

BERRY FIRE BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST



Berry Fire looking into Blackberry Ck. watershed above the Pit River near Pit 4 dam

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: Berry Fire B. Fire Number: CA-SHU-009460
C. State: CA D. County: Shasta
E. Region: 5 F. Forest: Shasta-Trinity
G. District: SMMU(Shasta-T) H. Fire Incident Job Code: P5?
I. Date Fire Started: 9/12/2017 J. Date Fire Contained: 9/22/2017
K. Suppression Cost: \$1 million
L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 12
2. Fireline seeded (miles): 0
3. Other (identify): 0
M. Watershed Number (HUC 6): Tunnel Reservoir (18020030904)

Part 2N, Acres Burned:

942 acres on FS lands

Part 2O, Vegetation Types:

Mixed conifer and true fir forest on north side of Chalk Mtn, south side of Chalk Mtn is mixed conifer with black oak and canyon live oak.

Part 2P, Dominant soils:

Xerorthents, Lithic Xerorthents, Washougal, Sheld, and Holland-ashy Families

Q. Geologic Types: Within the fire area the Pliocene age Tuscan Formation forms the principal unit. This unit is widespread within the region and partially covers sedimentary rocks of the Great Valley province to the south and crystalline basement rocks of the Klamath Mountains province to the west. The Tuscan Formation is believed to have originated in at least six source areas within the surrounding region. The principal rock types are: andesitic, dacitic, and basaltic volcanic breccia, tuff breccia, and interlayered flows of fluvially-reworked sand, gravel and tuff.

R. Miles of Stream Channels by Order or Class: 7 miles perennial , 2 miles intermittent; 5 miles ephemeral

S. Transportation System:

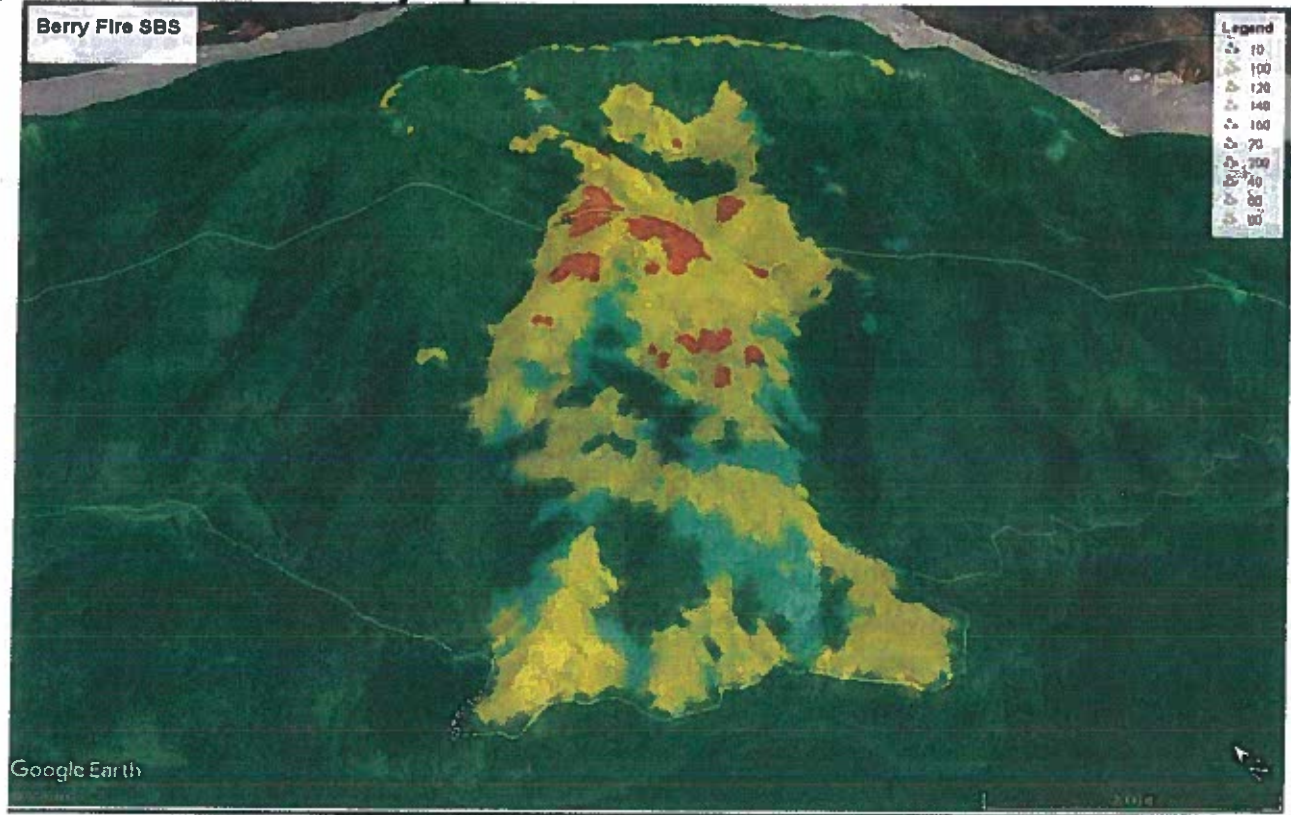
Trails: 0 miles Roads: 2 miles

PART III - WATERSHED CONDITION

Part 3A, Burn Severity:

| Sum of Acres | | | | |
|--------------|-----|----------|------|-------|
| Fire Name | Low | Moderate | High | Total |
| Berry | 262 | 620 | 80 | 962 |
| | | | | |
| Percentage | | | | |
| Fire Name | Low | Moderate | High | Total |
| Berry | 27% | 64% | 8% | 100% |
| | | | | |

Berry Fire Final Soil Burn Severity Map:



Part 3B, Water Repellent Soils:

Water repellency is present in the moderate and high soil burn severity classes, approx. 4,053 acres, but patchy in occurrence. Where it occurs, the repellent layer is from 2 to 6 inches thick, moderate to severe, and 50-70% continuity. Generalizations for occurrence were coarse textured soils with hydrophobic producing vegetation that were completely consumed.

Part 3C, Soil Erosion Hazard Rating:

Low = 262 acres, Moderate = 620 acres, High = 80 acres

Part 3D, Erosion Potential: (based on a 10-year storm)

| Berry ERMIT Erosion Rates* (40.02 north; 121.78 west) | | | | | | |
|--|---------------|--------------|--------------------|----------------|-----------------------------|-----------------------------|
| soil | % area | acres | dominate bs | texture | erosion 1st yr (t/a) | erosion 2nd yr (t/a) |
| washougal | 20 | 192 | moderate | xglcos | 42 | 30 |
| sheld | 50 | 481 | moderate | vgsl | 30 | 23 |
| sheld | 10 | 96 | high | vgsl | 44 | 31 |
| washougal | 20 | 192 | low | xglcos | 27 | 14 |
| | | | | | 36 | 25 |
| *10% probability of exceedance of calculated values | | | | | | |

First year average erosion: 22 to 47 tons/acre with average of 32 t/a.

Second year average erosion: 14 to 31 tons/acre with average of 21 t/a.

Note: Sheet and rill erosion only on a slope length of 1000 feet to draw.

Part 3E, Sediment Potential:

Average sediment delivery potential is 40 to 50% due to flatten stream gradients before the Pit River, roughness of surface topography with rock fragments, and large downed wood for entrapment.

PART IV - HYDROLOGIC DESIGN FACTORS

- A. Estimated Vegetative Recovery Period, (years): 15
- B. Design Chance of Success, (percent): 80
- C. Equivalent Design Recurrence Interval, (years): 10
- D. Design Storm Duration, (hours): 6hr
- E. Design Storm Magnitude, (inches): 3.2
- F. Design Flow, (cubic feet / second/ square mile): 156
- G. Estimated Reduction in Infiltration, (percent): 20%
- H. Adjusted Design Flow, (cfs per square mile): 220

PART V - SUMMARY OF ANALYSIS

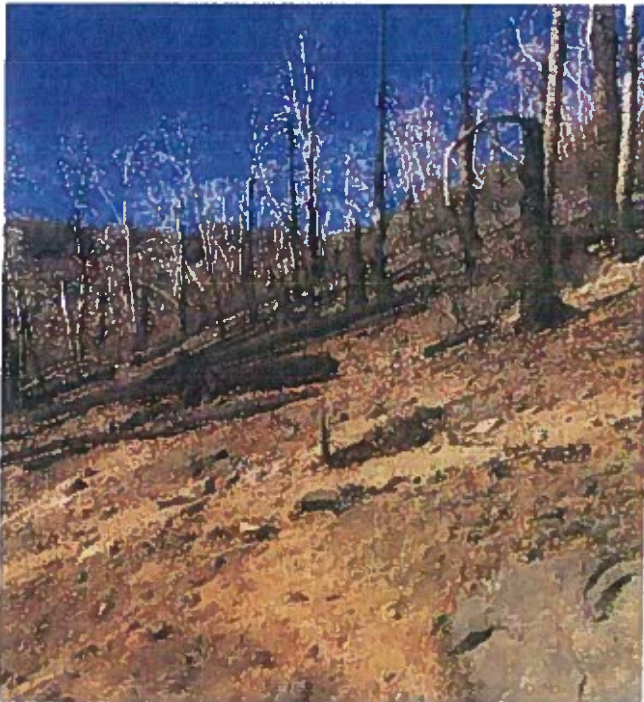
A. Describe Critical Values/Resources and Threats:

Background: The Berry Fire were caused by lighting on Saturday, August 1, 2009 six miles east of Big Bend, California in Shasta County within the Chalk Mountain LSR. The Berry Fire burned a total of 10,737 acres (8,777 acres Shasta-Trinity & 1,669 acres private & 344 acres Lassen NF) on steep rocky mountainsides to flat plateaus with mixed burn intensities. Approximately 37% burned at high and moderate soil burn severity (see soil burn severity map below). The rest of the fires were either low or very low soil burn severity.

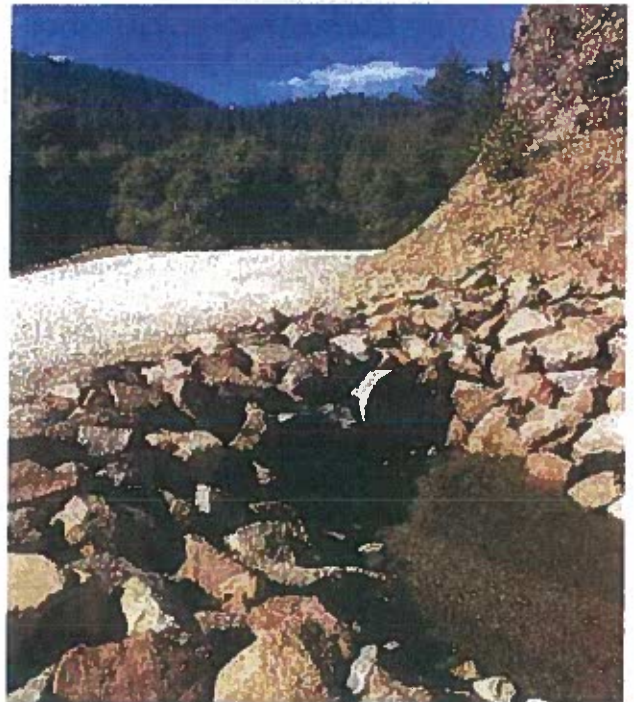
General trends ridges burned moderate to high severity fed by aligned up-canyon Pit River winds. Midslope areas burned moderate and lower areas along creeks and the Pit River had low burn severity.



In high soil burn severity areas on mixed brush/white fir in Blackberry Creek had deep water repellency, deep soil char, and repellency to 4 inches.



Blackberry Ck in hot burned vgs/ repellant soils



Fox Ck – Crossing above Pit 3 road 36N28Y

Values at Risk:

1. Roads and trails:

- a. Main Pit River road (FS 50) at several crossing (Fox and Blackberry creeks) could experience loss of water control.

2. *Water supply and quality:*

- a. Pit River water quality for beneficial downriver use will be turbid in the burned area.

3. *Fisheries and Aquatic Invertebrates:*

- a. Pit River Blue Ribbon Fisheries – The Pit 3/4 reach, just Lake Britton, provides a nationally renowned trophy trout fishery. Burned hillslopes, eroding sediments, and watershed with higher flows expected.
- b. The Pit 3/4 reaches are strongholds for the hardhead fish, a Forest Service Sensitive fish species in serious trouble elsewhere in California.
- c. Forest Service Sensitive mollusks and bivalves survive in a delicate balance within the Pit 3/4 reaches requiring very clean water and cold water temperatures.
- d. Foothill yellow-legged frog, erosion and sediments in the Pit River.

4. *Ecosystem stability and Soil stability/productivity:*

- a. Pit 4 dam and reservoir from possible debris flows/slides originating on severely burned slopes directly up from main access road to these facilities.
- b. Road 36N28Y (FS 50) from debris torrents and slides.
- c. PG&E powerlines have vegetation burned off and possible erosion of steep slopes into the Pit River from the Berry Fire.
- d. Concentrated large pockets of high soil burn severity in headwater pockets and reaches of Fox Creek and Blackberry Creek, all immediately above the Pit River.

5. *Botany (T&E, noxious weeds):*

- a. Noxious weed issue due to multi-dozer lines throughout LSR.
- b. Presence of Knapweed along Pit River that could have been drafted by helicopters from the river and dropped on firelines.
- c. T&E species located below PG&E powerlines on the Berry Fire burned out and hillslope is very prone to erosion.

B. Emergency Treatment Objectives: To allow safe passage of water to protect Forest Service and PG&E infrastructures and watersheds from accelerated sheet and rill erosion. To protect water quality and fish and aquatic habitat from degradation. To protect watersheds from the spread of noxious weeds and cultural site vandalism.

Risk determination is dependent on the design storm selected and downstream values at risk. By using an above average storm (10-year event) emergency planning measures can be designed to mitigate and minimize anticipated risks. Using a 10-year design storm the values at risk can be evaluated to determine if an emergency exists. Emergency determination matrix displayed below shows if an emergency exists, probability of failure if untreated or treated, and treatment proposed to mitigate the emergency.

Berry Fire Values @ Risk Emergency Determination Matrix

| <u>Value at Risk</u> | <u>Emergency</u> <u>U % (yes/no) T %</u> | | | <u>Reason</u> | <u>Treatment</u> |
|--|---|---|----|--------------------------|--------------------------------------|
| Pit River road and 36N28Y | 95 | Y | 25 | Loss of water control | Critical-dips, low-water cxs |
| Blackberry and Fox Creeks erosion and debris flows | 95 | Y | 55 | Burned hillslopes | Natural recovery & roadside chipping |
| Aquatics habitat – Pit River | 60 | M | 45 | Eroded fine sediments | Natural recovery, increase flow |
| Water quality – Pit River | 70 | M | 55 | Eroded fine sediments | Natural recovery, increase flow |
| Noxious weeds and T&E | 80 | Y | 10 | Firelines and powerlines | Detection survey and mulch |

U = untreated; T = treated; Where Y = yes, M = maybe, and N = no

C. Probability of Completing Treatment Prior to Damaging Storm or Event:Land 95 % Channel - % Roads 90 Trails - % Protection/Safety 95 %**D. Probability of Treatment Success**

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

E. Cost of No-Action (Including Loss): \$250,000**F. Cost of Selected Alternative (Including Loss): \$8,500****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 checked="" type="checkbox"/> Forestry | <input checked="" type="checkbox"/> Wildlife | <input checked="" type="checkbox"/> Fire Mgmt. | <input checked="" type="checkbox"/> Engineering | <input type="checkbox"/> |
| <input type="checkbox"/> Contracting | <input checked="" type="checkbox"/> Ecology | <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:**

(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.)

Land Treatments: Noxious weed detection surveys is the selected land treatments.

Noxious weed detection survey on firelines for introduced weeds due to suppression will consist of detection, handpulling and bagging. Areas found to be too large for bagging will be treated by hired handpulling crews. Costs for detection survey is due to required walking and camping to check all firelines, heli-spots, and sling drops used in this large suppression effort.

Channel Treatments: None selected use natural recovery.

Road Treatments: Storm-patrol. Post-fire summer debris flows triggered by the rapid influx of sediment from rills and gullies typical of places like southern California and the Rockies are less common in this region, most likely because intense summer storms occur less frequently. Discussions with Forest

personnel with long tenure on the Shasta-Trinity National Forest, however, revealed that debris flows and landslides following previous fires in this area have occurred. During the winter and spring of 2017, numerous landslides and debris flows occurred along Road 37N60Y due to heavy rainfall. The largest debris flow happened in Fox Creek which was within the burn scar of the 2009 Chalk Fire. If predictions of moderate to heavy winter rains in 2017-2018 are correct (NOAA), some slides could be reactivated or new ones created in areas which burned at high and moderate severity. Suggest that the culverts and inlets of stream crossing along roads 37N60Y and 37N50 within and below the fire perimeter be cleaned of any debris. We also suggest that this area be included in a winter storm patrol.

Trail Treatments: None selected use natural recovery.

Protection/Safety Treatments:

Posting of areas burned will alert the public to potential dangers of falling trees and rolling rocks on roads that will not be closed. Road and trail closure signs will protect the public from areas where road (FS50 and 36N28Y) will be susceptible to dry ravel, downed trees, debris flows, and landslides.

I. Monitoring Narrative:

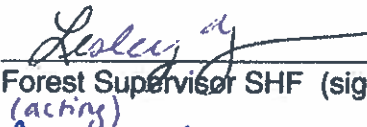
(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)


See Appendix B below for road monitoring.

Part VI – Emergency Stabilization Treatments and Source of Funds
Initial # 1

| Click red icons for notes. | | NFS Lands | | | | Money Spent \$ | Other Lands | | | Money Left Total \$ | |
|-------------------------------------|---------|--------------|---------------|---------|-------------|-------------------|---|-----------|---------------|---------------------------|---------|
| Line Items | Units | Unit Cost | # of Units | BAER \$ | Other \$ | | # of Units | Fed \$ | Non Fed \$ | | |
| A. Land Treatments | | | | | | | | | | | |
| NX Weed Det. Surv. | mi | \$700 | 10 | \$7,000 | | \$0 | | \$0 | | \$0 | \$7,000 |
| <i>Subtotal Land Treatments</i> | | | | \$7,000 | \$0 | \$0 | | \$0 | | \$0 | \$7,000 |
| B. Channel Treatments - none | | | | | | | | | | | |
| | | | | \$0 | | \$0 | | \$0 | | \$0 | \$0 |
| | | | | \$0 | | \$0 | | \$0 | | \$0 | \$0 |
| <i>Subtotal Channel Treatments</i> | | | | \$0 | \$0 | \$0 | | \$0 | | \$0 | \$0 |
| C. Road and Trails | | | | | | | | | | | |
| Storm patrol | project | \$1,000 | 1 | \$1,000 | | \$0 | | \$0 | | \$0 | \$1,000 |
| <i>Subtotal Road & Trails</i> | | | | \$1,000 | \$0 | \$0 | | \$0 | | \$0 | \$1,000 |
| D. Protection/Safety | | | | | | | | | | | |
| Warning signs | ea | \$250 | 2 | \$500 | | \$0 | | \$0 | | \$0 | \$500 |
| <i>Subtotal Protection</i> | | | | \$500 | \$0 | \$0 | | \$0 | | \$0 | \$500 |
| E. BAER Evaluation | | | | | | | | | | | |
| Assessment Team | --- | --- | --- | --- | \$1,000 | \$0 | --- | | --- | | \$0 |
| | --- | --- | --- | --- | \$0 | \$0 | --- | | --- | | \$0 |
| <i>Subtotal Evaluation</i> | | | | --- | \$1,000 | | --- | \$0 | --- | \$0 | \$0 |
| F. Monitoring | | | | | | | | | | | |
| Road monitoring | ea | | | \$0 | | \$0 | | \$0 | | \$0 | \$0 |
| <i>Subtotal Monitoring</i> | | | | \$0 | | \$0 | | \$0 | | \$0 | \$0 |
| G. Totals | | | | \$0 | | \$0 | | \$0 | | \$0 | \$8,500 |
| Previously approved | | | | | | | Comments: Fox Creek in 2016 had a large debris flow, this fire will likely cause more in Fox and Balckberry Creeks. | | | | |
| Total for this request | | | | \$8,500 | | | | | | | |

PART VII - APPROVALS

- 

 Forest Supervisor SHF (signature)
 (acting)
- 

 Regional Forester (signature)

1/24/18
Date

1/25/18
Date

APPENDICES: Supporting Information:

Appendix A: Storm-Patrol for Road Crossing Damage from Debris flows

Berry Fire 2017

Road Storm-Patrol

The 2500-8 report requests funds to monitor the effectiveness of road crossing on Berry fire roads.

1. Monitoring Questions

- Is the road crossing 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: _____
Time: _____

Inspector _____
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: _____