Date of Report: July 1, 2016

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: Sherpa Fire

B. Fire Number: CA-LPF-001643

C. State: California

D. County: Santa Barbara

E. Region: Pacific Southwest (5)

F. Forest: Los Padres

G. District: Santa Barbara

H. Fire Incident Job Code: P5KA0H (0507)

I. Date Fire Started: 6/15/2016

J. Date Fire Contained: 93% contained as of 6/27/2016; 100% containment expected 7/7/16

K. Suppression Cost: Approximately $20 million as of 6/28/16

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): 54.8 (not all completed as of 6/28/16)
2. Fireline seeded (miles): None to date
3. Other (identify): Safety zones, staging areas, helispots and drop points are in the process of being rehabilitated.

M. Watersheds:

HUC 6 subwatersheds affected by the Sherpa Fire. Percent of watersheds burned are reported in parentheses.

Subwatershed Name	Total Subwatershed Acres (Percent Burned)	Unburned or Very Low Acres	Soil Burn Severity		
			Low Acres	Moderate Acres	High Acres
Tajiguas Creek	31,893 (23%)	682 (2%)	2065 (6.5%)	4458 (14%)	261 (<1%)
Don Pueblos Canyon	23,510 (<1%)	2.2	3.5	0.5	1.1

Individual Pour-Point Watersheds (used for assessing potential values at risk)

Pourpoint Watersheds	Total Pourpoint Acres	Total Pourpoint Acres Burned	Acres by Burn Severity			
			High	Moderate	Low	Unburned
Canada de la Destiladera	521	220 (44%)	65 (12%)	21 (4%)	134 (26%)	301 (58%)
Canada Del Capitan	3905	1588 (41%)	57 (1%)	1078 (28%)	453 (12%)	2317 (59%)
Canada del Corral	4176	2936 (70%)	107 (3%)	2161 (52%)	667 (16%)	1241 (30%)
Las Flores above Corral	773	721 (93%)	13 (2%)	534 (69%)	174 (23%)	52 (7%)
Corral above Las Flores	3045	1958 (64%)	95 (3%)	1581 (52%)	284 (9%)	1085 (36%)
Canada del Venadito	1272	713 (56%)	4 (0%)	358 (28%)	351 (28%)	559 (44%)
Refugio	5062	1041 (21%)	23 (0%)	776 (15%)	242 (5%)	4021 (79%)
Las Lugas	1718	16 (1%)	5 (0%)	4 (0%)	7 (0%)	1702 (99%)

N. Total Acres Burned: 7,473 total acres

NFS Acres(2,515) BLM (0) State of California (1828) Private (3,130)

O. VegetationTypes: Soft and hard chaparral are present in bands along faulted and folded sedimentary rock formations across the landscape. South-facing slopes are mostly dominated by chaparral with oak woodlands with avocado and citrus orchards at lower elevations. Conifers exist in small patches along ridgetops and on north-facing slopes. Narrow riparian corridors contrast sharply with the otherwise dry landscape.

P. Dominant Soils: There are four dominant soil map units in the burned area. These soils are strongly dependent on the underlying geology and the slope/aspect of the topography. The soils are situated on a west facing slope of the Traverse Ranges of Southern California. This is a rapidly uplifting block of complex Cenozoic sedimentary rock comprised of shales and sandstones; the soils developed in this geology and climate generally have formed shallow, rocky and variable soil textures based on the age and parent material of the geology. Because of the rapid uplift of the region, there are deeply incised canyons which transport high energy flows creating over steepened walls. These steep canyons create very rocky colluvial slopes. The combination of these canyon walls and the predominance of shallow soils and rock outcrops, soils tend to be very boulder or rocky soils. This characteristic of the watersheds plays a prominent role in evaluating a landscape for land treatment feasibility

Parent Rock	Soil Texture	Acres	Percent of Fire Area
Maymen-Rock outcrop complex, 50 to 75 percent slopes	Stony fine sandy loam	2293	31%
Lodo-Sespe complex 50 to 75 percent slopes	Gravelly clay loam	1140	15%
Rock outcrop-Maymen complex, 75 to 100 percent slopes	Unweathered bedrock	1022	11%
Ayar clay 30 to 50 percent slopes, eroded	Clay	814	10%

Q. Geologic Types: Bedrock within the boundaries of the Sherpa Fire is underlain entirely by sedimentary rock formations, ranging in age from the oldest Eocene (~60 million years old) to younger Miocene (~25 million years old), and overlain by Quaternary alluvial and surficial sediments to present age. The majority of those rock types are of sandstone or shale composition with some conglomerate. Geological units in this area have been assigned to the following formations: Sacate Sandstone, Gaviota Sandstone, Alegria Sandstone, Sespe Formation, Vaqueros Sandstone, Rincone Shale and the Monterey Shale. These formations are listed in order

of decreased age. In addition to these formations there are also Quaternary age materials including older alluvium, landslide rubble and alluvium. Strata of all the older rock types typically dips (inclines) steeply, usually towards the south or southwest, but sometimes is overturned and dips towards the northeast. Numerous faults cross the fire area, trending east-west to northwest and include the Refugio, Cameros and the Dos Pueblos Faults.

R. Miles of Stream Channels by Order or Class: 28.7 miles of mapped drainages (mostly intermittent and ephemeral).

S. Transportation System

Trails: None, other than possibly a very small portion of the Bill Wallace Trail.

Roads: Mostly roadless within the fire perimeter on Forest Service lands; 0.16 miles of maintenance level 2 road. Most roads within the fire perimeter are on private lands.

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

All Lands	Unburned 685 (8%)	Low 2,068 (28%)	Moderate 4,458 (60%);	High 262 (4%)
NFS Land:	Unburned) 61 (2.4%)	Low 286 (11.4%)	Moderate 2090 (83%)	High 78 (3%)

B. Water-Repellent Soil (acres): 5,978 acres (80% of the fire area). Coastal chaparral is naturally water-repellant. The fire did not necessarily increase the extent of water repellency but likely did increase the severity of water repellency.

C. Soil Erosion Hazard Rating (acres): Low: 1624 acres (22%), Moderate: 46 acres (0.6%), High: 312 acres (4%), Very High: 5460 acres (73%). The Erosion Hazard rating reflects the predominance of low soil burn severity on gentle slopes and moderate soil burn severity on steep slopes.

D. Erosion Potential: Prefire – 0.23 tons/acre Postfire – 6.16 tons/acre.

E. Sediment Potential: see above erosion potential.

F. Debris Flow Potential: The US Geological Survey (USGS) Landslide Hazards Program has developed empirical models for forecasting the probability and the likely volume of post-fire debris flow events. To run their models, the USGS uses geospatial data related to basin morphometry, burn severity, soil properties, and rainfall characteristics to estimate the probability and volume of debris flows that may occur in response to a design storm (Staley, 2016). Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 12 – 40 millimeters per hour (mm/h) rate. We selected a design storm of a peak 15-minute rainfall intensity of 28 millimeters per hour (mm/h) rate to evaluate debris flow potential and volumes since this magnitude of storm seems likely to occur in any given year.

Based on USGS debris flow modeling it appears that the predicted volumes and probability of debris flows in the burn area is wide, ranging from some creeks predicted to produce debris flows with relatively small volumes and or small probability (0-20%) to other creeks which are predicted to produce debris flows of 10,000-100,000 cubic meters and or probabilities of 80-100%. From the debris flow combined hazard map it appears that under the selected design storm the majority of creeks in the burn area are predicted to produce debris flows of a moderate combined hazard.

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period	5 - 7 years
B. Design Chance of Success	80 %
C. Equivalent Design Recurrence Interval	2 year
D. Design Storm Duration	1 hr
E. Design Storm Magnitude	0.94 inches
F. Design Flow	21 cfs/mi^2
G. Estimated Reduction in Infiltration	25%
H. Adjusted Design Flow	34 cfs/mi^2

Summary of Watershed Response

Hydrologic Response: Due to the steepness of most of the drainages and the amount of moderate burn severity (large areas now devoid of vegetation and groundcover) after the fire, the first large runoff producing storm will likely create increased surface flow. This scenario, coupled with existing wet antecedent soil conditions from previous storms, could trigger a potential flood event with high sediment volumes. The highest amounts of sediment yields from the burned watersheds are expected during the first year after the fire.

Erosion Response: Erosion response is expected to increase considerably within the fire area; from 0.23 tons/acre pre fire to 6.2 tons/acre post fire. The soil burn severity shows the majority of the burned area falls within the low and moderate soil burn severity levels (28% and 60% respectively). High soil burn severity accounted for only 4% of the fire area and the remainder of fire was very low to unburned (9%). The primary areas of high soil burn occurred in Destiladera Canyon due to long fire residence time in an oak stand with high mortality. The moderate soil burn severity was concentrated on the steeper slopes of the chaparral areas. Those area dominated by grass burned with low soil burn severity. Initial high erosion rates are likely to negatively affect critical habitat for red-legged frog and steelhead trout.

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Values at Risk:

The table below is Exhibit 02 from FSM 2523.1. This matrix was used to evaluate the risk level for each value identified during this BAER assessment. See FSM 2523.1 for additional information.

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**

The table below is a summary of the values (some of which were not identified as 'critical' per Exhibit 01 from FSM 2523.1) within and along the Sherpa fire area, as well as, the threats to those values, the probability of damage or loss, magnitude of consequences and the resulting level of risk. Red shaded cells are those values that rated out as "very high" or "high" risk. Yellow shaded cells rated out "intermediate" risk and white cells rated out "low" or "very low".

Sherpa BAER – Forest Service Values At Risk Tracking Table

High / Very High Risk	
Intermediate Risk	
Low / Very Low Risk	

Category	Value (Life/ Property/ Resources)	Value at Risk	Threat to Value at Risk	Probability of Damage or Loss	Magnitude of Consequence	Risk	Treatment	Notes
Botany / Weeds	Resources	Native plant communities within the fire area, especially in the West Camino Cielo area	Spread of invasive plants into native and sensitive plant habitats. Known species posing threat include, but not limited to Yellow starthistle, Italian thistle, Tocalote, Bull thistle, Wild fennel and Spanish broom	Likely	Moderate	High	16.4 miles of dozer line detection surveys and manual treatment **(L1)**	Region 5 sensitive plants at risk include Sonoran maiden fern, Refugio manzanita, Late-flowering mariposa lily, Santa Barbara honeysuckle, Santa Ynez false lupine, Ojai fritillary and Mesa Horkelia.
Fish / Wildlife	Resources	T&E Critical Habitat for Steelhead and California Red-Legged Frog in Refugio and El Capitan Drainages	Post- fire sedimentation into streams and subsequent damage to T&E Critical Habitat	Very Likely	Moderate	Very High	No Treatment	No effective treatment to mitigate threat primarily due to steep slopes (>60%).
Safety	Life and Safety	Human Life and Safety on NFS lands and downstream areas	Increased flow and debris	Possible	Major	High	Early Warning System Coordination **(P1)**	Yet to be determined if needed. Funding request for administration of special use permit and agency coordination. System will be purchased with other non-BAER funds
Safety	Life / Property / Resources	Human Life and Safety on NFS lands and downstream	Increased flow and debris that may compromise downstream life and property and designated critical habitat	Possible	Major	High	Interagency Coordination **(P2)**	Funding request is for continued interagency coordination
Safety	Life and Safety	Human Life on NFS lands on East Branch of Refugio Creek	Increased flow and falling debris	Possible	Mayor	High	Closure, Signage, Fencing and Enforcement **(P3)**	Unauthorized use of trail/road along Refugio Canyon on NFS lands. The minimum treatment necessary (and deemed effective) would be to close, sign, fence and enforce closure.
Recreation	Life and Safety	Human Life and Safety on the Bill Wallace Trail	Increased flow and debris (i.e. falling rocks) that may compromise human life	Possible	Major	High	Interagency Coordination **(P2)**	Most of the trail appears to be on private property, but there may be a small portion on NFS lands.

B. Emergency Treatment Objectives:

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 to natural and cultural resources. The application of these BAER treatments are expected to minimize on-site and downstream damages to the identified values at risk previously mentioned. The emergency treatments being recommended by the Sherpa BAER Team are specifically designed to achieve the following results.

Proposed Land Treatments

The objective of the land treatments are to:

1. Promote and protect native and naturalized vegetative recovery by reducing the spread of noxious weeds **(L1).**

Proposed Channel Treatments

None proposed

Proposed Road and Trail Treatments

None proposed other than some interagency coordination of Bill Wallace Trail **(P2).**

Proposed Protection/Safety Treatments:

The objective of the protection/safety treatments are to:

1. Coordinate with other entities and provide assistance in processing a Special Use Permit for placement of early warning rain gages **(P1).**
2. Continue interagency coordination efforts to mitigate and identify post-fire related emergencies **(P2).**
3. Protect public safety through administrative closure and enforcement **(P3).**

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

Land **95** % Channel **NA** % Roads/Trails **NA** % Protection/Safety **95** %

D. Probability of Treatment Success

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

E. Cost of No-Action (Including Loss): Critical values identified in Section A would be damaged or lost. Cost of the no action is estimated to be $1.2 million.

F. Cost of Selected Alternative (Including Loss): Total cost of the action alternative (including loss) is $50,000

G. Skills Represented on Burned-Area Survey Team:

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

Team Leaders: Kevin Cooper – Forest Biologist, Los Padres NF

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Team Members:

Rob Tanner- Asst. Team Leader
Kyle Wright – Hydrologist
Patrick Lieske – Wildlife, Fisheries, Botany
Lloyd Simpson – Invasive Plants
Eric Nicita - Soil Scientist
Jonathan Schwartz- Geologist
Steve Galbraith – Archaeology
Marilyn Porter - GIS

H. Treatment Narrative:

Land Treatments:

L1 - Invasive Weed Detection and Manual Treatment: Invasive plant detection surveys and manual treatments are proposed to occur along approximately 16.4 miles of dozer line on NFS lands. Surveys and treatments would focus on locations where fire suppression activities may have introduced invasive plants. This treatment is necessary to prevent the spread and dispersal of non-native invasive plants into newly burned and disturbed areas. Invasive weeds known to occur near that areas of concern include Yellow starthistle, Italian thistle, Tocalote, Bull thistle, Wild fennel and Spanish broom. See Invasives report for more details.

Treatment	Units	Unit Cost	# of Units	Total Cost
Invasive Plant Surveys and Manual Treatment	Miles	$1100	16.4	$18,040

Channel Treatments:
None proposed

Roads and Trails Treatments:
None proposed

Protection/Safety Treatments:

P1- Early Warning Coordination: On going coordination may be required to provide assistance in processing a Special Use Permit for placement of early warning rain gages on NFS land.

Treatment	Units	Unit Cost	# of Units	Total Cost
Early Warning Coordination	Days	$400	10	$4000

P2- Interagency Coordination: On going interagency coordination for the Sherpa fire is considered essential for keeping city, county, state, and other agencies informed and relaying the BAER assessment findings.

Treatment	Units	Unit Cost	# of Units	Total Cost
Interagency Coordination	Days	$450	20	$9000

P3- Administrative Closure and Enforcement: While examining the Sherpa Fire area through Google Earth imagery after the Sherpa Fire, the BAER team noticed a series of unofficial trails that appeared to have been recently worked on National Forest Systems lands in the NW corner of the fire area in section 18. Historic imagery to 1992 shows this line and it appears to have been created during a fire because it has several older loops and dead ends attached to it as if spot fires along a fire perimeter were being lined. We drove to this area and walked the line and noticed that a small dozer, probably a D6, and horses had left tracks within a day or two of our visit and after the fire had burned, showing that riders are still using this. This road appears to be regularly maintained by bulldozer and had drainage established. There are approximately 3 miles of trail on Forest lands. These trails can only be accessed through the private lands at the north and south ends. The BAER team did not find out who the owners of these ranches are.

The lower end emanates from the Bar B Ranch on Refugio Creek and goes up this very steep canyon. There is a high danger of rockfall, falling trees that burned, and flooding during the rainy season here. The entirety of the trail has potential for washouts. Users of this unofficial trail are at risk of serious injury.

The BAER team recommends an administrative closure of the fire area and trails for one year from containment. This should be initiated with a contact between the LPNF and the land owners who use this trail. Because there may be an economic interest in the use of this trail, the closure should be enforced with the construction of a fence at both ends, signage, and law enforcement patrols.

Treatment	Units	Unit Cost	# of Units	Total Cost
Administrative Closure, Signage, Fencing and Enforcement	each	$13,300	1	$13,300

I. Monitoring Narrative:

None proposed

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(L)										
L1-Invasive Survey/ Detection	Miles	$1,100.00	16.4	$18,040	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
		$0	0	$0			$0		$0	
		$0	0	$0			$0		$0	
		$0	0	$0	$0		$0		$0	
Subtotal Land Treatments				$18,040						
B. Channel Treatments (C)										
None		$0	0	$0	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
Subtotal Channel Treat.				$0	$0		$0		$0	
C. Road and Trails (R-T)										
None		$0	0	$0	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
		$0	0	$0			$0		$0	
Subtotal Road & Trails				$0	$0				$0	
D. Protection/Safety (P)										
P1- Early Warning System Support	person days	$400	10	$4,000	$0		$0		$0	
P2- Interagency Coordination	person days	$450	20	$9,000	$0		$0		$0	
P3- Closure/Fence/Enforcement	each	$13,300	1	$13,300	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
Subtotal Structures				$26,300	$0		$0		$0	
E. BAER Evaluation										
Sherpa BAER				$40,780	$0		$0		$0	
F. Monitoring (M)										
		$0	0	$0	$0		$0		$0	
		$0	0	$0	$0		$0		$0	
				$0	$0		$0		$0	
Subtotal Monitoring				$44,340			**$0**		**$0**	
G. Totals										
Previously approved										
Total for this request				**$44,340**						

PART VII - APPROVALS

1. _____ July 1, 2016
Forest Supervisor (signature) Date

2. _____ 7/8/2016
Regional Forester (signature) Date