USDA-FOREST SERVICE

FS-2500-8 (6/06)
Date of Report: September 9, 2015

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[X] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[X] 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: **Mad River Complex**

B. Fire Number: **CA-SRF-001433**

C. State: **California**

D. County: **Trinity**

E. Region: **05 - Pacific Southwest**

F. Forest: **10 - Six Rivers & 14 - Shasta-Trinity**

G. District: **Mad River** (Six Rivers)
Yolla Bolla (Shasta-Trinity)

H. Fire Incident Job Code: **P5JOJC/0510**

I. Date Fire Started: **July 30, 2015**

J. Date Fire Contained: **September 2, 2015**

K. Suppression Cost: **$33,600,000** (projected from 9/3/2015 Incident Narrative)

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): **ongoing**
2. Fireline seeded (miles):
3. Other (identify):

M. Watershed Number:

HUC (6th level)	Watershed Name	Percent Watershed Burned
180101020203	Ruth Lake-Mad River	33
180101020302	Bear Creek-Mad River	11
180101050301	North Dobbyn Creek	10
180101050302	South Dobbyn Creek	<1
180101050303	Conley Creek-Dobbyn Creek	9
180101050601	Upper Larabee Creek	<1
180101050701	WF Van Duzen River-Van Duzen River	34
180101050702	Shanty Creek-Van Duzen River	37

HUC (6th level)	Watershed Name	Percent Watershed Burned
180101050902	Little Van Duzen River	28
180102120402	Smoky Creek-SF Trinity River	1
180102120404	Little Bear Wallow Creek-SF Trinity River	20

N. Total Acres Burned: NFS - 36,315 Private - 2,898 Unclassified - 249

Lassic Fire – 18,198 acres			
NFS - 17,592	Other Federal - none	Private - 420	Unclassified - 186
Gobbler Fire – 8,279 acres			
NFS - 7,446	Other Federal - none	State - none	Private - 833
Pickett Fire – 10,986 acres			
NFS - 9,366	Other Federal - none	State - none	Private - 1,620
(Six Rivers NF: 5,000 acres; Shasta-Trinity NF: 4,366 acres)			
Pine Fire – 1,796 acres			
NFS - 1,736	Other Federal - none	Private - 25	Unclassified - 35
Blueford Fire – 203 acres			
NFS - 175	Other Federal - none	Private - none	Unclassified - 28

O. Vegetation Types: Characteristic trees include coast Douglas-fir (Pseudotsuga menziesii var. menziesii), ponderosa pine (Pinus ponderosa), sugar pine (Pinus lambertiana), white fir (Abies concolor), incense cedar (Calocedrus decurrens), Jeffrey pine (Pinus jeffreyi), canyon live oak (Quercus chrysolepis), Oregon white oak (Quercus garryana), California black oak (Quercus kelloggii), tanoak (Notholithocarpus densiflorus), madrone (Arbutus menziesii), big leaf maple (Acer macrophyllum), California bay laurel (Umbellularia californica), and golden chinquapin (Chrysolepis chrysophylla). The shrub understory is dense and diverse; beaked hazel (Corylus cornuta), green leaf manzanita (Arctostaphylos patula), salal (Gaultheria shallon), oceanspray (Holodiscus discolor), buckbrush (Ceanothus cuneatus), Quercus garryana var. breweri (Brewer oak), Oregon grape (Berberis nervosa) and poison oak (Toxicodendron diversilobum).

P. Dominant Soils: Major soils include the Doty-Hecker Association (Fine-loamy, mixed, superactive, mesic Pachic Humixerepts); Clallam-Hugo-Holland Association (Fine-loamy, mixed, mesic Dystric Xerochrepts); Clallam, moderately deep, unstable Melbourne Association (Fine-loamy, mixed, mesic Dystric Xerochrepts and Fine, mixed, superactive, mesic Ultic Palexeralfs); Deadwood-rock outcrop, metasedimentary-Voorhies Association (Loamy-skeletal, mixed, superactive, mesic Lithic Dystroxerepts and Loamy-skeletal, mixed, superactive, mesic Mollic Haploxeralfs). Rock outcrops are common throughout the burned area. Many of the soils formed from weathering of sedimentary and metasedimentary rocks and have naturally high erosion hazard ratings. Hydrologic soil groups range from B to D. Group B soils have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15-0.30 in/hr.). Group C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05-0.15 in/hr). Group D soils have high runoff potential and very low infiltration rates when thoroughly wetted. Within the burned area, Group D soils consist chiefly of shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0-0.05 in/hr).

Q. Geologic Types: Mica schist; graywacke sandstone; argillaceous melange; serpentinite and peridotite, minor chert and metavolcanics. Geologic characteristics also include pervasive shearing and widespread deep-seated landsliding, with debris slides common in inner gorge settings.

R. Miles of Stream Channels by Class:
Perennial: 48 Intermittent: 73

S. Transportation System (miles)
Roads: 112 Trails: 21

PART III - WATERSHED CONDITION

A. Burn Severity:

Soil Burn Severity (SBS) - Acres					
Fire	High	Moderate	Low	Very Low/Unburned	Total
Lassic	653	3,377	5,314	8,594	17,938
Gobbler	74	1,202	2,271	4,732	8,279
Pickett	523	1,729	4,025	4,706	10,983
Pine	11	125	505	1,130	1,771
Blueford		8	157	38	203
Total	**1,261**	**6,441**	**12,272**	**19,200**	**39,174**

Soil Burn Severity (SBS) - Percent				
Fire	High	Moderate	Low	Very Low/Unburned
Lassic	4	19	30	48
Gobbler	1	15	27	57
Pickett	5	16	37	43
Pine	1	7	29	64
Blueford	0	4	77	19

B. Water-Repellent Soil (acres):

Fire	Strong	Medium	Weak	Total
Lassic	5,359	3,958	2,149	61,466
Gobbler	3,593	1,135	3,549	8,277
Pickett	3,258	5,372	2,353	10,983
Pine	137	126	1,509	1,772
Blueford	6	94	116	216
Total	12,353	**10,685**	**9,676**	32,174

C. Soil Erosion Hazard Rating (acres):

Fire	High	Moderate	Low	Total
Lassic	8,575	8,509	639	17,723
Gobbler	4,152	2,690	1,453	8,295
Pickett	2,059	2,617	557	5,233
Pine	0	1,752	0	1,752
Blueford				
Total	**14,786**	**15,568**	**2,649**	**33,003**

D. Erosion Potential: ### tons/acre

E. Sediment Potential: ### cubic yards/square mile

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period (years): 12-15

B. Design Chance of Success (percent): 75

C. Equivalent Design Recurrence Interval (years): see table below

D. Design Storm Duration (hours): 12

E. Design Storm Magnitude (inches): 3.48

F. Design Flow (cubic feet / second/ square mile): 88

G. Estimated Reduction in Infiltration (percent):

H. Adjusted Design Flow (cfs per square mile): see table below

Design and Adjusted Design Flows

HUC 7 Watersheds	Qp2			Qp5			Qp10		
	Pre	Post	Ratio	Pre	Post	Ratio	Pre	Post	Ratio
Upr North Dobbyn Creek	457	484	1.06	810	859	1.06	1,059	1,123	1.06
Lwr North Dobbyn Creek	1,029	1,029	1.00	1,839	1,839	1.00	2,409	2,410	1.00
SF and NF Conley Creek	529	543	1.03	946	971	1.03	1,240	1,273	1.03
Conley-Dobbyn	899	899	1.00	1,656	1,656	1.00	2,194	2,194	1.00
Bluford-Mud	1,009	1,011	1.00	1,803	1,807	1.00	2,363	2,368	1.00
Blanket Creek	464	479	1.03	811	838	1.03	1,055	1,090	1.03
Upr Little Van Duzen River	1,111	1,262	1.14	1,910	2,171	1.14	2,469	2,806	1.14
Hale-Olsen	1,085	1,134	1.05	1,950	2,038	1.05	2,559	2,675	1.05
Cable Creek-Farley Creek	1,267	1,268	1.00	2,235	2,237	1.00	2,914	2,917	1.00
Cave Creek-Swift Creek	1,229	1,302	1.06	2,182	2,312	1.06	2,852	3,022	1.06
Little Bear Wallow Creek-Hidden Valley	1,219	1,222	1.00	2,179	2,184	1.00	2,854	2,860	1.00
Headwaters Van Duzen River	822	822	1.00	1,462	1,462	1.00	1,913	1,913	1.00
WF Van Duzen River	955	1,157	1.21	1,670	2,023	1.21	2,171	2,630	1.21
Big Meadow Creek	464	464	1.00	821	822	1.00	1,074	1,075	1.00
Waggit Spring	706	802	1.14	1,241	1,411	1.14	1,617	1,838	1.14
Black Lassic-Red Lassic	891	1,041	1.17	1,559	1,822	1.17	2,028	2,370	1.17
Shanty Creek	424	513	1.21	743	899	1.21	968	1,170	1.21
Crooks-Senteney	1,040	1,040	1.00	1,816	1,816	1.00	2,359	2,359	1.00

At Qp2, increases range 0 to 21 percent. Average across the watersheds for post-fire Qp2 is 93 cfs, roughly a 6% increase.

PART V - SUMMARY OF ANALYSIS

Background: The Mad River Complex consists of three fires: Lassic (18,198 acres), Gobbler (8,279 acres), and Pickett (10,985 acres). The Lassic and Gobbler fires are within the Six Rivers NF administrative boundary. The South Mountain ridgeline divides the Pickett fire between the Six Rivers NF and Shasta-Trinity NF. Over 200 fire ignitions from lightning strikes were detected primarily from one storm event on July 30, 2015. The fires burned within several watersheds that include the Van Duzen, Mad River, and S.F. Trinity rivers.

A. Describe Critical Values/Resources and Threats (narrative):
(formatted to incorporate "Critical Values and Risk Assessment" from WO ID 2520-2014-1, effective December 17, 2014)

1. Human Life and Safety:

Potential threats to visitors/recreating public, residents of private lands, & agency personnel include flooding and debris flows, hazard trees, and rockfall along/at roads, trails, developed and designated dispersed sites, and FS administrative sites that are downstream or downslope of burned slopes, especially those with a moderate-high burn severity.

Very High Risk (likely, major) at Fir Cove and Bailey Canyon campgrounds from flooding; **High Risk** (possible, major) from debris flows (Treatment PS-01 and Treatment PS-02).

High Risk (possible, major) at Black Lassic and Red Lassic dispersed areas from hazard trees (Treatment PS-01 and Treatment PS-02).

Very High Risk (very likely, major) at 6E21 trailhead from hazard tree leaning over the trailhead parking area (Treatment PS-01 and Treatment PS-02). **High Risk** (possible, major) from numerous hazard trees adjacent to trails 6E01, 6E07, and 7E33 (Treatment PS-01).

Very High Risk (likely, major) associated with hazardous materials from burned structures at Burgess Cabin (Treatment L-03, Treatment PS-01, and Treatment PS-02).

Very High Risk (likely, major) from loss of ingress/egress. Loss of access from flooding and subsequent damage to road prisms at stream crossings could eliminate emergency ingress/egress along major roads of high concern, including SH36, CR501, CR511, and 1S26 (Treatment PS-01). With the exception of 1S26, access on state and county routes is not a BAER Critical Value, however interagency coordination is needed with local state/county highway districts and emergency management services.

Very High Risk (likely, major) to forest visitors and employees from confusion or loss of direction on roads and trails where directional signs were burned. Burned signs are not a BAER Critical Value, therefore no treatment recommended.

Low Risk (unlikely, moderate) to occupants at the Glen Creek rental cabin as the facility is not occupied during the winter season when a debris flow is most likely to occur.

2. Property:

High Risk (likely, moderate) to NFS roads and bridges at intermittent and perennial drainages from increased runoff, erosion, and debris flows. Undersized culverts are expected to plug or overtop and severely damage road infrastructure with loss of NFS investment. Locations include Forest Glen bridge, 1S06, 1S07, 2S08, and 1S11 (Treatments RT-01, RT-02, RT-03, and RT-04).

NFS Trail 7E33: **High Risk** (likely, moderate) of direct damage to trail tread and loss of constructed features (rubber water bars, primitive boardwalk, tread retention log, and culvert) from increased overland flows concentrating on route segment downslope from areas burned at moderate and high severity. Failure of this trail segment will deliver sediment to sensitive areas adjacent to the trail (Treatment RT-05).

NFS Trail 7E29: Low Risk (possible, minor) to from increased overland flows concentrating on route segment. No treatment recommended.

Glen Creek Rental Cabin: Low Risk (unlikely, moderate) to facility from debris flows. No treatment recommended.

Bailey Canyon Campground: infrastructure is at Intermediate Risk (possible, moderate) from flooding and sedimentation; Low Risk (unlikely, moderate) from debris flows. No treatment recommended.

Fir Cove Campground: infrastructure is at Low Risk (unlikely, moderate) from flooding and sedimentation; Moderate Risk (possible, moderate) from debris flows. No treatment recommended.

Intermediate Risk (possible, moderate) to surface water supply systems at Fir Cove and Bailey Canyon campgrounds from sediment and debris deposits from burned areas. This also applies to the Humboldt Bay Municipal Water District (Ruth Lake) where damage could result in increased maintenance to domestic and private water systems. No treatment recommended.

3. Natural Resources:

High Risk (likely, moderate) to critical habitat or suitable occupied habitat for ESA-listed Northern spotted owl (*Strix occidentalis caurina*) from tree mortality. It is estimated that 7 of the 8 northern spotted owl protected activity centers (PACs) in the area will sustain the loss of suitable nesting, foraging, and dispersal habitat. However, that is based on the assumption that areas of moderate and low fire intensity will function as suitable habitat. No treatment recommended.

Low Risk (possible, minor) expected to critical habitat or suitable occupied habitat for ESA-listed Coho salmon (*Oncorhynchus kisutch*). Potential threats include short- and long term modification of suitable and occupied habitat due to channel scouring from increased stream flows, increased sediment, and debris flows. Impacts to water quality include increased sediment and ash. Modifications of streamside vegetation and stream bank conditions can increase water temperature due to loss of shading in watersheds. No treatments recommended.

Intermediate (possible, moderate) to Low Risk (possible, minor) to critical habitat or suitable occupied habitat for ESA-listed California steelhead (*Oncorhynchus mykiss*). Potential threats include short- and long term modification of suitable and occupied habitat due to channel scouring from increased stream flows, increased sediment, and debris flows. Impacts to water quality include increased sediment and ash. Modifications of streamside vegetation and stream bank conditions can increase water temperature due to loss of shading in watersheds. No treatments recommended.

Intermediate (possible, moderate) to Low Risk (possible, minor) to critical habitat or suitable occupied habitat for ESA-listed Chinook Salmon (*Oncorhynchys tshawytscha*). Potential threats include short- and long term modification of suitable and occupied habitat due to channel scouring from increased stream flows, increased sediment, and debris flows. Impacts to water quality include increased sediment and ash. Modifications of streamside

vegetation and stream bank conditions can increase water temperature due to loss of shading in watersheds. No treatments recommended.

Very High Risk (likely, moderate) to grass and shrub native or naturalized vegetative communities due to the loss of vegetative cover from the fire. Known noxious and invasive weed populations exist within and immediately adjacent to the burned area, and they will compete aggressively with native species for space and nutrients (Treatment L-01).

Very High Risk (very likely, moderate) to water quality. Threats to 303d-listed streams include increased sediment delivery and elevated water temperatures. Impacts to watershed process and functions that regulate erosion, sediment delivery, and stream shade are expected in areas that burned at moderate to high severity. Threats to water quality can potentially impact beneficial uses that includes habitat for ESA-listed aquatic species, domestic water supply systems, and capacity and productivity of hydropower facilities.

Very High Risk (likely, moderate) to soil quality as accelerated erosion from moderate and high burn severity areas are expected. The loss of effective ground cover and above ground organic matter will leave the soil resource susceptible to erosive forces for 8 to 10 years. Over the long term loss of surface soils can lead to deceased site productivity and increased potential for the spread of invasive plant species and noxious weeds from known populations within and adjacent to the burned area. Additional threats to soil quality from accelerated erosion and introduction of non-native and invasive plant species exist from unauthorized OHV intrusions due to the loss of physical and vegetative barriers. No treatments recommended.

Very High Risk (likely, major) to Lassic lupine (*Lupinus constancei*) in terms of individual mortality and population viability due to high intensity fire at the "forest" site and "red lassic" site. This species exists nowhere else but two occurrences within the Lassics. Annual monitoring (most recently in June 2015) indicated a population size of about 650 plants. While not a currently ESA-listed species, candidacy status in under development. Mortality would depend, in part, on the degree of damage to the root crown of the plant. Lassic lupine is a perennial species so if burning was surficial/nominal, the species may regenerate, however the full extent of impacts will not be known until 2016 surveys are completed. No treatments recommended.
Intermediate Risk (possible, moderate) to Vernal Pools, unique habitats for Fairy shrimp. Short- and long term modification of suitable and occupied habitat due to increased sediment and debris flows. Modifications to water quality due to sediment and ash. Modification of riparian vegetation. Loss of populations due to sedimentation (Treatment L-02).

4. Cultural and Heritage Resources:

High Risk (likely, moderate) of degradation to 2 historic properties. Damage is likely from flooding as increased overland flow and hillslope erosion is expected to impact the sites. Additionally, flooding through the site will likely erode residual artifacts and result in loss of data and site integrity if not mitigated (Treatment L-03).

There are numerous NFS values that are not BAER Critical Values in addition to non-NFS values potentially at risk from post-fire threats originating primarily on NFS lands. These are summarized in a "Values at Risk" (VAR) table in the assessment record. Treatments for these other values have not been identified. Activities to address the non-BAER Critical Values on NFS lands can be considered for discretionary program funding. It is recommended the non-

NFS values identified be communicated to the appropriate parties through interagency coordination procedures.

B. Emergency Treatment Objectives:

- Mitigate and protect, to the extent possible, threats to personal injury or human life of forest visitors and Forest Service employees by raising awareness through posting hazard warning and signs on roads and trails, reinforcing trail tread, improving trail drainage and stream crossings, and communicate hazard of flooding, debris flows, and rock fall. Communicate to cooperating agencies and community groups. Consider temporary closures to protect public users of NFS lands and recreation facilities.

- Protect or minimize damage to NFS investments in roads and trail infrastructure by installing drainage features capable of withstanding potential increased stream flows and/or debris flows. Minimize damage to key NFS travel routes.

- Protect or mitigate potential post-fire impacts to critical natural and cultural resources within the burned area.

- Treat invasive plants that are a threat to naturalized ecosystems by minimizing the expansion of existing populations in the burned area and control of expected invasion of noxious weeds within and adjacent to the area where soils/vegetation was disturbed as a result of fire suppression activities.

- Assist cooperators, other local, State, and Federal agencies with the interpretation of the assessment findings to identify potential post-fire impacts to communities and residences, domestic water supplies, public utilities (including hydropower facilities, power lines, roads, and other infrastructure).

C. Probability of Completing Treatment Prior to Damaging Storm or Event:
Land 75% Channel NA Roads/Trails 80% Protection/Safety 90%

D. Probability of Treatment Success

Treatment	Years after Treatment		
	1	3	5
Land	80	85	90
Channel	NA	NA	NA
Roads/Trails	80	90	95
Protection/Safety	90	80	70
Initially, visitors will heed the warning signs. Complacency is expected after the initial year unless there is a damaging event.			

E. Cost of No-Action (Including Loss): REDACT

F. Cost of Selected Alternative (Including Loss): REDACT

Implementation of recommended response actions is based on market resources only and is economically justified with a 1.9 benefit:cost ratio. The likely probability of loss if treatments

were not applied is based on field observations and estimate of damage or loss with the longer duration precipitation event. For the recommended treatments there is a reduced probability of damage or loss with implementation. The expected loss would not be as costly when implementing the recommended treatments. The VAR analysis focused primarily on market values so potential benefits such as lowering level of risk to human life and safety, natural resources, and cultural resources were recognized in this BAER assessment, but not included in the cost basis for Values at Risk analysis.

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology	[X] Soils	[X] Geology	[ ] Range	[X] Recreation
[X] Forestry	[X] Wildlife	[ ] Fire Mgmt.	[X] Engineering	[ ]
[ ] Contracting	[ ] Ecology	[X] Botany	[X] Archaeology	[ ]
[X] Fisheries	[ ] Research	[X] GIS	[ ] Landscape Arch	

Team Leader: **Terry Hardy**
Email: REDACT Phone: REDACT FAX: REDACT

H. Treatment Narrative:
(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

Land Treatments:

L-01 EDRR: Reduce the potential for establishment of new noxious weed infestations in native or naturalized communities, particularly establishment of new noxious weed infestations in highly susceptible burned areas, prevent spread of existing infestations, and decrease rate of spread of weed density from existing infestations.

Treatment includes an initial detection survey combined with treatment at time of discovery, if possible. Surveys will begin in 2016 at times when the target species are the most visible. Because of differences in flowering times for potential species, two visits may be required during the growing season. Completion of surveys in roads, dozer lines, drop points, helispots, wilderness trailheads and trails, staging areas, and safety zones 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 disposed of properly.

EDRR Treatment Cost Estimate.

Assessment Area	Survey Area (acres)	Labor	Mileage	Supplies	Total
Mad River Complex	36,315	REDACT	REDACT		REDACT

L-02 Hillslope Stabilization at Vernal Pools: Apply wood chipping to steep hillslopes with high and moderately high burn severity (approximated 3-4 acres per pool). Install fiber rolls, wattles, or other sediment control near the bottom of the slope to minimize ash flow into the pools.

Hillslope Stabilization – Vernal Pools Treatment Cost Estimate.

GS-9 Specialist	REDACT
GS-5 Technician	
GS-5 Technician	
Vehicle Use	
Chipper Rental	
Materials (2 pallets wattles, stakes, delivery)	

L-03 Hillslope & Hazardous Materials Stabilization:

Site 1. Straw waddles will be placed for redirecting water flows away from the concern area and straw mulching will be hand strewn to help mitigate erosion. These treatments are to prevent the site surface from washing into the perennial stream, which would affect site context and integrity.

Twelve bales of weed free straw will also be hand strewn across the site to act as a duff layer, aid in vegetation regrowth, and help lessen the chances for erosion, and camouflage the site from potential site looting. Site monitoring is recommended to ensure the treatment methods are functioning as intended.

Hillslope Stabilization Treatment Cost Estimate.

Site 1	REDACT
GS-9 Archaeologist	
GS-5 Archaeological Tech	
Vehicle Use	
Materials (8 wattles, 12 bales, stakes, delivery)	
OR	
Private Archaeological Consultant	REDACT
Private Archaeological Consultant	
Per diem	
Vehicle Use	
Materials	

Site 2. Straw waddles will be placed for redirecting water flows away from the concern area and straw mulching will be hand strewn to help mitigate erosion. These treatments are to prevent water from funneling and concentrating flow on the jeep trail and slope to the south and east of the site, which would potential have enough force to push the burned historic refuse into REDACT REDACT

Ten straw waddles measuring 8" by 25' will be placed along the top of the slope break and the jeep trail will be placed at every 15' to slow the velocity of the water. The waddles will be placed to divert water and debris away from the springhead and slowly into the seasonal drainage on the western side of the site. Approximately 5 bales of weed free straw will also be hand strewn across the site to act as a duff layer, aid in vegetation regrowth and help lessen the chances for

erosion of the historic material into [REDACT]. Site monitoring is recommended to ensure the treatment methods are functioning as intended.

Hillslope and Hazardous Materials Stabilization Treatment Cost Estimate.

Site 2	
GS-9 Archaeologist	REDACT
GS-5 Archaeological Tech	
Vehicle Use	
Materials (10 wattles, 5 straw bales, stakes, delivery)	
OR	
Private Archaeological Consultant @ approx.	REDACT
Private Archaeological Consultant @ approx.	
Per diem	
Vehicle Use	
Materials	

Treatment L-03 Cost Summary

Site	Treatment	
1	FS 05-10-54-0177; straw and wattle erosion mitigation	REDACT
2	FS 05-10-54-0213; straw and wattle erosion mitigation	
	Total	

Channel Treatments:

None recommended.

Road and Trail Treatments:

RT-01 Road Storm Proofing: The majority of roads within the Mad River and Humboldt Complex area are expected to see an increase in flows over the next couple of years. Some existing culverts and drainage structures on these roads are undersized and/or are not designed for the expected increase in flows. It is nearly certain that damage will occur if measures aren't taken to stabilize the roads and drainage structures.

Clean culverts, ditches, run out ditches, and catchment basins of sediment and debris. Replace damaged culverts and install new culverts in locations determined by the Engineer that will provide relief to existing culverts. Undersize culverts should be upsized, where feasible, appropriate, and cost effective. Large culverts with high fills under major arterial roads (Level 3 roads) will be very expensive to install and should therefore be regularly maintained after each storm event. Slotted riser pipes or culvert end sections should be installed where feasible to reduce the possibility of sediment and debris plugging existing culverts. Install rolling dips where they will be most efficient and necessary. Rolling dips should be installed on the down slope side of culverts and in locations where culvert failure is possible or likely. These rolling dips will assist to remove water from the roadbed that has become trapped on the road surface causing erosion and travel hazards.

Some roads within the fire are outsloped and a berm has been created along the downhill side of the road shoulder. This berm should be pulled back into the road and incorporated into the road surface or removed in sections to promote sheet flow across the road.

See Burned Area Emergency Response Treatments Catalog Chapter 4, Rolling Dips pages 109-112, Low-Water Stream Crossings pages 121-126, Catchment-Basin Cleanout pages 145-148 and BAER Specification, Road Drainage Reconstruction for more information.

RT-02 Road Storm Patrols: The roads at risk within the Mad River Complex burned area are primarily located below areas of high to moderate burn severity. There is an immediate and future threat to travelers along the roads within the burned area due to the increased potential for culverts to plug with sediment and debris which could washout sections of the roads. With the loss of vegetation, normal storm frequencies and magnitudes can more easily initiate erosion on the slopes and it is likely that this runoff will cover the roads or cause washouts at drainage facilities (culverts) or stream crossings. These events make for hazardous access to forest roads and put the safety of users at risk.

Monitor road drainage structures and debris flow treatment structures after significant storm events to ensure the maximum drainage capacity is maintained until the natural re-vegetation of the burned area has occurred. Maintain and/or repair any damage to road surfaces. Remove sediment and debris from drainage and treatment structures and repair headcutting in streams and drainages to prevent further degradation of channels. Monitor the movement of large woody debris and make a determination of whether or not the material should be removed before it contacts bridge piers, abutments, or culverts. Mitigate hazard trees at treatment locations to provide for worker safety.

See Burned Area Emergency Response Treatments Catalog Chapter 4, Storm Inspection and Response pages 149 -152 and BAER Specification for Storm Patrols for more information.

RT-03 Riprap Placement: The Glen Creek Bridge on 1S26 is susceptible to scour of the right abutment from increase flows in Glen Creek. Stabilize the abutment with riprap, before winter rain and snow events. Mitigate hazard trees at treatment locations to provide for worker safety.

RT-04 Culvert replacements/critical armored dip installation: Numerous existing roadway culverts have been identified as being undersized for the post-fire flows and at risk of being overtopped.

On road systems where vehicle access is required and it is feasible and cost effective to replace the culverts to handle the post fire flows, proceed with full culvert replacements. On road systems where vehicle access is required and it is not feasible and cost effective to replace the culverts to handle the post fire flows, implement treatments to minimize the risk to human life and safety, property, and the impacts to water quality such as rolling dips or armored critical dips. Mitigate hazard trees at treatment locations to provide for worker safety.

See Burned Area Emergency Response Treatments Catalog Chapter 4, Culvert Modifications pages 127-129 and BAER Specifications for Road Drainage Reconstruction, Culvert Replacements, and Culvert Removals for more information.

Road Treatments Cost Estimate.

Engineering Treatments Specification		Cost
RT-01 Storm Proof Roads	For 66.2 miles of roads in the Lassic and Pickett fire areas, install rolling dips, clean ditches, clean culvert inlets and catch basins, culvert inlet end sections, slotted inlet riser pipes, debris racks, berm removal, and outsloping roads.	REDACT
RT-02 Storm Patrols	Storm patrols will be used to identify problem areas such as clogged culverts, washed out roads and damaged drainage and treatment structures. Storm patrols will complete limited maintenance by removing debris from treatment structures to ensure they continue to function during future flood events.	REDACT
RT-03 Riprap Placement	Install riprap below the abutment of the Glen Creek Bridge	REDACT
RT-04 Culvert Replacements	Remove and replace 2 culverts identified as being undersized or damaged. Replace culvert rundown (exposed 18" x 160' cmp) on NFS road 1S07 at mile 5.6. Replace 18" cmp with 24" x 35' cmp on NFS road 1S11 at mile 7.98. Structures shall comply with Forest Plan standards.	REDACT
	Total Cost	REDACT

RT-05 Recreation Infrastructure Stabilization: Emergency stabilization of recreation Infrastructure (accumulated values include human life and safety, water quality, soil productivity). Threats include direct damage to trail tread or constructed features (rubber water bars, primitive boardwalk, tread retention log, and culvert) from increased overland flows concentrating on routes downslope from burned areas, especially those with moderate to high burn severity. This can indirectly affect natural resources through sedimentation of sensitive areas from trail. Threats to property also include loss of fire and OHV restriction signs, which can lead to illegal campfires and unauthorized OHV use which may set a precedent that is difficult to manage. Additional threats to property include threats to Forest Service campground facilities and water supply systems from flooding, sedimentation, and debris flows in watersheds with moderate to high burn severity.

Install temporary drainage dips where necessary along 2.8 miles of trail 7E33 and repair damaged tread and stabilizing cutbank on 20' long trail segment damaged by burned fill material. Mitigate hazard trees at treatment locations to provide for worker safety.

Recreation Infrastructure Stabilization Cost Estimate.

Item	Materials	Labor	QTY	UOM	Total
Trail Crew	REDACT				
Saw Team (Hazard Tree Fallers)					
Vehicle Use - Trail Crew					
Vehicle Use - Hazard Tree Fallers					

Protection/Safety Treatments:

PS-01 Hazard Warning Signs: Potential threats to visitors/recreating public, residents of private lands, & agency personnel include flooding and debris flows, hazard trees, and rockfall along/at roads, trails, developed and designated dispersed sites, and FS administrative sites that are downstream or downslope of burned slopes, especially those with a moderate-high burn severity.

This treatment will purchase and install burned area warning signs to caution forest visitors recreating within the burned area. It is consistent with the language provided in the BAER Treatments Catalog. The treatment is a component of the overall travel control devices for the burned area (USDA Forest Service-EM7100-15, 2005). The warning signs will identify the types of hazards to watch for when traveling on NFS roads and trails, and recreation sites. This treatment will place hazard warning signs and information signs at 2 developed recreation campgrounds and 3 trailheads.

PS-02 Temporary Closures and Enforcement: This treatment includes establishing, posting, and enforcing temporary closure of the Black Lassic and Red Lassic camping areas until hazard trees can be mitigated. Closures should be implemented with a signed Forest Order and enforced through patrols by Law Enforcement Officers or Forest Protection Officers. Signs should be posted to warn of hazards and explain the closure.

Hazard Warning Signs and Temporary Closures Cost Estimate.

PS-01 Hazard Warning Signs	Materials	Labor	QTY	UOM	Total
Roadside Entering Burned Area Warning Signs	REDACT				
Trail/Recreation Burned Area Hazard Warning Signs					
PS-02 Temporary Closures and Enforcement	**Materials**	**Labor**	**QTY**	**UOM**	**Total**
Forest Order Preparation (GS-9 Rec)	REDACT				
Forest Order Signs					
Closure Order Enforcement (FPO, GS-5 Tech)					
LE Patrol (GL-9, 10 hr day)					
Vehicle-GS-5 Rec Tech					
Vehicle-LEO					

This treatment also includes optional temporary closures of the Fir Cove and Bailey Canyon developed campgrounds. Mid-season temporary closure in advance of forecasted storms may be necessary to protect life and safety. Temporary closure should be planned in advance based on weather forecasts so that campground users and Forest Service employees are not put at risk during campground evacuation. The need for temporary storm closure should be left to Forest discretion and based off the expertise of local resource specialists.

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.)

Associated activities obligated under ID-FSM2520-2014-1 need to be considered in the BAER funding request when emergency response actions are authorized. These are accumulated tasks above the normal program of work and generally not accounted for in out-year program planning. Because implementation of approved BAER response actions trigger these required tasks and the unit's allocated budget does not account for these obligations, BAER funding is the appropriate authorization to ensure this coordination and consultation is completed.

Interagency Coordination

Staff Officer (GS-13) Forest BAER Coordinator (GS-12) BAER Specialist (GS-12)	REDACT

Implementation Tracking and Required Reporting of Authorized Emergency Response Actions

Forest BAER Coordinator (GS-12) PIO (GS-11)	REDACT

Emergency Consultation on Implementation of Authorized Emergency Response Actions

Forest Fish Biologist (GS-12)	REDACT

NHPA Compliance for Implementation of Authorized Emergency Response Actions

Forest Archeologist (GS-12)	REDACT