mile	200	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 11 –Cost Estimates for Trailhead Work and Signage for Tower Fire (CNF)**

Cost Estimate for Trailhead Work and Signage for Grease Fire (CNF)				
Item	unit cost	Unit	total units	Total item cost
Trail Closure Signage	REDACT	per sign	10	REDACT
Burned Area - Haz Tree Sign	REDACT	per sign	10	REDACT
Avalanche Info Sign	REDACT	per sign	10	REDACT
Sign Installation	REDACT	Per Person (GS-5)	4	REDACT
Vehicle mileage	REDACT	/mile	200	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 12 –Cost Estimates for Trailhead Work and Signage for Grease Fire (CNF)**

(c) Imminent Hazard Trees on Trails and Trailheads

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 trees 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.

**Total Cost of Treatment: \$REDACT**

Cost Estimate for Imminent Trail Hazards and TH Hazard Tree Tower Fire (IPNF)				
Item	unit cost	Unit	total units	Total item cost
2 Sawyers	REDACT	GS-5 Trails Crew per Day	20	REDACT
Vehicle mileage	REDACT	/mile	200	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 13 –Cost Estimates for Storm Patrol for Tower Fire (IPNF)**

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	REDACT	GS-5 Trails Crew per Day	10	REDACT
Vehicle mileage	REDACT	/mile	200	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 14 –Cost Estimates for Storm Patrol for Grease Fire (CNF)**

(d) Storm Patrol

Roads and Trails within the Tower and Grease Creek Fires 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 and recreators on the trails within the burned area due to the increased potential for rolling and falling rock from burned slopes and increased potential for falling trees, flash floods and mudflows. 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 and trails or cause washouts. These events make for hazardous access along steep slopes and put the safety of users at risk.

**Total Cost of Treatment: \$REDACT**

Cost Estimate for Storm Patrol - Tower Fire (IPNF)				
Item	unit cost	Unit	total units	Total item cost
Recreation Specialist	REDACT	Recreation Personnel GS-5	16	REDACT
Recreation Specialist	REDACT	Recreation Personnel GS-11	16	REDACT
Vehicle mileage	REDACT	/mile	1600	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 15 – Storm Patrol (IPNF)**

Cost Estimate for Storm Patrol - Grease Creek (CNF)				
Item	unit cost	Unit	total units	Total item cost
Recreation Specialist	REDACT	Recreation Personnel GS-9	4	REDACT
Recreation Specialist	REDACT	Recreation Personnel GS-11	4	REDACT
Vehicle mileage	REDACT	/mile	400	REDACT
<b>Total Cost of Treatment</b>				<b>REDACT</b>

**Table 16 – Storm Patrol Fire (CNF)**

(e) Bridge Removal

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.

Cost Estimate for Burnt Bridge Removal - Tower Fire (IPNF)				
Item	unit cost	Unit	total units	Total item cost
Recreation Specialist	REDACT	Recreation Personnel GS-9	2	REDACT
Recreation Specialist	REDACT	Recreation Personnel GS-11	2	REDACT
Vehicle mileage	REDACT	/mile	400	REDACT
Total Cost of Treatment				REDACT

**Table 17 – Effectiveness Monitoring for Grease Fire (CNF)**

III. Discussion/Summary/Recommendations

In summary, the prescribed treatments for recreation facilities and trails will be implemented in concert with larger scale watershed treatments to help preserve life, public and administrative safety, infrastructure, cultural resources, and post-fire ecosystem recovery. Trail treatments are designed to minimize damage caused by increased runoff and sediment transport across steep slopes, and erosion from drainage channels in correlation with burn areas. Implementation of the prescribed trail treatments will mitigate potential risk to trail infrastructure and reduce further erosion and sediment transport. The risk assessment for trails and recreational sites showed areas of very likely probability of damage with major consequences resulting in a very high risk for areas with life/safety threats.

Temporary closures along with extensive warning signage are recommended for immediate implementation in order to inform public users of the known and unknown hazards present within the burn area.

Long Term Recommendations

- Trailhead Sign Replacement
- Parking Area Delineation with Barriers
- Resurvey Grouse Knob trail.
- Resurvey Mill Point trail.
- Reestablishment of tread on the Grouse Knob and Mill Point – Galena Point Trails

- Removal of hazard trees on all available snowmobile routes
- Reconstruction of trail structures including the bridge lost on the Icy Springs Trail.

#### IV. References

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