USDA-FOREST SERVICE

FS-2500-8 (6/06)
Initial Request
Date of Report: July 14, 2017

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: Lake Fire

B. Fire Number: CA-ANF-2017-2273

C. State: CA

D. County: Los Angeles

E. Region: 05

F. Forest: Angeles National Forest

G. District: 53

H. Fire Incident Job Code: P5K2C5

I. Date Fire Started: June 17, 2017

J. Date Fire Contained: June 23, 2017

K. Suppression Cost: $1.6 million

L. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles): 2.5 miles Hand Line, 6 miles of dozer line
2. Fireline seeded (miles): None
3. Other (identify): 10 mi Road repairs

M. Watershed Number: HUC 12: 180701020304 (Elizabeth Lake Canyon), 180701020306 (Middle Castaic Creek)

N. Total Acres Burned: 718
NFS Acres (670) State (48) Private (0)

O. Vegetation Types: Chamise, Mixed Chaparral, California Sagebrush, Annual Grasses and Forbs.

P. Dominant Soils: Stonyford-Millsholm families complex, 30-70 percent slopes (**40%**); Trigo family-Calcixerollic Xerochrepts-Vista family complex, 30-70 percent slopes (**57%**);

Q. Geologic Types: The burned area is located in the Transverse Province, on the western flanks of the San Gabriel mountain range. The San Gabriel Mountains are an east-west range bounded by the San Andreas and San Gabriel faults. Primary rock types are Precambrian and Cretaceous gneisses and granodiorite granitics, which produce toppling rockfall failures.

R. Miles of Stream Channels by Order or Class: Perennial = 0 miles, Intermittent = 1.5 miles, Ephemeral=0 miles

S. Transportation System

Trails: 0 miles Roads: 5 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 42 (6%) (unburned), 244 (34%) (low), 428 (59%) (moderate), 6 (0.8%) (high)

B. Water-Repellent Soil (acres): 434 (**60%** of fire has water repellency)

C. Soil Erosion Hazard Rating (acres):
0 (low) 0 (moderate) 718 (high) 0 (very high)

D. Erosion Potential after fire: 13 tons/acre Erosion potential before fire: 1.5 tons/acre

E. Sediment Potential: reported as tons per acre in D.

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years):	3-10
B. Design Chance of Success, (percent):	75
C. Equivalent Design Recurrence Interval, (years):	2
D. Design Storm Duration, (hours):	1
E. Design Storm Magnitude, (inches):	0.61
F. Design Flow, (cubic feet / second/ square mile):	21
G. Estimated Reduction in Infiltration, (percent):	50
H. Adjusted Design Flow, (cfs per square mile):	75

PART V - SUMMARY OF ANALYSIS

Background

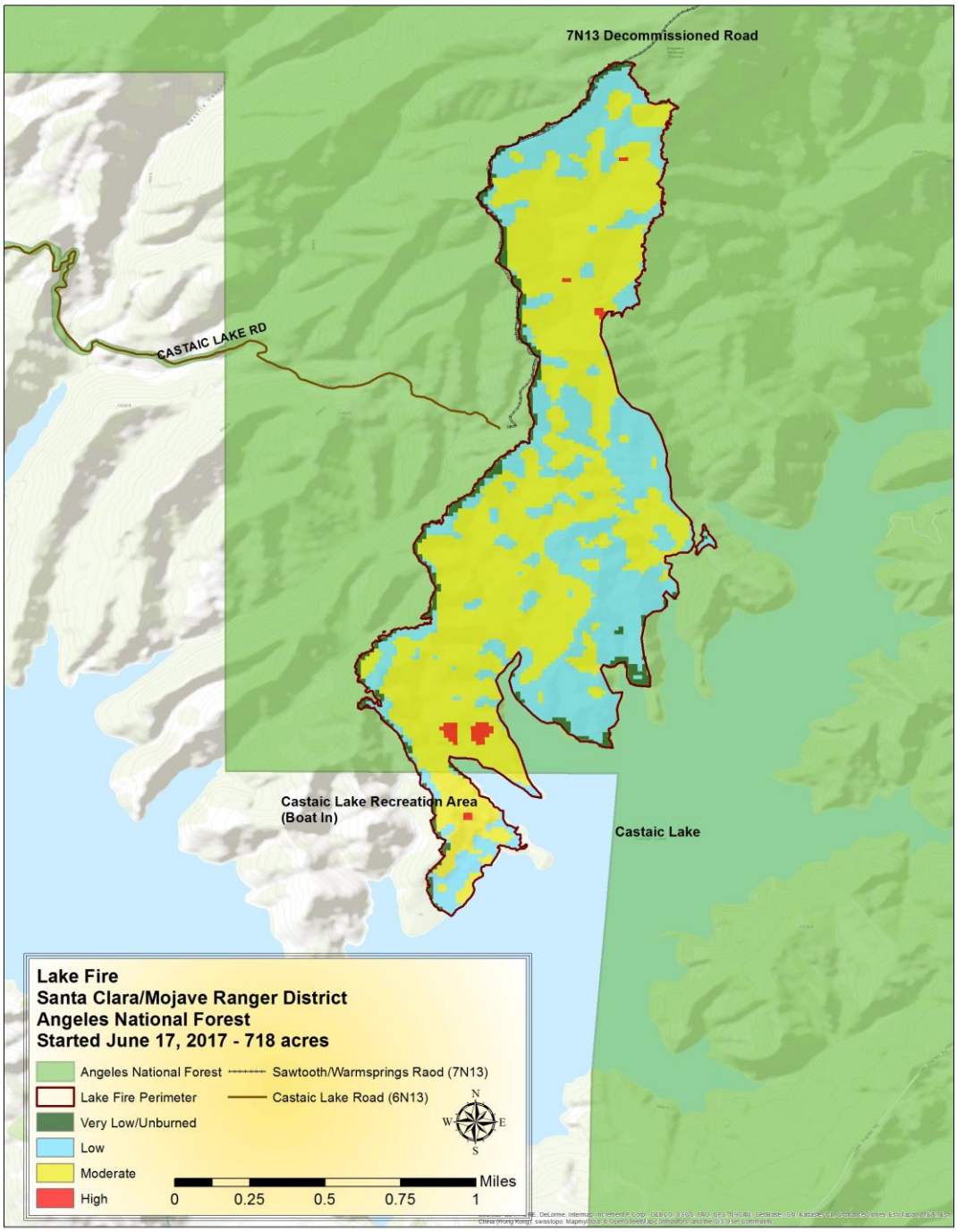
The Lake Fire began on Saturday June, 17, 2017 at the State Recreation Area, but high temperatures and low relative humidity the fire quickly spread onto land administered by the Santa Clara Mojave Ranger District. Ramp up of resources lasted for approximately three days. At six days the fire had reached 100% containment.

Approximately 60% of the burn area burned 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, but soil burn

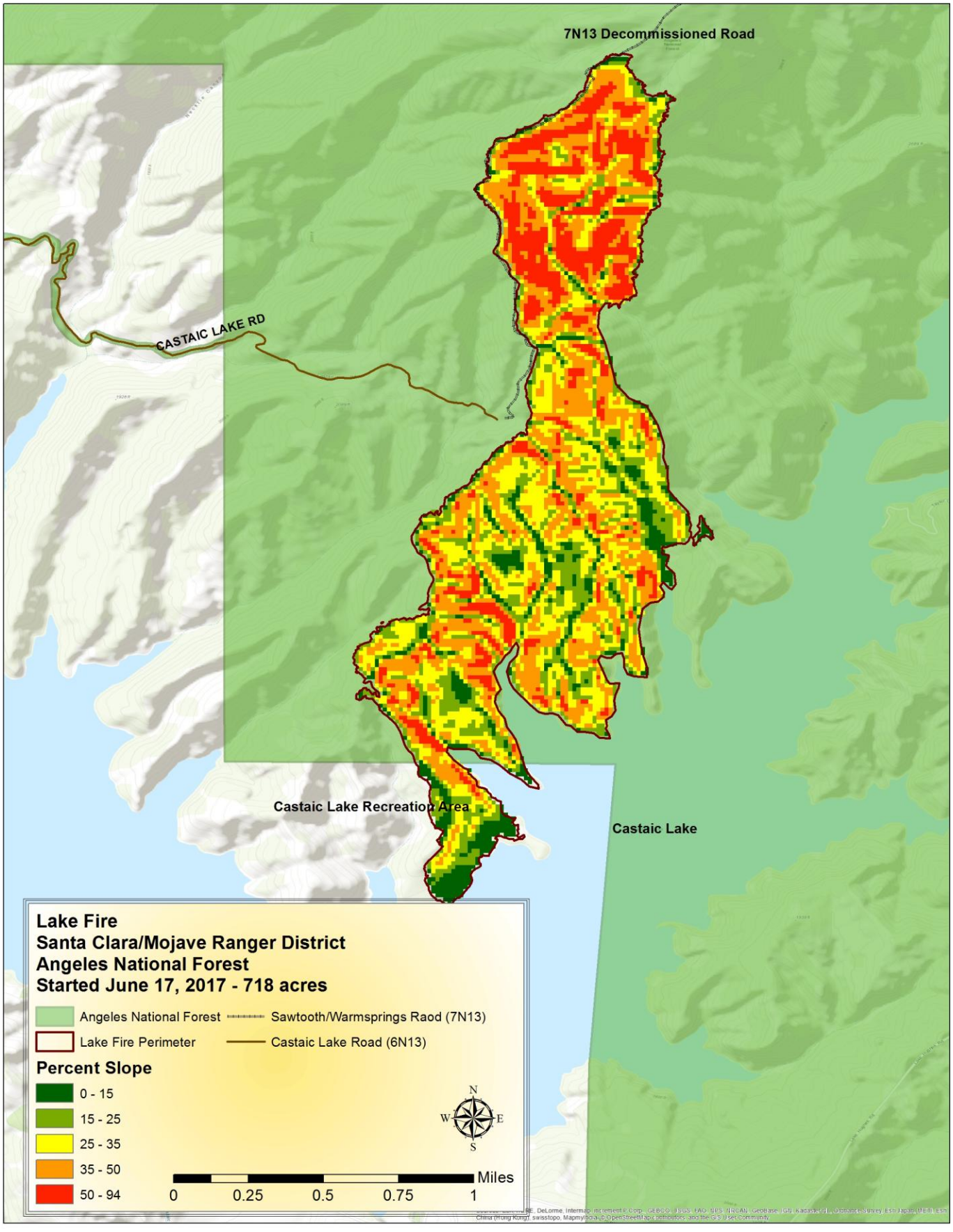
severity. Soil burn severity considers additional surface and below-ground factors that relate to soil hydrologic function, runoff and erosion potential, and vegetative recovery.

On Forest Service land the fire burned on steep slopes that have inherently high soil erosion hazards. The fire effects are expected to increase the high erosion hazard due to loss of vegetation canopy, effective ground cover, and formation of water repellent soil layers at varying depths. The burned, steep drainages have the ability to generate sudden releases of storm runoff at high velocities. The ensuing runoff from storm events can also erode and mobilize sediments and debris stored at the base of the slopes and in channel bottoms, leading to deposition of sediment along the lower reaches and Castaic Lake. Loading of sediment from the steep slopes into drainage channel was visible a few days after the fire occurred.

Lake Fire Soil Burn Severity Map:



Lake 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 Consequences**	**Risk**	**Forest Service Treatment Method**
Life/ Property	Castaic Lake Road	Rock fall, debris flow, flooding	ANF/ State of CA	unlikely	Very Low	Minor	Signs/ Coordination with LA County
Life/ Property	Castaic Lake State Recreation Area/ Lake shore	Rock fall Debris flow, flooding	State of CA	Possible	Major	High	Signs/Closure/ Coordination with LA County
Natural Resources	Soil productivity/ ecosystem recovery	Erosion and unauthorized OHV	USFS	Likely	moderate	High	OHV barriers/ signs
Natural Resources	Vegetation Recovery	Invasive plants	USFS	Very Likely	Major	Very High	weed detection/rapid response
Natural Resources	Water Quality	Debris/ sediment	USFS	Likely	Minor	Intermediate	coordination with Castaic Lake Rec Area/ LA County

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

Threats to Life and Property

The Castaic Lake road is closed to the public vehicle traffic, but during the fire Hikers and mountain bikers were seen on the road and OHV tracks were also on other trails in the area. Recreational user may hike up from the recreation area campground on state land. Users are at risk from rock fall, hazard trees in the campground, debris flows and washouts while traveling along the Castaic Lake Road or through old dozer lines (not pushed during the fire) and foot trails exposed when the vegetation was burned off. Though the roads are closed to motor vehicles except for administrative use by the Forest Service, the County, BLM, and others the public access the area through boats and on foot or bicycle. The BAER team recommend we sign road and possibly the shore warning public of potential dangers in burned areas. Coordination with the recreation area to warn users of the danger of recreating inside the burned watersheds.

Threats to Ecosystem Stability/Soil Productivity

The combined factors of severely burned watersheds directly above Castaic Lake, large volumes of loose, stored sediment in channels and on the steep slopes, moderate burn severity with water repellency, and the location of the Lake/reservoir directly below those watersheds indicate a resources impacting water quality in the reservoir.

Within the fire perimeter, Moderate to High soil burn intensity covered 59 percent of the landscape. 34 percent of the area burned with Low soil burn intensity, 1 percent burned at high. Post-fire field surveys indicate that almost all vegetation cover was consumed during the fire with burn intensities of moderate and high.

On average, there is 30 to 50 percent effective soil cover consisting of surficial gravel, large rock fragments and charred litter. There is high potential of increased surface erosion resulting from the fire

The slopes are steep on the north portion of the fire nearing 94% slope, and more moderate near the lake at 25% slope, averaging 35%, and have been stripped of the vegetation, much of the soil that is predicted to erode is and continues to dry ravel and load the channels with thick deposits of surface soil. This soil is quickly available for transport during critical precipitation events.

Water repellency is strong. Although water repellency is natural, the combination of soil cover removal, drought, and fire effects increases peak flows and subsequently the risk of damaging floods and debris flows.

Probability of Damage or Loss: Likely. This determination is due to the change in watershed response causing sheet and rill erosion of topsoil. There is some potential for unauthorized off-highway vehicle use within the dozer lines leading to the burn that could be detrimental to vegetation recovery, encouraging noxious weed invasion.

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. The BAER team recommends installation of OHV barriers if needed and signs explaining the area is a fire recovery site to encourage vegetation recovery, limit weed invasion and protect soil structure. Because of the steep slopes, and size of the fire, large rock content in the soil, and wind presence other treatments to reduce erosion risks are neither economically feasible nor effective. It was also determined that increased hydrophobicity and channel loading of sediment will increase the risk for other evaluated VARs downstream of the fire area including water quality and risk to recreational uses accessing the fire area.

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. A wash station was not onsite until several days into the fire. Equipment as active when there was no way to know if it was clean, where it came from or what weeds seeds it was carrying. 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 highly likely that existent weed infestations along fuelbreaks 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 6 miles of dozer line were also constructed outside and within the burn perimeter. In addition to causing an increase in weed invasion, the disturbances caused by dozer lines are expected to create accelerated erosion and soil compaction that may also inhibit the recovery of native plant populations.

Probability of Damage or Loss: Very Likely. This determination is due to the change in watershed response causing sheet and rill erosion of topsoil. There is also a potential for unauthorized off-highway vehicle use within the burn area and dozer lines that will be highly detrimental to vegetation recovery and encourage noxious weed invasion.

Magnitude of Consequence: Major. This determination is due to the high potential for vegetation type conversion to non-native annual grasslands and forbs (ie, Russian thistle) across the burn area, most especially along dozer lines.

Risk Level: Very High. The BAER team recommends early detection and rapid response weed surveys to locate and treat high priority infestations.

Threats to Cultural Resources
None

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 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- The Castaic Lake Recreation Area, roads, and Castaic Lake water quality within and downstream of the burn area are at greater risk from flash flooding and sedimentation after the fire. The treatment objective is to increase the awareness of the public recreational users, LA County, 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/rapid response and preventing unauthorized OHV.

• Road Treatments – Objective is to reduce the threat to life and safety for road and trail users by implementing closures and installing hazard signs. LA County maintains the Castaic Lake road accessing the State Recreation Area.

• Limit loss of soil productivity –Objective is to decrease rates of runoff water and erosion by conducting invasive species removal and OHV barrier installation.

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):

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Kelsha Anderson: Angeles National Forest

Email: kelshaanderson@fs.fed.us Phone: (626) 574-5257 FAX: (626) 574-5207

Core Team
Joanna Huckabee (Archaeologist)
Kelsha Anderson (Hydrology/Soils)
Kathleen Hemeon (assistant)
Nathan Sill (Wildlife/Fisheries)
Janet Nicerman (Botany)

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:

Noxious Weed Detection and Rapid Response

Weed detection surveys and rapid response eradication treatments are to determine whether ground disturbing activities related to the Lake Incident and the fire itself have resulted in new or the expansion of existing noxious weed infestations. With 6 miles of dozerline, 2.5 mile of handline, 1.5 miles of riparian corridors in the 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 2018 during the flowering periods of weed species. Because of differences in flowering times for all potential species, two visits will 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, and known invasive 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 and Rapid Response Cost

Item	Unit	Unit Cost	# of Units	Cost
1 GS-11 botanist	Days	$400	2	$800
4 GS-7 weed technicians	Days	$900	5	$4,500
Supplies	Each	$1,235	1	$1,235
Vehicle gas mileage	Miles	$0.55	1800	$990
			Total Cost	**$7,525**

Road and Trail Treatments: covered under Protection/Safety Treatments

Protection/Safety Treatments:

Interagency Coordination
Interagency coordination started during the fire and continued throughout the BAER Assessment and is a critical component to the BAER process. Continuing this coordination by providing the BAER Assessment Report, specialist reports and attending meetings is anticipated.

Interagency Team Cost

Item	Unit	Unit Cost	# of Units	Cost
BAER Coordinator/Hydrologist	Days	$400	2	$800
Vehicle mileage	Miles	$0.55	200	$110
			Total Cost	**$910**

Barriers for Unauthorized Off Road Vehicle Use and Protection Monitoring
Unauthorized access is a threat to the burned watershed due to the dozerlines created for the fire. The ANF is the most urban Forest in the nation with one of the highest use levels. The challenge for the ANF is managing the high number of users who gain unauthorized access to the Forest by driving/riding/entering through or around a locked gate or closure sign. This type of unmanaged use can cause damage to natural resources. In order to manage OHV potential access onto dozerlines and the burned area, the BAER team requests funding to purchase and install no-dig barriers, which have been proven to be effective and cost efficient barriers on the ANF in past fires.

Through past BAER experience, the ANF has determined that signage, barriers and other hard closures that are installed to 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 the closure and deter

unauthorized access, vandalism, and damage to National Forest System lands. The following treatment is needed.

OHV Barrier Installation and Cost

Item	Unit	Unit Cost	# of Units	Cost
No-digs barrier materials	Each	$36.25	20	$725
Installation Supplies	Each	$100	1	$100
Labor (4 GS 5 Techs)	Days	$800	2	$1,600
GS-5 OHV - FPO	Day	$225	10	$3,375
Mileage	Miles	$0.55	400	$220
			Total Cost	**$6,020**

Human Life and Resource Protection (Fire Area and Trails Closure/Warning Signs)
To ensure safety for Forest visitors and protection to Forest resources during the recovery period, fire area closure and warning signs will be placed at trailheads and road locations adjacent and within the fire perimeter. Given the typical amount of vandalism on the ANF, it is likely signs will need to be checked and replaced periodically.

Forest Infrastructure: To protect life and property associated with the public use of the lake shore, trails, and roads within and downslope/downstream of the Lake Fire, the BAER Assessment Team recommends the temporary closure of the burn area to all recreational users. The closures will be accomplished by various means such as placement of signs and informing the public at strategic locations of access points outside and within the fire perimeter which will effectively close off the burn area.

Closure and Hazard Signage (Trails, Roads, and Recreation Areas)

Item	Unit	Unit Cost	# of Units	Cost
GS-11 Recreation Officer	Day	$360	1	$360
2 GS-5 Recreation Technicians/ FPO	Days	$440	4	$1760
Trails closure signs (12”x 18”) Hi density plastic.	Each	$6	20	$120
Area closure signs (14” x 20”)	Each	$33	10	$330
Posts and hardware	Each	$18	20	$360
Vehicle mileage	Miles	$.55	400	$220
Vehicle FOR	Month	$350	0.5	$175
Total Cost				**$3,325**

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

Click red icons for notes.	NFS Lands					Other Lands				Money Left
Line Items	**Units**	**Unit Cost**	**# of Units**	**BAER $**	**Spent $**	**# of Units**	**Fed $**	**# of Units**	**Non Fed $**	**Total $**
A. Land Treatments										

NX Weed Det. Surv.	Ea	12,025	1.0	$7,525	$0		$0		$0	$0
Subtotal Land Treatments				$7,525	$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										
Subtotal Road & Trails				$0	$0		$0		$0	$0
D. Protection/Safety										
Interagency Coordination	ea	$3,125	1	$910	$0		$0		$0	$0
Closure & Hazard Signage	ea	$3,325	1	$3,325	$0		$0		$0	$0
OHV Barriers	ea	$6,020	1	$6,020	$0		$0		$0	$0
Subtotal Protection				$10,255	$0		$0		$0	$0
E. BAER Evaluation										
Assessment Team	0520	H5BAER	---	---	$4,000	---	$0	---	$0	$0
	---	---	---	---	$0	---	$0	---	$0	$0
Subtotal Evaluation				---	$4,000	---	$0	---	$0	$0
F. Monitoring										
Subtotal Monitoring				0	$0		$0		$0	$0
G. Totals				**$17,780**	**$4,000**		**$0**		**$0**	**$0**
Previously approved						Comments:				
Total for this request				**$17,780**						

PART VII - APPROVALS

1. _/s/ Jeffrey Vail_ _7/19/17_
   Forest Supervisor (signature) Date

2. _____ _____
   Regional Forester (signature) Date

Appendix A

NOXIOUS WEED DETECTION SURVEY PLAN

Fire Name: Lake Fire Month/Year: July 2017
Author: Janet Nickerman
Author Duty Station: Angeles National Forest

A. Background

Forest Service policy mandates the Forest to minimize the establishment of non-native invasive species to prevent unacceptable degradation of the burned area. It is necessary to conduct noxious weed detection surveys to evaluate the potential for spread from both existing populations and from the activities associated with fire suppression. Therefore, noxious and invasive weed detection surveys are proposed for the first year following the fires to verify the suspected infestations and determine the fires' potential impact on weed populations within the burned area. Tamarisk (*Tamarix spp*), Russian thistle (*Salsola sp*.), wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), cheatgrass (*Bromus tectorum*), tocalote (*Centaurea melitensis*), shortpod mustard (*Hirschfeldia incana*), tree tobacco (*Nicotania glauca*), castor bean (*Riccinus communis*) and Spanish broom (*Spartium junceum*) are known to occur within the burn area and along access routes adjacent to the burn. Many plant dispersal vectors such as Forest roads, high winds, and waterways occur within the fire area. Even though a weed washing station was utilized after five days of suppression activities, seed could have been transported into the burn on suppression vehicles and equipment that arrived on the fire before the washing station was established. Fire is known to enhance the establishment of all weed species present.

B. Management Concerns

Noxious weed invasions interfere with habitat recovery and ecosystem health within burned areas and fire suppression sites. In particular, noxious weeds hinder the recovery of habitat, especially in arid and riparian ecosystems, by aggressive colonization and reduction of water quality and quantity.

C. Objectives

To determine if the fire and associated ground disturbing activities have promoted the establishment and spread of noxious weeds to the extent that eradication efforts are necessary. Early detection dramatically increases the likelihood of successful treatment. If weeds are detected, a supplemental request for BAER funds will be made for eradication.

D. Parameters

Noxious weed presence, location, density, population size, and persistence.

E. Locations

In and along roads, dozerlines, handlines, drop points, safety zones, riparian areas, and adjacent to known invasive plant populations.

F. Weed Detection Survey Design and Methodology

Surveys will begin in 2017 during the flowering periods of weed species. Because of differences in flowering times for all potential species, two visits will be required during the growing season. Completion of surveys in roads, dozerlines, riparian areas, staging areas, safety zones, and known invasive plant populations will be the first priority. The second survey priorities will be along hand lines, and drop points. Surveys of the general habitats in the burned area will be the lowest priority. All locations of weed species will be mapped, using the Angeles NF, "Invasive Weeds" list.

Surveying will include documentation and hand pulling/herbiciding new weed occurrences at the time of inspection. New weed occurrences will be pulled to root depth, placed in sealed plastic bags, and properly disposed or sprayed with the appropriate and approved herbicide.

Documentation of new infestations will include:

- Mapping perimeter of new infestations
- Filling out Weed Element Occurrence Form (Appendix A)

- Treatment method required
- Incorporating data into local GIS spatial database
- Entering data into National Resource Information System (NRIS) database
- Entering data into FACTS database
- Evaluating success of treatment in subsequent inspections

G. Reporting

If weed introduction and spread has occurred to the point that funding provided in the detection cost is not sufficient, an interim BAER report will be completed to request eradication funding. Reporting costs are included in figures below.

H. Costs: Weed Detection Surveys for One Year =$12,025.00

Weed detection surveys to determine whether ground disturbing activities related to the Lake Fire have resulted in the expansion of noxious weeds is requested for the first year. Estimated costs are based on the assumption that two visits would be necessary because of the differences in flowering times. If timing is such that all the target species are detectable in one visit, the actual costs would be lower than displayed below.

Estimated Cost:	
1 GS-11 botanist ($400/day x 2 days)	$ 800
4 GS-7 weed technicians ($900/day x 5 days)	$ 4,500
Supplies	$ 1,235
Vehicle mileage (1800 miles @0.55/mile)	$ 990
TOTAL	**$ 7,525**

I. Follow-up Actions

Design and implement follow-up treatments as needed. Plan for integrated weed management and NEPA analysis has already been completed using non-BAER funding.