

Date of Report: 09/04/2013

BURNED-AREA REPORT
(Reference FSH 2509.13)**PART I - TYPE OF REQUEST****A. Type of Report**

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

B. Type of Action

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

☐ 2. Interim Report #_____
 ☐ Updating the initial funding request based on more accurate site data or design analysis
 ☐ Status of accomplishments to date

☐ 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

- A. Fire Name:** Salmon River Complex **B. Fire Number:** CA-KNF-005561
C. State: CA **D. County:** Siskiyou County
E. Region: R5 **F. Forest:** Klamath
G. District: Salmon River Ranger District **H. Fire Incident Job Code:** P5HS98
I. Date Fire Started: July 31, 2013 **J. Date Fire Contained:** 8/30/2013
K. Suppression Cost: \$23 million
L. Fire Suppression Damages Repaired with Suppression Funds

1. **Fireline waterbarred (miles):** Approximately 8.5 miles of handline and 5.2 miles of dozer line waterbarred.
2. **Fireline seeded (miles):** No fireline seeded at this time. 2 acres seeded (helispots, road pull outs, staging areas, drop points)
3. **Other (identify):** Safety zones, staging areas, spike camps and drop points are in the process of being repaired if needed. Roads were graded and drainage repaired where suppression activities warranted doing so.

M. Watershed Numbers:**Soil Burn Severity Acres by Watershed**

HUC 14	HUC 14 Name	Very Low Burn Severity (Acres)	Low Burn Severity (Acres)	Moderate Burn Severity (Acres)	High Burn Severity (Acres)	Total Watershed Burned (Acres)	Total Watershed Area (acres)	Percent Watershed Burned
18010210020801	Olsen Creek-North Fork Salmon River	418	1955	1410	279	4062	8297	49%
18010210020706	Shiltos Creek-North Fork Salmon River	337	856	220	1	1414	3910	36%
18010210020802	Big Creek-North Fork Salmon River	818	1614	951	374	3758	7786	48%
18010210020704	Jessups Gulch-North Fork Salmon River	15	16	0	0	32	4546	1%
18010210040201	Crapo Creek	6	20	10	0	36	11077	0%
18010210020503	Yellow Dog Creek-North Fork Salmon River	39	33	4	0	75	9200	1%
18010210020603	Specimen Creek	135	68	6	0	209	5009	4%
18010210020604	Lower Little North Fork Salmon River	747	1484	347	21	2599	4930	53%
18010210020705	Jackass Gulch	441	1656	302	127	2526	2788	91%
					Total	14710	57543	26%

N. Total Acres Burned:

[14703] NFS Acres [0] Other Federal [0] State [7] Private

Soil Burn Severity Acres by Land Status					
Land Owner	Very Low Severity (Acres)	Low Severity (Acres)	Moderate Severity (Acres)	High Severity (Acres)	Total Burned (Acres)
Klamath NF	2952	7699	3250	802	14703
Private	4	3			7

O. Vegetation Types:

Generally, mixed evergreen forests dominated by Douglas-fir and ponderosa pine, with mixed components of sugar pine, white fir, incense cedar, and knobcone pine. Hardwood understories composed of mixed evergreens including Pacific madrone, canyon live oak, and giant chinquapin are common. Areas of previous burns are dominated by regenerating shrub fields (multiple species of manzanita and Ceanothus) and intermittent conifer plantations of ponderosa pine and Douglas fir.

P. Dominant Soils:

The major soils within the Salmon Complex fires are Clallam, Deadwood, Gilligan, and Oval. Most are deep with the exception of Deadwood which is shallow. Half the area is granitics and the other half is metasedimentary or metavolcanic. Gilligan and Oval are granitic and have high to very high erosion hazard ratings depending on burn severity. Clallam and Deadwood are metamorphic and have moderate to high erosion hazard ratings depending on burn severity. Hydrologic soil group ratings are C for Deadwood and B for Clallam, Gilligan, and Oval. These four soils occupy 10,000 acres or 70% of the area and suffered the worst damage from this fire. Gilligan and Oval soils were particularly hit hard with moderate to high soil burn severities on steep erosive granitics.

Q. Geologic Types:

The fire area is underlain by two distinct terranes. The central fire area is underlain by the English Peak batholith which is primarily composed of quartz diorite, to a lesser extent, granodiorite. These units are typified by their grusification or the chemical alteration of feldspar and biotite by water. This causes granular crumbling of the rock.

The English Peak batholith is flanked by the Sawyers Bar terrane roughly west of China Gulch and east of the North Fork Salmon River. This terrane has three different map units including metavolcanic and metasedimentary rocks. These rocks have varying levels of fractures. Metasedimentary outcrops appear well stratified or layered in some locations.

R. Miles of Stream Channels by Order or Class:

Flow Regime by Severity (Miles)					
Flow Regime by Land Status	Very Low Severity (Miles)	Low Severity (Miles)	Moderate Severity (Miles)	High Severity (Miles)	Total (Miles)
Klamath NF					
Intermittent	6.2	26.7	8.2	2.9	44.1
Perennial	6.6	15.1	5.5	0.4	27.6
Grand Total	12.8	41.8	13.7	3.3	71.7

S. Transportation System

Trails: 11 miles

FS Roads: 31 miles

County Road: 9 Miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 2956 (very low) 7702 (low)
3250 (moderate) 802 (high)

Approximately 30% burned at high and moderate soil burn severity (see soil burn severity map below). The rest of the fire was either low or very low soil burn severity. It is very important to understand the difference between fire intensity or burn severity as discussed by fire behavior, fuels, or vegetation specialists, and soil burn severity as defined for watershed condition evaluation in BAER analyses. Fire intensity or burn severity as defined by fire, fuels, or vegetation specialists may consider such parameters as flame height, rate of spread, fuel loading, thermal potential, canopy consumption, tree mortality, etc. For BAER analysis, we are not mapping simply vegetation mortality or above-ground effects of the fire. Soil burn severity considers additional surface and below-ground factors that relate to soil hydrologic function, runoff and erosion potential, and vegetative recovery.

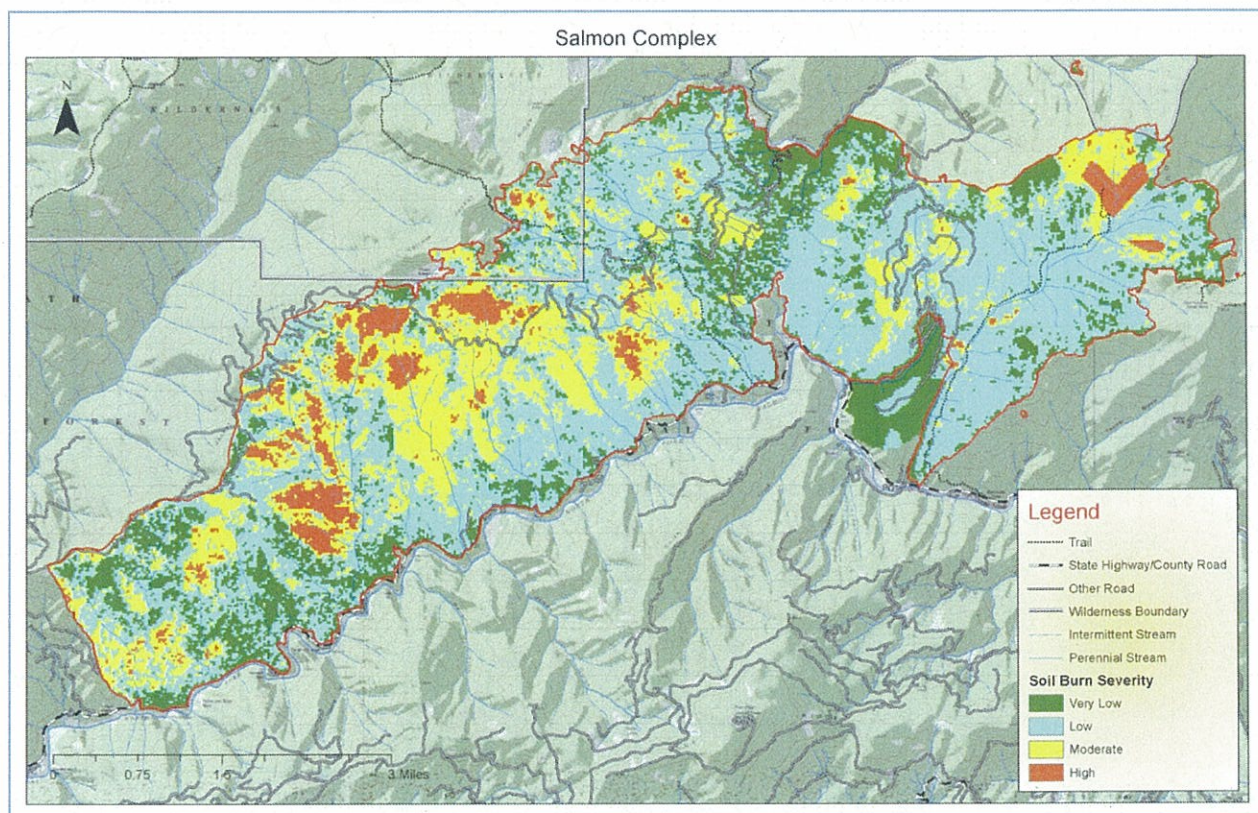
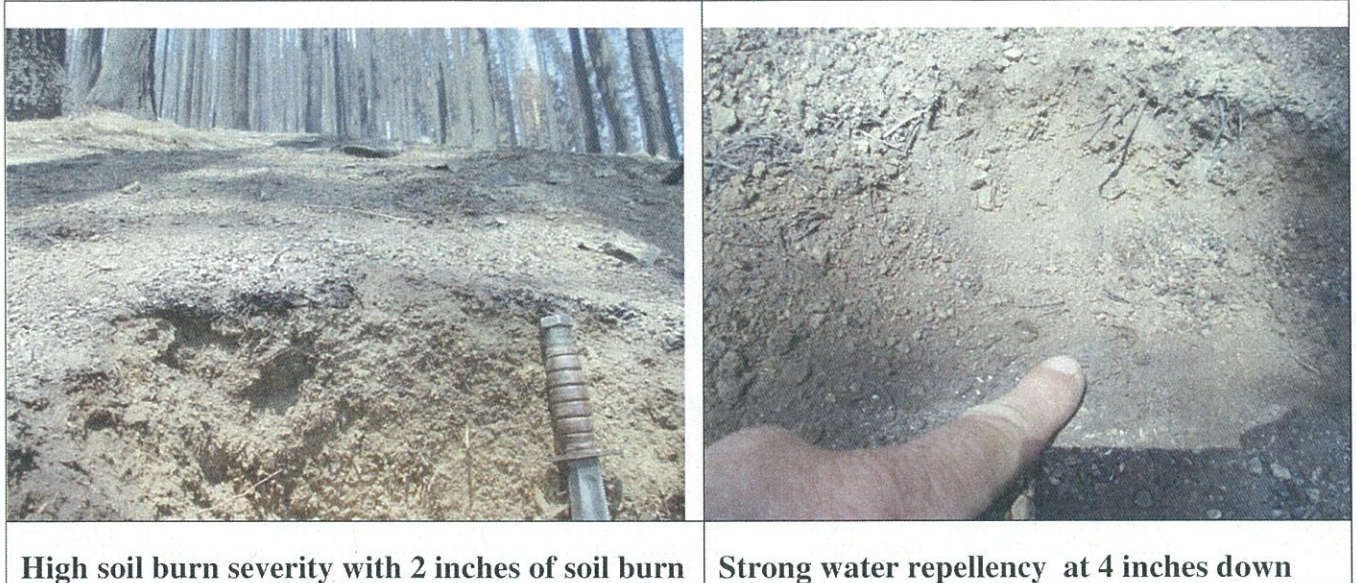


Figure 1 – Pictures of soil burn severity in upper Boulder Creek



Soil burn severity is assessed by looking at above ground cover and surface cover, soil char (depth of soil burning), soil structure, destruction of soil organic matter, destruction of fine roots, and water repellency strength and depth. Water repellency is running from 2 to 6 inches deep depending on soil texture and vegetation that was burned. Landscapes on north or east-facing were steep gravelly loam mixed conifer areas that burned moderately hot leaving strong water repellency down to 2 inches. Char and soil organic matter destruction was also present. Landscapes that were steep gravelly sandy loam P-pine/brush areas that were either south or west-facing burned hot leaving strong water repellency down to 4 inches. Deep char and soil organic matter destruction was also present. Soils within the fire perimeter generally have a weak granular structure consisting of soil microorganisms, soil organic matter, and fine roots. This is present in the upper 1 to 3 inches of most soils and is an important soil property protecting the soil from wind and water erosion. In the moderate and high soil burn severity areas, soil structure was destroyed down to 2 to 4 inches leaving loose unconsolidated single grained material lacking organic matter and soil cover.

B. Water-Repellent Soil (acres): 2,026 (50% repellency of high and moderate soil burn severity acres)

C. Soil Erosion Hazard Rating (acres):

158 (low) 10,500(moderate) 3,250 (high) 802 (very high)

Erosion Hazard Rating		
Rating	Acres	Percent
low	158	1
moderate	10500	71
high	3,250	22
very high	802	5
Total	14,710	

- D. Erosion Potential: # tons/acre:** average erosion potential is 26 tons/acre (Calculated from WEPP-ERMIT for a 2-year storm event and untreated hillslope. Model accuracy is +50%)
- E. Sediment Potential: # cubic yards / square mile:** 1,109 cu yards/sq mi (Calculated by converting erosion potential in D. to cu yards/square mile (assuming 1 cu yards equals 1.5 tons) and using a 10 percent delivery factor)

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period, (years):** 5
- B. Design Chance of Success, (percent):** 60
- C. Equivalent Design Recurrence Interval, (years):** 10
- D. Design Storm Duration, (hours):** 6
- E. Design Storm Magnitude, (inches):** 2.6
- F. Design Flow, (cubic feet / second/ square mile):** 279
(Average design flow of 10 sub-drainages delineated for soil erosion, hydrology and geo debris flow analysis)
- G. Estimated Reduction in Infiltration, (percent):** 74
(calculated based on increase in average adjusted design flow)
- H. Adjusted Design Flow, (cfs per square mile):** 457
(Average adjusted design flow of 10 sub-drainages delineated for soil erosion, hydrology and geo debris flow analysis)

PART V - SUMMARY OF ANALYSIS

Background- The Salmon River Complex burned approximately 14,789 acres of forest along tributaries to the North Fork River in Siskiyou County, CA from July 31 to August 30, 2013. The Complex was a combination of the Boulder and the Shelly fires that were human-started along the Sawyer's Bar road. The Salmon River Complex re-burned steep granitic watersheds which burned at high intensity during the 1987 fires, and to a lesser degree, during the Hog Fire of 1977. Experience from these past fires has shown that without treatment, large amounts of sediment are likely to be mobilized and delivered to the North Fork Salmon, Forest Service roads and trails located in granitic soils are likely to incur severe damage, and noxious weeds are likely to spread into previously unaffected areas.

A. Describe Critical Values/Resources and Threats (narrative):

The following is a brief summary of the values within and along the fire area as well as the threats to those values.

Values at Risk:

The risk matrix below, Exhibit 2 of Interim Directive No.: **2520-2010-1**, was used to evaluate the Risk Level for each value identified during Assessment:

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

Values At Risk Matrix Table

Risk Type	Value At Risk	Potential Threats	Probability of Damage	Magnitude of Consequences	Risk	Treatment
life/safety	Ingress/Egress on Sawyer's Bar Road	Debris flows and flooding	Possible	Moderate	Intermediate	Communicate risk with County and public
life/safety	Public Safety from rockfall on Sawyer's Bar Road and 40N51 and 40N42	Rock fall	Very Likely	Moderate	Very High	Temporary closure of level 2 section of 40N51. Communicate risk with County and public
life/safety/FS Property	Garden Gulch Trailhead and Trail	Rock fall, falling snags, erosion, trail collapse	Possible/Likely	Moderate	Intermediate/ High	Sign hazard, Install waterbars, treat trail collapse
life/safety/FS Property	Little North Fork Trailhead and Trail	Rock fall, falling snags	Possible/Likely	Moderate	Intermediate/ High	Sign hazards
life/safety/FS Property	Jackass Creek Trail	Rock fall, falling snags	Possible/Likely	Moderate	Intermediate/ High	Sign hazards
FS property	40N51	Elevated storm flows, debris flows	Likely	Major	Very High	Stormproof
FS Property	40N33	Elevated storm flows, debris flows	Likely	Moderate	High	Stormproof
FS Property	40N39	Elevated storm flows, debris flows	Likely	Moderate	High	Stormproof

FS Property	40N42	Elevated storm flows, debris flows	Likely	Major	Very High	Stormproof
Natural Resources	Soil Productivity	Soil Erosion affecting site productivity	Possible	Moderate	Intermediate	No treatment proposed due to slopes steeper than 60%
Natural Resources	Hydrologic Function	Stream channel alterations	Likely	Moderate	High	NFTS Road Stormproofing; Sed. Ret. Pond - Olsen
Natural Resource	Domestic Water Sources on Little North Fork	Elevated storm flows, debris flows	Possible	Moderate	Intermediate	Road stormproofing on 40N51
Natural Resources	303d listing - Jackass	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade loss	Likely	Moderate	High	Trail Maintenance
Natural Resources	303d listing - Shiltos-NF Salmon	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade loss	Likely	Moderate	High	NFTS Road Stormproofing
Natural Resources	303d listing - Lower Little NF Salmon	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade loss	Likely	Moderate	High	Trail Maintenance; NFTS Road Stormproofing
Natural Resources	303d listing - Olsen-NF Salmon	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade	Very Likely	Moderate	Very High	Trail Maintenance; NFTS Road Stormproofing; Sed. Ret. Pond - Olsen

		loss				
Natural Resources	303d listing - Big-NF Salmon	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade loss	Very Likely	Moderate	Very High	Sed. Ret. Pond - Olsen
Natural Resources	303d listing - Olsen-NF Salmon	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade loss	Very Likely	Moderate	Very High	Trail Maintenance; NFTS Road Stormproofing; Sed. Ret. Pond - Olsen
Natural Resources	Coho Critical Habitat - Kelly Gulch	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade loss	Possible	Moderate	Intermediate	Rolling dip on Kelly Gulch Crossing of 40N39
Natural Resources	Coho spawning habitat - Main Stem	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade loss	Likely	Moderate	High	Sed. Ret. Pond - Olsen
Natural Resources	Coho cold water refugia - Main Stem	Elevated storm flows, debris flows, excess sedimentation, stream channel alteration, stream shade loss	Likely	Moderate	High	Sed. Ret. Pond - Olsen Hand remove sediment at key confluences
Natural Resources	Native habitat prone to invasion - Kelly Gulch area	Invasives	Likely	Moderate	High	Survey and hand pull as necessary

Natural Resources	Native habitat prone to invasion - Little North Fork area	Invasives	Likely	Moderate	High	Survey and hand pull as necessary
Natural Resources	Native habitat prone to invasion - Yellow Jacket Ridge area	Invasives	Very Likely	Moderate	Very High	Survey and hand pull as necessary, disperse native grass seed as competition with Dyer's woad
USFS Site #05-05-54-00422	Vandalism/Looting	Likely	Moderate	High	Camouflage/obscure Historic Refuse Deposit from view. Monitor as necessary to assess effectiveness of treatment	USFS Site #05-05-54-00422

- Human Life and Safety-

- Potential loss of or injury to human life exists along County Road 1C01 (Sawyer's Bar road) from flooding and debris flows due to high and moderate soil burn severities, steep slopes, and hydrophobic soils. The Probability of Damage or Loss is possible and the Magnitude of Consequences from human life and safety is Major. Therefore risk to human life and safety high. **Treatments Recommended – Coordination with Siskiyou County and public to communicate risk of debris flow and flooding on Sawyer's Bar road.**
- Potential loss of or injury to human life exists along Sawyer's Bar road and FS Road 40N51 from rock fall due to high and moderate soil burn severities and steep slopes. The Probability of Damage or Loss is Very Likely and the Magnitude of Consequences from human life and safety is Moderate. Therefore risk to human life and safety very high. **Treatments Recommended – Coordination with Siskiyou County and public to communicate risk of rock fall on Sawyer's Bar road. Temporarily close to the public Road Maintenance Level 2 section of the FS Road 40N51.**
- Potential loss of or injury to human life exists along the Little North Fork Trail (Forest Trail No. 5406), Garden Gulch Trail (Forest Trail No. 5428), and Jackass Gulch Trail (Forest Trail No. 5444). The presence of fire damaged trees along all trails within the burned area, presents a hazard to recreationists with falling trees and fallen trees blocking the trail. Along sections of the Garden Gulch Trail, the trail shoulder and tread has been supported by shrub and tree roots which were burned, resulting in sloughing of the trail tread prism and collapsing of the trail tread. This presents a hazard to the recreating public utilizing the trails, especially those on horses that are traveling at higher rates of speed. The Probability of Damage or Loss to human life and safety would be Possible to Likely depending on the intensity of the burn and the topography of the area. The Magnitude of Consequences would be Moderate with potential injury to humans. With these two elements combined the risk is identified as

Intermediate to High. **Treatments Recommended** –Install hazard warning signs and trail work addressing areas with potential for trail collapse due to burned out roots and logs beneath the tread.

- Property–

- FS Roads 40N51, 40N33, 40N39, and 40N42. Based on the runoff and debris flow modeling results the Probability of Damage or Loss of the fire affected road segment is Likely and the Magnitude of Consequences is Moderate to Major resulting in an High to Very High risk. **Treatments Recommended** – **Storm-proof roads with treatments including: Installing rolling dips, critical dips, and upgrade/install new culverts on undersized and diversion prone road stream crossing and cross drains.**
- Garden Gulch Trail. Timber erosion control structures were burned during the fire along the Garden Gulch Trail. If run-off and sediment are not diverted from running directly down the trail tread, portions of the trail prism may be lost with storm activity over the winter. The Probability of Damage or Loss to human life and safety would be Possible to Likely depending on the intensity of the burn and the topography of the area. The Magnitude of Consequences would be Moderate property damage. With these two elements combined the risk is identified as Intermediate to High. **Treatments Recommended** –**On sections of the Garden Gulch Trail with steep grades, water bars will be installed or existing water bars cleaned to divert surface water, curb trail erosion and protect the investment in this facility. Installation should be designed to last no more than 3 years -- permanent structures are not part of this treatment.**

- Natural Resources –

- *Soil productivity on burned NFS lands.* After a fire there is the potential threat of increased soil erosion affecting site productivity. The Probability of Damage or Loss is Possible and the Magnitude of Consequences would be Moderate resulting in Intermediate risk. **No Treatments Recommended– Due to the extremely steep slopes in the burn area, hill slope treatments to reduce soil erosion including areal mulching, seeding, and contour felling have been shown to be ineffective on slopes greater than 60%.**
- *Hydrologic Function on burned NFS lands.* After a fire there is potential threat of stream channel alteration from increase peakflows, excess sedimentation and debris flows. Failure of road fill from debris flows and elevated peakflows would further impair stream channel function. The Probability of Damage or Loss is Likely and the Magnitude of Consequences would be Moderate resulting in High risk. **Reduce sediment loads and probability of fill failures via implementation of road and trail treatments. Re-establish sediment retention pond at Olsen Creek.**
- *Water used for municipal, domestic, hydropower, or agricultural supply or waters with special state or federal designations on or in close proximity to the burned NFS lands.*
 - 1) Domestic water sources located in the Little North Fork Salmon River are threatened by elevated storm flows and debris flows from upslope burned areas and FS roads 40N51. The Probability of Damage or Loss is Possible and the

Magnitude of Consequences is Moderate resulting in an Intermediate risk.

Treatments Recommended –Road storm proofing on 40N51 would indirectly protect domestic water use at Little North Fork Ranch by reducing the amount of sediment and lowering the probability of debris flows delivered to the Little North Fork roads with treatments

- 2) *The Salmon River watershed is 303(d) listed for temperature. Impairment has been linked to excess sediment loads and stream shade lost from debris flows, wildfire and past timber harvest. Post-wildfire elevated storm flows, debris flow potential, and associated road fill failures would further impair 303(d) listed streams. Excess sediment loads from the 1987 Yellow Fire and road failure related debris flows are well documented in fire the affected watersheds (De la Fuente et al. 1991 & 2006). Several small sub-watersheds have been entirely burned at mostly moderate to high soil burn severity wildfire. The Probability of Damage or Loss is Likely to Very Likely and the Magnitude of Consequences would be Moderate resulting in High to Very High risk. **Reduce sediment loads and probability of fill failures via implementation of road and trail treatments. Re-establish sediment retention pond at Olsen Creek.***

- *Critical habitat or suitable occupied habitat for federally listed threatened or endangered terrestrial, aquatic animal or plant species on or in close proximity to the burned NFS lands. Probability of Damage or Loss of habitat for Federally Threatened coho (and Critical Habitat) and FS Sensitive Chinook, steelhead, and lamprey species would be Possible to Likely. The Magnitude of Consequences would be Moderate. With these two elements combined the risk is identified as Intermediate to High. **Treatments Recommended - Reduce erosion threat via implementation of road and trail treatments which includes installing at rolling drip on the Kelly Gulch crossing on 40N39. Re-establish sediment retention pond at Olsen Creek. Hand remove excessive sediment within thermal refugia areas.***
- *Native or naturalized communities on NFS lands where invasive species or noxious weeds are absent or present in only minor amounts. The Salmon Complex on the Klamath National Forest lands occurred in areas where noxious weeds are absent or present in only minor amounts. Dense infestations of dyer's woad and yellow starthistle occur adjacent to the fire footprint and are a likely seed source into the burn area. The Probability of Damage or Loss from non-native species introduction or spread is Likely to occur, with the Magnitude of Consequences being Moderate, this results in a risk assessment of High. **Treatments Recommended - Noxious weed detection surveys, hand pulling, and seeding with local native grass species as competition.***

- Cultural Resources –

- *Values at risk relating to Cultural Resources include diminishing the National Register of Historic Places (NRHP) values of sites eligible for, or potentially eligible for, listing on the NRHP. The Salmon Complex occurred on NFS lands where previously recorded sites that have not been evaluated for NRHP eligibility were located. Sites which have not been formally evaluated must be considered as potentially eligible until a formal determination has been made. Areas within sites which have been denuded of vegetation due to the fire have exposed artifact concentration previously obscured from view, which are now subjected to*

an increased risk of looting. Due to these artifact concentration being located in close proximity to an easily accessible and highly traveled county road, as well as being visible from the same road, the *Probability of Damage or Loss* is considered *High*. The *Magnitude of Consequences* is *Moderate*, given that the loss of these resources would diminish the site's NRHP values. The combination of these elements results in an assessment of *High* utilizing the risk matrix. **Treatments Recommended – Installation of vegetative (or other appropriate) camouflage to obscurign artifact visibility from highly traveled road, limited monitoring to ensure that treatments are effective.**

B. Emergency Treatment Objectives (narrative): The primary objective of this Burned Area Emergency Response Report is to recommend prompt actions deemed reasonable and necessary to effectively protect, reduce or minimize significant threats to human life and property and prevent unacceptable degradation of natural resources. The application of these BAER treatments would minimize on-site and downstream damages to the identified values at risk. The emergency treatments being recommended by the Salmon River Complex BAER Team are specifically designed to achieve the following results.

Proposed Treatments

The objectives of the treatments are to:

1. Protect human life and safety by raising awareness through posting hazard warning signs on trails, reinforcing trail tread, improving trail drainage, improving road drainage, and communicate hazard of flooding and debris flow to cooperating agencies and community groups.
2. Protect Forest Service investment in road and trail infrastructure by installing drainage features capable of withstanding potential increased stream flows and/or debris flows.
3. Protect hydrologic function, domestic water sources and 303(d) listed streams through Trail Maintenance, NFTS Road Stormproofing, and re-establishment of the Olsen Creek sediment retention ponds.
4. Protect ecological values of critical habitat of federally listed habitat for Federally Threatened coho (and Critical Habitat) and FS Sensitive Chinook, steelhead, and lamprey species Creeks through road and trail work.
5. Protect ecological value of biological diversity by monitoring and treating as necessary, sites where introduction of noxious weeds may have occurred in previously uninvaded sites.

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

A programmatic biological assessment (BA) for facility maintenance (including road maintenance, trail maintenance), on KNF lands for threatened and sensitive salmon and steelhead is in place, which will streamline ESA compliance and allow immediate implementation of BAER treatments.

The goal is for road and in-stream treatments to be completed by October 15, 2013. Extensions past October 15 can be granted by a fish biologist or earth scientist assuming the project still meets BMPs and wet weather operations standards (WWOS). Examples of conditions that may warrant an extension are (a) an extended dry weather forecast or (b) a greater risk of environmental harm by leaving a site to over winter in its current condition versus finishing the work.

Land 90% Channel 90% Roads/Trails 90% Protection/Safety 90%

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	90	90
Channel	70	80	80
Roads/Trails	80	90	95
Protection/Safety	90	90	90

E. Cost of No-Action (Including Loss): \$3,454,750 (calculated from the Values at Risk (VAR) tool)

F. Cost of Selected Alternative (Including Loss): \$795,829
(calculated from the Values at Risk (VAR) tool)

G. Skills Represented on Burned-Area Survey Team:

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

Team Leaders: Joe Blanchard - Region 5 – Forest Soil Scientist, Klamath NF

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Team:

GREGG BOUSFIELD - HYDROLOGY
MARLA KNIGHT AND DANIKA CARLSON - BOTANIST/INVASIVE SPECIES
ANGIE BELL AND RYAN MIKULOVSKY - GEOLOGY/GIS
TOGAN CAPOZZA AND SAM COMMARTO - RECREATION
DAVE SEILER AND KEN BIGELOW - ENGINEERING
MAIJA MENEKS - FISHERIES
BRAD RUST - SOILS
JASON COATS - ARCHAEOLOGY

H. Treatment Narrative:**Land Treatments:****Cultural Resource Treatments.**

Treatment objectives to mitigate the Cultural Resources emergency include reducing the likelihood that sites will be subjected to looting and vandalism due to an increased visibility of artifacts, and ensuring that the implementation of treatments designed to mitigate other resource concerns do not negatively impact the NRHP values of eligible or potentially eligible sites.

Specific protection measures designed to reduce the probability of looting for selected artifact deposits include installation of locally available vegetative camouflage or other material (e.g. straw, wood shavings, etc.) to obscure the artifacts on the surface. Following this treatment, monitoring will be necessary to evaluate the effectiveness of this treatment, which would consist of periodic site visits (approximately four) throughout the year to monitor site condition and assess whether or not evidence of unauthorized artifact collection is present.

Cultural Resource protection measures applicable to the implementation of proposed treatments associated with other resources (e.g. soils, fishery, etc.) which occur within site boundaries include on-site monitoring by a qualified USFS Archaeologist during implementation.

Cultural Resource Treatment Costs

Item	Unit	Unit Cost	# of Units	Cost
GS-9 Archaeologist	Days	\$275	10	\$2,7500
Mileage	Miles	\$0.5	430	\$215
Camo Materials/Straw Bales	Bale	\$10	100	\$1000
			Total Cost:	\$3,965

Noxious Weed/Invasive Plant Detection Surveys.

Treatments to mitigate the noxious weed emergency include an initial detection survey, and seeding with locally collected and produced native perennial grass seed. Surveys will begin in 2014 at times when the species are the most visible. Because of differences in flowering times for all potential species, two visits may be required during the growing season. Completion of surveys in roads, dozer lines, drop points, helispots, wilderness trails, staging areas, safety zones, and areas where known invasive infestations were dormant prior to fire will be the first priority. The second priority for survey will be along hand lines.

All locations of noxious weeds discovered will be mapped and entered into the National Resource Inventory System (NRIS) according to National protocol. Treatment will be

recorded as directed by the same National protocols. Treatment will consist of hand pulling to root depth and if seed is present, plants will be bagged and properly disposed.

Seeding with desired local native grass species will occur in the Yellow Jacket Ridge weed assessment area where it is likely that these grass species can establish and compete with newly introduced noxious weeds. A seed mix of *Elymus glaucus* and *Melica harfordii* will be spread by hand in the vicinity of the K spur on road 40N51 that likely had noxious weed seed spread. This treatment will occur either just prior or just after the first rain of the season. Approximately 10 acres is planned, at a rate of approximately 25 lbs/acre, a total of 250 pounds of seed will be used.

Weed Survey Costs

Weed Assessment Area	Survey Miles	Survey Acres	Acres of Native grass seeding	Labor Cost	Mileage Cost	Seed and Application Cost	Supplies	Project Admin
Yellow Jacket Ridge	34.6	1.7	10	\$3,830	\$667	\$5,000	\$167	\$1,541
Little North Fork	17.4	1.1	0	\$2,023	\$667		\$167	\$1,541
Kelly Gulch	35	5	0	\$6,482	\$667		\$167	\$1,541
						Total Cost:	\$24,460	

Channel Treatments:

Sediment catch basin Olsen Creek

With vaules at risk including hydrologic response, 303(d) listing, and ESA Threatened and FS Sensitive salmonids species the treatment recommendation is re-establishment of the sediment retention pond located at Olsen Creek. This is supported following field review of the Yellow Jacket Ridge drainages where they intersect the County Road, and supplemented by a report on sediment discharge in the years following the 1987 fires (de la Fuente 1990). Although other drainages – Big Creek, especially – also have elevated risk of sediment delivery to NF Salmon River, they are excluded from treatment because the configuration of these streams near the County Road is such that ponds cannot be constructed.

The treatment includes regularly removing sediment from the Olsen Creek sediment catch basin and hauling sediment to a near by disposal area.

Sediment Basin Costs

Item	Unit	Unit Cost	Production Rate	# of Units	Cost
Excavator	Hours	250	50 CY/HR	140	35000
Dump truck	Hours	100	50 CY/HR	140	14000
				Total Cost:	\$49,000

Hand treatment of salmon refugia

The report by de la Fuente (1990) illustrates that creek mouth habitat is susceptible to in-filling and the creation of deltas. To maintain connectivity to cooler water in tributaries, a fisheries treatment recommendation is to hand-remove sands from confluences where elevated sediment is expected to occur due to moderate and high burn severity – i.e., Big Creek, Cronan Gulch, Kanaka Gulch, and Olsen Creek. This activity would likely occur in July following spring run-off as it becomes apparent where deltas might form and impede access to cool water, and before thermal refugia is needed. Removal of fines would also occur following storm events in the respective drainages.

Hand Treatment Costs

Item	Unit	Unit Cost	# of Units	Cost
GS-5 Seasonal	Days	\$132	\$20	\$2,640
GS-11 Fish Bio	Days	\$320	\$5	\$1,600
Mileage	Miles	\$0.5	\$520	\$260
			Total Cost:	\$4,500

Roads Treatments:

Of the roads burned in the Salmon River Complex approximately 27.47 miles of road were classified as High or Very High Risk during the risk assessment. These 27.47 miles are the values at risk (VAR) that warrant treatment for emergency response. The roads that meet VAR criteria for treatment are constructed in highly unstable and erosive decomposed granite. This places the roads at much higher failure risk from sediment laden runoff during post fire storm flows.

Three options to address the emergency of undersized culverts for expected increased post-fire storm flows were considered. These include pulling culverts and closing roads or sections of roads, modify existing culverts, or upgrading culverts. Road closure was ruled out for FS Roads 40N51 and 40N33 because they are major arterial roads on the Salmon River District. In addition to the value of the roads, values at risk if these road are closed include access to hundreds of acres of plantations, Wilderness access, trails heads, and an alternative travel route for residents on the North Fork of the Salmon should the Sawyer's Bar road become blocked. At other locations including FS Roads 40N42 and 40N39, pulling major culverts instead of upgrading or modifying would restrict access to more than 10 miles of road on which maintenance of existing ditches, catch basins, and culvert cleaning is recommended.

In the low to very low burn severity areas the risk of damage to roads and crossings from elevated post-fire runoff and debris flows is intermediate or low and therefore no treatments are recommended.

In areas that have a high to moderate burn severity there is a larger risk of damage and/or loss of the road from the post fire flows. Each crossing was analyzed to determine the most cost effective treatment to mitigate risk from post-fire runoff and debris flow. Treatments include cleaning existing ditches, catch basins and plugged culverts while installing critical dips with energy dissipaters at select locations subject to the most risk. This action is less expensive than installing new culverts and helps minimize the cost of treatment while decreasing the risk to the roads.

At crossings where risk cannot be mitigated with other means, proposed treatment include upsizing undersized culverts to handle the additional flow. Two of the upsized culverts are in the Garden Gulch drainage on the 40N51 road. This steep grantic drainage had an estimated post-fire peak flow increase of 136% for a 2-year rainfall event. Culvert upgrading was recommended over installing critical dips because of the likelihood of the existing culvert becoming overwhelmed by post-fire runoff and the sensitivity of the grantic soils to erosion. Culvert upgrading is justified at other locations because drainage crossings with plastic pipes and aluminum culverts have been damaged beyond repair, which has led to severely reduced to no hydraulic capacity. With predicted post-fire peak flow increases, these crossings are a high risk of failure which would compromise the stability of the road during a storm.

COST ESTIMATE

Salmon River Complex BAER Project Specified Road Package

ITEM #	DESCRIPTION	UNIT	EST. QUANT	UNIT PRICE	TOTAL COST	COMMENT
15101	Mobilization	LS	1	\$ 35,614.40	\$ 35,614.40	
15754	Erosion Control & Pollution Prevention Plan	LS	1	\$ 1,000.00	\$ 1,000.00	
20420	Drainage Excavation - Type IV Rolling Dip	EA	58	\$ 1,500.00	\$ 87,000.00	
25101A	Machine Placed Riprap Class III	CY	910	\$ 68.00	\$ 61,880.00	
20701	Geotextile w/out Gravel Cushion, FCT J, Non-Woven Needle Punched	SY	2790	\$ 2.50	\$ 6,975.00	
30111A	Aggregate Type 1-1/2 Minus Surface Aggregate, Commercial Source, Grading C, Compaction C	CY	2104	\$ 56.00	\$ 117,824.00	
30111B	Aggregate Type 12"-minus Surface Course, Commercial Source, Grading C, Compaction C	CY	217	\$ 56.00	\$ 12,152.00	
30304	Road Reconditioning, Maintain Ditch	MILE	4.11	\$ 150.00	\$ 616.50	

60208	Install End Section for 18" Dia Culvert	EA	1	\$ 200.00	\$ 200.00	
60211A	18" Dia CMP, 0.079-in thick for Stl, Method A	LF	100	\$ 61.00	\$ 6,100.00	Replace culverts with little to no hydrologic capacity and large post-fire peak flow increase
60211B	24" Dia CMP, 0.079-in thick for Stl, Method A	LF	450	\$ 90.00	\$ 40,500.00	
60211C	30" Dia CMP, 0.109-in thick for Stl, Method A	LF	80	\$ 155.00	\$ 12,400.00	
60211D	36" Dia CMP, 0.109-in thick for Stl, Method A	LF	60	\$ 186.00	\$ 11,160.00	Garden Gulch
60211E	48" Dia CMP, 0.109-in thick for Stl, Method A	LF	40	\$ 210.00	\$ 8,400.00	Garden Gulch
60404	Catch Basin, Clean out/Maintain	EA	6	\$ 125.00	\$ 750.00	
60452	Install Drop Inlet Cover Type A	EA	4	\$ 150.00	\$ 600.00	
60708	Cleaning Culverts in place	EA	20	\$ 100.00	\$ 2,000.00	
61001	6" PE Drain Pipe for MSE Wall	LF	90	\$ 5.00	\$ 450.00	
				\$		
				TOTAL = 405,621.90		

Trail Treatments:

On the Garden Gulch Trail in areas where there are burned out cavities beneath the tread, rock will be used to fill and reinforce the area.

On sections of the Garden Gulch Trail with steep grades, water bars will be installed or existing water bars cleaned to divert surface water, curb trail erosion and protect the investment in this facility. Installation should be designed to last no more than 3 years -- permanent structures are not part of this treatment.

Trail work addressing areas with potential for trail collapse due to burned out roots and logs beneath the tread and erosion control measures will be implemented by a small force account trail crew. The implementation of the work will take place as soon as practical, before the winter season. The cost of this trail tread work is \$7,436.00.

Trail Treatments Costs

Item	Unit	Unit Cost	# of Units	Cost
Trail Crew	Hours	\$46	120	\$5,520

GS-7 Crew Oversight	Hours	\$29	40	\$1,160
Mileage	Miles	\$1	1050	\$756
			Total Cost:	\$7,436

Protection/Safety Treatments:

Relative to the increased risk posed by wind thrown trees and deteriorated trail tread conditions within the burned area, safety-hazard notification signs should be developed, purchased and posted at all trailheads leading into the burned area.

Purchasing and installing hazard warning signs at trailheads that enter the burned area could be implemented almost immediately. This would help warn users of the possible dangers they may encounter along the trails. This treatment is practical and technically feasible and the cost \$695.00.

Trail Safety Costs

Item	Unit	Unit Cost	# of Units	Cost
GS-7	Days	\$248	2	\$496
Posts	Each	\$12	4	\$48
Hazard Signs	Each	\$10	4	\$40
Mileage	Miles	\$1	140	\$111
			Total Cost:	\$695

I. Monitoring Narrative:

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

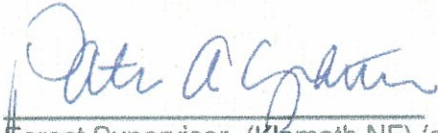
None requested.

Part VI –Emergency Stabilization Treatments and Source of Funds

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands				All Total \$
			# of Units	BAER \$		# of units	Fed \$	# of Units	Non Fed \$	
A. Land Treatments										
Noxious Weed Detection	Miles	\$281	87	\$24,460	\$0		\$0		\$0	\$24,460
Cultural Resource Trt.	EA	\$3,965.00	1	\$3,965			\$0		\$0	\$3,965
				\$0						
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Land Treatments				\$28,425	\$0		\$0		\$0	\$28,425
B. Channel Treatments										
Olsen Cr. Sed. Basin	EA	49000	1	\$49,000	\$0		\$0		\$0	\$49,000
Sediment Hand Trt.	EA	4500	1	\$4,500	\$0		\$0		\$0	\$4,500
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Channel Treat.				\$53,500	\$0		\$0		\$0	\$53,500
C. Road and Trails										
40N33	Miles	\$ 7,320.26	1.53	\$11,200	\$0		\$0		\$0	\$11,200
40N39	Miles	\$ 3,431.88	2.4	\$8,237			\$0		\$0	\$8,237
40N42	Miles	\$ 20,057.59	5.92	\$118,741			\$0		\$0	\$118,741
40N51	Miles	\$ 15,178.46	17.62	\$267,444	\$0		\$0		\$0	\$267,444
Trail work	mile	2,124.57	3.5	\$7,436	\$0		\$0		\$0	\$7,436
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Road & Trails				\$413,058	\$0		\$0		\$0	\$413,058
D. Protection/Safety										
Install hazard signs	each	173.75	4	\$695	\$0		\$0		\$0	\$695
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Structures				\$695	\$0		\$0		\$0	\$695
E. BAER Evaluation										
BAER Assessment	report	30675			\$30,675		\$0		\$0	\$30,675
<i>Insert new items above this line!</i>				--	\$0		\$0		\$0	\$0
Subtotal Evaluation				--	\$30,675		\$0		\$0	\$30,675
F. Monitoring										
				\$0	\$0		\$0		\$0	\$0
<i>Insert new items above this line!</i>				\$0	\$0		\$0		\$0	\$0
Subtotal Monitoring				\$0	\$0		\$0		\$0	\$0
G. Totals				\$495,678	\$30,675		\$0		\$0	\$526,353
Previously approved										
Total for this request				\$495,678						

PART VII - APPROVALS

1.

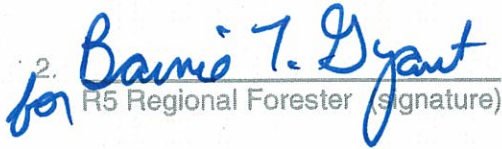


Forest Supervisor (Klamath NF) (signature)

9.4.13

Date

2.



R5 Regional Forester (signature)

9/11/13

Date