

Date of Report: 06/29/2022**BURNED AREA REPORT****PART I - TYPE OF REQUEST****A. Type of Report**

- ☒ 1. Funding request for estimated emergency stabilization funds
☐ 2. No Treatment Recommendation

B. Type of Action

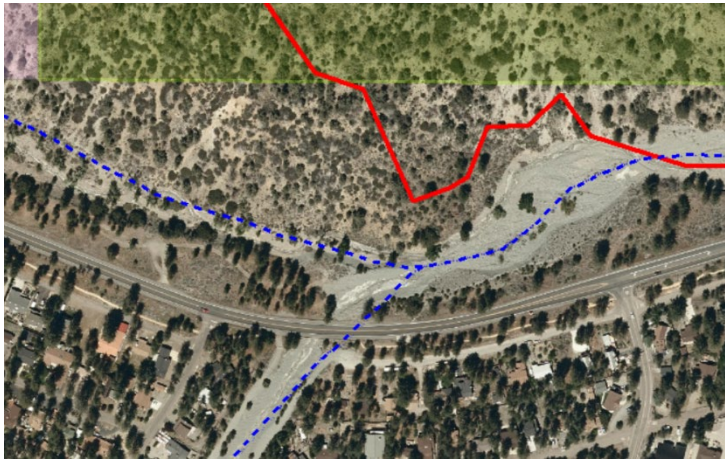
- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
☐ 2. Interim Request #_____
☐ Updating the initial funding request based on more accurate site data or design analysis

PART II - BURNED-AREA DESCRIPTION**A. Fire Name:** Sheep**B. Fire Number:** CA-ANF-0174**C. State:** CA**D. County:** Los Angeles**E. Region:** 05**F. Forest:** Angeles**G. District:** San Gabriel Mountains National Monument**H. Fire Incident Job Code:** P5PP6U22**I. Date Fire Started:** 06/11/2022 @ 1836 hrs**J. Date Fire Contained:** 100% as of 06.19.2022**K. Suppression Cost:** \$8 M

L. Fire Suppression Damages Repaired with Suppression Funds (estimates)

1. **Fireline repaired (miles):** Repaired approx. 16.2 miles of dozer lines and fuelbreaks.
2. **Other (identify):** handline (with slash, dozer line with waterbars.)

BACKGROUND:

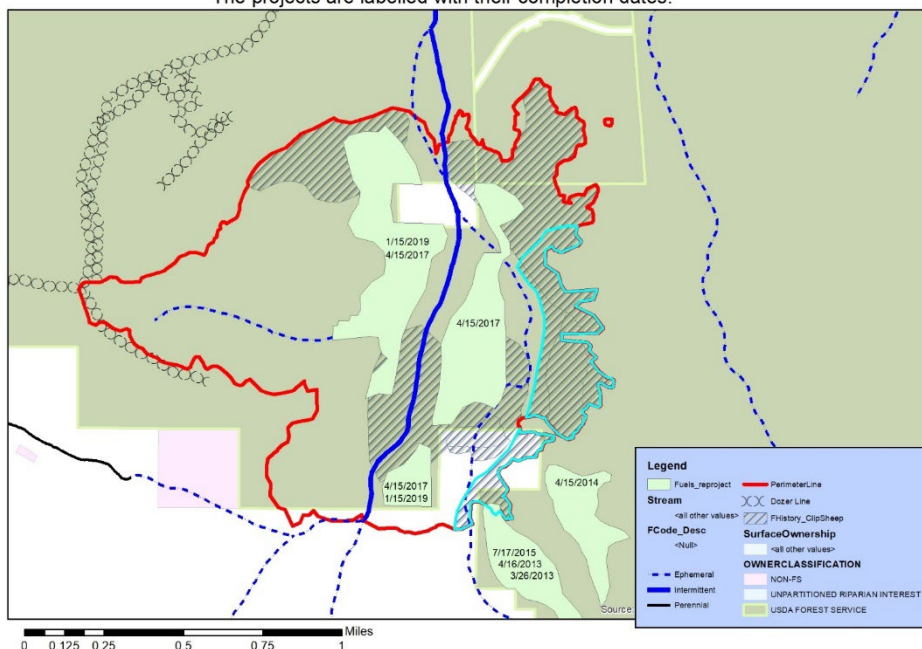


The Sheep Fire started on June 11, 2022 on the north side of Hwy 2, just outside of the town of Wrightwood, above the Sheep Creek floodplain. For the first day, it moved upslope and was around 65 acres. On June 12, however, the winds kicked up spreading the fire through the area up to the 856 acres. On June 12 and 13, about 6 miles of handline was put in along with ~400 aerial drops of water and retardant. The objective was to hold the fire and keep it from cresting into Wrightwood. Most of the dozer lines were installed on June 12, along the Table Mountain East mountain bike trail (4N21) fuelbreak going toward quarry, the Level One road and trail to Circle Mountain (3N51) for 2.6 mi, and in

the floodplain paralleling Desert Front Road, 0.14 mi.

At approximately 5300' elevation, this area is considered part of the high desert foothills of the Mojave Desert. As such, it is subject to snowfall (~55") and rainfall (~25") with some rainfall occurring in summer monsoons.

Within the Sheep Fire perimeter, the most recent wildfire was the Bluecut Fire (blue outline). The Wrightwood Fuels Reduction projects used an excavator to rearrange fuels. The projects are labelled with their completion dates.



Vegetation Management History:

Only about 77 acres had burned in fire in the last 10 years in the Blue Cut Fire. However, 161 acres in the floodplain had been part of a fuels reduction project in 2017. In that project they used an excavator to rearrange fuels. In 2019, the area was reentered for a broadcast burn project. This area is high in biodiversity with an unusual combination of Joshua trees, Pinyon pine/juniper, and understory sagebrush/desert shrubs. (Fig 1 and Appendix A)

Figure 1 Map describing Sheep Fire perimeter, recent fire history, and fuels' projects.

The Sheep Fire footprint is within two watersheds:
Sheep Creek and Horse Canyon - Fremont Wash.

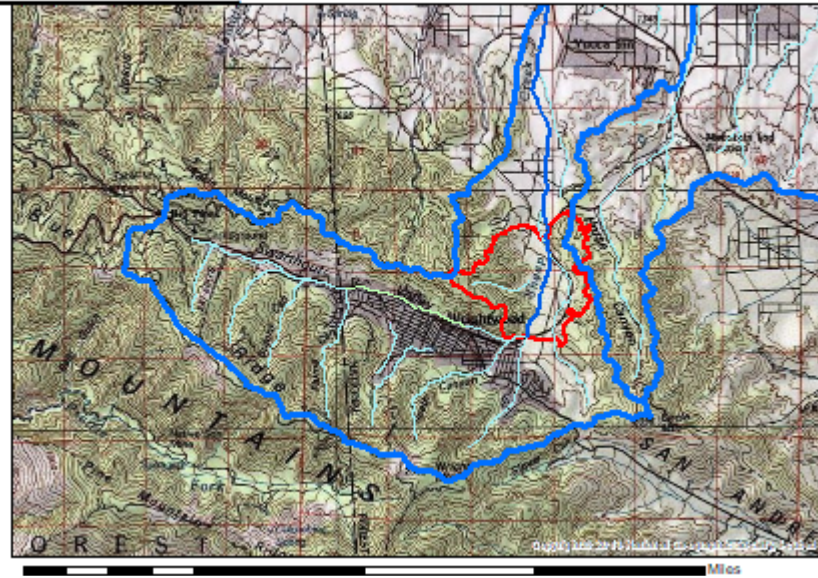


Figure 2 Watershed perimeters

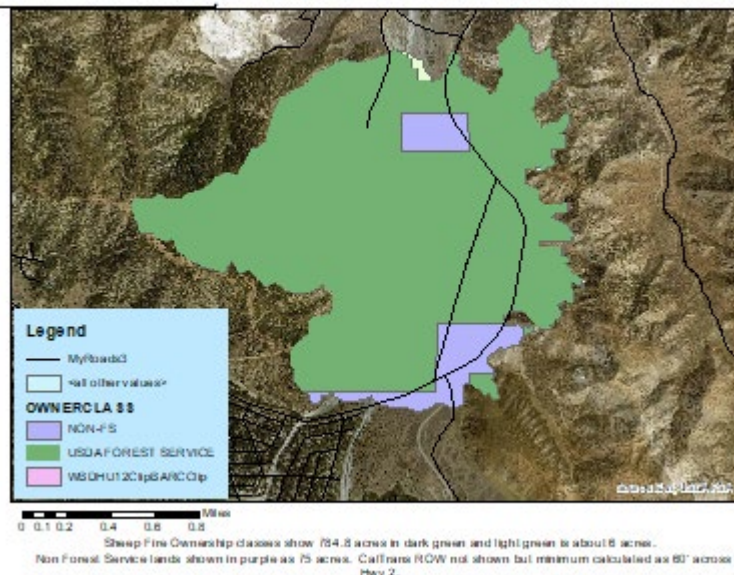
HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
180902080401	Sheep Creek	20,275	820	4%
180902080504	Horse Canyon - Fremont	31,147	45	~0.1%
TOTALS			865	

M. Watershed Numbers

The Sheep Fire burned in two watersheds, (Fig 2).

Table 1: Acres Burned by Watershed (Get watershed layers for the SBNF)

Sheep Fire Ownership Classes



N. Total Acres Burned

Nearly all of the Sheep Fire acres were on Forest Service lands.

Table 2: Total Acres Burned by Ownership

OWNERSHIP	ACRES
NFS	790
STATE - CALTRANS ROW, HWY 2	16
NON-NFS	59
TOTAL	865

O. Vegetation Types: pinyon pine-juniper with chaparral associations, Mixed chaparral with Joshua trees (See Appendix A)

P. Dominant Soils are Dry families and Associations: FsD Wilshire-Oak Glen, < 40%, hydrologic soil group (HSG) A: well-drained with low runoff; Springdale, dry-Olete families complex, minor %, Lithic Xerorthents-dry rubble land association <40%; Riverwash minor %; Olete-Goulding families, about 20%, HSG C and D: well-drained with high runoff. The dominant soils are generally well-drained and vary in runoff potential with depth to bedrock.

Q. Geologic Types: Granite, gneiss, granodiorite

R. Miles of Stream Channels by Order or Class; NHD data from EDW site, R5.

Table 3: Miles of Stream Channels by Order or Class

STREAM TYPE	MILES OF STREAM
Perennial	0
Intermittent	1.26
Ephemeral	2.26
Other (Channelized stream with berms)	On private
Total	

S. Transportation System:

Trails: National Forest (miles): Other (miles): 0.0

Roads: National Forest (miles): 0.81 mi of Quarry Road before it meets the Dozer line around quarry;

2.87 miles of Level One Road 3N51 dozed for access;

2.88 4N51 dozer walked out in fuelbreaks. Other (miles):

PART III - WATERSHED CONDITION

A. Burn Severity (acres)

Table 4: Burn Severity Acres by Ownership

Soil Burn Severity	NFS	State	Non-FS	Total	% within the Fire Perimeter
Unburned/Very Low				85.2	9.9%
Low				527.3	61.3%
Moderate				242.7	28.2%
High	4.5			4.5	0.5%
Total				859.7 GIS acres	

B. Water-Repellent Soil (acres)

Water-Repellent Soil: No hydrophobicity tests were conducted based on gravelly soils and lack of organic matter.

C. Soil Erosion Hazard Rating

EHR Rating	Acres	%
Low	433	50
Moderate	303	35
High	86	10
Very High	43	5

Soil Erosion Hazard ratings range from predominantly low to moderate over 85% of the soils within the burn area. Moderate ratings indicate that accelerated erosion is likely to occur in most years. Although water quality impacts may occur for the upper part of the moderate numerical range, no impacts to water quality are expected given this fire and moderate to low level of soil burn severity. 15% of the burn area has high to very high EHR ratings indicating that accelerated erosion is likely to occur in most years. No erosion control measures are considered to be effective for these very steep gravelly slopes.

D. Erosion Potential

Steep west and northwest slopes with pre-fire active landslides indicate high erosion potential for this area within the fire perimeter and along dozer lines outside of the fire perimeter.

E. Sediment Potential

Modeling based on the USFS RMRS WEPP model eRMIT for similar climates found 18 tons/ac of sediment produced from erosion for the first year off the steep slopes, reducing to 7 tons/ac for the second year, 3.8 tons/ac for the third and fourth years, and declining to 1.4 tons/ac for the 5th year after this wild fire.

A critical value is the safety risks due to access into fire footprint, flooding and debris flows in floodplain during and post-storm events, and access onto dozer lines past quarry.

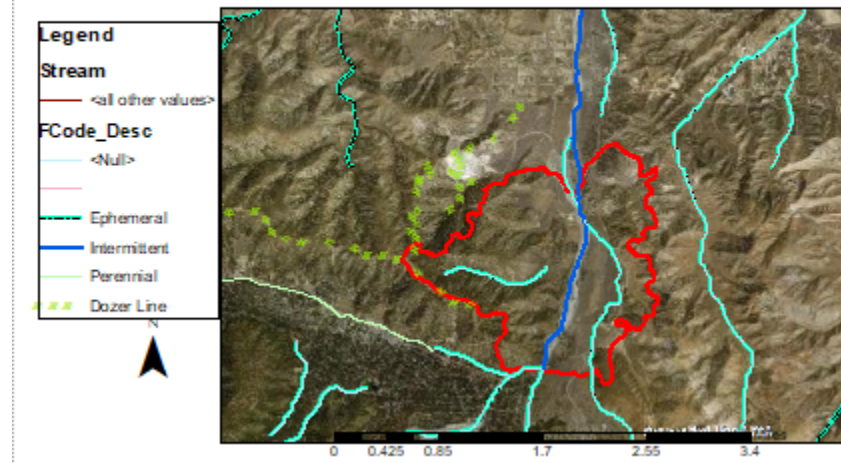


Figure 3 Sheep Creek is an intermittent stream. Other drainages feeding into Sheep Creek are typed as ephemeral.

F. Estimated Vegetative Recovery Period (years)

10 to 50 years; faster in low burn severity areas chaparral and longer in Joshua Tree and Pinyon Pine/juniper Communities.

G. Estimated Hydrologic Response (brief description)

1. Estimated Erosion Response

Depending on the area, precipitation intensity, and degree of soil burn severity, the steep, moderately burned slopes lying to the west and northeast in the burn area are expected to deliver additional sediment in a storm. Historical imagery of Sheep Creek and CA-2 in September of 2016 shows that flooding has occurred near the downstream point near the forest boundary. There is potential for flooding to reach CA-2 with sufficient rain and spring snowmelt.

2. Watershed Response

Hydrologic Design Factors	
A. Estimated Vegetative Recovery Period	5 to 50 years
B. Design Chance of Success	80 %
C. Equivalent Design Recurrence Interval	1 years
D. Design Storm Duration	3.75 hours
E. Design Storm Magnitude	0.57 in
F. Design Flow	0 cfs / mi ²
G. Estimated Reduction in Infiltration	0%
H. Adjusted Design Flow	0 cfs / mi ²

USGS Debris Flow model results were mapped for the burn area and the surrounding watersheds. The rainfall amount and intensity found to be a potential threat to State Highway CA-2 would be from a 15-minute, 44 mm/hr., 5-year RI rainfall event occurring within the year following the fire. This event could generate mud or debris flow activity from slopes along both sides of CA-2. As it may have occurred in the past, the erosion effects from the lack of vegetation in the burn area was incorporated into this event model.

The amount of runoff and initiation of mudflow would be dependent on the storm overall duration and peak intensity of rainfall. The five-year storm with 1.91 inches in 6.89 hours is likely to result in 0.72 inches of runoff, when modelled with a 10-minute peak rainfall intensity of 1.42 inches. This intensity is sufficient to initiate mudflow behavior on steeper slopes where vegetation has burned.

However, smaller precipitation events are expected to result in little hydrologic response from the watershed. The annual return interval storm with 0.57 inches of rainfall over 3.75 hours would likely result in 0.01 inches of runoff. The watershed response for a two-year storm would be similar with approximately 0.99 inches of rainfall over a 3.22-hour duration producing 0.21 inches of runoff.

Sheep Creek is within an un-gaged basin with no streamflow or discharge measurements available. Precipitation records from Wrightwood, CA which are of particular interest include a storm of 15.99 inches that fell in Wrightwood for 4 days, beginning 12/22/2010. Review of records and aerial imagery notes that a rocked rip-rap levy paralleling CA-2 held back a considerable amount of flooding sometime between 2015 and 2016. Evidence of breaching can be seen as well as re-arrangement of flood material in Sheep Creek by heavy equipment into a straight channel. The levy is likely to be effective in preventing future floods similar in size away from the levy and CA-2.

Using rainfall events from previous storms and basin characteristics, the Rocky Mountain Research Station WEPP model was used to evaluate the rainfall runoff for Sheep Creek. A storm event from 8.6 inches of precipitation over an 11.18-hour period occurred on March 25, 1972, producing 5.77 inches of runoff, the largest known storm, but without sufficient records to identify a return interval. The 20-year storm interval for 5.03 inches over 6.69 hours produced 3.12 inches of runoff. The 10-minute peak rainfall intensity was 4.58 inches/hour.

The generally low to moderate soil burn severity of the fire, with isolated pockets of high burn severity, is expected to leave roots intact and maintain pre-fire soil strength lowering erosion risk after 2-5 years. The Sheep Fire is expected to include: 1) an initial flush of ash, 2) rill and gully erosion in less rocky drainages on steep slopes within the burned area, 3) minor active landslides for some years, 4) floods with increased peak flows and sediment deposition above normal, and 4) possible mud or debris flows during large precipitation events.

Initial erosion of ash and surface soil during the first storm events may deposit sediment on lower slopes. Coarse sand, gravel, and boulders are expected to erode and move downslope to accumulate on alluvial fans, floodplains, and in the main channel of Sheep Creek. Upper to mid-slopes are expected to transport material to lower slopes during 5-year rainfall events. Following monsoonal summer moisture, fall rains, and spring snowmelt steep drainages would transport sediment to Sheep Creek.

The burned slopes have high infiltration capacity except in proximity to shallow bedrock. In these areas rapid runoff may occur and have the ability to carry large sediment loads for some distance downstream. This will increase the potential for flooding. The primary concern for vegetative recovery, and in turn hydrologic recovery, is in the low to moderate severity burn areas. The greatest hydrologic response is expected from initial storm events when there is little vegetation. Once vegetation is reestablished, ground cover and surface roughness would improve the infiltration capacity of the soils. The estimated vegetative recovery for watersheds affected by the Sheep Fire is expected within 5 to 15 years as observed in other watersheds on the Angeles National Forest.

3. Geology/Geologic Response

Past evidence of mass wasting such as landslides, debris slides, and rock fall is seen on steep slopes to the west and northwest, with some small areas to the northeast. These occur well away from roads except at a small outcrop near CA-2. These slopes have stored gravels and boulders, and channels with steep gradients that coalesce on alluvial fan deposits that reach over a mile to a nearly flat valley floor. The very active Sheep Creek

floodplain receives episodic landslide and mudflow sediment from upstream sources where a very unstable schist produces considerable amounts of sand, gravel, and boulder material.

Mass wasting features are prominent throughout the area and form adjacent to the steepest slopes. These features are most likely to be affected by the fire and produce the most sediment. The absence of vegetation to intercept rock fall, especially from the steepest slopes and where fire severity was greatest, will likely cause a slight increase in dry ravel and debris sliding compared to before the fire.

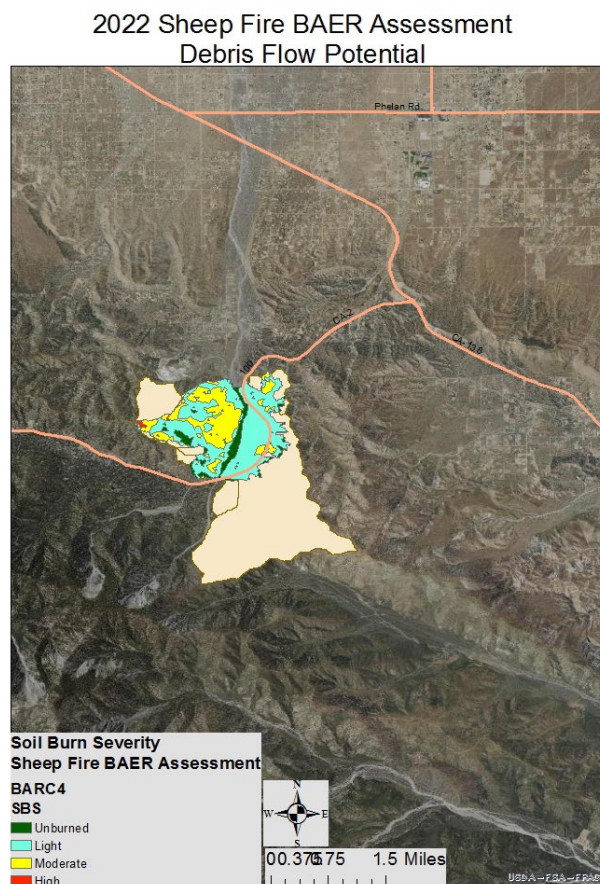
Rock Fall

Rock fall along Forest roads and CA-2 is not expected to change from this event.

Debris Flow

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).



USGS models estimate a low level of debris-flow hazard for most of the area burned by the Sheep fire. Most stream reaches and drainage basins have a less than 20% likelihood of debris-flow occurrence at the modeled rainfall intensity. A few small drainages have a higher level of debris-flow hazard, with a 40-60% likelihood of debris-flow occurrence. These higher hazard areas occur in the northern portion of the burn area along some sections of Sheep Creek. Most of the assessed burn area requires rainfall rates greater than 44 mm/h (1.73 in/h) to exceed a 50% likelihood of debris-flow occurrence. Higher hazard areas require much more modest rainfall rates between 20 and 28 mm/h (0.79 in/h and 1.1 in/h) to exceed a 50% likelihood of debris flow occurrence. Most modeled watersheds have the potential to produce sediment volumes less than 10,000 m³ (13,079 cy), resulting in low to moderate combined hazard for most of the burn area.

The year 1 and 2 model-estimated rainfall thresholds (segment-scale) for the burn area

and corresponding return intervals are as follows:

YEAR 1:

15-minute: 44 mm/h, or 0.45 inches in 15 minutes, RI = 5.8 years

30-minute: 35 mm/h, or 0.7 inches in 30 minutes, RI = 8.0 years

60-minute: 31 mm/h, or 1.25 inches in 60 minutes, RI = 16.0 years

YEAR 2:

15-minute: 57 mm/h, or 0.55 inches in 15 minutes, RI = 13.1 years

30-minute: 46 mm/h, or 0.9 inches in 30 minutes, RI = 19.5 years

60-minute: 42 mm/h, or 1.65 inches in 60 minutes, RI = 50.8 years

The model predictions represent estimates based on free, readily available data. Certain local conditions not represented by the input data may significantly impact site-specific debris-flow hazard. In addition, our models only consider debris flows; floods are not considered in the model (including sediment-laden flash-floods).

We selected a design storm based on the NOAA Atlas 14 Point Precipitation Frequency Estimates, of a peak 15-minute rainfall intensity of 44 millimeters per hour (mm/h), or 0.45 inches in 15-minutes, which resulted in a 5.8-year recurrence interval (RI). This rainfall intensity would best evaluate debris flow potential and volumes since debris flow generation would require rainfall rates to be greater than 40 mm/h. In contrast, an annual frequency, 1 year RI, 15-minute event is likely to produce 0.236 inches of rainfall, well below the 0.45 inches in 15-minutes expected to generate debris flow conditions.

General information about the fire was shared through normal public announcements. Responsible emergency and other agencies were contacted; USGS shared their hazard assessment with CalOES and NOAA. NOAA reviewed the information and thresholds and concluded the combined hazard results may be too small for specific warning and decision support services from NOAA at this time.

PART V - SUMMARY OF ANALYSIS

Introduction/Background

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

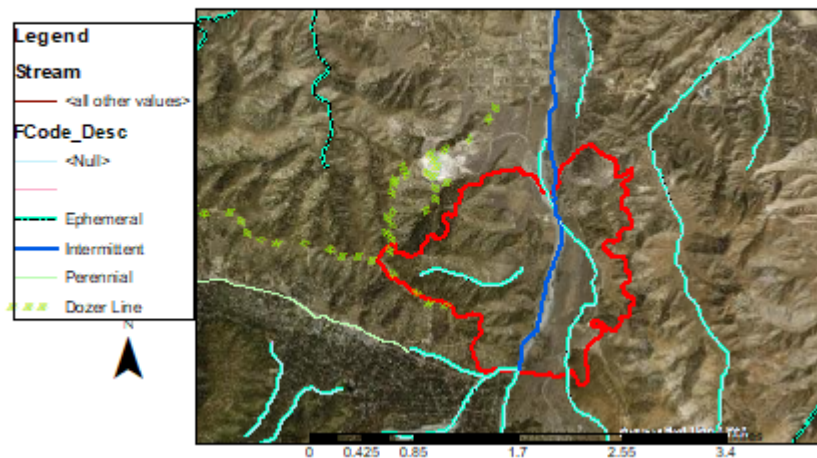
Table 5: Critical Value Matrix

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

1. Human Life and Safety (HLS)

Based on the potential for visitor falls, the BAER team identified a serious risk to public, employees, and cooperator staff in the Sheep Fire area. The dozer lines now connect the mountain bike trail from Table Mountain (4N21) through to the Desert Front Country Road. These dozer lines now surround a deep pit quarry which would be a very high risk. There is also Quarry Road which goes to the quarry. Mountain bikers and hikers frequent these trails and now that they are open, there is a need to ensure access is limited.

A critical value is the safety risks due to access into fire footprint, flooding and debris flows in floodplain during and post-storm events, and access onto dozer lines past quarry.



Probability: Possible

Magnitude: Major

Risk: High

2. Property (P)

a) Roads

Overview: There is a road on FS lands which services the Quarry and SCE transmission lines (0.81 miles) and a Level One road/trail in Horse Canyon which goes to Circle Mountain, 3N51 (2.87 miles).

Quarry Road



Figure 4 Roads, streams, and dozer lines. Dozer lines are marked as X and surround the quarry. Right bottom corner shows Hwy 2. Road off of Hwy 2 is Desert Front Road.

Risk Assessment for Roads: National Forest System roads were assessed in order to determine the probability and magnitude of road damage or loss as a result of the changed watershed condition. User safety on roads in the burned area is also an equally important consideration. The risk assessment for each road is based on the probability of damage or loss and the magnitude of consequences.

Quarry Road, Desert Front Road (non-FS road), and Hwy 2 could be damaged in a flood following a 5-yr recurrence storm (or 15-min intensity of 0.43"). For Quarry Road, there are no proposed treatments. The BAER team did note that on Desert Front Road, a concrete low-water road crossings are being undercut. For suppression repair, a firebreak was installed which paralleled 0.14 mi along the Desert Front Road. This firebreak interrupted the many small channels which the road intercepted. For suppression repair, they removed the berms created by the fuelbreak so that water would not flow

down the road, allowing it to flow across the road and continue into the channel on the other side. (Pictures of fuelbreak available upon request). The County road department should be informed of the condition of the road.

Level One Road/Hiking trail to Circle Mountain --The 3N51 road was pushed open from Hwy 2 toward Circle mountain. For much of its length, it is within the stream channel. However, 3N51 is not within the burned area, but was opened as a contingency line. This Level One road was deeply rutted and the road was widened when pushing open the contingency line. Sand was pushed into the ruts and the road prism appears widened since 2007 photo images from a hiker.

Probability: Very Likely

Magnitude: Moderate

Risk: Very High

- b) Trails – There are no trails within the burn perimeter, itself. However, the Level One Road is also used as a trail for hikers.

a) Natural Resources (NR) Water Quality for Municipal and Domestic Use

There are no known municipal or domestic uses of water in or adjacent to the fire area that could be impacted by the fire. However, debris flow and ash into the stream may affect water quality for the habitat. This floodplain is periodically flooded as noted in 2016 and 2018, and the volume of water may flush the ash within a storm.

b) Hydrologic Function

It is estimated that high intensity storms (>40 mm/hr.) will tend to initiate/trigger debris flows. These include summer thunder-storms, fall rain, as well as snowmelt events, the probabilities of debris flows would be 50%. However, less than a 15-min intensity of 40 mm/hr rate is not likely to initiate damaging debris flows.

Probability: Possible

In the event of a 15-min intensity of >40 mm/hr. rate, a debris flow will be highly likely. In that case, the debris flow could reach Hwy 2 thereby impacting traffic flow. Even in that storm, no structures off-Forest are likely to be impacted. However, the infrastructure owned by Sheep Creek Water Co and SCE transmission lines may be affected by flows. While no known municipal or domestic uses are affected by the fire, ash and sediment will degrade water quality in drainages.

Magnitude: Moderate Rill and gully erosion on the hillslopes could damage critical values such as Forest Roads and Trails and affect off-Forest values.

Risk: Intermediate High in the event of that storm intensity, Moderate in a lesser intensity but longer duration storm, and Low in short, less intense storms.

c) Soil Productivity

Soils in this area are poor in nutrients with little organic matter. Therefore, soil productivity is low. However, there were approximately 400 air retardant drops, and the addition of the retardant fertilizer along with water may have increased the soil productivity in those areas where frequent drops were made. This may allow nonnative plants to establish quickly. In addition, there are barren fields which in this area could be alkaline soils. Barren areas are noted chiefly along the intermittent area of Sheep Creek, a distance of 1.28 miles.

The burned area also exposed landslides and gullies which have occurred, with perched boulders observable mid-slope. Without the vegetative cover to impede slides, more mass wasting will occur. However, suitable areas for treatments are very limited due to steep slopes and accessibility. The 5 acres of high

severity is within a steep drainage. Therefore, hillslope treatments would not result in effective slope stabilization because the available areas are so small.

Risk Assessment:

Probability: Very Likely because intense rainfall of more than a 5-year rainfall event could result in severe surface erosion.

Magnitude: Moderate because loss of surface soil could reduce productivity or delay recovery of pre-fire vegetation types.

Risk: Intermediate

d) Wildlife Resources

An old shooting range off of 3N51 was assessed for ammunition and microtrash. None was observed and except for the road prism which had been dozed and widened, no trash nor ammunition was observed.

Risk Assessment for California condor: Probability: Unlikely

Wildlife Water Developments:

Risk Assessment for Wildlife Water Developments – Property: The presence of wildlife guzzlers was not checked in the area. According to spring data, there are no recorded springs within the fire's footprint so the likelihood of guzzler developments is low.

4. Cultural and Heritage Resources

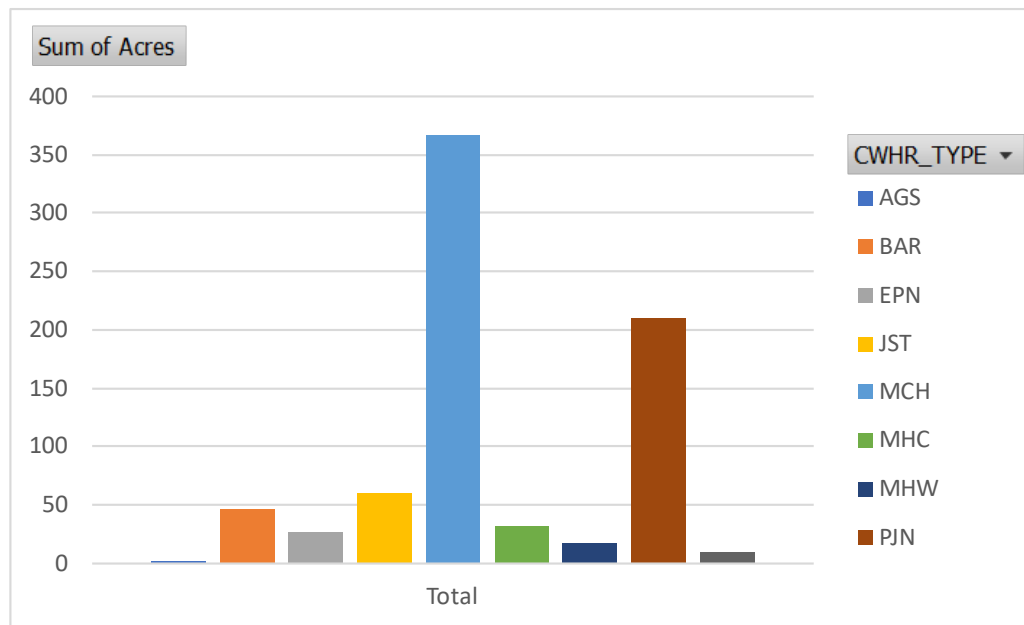
Risk Assessment for Cultural Resources: Probability= Unlikely. The cultural resources in the area were assessed by Thalia Ryder when she was a READ. No surface manifestations were noted.

Magnitude: Very Low because cultural resources are buried.

Risk Assessment: Very Low

5. Botanical Resources/native plant recovery/Ecosystem Recovery

Below chart highlights of the two rare ecotypes: Joshua tree and singleleaf pinyon juniper

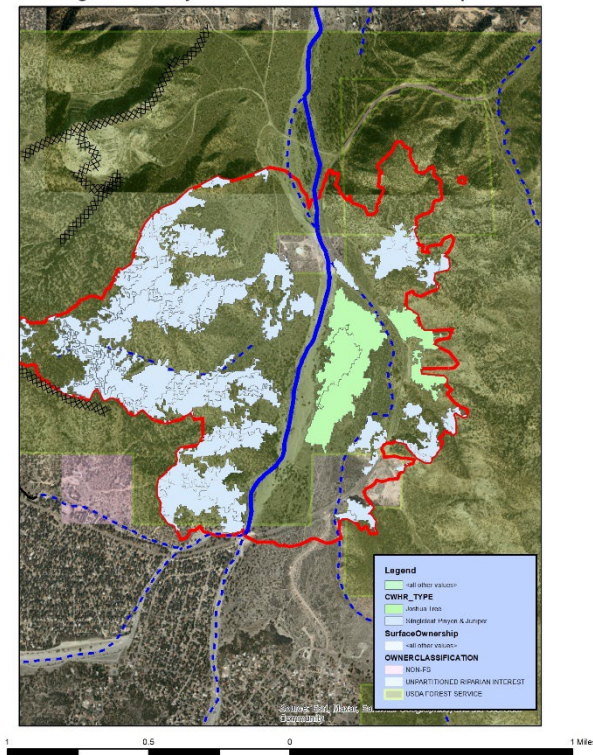


AGS = Ag/Grass lands
 BAR = barren (alkaline?)
 EPN = Yellow pine/western juniper
 JST = 59 acres JOSHUA TREE Woodland
 MCH = Mixed Chaparral with Scrub oak, Tucker/Muller scrub oak, manzanita, bladderpod, ceanothus, Yucca, birchleaf mountain mahogany types possible
 MHC = Western Juiper, Ponderosa Pine, Singleleaf Pinyon Pine, California Juniper,

Bigcone doug fir,

MHW = Interior Live Oak or Canyon Live Oak, PJN – 209 acres Pinyon (Singleleaf) juniper, NO Urban

Sheep Fire with Joshua Tree Woodland and
Singleleaf Pinyon Pine and Western Juniper



Due to the slow nature of Joshua Tree, Pinyon Pine and Juniper recovery, it's important to address invasive plants such as cheat grass, Russian thistle and mustards. All three are noted in the ANF invasive weed database. In addition, observations of intact ecosystem next to the burned area noted scattered individuals of these species. Also, observations were made of Russian thistle in the suppression piles of pushed vegetation and in flumes draining Hwy 2. (Appendix A) These are highly flammable and quick to spread flames. If a fire occurs in the Sheep Fire area within the next 20 to 30 years, the area will be permanently type converted and we will lose these important cornerstone species.

An emergency exists to address the threat of post-fire weed incursion within the fire perimeter and in areas where fire suppression activities occurred. The incursion 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

dozerlines and fuelbreaks will increase in the burn area due to their accelerated growth and reproduction and lack of competition with natives. These weed populations could affect the structure and habitat function of native plant communities within the burn area. The ground disturbances caused by dozer lines are also expected to create accelerated erosion and soil compaction and may contribute to inhibiting recovery of native plant communities. Approximately 16 miles of dozerline were constructed or fuelbreaks were used within and outside of the burn perimeter without a weed washing station. Therefore, it is critical that early and rapid detection surveys and treatment for invasive weeds is implemented within and around the burn perimeter, to improve native vegetation recovery. It is expected that most native vegetation would recover if weed invasions are minimized.



Figure 5. The invasive weeds can be dispersed by equipment as well as wind and water action in streams onto burned areas. (XX are dozer lines, red is fire perimeter, yellow are invasive weed locations with species' names, blue/dark blue are streams.)

could affect the structure and habitat function of native plant communities within the burn area. It is expected that most native vegetation adapted to moderate or infrequent high severity fire would recover if weed invasions are minimized.

Additionally, localities within the burn area have a history of unauthorized OHV and mountain bike use, and user-created trails are evident which access the Forest. Prior to the fire, chaparral vegetation, blocks and fencing inhibited movement of OHVs and mountain bikes. With the loss of this vegetative barrier, there is a potential for unauthorized dispersal of OHVs and mountain bikes into the burned area. The introduction and expansion of weed populations

Risk Assessment for Ecosystem/Native Plant Recovery: Probability: Very Likely 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 and mountain bikes within the burn area and dozer lines that will be highly detrimental to vegetation recovery and encourage noxious weed invasion in native habitats

Magnitude: Major due to the high potential for vegetation type conversion to non-native annual grasslands across the burn area. Recovery of native vegetation for mixed chaparral is about 10 to 15 years but the recovery for Joshua Tree, Juniper and Pinyon Pines is at least 45 to 50 years.

Risk Level: Very High. *Several treatments are proposed to address the ecosystem/native plant recovery critical value.* An early detection/rapid response treatment is proposed for the non-native invasive plants. A forest closure and closure patrols are proposed to limit the potential for OHV incursions.

B. Emergency Treatment Objectives

- Provide for public safety
- Limit damage to property
- Limit loss of soil productivity and provide for natural vegetative recovery
- Early detection and rapid response of nonnative invasive plants

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

- **Land:** EDDR: 85
- **Channel:** n/a
- **Roads/Trails:** 8
-

D. Protection/Safety: 85

Table 6: Probability of Treatment Success

	<i>1 year after treatment</i>	<i>3 years after treatment</i>	<i>5 years after treatment</i>
Land	85	95	100
Channel	NA		
Roads/Trails	85		
Protection/Safety	85	100	100

E. **Cost of No-Action (Including Loss):** Erosion and loss off of soil productivity off of steep dozer line onto Desert Front Road, even with water bars put into place; Likely spread of invasive weeds in fire area impeding native plant recovery; spread of invasive weeds from dozer lines and opened roads; potential access to quarry hazards (although visual barriers were put in place; Without blocking roads and trails, access to hazardous conditions and road damage could occur.

F. Cost of Selected Alternative (Including Loss)

G. Skills Represented on Burned-Area Survey Team:

<input type="checkbox"/> Soils	<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Engineering	<input checked="" type="checkbox"/> GIS	<input checked="" type="checkbox"/> Archaeology
<input checked="" type="checkbox"/> Weeds/Botany	<input checked="" type="checkbox"/> Recreation	<input type="checkbox"/> Fisheries	<input checked="" type="checkbox"/> Wildlife	
<input type="checkbox"/> Other: PAO				

Team Leader: Jamie Uyehara (trainee)

Email: julie.uyehara@usda.gov

Phone(s) 626-372-6107

Acting Forest BAER Coordinator: Jamie Uyehara

Email: Jamie.uyehara@usda.gov **Phone(s):** 626-372-6107

Team Members *Table 7: BAER Team Members by Skill*

Skill	Team Member Name
<i>Team Lead(s)</i>	Jamie Uyehara (trainee)
<i>Soils</i>	Heidi George/Janet Nickerman
<i>Hydrology</i>	Heidi George
<i>Engineering</i>	Bradley Hoffman (READ/REAF)
<i>GIS</i>	
<i>Archaeology</i>	Thalia Ryder (READ also)
<i>Botany/Weeds</i>	Janet Nickerman
<i>Recreation</i>	Ray Kidd
<i>Wildlife</i>	Jamie Uyehara
<i>PAO</i>	

H. Treatment Narratives

Land Treatments

1) Early Detection and Rapid Response (EDRR) – Invasive and Noxious Weeds

In and along dozer lines, hand lines, drop points, safety zones, riparian areas, and adjacent to known invasive plant populations.

Proposed Treatment Areas	
Dozer lines and opened preattack/fuelbreaks	16.2 miles
Riparian Corridors	3 miles
Recovering Joshua tree forest	59 acres

Surveys will begin in 2023 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 and retardant drops in floodplains 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.

SPECIES	BLOOM PERIODS/maturation	Probability of success
Prickly Russian thistle	‘Tumbles’ in late summer to fall, allowing spread of seeds to new areas. Seeds can germinate with little rainfall.	High-90% of seeds bloom in the first year, so treatment within one year will control most of the dispersed seeds onto the fire footprint and suppression activity areas.
Cheatgrass	Casts seeds by mid-June	An unburned area next to the fire showed scattered cheatgrass, so early detection and response of new seedlings prior to their setting seed is likely to be successful.
Tumble mustard	Flowers April through Sept	Tumble mustard was noted in patches along Horse Canyon Road (Appendix A); Because of this patchiness, treatments are likely to be successful.

Surveying will include walking the lines, documenting and hand pulling and/or applying approved herbicides to weed occurrences at the time of inspection. Herbicide will be used in compliance with the Forest Wide NEPA project, “Angeles National Forest and San Gabriel Mountains National Monument Plan for Invasive Plants”,

September 2015. 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.

Priority treatment areas:

- a. Riparian corridors
- b. All dozer lines that crossed known populations of invasive plants
- c. Areas where the fire crossed the highway.
- d. Joshua tree woodlands

The estimated cost and implementation approach for EDRR was closely considered based on previous forest efforts. Two reasons below highlight the need for EDRR.

- A weed wash station did not arrive until the fire was nearly contained.
- The ANF has extremely limited staff and cannot do this work internally. We've had great success in controlling invasives after fires with our partners and contractors. The ANF ecosystem would be completely different if not for EDRR BAER funding.

Weed detection surveys to determine whether ground disturbing activities related to the Sheep Fire have resulted in the expansion of noxious weeds is requested for the first year. Estimated costs assume that three 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.

EDRR surveys for Burn Area will include areas with Joshua tree woodland along the intermittent Sheep Creek and ephemeral drainage in the floodplains near Hwy 2. Pinyon pine juniper and western/California juniper areas will be surveyed for weeds to reduce competition for the native species. Pinyon pine seedlings are vulnerable to competition and to further wildfire activity. With the ash and nutrients, pinyon pine seedlings could regrow the forest and this reforestation process would be enhanced with removal of the invasive weeds for competition. Removing the invasive weeds will also reduce the fuel type which will carry wildfire to the vulnerable seedlings.

EDRR Surveys for Burn Area					
Item	# of Units	Unit	Unit Cost	# of Days	Cost
4 person contract weed crew	1 crew	Day	\$3,000.00	4	\$12,000.00
Hotel room	2	Lump	\$200.00	3	\$1,200.00
Supplies- herbicide and PPE	1	Lump	\$1000.00	1	\$700.00
Total Cost for EDRR in Burn Area					\$13,900.00
EDRR Surveys for Fire Suppression Activities					
4 person contract weed crew	1	Crew/Day	\$3,000.00	6	\$18,000.00
Hotel room	2	1	\$200.00	4	\$2000.00
Supplies- herbicide and PPE	1	1	\$1,500.00	1	\$1000.00
Total Cost					\$21,000.00
GRAND TOTAL					\$34,900.00

****Four people can treat approximately 1.5 miles per day with heavy infestations and steeper slopes.** Because the native plants will also be establishing and growing, the use of herbicides might be limited. Observations noted that the unburned Joshua trees tended to have annual grasses and weeds under them, so treatment will require canvassing area of Joshua tree woodlands for newly germinated weeds. Pine seedlings will also be establishing in the lower slopes and will need a careful strategy to try and allow 'scalping' around seedlings to reduce the probability of recurring fire.

Hazardous Materials -- There was an old shooting range within the fire area, but no ammunition was found at the site when visited on June 16. So, no cleanup of hazardous materials nor micro-trash materials are needed.

Road Treatments

Roads: Access to administrative roads will be blocked by boulders.

Treatment Objectives: The primary objectives of the road and infrastructure treatments are to:

- a. Protect and stabilize Forest Service infrastructure at risk of damage for resource recovery time and preventing trespass.
- b. Mitigate public safety hazards along NFS roads.
- c. Reduce risk to downstream and downslope infrastructure where possible.

1. Road blockage installation with boulders. This will be done by contractor with heavy equipment and purchased boulders. Contractor will need to use a backhoe or similar equipment to set the boulders into place, burying the lower third of boulders into the ground.

Contract estimate per site	\$3,000
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2. Road Storm-Proofing NA

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3. Road Drainage Structure Replacements/Improvements-NA

4. Storm Inspection/Response

Storm inspection/response will keep erosion controls and roadblocks functional by cleaning sediment and debris from in and around features between or during storms. This work will be accomplished through employees, contractor or youth group equipment and labor.

Locations: Quarry Road; Dozer line onto Desert Front Road;

Road Treatments #3: Storm Inspection/Response				
Item	Unit	Unit Cost	# of Units	Cost
Storm Response – OT for employees	Hr	\$40/hr	15	\$ 600
Reapplication of boulder blockage OT, twice/winter	8-hr day	\$ 40/hr	2	\$ 640
Total				\$1240

5. Contract Preparation and Administration – usual salary expense
6. Cultural Monitor (Archaeologist) Archaeologist will review digging for boulder work for regular salary expense.

Trail Treatments: It is expected that hiking and mountain biking use will increase on FS trails, and may spill onto opened up areas from dozer line work. However, no trail treatments are proposed, (other than EDRR). ANF considered signs, but think that the signs will attract more attention than the visual barriers that have been put into place during suppression repair.

- 1) Trail Storm-Proofing – NA

Protection/Safety Treatments

- 1) Dozer Line and Road Access

Previously described.

- 2) Protection of Forest Service Property

- 3) Roads & Trails: Human Life and Safety (and Resource) Protection – Closure and Hazard Warning Signage

To ensure safety for Forest visitors and protection to Forest resources during the natural recovery period,

1. Dozer line from Table Mountain Road ==gate will be closed at the bottom of Table Mountain Road. The dozer line that was opened up from Table Mountain Road is currently blocked with logs. Visual barriers plus large boulders will be embedded into access points where there might be interception from other trail use in the area.

Dozer line Treatments on Table Mountain and dozer line off of Desert Front Road: Visual Barrier				
Item	Unit	Unit Cost	# of Units	Cost
Contract estimate for purchase, transport and installation of boulders	2	\$3,000		\$6,000
Total Cost – Dozer line				\$6,000

4) Treatment Implementation Leader

The ANF currently has the staff to dedicate to properly guiding the implementation of the suite of treatments recommended for this fire. In the future, we may ask for an implementation lead by contractor. Currently, we will have the Monument Resource Officer or Monument Recreation Officer oversee the implementation of these projects.

I. Monitoring Narrative

Treatment Effectiveness Monitoring

Effectiveness Monitoring: Monitoring the effectiveness of BAER treatments (as described above) will be used to determine if additional treatments are needed. For EDRR effectiveness, one service purchase order of less than \$2,500 will use either a drone or remote sensing combination to examine weed occurrence following treatment.

For roads, currently, the implementation leader will monitor this effectiveness. The following form or similar form will be filled out to assess the roads.

1) Road and dozer line treatment Effectiveness Monitoring:

- a. *Monitoring Questions*
 - ☐ Is the road-tread stable?
 - ☐ Is the road leading to concentrating runoff leading to unacceptable off-site consequences?
- b. *Measurable Indicators*
 - ☐ Rills and/or gullies forming of the road
 - ☐ Loss of road bed.
- c. *Data Collection Techniques*
 - ☐ Photo documentation of site
 - ☐ Inspection Checklist (attached)
- d. Analysis, evaluation, and reporting techniques
 - ☐ Monitoring will be conducted after storm events. If the monitoring shows the treatment to be ineffective at stabilizing road and there is extensive loss of road bed or infrastructure an interim report will be submitted. A several page report would be completed after the site visit. The report would include photographs and a recommendation on whether additional treatments are necessary.
- e. EDRR treatment effectiveness will be conducted as a contract for remote sensed and satellite imagery data.

Road Inspection Checklist (Example)

Date: _____ Time: _____

Inspector _____

Forest _____ Road # _____

Portions of Road Inspected _____

Describe locations reviewed during inspection: _____

Was there road damage? Yes _____ No _____

If yes, GPS coordinates of repair site _____

Describe damage and cost to repair _____

Photo taken of road damage _____

Recommended actions to repair: _____

Monitoring Treatment: Dozer line and EDRR treatments				
Item	Unit	Unit Cost	# of Units	Cost
Contractor for remote sensing or drone	Day	\$500	5	\$2500
Total Cost				\$2500

Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

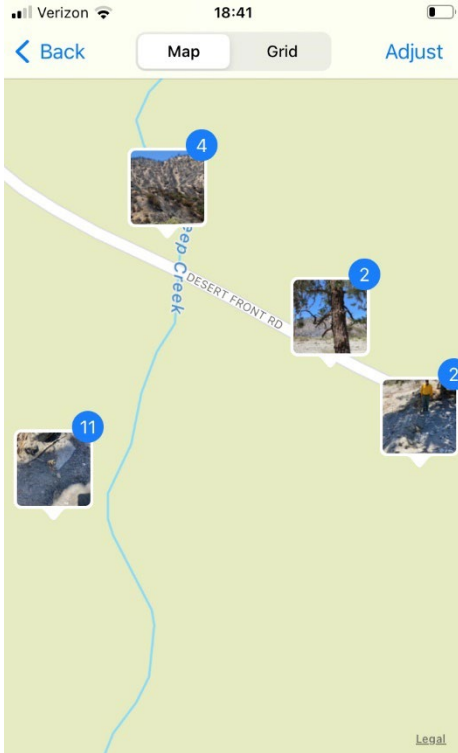
			NFS Lands				Other Lands			All
		Unit	# of	WFSU	Other		# of	Fed	# of	Non Fed
Line Items	Units	Cost	Units	SULT \$	\$		units	\$	Units	\$
A. Land Treatments										
EDRR Fire	day	3000	4	\$12,000				\$0		\$0
EDRR travel/supplies	\$	1900		\$1,100				\$0		\$1,100
EDRR Suppression	day	3000	6	\$18,000				\$0		\$0
EDRR travel/supplies		1000		\$1000				\$0		\$0
<i>Subtotal Land Treatments</i>				<i>\$34,900</i>				<i>\$0</i>		<i>\$0</i>
B. Channel Treatments										
NA				\$0				\$0		\$0
				\$0				\$0		\$0
				\$0				\$0		\$0
				\$0				\$0		\$0
<i>Subtotal Channel Treat.</i>				<i>\$0</i>				<i>\$0</i>		<i>\$0</i>
C. Road and Trails										
Blockage of road	contract	3000	2	\$6,000				\$0		\$0
Storm patrols	agreement	900	2	\$1,240				\$0		\$0
				\$0				\$0		\$0
				\$0				\$0		\$0
<i>Subtotal Road & Trails</i>				<i>\$7,240</i>				<i>\$0</i>		<i>\$0</i>
D. Structures										
				\$0				\$0		\$0
				\$0				\$0		\$0
				\$0				\$0		\$0
<i>Subtotal Structures</i>				<i>\$0</i>				<i>\$0</i>		<i>\$0</i>
E. BAER Evaluation										
GS-13	day	675.56	6	\$4,053				\$0		\$0
GS-12	day	550	4.5	\$2,475				\$0		\$0
GS-11s	day	465	5	\$2,325						\$2,325
F. Monitoring	FA	0		\$0				\$0		\$0
Contract	contract	2500	1	\$2,500						\$2,500
G. Totals				\$44,640				\$0		\$0

PART VII - APPROVALS

Forest Supervisor

Date

Appendix A

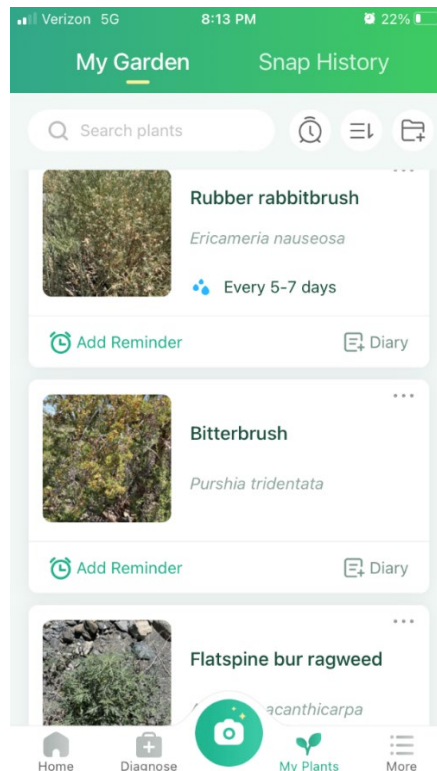
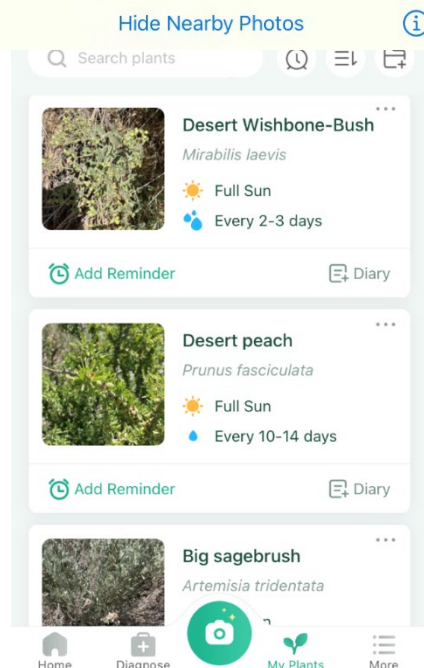


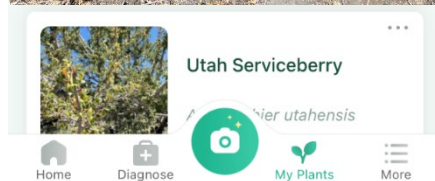
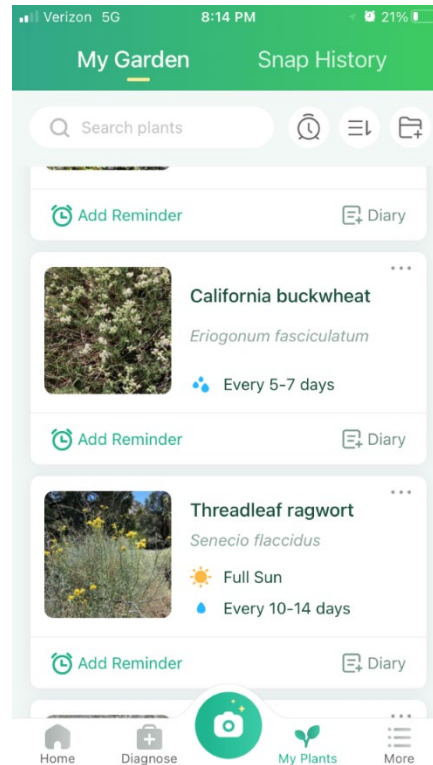
On June 9, 2022, Ray Kidd, Recreation Officer, and Jamie Uyehara, Wildlife/Resources, took these representative pictures of the unburned vegetation in the floodplain of Sheep Creek.

Sheep Creek is an intermittent stream that is fed by snowmelt/winter storms and monsoon summer storms. The substrate reflect the flooding events that occur.

And the vegetaton type is 'mixed chaparral' which inadequately describes the biodiversity of this area. Possibly because of the frequent mobilization of substrates and the poor nutrient quality, there are few weeds within the floodplain itself (annual grass species including cheatgrass and other annual grasses, as well as mustard

These photos were taken within 100-m north of the Desert Front Road. The identification of the plants in the photos was by the app, "Picture This".





Blazing star was also

found in the area just south of Desert Front Road.

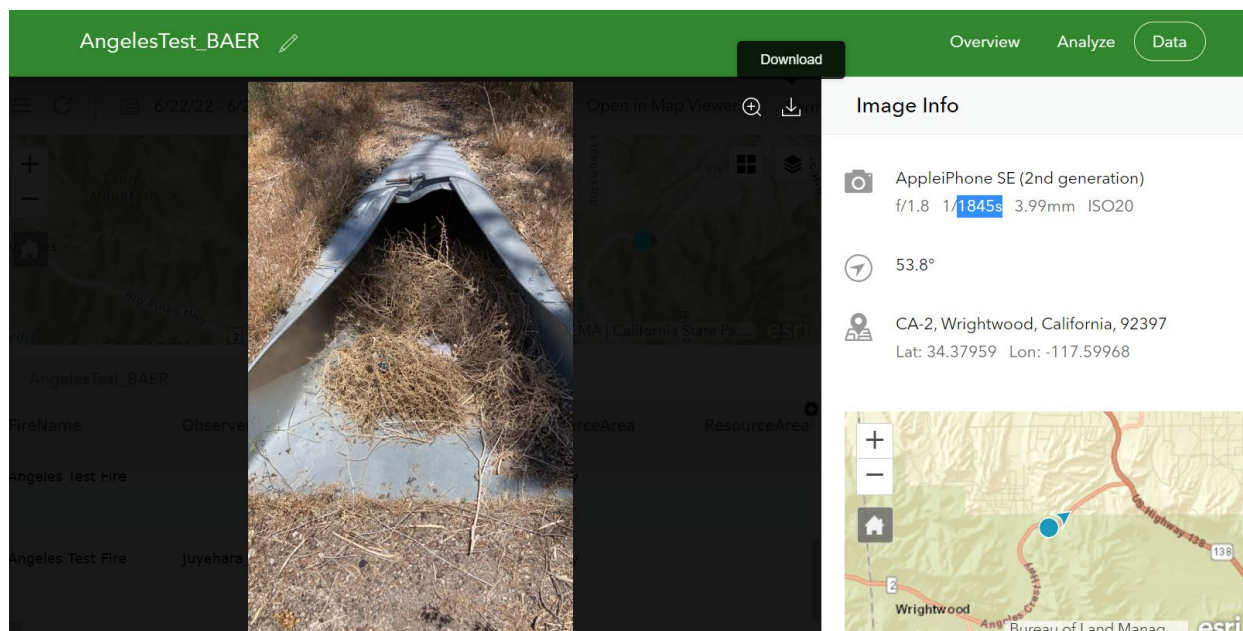


Other species which were noted were singleleaf pinyon pine and western juniper.

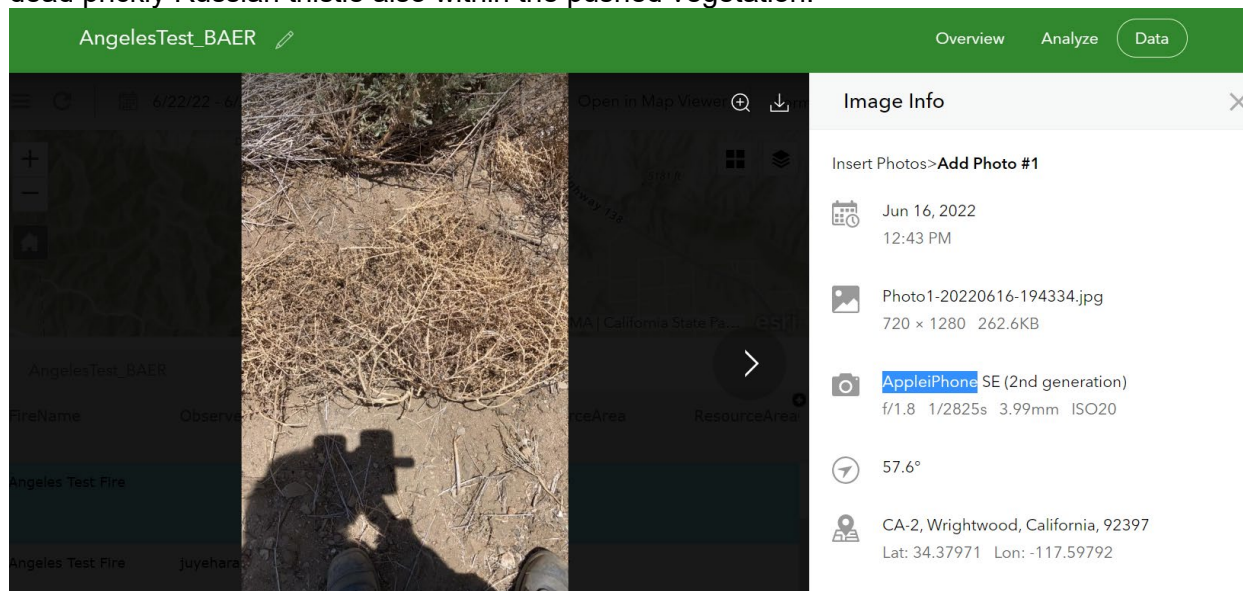
Prickly Russian Thistle as noted in vegetation/dirt pile and flumes

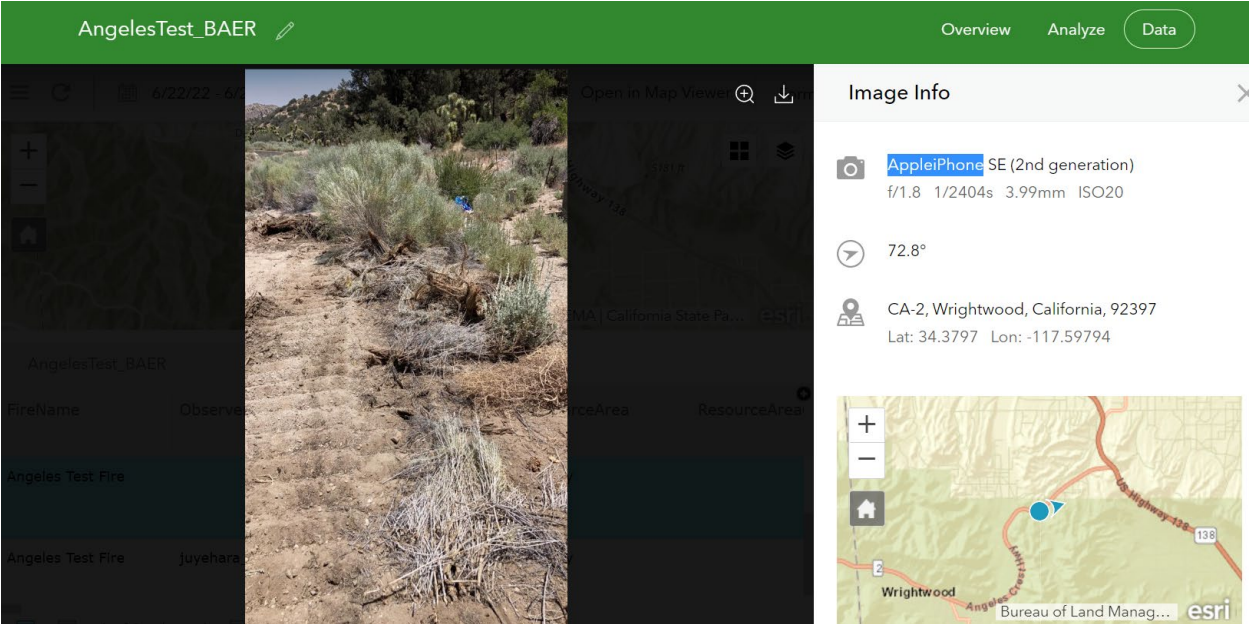
Survey123 photos

Along Hwy 2, there was a flume with dead prickly Russian thistle. This is within the CalTrans ROW but may want to let them know to remove the Russian thistle along their ROW.



Below, are photos of the shoulder where the vegetation was pushed aside, widening the shoulder. Here was dead prickly Russian thistle also within the pushed vegetation.





Vegetation along Horse Canyon Road
In general, there are not many invasive weeds

