Date of Report: 08/13/2014

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: Bridge 99 Complex

B. Fire Number: OR-DEF-000392

C. State: Oregon

D. County: Jefferson

E. Region: Pacific Northwest (6)

F. Forest: Deschutes

G. District: Sisters

H. Fire Incident Job Code: P6H8FE (0601)

I. Date Fire Started: 7/13/14

J. Date Fire Contained: 98% Contained

K. Suppression Cost: $ 6,573,889 as of July 25th.

L. Fire Suppression Damages Repaired with Suppression Funds

1. **Fireline waterbarred (miles)**: Approximatly 3 miles of interior fire line has been rehabed at this time. Exterior fire line will be rehabed later this fall following a fire season ending storm event.
2. **Fireline seeded (miles):** No seeding of fire line is planned.
3. **Other (identify):** Safety zones, staging areas, and drop points are in the process of being rehabilitated. Road drainage installed where suppresssion activities warranted so.

M. Watershed Numbers:

Watershed	Subwatersheds (SWS)	SWS #	SWS Acres	Burn Acres
Upper Metolius River - 1707030109	Headwaters of the Metolius River	170703010911	19,309	1513
Lower Metolius River - 1707030110	Upper Metolius River	170703011002	31,565	721
	Middle Metolius River	170703011003	21,222	1753
	Lower Fly Creek	170703011005	16,256	343
	Spring Creek-Metolius River	170703011007	24,320	750

N. Total Acres Burned: 5082
[X] NFS Acres **[ ] Other Federal** **[ ] State** **[ ] Private**

O. Vegetation Types: The plant communities affected by the wildfire and subsequent fire suppression activities include plant association groups climaxed by white/grand fir (Abies concolor/grandis) communities (1,600 acres), ponderosa pine (Pinus ponderosa) communities (1,400 acres), and Douglas-fir (Psuedotsuga menziesii) communities (1,900 acres). In addition, the Bridge 99 fire contained rocky areas with little to no vegetation (90 acres) and a small portion with a mesic shrub community (10 acres).

P. Dominant Soils: Surface soils have fine sandy loam textures that result from fine basaltic ash deposits from older Cascade vents to the west. Airfall ash overlies older residual soils in some locations. Soils are classified as ashy Viticryands within the Andisol soil order.

Q. Geologic Types: The west face of Green Ridge is a fault scarp adjacent to the Metolius Basin and is comprised of numerous Pliocene aged ash, andesite and basalt flows from an older Cascade Range. The east slope of Green Ridge is an uplifted surface with comparatively gentle slopes.

R. Miles of Stream Channels by Order or Class:
- 10.85 miles of intermittent streams;
- 9.54 miles of ephemeral streams

S. Transportation System

Trails: 1 **miles** **Roads:** 34 **miles**

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 3,826 **(low)** 750 **(moderate)** 0 **(high)**

B. Water-Repellent Soil (acres): 0

C. Soil Erosion Hazard Rating (acres): 1,960 **(low)** 1,516 **(moderate)** 1,601 **(high)**

D. Erosion Potential:
- 0.09 tons/acre (soils on top of Green Ridge - Street and Spring Creek tributaries)
- 17.19 tons/acre (soils on steep slopes of the Green Ridge scarp)

E. Sediment Potential:
- 2.81 cubic yards of potential sediment contribution to North Fork of Spring Creek
- 206 cubic yards of potential sediment contribution down Green Ridge tributary drainages into the Metolius river

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 5 yrs

B. Design Chance of Success, (percent): 80%

C. Equivalent Design Recurrence Interval, (years): 25 yrs

D. Design Storm Duration, (hours): 0.5 hrs

E. Design Storm Magnitude, (inches): 0.67 to 0.77 inches

F. Design Flow, (cu feet / second/ square mile): 86 to 99 cfsm

G. Estimated Reduction in Infiltration, (percent): None

H. Adjusted Design Flow, (cfs per square mile): 86 to 99 cfsm

PART V - SUMMARY OF ANALYSIS

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

The following critical values/resources and threats were identified in the BAER analysis.

Natural Resources

- Federally Protected Native plant communities at risk from invasive plant introduction/spread
  - Metolius Late Successional Reserve, Metolius Wild and Scenic River, Metolius Breaks Proposed Research Natural Area, Metolius Breaks Proposed Wilderness Area – Native plant communities in two federally protected areas and 2 additional areas proposed for federal protection are biological reserves of high ecological value. Habitats in these areas are threatened by the expansion of invasive plant populations which exist in the wildfire area or may have been introduced by wildfire activities. There are 13 invasive plant sites in or adjacent to the fire area. Multiple vectors for invasive plant spread exist in the area such as water flows, wind, animals, and vehicles. BAER assessments conducted in 13 previous wildfires in the past 12 years on the Sisters Ranger District has shown that known weed sites can expand rapidly in the favorable conditions following wildfires. Field observations have shown that even low severity burn areas can be invaded. Many known weed sites in fire areas have increased in size. Small sites and new starts on dozer lines have been reduced in size by early detection and control. Early detection of new starts or expansions and rapid responses are the most economical means of weed management. There is a *Likely* probability of damage or loss to native plant communities from the spread of invasive weeds with post-fire soil conditions. The magnitude of consequence is *Moderate* resulting in a *High risk*.

Recommended Treatments:

- L1 – Weed detection and early treatment. Cost = $8,194

Road Treatments

- Forest Road 1400 – This is a Maintenance Level 4 Paved Road at the bottom of the scarp along the Metolius River. This is a high-use road used to access campgrounds, the Metolius River, and Bridge 99. There are very few culverts along this road and the ditch is intermittent.
  - Forest Road 14 is located at the base of the scarp on the fan deposit. Moderate burn severity exists on the upper, steep slopes of the scarp. Some areas of the scarp, such as the face Forest Road 1490 traverses, have not completely sluced yet and conditions could be such that drainages and slopes may be more saturated because of the loss of vegetation. This area has a very likely probability of slucing and causing damage to roads and the Metolius River. The remainder of the scarp in the fire area has already sluced but still has a very likely probability of damage to roads and the Metolius River from increased peak flows and sedimentation in the sluced drainages. The magnitude of consequences was rated based on the fact that Road 1400 is a heavily traveled by the general public and forest service employees. The

potential of a motor vehicle accident resulting in injury could occur if sediment, debris or even a road wash out is present. A parcel of private land is located downstream of Draw 1 and could likely be affected during a high flow event. There is also the potential of sediment deposits being transported down to the Metolius River, all resulting in a moderate consequence. The probablity of damage is *Very Likely*, and the magnitude of consquense is *Major* resulting in a *Very High* risk determination.

- No road treatments are recommended at the draw crossings because it's difficult to determine the crossing location because the road is located on a dynamic fan. Also, if the draws run episodically or sluce, drainage treatments would not likely help. There are currently no culverts at the locations of the draws. Maintaining the relief culverts and ditch drainage where it exists is important as well as field reconnaissance after storms to identify any hazards or damage (see Transportation Report). Notifying the landowners downstream of Draw 1 of the hazards is also recommended and is in process.

Recommended Treatments:

- R1 - Clean out ditches and culverts to assist in more effective storm flow dispersion. Cost = $2,000

- Forest Road 1490, 1490-200, 1490-400, 1490-600 – Forest Road 1490 is a Maintenance Level 2 gravel road and is a main access route from the Metolius River to Green Ridge and the Green Ridge Lookout that switch-backs up the steep scarp. Forest Roads 200, 400, 600 are Maintenance Level 2 dirt spur roads off Forest Road 1490 that traverse the scarp and are less traveled. Culverts on these intermittent drainages range from 12 to 24" dia.
  - The probability of damage was rated based on the fact that Road 1490 is located on very steep slopes and areas of moderate burn severity exist in these ephemeral drainages that cross the road. Given that much of this area of the scarp has not yet sluced and conditions could be such that drainages and slopes may be more saturated because of the loss of vegetation, there is a very likely probability of damage to roads and the Metolius if these drainages sluce. Even if they do not sluce, there's a very likely probability of damage to roads and the Metolius River from increased peak flows and sedimentation. The magnitude of consequences was rated based on the fact that Road 1490 is moderately traveled by the general public and forest service employees. The potential of a motor vehicle accident resulting in injury could occur if sediment, debris or even a road wash out is present. There is also the potential of sediment deposits being transported down the 1490 road and eventually ending up in the Metolius River, all resulting in a moderate consequence. The probablity of damage is *Very Likely*, and the magnitude of consquense is *Moderate* resulting in a *Very High* risk determination.
  - All recommended treatments focus on increasing drainage along the 1490 road system. Draws with inadequate crossings, damaged crossings, or large portions of the contributing area burned are targeted for treatments to increase drainage capacity and reduce the risk of debris plugging the crossings. Treatments may have to be delayed until after the first freeze-thaw cycle to reduce the risk of rocks falling on workers.

Recommended Treatments:

- R1 - Clean out ditches and culverts to assist in more effective storm flow dispersion. Cost = $2000
- R2 - Installation of (3) armored dips and outlets. Cost = $10,500

- R3 - Pull culvert. Cost = $2,000
- R4 - Pull road fill. Cost = $2,500

- Forest Road 1499 – This Maintenance Level 1 dirt road is a main access route down the Metolius River to Private property parcels (well past the northern perimeter of the fire) and a popular destination for anglers, hikers and dispersed camping. The southern most drainage that crossing this road has the potential to effect the Lower Bridge Campground. Culverts on these ephemeral drainages range from none to 18" dia.
  - This was rated based on the fact that Road 1499 is a moderately traveled by the general public and forest service employees. The 1499 road is located on at the base of very steep slopes and areas of high burn severity exist in these ephemeral drainages upslope of the road. The 1499 road runs adjacent to the Metolius River often in the Riparian Reserve. The potential of a motor vehicle accident resulting in injury could occur if sediment, debris or even a road wash out is present. There is also the potential of sediment deposits being transported into the Metolius River. The probablity of damage is *Very Likely*, and the magnitude of consquense is *Moderate* resulting in a *Very High* risk determination.
  - Similar to the 1490 road system, all recommended treatments for the 1499 road focus on increasing drainage. Draws with inadequate crossings, damaged crossings, or large portions of the contributing area burned are targeted for treatments to increase drainage capacity and reduce the risk of debris plugging the crossings.

  Recommended Treatments
  - R1 - Clean out ditches and culverts to assist in more effective storm flow dispersion. Cost = $2,000
  - R5 – Pull 4 culverts and build 4 armored dips and outlets. Cost = $22,000

- Forest Road 1150 and 1190 – These Maintenance Level 2 gravel roads are main access routes to the northeast area of the Sisters RD and the Green Ridge and the Castle Rocks area. Culverts on these intermittent drainages range from 12 to 30" dia.
  - This was rated based on the fact that Road 1150 and 1190 are major travel routes to the northeast portion of the Sisters RD. The 1150 road at the SF and MF Street Creek crossings and the 1190 road at the SF Street Creek crossing all have high fill banks and are located below moderate burn severity slopes. The potential of a motor vehicle accident resulting in injury could occur if sediment, debris or even a road wash out is present. There is also the potential of sediment deposits being transported down into Street Creek if the crossings failed. Threaten species (bull trout) and sensitive species (redband trout) are located in both Street Creek and downstream in Lake Billy Chinook reservoir and could be affected. The probablity of damage is *Possible*, and the magnitude of consquense is *Major* resulting in a *High* risk determination.
  - Armored dip treatments recommended for the 1150 and 1190 roads focus on increasing drainage. Draws with deep fill slopes below burned areas are targeted for treatments to reduce the risk of a road fill failure. Constructed armored dips are an out sloped drainage feature adjacent to existing culverts to improve the culverts ability to better handle anticipated increases in stream flow and debris and reduce the risk of a total fill failure.

Recommended Treatments
- R2 - Installation of (3) armored dips and outlets. Cost = $10,500
- R6 - Clean out (3) culverts. Cost = $1,500

- Forest Road 1180–900 This Maintenance Level 2 gravel road is a main connector route from the 11 road to the 1150 road. Culverts on these intermittent drainages range from 12 to 24" dia.
  - This was rated based on the fact that Road 1180-900 is a moderately traveled by the general public and forest service employees and and the 1150 road provides an alternate travel route. The 1180-900 road is located below moderate slopes and the majority of the drainage above the 1180-900 crossing of NF Spring Creek was burned moderately resulting in a predicted increase in high flows and debris movement. Likewise, the orientation of the two culverts is at a 45 degree angle, thus reducing the capacity of the two 24" cmps and increasing the risk of plugging them with debris. The potential of a motor vehicle accident resulting in injury could occur if sediment, debris or even a road wash out is present. There is also the potential of sediment deposits being transported down into Spring Creek and the Metolius River, affecting threatened (bull trout) and sensitive (redband trout) species. The proposed treatment would increase the drainage capacity at the NF Spring Ck crossing and reduce the risk of a road failure. The probablity of damage is *Very Likely*, and the magnitude of consquense is *Moderate* resulting in a *Very High* risk determination.

Recommended Treatments
- R2 - Installation of (1) armored dip and outlet. Cost = $3,500

- Storm Patrol – Patrol area during and immediately after storm events to repair, unplug, or aid in drainage of road drainage features along Forest Service roads to reduce the risk of catastrophic road drainage failure and high sedimentation yield.

Recommended Treatments
- R8 – 16 days for monitoring. Cost = $4,000
- Equipment operators and equipment 6 days. Cost= $7,500

Human Life and Safety

- Forest Road 1490 – This is a Maintenance Level 2 road that is the principle connector in the northern area of Green Ridge. The terrain consists of very steep slopes (<100%) with rock cliffs. Sections of this road are within moderate/high burn severity which has exposed loose, rocky areas. As of this report, an incident of a large boulder falling onto the road bed has been reported. Fire crews attached to the Bridge 99 Complex are not utlizing the road unless absolutely necessary due to the safety concern of falling rocks. Treatment recommendation includes a temporary closure of Forest Road 1490 through the winter and spring seasons (2014-2015) to allow the natural freeze/thaw process to mitigate some of the rock hazards. Rock fall potential would be reassessed in the late spring. The probably of damage or loss is *Likely*, and the magnitude of consequences is *Major*, resulting in a *Very High* risk determination.

Recommended Treatments:

- S1 – Manufacturing and installing two pole gates. Cost = $10,000
- S2 – Hazard signage, and road closed ahead sign $550

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 and cultural resources. The application of these BAER treatments would minimize on-site and downstream damages to the identified values at risk previously mentioned.

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

Land 70% **Channel** NA% **Roads/Trails** 80% **Protection/Safety** 90%

D. Probability of Treatment Success

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

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

Botany

Current costs for invasive plant control are about $54/acre with herbicide use. Once a population is established seed may be viable for up to 8 years and will require years of follow-up treatments. Costs over time (8 years) become at least $432/ acre. If 5% of the 5,721 acres of federal lands on the Sisters RD in the wildfire become infested it could cost over $123,000 to control established infestations. (5721 acres x 0.05=286 acres x $432/acre = **$123,573**)

Roads

If a no action prescription was implemented and all of the 13 road treatments were to fail, the total cost of no action would be **$52,000**. This estimate represents an average cost of

culvert replacement of $4,000 per culvert. This estimate only represents the cost of culvert replacement and not the damage that may occur to resources resulting from culvert frailer.

F. Cost of Selected Alternative (Including Loss): $ 92,244

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Terry L. Craigg

Email: tcraigg@fs.fed.us **Phone**: 541 549-7748 **FAX**: 541 549-7746

Team:

Terry Craigg – Team Lead
Peter Sussmann – Soil Scientist
Cari Press – Hydrologist
Bernie Knotts – GIS Specialist
Will Brendecke – Silviculturist
Amy Racki – Recreation
Nate Dachtler – Fisheries
Matt Mawhirter – Archaeologist
Bart Wills – Geologist
Maret Pajutee – Botany/Weeds/Ecology
Sarah Callaghan – Botany/Weeds/Ecology
Don Walker – Engineering

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:

Weed Detection and Early Treatment – This treatment would involve assessing new invasive weeds within the fire area on high risk suppresion structures (Major roads, dozerlines which intersect weed populations, and safety zones, & drop points) and treating them prior to spread by manual and herbicide treatment.

- L1 – Requesting 18 employee days, contract, and vehicle costs. Cost = $8,194

Channel Treatments: There are no proposed channel treatments.

Roads Treatments:

Forest Road 1400
- R1 - Clean out ditches and culverts to assist in more effective storm flow dispersion. Cost = $2,000

Forest Road 1490, 1490-200, 1490-400, 1490-600
- R1 - Clean out ditches and culverts to assist in more effective storm flow dispersion. Cost = $2000
- R2 - Installation of (3) armored dips and outlets. Cost = $10,500
- R3 - Pull culvert. Cost = $2,000
- R4 - Pull road fill. Cost = $2,500

Forest Road 1499
- R1 - Clean out ditches and culverts to assist in more effective storm flow dispersion. Cost = $2,000
- R5 – Pull 4 culverts and build 4 armored dips and outlets. Cost = $22,000

Forest Road 1150 and 1190
- R2 - Installation of (3) armored dips and outlets. Cost = $10,500
- R6 - Clean out (3) culverts. Cost = $1,500

Forest Road 1180–900
- R2 - Installation of (1) armored dip and outlet. Cost = $3,500

Storm Patrol
- R7 – 16 days for monitoring. Cost = $4,000
- Equipment operators and equipment 6 days. Cost= $7,500

Protection/Safety Treatments:

Forest Road 1490
- S1 – Manufacturing and installing two pole gates, hazard signage, and road close ahead sign 10,000.
- S2 – Safety signing. Cost $550

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.)

M1: Effectiveness Monitoring of L1 – Results of the weed prevention treatments including herbicide treatment of populations likely to expand (L1) will be monitored and the results documented in a brief report. This documents implementation, control effectiveness and provides valuable documentation of the weed risk from inadequate prevention measures, describes problem areas, and will provide data for future weed control in the area if needed. **Cost included in personnel costs.**

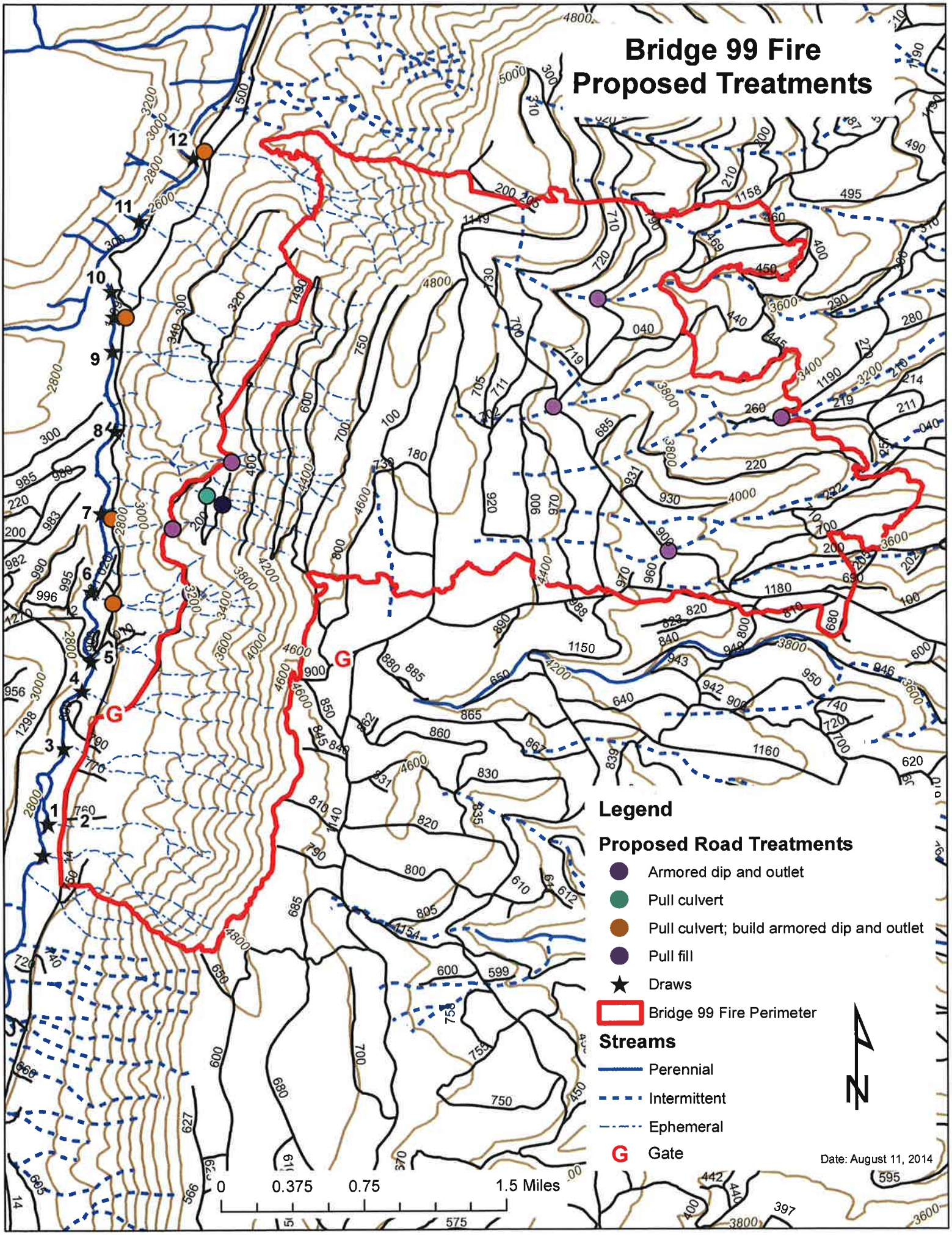
Part VI – Emergency Stabilization Treatments and Source of Funds Interim

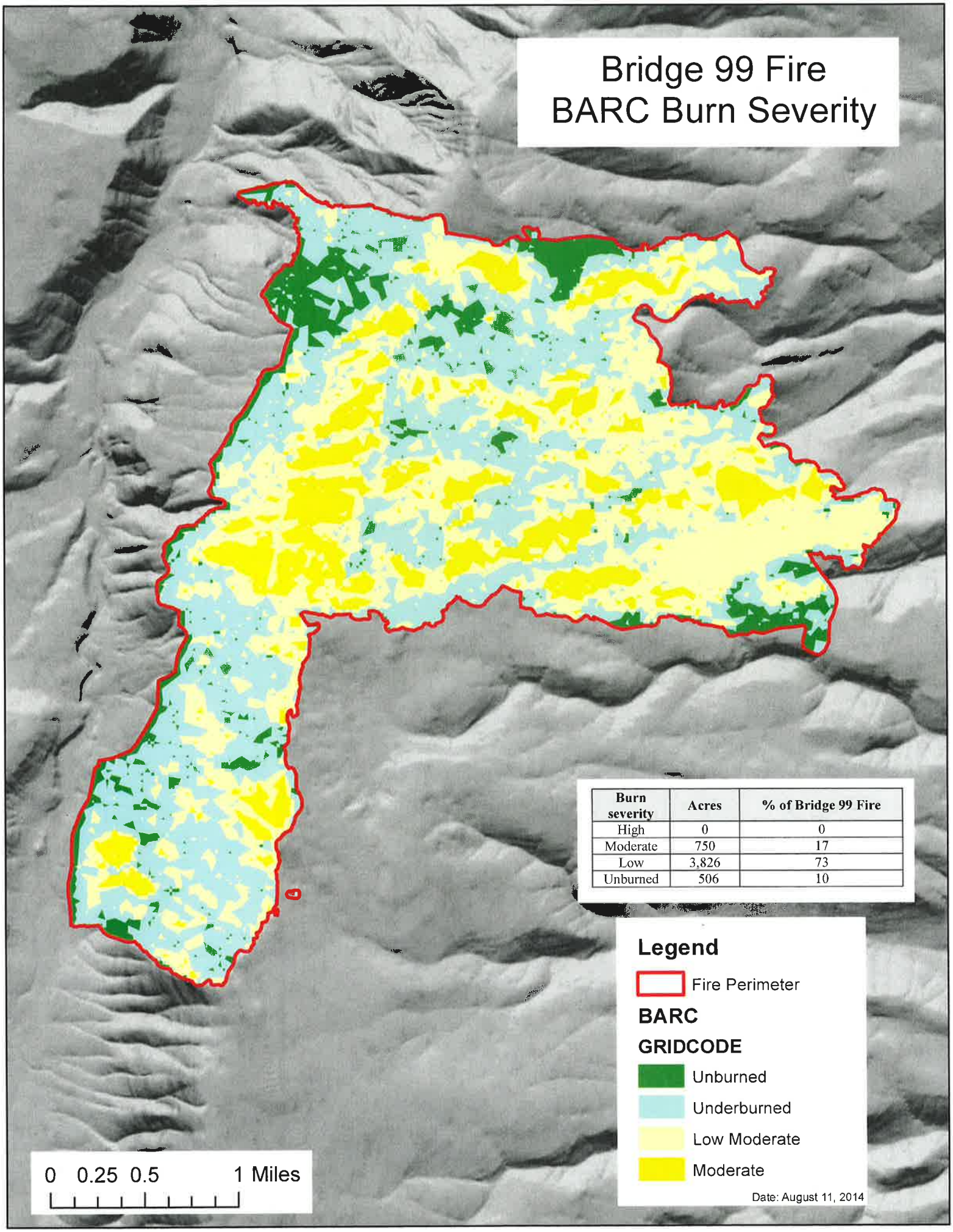
			NFS Lands				Other Lands			All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
L1 - Weed Detect/Trea	lump	8194	1	$8,194	$0		$0		$0	$8,194
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$8,194	$0		$0		$0	$8,194
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										
R1 - Clean Ditches	each	2000	3	$6,000	$0		$0		$0	$6,000
R2 - Armor Dips/Outlet	each	3500	7	$24,500	$0		$0		$0	$24,500
R3 - Pull Culvert	each	2000	1	$2,000	$0		$0		$0	$2,000
R4 - Pull Fill	each	2500	1	$2,500	$0		$0		$0	$2,500
R5 - Pull Culvert	each	5500	4	$22,000	$0		$0		$0	$22,000
R6 - Clean Culvert	each	500	3	$1,500	$0		$0		$0	$1,500
R7 - Storm Patrol	lump	11500	1	$11,500	$0		$0		$0	$11,500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$70,000	$0		$0		$0	$70,000
D. Protection/Safety										
S1 - Instal Gates	each	5000	2	$10,000	$0		$0		$0	$10,000
S2 - Safety Signing	lump	550	1	$550	$0		$0		$0	$550
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$10,550	$0		$0		$0	$10,550
E. BAER Evaluation										
Bridge 99 Complex				$14,800			$0		$0	$0
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$0		$0		$0	$0
F. Monitoring										
Imp Leader	days	350	10	$3,500	$0		$0		$0	$3,500
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Monitoring				$3,500	$0		$0		$0	$3,500
G. Totals				$92,244	$0		**$0**		**$0**	**$92,244**
Previously approved										
Total for this request				**$92,244**						

PART VII - APPROVALS

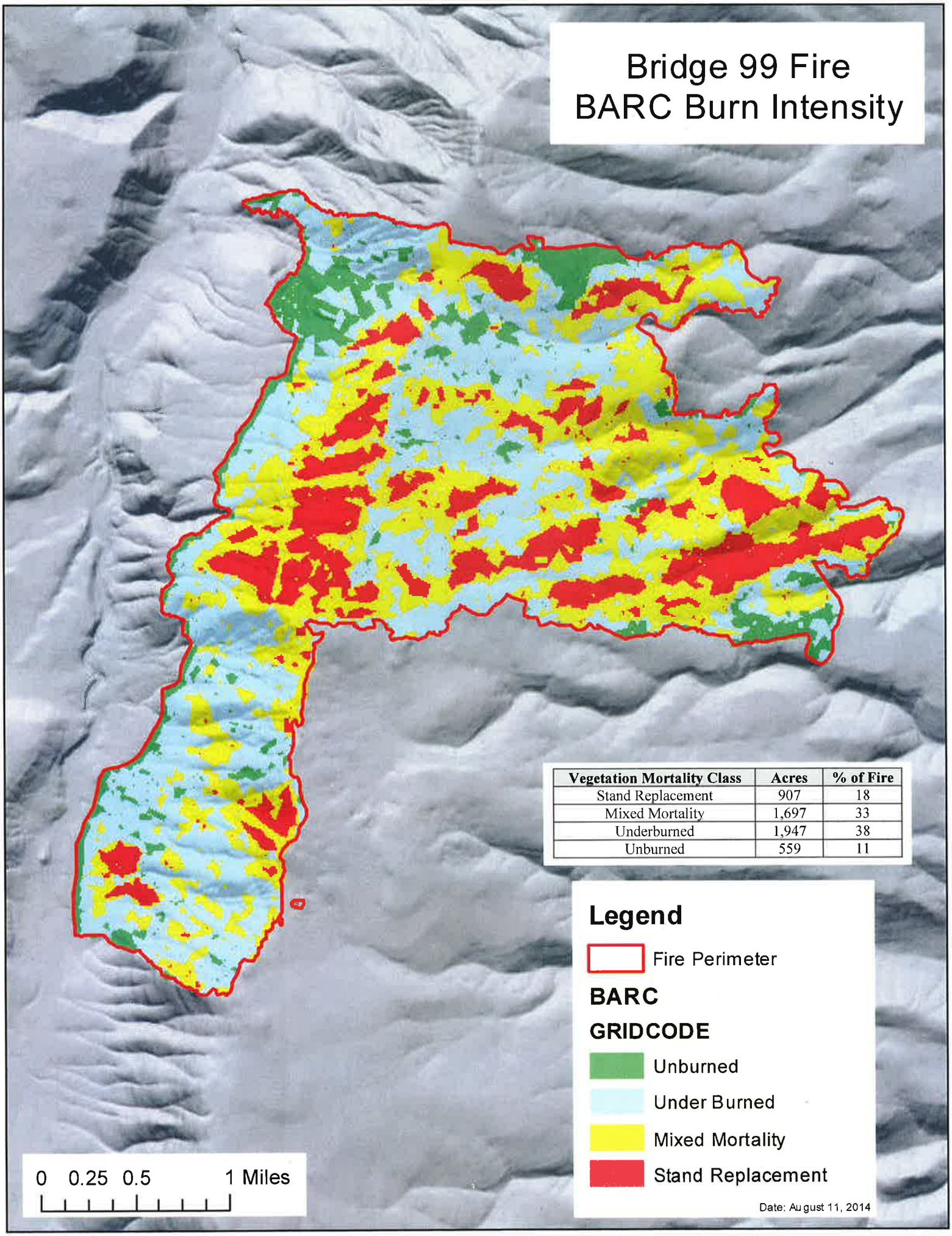
1. _____ 8/14/14
Forest Supervisor (signature) Date

2. _____ 9.16.14
Regional Forester (signature) Date


Bridge 99 Fire
Proposed Treatments
Legend
Proposed Road Treatments
Armored dip and outlet
Pull culvert
Pull culvert; build armored dip and outlet
Pull fill
Draws
Bridge 99 Fire Perimeter
Streams
Perennial
Intermittent
Ephemeral
G Gate
Date: August 11, 2014
0
0.375
0.75
1.5 Miles
N


Bridge 99 Fire
BARC Burn Severity
Burn severity | Acres | % of Bridge 99 Fire
High | 0 | 0
Moderate | 750 | 17
Low | 3,826 | 73
Unburned | 506 | 10
Legend
Fire Perimeter
BARC
GRIDCODE
Unburned
Underburned
Low Moderate
Moderate
Date: August 11, 2014
0 0.25 0.5 1 Miles

Bridge 99 Fire
BARC Burn Intensity



Vegetation Mortality Class	Acres	% of Fire
Stand Replacement	907	18
Mixed Mortality	1,697	33
Underburned	1,947	38
Unburned	559	11

Legend

Fire Perimeter

BARC

GRIDCODE

Unburned

Under Burned

Mixed Mortality

Stand Replacement

Date: August 11, 2014

0 0.25 0.5 1 Miles