USDA-FOREST SERVICE

FS-2500-8 (6/06)
Initial Request
Date of Report: June 23, 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: Shirley Fire

B. Fire Number: CA-SQF-001920

C. State: CA

D. County: Kern

E. Region: 05

F. Forest: Sequoia National Forest

G. District: 54

H. Fire Incident Job Code: P5H5ZN

I. Date Fire Started: June 13 , 2014

J. Date Fire Contained: June 20, 2014

K. Suppression Cost: $14 million

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 6 miles of hand line, 7 miles of dozer line
2. Fireline seeded (miles): None
3. Other (identify): None

M. Watershed Number: HUC 6: 180300010606 (Kern River/Isabella Lake)

N. Total Acres Burned: 2545
NFS Acres (1126) BLM (972) State (0) Private (447)

O. Vegetation Types: Mixed Chaparral, Lower Mixed Conifer Forest, Gray Pine Savanna, Live Oak Forest, Buckbrush Chaparral

P. Dominant Soils: Tollhouse-Tweedy-Locobill association, 30 to 60 percent slopes; Chaix-Rock outcrop-Chawanakee complex, 50 to 75 percent slopes

Q. Geologic Types: Mesozoic granitic rocks with folding evident in road cuts

R. Miles of Stream Channels by Order or Class: : Perennial = 0 miles, Intermittent = 6 miles, Ephemeral=unknown miles

S. Transportation System

Trails: 2 miles Roads: 6 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 123 (5%) (unburned), 682 (27%) (low), 1442 (57%) (moderate), 298 (11%) (high)

B. Water-Repellent Soil (acres): 70

C. Soil Erosion Hazard Rating (acres):
205 (low) 854 (moderate) 1361 (high) 111 (very high)

D. Erosion Potential after fire: 3.8 tons/acre Erosion potential before fire: 0.5 tons/acre

E. Sediment Potential: 5-10 times normal (annual erosion rate cu.yds./sq.mi.; 253 before fire,1923 after)

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):	3-6
B. Design Chance of Success, (percent):	64
C. Equivalent Design Recurrence Interval, (years):	2
D. Design Storm Duration, (hours):	6
E. Design Storm Magnitude, (inches):	1.8
F. Design Flow, (cubic feet / second/ square mile):	7.1
G. Estimated Reduction in Infiltration, (percent):	50
H. Adjusted Design Flow, (cfs per square mile):	21.7

PART V - SUMMARY OF ANALYSIS

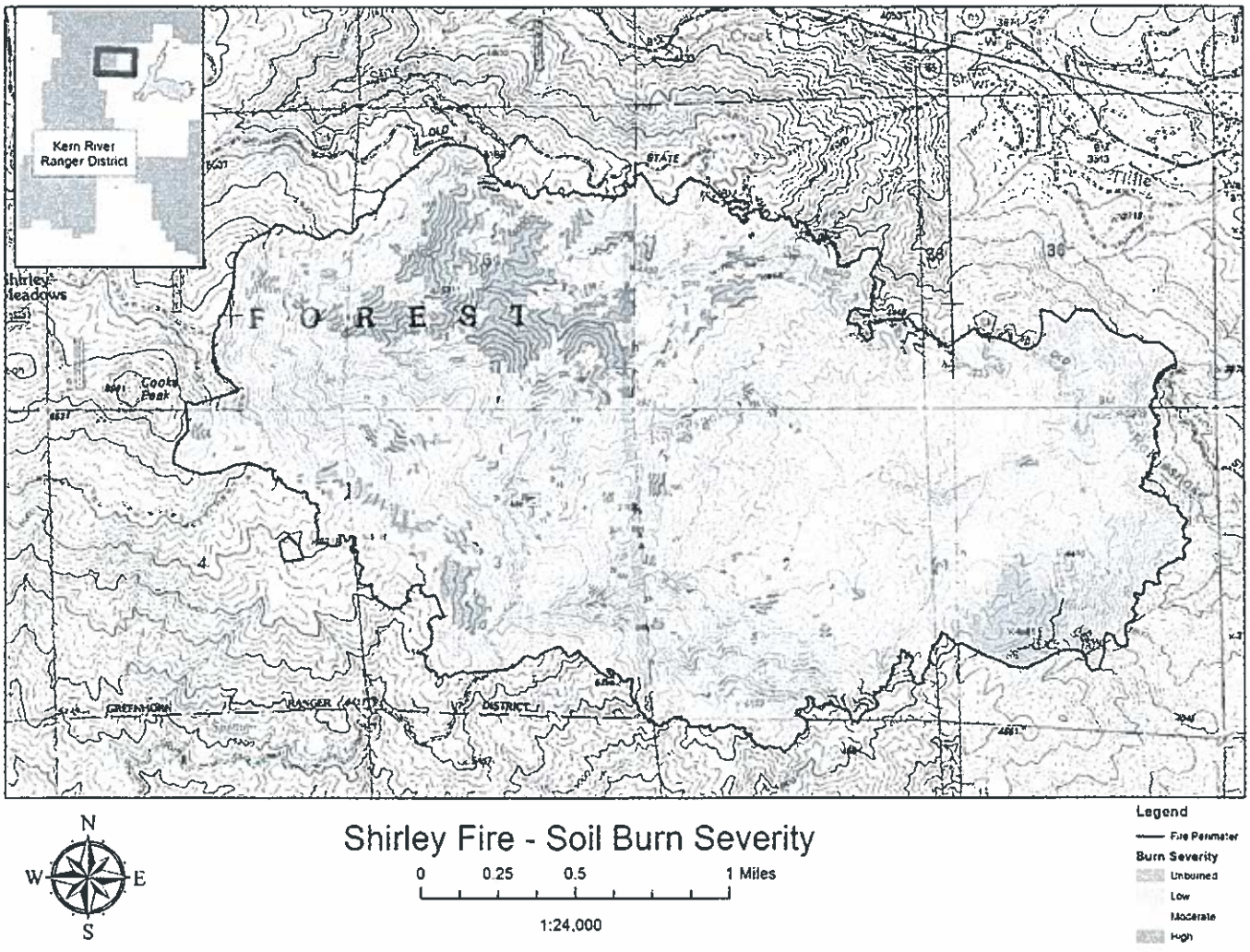
Background

The Shirley Fire began on Friday, June 13, 2014, on land administered by the Kern River Ranger District, Sequoia National Forest. It was driven primarily by wind on steep terrain with relatively low humidities. The fire spread quickly, burning downhill onto Bureau of Land Management and private jurisdictions.

At its height, nearly 1,600 firefighters and support personnel were assigned to the fire, with a very steep ramp up of resources.

Approximately 68% of the area burned is at a high and moderate soil burn severity (see soil burn severity map below). The rest of the fire was either low or very low soil burn severity. It is very important to understand the difference between *fire intensity* and *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.

Shirley Fire Soil Burn Severity Map:



A. Describe Critical Values/Resources and Threats:

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 the 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 and Risk Matrix Table[1]

Risk Type	Value at Risk	Potential Threats	Owner ship	Probability of Damage	Magnitude of Conseq.	Risk	Forest Service Treatment Method
Life/ Property	Tillie Cr. crossing on Old State Rd.	flooding, debris flow	Kern County	Very Likely	Minor	Low	Coordinate with County
Life/ Property	Lower Tillie Cr. crossing on Wagy Rd.	flooding, debris flow	BLM	Possible	Minor	Low	Coordinate with BLM
Life/ Property	Upper Tillie Cr. crossing on Wagy Rd.	flooding, debris flow	BLM	Very Likely	Minor	Low	Coordinate with BLM
Life/ Property	Shirley Rd. (25S21)	Rock fall	FS	Unlikely	Minor	Very Low	none
Life/ Property	S. Live Oak Campground (2 low water crossings)	flooding, debris flow	FS	Unlikely	Major	Intermediate	Coordinate storm closure of campground with CLM
Life/ Property	Tillie Cr. Campground (2 low water crossings)	flooding, debris flow	FS	Unlikely	Major	Intermediate	Coordinate storm closure of campground with CLM
Life/ Property	N. culvert crossing to Tillie Cr. Group Campground	flooding, debris flow	FS	Unlikely	Moderate	Low	Coordinate storm closure of campground with CLM
Life/ Property	S. culvert crossing to Tillie Cr. Group Campground	flooding, debris flow	FS	Possible	Moderate	Intermediate	Coordinate storm closure of campground with CLM
Life/ Property	Highway 155 Tillie Cr. 2 culvert crossings	flooding, debris flow	Caltrans	Unlikely	Major	Intermediate	Coordinate with Caltrans

Life/ Property	Highway 155 Rattlesnake Cr. culvert crossing	flooding, debris flow	Caltrans	Unlikely	Major	Intermediate	Coordinate with Caltrans
Life/ Property	Residences East of Highway 155 near Tillie & Rattlesnake Creeks	flooding, debris flow	Pvt	Possible	Moderate	Intermediate	Coordinate with NRCS
Life/ Property	Wofford Heights Residences near Tillie Cr. (3)	flooding, debris flow	Pvt	Possible	Major	High	Coordinate with NRCS
Life/ Property	Old State Rd. Residence near Rattlesnake Cr.	flooding, debris flow	Pvt	Very Likely	Major	Very High	Coordinate with NRCS
Life/ Property	Old State Rd. Residence driveway crossing of Rattlesnake Cr.	flooding, debris flow	Pvt	Very Likely	Moderate	Very High	Coordinate with NRCS
Cultural Resources	Rattlesnake Cr. Arch Site	flooding, debris flow	BLM	Likely	Major	High	Coordinate with BLM
Natural Resources	Lake Isabella	Debris, Sediment	FS	Possible	Minor	Low	None
Natural Resources	Vegetation Recovery	Invasives, unauthorized OHV	FS	Possible	Major	High	Invasive Detection and Rapid Response
Natural Resources	Soil Productivity	Unauthorized OHV	FS	Likely	Moderate	High	signs, enforcement monitoring

Note: Only values at risk intermediate or greater will be addressed below. County and private property requires interagency coordination.

Threats to Life and Property

The combined factors of burned watersheds directly above private property, large volumes of loose, stored sediment in channels and on the steep slopes, moderate and high soil burn severity with water repellency, and the location of property in the floodplains directly below those watersheds indicate a high risk to life and property creating an emergency situation.

Old State Road Residence along Rattlesnake Creek
Risk Assessment –Life and Infrastructure

Probability of Damage or Loss: Very likely. The house is located at or near the floodplain. Although the cinderblock foundation may situate the house above the flooding surface, floodwaters may damage that foundation.

Magnitude of Consequence: Major. Flooding and potential debris flows in Rattlesnake Creek are very likely and could endanger the homeowner(s) and their property.

Risk Level: Very High.

Old State Road Residence Driveway across Rattlesnake Creek
Risk Assessment –Life and Infrastructure

Probability of Damage or Loss: Very likely. The driveway crossing goes through Rattlesnake Creek. Although the crossing has two poorly placed culverts to allow for water movement, floodwaters may plug the culverts and erode the crossing.

Magnitude of Consequence: Moderate. Flooding and potential debris flows in Rattlesnake Creek are very likely and may prevent the homeowner(s) from entering/exiting their property.

Risk Level: Very High.

Three Wofford Heights Residences along Tillie Creek
Risk Assessment –Life and Infrastructure

Probability of Damage or Loss: Possible. The houses are located at or near the floodplain. Although the house foundations may situate the houses above the flooding surface, floodwaters may damage foundations.

Magnitude of Consequence: Major. Flooding and potential debris flows in Tillie Creek are possible and could endanger the homeowner(s) and their property.

Risk Level: High.

South Live Oak and Tillie Creek Campground Low Water Crossings
Risk Assessment – Life and Infrastructure

Probability of Damage or Loss: Unlikely. This determination is due to the adequate size and condition of the crossings.

Magnitude of Consequence: Major. If the public is not informed of the potential risk of flooding and excluded from these creek crossings, they could possibly be impacted.

Risk Level: Intermediate.

Rattlesnake Creek Crossing North of Tillie Group Campground
Risk Assessment – Life and Infrastructure

Probability of Damage or Loss: Possible. This determination is due to the braided condition of the channel at this crossing, which distributes water flow across multiple small channels.

Magnitude of Consequence: Moderate. If the public is not informed of the potential risk of flooding and excluded from these creek crossings, they could possibly be impacted, although flows in this braided, alluvial area are expected to be lower.

Risk Level: Intermediate.

Highway 155 Rattlesnake and Tillie Creek Crossings
Risk Assessment – Life and Infrastructure

Probability of Damage or Loss: Unlikely. This determination is due to the adequate size and condition of the crossings to mitigate a hundred-year storm event.

Magnitude of Consequence: Major. If Caltrans is not informed of the potential risk of flooding/debris flows life and infrastructure could possibly be impacted.

Risk Level: Intermediate.

Residences East of Highway 155 near Rattlesnake and Tillie Creeks
Risk Assessment – Infrastructure

Probability of Damage or Loss: Possible. The houses are located at or near the floodplain. Although the house foundations may situate the houses above the flooding surface, floodwaters may damage foundations.

Magnitude of Consequence: Moderate. Flooding and potential debris flows in Tillie and Rattlesnake Creek are possible and could impact these properties.

Risk Level: Intermediate.

Threats to Water Quality
None

Threats to Threatened, Endangered and Sensitive Wildlife Species
None

Threats to Ecosystem Stability/Soil Productivity
During field surveys, soil conditions were described, post-fire resource damage conditions were noted, and threats to soil productivity were determined. The magnitude and longevity of fire effects may be generally inferred from the soil burn severity rating. Within the fire perimeter, soils that burned with a 'Low' rating had little to no effect other than a slight reduction in soil cover and a minimal increase in water repellency. 'Low' rating soils still have good surface structure and still contain intact fine roots and organic matter. Recovery is expected to return to pre-fire condition within a growing season as vegetation re-sprouts and litter deposits on the soil surface. The effects of soils burned with a 'Moderate' and 'High" soil burn severity rating are similar. With both severity ratings, very little soil cover remains and the watershed response is similar. The difference, however, between the 'High' and 'Moderate' rating is the degree of soil heating. There is enough soil heating in the 'High' rating that the chemical and biological agents that bind soil particles have been destroyed in the soil. Erosion is generally much higher in soils with 'High' soil burn severity rating and soil productivity is considered a long-term impact. Heating is surficial in the 'Moderate' rating soils such that chemical and biological changes are limited. The effects to soil with a 'Moderate' rating are highly dependent on re-vegetation rates and storm intensities, but generally there is less soil productivity loss than 'High' ratings.

The overall soil burn severity in the Shirley Fire is 5% unburned/very low, 27% low, 57% moderate, and 11% high.

Risk Assessment – Soil Productivity

Probability of Damage or Loss: Likely. This determination is due to the change in watershed response causing sheet and rill erosion of topsoil. Soil in areas with 'High' burn severity will lose long-term productivity in a normal precipitation year, but much wetter years are needed to change the productivity in areas not burned with a 'High' rating. There is also a significant amount of unauthorized off-highway vehicle use possible within the burn area that, along with suppression dozer lines, could increase erosion and encourage noxious weed invasion which would affect recovery

Magnitude of Consequence: Moderate. This determination is due to the change in watershed response causing erosion of topsoil in a fire-adapted ecosystem.

Risk Level: High.

Threats to Vegetation Recovery

Increase in Noxious Weed Populations: An emergency exists with respect to vegetative recovery as a result of the threat of post-fire weed introduction and spread. The unknowing introduction and dispersal of invasive weeds into areas disturbed by fire suppression and rehabilitation has the potential to establish large and persistent weed populations. In addition, it is likely that existent weed infestations along roadsides will increase in the burn area due to their accelerated growth and reproduction and a release from competition with natives. These weed populations could affect the structure and habitat function of native plant communities within the burn area. It is expected that most native vegetation would recover if weed invasions are minimized. Approximately 7 miles of dozer line and 6 miles of handline were also constructed outside and within the burn perimeter. In addition to causing an increase in weed invasion, the disturbances caused by dozer/hand lines are expected to create accelerated erosion and soil compaction that may also inhibit the recovery of native plant populations.

Risk Assessment – Vegetation Recovery

Probability of Damage or Loss: Possible. This determination is due to the potential for vegetation type conversion from new or expanding weed populations, brought in by suppression equipment or released from native plant competition by the fire, invading burned areas, most especially dozer lines, roadsides and riparian areas.

Magnitude of Consequence: Major. If weed infestations are allowed to proliferate in the burn they may alter soil and hydrologic properties/function and degrade habitats.

Risk Level: High.

Threats to Cultural Resources

Rattlesnake Creek Arch Site

Risk Assessment –Cultural Resources

Probability of Damage or Loss: Likely. The arch site is located in the floodplain of Rattlesnake Creek, which is burned entirely to its headwaters.

Magnitude of Consequence: Major. Flooding and potentially debris flows in Rattlesnake Creek are likely and could damage or destroy the arch site, which is eligible for the National Register.

Risk Level: High.

B. Emergency Treatment Objectives:

• Provide for Public Safety– Ensure communication of potential post fire values at risk has occurred. Reduce threat to life and safety by closing hazardous areas and roads until watershed stabilization has occurred and/or the threats/hazards have been removed. Re-evaluate the burned area before lifting the closures. Further reduce threat to life and safety by installing and maintaining educational/safety signing in hazardous areas and roads until watershed stabilization has occurred and/or the threats/hazards have been removed.

• Limit Damage to Property- Private residences and roads within and downstream of the burn area are at greater risk from flash flooding and sedimentation after the fire. Clearing channel obstructions and increasing the road cross-drainage capacity will help mitigate the effects of accelerated storm flows and sedimentation to property. The treatment objective is to increase the awareness of the private property owners, Natural Resource Conservation Service (NRCS), and other agencies of the potentially hazardous conditions resulting from the fire.

• Noxious Weeds - Reduce the potential for impaired vegetative recovery and introduction/spread of noxious weeds by conducting detection surveys.

• Road Treatments – Objective is to improve road drainage to protect the road system. Reduce erosion from the road surface and sediment delivery to stream channels. Reduce the threat to life and safety for road users.

• Limit loss of soil productivity – Post fire erosion rates have increased due to the burn itself. Noxious weed invasions and unauthorized OHV use should be controlled.

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

Land 90 % Channel 0% Roads/Trails 90 % Protection/Safety 90 %

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	90%	80%	N/A
Channel	N/A	N/A	N/A
Roads/Trails	90%	75%	70%
Protection/Safety	90%	80%	75%

E. Cost of No-Action (Including Loss): $150,000

F. Cost of Selected Alternative (Including Loss): $30,000

G. Skills Represented on Burned-Area Survey Team:

[X] Hydrology [X] Soils [] Geology [ ] Range [X] Recreation
[ ] Forestry [] Wildlife [ ] Fire Mgmt. [] Engineering [ ] Lands

[ ] Contracting [ ] Ecology [X] Botany [X] Archaeology [ ] Hazmat
[ ] Fisheries [ ] Research [ ] Landscape Arch [X] GIS

Team Leader: Katie VinZant: Angeles National Forest

Email: kvinzant@fs.fed.us Phone: (626) 383-1626 FAX: (626) 226-2485

Core Team
Fletcher Linton (Co-team lead, Botanist)
Eric Nicita (Soils)
Tim Kelly (Archaeologist)
Katie VinZant (Team Lead)
Wendy Rannals (GIS)
Bobby Frenes (Recreation)
Josh Courter (Hydrologist)
Chris Ryan (BLM rep)
Cody Norris (PAO)

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.)

Implementation and Interagency Coordination Team
This treatment is to provide for logistics, interagency coordination and tracking of treatment implementation.

Interagency coordination started during the fire and continued throughout the BAER Assessment. A need for continuing this coordination by providing the BAER Assessment Report, specialist reports and attending meetings is anticipated. In addition, meetings detailing potential physical responses and impacts from the fire that may influence safety downstream of the fire area will be needed with various agencies/groups, such as those listed below for the following values at risk:

- NRCS –Old State Road, Highway 155, and Tuttle Road residences
- Kern County-Old State Road maintenance
- BLM-Rattlesnake archeological site, Wagy Flat road culverts
- CLM-South Live Oak and Tillie Creek Campgrounds
- Caltrans-Highway 155 Rattlesnake and Tillie Creek crossings

Implementation/Interagency Team Cost

Item	Unit	Unit Cost	# of Units	Cost
BAER Coordinator	Days	$400	5	$2,000
Recreation Officer	Days	$400	5	$2,000
Vehicle mileage	Miles	$0.55	2000	$1,100
			Total Cost	**$5,100**

Land Treatments:

Noxious Weed Detection and Rapid Response
Weed detection surveys and rapid response eradication treatments are to determine whether ground disturbing activities related to the Shirley Incident and the fire itself have resulted in new or the expansion of existing noxious weed infestations. With 7 miles of dozerline, 6 miles of handline, 7 miles of riparian corridors, 6 miles of road and 2 miles of trail in the Shirley fire, it is expected that new and expanding weed infestations will proliferate in and along these vectors if left unchecked, eventually leading to vegetation type conversion.

Surveys and rapid response eradication treatments will begin in 2015 during the flowering periods of weed species. Because of differences in flowering times for all potential species, two visits may be required during the growing season. If timing is such that all the target species are detectable/treatable in one visit, the actual costs would be lower than displayed below. Completion of surveys in riparian areas, dozer lines, roads, staging areas, safety zones, known invasive and sensitive plant populations would be the first priority. The second survey priorities would be along handlines and drop points. Surveys of the general habitats in the burned area would be the lowest priority. Detailed weed detection survey guidelines are attached in Appendix A.

Weed Detection Cost

Item	Unit	Unit Cost	# of Units	Cost
1 GS-11 botanist	Days	$400	1	$400
2 GS-5 weed technicians	Days	$200	10	$4,000
Supplies	Each	$500	1	$500
Vehicle gas mileage	Miles	$0.55	1000	$550
			Total Cost	**$5,450**

Road Treatments:

No road treatments are proposed at this time. However, an assessment for values at risk was not completed for Forest Service Road No.25S02 (Wagy Flat), because the road was made inaccessible by supression activities. At the time of the BAER team assessment, discussions as to how/if supression repair would mitigate damage to the road were underway. Depending on the result of these discussions it may be necessary to bring in a BAER team road engineer to assess potential threats to both the road and impacts from the road to surrounding burned habitat. Any treatments that were deemed neccesary and within the scope of a BAR emergency determination would be captured in an interim 2500-8 report.

Protection/Safety Treatments:

Human Life and Resource Protection

To ensure safety for Forest visitors and protection to Forest resources during the recovery period closure/warning signs will be placed at campgrounds and road locations adjacent to and within the fire perimeter.

Protection Signage Treatment Cost

Item	Unit	Unit Cost	# of Units	Cost
Informational Signs (53" x 23')	Each	$150	30	$4,500
Sign Posts	Each	$22.50	30	$675
Sign Installation Labor (1 GS-5)	Days	$200	3	$600
Total Cost				**$5,775**

Protection Enforcement

Unauthorized access is a threat to burned watersheds and public safety. The Shirley Fire area is within several miles of the Wofford Heights community and public visiting the Kern River Valley. One of the challenges for the Kern River District will be managing the high number of users who gain unauthorized access to the Forest by driving/riding/entering on unauthorized OHV trails or through or around a locked gate or closure sign. This type of unmanaged use can cause damage to natural and cultural resources. Due to increasing populations and developments that border the forest, it is difficult to control this unauthorized access.

Through past BAER experience, the SQF has determined that signage, gates and fencing that are installed to inform the public of hazards, discourage soil disturbance and assist in allowing natural vegetative recovery are not effective by themselves. Patrolling within and adjacent to the burn area is needed to enforce this signage and deter unauthorized access, vandalism, and damage to National Forest System lands.

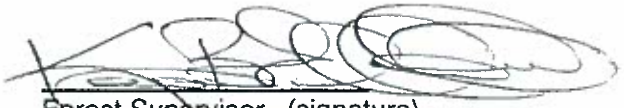
Protection Enforcement Treatment

Item	Unit	Unit Cost	# of Units	Cost
1 - GS-9 Recreation Officer	Day	$340	2	$680
2 – GS-7 Recreation Technicians	Day	$225	10	$4,500
Vehicles Mileage	Miles	$0.55	1000	$550
			Total Cost	**$5,730**

Part VI – Emergency Stabilization Treatments and Source of Funds **Initial**

Click red icons for notes.	NFS Lands					Other Lands				Money Left Total $
Line Items	**Units**	**Unit Cost**	**# of Units**	**BAER $**	**Spent $**	**# of Units**	**Fed $**	**# of Units**	**Non Fed $**	
A. Land Treatments										
Implementation/Interagency Team	ea	$5,100	1	$5,100	$0		$0		$0	$0
NX Weed Det. Surv.	ea	$5,450	1	$5,450	$0		$0		$0	$0
Subtotal Land Treatments				$10,550	$0		$0		$0	$0
B. Channel Treatments - none										
				$0	$0		$0		$0	$0
Subtotal Channel Treatments				$0	$0		$0		$0	$0
C. Road and Trails-none										
					$0		$0		$0	$0
Subtotal Road & Trails					$0		$0		$0	$0
D. Protection/Safety										
Protection Signs	ea	$5,775	1	$5,775	$0		$0		$0	$0
Protection Enforcement	ea	$5,730	1	$5,730						
Subtotal Protection				$11,505	$0		$0		$0	$0
E. BAER Evaluation										
Assessment Team	0520	H5BAER	---	---	$19,201	---	$0	---	$0	$0
	---	---	---	---	$0	---	$0	---	$0	$0
Subtotal Evaluation				---	$19,201	---	$0	---	$0	$0
F. Monitoring										
Subtotal Monitoring				$0	$0		$0		$0	$0
G. Totals				**$22,055**	**$0**		**$0**		**$0**	**$0**
Previously approved						Comments:				
Total for this request				**$22,055**						

PART VII - APPROVALS

1.  27 JUNE 2014
Forest Supervisor (signature) Date

2. Bonnie T. Grant 7/8/2014
Regional Forester (signature) Date