

USDA-FOREST SERVICE

FS-2500-8 (7/08)
Date of Report: 9/8/14

OREGON FIRE BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST



The Oregon Fire of 2014 looking into McKenzie Gulch area reburned since Oregon Fire of 2001.

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: Oregon Fire
- B. Fire Number: Oregon = CA-SHU-007763
- C. State: CA
- D. County: Trinity
- E. Region: 5
- F. Forest: Shasta-Trinity
- G. Districts: Trinity River Management Unit
- H. Fire Incident Job Code: PNJC78
- I. Date Fire Started: Day = August 24, 2014
- J. Date Fire Contained: Day = August 28, 2014
- K. Suppression Cost: Day = \$2 million
- L. Fire Suppression Damages Repaired with Suppression Funds
- Oregon =
1. Dozerline repaired / waterbarred: 13 miles
 2. Hand line repaired: 5 miles
 3. Hand line still needing repair: 0 miles
- M. Watershed Number and Name:
- Oregon = 1801021106 -- Weaver Creek
- N. Total Acres Burned:
- Oregon: 590
- NFS Acres (441), Private (149)
- O. Vegetation Types:
- Douglas-fir-Pine Mixed Conifer Forest, Open Ponderosa-Gray Pine-Deciduous Oak Forest
- P. Dominant soils: Forbes
- Q. Geologic Types: Quaternary nonmarine deposits
- R. Miles of Stream Channels by Order or Class:
- 0.2 Miles Perennial, 2 Miles Intermittent, 4 Miles Ephemeral

S. Transportation System:

Oregon: Trails: 1.1 miles Roads: 1.0 miles**PART III - WATERSHED CONDITION**

A. Soil Burn Severity by total and FS (acres):

Oregon Fire - Soil Burn Severity				
Rating	FS	Pvt.	Acres	%
Very Low	172	80	252	42
Low	68	40	98	17
Moderate	154	46	200	34
High	37	3	40	7
Totals	441	149	590	100

Soils

B. Soil Resource Condition Assessment Sections:

The Oregon fire occurred in the vicinity of Weaverville just west along Hwy 299 at West Weaver Creek. NFS lands as well as private ownerships were affected. FS BAER team earth scientists assessed the incidents with a whole-watershed approach regardless of ownership. Soil burn severity patterns varied for the fires due to different topographies and fire behavior.

The high and moderate soil burn severity classes have evidence of severe soil heating in a patchy distribution. Soil seedbank and infiltration characteristics are impacted in the areas that have burned repeatedly (Oregon 1 Fire, 2001 and Junction Fire, 2007) for the high and moderate soil burn severity (SBS) areas, so natural recovery will be slow in these areas along with high runoff and erosion. The low to very low soil burn severity classes (areas to the east of Sidney Gulch) still have good surface structure, contain intact fine roots and organic matter, and should recover in the short-term once revegetation begins and the soil surface regains cover. Water repellency is common, varying from slight and surficial in all burn classes; so it is expected to exacerbate runoff production. Unburned areas had no repellency. Soils are fine-loamy (Forbes) that generally have moderately slow infiltration rates; thus surface runoff and erosion should be significant in steep sparsely-vegetated slopes (McKenzie and Sidney Gulch areas). There is high potential for sediment delivery to the fluvial system due steep burned hillslopes that lack cover, so aquatic habitat and water quality effects from sediment will be significant.

C. Water Repellent Soils:

Water repellency is common, varying from slight and surficial in in all soil burn classes, so it is expected to greatly exacerbate runoff production. Unburned areas had no repellency.

D. Erosion Potential (erosion hazard rating):

Erosion hazard ratings for low, moderate, and high soil burn severity are listed in the table below. With removal of soil cover and soil burning, moderate erosion hazard areas on steeper map unit 67 rate as

high and low as moderate. Looking at the table below shows about 16% high erosion hazard due to soil burning and 84% rates as moderate soil erosion hazard.

Map Unit	Soil Name	Acres	Burn Severity	Erosion Hazard Rating
66	Forbes Family, 20-40% slopes	384.0	Low	Moderate
			Moderate	Moderate
			High	Moderate
67	Forbes Family, 40-60% slopes	76	Low	Moderate
			Moderate	Moderate
			High	High

E. Sediment Potential:

ERMiT estimates (part 3D) try to account for hillslope re-deposition, and sediment production numbers are delivery to the bottom of the hillslope. Many modeled hillslopes in this fire have streams at the base of the slope; water will run off these fine-loamy soils and fine sediment will be deposited into Sidney and West Weaver Creek. Looking at the table below shows for the whole watershed there is a 16 times increase in erosion for a 2-year storm, a 23 times increase for a 5-year storm, and a 33 times increase for a 10-year storm over background levels of 1 ton/acre. Individual watersheds are listed below the whole watershed values. These watersheds were modeled to determine the amount of erosion to a particular value at risk (culvert, bridge, stream, etc.) each with its own watershed size. In all cases the relative increase are the same except in Garden Gulch watershed burned area due to steeper slope that generated greater rates of erosion. With these anticipated rates of erosion the fine-textured Forbes soil high amounts of red clay that will mobilize causing significant turbidity affecting water quality and fish habitat.

Estimated Sediment Production for a range of storm runoff events											
					2 year event		5 year event		10 year event		
Watershed Name	Total Acres	Acres Burned	% Burned	% Unburned	tons/acre	tons	tons/acre	tons	tons/acre	tons	
Whole watershed	460	460	100	0	16.56	9550.8	23.49	13,743.40	32.59	18,700.90	
Watershed near origin	28	27	96	4	14.45	396.9	20.31	553.3	26.63	703	
Garden Gulch	104	74	71	29	22.9	2,082.60	33.02	3,064.40	50.49	4,762	
Sidney/Weaver Bally	263	206	78	22	14.45	3,508.00	20.31	5,021.00	26.63	6,561.10	
Sidney/Ash Hollow	268	207	77	23	14.45	3,563.40	20.31	5,104.60	26.63	6,674.50	

Hydrology

Field evaluations were conducted to identify potential values at risk. Key values at risk identified by the team lead (Forest Soil Scientist) prior to field surveys were a suite of road crossings in and downstream of the fire area. The crossings (pour points) that were assessed and analyzed were:

- FS Culvert near the fire origin
- Private bridge constricting Garden Gulch
- Sidney Gulch at Weaver Bally Loop Road
- Sidney Gulch at Highway 299 (adjacent to the FS district office)

In addition to the road crossings, the Sidney Gulch stream system is considered a critical value as portions of it are anadromous fish-bearing.

An analysis of pre- and post-fire discharge was done for the four stream pour points. The USGS StreamStats analysis tool (<http://water.usgs.gov/osw/streamstats/california.html>) was used to estimate 2, 5, and 10-year return flows. In California the analysis tool relies on regression equations from Waananen and Crippen (1977). These *design* flow rates were then used as the basis for estimating post-fire increased flows after a method by Kaplan-Henry (2007). Results of the hydrologic assessment are summarized below.

Pour Point	Drainage Area (miles ²)	High and Moderate Severity Burn (miles ²)	Q2 (cfs)	POST-Fire Q2 (cfs)	POST-Fire Q2 Factor Increase	Q10 (cfs)	POST-Fire Q10 (cfs)	POST-Fire Q10 Factor Increase	Notes
Culvert Near Origin	0.04	0.04	4	10	2.5	10	18	1.8	Recommend culvert up-size
Garden Gulch at Constriction	2.3	0.07	137	146	1.1	332	349	1.1	Private bridge not at increased risk
Sidney Gulch at Weaver Bally Loop Rd.	2.4	0.25	145	167	1.2	348	386	1.1	Existing culvert not at increased risk
Sidney Gulch at State Highway 299	2.7	0.25	162	188	1.2	386	434	1.1	Existing culvert not at increased risk

The table above shows for a 2-year storm event a 2.5 times increase for the drainage above West Weaver Creek and 1.1 to 1.2 times increase for all other modeled drainages. This is due to the nature of the fire cutting across most of the bigger watersheds and only burning a small watershed completely above West Weaver Creek. The table above shows increases in flow due to the fire but only one watershed with a significant increase due to being burned completely (watershed above West Weaver Creek).

Geology

The terrain in the burn area is gently sloping to the south, averaging about 15%, but ranging from 5% to 40%; the inclines are steeper in the north and gentler to the south. Although no dormant landslides or inner gorges are mapped within the fire area, the watersheds that drain into Weaverville are lie on a series of Tertiary/Quaternary debris flow and glacial till deposits.

Landslide and Erosion Hazards- The presence of a recent debris slide, despite the gentleness of slopes, reveals an increased potential for slumps and shallow debris slides. There is also significant potential for sediment transport due to three main factors:

1. Historical placer and hydraulic mining in the vicinity has destabilized the poorly-cemented conglomerate of the Weaverville Formation. McKinzey Gulch, especially, shows signs of past mining activities. This drainage suffered the highest fire severity and should prove be the greatest contributor of sediment and debris.
2. Forest soil scientist at the Shasta-Trinity SO, performed soil tests in the area. The extreme temperature of the fire over most of the burn area has increased the hydrophobicity of the soil, with water repellency reaching 1" in depth in areas with the highest burn severity.

3. The lack of vegetative and organic debris cover caused by this fire and the two previous fires increases the likelihood of sheeting, rilling, gullyng and movement of sediments.

Potential Effects- Due to the Mediterranean climate, the Weaverville area receives between 6.5 to 8 inches of rain per month during the winter rainy season (U.S. Climate Data). With nearly all vegetation and organic litter removed from the slopes in the larger perimeter of the burn, a large volume of fine to pebble-sized sediment as well as plant debris is likely to be entrained and transported into the ephemeral creeks. This will most likely have an impact on the infrastructure in the town of Weaverville, namely the culverts under Weaver Bally Loop, Sidney Gulch Road, Main Street (SR 299), Forest Avenue, and Odd Fellows Avenue. The foot bridges over Sydney Gulch within the U.S. Forest Service Weaverville Ranger Station compound may be affected, as well as the area behind the Joss House State Historic Park.

PART IV - HYDROLOGIC DESIGN FACTORS

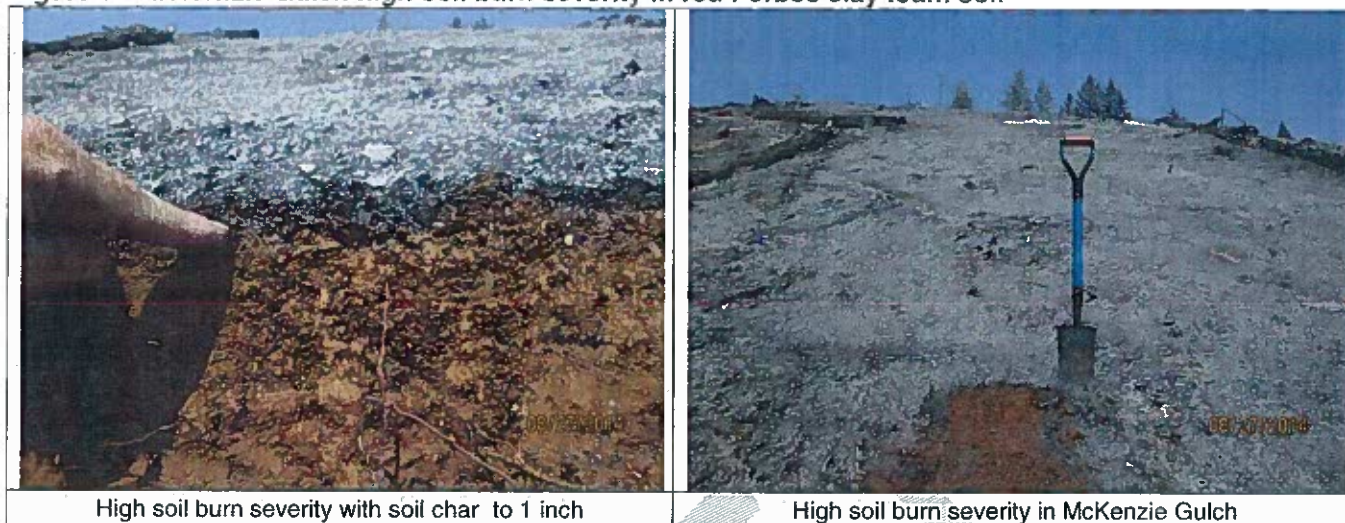
A. Estimated Vegetative Recovery Period, (years):	5
B. Design Chance of Success, (percent):	80
C. Equivalent Design Recurrence Interval, (years):	2
D. Design Storm Duration, (hours):	6
E. Design Storm Magnitude, (inches):	1.3
F. Design Flow, (cubic feet / second/ square mile):	60
G. Estimated Reduction in Infiltration, (percent):	50
H. Adjusted Design Flow, (cfs per square mile):	68

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

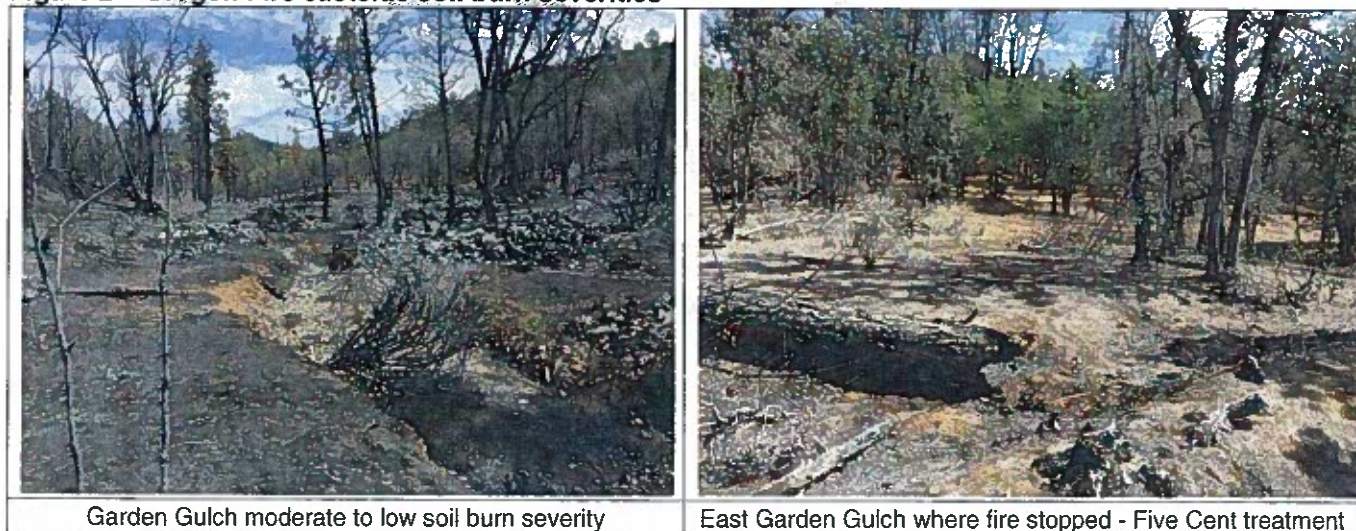
Background:

The Oregon fire started on August 24, 2014, near the Oregon Mountain summit, which is approximately 3 miles northwest of Weaverville, CA. The fire was ignited by a vehicle on Highway 299 towing a boat trailer that became unhitched and threw sparks off of Highway 299. High winds pushed the fire towards the east over steep terrain and into a fuel treatment area, where the fire was stopped. A small spot fire occurred just east of the 5-cent fuel treatment area (2013). A total of 580 acres was recorded as burned but the heat perimeter showed 590 acres and BARC imagery showed only 480 as burned. The decision was made to go with the heat perimeter acres since the area between the main fire and a large spot fire have multiple under canopy spot fires. In 2001, the Oregon fire occurred, which covered the western portion of the current Oregon fire perimeter and stopped approximately a quarter mile west of Garden Gulch. In 2006, the area burned again in the Junction fire. The Junction fire burned on the very western portion of the 2014 Oregon fire along Weaver Creek. The Oregon fire of 2014 was stopped by the 2013 5-Cent Fuels treatment project that removed all ladder fuels.

Figure 1 – McKenzie Gulch high soil burn severity in red Forbes clay loam soil

Approximately 40% burned at high and moderate soil burn severity (see soil burn pictures above). The rest of the fire was either low or very low soil burn severity (see below soil burn severity map). 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.

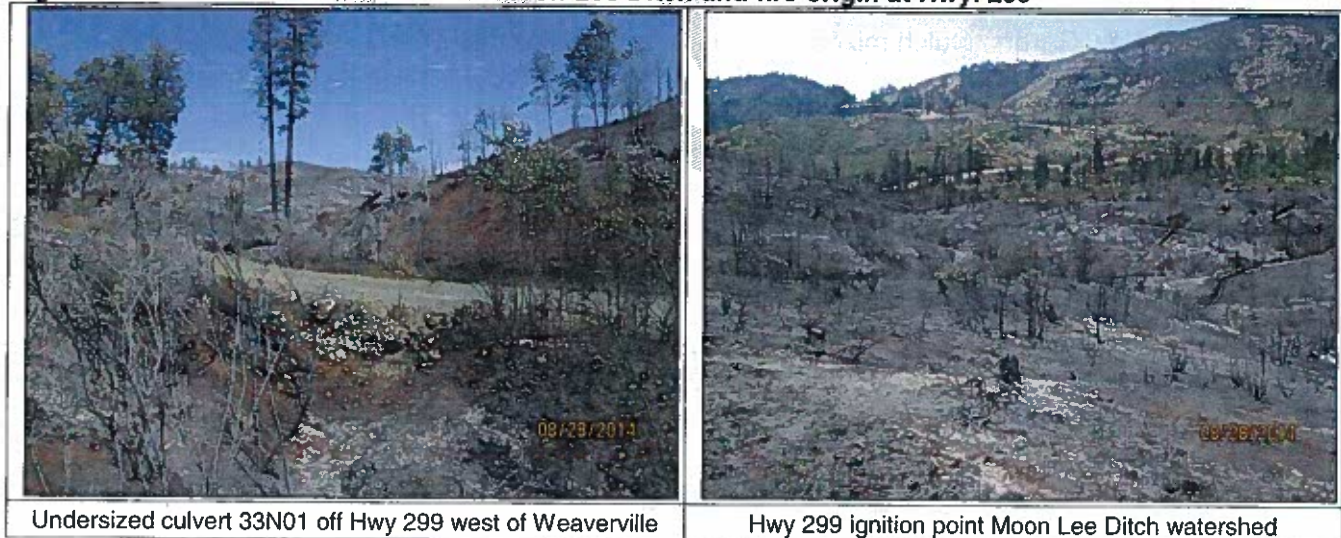
Pictures below show Garden Gulch mixed mortality where the picture on the right shows low to very low soil burn intensities due to the fire stopping at the 5-cent fuels treatment on the east side of the Oregon fire.

Figure 2 – Oregon Fire eastside soil burn severities

Based on the observations and fire area conditions described above, an emergency exists for the following: 1) West Weaver Creek (perennial), Sidney Gulch and McKenzie Gulch (presently intermittent drainages in the fire area) are an anadromous rearing habitat on the Upper Trinity River system. West Weaver Creek is also a domestic water source and irrigation source for the community water system and adjacent properties in the town of Weaverville. The fire burned and incinerating much of the ground cover including the vegetative and duff layer. Land treatments for reestablishing ground cover and creating in channel sediment control structures are necessary to keep expected sediment transport from reaching anadromous habitat and an important source to the town's water delivery system. 2) The Moon Lee Ditch (see pictures below) is a historic feature dating prior to 1860 and a primary domestic and irrigation source for the town of Weaverville. Moon Lee Ditch is a diversion off West Weaver Creek servicing Weaverville water demands. The ditch was directly damaged by intense fire as was the adjacent area and associated watershed draining into it. Treatments to establish ground cover, removing adjacent burnt dead standing vegetation and creating in-channel sediment control structures above the ditch are necessary for protecting the ditch and the municipal water supply and irrigation delivery system. 3) Damage to drainage structures occurred on Forest Roads 33N42 and 33N01. These roads drain directly into the anadromous fishery mentioned above and will need immediate repair in addition to the suppression rehabilitation treatments completed previously (see pictures below). 4) The potential for spread of noxious weeds by the use of heavy equipment for fire line construction exists. 5) Exposed archeological and mining sites are at risk to vandalism and erosion and will need treatments to protect these resources.

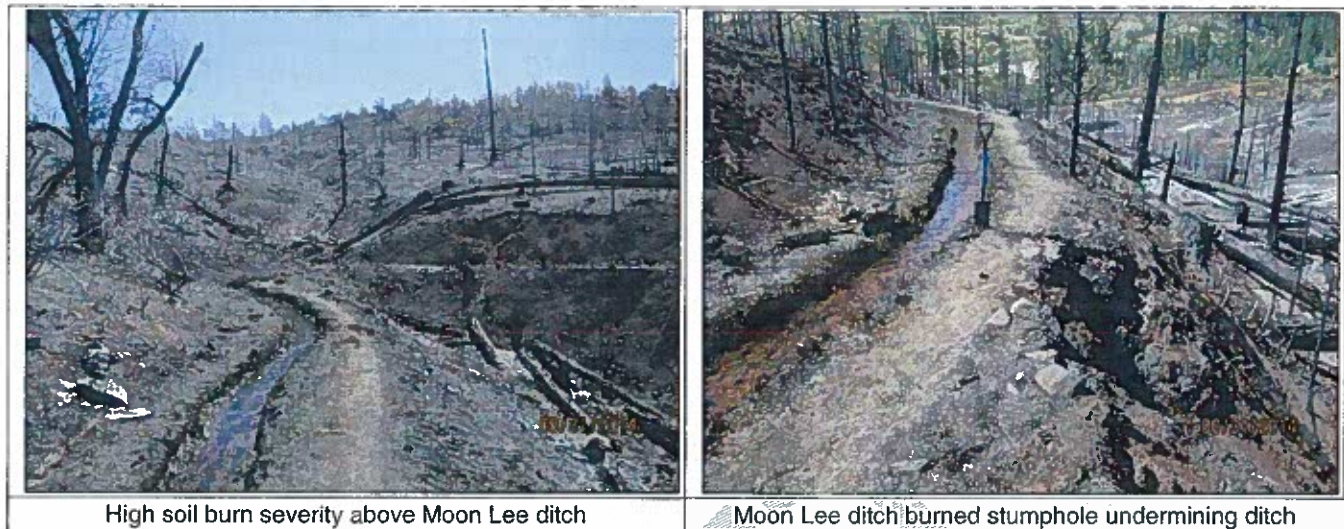
Particular area of concern is located northeast ¼ of section 2 into section 1. This area is a Forbes soils in the headwaters of McKenzie Gulch a tributary of Sidney Gulch (see cover picture). The area in the past was hydraulically mined. Several small area slides existed in the drainage system prior to the fire. All vegetation including an existing conifer stand was 100 percent killed and in-channel structures projects are proposed for this area to curb anticipated erosion.

Figure 3 – West Weaver Creek area of Moon Lee Ditch and fire origin at Hwy. 299



Undersized culvert 33N01 off Hwy 299 west of Weaverville

Hwy 299 Ignition point Moon Lee Ditch watershed



High soil burn severity above Moon Lee ditch

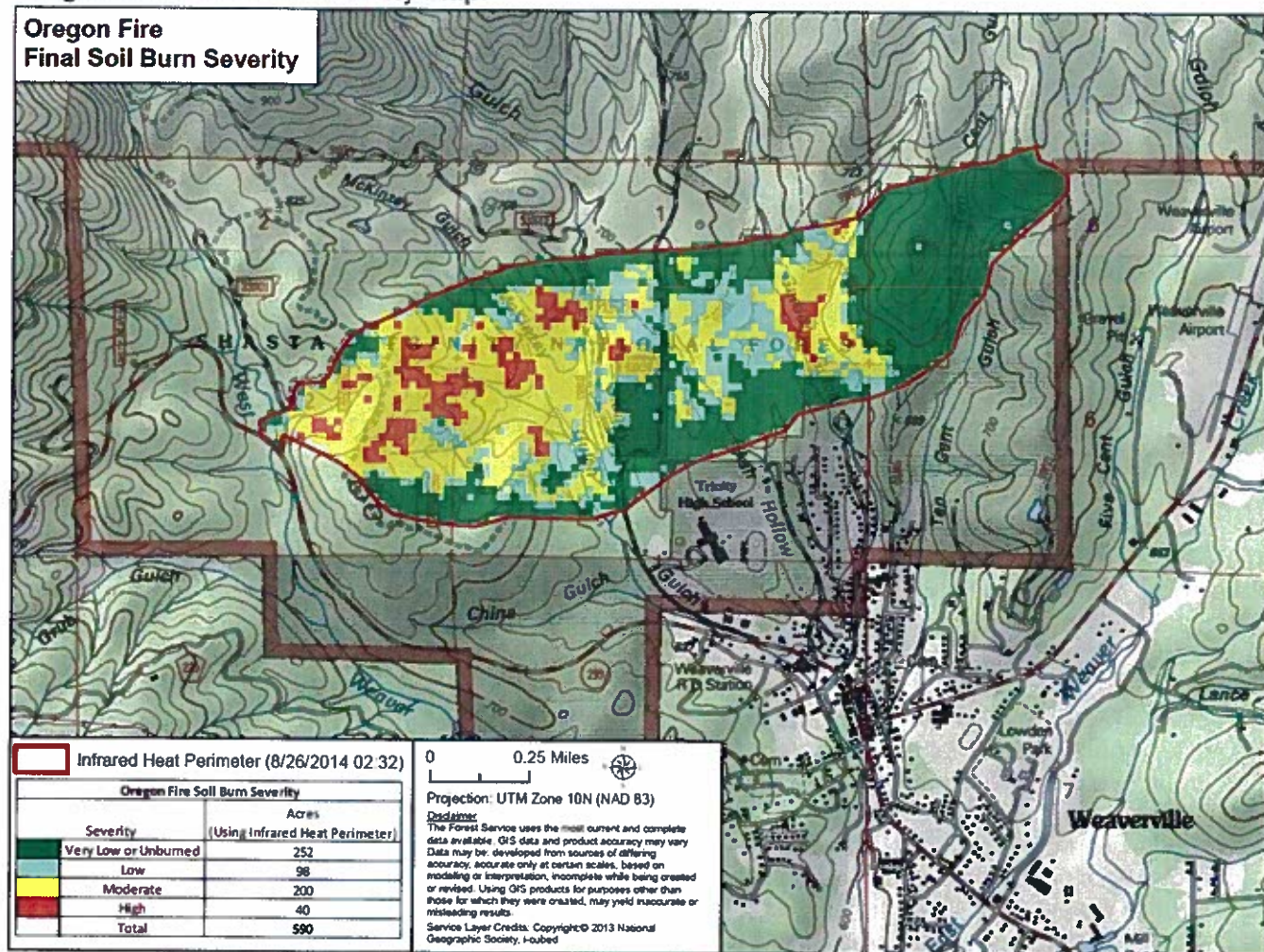
Moon Lee ditch burned stump hole undermining ditch

The fire burned with high intensity the area in and adjacent to the Moon Lee Ditch (see pics above). This ditch is a diversion off of West Weaver Creek initiating on USFS land in the NW ¼ of section 2 and moves onto private ownership land in the NE ¼ of section 11. Just north of the section line common to sections 2 and 11 an underground piped diversion off the ditch belongs to the Weaverville Community Services District which feeds a holding tank and water treatment system. During the six month warm season period, demands for water increase and this system provides ten to fifteen percent of the towns domestic water supply, where the remaining water (in the open ditch) services 17 private ownerships with water rights. Water rights for all users exist prior to 1866. The primary water user off the open ditch is the Weaverville Cemetery. The ditch is a registered historical site. After consultation with FS Special Uses, only portions of the ditch system are under permit and most either predates the need or is currently not under permit. The portions in section 11 have been historically maintained by the private ownerships. It is unclear exactly who has responsibility for maintenance on USFS ownership although the Weaverville Community Services District has performed emergency repairs as needed in the past. The Proposed BAER treatments are listed below in the Treatment Narrative for 2,215 feet of USFS lands only.

Weaver Creek is the seventh largest tributary in the Trinity Rivers watershed below Trinity Dam. West Weaver Creek and Sidney Gulch sub-watersheds have been impacted by the fire. Both are important parts of the Trinity Rivers anadromous fishery. Coho salmon and winter run steelhead are federally listed as Threatened fish species. Both species are known to occur in West Weaver creek within the perimeter of the fire and in McKenzie/Sidney Gulch just downstream from the fire perimeter. There are no known locations of federally Threatened or Endangered plant or wildlife species within the fire area. There are no other Forest Service Sensitive or Survey and Manage species locations but there is suitable habitat within the fire perimeter for Goshawk and Spotted Owl wildlife species and *Cypripedium montanum*, *Cypripedium fasciculatum*, *Smilax jamesii*, and *Sedum paradisum* plant species.

Twenty soil burn samples were taken in the field to confirm the soil burn severity mapping (see Appendix E). Looking at the soil burn severity maps below shows the majority of soil burn severity was moderate to low east of Sidney Gulch. Areas that burned the hottest were the west portion of the fire above West Weaver Creek, McKenzie and Sidney Gulches. This was due to heavy accumulations of dead and down timber left from the Oregon fire of 2001.

Oregon Fire Soil Burn Severity Map:

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:

The values at risk (VAR) matrix displayed below shows all the ratings for the potential values at risk for the Oregon fire. Only ones that rated as high or very high are discussed in detail, all others that rated intermediate to very low are only briefly discussed below or listed with their ratings in the table below.

Oregon BAER Risk Matrix		Magnitude of Consequences			Risk			Treatment			Responsibility
Critical Value	Probability	Life	Property	Other	Life	Property	Other	Life	Property	Other	
Infrastructure											
Flooding in the community of Weaverville	Possible	Moderate	Moderate		Intermediate	Intermediate		NOAA alert warning			Share info with NRCS
WFS Road damage	Likely		Major			High		Install rolling dips and upgrade 2 culverts			USFS
Weaver Basin and McKenzie trails damage	Likely		Moderate			High		Trail storm proofing of both trail systems & earthen barriers to decrease ohv users			Share info with Weaverville Trails assoc
Weaverville Ranger Station damage	Unlikely		Minor			Very Low		None			USFS
Weaverville water intake damage	Possible		Moderate			Intermediate		Assessment information			Share info with town
Weaverville irrigation water system (Moon Lee Ditch)	Likely		Moderate			High		Handmulch, or hell-mulch above Moon Lee Ditch			Share info with town
Aquatics											
										Straw bale check dams, gully plugs & rock check dam & culvert crossing rock armoring with culvert aprons along with helmulching	
T&E Aquatics species (Coho salmon habitat)	Likely		Major			Very High					USFS
Water Quality											
Domestic water of Weaverville	Likely	Moderate				High		Helmulching 120 acres			Share info with town
McKenzie and Sydney Gulch erosion causing turbidity	Likely		Moderate			High		Culvert crossing brushing and log debris removal			Share info with town
Headcutting channels in McKenzie Gulch	Possible		Moderate			Intermediate		Gully plugs & rock check dams			Share info with town
Cultural											
Exposed arch sites to vandalism	Likely		Moderate			Intermediate		Mulch sites to protect			USFS
Open and exposed McKenzie Mine	Very likely	Major				Very High		Safety signs to warn public	Sites fenced and mulched		USFS
Wildlife											
Habitat for NBD	Possible		Moderate			Intermediate				none	USFS
Soil Productivity											
Loss of soil productivity in high to moderate SBS areas	Likely		Moderate			High		Hel-mulch on less than 65% slopes			USFS
Geology											
Debris Flow Potential above the town of Weaverville	Unlikely	minor				Low		None			Share info with town
Rock fall above 299	Unlikely	minor				Low		None			Share info with CalTrans
Ecosystem Stability											
Unsettled open exposed ORV access	Possible		Moderate			High		Boulder barriers			USFS
Botany											
Native plant community invasive weeds	Likely		Major			High		Noxious weed detection surveys	Weed detection surveys; early detection rapid response treatments		USFS

Forest Service Roads and Trails

Life: As a result of the severely burned watershed risks to life and safety of Forest visitors and personnel entering certain areas of the burn are likely and pose a moderate risk, due to burned hazard trees along roadways.

Property: Based on the watershed response, the BAER Assessment team determined that residences and private property within and below the fire area are at increased risk of flooding as a result of the Oregon Fire. Forest roads within the fire area will be repaired as a result of suppression activity which is critical to protect road-bed and associated infrastructure. But because of the expected increase in watershed response, the assessment team feels that significant damage would occur on some roads in the fire perimeter due to undersized culverts and poor drainage (see hydrology and roads report for details). There is a likelihood that post burn conditions will increase runoff and the movement of sediment into drainage features, such as culvert inlets, overside drains, roadway dips and run outs, this occurrence could cause drainage function to fail and uncontrolled water to divert, resulting in a moderate risk of damage to the invested road improvements, loss of road function and the denial of access. Also county roads (Memorial Drive and Weaver Bally Loop Road) and even State Highway 299

at Sidney Gulch could be areas of concern due to limited culvert sizes. Forest trails (Weaver Basin Trail System and McKenzie Trail) are at risk from erosion and trail collapse due to burned hillslopes and stumpholes compromising the trail tread in multiple locations.

Risk Assessment – Forest Service roads

Probability of Damage or Loss: Likely. This determination is based on the expectation that increased erosion and sediment will occur and could plug drainage structures along roads.

Magnitude of Consequence: Moderate. This determination was made based on the amount of damage that would occur if culverts were temporarily plugged.

Risk Level: High

Risk Assessment – Forest Service Trails

Probability of Damage or Loss: Likely. This determination is based on the expectation that increased erosion and trail tread collapse will occur compromising the trail.

Magnitude of Consequence: Moderate. This determination was made based on the amount of damage that would occur if the trail was rendered impassible.

Risk Level: High.

Water Quality, Quantity, and Fisheries

West Weaver Creek and Sidney Gulch sub-watersheds have been impacted by the fire. Both are important parts of the Trinity Rivers anadromous fishery. Coho salmon and winter run steelhead are federally listed as Threatened fish species. Both species are known to occur in West Weaver Creek within the perimeter of the fire and in McKenzie/Sydney Gulch just downstream from the fire perimeter.

The second area of concern is located northeast ¼ of section 2 into section 1. This area is a Forbes soils in the headwaters of McKenzie Gulch a tributary of Sydney Gulch. The area was hydraulically mined with several small area slides existed in the drainage system prior to the fire. This area was burned extensively during the 2001 Oregon Fire and now has been extensively reburned by the 2014 Oregon fire. Erosion and flows will be high coming off this area causing significant turbidity and possible flooding at downstream crossing and possibly at the crossing of Hwy. 299 at Sidney Gulch box culvert above the FS Weaverville Ranger Station.

The Moon Lee Ditch is a historic feature dating prior to 1860 and a primary domestic and irrigation source for the town of Weaverville. Moon Lee Ditch is a diversion off West Weaver Creek servicing Weaverville water demands. The ditch was directly damaged by intense fire as was the adjacent area and associated watershed draining into it. Moon Lee Ditch hillsides and ditch structures were severely burned and areas of the ditch are undermined by burned out trees making the ditch susceptible to extensive damage from hillslope erosion.

Risk Assessment – Water Quality

Probability of Damage or Loss: Likely.

Magnitude of Consequences: Moderate.

Risk: High

Risk Assessment – Fisheries of Weaver and Sidney Creeks

Probability of Damage or Loss: Likely. This determination is due to the change in watershed response and increased bed-load turbidity affecting the fish habitat in Weaver and Sidney Creeks.

Magnitude of Consequence: Major. This determination is due to the change in sediments in the water and spawning gravel embeddiness that could occur.

Risk Level: Very High.

Risk Assessment – General aquatics

Probability of Damage or Loss: Likely. This determination is due to the change in watershed response and increased bed-load turbidity and embeddiness affecting the benthic macroinvertebrates in Weaver Creek.

Magnitude of Consequence: Minor. This determination is due to the mixture in responses that to a change in sediments in the water and gravel embeddiness that could occur. Most macroinvertebrates can also recolonize areas once the response has abated.

Risk Level: Low.

Soil Productivity

Soil productivity could be compromised in the areas that have burned in the past in West Weaver Creek, McKenzie and Sidney Gulch (Oregon Fire 2001 and Junction Fire 2007) due to lack of cover, steep slopes, and fine-loamy soils (Forbes series) that are highly erodible with high clay amounts (red clay) that cause extreme turbidity affecting water quality.

Risk Assessment – Soil Productivity

Probability of Damage or Loss: Likely.

Magnitude of Consequences: Moderate.

Risk: High

Threatened, Endangered, Sensitive and Invasive Plants

There are no known locations of federally Threatened or Endangered plant species within the fire area. There are no other Forest Service Sensitive or Survey and Manage species locations but there is suitable habitat within the fire perimeter for *Cypripedium montanum*, *Cypripedium fasciculatum*, *Smilax jamesii*, and *Sedum paradisum* plant species.

Forest Sensitive Botanical Species

No federally listed Threatened or Endangered plant species or their habitats are known to occur in the Oregon fire. There was one Forest Service Sensitive species observed on the Weaverville basin trail system, dozer or handlines within the fire perimeter and no other sensitive species or watch list botanical

species are known within the Oregon fire. Information on rare plant habitat and populations was derived from Shasta-Trinity National Forest file records, the California Natural Diversity Database, and the California Native Plant Society Inventory of Rare and Endangered Plants, and from visits to the fire area between August 29 through September 1, 2014.

Invasive plants and Noxious Weeds

Invasive plants observed and/or documented to occur within the Oregon fire are shown in the following table.

Scientific Name	Common Name	Symbol	CDFA Weed List
<i>Centaurea solstitialis</i>	Starthistle	CESO	A
<i>Centaurea diffusa</i>	Diffuse knapweed	CEDI	A
<i>Cytisus scoparius</i>	Scotch broom	CYSC	A
<i>Cirsium vulgare</i>	bull thistle	CIVU	-
<i>Hypericum perforatum</i>	Klamath weed, St. Johnswort	HYPE	C
<i>Verbascum thapsus</i>	mullein	VETH	-

Value at Risk: Ecosystem Stability of Native Plant Communities.

Priority Threats: Hand line and dozer construction through known populations and new habitat created for invasion from high burn severity on the west side of the fire. Weed infestations will displace valuable native plant species, reducing wildlife habitat, and can result in increased soil erosion because these species are less capable of stabilizing soil than their native counterparts. Mackenzie and Sydney gulch had large infestations of Scotch broom and there is a rapidly growing population of Diffuse knapweed off of Weaver Bolly Road on FS and private (Sable whose fire burned down). Both of these areas burned high to moderate and have a very high potential of further establishment. Unfortunately no equipment washing was instituted during the fire and there is a potential that fire engines using roads to access the fire will establish new populations.

The value at risk is the ecosystem health and integrity of the native plant communities within the burned areas. The threat is the potential loss of that health and integrity due to new invasive plant introductions and invasive plant spread from existing infestations which could inhibit the return of the native plant communities and crowd out recovering native vegetation resulting in nonfunctioning or poorly functioning ecosystems. The deep taproots of these aggressive species are able to access soil water previously utilized by native vegetation, making it unavailable to the new growth of the native species. For these reasons, loss of the ecosystem health and integrity of the native plant communities from weed invasion in the burned area is an emergency requiring mitigation.

The value at risk ratings and treatments for the specific fires are as follows:

Risk Assessment – Oregon Fire Invasive Plants

Probability of Damage or Loss: Likely. There is a likely probability of spread and introduction of non-native invasive plants into areas disturbed by the fire.

Magnitude of Consequences: Moderate. Damage to these plant communities would be considerable and long-term. Helicopter landings and hand crew activities may have introduced yellow star thistle.

Risk Level: High. Weed detection surveys would occur in the priority areas of dozer lines, drop point, roads, and small, known invasive plant infestations would be conducted outside the fire. Rapid response treatments by manual removal would occur where new, small invasive plant occurrences are discovered. Where large invasive plant occurrences are discovered, additional funding for treatment of these sites may be requested.

Heritage Resources

Within the fire perimeter are 11 previously recorded historic mining related archaeological sites. No prehistoric sites have been found within the fire area. Only one site, a mining ditch, was damaged by suppression activity.

Risk Assessment – These sites were burned over, but appeared to have received minimal thermal damage. This was due to the rapid spread of this fire burning through relatively light fuels. Temperatures were high, but not sustained which did not significantly harm metal, glass, and ceramic artifacts. However, any organic cultural material, leather, rubber, or wood were destroyed if they were on the ground surface.

Probability of Damage or Loss: Possible. The removal of vegetation by the fire has exposed artifacts leaving these sites vulnerable to looting.

Magnitude of Consequence: Major. A major risk to these sites is illegal collecting of artifacts.

Risk Level: High. A major risk to these sites is illegal collecting of artifacts. The removal of vegetation by the fire has exposed artifacts leaving these sites vulnerable to looting. Second major risk is water erosion since no vegetation is left on these sites.

Ecosystem Stability: Unfettered OHV access causing excess hillslope erosion is and concern for soil productivity and for sediments being deposited into McKenzie and Sidney Gulches.

Threats to Wildlife: There are no wildlife concerns for the Oregon Fire due to no T&E species (see wildlife report). There are no other Forest Service Sensitive or Survey and Manage species locations but there is suitable habitat within the fire perimeter for Goshawk and Spotted Owl wildlife species. No emergency exists for wildlife habitat as result of the Oregon Fire.

B. Emergency Treatment Objectives: To allow safe passage of water to protect infrastructures, watersheds, cultural sites, and fish habitat from accelerated sheet and rill erosion. Also to protect watersheds from the spread of noxious weeds.

Risk determination is dependent on the design storm selected and downstream values at risk. By using a set of average storms (2, 5, and 10-year events) emergency planning measures can be designed to mitigate and minimize anticipated risks. Using a 2-year design storm the values at risk can be evaluated to determine if an emergency exists for a typical winter storm.

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

Land 80 % Channel 95 % Roads/Trails 95 % Protection/Safety 90 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	90%	85%	80%
Channel	85%	80%	70%
Roads/Trails	95%	90%	85%
Protection/Safety	95%	90%	85%

E. Cost of No-Action (Including Loss): \$2,200,000**F. Cost of Selected Alternative (Including Loss): \$243,650****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"/>
<input type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input type="checkbox"/>
<input type="checkbox"/> Contracting	<input checked="" type="checkbox"/> Aquatics	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input type="checkbox"/>
<input checked="" type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

Team Leader: Brad RustEmail: brust@fs.fed.usPhone: 530-226-2427FAX: 530-226-2485**H. Treatment Narrative for Forest Service:**

See Appendix F for treatment map and narratives below describing treatments.

Land Treatments:**Strip Mulching/Mulching**

Hand-mulching is proposed in treatment area 1. Strip mulching 20 acres with wood straw is proposed above the Weaverville community irrigation ditch (Moon Lee ditch) and watershed above West Weaver Creek to protect from accelerated erosion. The purpose of the treatment is to provide a suitable ground cover where there presently is none. Mulching in strips, across slopes has proven to be a more cost effective method of applying this treatment. Strip widths of 10 to 15 feet alternate between mulched and unmulched areas. Strip mulching will be applied at a rate of 1 ton per acre. Areas requiring full mulching will be applied by hand at a rate of 2 tons per acre. This treatment will reduce potential erosion from 17 t/a to 6 t/a a 65% reduction.

Heli-mulching

Heli-mulching is proposed in treatment area 2. The treatment area is 100 acres and will be treated at 2 tons rice straw per acre. This treatment is deemed to be more cost effective than conventional straw mulching by hand. This treatment broadcasts rice straw from a helicopter traveling at approximately 30 knots. Following this treatment a work crew will spread out a few

remaining clumpy. This treatment will reduce potential erosion from 17 t/a to 6 t/a a 65% reduction for a 2-year storm event.

Invasive weed detection surveys

Invasive weed detection surveys are proposed in treatment area 3. Weed detection surveys are the selected treatments to deal with potential invasive weeds affecting the native plant community.

Seeding and Mulching Treatments

Dozer lines will be seeded at the end of September during Suppression Repair phase 2.

TREATMENT COSTS

Cost Summary

	Units	Unit Cost	# of Units	BAER \$
Land Treatments				
Seeding & Mulching Dozer Line - Road Intersections	acres	0	0	suppression repair
Monitoring				
Noxious Weed Detection Surveys & treatment	miles	1200	13	\$15,600
TOTAL ALL LINE ITEMS				\$15,600

Each unit cost per mile includes cost to government, supplies, vehicle, and travel costs for two people. Surveys will encompass all the trails, dozer, Makenzie and Sydney gulches and perimeter of the fire.

With approximately 16 miles of dozer line and hand line, numerous drop points, and staging areas in the fire it is expected that new and expanding invasive plant infestations will proliferate along these vectors and if left unchecked may eventually lead to vegetation type conversion. Surveys and rapid response eradication treatments will begin in 2015 during the flowering periods of invasive plant species. The area requiring assessments 16 miles of dozer line and hand line needing survey, largely on the Shasta-Trinity National Forest.

Natural Recovery: Vegetation in the mixed conifer will recover slowly. Even in areas of moderate soil burn severity, the canopy was mostly killed and the seed source removed. Stands with an element of Ponderosa pine will likely recover more quickly, since at least a few mature trees are likely to have survived to produce seed into newly exposed mineral soil. Meadows dominated by grasses and forbs will recover within a year, because for the most part soil temperatures were not hot enough to kill root systems. The montane chaparral shrubs were mostly killed by the fire, but fire stimulates manzanita seeds stored in the soil to germinate. In riparian areas along Sidney and Garden creeks, sedges and grasses were resprouting within 10 days of the fire, and most riparian shrubs are also likely to resprout.

Channel Treatments:**Straw Bale Check Dams**

Straw bale check dams with rock dissipators are proposed in treatment area 4. The purpose of a small straw bale check dam with rock dissipators is to temporarily capture sediment in the upper reaches of stream channels. Wood or rock is used to dissipate the overflow of water on the downstream side of each dam and to provide a longer term storage capacity once the straw has decomposed. Straw dams have been proven effective in similar burned areas. The dams are effective at catching sediment in the first two years after the fire and allow the sediment to be metered out at a lower rate in subsequent years. This treatment will be used above the Moon Lee Irrigation Ditch and selected locations in McKenzie Gulch.

Rock or Log Grade Control Structures

Rock or log grade control structures are proposed in treatment area 5. Another channel treatment deemed necessary for the BAER effort in this fire area is the use of native materials to reestablish stream bed stability in the small channels that were burned intensely in the fire. Depending on availability of local materials either rocks or small diameter logs are used to establish a nick point, or grade control in the small channels. These structures are designed to provide for channel bed stability, not collection and storage of sediment.

Roads and Trail Treatments:

FS Roads goal of restoring overall drainage function along with installing culvert inlet treatments, critical dips, upsizing culverts and drainage armor will control water from moving off site reducing the risk to adjacent resources along some road.

Road stormproofing is proposed in spot treatment areas 6. Treatments Type: will include culvert cleaning, rolling dip installation and culvert up-sizing and replacement on National Forest System Roads. For roads under the jurisdiction of Trinity County, Caltrans and private individuals, we will provide recommendations of evaluating stream crossings identified to be at risk.

- Install Roadway Dips (critical dips at culvert crossings and intermediate rolling dips at grade breaks).
- Restore Drainage Function (restore drainage features along roadways to function at full capacity while storm proofing and winterizing).
- Install Drainage Armor (rip/rap rock at critical dips, low water crossings and fill slope protection).
- Install Culvert Inlet Treatments (metal end sections).
- Install Upsized Culverts for increased water and debris flows.

Treatment Descriptions and Costs:

Treatment	Quantity	Estimated Cost	Justification
NFSR 33N01-Reconstruct Rolling Dip	1	\$ 1,500.00	Minimize damage to the road surface and template by diverting storm water run-off flow off the road
NFSR 33N01- Culvert Replacement (Upsizing) 24" X 40'	1	\$ 2,800.00	Increase the capacity of the drainage structure to handle the expected increased flows from the burned area. Decrease the probability of road failure
NFSR 33N42- Culvert Replacement (Upsizing) 24" X 40'	1	\$ 2,800.00	
Total Cost=		\$ 7,100.00	

The work proposed herein is intended to stabilize the identified roads and structures in preparation for the anticipated increase in stormwater runoff. In addition, we shall recommend that the stream crossings identified as possible risks under the jurisdiction of Trinity County, Caltrans and private individuals should be evaluated further. The Highway 299 crossing on Sidney Gulch should be evaluated by Caltrans. The Weaver Bally Loop Road and Memorial Drive crossings of Sidney Gulch should be evaluated further by Trinity County. The two private bridges crossing Garden Gulch should be evaluated by a professional through the private land owner. These private land owners may seek further guidance and help through the NRCS.

Weaver Basin Trail Network and McKenzie Trail has many trees that were burned in areas that have moderate to high soil burn severity compromising their integrity and pose a hazard to trail crews working on these trails. These hazards are scattered throughout the trail so trail crews would be at risk during remediation.

Trail stormproofing is proposed in treatment areas 7. Sections of the trails are at risk due to steep burned hillslopes that will experience accelerated erosion and trail tread failure due to burned out stumps. These trails are the main recreational trails for the community of Weaverville. They are used extensively and enjoyed by all in the community. These trails are now at risk to erosion and collapse compromising their use as community recreation.

A combination of actions is necessary to protect the users of the area and crews working to repair these trails:

- a. Emergency work to be completed on Weaver Basin and McKenzie trails - trail crews.
- b. Signing trail with warning of hazardous conditions due to the burn.
- c. Replacing burned trail signs for safety.
- d. Replacing trail ditch plank crossing for safety.

Cost of Trail Treatments

Treatment	Unit	Amount	Cost
Trail erosion control	miles	2.5	5,300
Stumphole repair	ea.	30	1,500
Warning & trail signs	ea.	12	1,200
Trail ditch planking	ea.	8	800
Hazard tree removal	miles	0.25	500
		Total	\$9,300

Protection/Safety Treatments: Burned area road and trail signs.

Safety: Posting of areas burned will alert the public to potential dangers of falling trees and rolling rocks. Repair of road and trail signs burned will insure public safety.

Heritage Resource Prescriptions:

Treatment Type - In discussion with Luzetta Nelson, botanist for the Trinity side, we will carry out grass seeding at these sites. **Treatment Objective** - Grass will help conceal the artifacts on the sites and help control erosion. **Treatment Description** - Grass seed will be spread over the site and lightly covered over with soil to help seed germinate and protect from animals. Also fencing McKenzie Mine and mulching the area. **Treatment Cost** (see Botany Report), Treatment Area 8. This work will be completed prior to first season storm.

Ecosystem Stability: With the lack of brush due to extensive burning areas closed due to brush are now open and exposed for unfettered OHV unauthorized travel causing additional erosion of hillsides. Several areas are open to unauthorized travel and boulder barriers are necessary to control access to the severely burned areas in McKenzie and Sidney Gulch along with increased law enforcement to insure unauthorized travel does not occur, Treatment Area 9.

Item	Unit	Unit Cost	# of Units	Cost
boulder	ea	\$450	5	\$2,250
law enforcement	project	\$2,000	1	\$2,000

Coordinator/Implementation Team Leader:

Interagency coordination started during the fire and continued throughout the BAER Assessment. Continuing this coordination by providing the BAER Assessment Report, specialist reports and attending meetings is anticipated. In addition, letters detailing potential physical responses and impacts from the fire that may influence safety in and downstream of the fire area will need to be composed and sent to all public and private stakeholders. Also to lead the implementation effort on coordinating all treatments in a timely and cost effective manner. Cost is for this position is \$6,000.

Item	Unit	Unit Cost	# of Units	Cost
Interagency Coordinator	Day	\$400	15	\$6,000

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.)

See Appendix C below for road, heritage, and trail monitoring.

Part VI – Emergency Stabilization Treatments and Source of Funds

Initial Request

Oregon Fire BAER Costs						NFS Lands				Other Lands				Money Left Total \$
Line Items	Units	Unit Cost	# of Units	BAER \$	Spent \$	Units	Fed \$	Units	Non Fed \$					
A. Land Treatments														
Handmulching (1ton/ac) - woodstraw	acre	\$1 500	20.0	\$30,000	\$0		\$0		\$0	\$0				
Aerial Helmulching (2.0 ton/ac) - ricestraw	acre	\$1,200	100.0	\$120,000	\$0		\$0		\$0	\$0				
NX Weed Det. Survey	mile	\$1,200	13.0	\$15,600	\$0		\$0		\$0	\$0				
Subtotal Land Treatments				\$165,600	\$0		\$0		\$0	\$0				
B. Channel Treatments - none														
In-channel straw and rock checkdams - CalFire con crew	each	\$450	20.0	\$9,000	\$0		\$0		\$0	\$0				
Subtotal Channel Treatments				\$9,000	\$0		\$0		\$0	\$0				
C. Road and Trails														
Road Stormproofing	project	\$7,100	1	\$7,100	\$0		\$0		\$0	\$0				
Weaver Basin and McKenzie Trail Stormproofing - con crew*	project	\$9,300	1	\$9,300	\$0		\$0		\$0	\$0				
Subtotal Road & Trails				\$16,400	\$0		\$0		\$0	\$0				
D. Protection/Safety														
Heritage Site Protection (1 site)	project	\$1,000	1	\$1,000	\$0		\$0		\$0	\$0				
Burned Area Warning Signs	ea	\$300	5	\$1,500	\$0		\$0		\$0	\$0				
Road & Trail Signs	ea	\$250	8	\$2,000	\$0		\$0		\$0	\$0				
Boulder Barriers	ea	\$450	5	\$2,250	\$0		\$0		\$0	\$0				
Law Enforcement	project	\$2,000	1	\$2,000	\$0		\$0		\$0	\$0				
Interagency Coordinator & Implementation Team Leader	ea	\$6,000	1	\$6,000	\$0		\$0		\$0	\$0				
Subtotal Protection				\$14,750	\$0		\$0		\$0	\$0				
E. BAER Evaluation														
Assessment Team	0520	H5BAER	---	---	\$15,214	---	\$0	---	\$0	\$0				
Subtotal Evaluation				---	\$15,214	---	\$0	---	\$0	\$0				
F. Monitoring														
Hillslope Treatment Monitoring	ea	\$1,000	1	\$1,000	\$0		\$0		\$0	\$0				
Road & Trail Treatment Monitoring	ea	\$1,000	1	\$1,000	\$0		\$0		\$0	\$0				
Heritage Treatment Monitoring	ea	\$1,000	1	\$1,000	\$0		\$0		\$0	\$0				
Subtotal Monitoring				\$3,000	\$0		\$0		\$0	\$0				
G. Totals				\$208,750	\$0		\$0		\$0	\$0				
Previously approved						Comments: * W. Trail treatment consists of trail tread water-barring and filling in burned out stump holes that compromise trail.								
Total for this request				\$208,750										

PART VII - APPROVALS

1.

David R. Myers
Shasta-Trinity Forest Supervisor (signature)

9/15/14
Date

2.

David Myers
Regional Forester (signature)

9/17/14
Date

APPENDICES: Supporting Information:

Appendix A: Oregon Fire BAER Team

Appendix B: Oregon Fire Stakeholder Contacts

Appendix C: Monitoring for Roads, Heritage, and Trails

Appendix D: Summary of Cost-Risk Analysis

Appendix E: Soil Burn Severity Soil Sample Points for the Oregon Fire

Appendix F: Treatment Map for the Oregon Fire

Appendix A: Oregon Fire BAER Team:

Position	Name	Cell Phone	Work Phone
Team Leader	Brad Rust	530-917-0434	530-226-2427
Hydrology	Zack Mondry		530-440-6344
Soils	Ashley Knight	209-535-6955	530-226-2432
Archaeology	Mark Arnold		530-628-5227
Botany	Lusetta Nelson	530-739-3595	530-623-1750
Geology	Dennis Veich		530-226-2423
Roads	Justin Krieg	701-300-0943	530-623-1726
Trails	Brad Rust	530-917-0434	530-226-2427

Appendix B: Oregon Fire Stakeholder Contacts

BAER Burned Area Emergency Response		
Oregon Fire Contacts	Phone #	Other
Special Use Permit USFS- Lisa Wrenn	530-623-1744	John Condon
Moon-Lee Ditch Water District (owned by Weaverville Community Service District)	530-623-5051	
Weaverville Community Service District (water)	530-623-5051	
Caltrans Trinity County Manager-Steve Rogers	530-225-2455	
Trinity County road dept.	530-623-1365	
Trinity County RCD	530-623-6004	
USFS-TRMU District Ranger-Tina Lynsky	530-623-1700	
Fish and Wildlife U.S. Area Manager-Neil Manji	530-225-2055	
North Coast WRCB-Maggie Robinson	707-576-2292	
USFS Wildlife-Tom Quinn	530-623-1756	
USFS Fish Biologist-Eric Wiseman	530-623-1754	
USFS Watershed Manager-Christine Mai	530-226-2428	
USFS Forest Soils-Brad Rust	530-226-2427	
NOAA Early Warning	301-713-0622	
Trinity County Board of Supervisors-Debra Chapman	530-623-1227	
Rice Straw Shadenger	530-628-5835	Roger Yegal http://oregonhaygrowers.com/ Lucia Beccerra 241-3030
YCC Redding	redding CCC: 530-241-3030	
Weaverville Basin Trail Association (Noreen Doyas or Matt Silveria (trails tech) TCRCO	530-623-6004	
CalFire Weaverville	530-623-4201	
USFS Public Affairs- Debra-Ann Brabazon	530-226-2494	
Weaverville City manager Public works (water intake)	530-	

Appendix C: Monitoring Protocols:**Oregon Fire
Road Effectiveness Monitoring**

The 2500-8 report requests funds to monitor the effectiveness of road treatments on Oregon Fire roads.

4. Monitoring Questions
 - Is the road-tread stable?
 - Is the road leading to concentrating runoff leading to unacceptable off-site consequences?
2. Measurable Indicators
 - Rills and/or gullies forming of the road
 - Loss of road bed.
3. Data Collection Techniques
 - Photo documentation of site
 - Inspection Checklist (attached)
4. Analysis, evaluation, and reporting techniques
 - Monitoring will be conducted after storm events. If the monitoring shows the treatment to be ineffective at stabilizing road and there is extensive loss of road bed or infrastructure an interim report will be submitted. A several page report would be completed after the site visit. The report would include photographs and a recommendation on whether additional treatments are necessary.

Road Inspection Checklist

Date: _____

Inspector: _____

Time: _____

Forest Road: _____

Describe locations reviewed during inspection: _____

Was there road damage? _____

Was culvert plugged? _____

GPS _____

Describe damage and cost to repair? (GPS) _____

Photo taken of road damage _____

Recommended actions to repair: _____

Oregon Fire
Hillside Mulching Effectiveness Monitoring

The 2500-8 report requests funds to monitor the effectiveness of straw mulch treatments on Oregon Fire.

4. Monitoring Questions

- Is the straw mulch with good cover stable?
- Is the straw mulch being undercut by concentrated runoff leading to unacceptable on-site erosion?

2. Measurable Indicators

- Rills and/or gullies forming
- Loss of topsoil

3. Data Collection Techniques

- Photo documentation of site
- Inspection Checklist (attached)

4. Analysis, evaluation, and reporting techniques

- Monitoring will be conducted after storm events. If the monitoring shows the treatment to be ineffective at stabilizing and there is extensive riling an interim report will be submitted. A several page report would be completed after the site visit. The report would include photographs and a recommendation on whether additional treatments are necessary.

Hillside Protection Inspection Checklist

Date: _____ Inspector: _____
Time: _____ Forest Road Nearby: _____

Describe locations reviewed during inspection: _____

Was there riling or rutting? _____

Was topsoil lost or eroded? _____

GPS) _____

Describe damage and cost to repair? (GPS) _____

Photo taken of damage _____

Recommended actions to repair: _____

Oregon Fire
Trail Effectiveness Monitoring

The 2500-8 report requests funds to monitor the effectiveness of trail treatments on Forest Trails in the Oregon Fire.

1. Monitoring Questions

- Is the trail tread stable?
- Is the trail leading to concentrating runoff leading to unacceptable off-site consequences?

2. Measurable Indicators

- Rills and/or gullies forming on the trail
- Loss of trail bed

3. Data Collection Techniques

- Photo documentation of site
- Inspection Checklist (attached)

4. Analysis, evaluation, and reporting techniques

- Monitoring will be conducted after storm events. If the monitoring shows the treatment to be ineffective at stabilizing trail and there is extensive loss of trail bed or infrastructure an interim report will be submitted. A several page report would be completed after the site visit. The report would include photographs and a recommendation on whether additional treatments are necessary.

Trail Inspection Checklist

Date: _____

Inspector _____

Time: _____

Forest Trail _____

Describe locations reviewed during inspection: _____

Was there trail damage? _____

Did the trail crossing fail? _____

GPS) _____

Describe damage and cost to repair? (GPS) _____

Photo taken of trail damage _____

Recommended actions to repair: _____

Appendix D: Summary of Cost-Risk Analysis

Oregon Fire Benefit/Cost Analysis:										
Total benefits of resource:										
Resource	Value \$									
roads & trails	\$200,000									
water quality & fish habitat	\$750,000									
ecosystem stability (native plants & soils productivity)	\$200,000									
public safety	\$1,000,000									
cultural	\$50,000									
total loss										\$2,200,000
Probability of loss without and with treatments:										
Resource	Probability loss no treatments:				Probability loss w/ treatments:			Reduction in probability of loss		
roads & trails	65%				15%			50%		
water quality & fish habitat	70%				20%			50%		
ecosystem stability (native plants & soils productivity)	65%				15%			50%		
public safety	50%				20%			30%		
cultural	50%				15%			35%		

Oregon Fire BAER Costs			NFS Lands				Other Lands				Money Left
Line Items	Units	Unit Cost	# of Units	BAER \$	Spent \$	Units	Fed \$	Units	Non Fed \$	Total \$	
A. Land Treatments											
Handmulching (1ton/ac) - woodstraw	acre	\$1,500	20.0	\$30,000	\$0		\$0		\$0	\$0	
Aerial Helimulching (2.0 ton/ac) - ricestraw	acre	\$1,200	100.0	\$120,000	\$0		\$0		\$0	\$0	
NX Weed Det. Survey	mile	\$1,200	13.0	\$15,600	\$0		\$0		\$0	\$0	
Subtotal Land Treatments				\$165,600	\$0		\$0		\$0	\$0	
B. Channel Treatments - none											
In-channel straw and rock checkdams - CalFire con crew	each	\$450	20.0	\$9,000	\$0		\$0		\$0	\$0	
Subtotal Channel Treatments				\$9,000	\$0		\$0		\$0	\$0	
C. Road and Trails											
Road Stormproofing	project	\$7,100	1	\$7,100	\$0		\$0		\$0	\$0	
Weaver Basin and McKenzie Trail Stormproofing - con crew*	project	\$9,300	1	\$9,300	\$0		\$0		\$0	\$0	
Subtotal Road & Trails				\$16,400	\$0		\$0		\$0	\$0	
D. Protection/Safety											
Heritage Site Protection (1 site)	project	\$1,000	1	\$1,000	\$0		\$0		\$0	\$0	
Burned Area Warning Signs	ea	\$300	5	\$1,500	\$0		\$0		\$0	\$0	
Road & Trail Signs	ea	\$250	8	\$2,000	\$0		\$0		\$0	\$0	
Boulder Barriers	ea	\$450	5	\$2,250	\$0		\$0		\$0	\$0	
Law Enforcement	project	\$2,000	1	\$2,000	\$0		\$0		\$0	\$0	
Interagency Coordinator & Implementation Team Leader	ea	\$6,000	1	\$6,000	\$0		\$0		\$0	\$0	
Subtotal Protection				\$14,750	\$0		\$0		\$0	\$0	
E. BAER Evaluation											
Assessment Team	0520	H5BAER	---	---	\$15,214	---	\$0	---	\$0	\$0	
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F. Monitoring											
Hillslope Treatment Monitoring	ea	\$1,000	1	\$1,000	\$0		\$0		\$0	\$0	
Road & Trail Treatment Monitoring	ea	\$1,000	1	\$1,000	\$0		\$0		\$0	\$0	
Heritage Treatment Monitoring	ea	\$1,000	1	\$1,000	\$0		\$0		\$0	\$0	
Subtotal Monitoring				\$3,000	\$0		\$0		\$0	\$0	
G. Totals											
Previously approved				\$208,750	\$0		\$0		\$0	\$0	
Total for this request				\$208,750							
Comments: * W. Trail treatment consists of trail tread water-barring and filling in burned out stump holes that compromise											

Benefit of treatments:										
Resource	Value \$		Reduction in probability of loss							
roads & trails	\$200,000		50%							
water quality & fish habitat	\$750,000		50%							
ecosystem stability (native plants & soils productivity)	\$200,000		50%							
public safety	\$1,000,000		30%							
cultural	\$50,000		35%							
Benefit/cost ratio:										
Resource	Benefit of treatment		Treatment Cost		B/C ratio		Justified			
roads & trails	\$100,000		\$17,400		5.7		yes			
water quality & fish habitat	\$375,000		\$151,000		2.5		yes			
ecosystem stability (native plants & soils productivity)	\$100,000		\$20,850		4.8		yes			
public safety	\$300,000		\$17,500		17.1		yes			
cultural	\$17,500		\$2,000		8.8		yes			
overall	\$892,500		\$208,750		4.3					

Appendix E: Soil Burn Severity Soil Sample Points for the Oregon Fire

SiteID	SurveyDate	GroundCover	AshColor	AshDepth (mm)	SoilStructure	RootAlteration	InfiltrationMethod	InfiltrationTime	InfiltrationObs	SoilBurn	Comment	Aspect	Slope (%)	Slope (ft)	SlopePos	SoilTexture	SoilRock (%)	SoilComment	PreFireVeg	PreFireDensity	VegComment
1	8/27/2014	0-20 Percent	Gray	2.00	Slightly Altered	Very Fine Consumed	Water Drop	Moderate (<10 sec)	>8 mL	Moderate	stream terrace	South	5	0	Valley Bottom	Other	50	neroflu	Chaparral	low	
2	8/27/2014	0-20 Percent	Black	2.00	Original Structure	No Change	Water Drop	Weak (<10 sec)	>8 mL	Moderate	all water gone	Southeast	25	0	Foot Slope	Loam	30	weaver	Chaparral	Other	3 reburn
3	8/27/2014	0-20 Percent	Gray	1.80	Slightly Altered	Very Fine Consumed	Water Drop	Weak (<10 sec)	>8 mL	Moderate	mckenzie gulch	South	2	200	Valley Bottom	Loam	40	soulique	Chaparral	High	all gone
4	8/27/2014	0-20 Percent	White	10.00	Degraded/Powdery	Moderate Consumed	Water Drop	Weak (<10 sec)	>8 mL	Moderate	surface wr only	South	35	400	Midslope	Clay loam	30	forbs	Forest	High	mix trees brush
5	8/27/2014	0-20 Percent	Gray	2.00	Slightly Altered	No Change	Water Drop	Weak (<10 sec)	>8 mL	Moderate	surface wr	Southeast	40	500	Midslope	Clay loam	30	forbs	Forest	Other	reburn 3x
6	8/27/2014	0-20 Percent	Gray	2.00	Slightly Altered	No Change	Water Drop	Weak (<10 sec)	>8 mL	Moderate	surface wr	Southwest	50	500	Midslope	Clay loam	30	forbs	Forest	High	mix f b
7	8/27/2014	0-20 Percent	White	3.00	Slightly Altered	Very Fine Consumed	Water Drop	Weak (<10 sec)	>8 mL	High	surface wr	South	40	1000	Upper Slope	Clay loam	30	forbs	Forest	High	mix b & t
8	8/28/2014	0-20 Percent	Black	0.00	Slightly Altered	Very Fine Consumed	Water Drop	Weak (<10 sec)	>8 mL	Moderate	soil char 1	Southwest	15	100	Ridgetop	Loam	30	soulique	Chaparral	High	
9	8/28/2014	0-20 Percent	Gray	4.00	Slightly Altered	No Change	Water Drop	None	>8 mL	Moderate		Southeast	25	50	Midslope	Loam	25	musser	Chaparral	High	
10	8/28/2014	0-20 Percent	White	10.00	Slightly Altered	Very Fine Consumed	Water Drop	Weak (<10 sec)	>8 mL	High		East	25	500	Midslope	Loam	15	musser	Forest	High	3x burn
11	8/28/2014	0-20 Percent	Black	1.00	Slightly Altered	No Change	Water Drop	Weak (<10 sec)	>8 mL	Low	surface char	West	20	500	Ridgetop	Loam	30	musser	Chaparral	High	3x burn
12	8/29/2014	>50 Percent		5.00	Slightly Altered	No Change	Water Drop	Weak (<10 sec)	>8 mL	Low		South	35	70	Foot Slope	Loam	10				forest
13	8/29/2014	>50 Percent	Black	0.00	Original Structure	No Change	Water Drop	Weak (<10 sec)	>8 mL	Low		South	5	30	Midslope	Silt Loam	15				
14	8/31/2014	0-20 Percent	Black	3.00	Slightly Altered		Water Drop	Weak (<10 sec)	>8 mL	Low	surface wr	Southwest	5	50	Foot Slope	Clay loam	30	musser	Forest	High	
15	8/31/2014	0-20 Percent	Black	2.00	Slightly Altered	No Change	Water Drop	Weak (<10 sec)	>8 mL	Low	surface wr	Southeast	5	300	Midslope	Clay loam	30	musser	Other	Other	oak w/ mod den
16	8/31/2014	0-20 Percent	Black	2.00	Original Structure	No Change	Water Drop	Weak (<10 sec)	>8 mL	Low	surface wr	Southwest	2	50	Valley Bottom	Other	40	zerofluents sandy loam	Chaparral	High	
17	8/31/2014	0-20 Percent	Black	2.00	Original Structure	No Change	Water Drop	Weak (<10 sec)	>8 mL	Low	surface wr	West	35	500	Midslope	Clay loam	30	musser	Other	High	oak brush
18	8/31/2014	20-50 Percent	Black	2.00	Original Structure	No Change	Water Drop	Weak (<10 sec)	>8 mL	Very Low	surface wr	East	35	300	Midslope	Clay loam	30	musser	Other	High	oak brush
19	8/31/2014	0-20 Percent	Gray	3.00	Slightly Altered	Very Fine Consumed	Water Drop	Weak (<10 sec)	>8 mL	Moderate	surface wr	East	25	200	Midslope	Clay	20	musser	Other	High	oak brush
20	8/31/2014	20-50 Percent	Black	3.00	Original Structure	No Change	Water Drop	Weak (<10 sec)	>8 mL	Very Low	surface wr	Southwest	20	200	Foot Slope	Clay loam	20	musser	Chaparral	High	oak brush

Appendix F: Treatment Map - Oregon Fire

