Fisheries Specialist Report
Kaniksu Complex Burned Area Emergency Response BAER Assessment
Colville National Forest

Resource Specialty: Aquatic Species and Habitat
Fire Names: Kaniksu Complex, Tower, Grease Creek and Baldy Fires
Month and Year: October, 2015
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I. Potential Values at Risk (prior to on-the-ground survey)

A. Critical Values

Tower Fire

- Mill Creek
  - Fish habitat and water quality for designated critical habitat for threatened bull trout (not occupied).
- Cee Cee Ah Creek
  - Fish Habitat and water quality for culturally significant and Region 6 sensitive westslope cutthroat.

Grease Creek Fire

- Sullivan Creek - Designated bull trout critical habitat downstream of fire perimeter
  - Fish habitat and water quality for designated critical habitat for threatened bull trout (not occupied).

Baldy Fire

- Cedar Creek Designated bull trout critical habitat downstream of fire perimeter.
  - Fish habitat and water quality for designated critical habitat for threatened bull trout (not occupied).

B. Resource Condition Assessment

(a) Resource Setting

This rapid aquatic analysis is based on site-specific and aerial review between October 8th thru 15th, 2015. Due to time constraints, every effort was made to visit high priority fisheries and aquatic habitat sites in the field. Areas with high to moderate burn severity were the focused area for this assessment on National Forest Lands to effectively evaluate impacts within the fire perimeter. Information on the fires within the Kaniksu Complex can be found in Table 1 and 2 below.

Table 1. Start, cause, location and total acres for each fire.

Fire	Date Fire Started	Cause	Fire Location	Total Acres
Tower	08/12/2015	Lightening	6 miles northeast of Usk, Wash., and 6 miles west of Priest Lake, Idaho.	24,702
Baldy	08/01/2015	Lightening	6 miles north of Ione, Wash.	514
Grease Creek	08/14/2015	Lightening	Located east of Sullivan Lake	717

Table 2. Burned Acres by ownership for each fire.

Fire	Ownership	Acres
Tower	Colville NF	5,473
	Idaho Panhandle NFs	12,128
	State of Washington	2,203
	Private	4,898
	Total	**24,702**
Baldy	Colville NF	514
	Total	**514**
Grease Creek	Colville NF	717
	Total	**717**

The burn area for each of these fires was surveyed for intensity. Table 3 summarizes the acreages burned in each of the HUC 12 subwatersheds.

Table 3. Burned acres by watershed for Tower, Grease Creek, and Baldy Fires.

HUC 12 Watershed	Acres	Burn Intensity (acres) Low	Moderate	High	Unburned	Total Ac. Burned	% of Subshed Burned*
Tower Fire							
Cee Cee Ah Creek	12,063	940	1,831	367	373	3,138	26%
East Branch Le Clerc Creek	26,663	6	20	1	21	27	<1%
Flat Creek-Lower West Branch Priest River	24,551	591	264	17	56	872	<1%
Goose Creek	14,044	1,235	463	100	32	1,798	13%
Headwaters Upper West Branch Priest River	20,235	4,367	1,924	555	2,524	6,846	39%
Middle Creek-Pend Oreille River	23,209	2,496	3,441	1,068	1,163	7,005	30%
Mission Falls-Upper West Branch Priest River	10,614	3	30	116	0	33	<1%
Skookum Creek	31,811	242	413	13	30	668	<1%
Grease Creek Fire							
Harvey Creek	32,999	485	28	29	0	542	<1%
Headwaters Sullivan Creek	45,516	143	14	17	0	174	<1%
Baldy Fire							
North Fork Deep Creek	49,256	5	1	0	0	6	<1%
Sweet Creek-Pend Oreille River	41,831	294	35	36	144	364	<1%

* Percent of subwatershed with high intensity burn

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

The Tower Fire has 35.6 miles of perennial channels, and 134.9 miles of intermittent channels within the fire perimeter. The Grease Creek Fire has 0.2 miles of perennial channels, and 0.7 miles of intermittent channels within the fire perimeter. The Baldy Fire has 0.2 miles of perennial channels, and 0.5 miles of intermittent channels within the fire perimeter.

Methods used to determine burn severity are described in the BAER soils report. Areas of moderate to high burn severity have the greatest potential to move sediment into stream systems and impact fisheries or other aquatic resources. Aquatic habitat and biota would be affected by such movement due to turbidity effects on water quality, and from loss of habitat due to sediment accumulation in pools and riffles. Sedimentation may also reduce the productivity of the stream system through effects on macroinvertebrates and reduce availability of spawning habitat.

Based on historical precipitation patterns, it can be expected that winter storms have a high probability of occurring in the weeks following the Tower Fire. The risk of flooding and erosional events will increase as the result of the fire, creating hazardous conditions within and downstream of the burn area. These hazardous conditions maybe worsened in the case of a rain-on-snow event, where long-duration rainstorms falling on a ripe snowpack can produce very high peak flows. Debris flows may trigger well before the peak rainfall amount falls during a long duration winter storm.

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

Tower Fire

Stream channel response to fire – channel erosion, sediment movement, road drainage problems, alteration of stream morphology related to threatened and sensitive fish habitat and water quality.

- The fire likely had little to no direct effect on fish populations within the fire. This is due to the minimal amount of high intensity/severity burn areas on fish bearing streams. Most areas along perennial fish bearing reaches had low intensity/severity fire, unburned areas, or just a few pockets of moderate to high intensity/severity.
- Mill Creek- Significant amount of high and moderate burn severity in headwaters. Likely that ash and sediment make it to stream which could cause detrimental effects to fish habitat and populations. High concern for culvert on 1920 road stream crossing (high potential for road failure)..
- Solo Creek- Significant amount of high and moderate burn severity in headwaters. High concern for 659 road stream crossings in headwater tributaries (high potential for road failure)..
- Cee Cee Ah Creek- Little burn in riparian area around perennial fish bearing reaches. Low to moderate burn severity in headwaters.
- Browns Lake- Significant amount of high and moderate burn severity. High concern for northwest tributary and culvert crossing within high burn severity (high potential for road failure). Likely that ash and sediment make it to lake which could cause detrimental effects to fish populations in the lake.

Grease Creek Fire

Stream channel response to fire – channel erosion, sediment movement, road drainage problems, alteration of stream morphology related to threatened fish habitat and water quality.

- The fire likely had little to no direct effect on fish populations within the fire. This is due to the minimal amount of high intensity/severity burn areas on fish bearing streams. Most areas along perennial fish bearing reaches had low intensity/severity fire, unburned areas, or just a few pockets of moderate to high intensity/severity.
- Streams are in good condition which should help trap and transport sediment. There was very little burn in the riparian area around tributaries to Sullivan Creek.

Baldy Fire

Stream channel response to fire – channel erosion, sediment movement, road drainage problems, alteration of stream morphology related to threatened fish habitat and water quality.

- The fire likely had little to no direct effect on fish populations within the fire. This is due to the minimal amount of high intensity/severity burn areas on fish bearing streams. Most areas along perennial fish bearing reaches had low intensity/severity fire, unburned areas, or just a few pockets of moderate to high intensity/severity.
- Streams are in good condition which should help trap and transport sediment. There was very little burn in the riparian area around tributaries to Cedar Creek.

(c) Consequences of the fire on values at risk

Tower Fire

- Mill Creek and Cee Cee Ah
  Decrease in water quality and loss of designated critical habitat for bull trout and culturally significant westslope cutthroat trout (Cultural interest from Kalispell Tribe) due to:
  - Increased flows causing flooding
  - Excess sedimentation, which will reduce the productivity of the stream system through effects on macroinvertebrates and reduce availability of spawning habitat
  - 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
  - Changes in streambed/pool habitat due to geomorphic movement (debris flows)
  - Mass failure of culverts, causing stream degradation
  - Flushing of individual fish downstream during flood events.
  - Possible increased productivity and release of nutrients.

Grease Creek and Baldy Fires

- Sullivan Creek and Cedar Creek
  Decrease in water quality and loss of designated critical habitat for bull trout and culturally significant westslope cutthroat trout due to:
  - Increased flows causing flooding
  - Excess sedimentation, which will reduce the productivity of the stream system through effects on macroinvertebrates and reduce availability of spawning habitat
  - 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,
- Changes in streambed/pool habitat due to geomorphic movement (debris flows), sediment delivery
- Flushing of individual fish downstream during flood events.
- Possible increased productivity and release of nutrients.

II. Risk Assessment:

Tower Fire

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 (No bull trout habitat) 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 in Mill Creek 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 road treatment package.

Low risk for water quality concerns exists due to 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.

Baldy Fire

Low risk for the loss of designated critical habitat exists due to flooding and excess sedimentation for bull trout (T&E) 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.

Grease Creek Fire

Low risk for the loss of designated critical habitat exists due to flooding and excess sedimentation for bull trout (T&E) 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.

Fisheries Summary

For aquatic species, much of the post-fire impacts from the three fires will be minimal. Within each fire, riparian areas are generally burned at low or low moderate severity allowing streamside vegetation to buffer and filter potential sediment. However, some headwater tributaries burned more severely causing locations to be completely denuded of vegetation. This bare soil and steep terrain could lead to a loss or reduction of suitable stream habitat and water quality downstream. For all fish species, there is a concern that until enough vegetative recovery has occurred habitat degradation and the possibility for poor water quality will continue. The fisheries resource will benefit from the proposed road, trail and land treatments.

Emergency Determination

Tower Fire

Based on the above assessment of the Tower Fire it is my determination that an emergency **does** exist for bull trout critical habitat (not occupied) and water quality in Mill Creek. Specific fisheries treatments to reduce potential impacts to habitat will rely on the roads treatment package. Important treatment point of interest is the Mill Creek 1920 road stream crossing.

Based on the above assessment of the Tower Fire it is my determination that an emergency **does** exist for water quality in Browns Lake. Specific treatments to reduce potential impacts to water quality will rely on the roads treatment package. Important treatment point of interest is the northwest tributary to Browns Lake the 5080 road stream crossing.

Based on the above assessment of the Tower Fire it is my determination that an emergency **does not** exist for culturally significant westslope cutthroat in Cee Cee Ah Creek. Do to the low percentage of severity on the landscape and distance of stream to the designated critical habitat no mitigation measures are necessary that comply with the BAER guidelines.

Based on the above assessment of the Tower Fire it is my determination that an emergency **does not** exist for Idaho Panhndle NF streams (i.e. Solo Creek, other tributaries to Upper West Branch Priest River). There are no threatened and endangered species. No mitigation measures are necessary that comply with the BAER guidelines. There is still a concern for native trout populations and habitat where high severity burns occurred.

Grease Creek Fire

There are no emergency situations for fisheries existing on this fire

Based on the above assessment of the Grease Creek Fire it is my determination that an emergency **does not** exist for bull trout critical habitat (not occupied) in Sullivan Creek. Do to the low percentage of severity on the landscape and distance of stream to the designated critical habitat no mitigation measures are necessary that comply with the BAER guidelines.

Baldy Fire
Based on the above assessment of the Baldy Fire it is my determination that an emergency **does not** exist for bull trout critical habitat (not occupied) in Cedar Creek. Do to the low percentage of severity on the landscape and distance of stream to the designated critical habitat no mitigation measures are necessary that comply with the BAER guidelines.

Treatments to Mitigate the Emergency
It is recommended to follow the land, road, and trail packages to treat emergencies for fisheries concerns on the Tower Fire. BAER treatments that propose land, road and trail work would benefit fish by reducing overland flow and sediment delivery to stream drainages. Treatments to reduce sedimentation effects from trail and road runoff will help in the recovery of water quality and habitat for fish in these watersheds. Forest area closures and road/gate treatments would prevent unauthorized vehicle (OHV) access to stream drainages and would allow for natural vegetative recovery in riparian and hillslope areas.

III. Discussion/Summary/Recommendations

There are two emergency situations related to the Tower Fire for fish habitat and water quality. There is potential for effects from sediment delivery into streams from storm events. Mitigation measures to reduce potential impacts to habitat and water quality will rely on the road, trail and land treatment packages to minimize these effects and eliminate the "emergency" situation under BAER guidelines.

It is recommended that the following work/monitoring be pursued using non-BAER funding:

1. Trout populations should be monitored in Mill Creek and Browns Lake to evaluate post-fire effects. Monitoring using electroshocking over time, preferably over several years, will help determine the status of these resident trout populations. When there are future impacts, the effects to the population will be more accurately determined.

2. Additional water quality samples in Mill Creek and Browns Lake should be taken to help to better understand changes in habitat conditions for aquatic biota following wildfire events.

Throughout the rest of the Tower, Baldy, Grease Creek Fires there is the potential for some short-term effects from sediment delivery into streams from storm events. However field survey determinations identified that sufficient down wood on open slopes and along stream banks will minimize this effect and eliminate the "emergency" situation under BAER guidelines. In addition, the fires did not burn intensely within riparian zones leaving live streamside vegetation to buffer and filter potential sediment. A storm event would tend to move sediment through the system and onto flood plains and not deposit in stream channels and impact spawning gravel. There were very few locations where fire actually burned to the water edge along streams and these were located, for the

most part, in ephemeral to intermittent channels. Oberbillig et.al.,(1995) found streams much richer in insects and aquatic life, thanks to the addition of nature's fertilizers – ash and nutrients from the burned trees that topple into the waters. Several examples of fire response by inland fish species were reported (Oberbillig et.al., 1995) where fish populations may have suffered short-term effects, but, long-term benefits were quickly documented with increased populations and improved habitat conditions. Fires serve to restore nutrients into the aquatic environments and to rejuvenate habitat conditions.

In western Montana, the two primary natural disturbance mechanisms responsible for initiating stream dynamics that ultimately increase habitat complexity and diversity are fires and floods (Brassfield et.al. 2001). In the short-term, fires trigger other processes, such as erosion and woody debris recruitment, which are critical in the formation of young, biologically rich stream systems. Over longer time periods, fires recycle nutrients, regulate forest development and biomass, and maintain biological pathways. The effect of fire on these processes is ultimately transferred to stream channels. Fires, and the ecological processes associated with them, are thus an integral part of maintaining our native fish populations and their habitat.

IV. References

Brassfield et al. 2001. Reducing Fire Risks to Save Fish – A Question of Identifying Risk: A Position paper by the Western Montana Level 1 Bull Trout Team.

Oberbillig, Deborah Richie (writer). August 29, 2000. The Nature of Fire in the Northern Rockies: A Series From the Watershed, Wildlife, Fish and Rare plants Program, Northern Region, U.S. Forest Service. Fire Recharges Native Fisheries. Clearwater National Forest publication.