Forest Service
Six Rivers National Forest
1330 Bayshore Way
Eureka, CA 95501-3841
(707) 442-1721 Text (TTY)
(707) 442-1721 Voice

File Code: 2520
Route To: (2520)

Date: October 22, 2013

Subject: Corral Fire BAER 2500-8 request

To: Regional Forester

Enclosed is the initial Burned Area Emergency Response (BAER) Report 2500-8 for the Corral Fire. The report describes the values at risk, threats to those values, proposed emergency treatments with their objectives, and funds requested for the emergency treatments.

The Corral Fire burned a total of 12,540 acres on the Six Rivers (11,650 ac) and Shasta Trinity (890 ac) National Forest lands in Humboldt and Trinity County, CA from August 10 to October 2, 2013. The majority of the fire was located in the Trinity Alps Wilderness. The cause of the fire was multiple lightning strikes from one storm event. These small fires spread, eventually becoming one large fire by late August. The fire burned over several watersheds that drain into the Trinity River, mostly in the upper reaches and their tributaries of Horse Linto and Tish Tang Creeks. Elevations range from 2,000 to 6,300 feet. The fire re-burned moderately-sloping to steep granitic and metasedimentary watersheds which had previously burned at high intensity during the Megram Fire of 1999 and Backbone Fire of 2009. Experience from these past fires has shown that without treatment, small to moderate amounts of sediment are likely to be mobilized and delivered to the Trinity River, Forest Service roads and trails located in granitic soils are likely to incur some damage, and noxious weeds are likely to spread into previously unaffected areas.

I support the BAER Team's recommendations to implement the enclosed road, trail, and safety treatments to protect human life and property, significant natural resource values, and cultural resources in the burned area. I am requesting funds in the amount of $47,292 to implement the proposed treatments.

I have reviewed the plan and determined that this is an emergency in nature and the actions will assist in reducing the risks to the values identified.

If you have any questions, please contact Carolyn Cook, Watershed, Fish and Wildlife Program Manager and BAER Coordinator at (707) 441-3551, cacook@fs.fed.us or contact Scott Hagerty, Corral BAER Team Leader at (707) 441-3636, shagerty@fs.fed.us.

TYRONE KELLEY
Forest Supervisor

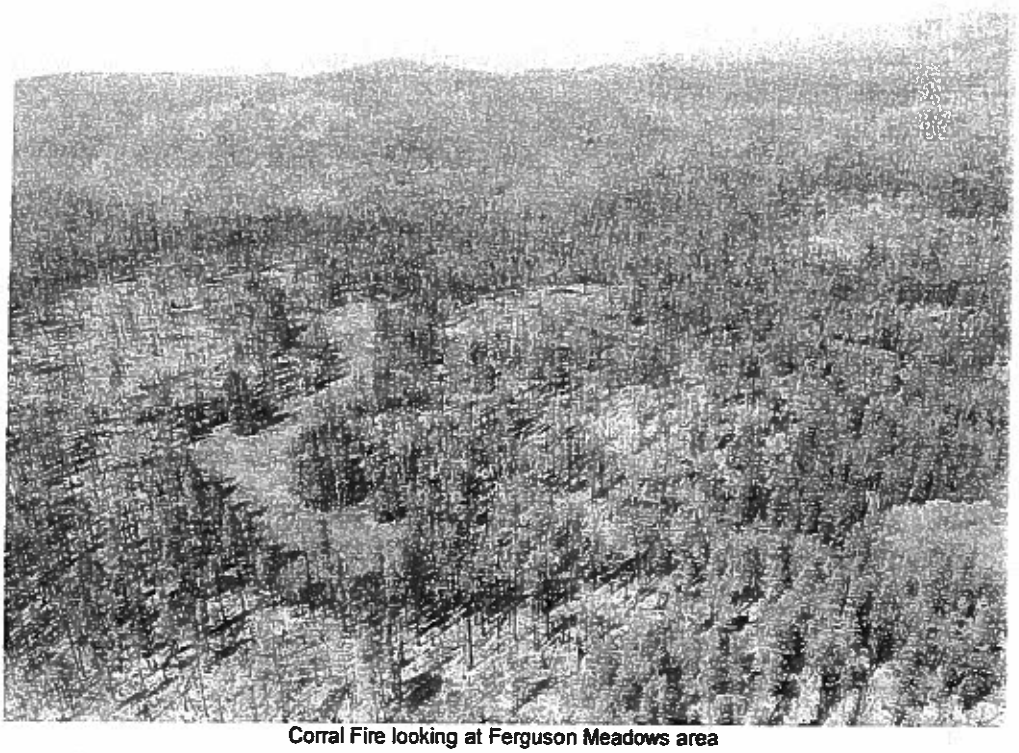
Enclosure

cc: Jeff D TenPas, Brad L Rust, Carolyn A Cook, Scott Hagerty

Date of Report: 10/18/2013

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST



Corral Fire looking at Ferguson Meadows area

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**: Corral Fire

B. **Fire Number**: CA-SRF-001494

C. **State**: CA

D. **County**: Humboldt and Trinity County

E. **Region**: R5

F. **Forest**: Six Rivers, Shasta-Trinity

G. **District**: Lower Trinity RD (SRF), Big Bar RD (SHF)

H. **Fire Incident Job Code**: P5HU49

I. **Date Fire Started**: August 10, 2013

J. **Date Fire Contained**: October 02, 2013

K. **Suppression Cost**: $36,666,073

L. Fire **Suppression Damages Repaired with Suppression Funds**

1. **Fireline waterbarred (miles)**: Approximately 33 miles of dozer line to date, some of which are historic jeep trails and current system trails. Approximately 7.6 of 19 miles of handline waterbarred to date.
2. **Fireline seeded (miles):** No fireline seeded at this time.
3. **Other (identify):** Approximately 11 acres of helispots, drop points, spike camps, dip sites, and safety zones exist within the fire, many of which have been repaired.

   Approximately 5 acres of Humboldt crossings and other clearing also exist, most of which have been rehabilitated.

M. **Watershed Numbers**:

Soil Burn Severity Acres by Watershed

HUC 14	HUC 14 Name	Acres	very low/unburned	low severity	moderate severity	high severity	total burned	% burned
18010211120401	Upper Tish Tang A Tang Creek	9969	8636	541	686	107	1333	13%
18010211120402	South Fork Tish Tang A Tang Creek	3291	2009	223	697	362	1283	39%
18010211120303	Tributaries Horse Linto Creek	4556	2252	776	1154	374	2304	51%
18010211120304	Middle Horse Linto Creek	3124	2631	170	303	21	493	16%
18010211120301	Upper Horse Linto Creek	6625	3369	923	1651	682	3256	49%
18010211120302	East Fork Horse Linto Creek	4149	3245	73	320	512	904	22%
18010211100103	Twomile Creek – Virgin Creek	7506	7382	72	52	1	124	2%
18010211100401	Quinby Creek	5630	5382	166	79	2	248	4%

N. **Total Acres Burned**:

12,540 NFS Acres [0] Other Federal [0] State [0] Private

Soil Burn Severity Acres by Land Status

Land Owner	Very Low Severity (Acres)	Low Severity (Acres)	Moderate Severity (Acres)	High Severity (Acres)	Total Burned (Acres)
Six Rivers NF	2,145	2,697	4,775	2,033	11,650
Shasta Trinity NF	441	248	172	29	890
Total	3,406	2,945	4,947	2,062	12,540

O. Vegetation Types:

Dominant vegetation series within the burned area is white fir series, followed by Douglas-fir and tanoak series. A host of other vegetation types are also present to a lesser extent. The vegetation can generally be described as, mixed evergreen forests dominated by Douglas-fir and ponderosa pine, with mixed components of red fir, sugar pine, white fir, and varies primarily by elevation and aspect. Areas of previous burns (within 10 years) within the Megram Fire are dominated by regenerating shrub fields with multiple species of manzanita, deerbrush and snowbrush with overstory of standing snags and scattered conifers. Numerous conifer stands of ponderosa pine and Douglas fir exist within the fire perimeter dating back to the 2009 Backbone and 1999 Megram Fire.

P. Dominant Soils:

The major soils within the Corral Fire are Chaix, Clallam, Deadman, Deadwood, Maymen, Raisio, Rouge, and Wapal. These eight soils represent 98% of the project area (the remiainng 2% is represented by soil map unit 500 – Rock Outcrop). Most of these soils are moderartely deep or deep with the exception of Deadwood which is shallow. A majority of the area is dioritic, metasedimentary or metaigenous with low to moderate to high erosion hazard ratings depending on burn severity. Hydrologic soil group range from B to D. Although the Chaix soil map unit (SMU) has a high average erosion hazard rating (EHR) the hydrologic group for this soil is group B. Group B soils have moderate water infiltration rates 0.15 to 0.30 inch per hour and percolate through the soil column at a moderate rate as well. They are moderately well-to-well-draining soils. A higher average EHR couples with a Hydrologic Group C or D would be more of a concern as Groups C and D have slow and very low infiltration rates, repsectively.

Soil Resource Inventory Soil Map Unit Acreage Within the Corral Fire perimeter (includes unburned area)

Soil Map Unit	Association	Acres	Parent Material	Hydrologic Group	Average Erosion Hazard Rating
552	WAPAL, MOD. DEEP-DEADMAN, DEEP	2,667	Diorite Rock	B	Moderate
503	ROCK OUTCROP, DIORITIC-WAPAL, MOD. DEEP	1,909	Diorite Rock	B, D*	Low
280	DEADWOOD-CLALLAM, DEEP, EXT. GRAVELLY	1,101	Sedimentary, Metasedimentary & Metaigneous Rock	C-D	Low
520	CHAIX, MOD. DEEP	1,062	Diorite Rock	B	High
281	CLALLAM, DEEP, EXT. GRAVELLY-DEADWOOD	1,052	Sedimentary & Metasedimentary Rock	C	Moderate
530	MAYMEN, DIORITIC	1,019	Diorite Rock	C	Moderate
501	ROCK OUTCROP-MAYMEN COMPLEX, DIORITIC	959	Diorite Rock	C-D	Low
550	WAPAL, MOD. DEEP	806	Diorite Rock	B	Moderate
356	RAISIO-CLALLAM COMPLEX, MOD. DEEP	746	Metaigneous Rock	C	Low

282	DEADWOOD-ROCK OUTCROP, METASEDIMENTARY-VOORHIES	577	Sedimentary & Metasedimentary Rock	B-D	Low
20	CHAIX FAMILY	446	Diorite Rock	B	Very High
500	ROCK OUTCROP, DIORITIC	300	Diorite Rock	D	Low
270, 259	ROCK OUTCROP, METASEDIMENTARY	297	Metasedimentary Rock	D	High
331	CLALLAM, MOD. DEEP-SKALAN, DEEP	172	Metaigneous Rock	B-C	Moderate
524	DEADMAN-ROGUE, DEEP	164	Diorite Rock	B	Moderate
224	NEUNS FAMILY	57	Metasedimentary Rock	D	High
81	GOULDING FAMILY	36	Metasedimentary Rock	D	High
FM1	ROCK OUTCROP	12	Metasedimentary Rock	D	Moderate
340	CLALLAM, MOD. DEEP-ROCK OUTCROP, METAIGNEOUS	3	Metaigneous Rock	B-C	Moderate
-	Total Acres	13,386			

* No C Hydrologic Group for SMU 503 Association

Q. Geologic Types: :

Dominated by intrusive igneous bedrock of the Ironside Mountain batholith. This plutonic unit comprises over 85% of the bedrock in the burned area, comprised largely of medium-grained diorite to monzodiorite. The Ironside Mountain intrusion is associated principally with the Western Hayfork subterrane of Irwin, part of the Western Paleozoic and Triassic belt (TrPz) of Klamath accreted terranes, and is of Jurassic age (~170 ma). The relatively mafic composition of the rock includes a high proportion of biotite mica, leading to disaggregation (grusification) of rock into individual grains when subjected to hydration weathering processes. This favors deep weathering and the development of cohesionless, highly erodible soils commonly referred to as "decomposed granite" or D.G. The intrusion is massive and moderately jointed, supporting a modified trellis drainage pattern, where stream channels and wet meadows are frequently co-located with the surface expression of the joint pattern.

The easternmost portion of the burned area is underlain by metasediments of the Western Hayfork subterrane. These occupy steep headwater slopes in upper East Fork Horse Linto Creek and upper tributaries of mainstem Horse Linto Creek. Lithologies in the area are largely argillaceous and cherty metasediments with occasional limestone. Steep linear to concave slopes predominate.

The majority of the burned area landscape (9,589 acres; 78%) consists of gentle to moderately sloping terrain, mapped as eroding hillslopes on the granitic, mostly formerly glaciated, plateau highlands (Figure 3). Steep, rock fall-prone escarpments and debris slide basins dominate the canyon slopes of Horse Linto Creek and Tish Tang Creek at the south and west margins of the area. Steep headwall basins occupy the Trinity Mountain ridge east of the Horse Ridge National Recreation Trail (USDA Forest Service, 2008).

R. Miles of Stream Channels by Order or Class:

Flow Regime by Severity (Miles)					
Flow Regime by Land Status	**Very Low Severity (Miles)**	**Low Severity (Miles)**	**Moderate Severity (Miles)**	**High Severity (Miles)**	**Total (Miles)**
Six Rivers NF					
Intermittent	3.4	7.4	9.3	1.53	21.6
Perennial	15.6	12.2	9.5	1.90	39.2
Shasta-Trinity NF					
Intermittent	2.1	1.7	0.4	0	4.2
Perennial	1.8	0.56	0.13	0	2.5
Grand Total	22.9	21.9	19.3	3.4	67.5

S. Transportation System

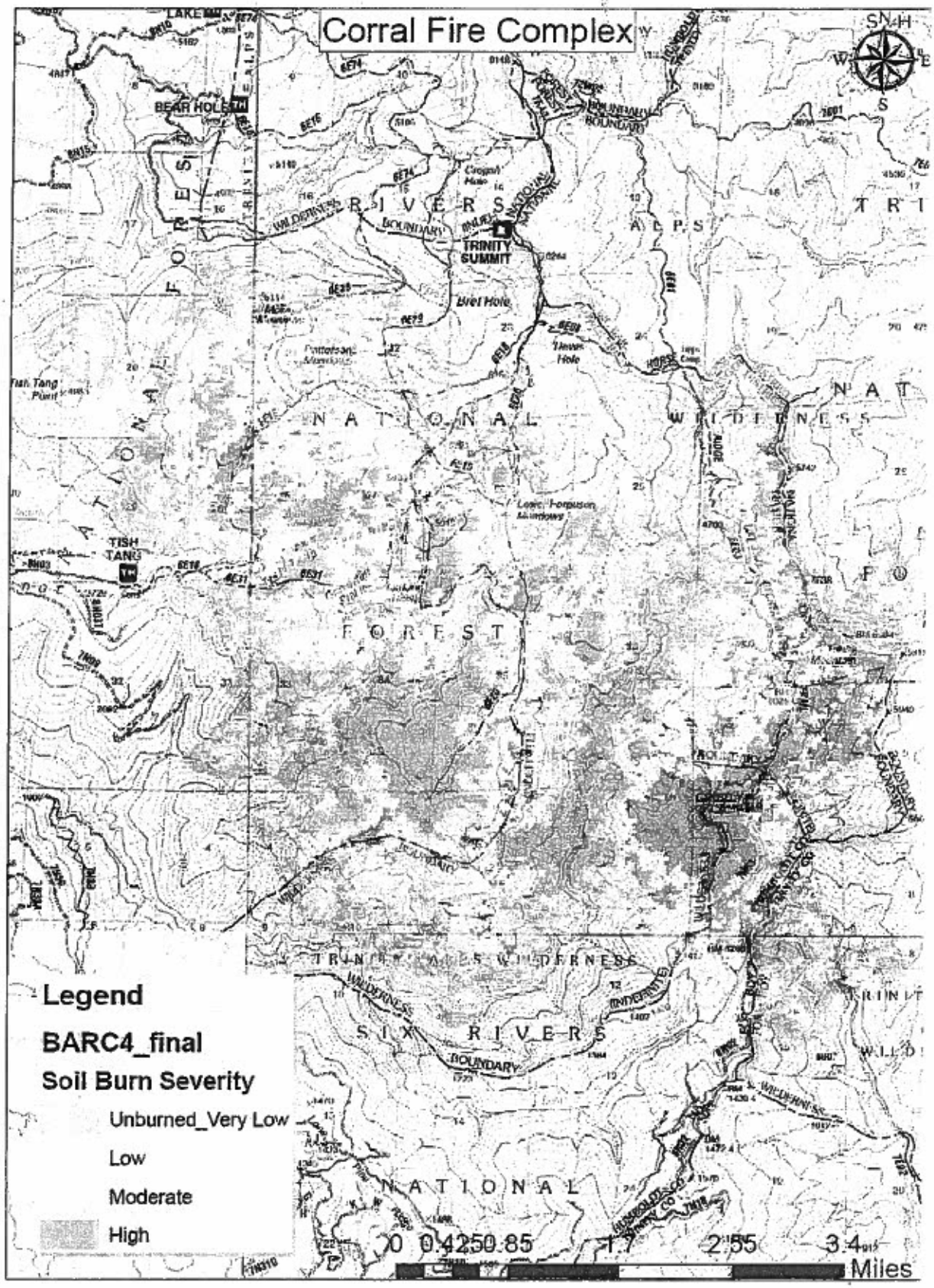
Trails: 18 miles **FS Roads:** 2.9 miles **County Road**: 0 Miles

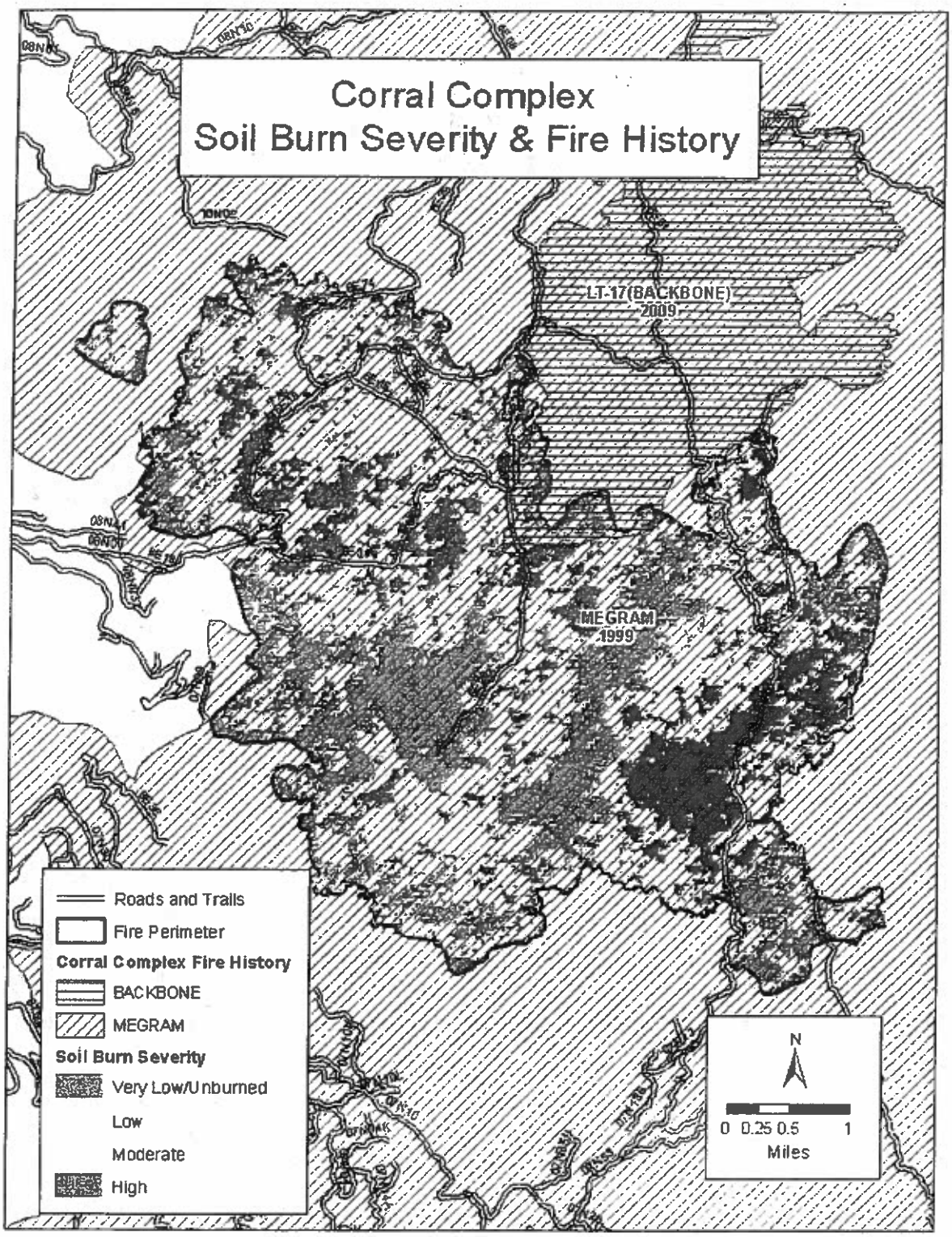
PART III - WATERSHED CONDITION

A. Burn Severity (acres): 2,586 ac **(very low)** 2,945 ac **(low)**
4,947 ac **(moderate)** 2,062 ac **(high)**

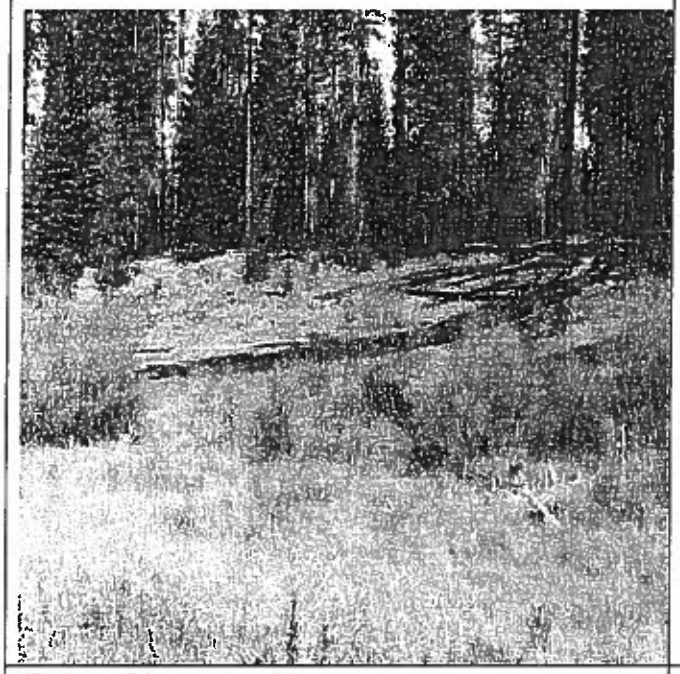
Approximately 15% of the Corral Fire had a high soil burn severity and 37% had a moderate soil burn severity (see soil burn severity map below). These areas are well distributed throughout the fire, and with the exception of the East Fork Horse Linto Creek watershed, areas of high and moderate soil burn severity are relatively small. The remainder of the fire was either low or very low soil burn severity. It is very important to understand the difference between fire intensity or burn severity as discussed by fire behavior, fuels, or vegetation specialists, and soil burn severity as defined for watershed condition evaluation in BAER analyses. Fire intensity or burn severity as defined by fire, fuels, or vegetation specialists may consider such parameters as flame height, rate of spread, fuel loading, thermal potential, canopy consumption, tree mortality, etc. For BAER analysis, we are not mapping simply vegetation mortality or above-ground effects of the fire. Soil burn severity considers additional surface and below-ground factors that relate to soil hydrologic function, runoff and erosion potential, and vegetative recovery.

Corral Fire BAER Assessment Soil Burn Severity Map


Corral Fire Complex
Legend
BARC4_final
Soil Burn Severity
Unburned_Very Low
Low
Moderate
High
0 0.425 0.85 1.7 2.55 3.4
Miles
TRINITY SUMMIT
BEAR HOLE
TISH TANG
SIX RIVERS
NATIONAL FOREST
NATIONAL WILDERNESS
TRINITY ALPS WILDERNESS


Corral Complex
Soil Burn Severity & Fire History
LT-17(BACKBONE)
2009
MEGRAM
1999
Roads and Trails
Fire Perimeter
Corral Complex Fire History
BACKBONE
MEGRAM
Soil Burn Severity
Very Low/Unburned
Low
Moderate
High
N
0 0.25 0.5 1
Miles

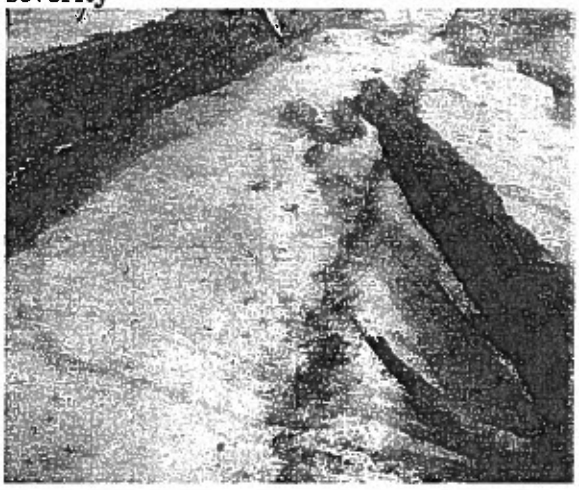
Low soil burn severity



Moderate soil burn severity

High soil burn severity

Charred mineral soil in high soil burn severity



Soil burn severity is assessed by looking at above ground cover and surface cover, soil char (depth of soil burning), soil structure, destruction of soil organic matter, destruction of fine roots, and water repellency strength and depth. Areas of high soil burn severity typically had nearly all surface organics removed and char depths of up to 1 in affecting soil structure and fine roots. Water repellency in high soil burn severity is running from 2 to 4 inches deep depending on soil texture and vegetation that was burned. In moderate soil burn severity most of the surface organics are consumed but fine roots and soil structure are unaffected. Water repellency is low or non-existent and scorched needed and leaves provide for potential soil cover. In low soil burn

severity the surface litter is only partially consumed and the shrub or canopy is still partially green.

B. **Water-Repellent Soil (acres)**: est. 3,505 ac (50% repellency of high and moderate soil burn severity acres)
Water repellency is present in the moderate and high soil burn severity classes, approximately 3,505 acres, but extremely patchy in occurrence. Where it occurs, the repellent layer is from 0.5 to 8 inches in depth, moderate to severe, and 20 to 30% continuity.

C. **Soil Erosion Hazard Rating (acres)**:

Erosion Hazard Rating		
Rating	**Acres**	**Percent**
Low	5,567	42
Moderate	5,895	44
High	1,452	11
Very High	446	3
Total	**13,360**	**100**

Soil Erosion Hazard Ratings (EHR) within mapped High Soil Burn Severity.

Average EHR	Soil Burn Severity	Acres	Percent
Very High and High	High	547	26
Moderate	High	682	33
Low	High	855	41
	Total Acres	**2,084**	100

D. **Erosion Potential**: **# tons/acre:** average erosion potential is 16 tons/acre (Calculated from WEPP-ERMiT for a 2-year storm event and untreated hillslope. Model accuracy is +-50%)

E. **Sediment Potential**: **# cubic yards / square mile:** 693 cu yards/sq mi (Calculated by converting erosion potential in D. to cu yards/square mile (assuming 1 cu yards equals 1.5 tons) and using a 10 percent delivery factor

PART IV - HYDROLOGIC DESIGN FACTORS

A. **Estimated Vegetative Recovery Period, (years)**: 6

B. **Design Chance of Success, (percent):** 75

C. **Equivalent Design Recurrence Interval, (years):** 10

D. **Design Storm Duration, (hours):** 24

E. **Design Storm Magnitude, (inches):** 5.71

F. **Design Flow, (cubic feet / second/ square mile):** 163
(Average design flow of 8 sub-drainages delineated for soil erosion, hydrology and geo debris flow analysis)

G. **Estimated Reduction in Infiltration, (percent)**: 20
(calculated based on increase in average adjusted design flow)

H. **Adjusted Design Flow, (cfs per square mile):** 169
(Average adjusted design flow of 8 sub-drainages delineated for soil erosion, hydrology and geo debris flow analysis)

PART V - SUMMARY OF ANALYSIS

Background - The Corral Fire burned approximately 12,540 acres of forest in Humboldt and Trinity County, California from August 10 to October 2, 2013. The fire perimeter encompasses 13,361 acres of varying burn severity, including internal unburned islands in the vicinity of Bell Swamps and in the upper Horse Linto Creek canyon. The cause of the fire was multiple lightning strikes from one storm event. These small fires spread, eventually becoming one large fire by late August. The fire burned over several watersheds that drain into the Trinity River, mostly in the upper reaches and their tributaries of Horse Linto and Tish Tang Creeks. Elevations range from 2,000 to 6,300 feet. The Corral Fire re-burned areas previously burned in the Megram (1999) and Backbone (2009) fires. A small area in the northeastern portion of the burned area was also burned in the Backbone Fire, although mostly at very low to low soil burn severity. Some unburned areas within the Megram Fire perimeter burned in the Corral Fire, while significant areas of unburned vegetation still remain within the fire perimeter.

The fire resulted in 44 percent very low and low, 39 percent moderate and 16 percent high soil burn severity. Values at-risk include public safety on affected trails and one road segment, Forest Service road infrastructure, natural resources including native plant communities in wilderness, and cultural resources.

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

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

Values at Risk:

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

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	RISK		
Very Likely	Very High	Very High	Low
Likely	Very High	High	Low

Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

Values At Risk Matrix Table

Risk Type	Value At Risk	Potential Threats	Probability of Damage	Magnitude of Consequences	Risk	Treatment
Life/Safety	Tish Tang Trails 6E18 and 6E35	Falling snags, orientation; debris slide, erosion and trail collapse;	Likely	Moderate	High	Install hazard warning and trail directional signs; Repair collapsed tread; log out for treatment
Life/Safety	Horse Ridge Trail 6E08	Falling snags, orientation; erosion and trail collapse;	Likely	Moderate	High	Install hazard warning/trail signs; Repair collapsed tread; log out for treatment
Life/Safety/ FS Property	Grizzly Camp Trailhead (Trail 6E08) and FS Road 7N53	Falling snags, debris flow	Possible	Major	High	Install hazard warning signs on road near fire perimeter and trailhead
FS property	Road 7N53, MP4.67	Flooding, overtopping/diversion and loss of fill	Likely	Moderate	Intermediate	Replace 24" culvert with 48"
Natural Resources	Native habitats prone to invasion	Invasive plants	Likely	Moderate	High	Detection survey and hand treatment to remove noxious weeds
Natural Resources	Soil productivity	Soil erosion affecting site productivity	Possible	Moderate	Low	None

Natural Resources	303D listing - Lower Trinity River watershed	Accelerated sediment delivery from landsliding	Possible	Moderate	Intermediate	None: treatments not feasible or appropriate in wilderness
Natural Resources	Critical Coho habitat in lower Horse Linto Creek	Accelerated sediment delivery	Unlikely	Moderate	Low	None - Low Risk
Cultural Resources	Known archaeological sites	Looting, vandalism, erosion	Possible	Moderate	Intermediate	On-site monitoring

- **Human Life and Safety**-
  Potential loss of or injury to human life exists along the Tish Tang (6E18, 6E35) and Horse Ridge National Recreation Trail (6E08). The presence of fire damaged trees along all trails within the burned area, presents a hazard to recreationists with falling trees and fallen trees blocking the trail. Along sections of these trails within High and Moderate burn severity that have high erosion hazards, the trails shoulder and tread has been supported by shrub and tree roots which were burned, resulting in sloughing of the trail tread prism and collapsing of the trail tread and at trail stream crossings. This presents a hazard to the recreating public utilizing the trails, especially those on horses that are traveling at higher rates of speed. There are also seven trail intersections that have damaged or loss of directional signage that may result in public getting lost in the wilderness. The *Probability of Damage or Loss* to human life and safety would be *Possible* to *Likely* depending on the intensity of the burn and the topography of the area. The *Magnitude of Consequences* would be *Moderate* with potential injury to humans. With these two elements combined the *risk* is identified as *Intermediate to High.* **Treatments Recommended –Install hazard warning signs and trail work addressing areas with potential for trail collapse due to burned out roots and logs beneath the tread and hardening/drainage work at hazardous stream; replace/repair directional signage.**

- **Human Life/Safety and Property**-
  Potential loss of or injury to human life exists along the Horse Ridge National Recreation Trail (6E08) and the Grizzly Camp Trailhead. The Forest Service Road 7N53 into the trailhead passes through high and moderate soil burn severity areas. Several channels cross the road south of the trailhead, including one that exhibits signs of an old debris flow deposit upslope of the stream crossing. Drainage areas are small (50 acres or less), but there appears to be some increased risk of a debris flow impacting the road prism. Also, denuded cutslopes in cohesionless granitic soils are prone to slumping and/or ravel, and may deliver deposits or burned tree boles to the roadway. One large bole has already partially blocked the road. The *Probability of Damage or Loss* to human life and safety would be *Possible.* The *Magnitude of Consequences* would be *Major* with potential impacts to the road and personal property. With these two elements combined the *risk* is identified as *High.* **Treatments Recommended –Install hazard warning signs at the burned area perimeter and Grizzly Camp Trailhead to warn travelers of the hazrds within the burned area. areas with potential for trail collapse due to burned out roots and logs beneath the tread and hardening/drainage work at hazardous stream; replace/repair directional signage.**

- **Property**–
  FS Road 7N53 at MP 4.67. Based on the runoff, burn severity and debris flow modeling results in this sub-watershed, the *Probability of Damage or Loss* of the fire affected road segment is *Likely* and the *Magnitude of Consequences* is *Moderate* resulting in a *Intermediate* Risk. **Treatments Recommended –replace 24 inch culvert with 48 inch.**

- **Natural Resources –**
  - *Soil productivity on burned NFS lands.* After a fire there is the potential threat of increased soil erosion affecting site productivity. The *Probability of Damage or Loss* is *Unlikely* and the *Magnitude of Consequences* would be *Moderate* resulting in *Low* risk. **No Treatments Recommended**

  - *Mass wasting and hydrologic function on burned NFS lands.* The critical values at risk are related to waters with special state or federal designations on or in close proximity to the burned NFS lands. The Lower Trinity River is a 303(d)-impaired for water quality. The steep high and moderate burn severity slopes east of East Fork Horse Linto Creek on the Trinity Mountain ridge are the site of historic active debris slides and debris flows. Field observations of colluvial hollows in the burned drainage axes on these re-burned and denuded slopes are indicative of increased post-fire landslide risk in this area. There is an *elevated threat* here of *increased sediment delivery to East Fork Horse Linto Creek from landsliding.* The *Probability of Damage to water quality is Moderate and the Probability of Damage to Coho habitat is Unlikely due to the distance from the headwaters to the critical habitat reaches.*, with the *Magnitude of Consequences* being *Moderate*, this results in a risk assessment of *Low to Intermediate*. **Treatments Recommended – no treatment.**

  - *Native or naturalized communities on NFS lands where invasive species or noxious weeds are absent or present in only minor amounts.* The fire occurred in areas where noxious weeds are absent or present in only minor amounts along dozer lines and other disturbed areas where invasive plant introduction and. Dense infestations of French broom, Scotch broom, Klamath weed, bull thistle, Himalayan blackberry, and mullein. Priority species that are known to exist within the fire perimeter (or have existed within the fire perimeter in the past) include yellow starthistle and Klamath weed. These two species are likely to expand within the fire perimeter. The *Probability of Damage or Loss* from non-native species introduction or spread is *Likely* to occur, with the *Magnitude of Consequences* being *Moderate*, this results in a risk assessment of *High*. **Treatments Recommended – One year (2014) of noxious weed detection surveys and hand treatments.**

- **Cultural Resources-**
  Wildfires have the potential to damage, or destroy cultural resource through: (1) direct effect of the fire; (2) ground disturbing suppression or rehabilitation activities; and/or (3) erosive soil movement caused by subsequent storm precipitation. These impacts may completely destroy prehistoric, historic, and Native American resources (such as traditional gathering and ceremonial areas) or alter the context of surface and subsurface cultural/natural remains vital to living Tribes, or important for their scientific analysis or interpretation. Also, wildfire may increase the accessibility and

visibility of cultural resources, making them more susceptible to vandalism/artifact looting and unauthorized recreational activity.

Nine cultural resources (eight prehistoric sites and one ceremonial use area) are identified as values at risk. The *Probability of Damage or Loss* is considered *Possible*, since artifacts and features that were previously hidden by duff and other vegetation may now be exposed.artifacts and features that were previously hidden by duff and other vegetation. The *Magnitude of Consequences* is *Moderate*, given that the potential for vandalism to nine cultural resources either bisect or are adjacent to recreational wilderness trails. The combination of these elements results in an assessment of *Intermediate.* **Treatments Recommended – Two years (2014, 2015) of cultural resources detection surveys to assess exposure in relation to erosion and vegetation growth, and to determine whether looting is occurring.**

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

Proposed Treatments

The objectives of the treatments are to:

1. Protect human life and safety by raising awareness through posting hazard warning and directional signs on trails, reinforcing trail tread, improving trail drainage and stream crossings, and communicate hazard of flooding, debris flow and rock fall to cooperating agencies and community groups.
2. Protect Forest Service investment in road and trail infrastructure by installing drainage features capable of withstanding potential increased stream flows and/or debris flows.
3. Protect ecological value of biological diversity by monitoring and treating as necessary, sites where introduction of noxious weeds may have occurred in previously uninvaded sites.
4. Protect cultural resources by conducting detection surveys of sites in close proximity to trails that may have been or will be exposed due to loss of vegetation or erosion associated with the fire.

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

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

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	80	90	90
Channel	NA	NA	NA

Roads/Trails	80	90	95
Protection/Safety	90	90	90

E. Cost of No-Action (Including Loss): $418,500 (calculated from the Values at Risk (VAR) tool)

F. Cost of Selected Alternative (Including Loss): $ 48,292 (calculated from the Values at Risk (VAR) tool)

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Scott Hagerty - Region 5 – Forest Soil Scientist, Six Rivers NF
Email: scotthagerty@fs.fed.us **Phone**: 707-441-3636 **FAX**: 707-441-3502

Team:

SCOTT HAGERTY (TEAM LEAD) AND SOILS
KARLA KNAPEK (TRAINEE)- SOILS, HYDROLOGY, GIS
FRED LEVITAN - GEOLOGY
ADAM DRESSER -HYDROLOGY
CARRIE SCHREIBER - BOTANIST/INVASIVE SPECIES
JULIE CASSIDY AND DOREEN HRIVNAK – ARCHAEOLOGY
KARY SCHLICK – RECREATION AND WILDLIFE
AMY ZIEGLER - GIS

H. Treatment Narrative:

Land Treatments:

Cultural Resource Treatments.

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

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

Cultural Resource Monitoring Costs (2014, 2015)

Item	Unit	Unit Cost	# of Units	Cost
GS-9 Archaeologist	Days	$240	15	$3600
GS-7 Archaeolgist	Days	$160	15	$2400
Mileage	Miles	$0.39	140	$220
			Total Cost:	$6,220

Noxious Weed/Invasive Plant Detection Surveys.

Treatments to mitigate the noxious weed emergency include an initial detection survey, combined with treatment at time of discovery, if possible. Surveys will begin in 2014 at times when the target species are the most visible. Because of differences in flowering times for all potential species, two visits may be required during the growing season. Completion of surveys in roads, dozer lines, drop points, helispots, wilderness 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.

Weed Survey Cost Estimate

Weed Assessment Area	Survey Miles	Survey Acres	Labor Cost	Mileage Cost	Supplies	Project Admin	Total
Six Rivers	100		$8,230	$280			$9,430

Roads Treatments:

Results from hydrology, soil erosion, and debris flow models indicate that one segment of road within the Corral Fire area is at risk due to increased peak flows, sedimentation, and debris flows. The ground cover was completely consumed in this drainage area above the culvert with High soil burn severity. The lack of vegetation and ground cover is expected to result in increased flashy runoff, down slope movement of fine ash and sediment, and does show evidence of historic/potential debris flow path. Treatments are related to restoring and improving the drainage function to preserve property, public safety, and water quality.

This culvert in a tributary to East Fork Horse Linto Creek (FS road 7N53, MP 4.67 may not be able to accommodate increased stormflow and potential debris flow. For this small sub-watershed, 83% burned at high severity and 16% burned at moderate severity, which would indicate a peak flow increase of nearly 20%. Although this is not a huge increase in peak flow, the culvert is currently under-sized for the 100-year storm event even under unburned conditions. Therefore, any additional flow, particularly if large amounts of sediment or debris also occur, could cause this culvert to fail.

This culvert must be crossed to access the Grizzly Camp Trailhead. The nearest place to turn around if this crossing were to fail would require backing up over one mile, which could be a significant safety issue for vehicles pulling stock or other trailers.

Treatment: Replace existing 18" with 48" culvert

Item #	Description	Method of measurement	Unit	Est. Quantity	Unit Price	Total Price
15101	Mobilization	LSQ	LS	1	$ 1,000.00	$ 1,000.00
20305	Removal of metal culvert pipe	DQ	EA	1	$ 100.00	$ 100.00
60252	48 inch culvert	AQ	LF	40	$ 250.00	$ 10,000.00
Total Base Pricing:						$ 11,100.00
FS personnel: GS-11 for 3 days (survey, contract package, inspection) =						$ 966.00
Vehicle 2554 for 3 days = (use 0.34 per mile * 400 miles) =						$ 136.00
					TOTAL	$12,202.00

Trail Treatments:

On the Tish Tang and Horse Mountain National Recreation Trails there are on moderate to high soil burn severity areas where there are burned- out cavities beneath the tread, rock will be used to fill and reinforce the area.

On sections of these trails there are 4 areas on segments with moderate and high burn severity where accelerated surface erosion is expected. Ten (10) water crossings along the trail have been identified as needing to have waterbars installed and rock placed to harden crossings to mitigate potential trail-damaging erosion, rendering the trail hazardous to hikers and stock. These treatments will be installed in order to divert surface water, curb trail erosion, and protect water quality. Installation should be designed to last no more than 3 years – permanent structures are not part of this treatment.

Trail work addressing areas with potential for trail collapse due to burned out roots and logs beneath the tread and erosion control measures will be implemented by the California Conservation Corps crew and fire personnel. Log out costs are included in order to access the work sites. The implementation of the work will take place spring 2014. Reason for this is that likely damaging storm events will not occur until summer 2014. The cost of this trail tread work is $16,640.

Improve Trail Drainage: Four areas require treatments that occur on trial segments within moderate and high intensity burn areas where moderate to high risk of accelerated surface erosion is expected. Each water crossing point (number 1 and 2 below) is estimated to include <50 feet on each side to repair and harden it. There are 10 water crossings (high and moderate) therefore 1000' of repair is estimated. There are two known wilderness trail sections with serious erosion problem areas (number 3 and 4 below).

1) 5 water crossings points at High severity/High *Erosion* hazard to be "Hardened" (500ft)
2) 5 water crossings points at Moderate severity/ Moderate *Erosion* hazard to be "Hardened" (500ft)
3) 1 highly *Eroded* Trail Section on Tish Tang (attached photo 6) (850ft)
4) 1 Zig Zag Section w/bad *Rills* off Grizzly Trail (1600ft)

Treatment #T1 requires 3400 feet or 0.64 miles of trail work. This work is remote and requires various types of tools and rock transport. The most efficient and cost effective estimate to accomplish the work would be with a trail crew for several days spiked out with stock support. This work is estimated at $7,000 to $10,000/mile therefore the Treatment #T1 total BAER request is $6440.

Treatment #T2 –Trail Access—Down Trees: A high number of fire-killed trees are falling and blocking trail access and expected to increase with the onset of winter. Trail log out will be necessary along 17 miles of trail in order to access Treatment Sections. This work is time consuming and arduous requiring trained cross-cut labor. Only large downed trees or jack-strawed down trees will be logged-out for the sole purpose to implement BAER work using BAER funds. The remaining downed trees will be will be logged out with appropriated or fire recovery funds. This estimate is based on a 20% increase of work load directly related to the extensive dead and dying large trees (>15dbh & 100-300` tall) caused by the fire. The most efficient and cost effective estimate to accomplish the work would be with a Forest hotshot crew for three days therefore Treatment #T2 total BAER request is $10,500.

Protection/Safety Treatments:

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

Purchasing and installing hazard warning signs at trailheads that enter the burned area could be implemented almost immediately. This would help warn users of the possible dangers they may encounter along the trails. This treatment is practical and technically feasible and the cost $1,231.

Treatment #T3 – Improve Trail Safety, Orientation, & Orienteering —Signage & Structures: Wilderness directional signs were damaged or lost due to fire burn and certainly wind throw within the burned area. There are seven intersections within low to high burn severity areas that will require 1 to 3 directional signs ($1550). Fire damaged a sign board at the Grizzly Trail Head ($450). For safety reasons, some of the access roads leading up to trail heads should be temporarily signed (High Fire Severity Area, Stock Not Recommended, Trailers Not Recommended, No turnaround, etc.) ($500). Treatment #T3 total BAER request is $2500.

Estimate to complete the work for BAER is $19,440.

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

None requested.

Part VI –Emergency Stabilization Treatments and Source of Funds

			NFS Lands				Other Lands			All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER$	$	units	$	Units	$	$
A. Land Treatments										
Nox.Weed Detection	Miles	$94	100	$9,430						$9,430
Cultural Res Dist. Surveys	Each	$6,220.00	1	$6,220			$0		$0	$6,220
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$15,650	$0		$0		$0	$15,650
B. Channel Treatments										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
Culvert replacement	Each	$ 12,202.00	1	$12,202	$0		$0		$0	$12,202
Trail work	Each	16,940.00	1	$16,940	$0		$0		$0	$16,940
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$29,142	$0		$0		$0	$29,142
D. Protection/Safety										
Install hazard signs	each	625	4	$2,500	$0		$0		$0	$2,500
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$2,500	$0		$0		$0	$2,500
E. BAER Evaluation										
BAER Assessment	report				$27,000		$0		$0	
Insert new items above this line!				—	$0		$0		$0	$0
Subtotal Evaluation				—	$27,000		$0		$0	$0
F. Monitoring										
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				$47,292	$27,000		$0		$0	$47,292
Previously approved										
Total for this request				$47,292						

PART VII - APPROVALS

1. Forest Supervisor (Six Rivers NF) (signature) — Date: Oct 22, 2013

2. for R5 Regional Forester (signature) — Date: 10/29/2013